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Callous-Unemotional Traits and Conduct Disorder Symptoms as Prospective Risk Factors for Adolescent Sexual Activity

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Abstract

Objective: Conduct disorder (CD) has been shown to increase risk for adolescent sexual activity and pregnancy. Despite increasing evidence underscoring callous-unemotional (CU) traits as a marker for youth with CD prone to especially poor outcomes, researchers have yet to explore whether CU traits confer additional risk of early sexual intercourse, unprotected sex and pregnancy. **Method:** The Developmental Pathways Project sample, including 471 ethnically-diverse 6th grade boys and girls followed into 12th grade, was used to examine whether CU traits and CD symptoms in 6th grade uniquely and/or synergistically predicted having sexual intercourse by age 13 as well as unprotected sex and pregnancy by 12th grade. **Results:** Parent-rated CU traits and CD symptoms interacted to predict young adolescents having sexual intercourse, such that youth with elevated CU traits *and* CD symptoms in 6th grade were more likely to reporting having sex by age 13 than those with low CU traits and/or low CD symptoms. Elevated CD symptoms, but not CU traits, uniquely increased risk of pregnancy by 12th grade. Neither CU traits nor CD symptoms predicted engagement in unprotected sex in 12th grade. **Conclusions:** Our findings indicate that adolescents with conduct problems and CU traits are especially at risk for early sexual intercourse. Conversely, elevated CU traits do not appear to increase risk of unprotected sex or pregnancy among young adolescents with conduct problems. Research is needed to replicate these findings and to explore mechanisms underlying the association between CU traits, CD symptoms and early adolescent sexual activity.

Keywords

Callous-unemotional traits; conduct disorder; sexual intercourse; unprotected sex; pregnancy

A recent report from the Centers for Disease Control and Prevention (CDC; 2012) indicates that having sexual intercourse during adolescence is a normative behavior, with over 60% of boys and girls reporting that they had sex by 12th grade. However, having intercourse in *early* adolescence (i.e. by 13 years of age) is relatively uncommon (6.2%; CDC, 2012) and is associated with a number of problem behaviors, including aggression, delinquency, substance use and suicidal ideation (Albert, Brown, & Flanigan, 2003; Epstein & Spirito, 2010; Williams, Connolly, & Cribbie, 2008). Early engagement in sexual activity is also

concerning amid evidence indicating that sexually-active adolescents tend to use birth control inconsistently (CDC, 2012). Thus, the earlier adolescents have sex, the greater their potential risk for unintended pregnancies (Albert et al., 2003). Given the problems associated with early sexual activity, not to mention the difficulties faced by teen parents (Klein, 2005), studies are needed to identify potential risk factors for early and risky sexual behavior during adolescence.

Researchers have begun to highlight variables that increase risk of adolescents reporting early sexual intercourse, unprotected sex and unintended pregnancy. One risk factor appears to be conduct disorder (CD). Adolescents with CD exhibit a range of problem behaviors, including delinquency and substance abuse/dependence (Lahey & Waldman, 2007). As health-risk behaviors tend to cluster together during adolescence (Donovan, Jessor, & Costa, 1988), there is reason to believe that adolescents with CD may be more likely than those without CD to engage in intercourse, to not use birth control, and to become pregnant or impregnate their partners. Preliminary evidence indicates that youth with elevated CD symptoms are at increased risk of having sexual intercourse by age 16 (Monuteaux, Faraone, Gross, & Biederman, 2007; Paul, Fitzjohn, Herbison, & Dickson, 2000) and of becoming pregnant or impregnating a partner by late adolescence / emerging adulthood (i.e. ages 18 to 26; Flory, Molina, Pelham, Gnagy, & Smith, 2006; Pajer, Kazmi, Gardner, & Wang, 2007). Studies have yet to examine whether CD is associated with having sex by *early* adolescence (i.e. by age 13), when sexual activity is not normative and is associated with problem behaviors (e.g., delinquency, substance use; Albert et al. 2003; Williams et al., 2008), and research has not assessed for predictors of pregnancy during high school, when the stress of being a teen parent is at its zenith (Klein, 2005). Research is also needed to build upon our limited understanding of CD as a risk factor for inconsistent use of birth control during adolescence, with one study finding a marginally significant trend in the expected direction (Flory et al., 2006).

Another unaddressed gap in the literature is the role that callous-unemotional (CU) traits (i.e. lack of empathy, lack of guilt for wrong doing, shallow affect) may play in exacerbating early and risky sexual behavior among youth with elevated CD symptoms. CU traits have been consistently shown to predict delinquency over and above CD symptoms and to enhance the effects of CD symptoms in the development of later antisociality, such that youth with elevated CU traits *and* CD symptoms are at greatest risk of delinquency through adolescence and young adulthood (for a review, see Frick & Moffitt, 2010). CU traits may be linked with early and risky sexual behavior independent of CD symptoms for at least two reasons. First, youth with elevated psychopathic traits, including CU traits, are known to disregard social norms (e.g., viewing moral transgressions as permissible; Blair, 1997; Blair, Jones, Clark, & Smith, 1995). As perceived norms about refraining from sex during early adolescence tend to reduce the likelihood of young adolescents engaging in sexual activity (Santelli et al., 2004), it may be that youth who do not abide by social norms, such as those with elevated CU traits, are most likely to engage in early sexual intercourse. Second, because youth with elevated CU traits tend to be more sensation-seeking (Essau, Sagagawa, & Frick, 2006) and more fearless (Frick, Lilienfeld, Ellis, Loney, & Silverthorn, 1999; Pardini, 2006), they may be more likely to engage in high risk sexual behavior (e.g., not using birth control). Indeed, sensation-seeking and fearlessness are positively associated with risky sexual activity (Fulton, Marcus, & Payne, 2010; Hoyle, Fejfar, & Miller, 2000).

Preliminary studies have found positive associations between CU traits and adolescent sexual behavior (Caputo, Frick & Brodsky, 1999; Lawing, Frick & Cruise, 2010; White, Cruise, & Frick, 2009). However, the generalizability of these findings is limited in two meaningful ways. First, every study was conducted with juvenile offenders and only assessed for prediction of sexual aggression. It remains unclear whether CU traits are linked

with early or risky sexual activity in community samples of adolescents and with sexual behaviors more germane to typical adolescents, such as rates of unprotected sex. Second, none of the prior studies accounted for the severity of CD symptoms. It may be that CU traits increase risk of adolescent sexual activity regardless of CD symptoms, as has been shown in the prediction of delinquency (Frick, Stickle, Dandreaux, Farrell, & Kimonis, 2005). Alternatively, CU traits may predict sexual behavior in adolescence because they identify youth with elevated CD symptoms who are most likely to report early and risky sexual activity, as has been observed in relation to substance use (Wymbs et al., 2012).

The current study investigated whether CU traits and CD symptoms in early adolescence uniquely or synergistically predicted early engagement in sexual intercourse, infrequent use of birth control, and pregnancy. We hypothesized that youth with elevated CU traits or CD symptoms in 6th grade would be more likely to have had sex by 13 years of age, to engage in unprotected sex, and to become pregnant (girls) or impregnate their partner (boys) by 12th grade than youth with lower CU traits or CD symptoms. Next, we hypothesized that youth with elevated CU traits *and* CD symptoms in 6th grade would be at particularly high risk of reporting early engagement in sexual intercourse, infrequent birth control use, and becoming pregnant or impregnating their partner by 12th grade.

Method

Sample

The Developmental Pathways Project (DPP) is a community-based prospective cohort study designed to examine the antecedents, phenomenology, and outcomes of depression and conduct problems in early adolescence. DPP participants were recruited from four Seattle-area public schools located in distinct areas within the city, and together have a racial/ethnic distribution that is nearly identical to the total enrolled student population of the school district. Universal emotional health screening was carried out with 6th grade students at these schools in four consecutive years (2001–2004); details of the screening procedure have been described elsewhere (Vander Stoep et al., 2005).

In brief, a stratified random sample of 807 students was selected for longitudinal follow-up with students scoring high ($> .5$ SD above sample mean) on depressive and/or conduct problem scores over-sampled according to a ratio of 1:1:1:2 from the four psychopathology screening groups (comorbid [CM], depressed only [DP], conduct problem only [CP], elevated on neither dimension [NE]). Since in the general school population, the ratio is approximately 1 CM: 1 DP: 1 CP: 6 NE, this sample selection approach yielded an over-representation of children in the CM, DP, and CP groups relative to their distribution in the general population. Of those selected, 521 (64.6%) students and their parents/guardians consented to participate in the DPP (described in Vander Stoep et al., 2011). At baseline, participants were 12.0 years-old on average (range 11–13.6), 51.6% male and included 1.4 % Native Americans, 24.9% Black, 24.1 % Asian/Pacific Islanders, and 10.1% Hispanics; the remaining 39.5% were Caucasian. Nearly half (48.1%) were raised in households with a total income under \$50,000.

Baseline interviews were conducted within 3 months of screening (Fall 6th Grade), and in-person follow-up interviews were conducted 6, 12, 18, 24, 36 and 72 months afterward (12th grade). Of the 521 participants originally enrolled in DPP, 471 (90.4%) completed the 12th grade assessment and provided data for this study. The participants included in this study did not differ significantly from those without follow-up data on any demographic or predictor variable (Cohen's d range .00 – .26).

Measures

CD symptoms—CD symptom counts were measured in 6th grade using the Diagnostic Interview Schedule for Children (DISC; Shaffer, Fisher, Lucas, Dulcan, & Schwab-Stone, 2000). The DISC has well-established psychometrics, including good test-retest agreement ($r = .66$) and concurrent validity ($r = .70$) for parent-reported CD (Schwab-Stone, Shaffer, Dulcan, Jensen, & Fisher, 1996). Symptoms endorsed by parents as occurring within the past year were summed to form CD symptom counts, ranging from 0 to 26.

CU traits—Adolescent CU traits were measured in 6th grade using the parent-rated Antisocial Process Screening Device (APSD; Frick & Hare, 2001). The APSD has well-established inter-rater and test-retest reliability as well as discriminant and predictive validity (Frick & Hare, 2001). For the purpose of this study, only the 6 items assessing CU traits were used. As discussed previously by Wymbs and colleagues (2012), confirmatory factor analysis (CFA) factor loadings and item-total correlations with the present sample indicated that two CU scale items (“Does not show feelings or emotions” and “Keeps the same friends”) did not fit well with the remaining items. CFA indicated that the 4-item CU scale (excluding the two underperforming items) fit the data well [$\chi^2(2) = 2.11, p = .34$, RMSEA = .01, CFI = 1.00]. Factor loadings ranged between .54 and .74, and the latent factor explained between 29% and 54% of the variability in the indicators. Internal consistency was adequate ($r = .66$).

Sexual Activity—As part of the 12th grade assessment, adolescents were queried regarding their sexual activity on a shortened version of the Quality of Life Interview (QOLI). The QOLI was developed and implemented by Cohen and colleagues (1993) during their “Children in Community Study” to assess adolescent functioning across a number of core domains. For the purposes of the DPP, the QOLI was pared down to assess only the quality of romantic relationships, including items related to sexual activity. Participants reported on whether they had ever engaged in “sexual intercourse,” which was defined as vaginal, anal or oral sex. Those who reported having sex ($n = 281$) indicated how old they were the first time they had intercourse. The number of adolescents who reported engaging in sexual intercourse by 13 years of age was recorded. Sexually-active adolescents also reported their present frequency of birth control use (0 = no, 1 = Sometimes, 2 = Always) and whether they had ever been pregnant (if female) or gotten someone pregnant (if male).

Covariates—We utilized sampling weights based on depression/conduct problem status, gender, race/ethnicity, and educational program in all analyses to ensure the generalizability of study findings to the screened population of Seattle Public School students. Participant age, gender, race/ethnicity and depressive symptoms at baseline were also covaried in all analyses as these variables were associated with outcomes tested in this study. Additionally, parent-reported DISC depression symptom counts at baseline were covaried in these analyses.

Results

Descriptive statistics for covariates, predictors and outcome variables in the regression analyses are included in Table 1. In this sample, 20 adolescents reported having sex by time they were 13 years old, 98 adolescents reported using birth control “no” or “sometimes” in 12th grade, and 28 adolescents reported becoming pregnant (girls) or impregnating their partner (boys) by 12th grade. Adolescents whose parents reported they exhibited more CU traits and more CD symptoms in 6th grade were more likely to report having had sex by age 13 and to become pregnant/impregnate their partner by 12th grade. Adolescents whose

parents reported they exhibited more CU traits and CD symptoms in 6th grade were less likely to use birth control in 12th grade.

Binary logistic regression analyses demonstrated that parent-reported CU traits and CD symptoms in 6th grade interacted in the prediction of adolescents reporting early engagement in sexual intercourse (Table 2).¹ Simple slopes calculated at different levels of CU traits indicated that adolescents whose parents rated them as having elevated CU traits *and* CD symptoms in 6th grade were more likely to have sex by age 13 than those with low levels of CU traits and elevated CD symptoms (Figure 1). Ordinal logistic regression showed that neither parent-reported CU traits nor CD symptoms in 6th grade uniquely predicted use of birth control in 12th grade among sexually-active adolescents (Table 3). Finally, binary logistic regression analyses demonstrated that parent-reported CD symptoms, but not CU traits, in 6th grade uniquely predicted pregnancy by 12th grade (Table 4). Specifically, sexually-active adolescents whose parents rated them as having more CD symptoms in 6th grade were more likely to have become pregnant or to impregnate their partner by 12th grade.

Discussion

This study examined whether CU traits and CD symptoms operated as unique or synergistic predictors of early sexual intercourse, unprotected sex and pregnancy in a community sample of adolescent boys and girls. First, logistic regression models demonstrated that adolescent CU traits and CD symptoms reported by parents in 6th grade interacted to predict early sexual intercourse. To our knowledge, this is the first study to find that CD symptoms and CU traits interact to predict the early initiation of sexual activity during adolescence. Our findings extend previous research demonstrating parent-rated CD as a risk factor for sexual activity by age 16 (Monuteaux et al., 2007; Paul et al., 2000) by indicating that those with elevated CD symptoms, who do not feel guilty for wrongdoing or are not concerned about the feelings of others, are especially likely to have sex at even younger ages (by age 13). Youth with elevated CU traits may be more likely to act on desires to have sex in early adolescence given their sensation-seeking and fearless tendencies (e.g., Essau et al., 2006; Pardini, 2006) and proclivity to ignore social norms (e.g., Blair, 1997). In light of the difficulties commonly faced by adolescents reporting sexual activity by age 13 (e.g., alcohol and illicit drug use; Albert et al., 2003), the present findings underscore another potential factor contributing to deleterious outcomes faced by youth with elevated CU traits and CD symptoms (for review, see Frick & Moffitt, 2010).

Somewhat differently, analyses showed that neither CU traits nor CD symptoms uniquely increased risk of sexually-active adolescents engaging in unprotected sex in 12th grade. These results corroborate findings from Flory and colleagues (2006), who also failed to find that youth with elevated CD symptoms reported significantly less consistent condom use relative to peers with low CD symptoms. That said, because correlations in this study indicated that both CU traits and CD symptoms were associated with less frequent use of birth control, it may be that both variables accounted for the same variance in our regression analyses (i.e. they were non-unique predictors). Conversely, CU traits and CD symptoms in 6th grade were significantly correlated with level of pregnancy in 12th grade, but only CD symptoms uniquely predicted adolescent pregnancy by 12th grade. This finding replicated previous research demonstrating positive associations between CD and teen pregnancy

¹Though not reported herein, we tested gender as a moderator of the associations between CU traits, CD symptoms, and early sexual activity. In brief, gender did not moderate associations between parent-reported CU traits or CD symptoms and adolescents engaging in sexual activity prior to age 13. Gender also did not moderate associations between CU traits or CD symptoms and birth control use in 12th grade or pregnancy by 12th grade.

(Flory et al., 2006; Pajer et al., 2007) and extends it by suggesting that CU traits do not increase risk over and above CD symptoms. It is unclear why CU traits contributed uniquely to risk of early sexual activity, but not pregnancy (or birth control use). It may be that if these outcomes were assessed earlier (e.g., by 9th grade), which would be an indicator of less normative sexual behavior, CU traits could have more strongly associated with birth control use and pregnancy. Additional studies are needed to examine the unique and synergistic roles of CU traits and CD symptoms in predicting contraception use and teen pregnancy, particularly in early adolescence or in clinic-referred samples, and to examine how youth with conduct problems handle the outcomes of unprotected sex and pregnancy (e.g., sexually-transmitted diseases; parenting behavior).

This study has many strengths, including use of a large, diverse, longitudinal sample and prediction of sexual activity from early to late adolescence. Nonetheless, several weaknesses limit the generalizability of our findings. First, the measure of CU traits used in this study included fewer items than the subscale proposed by Frick and Hare (2001), which means that the interpretation of our CU scale, although more internally consistent and unidimensional (by alpha and CFA), differs somewhat from what is reported elsewhere in the literature. Second, engaging in oral and anal sex was included in the definition of “sexual intercourse.” As these behaviors are not commonly included in typical definitions of sexual (i.e. vaginal) intercourse, it may be more appropriate to consider *early sexual intercourse* in this study as *early sexual activity*. Finally, because study participants may have been in the same grade level and in the same school as other participants, they may have engaged in sexual activities together, thereby creating dependency in the data. Though unlikely, dependency cannot be ruled out and should be considered when interpreting the results.

Taken together, this study underscores early adolescent CU traits and CD symptoms as unique risk factors for early sexual activity during adolescence. In light of the proposal to add CU traits as a modifier of CD diagnostic criteria in DSM-V (Frick & Moffitt, 2010), studies are needed to determine the degree to which CU traits increase risk of delinquency as well as relevant related behaviors, such as early sex, among youth with CD. Particularly warranted is research on potential modifiable mechanisms that may shape prospective associations between CU traits, CD symptoms and deleterious outcomes. For example, it would be intriguing to extend emerging research showing negative associations between parental warmth and later behavior problems among youth with elevated CU traits and CD symptoms (McDonald, Dodson, Rosenfield, & Jouriles, 2011; Pasalich, Dadds, Hawes, & Brennan, 2011) by examining whether parental warmth may also deflect adolescents off paths towards early engagement in sexual activity. Furthermore, clinicians treating young adolescent men and women with conduct problems should consider routinely providing psychoeducation on safe sex practices and effective methods of birth control. Finally, researchers should test whether pregnancy prevention programs (e.g., Lieberman, Berlin, Palen, Silber Ashley, 2012) are effective for adolescents with conduct problems, and improve them as needed by including parents (sp. parental warmth) or offering free access to contraception. Studies of this kind may provide a foundation for reducing the number of children raised by at-risk teenage parents.

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References

- Albert, B.; Brown, S.; Flanigan, C. 14 and Younger: The Sexual Behavior of Young Adolescents (Summary). Washington, DC: National Campaign to Prevent Teen Pregnancy; 2003.
- Blair RJR. Moral reasoning and the child with psychopathic tendencies. *Personality and Individual Differences*. 1997; 22:731–739.
- Blair RJR, Jones L, Clark F, Smith M. Is the psychopath ‘morally insane’? *Personality and Individual Differences*. 1995; 19:741–752.
- Caputo AA, Frick PJ, Brodsky SL. Family violence and juvenile sex offending: The potential mediating role of psychopathic traits and negative attitudes toward women. *Criminal Justice and Behavior*. 1999; 26:338–356.
- Centers for Disease Control and Prevention. Youth Risk Behavior Surveillance—United States, 2011. *Morbidity and Mortality Weekly Report*. 2012; 61
- Cohen P, Cohen J, Kasen S, Velez CN, Hartmark C, Johnson J, Rojas M, Brook J, Streuning EL. An epidemiological study of disorders in late childhood and adolescence —I. Age-and gender-specific prevalence. *Journal of Child Psychology and Psychiatry*. 1993; 34:851–867. [PubMed: 8408371]
- Donovan JE, Jessor R, Costa FM. Syndrome of problem behavior in adolescence: A replication. *Journal of Consulting and Clinical Psychology*. 1988; 56:762–765. [PubMed: 3192793]
- Epstein JA, Spirito A. Gender-specific risk factors for suicidality among high school students. *Archives of Suicide Research*. 2010; 14:193–205. [PubMed: 20658374]
- Essau CA, Sagagawa S, Frick PJ. Callous-unemotional traits in a community sample of adolescents. *Assessment*. 2006; 13:454–469. [PubMed: 17050915]
- Flory K, Molina BSG, Pelham WE, Gnagy E, Smith B. Childhood ADHD predicts risky sexual behavior in young adulthood. *Journal of Clinical Child and Adolescent Psychology*. 2006; 35:571–577. [PubMed: 17007602]
- Frick, PJ.; Hare, RD. *Antisocial Process Screening Device (APSD): Technical Manual*. Tonawanda, NY: Multi-Health Systems Inc.; 2001.
- Frick PJ, Lilienfeld SO, Ellis M, Loney B, Silverthorn P. The association between anxiety and psychopathy dimensions in children. *Journal of Abnormal Child Psychology*. 1999; 27:383–392. [PubMed: 10582839]
- Frick, PJ.; Moffitt, TE. A proposal to the DSM-V Childhood Disorders and the ADHD and Disruptive Behavior Disorders Work Groups to include a specifier to the diagnosis of conduct disorder based on the presence of callous-unemotional traits. 2010. <http://www.dsm5.org/Proposed%20Revision%20Attachments/Proposal%20for%20Callous%20and%20Unemotional%20Specifier%20of%20Conduct%20Disorder.pdf>
- Frick PJ, Stickle TR, Dandreaux DM, Farrell JM, Kimonis ER. Callous-unemotional traits in predicting the severity and stability of conduct problems and delinquency. *Journal of Abnormal Child Psychology*. 2005; 33:471–487. [PubMed: 16118993]
- Fulton JJ, Marcus DK, Payne KT. Psychopathic personality traits and risky sexual behavior in college students. *Personality and Individual Differences*. 2010; 49:29–33.
- Hoyle RH, Fejfar MC, Miller JD. Personality and sexual risk taking: A quantitative review. *Journal of Personality*. 2000; 68:1203–1231. [PubMed: 11130738]
- Klein JD. Adolescent pregnancy: Current trends and issues. *Pediatrics*. 2005; 116:281–286. [PubMed: 15995071]
- Lahey, BB.; Waldman, ID. Personality dispositions and the development of violence and conduct problems. In: Flannery, DJ.; Vazsonyi, AT.; Waldman, ID., editors. *The Cambridge Handbook of Violent Behavior and Aggression*. New York: Cambridge University Press; 2007. p. 260–287.
- Lawing K, Frick PJ, Cruise KR. Differences in offending patterns between adolescent sex offenders high or low in callous-unemotional traits. *Psychological Assessment*. 2010; 22:298–305. [PubMed: 20528057]
- Lieberman LD, Berlin C, Palen L, Silber Ashley O. A theater-based approach to primary prevention of sexual behavior for early adolescents. *The Journal of Early Adolescence*. 2012; 32:730–753.

- McDonald R, Dodson MC, Rosenfield D, Jouriles EN. Effects of a parenting intervention on features of psychopathy in children. *Journal of Abnormal Child Psychology*. 2011; 39:1013–1023. [PubMed: 21553346]
- Monuteaux MC, Faraone SV, Gross LM, Biederman J. Predictors, clinical characteristics, and outcome of conduct disorder in girls with attention-deficit/hyperactivity disorder: A longitudinal study. *Psychological Medicine*. 2007; 37:1731–1741. [PubMed: 17451627]
- Pardini DA. The callousness pathway to severe violent delinquency. *Aggressive Behavior*. 2006; 32:1–9.
- Pajer KA, Kazmi A, Gardner WP, Wang Y. Female conduct disorder: Health status in young adulthood. *Journal of Adolescent Health*. 2007; 40:84.e1–84.e7. [PubMed: 17185210]
- Pasalich DS, Dadds MR, Hawes DJ, Brennan J. Do callous-unemotional traits moderate the relative importance of parental coercion versus warmth in child conduct problems? An observational study. *Journal of Child Psychology and Psychiatry*. 2011; 52:1308–1315. [PubMed: 21726225]
- Paul C, Fitzjohn J, Herbison P, Dickson N. The determinants of sexual intercourse before age 16. *Journal of Adolescent Health*. 2000; 27:136–147. [PubMed: 10899475]
- Santelli JS, Kaiser J, Hirsch L, Radosh A, Simkin L, Middlestadt S. Initiation of sexual intercourse among middle school adolescents: The influence of psychosocial factors. *Journal of Adolescent Health*. 2004; 34:200–208. [PubMed: 14967343]
- Schwab-Stone ME, Shaffer D, Dulcan MK, Jensen PS, Fisher P, Bird HR, et al. Criterion validity of the NIMH Diagnostic Interview Schedule for Children Version 2.3 (DISC-2.3). *Journal of the American Academy of Child and Adolescent Psychiatry*. 1996; 35:878–888. [PubMed: 8768347]
- Shaffer D, Fisher P, Lucas CP, Dulcan MK, Schwab-Stone ME. NIMH diagnostic interview schedule for children version IV (NIMH DISC-IV): Description, differences from previous versions, and reliability of some common diagnoses. *Journal of the American Academy of Child and Adolescent Psychiatry*. 2000; 39:28–38. [PubMed: 10638065]
- Vander Stoep A, Adrian M, McCauley E, Crowell S, Stone AL, Flynn C. Co-occurring depressive and conduct problems in early adolescence: A longitudinal evaluation of risk for suicide ideation and attempts. *Journal of Suicide and Life-Threatening Behaviors*. 2011; 41:316–329.
- Vander Stoep A, McCauley E, Thompson KA, Herting JR, Kuo ES, Stewart DG, et al. Universal emotional health screening at the middle school transition. *Journal of Emotional and Behavioral Disorders*. 2005; 13:213–223. [PubMed: 21430789]
- White SF, Cruise KR, Frick PJ. Differential correlates to self-report and parent-report of callous-unemotional traits in a sample of juvenile sexual offenders. *Behavioral Sciences and the Law*. 2009; 27:910–928. [PubMed: 19937922]
- Williams T, Connolly J, Cribbie R. Light and heavy heterosexual activities of young Canadian adolescents: Normative patterns and differential predictors. *Journal of Research on Adolescence*. 2008; 18:145–172.
- Wymbs BT, McCarty CA, King KM, McCauley E, Vander Stoep A, Baer J, et al. Callous-unemotional traits as unique prospective risk factors for substance use in early adolescent boys and girls. *Journal of Abnormal Child Psychology*. 2012; 40:1099–1110. [PubMed: 22453863]

Figure 1. Adolescent CU traits and CD symptoms reported by their parents in 6th grade interact to predict having sexual intercourse by 13 years of age.

Table 1

Means, standard deviations and correlations among covariates, predictors and outcomes

	M (SD) or %	1	2	3	4	5	6
1. % Male	51.6	–					
2. % Caucasian	45.4	.04	–				
3. Age	11.99 (.41)	.07	–.10*	–			
4. 6 th grade MDD symptoms	4.16 (3.54)	.12	.01	.01	–		
5. 6 th grade CU traits	1.85 (1.68)	.09*	–.22**	.18**	.06	–	
6. 6 th grade CD symptoms	1.66 (2.28)	.14**	.03	.21**	.36**	.28**	–
7. Sex by age 13?	4.3	.14**	–.07	.12*	.13**	.18**	.26**
8. Use of birth control in 12 th grade ^a	62.3	–.05	.14*	–.10	–.05	–.12*	–.13*
9. Pregnant by 12 th grade? ^a	10.0	–.05	–.14*	.09	.00	.13*	.19**

Notes: Due to missing data, sample sizes range from 468 to 471 for most correlations. Age = years old at 6th grade assessment. MDD symptoms = DISC major depressive disorder symptom counts reported by parents, which ranged from 0 to 19; CU traits = Callous-unemotional trait summary score reported by parents, which ranged from 0 to 8; CD symptoms = DISC conduct disorder symptom counts reported by parents, which ranged from 0 to 17; Sex by age 13?: 0 = No, 1 = Yes; Use of birth control in 12th grade: 0 = No, 1 = Sometimes, 2 = Yes; Pregnant by 12th grade?: 0 = No, 1 = yes.

^aOnly participants (n = 281) who endorsed having sexual intercourse by 12th grade answered these questions.

*
p < .05

**
p < .01

Table 2

Adolescent CU traits and CD symptoms reported by parents in 6th grade as predictors of early sexual intercourse

Likelihood of Having Sexual Intercourse by Age 13						
	Model 1		Model 2		Model 3	
	B (SE)	O.R.	B (SE)	O.R.	B (SE)	O.R.
Gender	1.58 (.54)**	4.85	1.52 (.59)*	4.55	1.44 (.62)*	4.21
Race/ethnicity	-.83 (.55)	0.44	-.77 (.58)	0.46	-.74 (.58)	0.48
Age	1.17 (.62)	3.21	.78 (.64)	2.17	.92 (.70)	2.50
MDD Symptoms	.15 (.05)**	1.17	.10 (.06)	1.10	.11 (.06)	1.11
CU Traits			.26 (.15)	1.30	.14 (.15)	1.15
CD symptoms			.20 (.07)**	1.22	.08 (.11)	1.08
CU × CD					.08 (.04)*	1.08

Notes. N = 466. Sex by age 13?: 0 = No, 1 = Yes. Model 1 includes only covariates; Model 2 includes covariates and main effects; and Model 3 includes covariates, main effects and their interaction. O.R. = Odds ratio. With exception of gender (0 = female, 1 = male) and race/ethnicity (0 = Non-Caucasian, 1 = Caucasian), all predictors are centered.

* $p < .05$

** $p < .01$.

Table 3

Adolescent CU traits and CD symptoms reported by parents in 6th grade as predictors of birth control use in 12th grade

	Use of Birth Control in 12 th Grade					
	Model 1		Model 2		Model 3	
	B (SE)	O.R.	B (SE)	O.R.	B (SE)	O.R.
Gender	-.29 (.32)	0.75	-.22 (.33)	0.80	-.21 (.33)	0.81
Race/ethnicity	.53 (.30)	1.70	.48 (.32)	1.62	.50 (.32)	1.64
Age	-.43 (.40)	0.65	-.28 (.44)	0.76	-.30 (.44)	0.74
MDD Symptoms	-.02 (.04)	0.98	.00 (.04)	1.00	-.01 (.04)	1.00
CU Traits			-.09 (.12)	0.92	-.07 (.12)	0.93
CD symptoms			-.06 (.06)	0.94	.02 (.08)	0.98
CU × CD					-.03 (.03)	0.98

Notes: N = 271. Use birth control?: 0 = No, 1 = Sometimes, 2 = Yes. Model 1 includes only covariates; Model 2 includes covariates and main effects; and Model 3 includes covariates, main effects and their interaction. O.R. = Odds ratio. With exception of gender (0 = female, 1 = male) and race/ethnicity (0 = Non-Caucasian, 1 = Caucasian), all predictors are centered.

* $p < .05$

** $p < .01$.

Table 4

Adolescent CU traits and CD symptoms reported by parents in 6th grade as predictors of pregnancy by 12th grade

	Pregnancy by 12 th Grade					
	Model 1		Model 2		Model 3	
	B (SE)	O.R.	B (SE)	O.R.	B (SE)	O.R.
Gender	-.31 (.45)	0.74	-.51 (.46)	0.6	-.54 (.48)	0.58
Race/ethnicity	-.99 (.57)	0.37	-.97 (.56)	0.38	-.97 (.56)	0.38
Age	.51 (.57)	1.67	.15 (.57)	1.17	.21 (.57)	1.24
MDD Symptoms	-.01 (.06)	0.99	-.09 (.08)	0.92	-.08 (.08)	0.93
CU Traits			.10 (.12)	1.11	.07 (.13)	1.07
CD symptoms			.21 (.08)**	1.24	.16 (.08)*	1.17
CU × CD					.03 (.03)	1.03

Notes: N = 281. Ever pregnant?: 0 = No, 1 = Yes. Model 1 includes only covariates; Model 2 includes covariates and main effects; and Model 3 includes covariates, main effects and their interaction. O.R. = Odds ratio. With exception of gender (0 = female, 1 = male) and race/ethnicity (0 = Non-Caucasian, 1 = Caucasian), all predictors are centered.

* $p < .05$

** $p < .01$.