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Adult Retrospective Reports of Externalizing Behavior:

Distinct Dimensions and Key Associations for Past Conduct Disorder Ratings

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Abstract

Many studies have examined the correlates and factor structure of the conduct disorder (CD) criteria in child and adolescent samples, finding that the set of behaviors defining CD are heterogeneous in nature. However, the factor structure of the CD criteria has not been examined in adults, even though the CD criteria often must be assessed retrospectively when diagnosing antisocial personality disorder (ASPD) in adulthood. To advance understanding of assessing CD behaviors retrospectively in adults, we present factor analytic and correlational results from a large sample of adult outpatients ($N = 1,793$). Our results indicate that CD ratings are defined by at least two latent factors of *Rule Violation* (e.g., curfew violations) and *Aggression* (e.g., using a weapon). Ratings of aggressive behaviors tended to show somewhat stronger associations with other externalizing psychopathology than did rule violation ratings. Furthermore, CD dimensions identified in our factor analyses correlated robustly with ASPD but correlated just as strongly with diagnostic ratings of other externalizing psychopathology such as substance use history. We discuss how these findings from a large adult sample parallel results from child and adolescent samples indicating that the CD criteria are defined by distinct dimensions. Furthermore, we interpret these findings within the context of other recent studies suggesting that a CD history may not be a specific precursor to ASPD in adulthood.

KEYWORDS: externalizing spectrum, comorbidity, diagnosis, assessment, factor analysis

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Conduct disorder (CD) is described within the *Diagnostic and Statistical Manual of Mental Disorders* (currently 5th ed.; *DSM-5*; American Psychiatric Association [APA], 2013) as being characterized by a history of violating others' rights and social norms. The CD criteria represent a heterogeneous collection of externalizing behaviors (e.g., physical fights, destroying property, lying, truancy), and many studies have examined issues related to the heterogeneity of the CD criteria in child and adolescent populations (e.g., Castellanos-Ryan, & Conrod, 2011; Gelhorn et al., 2009; Tackett, Krueger, Sawyer, & Graetz, 2003; Tackett, Krueger, Iacono, & McGue, 2005). For example, findings presented by Tackett and colleagues (2003, 2005) from multiple, large samples of children and adolescents indicate that CD behaviors define aggressive (e.g., initiates physical fights) and rule-breaking/delinquency factors (e.g., truancy). This factor analytic work has informed research examining the developmental trajectories of externalizing traits and behavior, where overlapping but distinct aggressive and rule-breaking dimensions often are a research focus in addition to global ratings of CD and other *DSM* disorders (Burt, 2009; Hyde, Burt, Shaw, Donnellan, & Forbes, 2015; Lahey & Waldman, 2012).

Although three or more of any combination of the 15 CD criterion A behaviors must be present to diagnose CD—an approach that does not account for the heterogeneity of this set of behaviors—it is worth noting that the *DSM-5* recognizes the heterogeneous nature of the CD behaviors at some level. Specifically, these 15 CD behaviors are organized in the *DSM-5* into four groupings: Aggression to People and Animals (defined by 7 behaviors), Destruction of Property (2 behaviors), Deceitfulness or Theft (3 behaviors), and Serious Violations of Rules (3 behaviors). The *DSM-5* also provides specifiers that can be added when diagnosing CD (e.g.,

based on age of onset, if limited prosocial emotions are present) to capture differences in CD course and presenting issues across individuals. Furthermore, some types of CD criterion A behaviors are described as more severe (e.g., physical cruelty) than others (e.g., lying and truancy; APA, 2013).

Key Issues for Assessing Conduct Disorder in Adults

In addition to being a standalone diagnosis studied widely in childhood and adolescence, a history of CD is required to diagnose antisocial personality disorder (ASPD) in adults according to the main section (Section II) of the *DSM-5* (APA, 2013). The *DSM-5*'s Section III for Emerging Measures and Models features the Alternative Model for Personality Disorders (AMPD), wherein ASPD and other specific PD diagnoses are described as being characterized by at least moderate impairment in personality functioning and the presence of pathological personality traits (e.g., elevated levels of traits such as manipulateness are identified as characterizing ASPD). In contrast to the Section II ASPD diagnosis, a CD history is not required to diagnose ASPD in the AMPD.

Although the AMPD already has received significant research attention (Somma, Krueger, Markon, & Fossati, 2019), the *DSM-5* Section II PD model will remain the diagnostic standard for the foreseeable future. Thus, a history of CD with onset before age 15 remains a key ASPD diagnostic criterion. Interestingly, however, findings presented by McGonigal and colleagues (2019) indicate that it may be *more common* for adults to (a) meet criterion A (i.e. behaviors indicating the disregard and violation of others' rights) of ASPD without having a CD history than it is to (b) meet ASPD criterion A and also report a CD history. Specifically, 80 of 139 (57.6%) of adult outpatients identified as having clinically significant ASPD traits did not report a CD history necessary for ASPD diagnosis (McGonigal et al., 2019).

Accurately ascertaining a CD history when diagnosing ASPD in adults may be challenging due to often having to assess CD retrospectively, as the precise details of past cognitive states, emotions, and behaviors may be difficult to recollect accurately (Robinson & Clore, 2002; Watson, 2004). Unfortunately, relying on retrospective recall of CD behaviors may be common and necessary for ASPD diagnosis in many cases, as a prior documented history of CD-relevant behaviors or lack thereof may not be available for many adults being assessed. It is worth noting here that the occurrence of some extreme, discrete externalizing behaviors potentially could be accurately recollected (e.g., recalling if one ever broke into a home as an adolescent). However, accurately being able to recollect the timing, frequency, and severity of some behaviors may be more difficult, especially if they occurred many years ago (e.g., how often one stayed out late at night at a specific age as a child or adolescent).

These challenges regarding retrospective recall are related to previously noted issues concerning the heterogeneity of the CD criteria. For example, when considering McGonigal and colleagues' (2019) results regarding a potential disconnect between a CD history and ASPD diagnosis, it may be the case that *some specific types of CD behaviors* (e.g., extreme aggressive behaviors compared to behaviors such as truancy) are linked more strongly to current, adult ASPD traits than are others. However, focusing solely on global, overall ratings of CD (i.e., is a history of CD present or not) precludes being able to examine if adults' retrospective ratings of different CD behaviors are differentially related to ASPD traits and diagnosis.

Explicating the Nature of Retrospective Reports of Conduct Disorder Behaviors in Adults

Although there are many issues that could be addressed when studying CD assessment (e.g., links between CD and ASPD; the use of specifiers when diagnosing CD), our goals were to examine the factor structure and correlates of retrospective ratings of CD criterion A behaviors in

adults. This work represents an extension of the research conducted by McGonigal et al. (2019), who found that many adults identified as having clinically significant levels of ASPD traits did not appear to have a clear CD history. However, this prior research focused on CD at the disorder level and did not examine the correlates or factor structure of individual CD criterion A ratings.

Before proceeding further into discussion of our specific study aims, we again would like to recognize that (a) there are challenges associated with relying on retrospective ratings of behavior and (b) it would be ideal to follow children/adolescents longitudinally into adulthood to determine the continuity between CD ratings and adult psychopathology. However, aside from the obvious challenges associated with conducting such research, the approach adopted here parallels what likely will continue to be standard practice in research and clinical settings for diagnosing ASD in adults. That is, assuming a CD history remains necessary to diagnosis ASPD, it will continue to be standard practice to rely on retrospective assessment of CD behaviors when conducting assessments with adults.

Therefore, acknowledging these issues, we believe that explicating the factor structure and correlates of CD ratings in adults has the potential to advance assessment of externalizing behaviors in several key ways. Most CD research understandably has focused on child and adolescent samples (Burt, 2009; Lahey, & Waldman, 2012), and prior work examining the structure of CD ratings has been challenging due to low endorsement rates for some CD behaviors (e.g., some studies could not include ratings with low endorsement rates such as “stealing while confronting a victim”; Tackett et al., 2005). In fact, the factor structure of retrospective ratings of CD in adults has not been examined to our knowledge. We address this

issue here by determining the extent to which interpretable dimensions defining retrospective reports of CD behaviors can be identified in a large outpatient sample using factor analysis.

We were particularly interested in determining if the factor structure of these retrospective ratings would align with the *DSM-5* groupings of CD behaviors (i.e., Aggression, Property Destruction, Deceitfulness/Theft, Rule Violations), especially because prior factor analytic investigations of CD ratings in children/adolescents indicate less nuanced factor structures. Therefore, we examined a factor analytic model corresponding with these groupings and also a single-factor structure corresponding with the composite CD diagnosis. More generally, we were interested in determining how many interpretable dimensions could be identified when factor analyzing CD ratings. Based on prior research and the CD ratings' content, we anticipated the emergence of at least two distinct aggression and rule-breaking factors.

As a related aim, we also examined how emergent CD dimensions from our factor analyses correlated with other forms of psychopathology and impairment. This is important for several reasons. First, although a CD history is listed as an ASPD criterion, CD also overlaps considerably with other externalizing disorders (e.g., attention-deficit/hyperactivity disorder; Castellanos-Ryan, & Conrod, 2011; Kotov et al., 2017; Lahey & Waldman, 2012). Thus, examining the degree to which CD dimensions associate more strongly with ASPD than other diagnostic ratings may be useful for determining the extent to which a CD history is a specific, distinctive feature of adult ASPD versus being linked to a number of *DSM* disorders. Furthermore, given the heterogeneous nature of CD ratings, it is possible that different CD dimensions may display distinct patterns of associations with other forms of psychopathology and psychosocial impairment (e.g., behaviors such as stealing without confrontation may show weaker psychopathology relations than other CD behaviors; Gelhorn et al., 2009). Therefore, we

believed that these analyses would be useful for understanding the extent to which CD dimensions showed (a) differential relations from one another and (b) robust relations with impairment and forms of psychopathology other than ASPD. Our predictions regarding the correlates of CD dimensions were dependent on which specific dimensions emerged in our factor analyses, but we anticipated that emergent dimensions would should show robust relations with substance use disorders (SUDs) and other PDs (e.g., narcissistic PD [NPD]), in addition to associating strongly with ASPD.

Method

Participants

Participants were 1,793 adult outpatients who completed a range of interview measures assessing CD, other psychopathology, and psychosocial impairment as part of their intake process at a community-based outpatient psychiatry practice. Services at this practice are not restricted based on presenting clinical issues or diagnosis. Consequently, patients comprising this sample could have been seeking treatment for a range of psychiatric symptoms and concerns. The vast majority of participants identified as White/Caucasian (i.e., 90.9%; 4.2% Black/African-American; 2.4% Hispanic/Latinx; 2.5% other ethnicities or unidentified). Mean age was 37.3 years ($SD = 12.6$), and the majority of participants identified as female (60.6%). Participants were most likely to indicate having completed some college or an associate's/vocational degree as their highest level of education completed (40.5%); next, 25.4% completed a bachelor's degree or higher; 23.4% completed a high school degree/GED equivalent; finally, 10.7% reported having completed less than a high school education.

Measures and Study Procedure

Study measures. First, CD ratings and personality pathology were assessed using the Structured Interview for *DSM-IV* Personality (SIDP-IV; Pfohl, Blum, & Zimmerman, 1997). All

individual SIDP items, including items used to assess the CD criteria, were rated on a 0 (*not present*) to 3 (*strongly present*) scale. Of the participants in the current sample, 9.5% ($n = 171$) met criteria for a CD history. Lifetime and current diagnostic ratings for many other diagnoses also were obtained via the Structured Clinical Interview for *DSM-IV* Axis I Disorders (First, Spitzer, Gibbon, & Williams, 1995). Outpatients also were administered other items from the Schedule for Affective Disorders and Schizophrenia (SADS; Endicott & Spitzer, 1978), including items assessing current and past psychosocial functioning (e.g., work missed).

Given the wide range of variables assessed, we focused on examining relations for CD scores with “common” internalizing (e.g., major depressive disorder [MDD]) and externalizing diagnoses (e.g., SUDs) and ratings of psychosocial impairment that we anticipated would overlap strongly with CD (e.g., narcissistic PD; Kotov et al., 2017). Therefore, we included lifetime ratings of the following diagnoses in our analyses (lifetime prevalence rates follow each diagnosis): MDD (65.1%), alcohol use disorder (AUD, 42.0%), social anxiety disorder (SAD; 31.7%), any non-alcohol SUD (28.0%; referred to simply as “SUD” from here on), panic disorder (24.5%), posttraumatic stress disorder (PTSD; 21.8%), generalized anxiety disorder (GAD; 18.9%), borderline PD (BPD; 11.8%), ASPD (7.8%); intermittent explosive disorder (IED; 6.8%), and NPD (2.5%). Diagnostic ratings of ASPD were based solely on whether or not participants met criteria for three or more ASPD traits, which represents the *DSM-5* ASPD criterion A threshold. A CD history was not taken into account for scoring ASPD diagnoses to allow us to examine correlations for CD scores with ASPD.

Furthermore, due to accumulating evidence indicating that psychopathology structure is better represented by continuous dimensions rather than categorical, *DSM*-based diagnoses, we examined how CD scores correlated with scores representing the internalizing and externalizing

spectra. Guided by the Hierarchical Taxonomy of Psychopathology Framework (HiTOP; Kotov et al., 2017), we summed diagnostic ratings of GAD, PTSD, SAD, panic disorder, MDD, and BPD to model internalizing (e.g., if criteria for GAD were met, then this was scored as a “1” toward computing an internalizing score, whereas no GAD history was scored a “0”). To model externalizing, we summed NPD, ASDP, IED, AUD, SUD, and BPD diagnostic ratings; note that BPD was scored for both spectra because it is comprised of a heterogeneous collection of traits related to both the internalizing (e.g., affective lability) and externalizing (e.g., impulsivity) spectra. Finally, we also included psychosocial ratings of the past number of inpatient hospitalizations for psychiatric issues, lifetime number of suicide attempts, work missed over the past 5 years due to psychiatric reasons (rated on 1-10 scale; higher scores indicate more work missed), and psychosocial functioning impairment ratings over the past 5 years (rated on 1-7 scale; higher scores indicate more impairment).

Interviewers, procedure, and reliability of ratings. All interviews were administered and scored by interviewers who were Ph.D.-level psychologists or research assistants with bachelor’s level degrees in the behavioral/biological sciences. Research assistants were required to observe 20 or more intake interviews and then were observed when conducting over 20 interviews as part of their training process, in addition to receiving training focused on the *DSM* diagnostic criteria and clinical interviewing skills. Intake interview sessions for patients seeking services took place in the context of a single day. Interrater reliability information for diagnoses and other ratings are reviewed in several other recent papers based on data from this sample (e.g., Gorlin, Dalrymple, Chelminski, & Zimmerman, 2016; Stanton & Zimmerman, 2018; Zimmerman, 2016). Analyses of interrater reliability indicate that kappas for all diagnoses are

within the good to excellent range. For example, kappas for BPD and all internalizing diagnoses exceed .80, and kappa for both SUD and AUD were estimated to be .64 (Gorlin et al., 2016).

Results

Overview

Prior to conducting primary study analyses, we examined the frequencies of CD ratings, which are provided in Table 1. As Table 1 shows, virtually all outpatients (i.e., 1,788 of 1,793 outpatients; 99.7%;) received a rating of 0 (*not present*) for the fourth CD rating (“harmed other people physically”). Therefore, we excluded this item from subsequent analyses. We then conducted a series of factor analyses to examine the structure of CD ratings. Following that, we present correlations for emergent CD dimensions from our factor analyses.

Factor analyses

Confirmatory factor analyses. We first conducted confirmatory factor analyses (CFAs) with a weighted least squares mean and variance adjusted (WLSMV) estimator due to the categorical nature of the data yielded from the 14 SIDP-IV CD items. First, we examined a single-factor structure of these CD ratings to determine the degree to which various behaviors defining CD clearly define a common factor. We also examined the degree to which CD behaviors define the four groupings as outlined in the *DSM-5*. Consistent with the *DSM-5* description, items assessing CD criteria A1-A3 and A5-A7 were specified to load on an aggression factor (again, the item assessing criterion 4 was dropped); criteria A8 and A9 were specified to define a factor representing destruction of property; criteria A10-A12 to a deceitfulness and theft factor; and finally, criteria A13-A15 to a rule violations factor. In evaluating these CFA models, we considered the following fit indices: the root mean square error of approximation (RMSEA), the weighted root mean squared residual (WRMR), Bentler’s comparative fit index (CFI), the Tucker-Lewis Index (TLI), and chi-square values. Values < .08

or less indicate acceptable fit for RMSEA, and WRMR values < 1.0 indicate acceptable model fit (Yu, 2002). Values $\geq .90$ are considered to indicate acceptable fit for both CFI and TLI (Hu & Bentler, 1999).

Examining a single-factor CFA model indicated that all CD items loaded strongly (i.e., $> .50$) on a common factor. Items assessing truancy, use of a weapon, and property damage were among the items loading most strongly on this factor (i.e., loadings $> .75$). All model fit indices indicated acceptable to good model fit for this single-factor structure with the exception of WRMR ($\chi^2 = 315.7$, $df = 77$; RMSEA = .042; CFI = .952; TLI = .944; WRMR = 1.37).

Next, we examined a four-factor model corresponding with the *DSM-5* groupings. However, the latent variable covariance matrix for this model was not positive definite (see Wothke, 1993 for discussion of this issue), and this model was challenging to interpret because the property destruction factor correlated > 1.0 with multiple other factors. These issues may have arisen at least in part because the property destruction factor was defined by only two indicators (i.e., items assessing CD criteria A8 and A9), thereby representing a very narrow latent factor (Clark & Watson, 2019; Stanton, McDonnell, Hayden, & Watson, 2020). Furthermore, these CFAs do not account for the possibility that items included in our analyses may strongly load onto multiple factors, and CFAs of strongly interrelated item sets can yield very highly correlated factors (Hopwood & Donnellan, 2010). We examined if this model would be interpretable if we removed the two additional items that had low frequencies in our sample but had not already been removed from analyses (i.e., bullying/threatening others, using a weapon; over 97% of participants received a rating of 0 [*not present*] for both items); nevertheless, these issues continued to arise.

Exploratory factor analyses. Due to the difficulties conducting and interpreting the CFA factor solution representing the *DSM-5* behavior groupings, we conducted a series of exploratory factor analyses (EFAs). A WLSMV estimator again was used, and factors were rotated using promax. In regard to factor solutions examined, we sought to determine the maximum number of well-defined (i.e., defined strongly by several or more item indicators), psychologically meaningful factors defining the CD items. This included potentially examining a four-factor solution, which possibly could parallel the *DSM-5* CD behavior groups but allowed us to circumnavigate limitations of applying a CFA framework (e.g., only two indicators being allowed to load on the property destruction factor).

Once again, when extracting a single factor, all 14 items loaded $> .50$ loaded strongly on the dimension corresponding with the global CD diagnosis. The two-factor solution shown in Table 2 also yielded interpretable dimensions. The first factor was defined most strongly by items assessing violating rules (e.g., truancy, staying out late at night) and was labeled *Rule Violation*. The second factor was labeled *Aggression* due to being defined strongly by items assessing a range of aggressive behaviors (e.g., property damage, having forced sexual activity). These two factors were strongly intercorrelated ($r = .69$).

Next, the three-factor solution is shown in Table 3. The first factor in this solution closely resembled the *Rule Violation* factor from the two-factor solution and thus was given this label. It is worth noting that this factor was defined strongly by only three ratings, one of which (i.e., item 1; “Bullied, threatened, intimidated others”) also had a moderate cross-loading of .38 on the second factor. Next, the second factor again was labeled *Aggression*. The third factor was labeled *Theft*, as it was defined most strongly by items assessing a history of stealing. These three factors were moderately to strongly intercorrelated with one another. Specifically, the Rule

Violation factor correlated .63 and .45 with Aggression and Theft, respectively; Theft and Aggression also correlated strongly ($r = .50$).

When considering the four-factor solution displayed in Table 4, the first and second factors resembled the Rule Violation and Theft factors from the three-factor solution, with each factor being defined strongly by several or more items. However, the third factor had only two clear item markers (i.e., items 2 and 5). Items 7 (“forced sexual activity”) and 9 (“deliberately damaged property”) loaded strongly on the third factor (both loadings $> .50$), but also loaded strongly on the second factor (both loadings $> .40$). Similarly, the fourth factor had only two clear item markers: Item 11 (“often conned others”) and item 8 (“intentionally started a fire”) loaded .76 and .38 on this factor, respectively, and had weak crossloadings on other factors. Item 3 (“used a weapon”) also loaded .35 on the fourth factor but had a loading of a similar magnitude (.30) on the second factor. Therefore, because multiple factors were defined clearly by only two item indicators in the four-factor solution, we did not consider this model further. Solutions consisting of five or more factors also yielded multiple factors with only one or two clear item markers, and thus were not considered further.

Correlations for Conduct Disorder Dimensions

We examined relations both for a (a) global CD ratings obtained by summing all 14 items used in our structural analyses and (b) subscales modeling the factors from the two- and three-factor solutions shown in Tables 2 and 3, respectively. We examined relations for subscales modeling both two- and three-factor solutions because both yielded interpretable sets of factors each defined by several indicators, although the first factor in the three-factor solution (i.e., Rule Violation) was fairly narrow in nature as noted. Consistent with measure development recommendations (Clark & Watson, 2019), subscales modeling factors from each of these factor

solutions were created by using items that had (a) loadings $\geq .35$ on their primary factor and (b) cross-loadings $\leq .30$ on other factors (see Tables 2 and 3 for item scoring compositions used to create subscales). However, we relaxed these selection criteria slightly in several cases for which items still emerged as relatively clear indicators of a single factor. For example, in the Table 3 results, item 9 (“deliberately damaged property”) loaded .77 and .38 on Aggression and Theft, respectively, but still was a relatively clear indicator of Aggression.

Additionally, although a CFA model representing the four *DSM-5* CD groupings was difficult to interpret, we created subscales representing these groupings to determine the extent to which measures reflecting the formal *DSM* model showed interesting and distinct patterns of correlations with psychopathology and impairment. Given that we examined a large number of correlations using a large sample size, we considered the statistical significance of correlations at a conservative $p < .001$ level. Note that we primarily were interested in patterns of correlations for each subscale rather than whether individual correlations were statistically significant. Pearson correlations are reported for CD correlations with psychosocial impairment indicators, and polyserial correlations are reported when examining relations for CD scores with specific diagnoses and psychopathology spectra.

Composite conduct disorder and *DSM-5* subscale correlations. Correlations for the CD total composite score and for subscales representing the four *DSM-5*-based groupings are shown in Table 5. The CD composite and each *DSM-5* CD subscale correlated most strongly with diagnoses characterizing the externalizing spectrum (e.g., ASPD, SUD, AUD). Notably, CD ratings generally correlated roughly as strongly with a history of AUD and SUD as with ASPD (e.g., CD total composite scores correlated .40 with both AUD and SUD and .41 with ASPD). These CD scores also generally showed very weak correlations with internalizing indicators and

impairment ratings, although there were several significant correlations (e.g., the CD total composite and Aggression correlated .18 with past number of inpatient hospitalizations). Thus, these various CD ratings showed similar patterns of correlates in many ways.

To formally examine the similarity of the correlates of subscales representing *DSM*-based CD groupings, we conducted significance testing for pairs of correlations using the Williams modification of the Hotelling test for two correlations involving a common variable. These tests indicated that in no instance did any subscale have a significantly stronger correlation than all other subscales with the same criterion variable (e.g., even though Aggression correlated most strongly with AUD, at least one other *DSM-5* CD subscale showed a correlation with AUD that did not differ significantly). That being said, some *DSM-5* subscales showed slightly stronger overall patterns of correlates than others. For example, Aggression had four correlations $\geq .30$, whereas Rule Violation had only one such correlation (again, see Table 5).

Correlations for subscales modeling other factor structures. Finally, Table 6 presents correlations for the subscales modeling the two- and three-factor CD rating structures. At a general level, these patterns of correlations paralleled those shown in Table 5: Various CD scores showed their strongest relations with externalizing spectrum indicators and generally associated quite weakly with internalizing psychopathology and specific impairment ratings. Once again, it is notable that subscales representing these two different factor structures displayed correlates with other externalizing diagnoses (e.g., AUD, SUD, NPD) that were similar in nature to their correlates with ASPD. For instance, the Rule Violation subscale based on the two-factor solution correlated slightly *more strongly* with NPD ($r = .31$) than with ASPD ($r = .28$).

The subscales in Table 6 also showed distinctive patterns of associations in some ways, and correlations with other study variables for subscales modeling dimensions from the same

factor solutions again were compared using the Williams modification of the Hotelling test. For instance, when considering the subscales modeling the two-factor solution, Aggression showed significantly stronger correlates than Rule Violation with some externalizing indicators (e.g., overall externalizing spectrum scores, SUD) and several other indicators (e.g., prior suicide attempts). Similarly, when comparing correlates for subscales modeling the dimensions from the three-factor solution, Aggression correlated significantly more strongly with externalizing spectrum scores, ASPD, and SUD (all $r_s \geq .39$) than did the Rule Violation and Theft subscales.

Discussion

We sought to determine the factor structure and correlates of retrospective ratings of CD behaviors in adults. We were particularly interested in determining the extent to which these ratings' factor structure aligned with their *DSM-5* designated groupings (i.e., Aggression, Property Destruction, Deceitfulness/Theft, Rule Violations). When interpreting our findings, it is important to note that very small percentages of our sample reported histories of some specific CD behaviors (e.g., bullying/threatening others, running away from home overnight), and the fourth CD rating ("harmed other people physically"; 99.7 of participants had a rating of "0") was excluded from primary analyses due to a lack of variation in scores on this item.

Acknowledging these issues, our factor analytic results indicated that CD ratings cohered to define a common factor reflecting the use of CD composite scores. However, our results also indicated that a factor structure representing the four *DSM-5* groupings of CD criterion A behaviors may be difficult to model using a CFA framework. This was not surprising in some ways given that we attempted to model a fairly complex four-factor structure with only 14 items. Still, our EFA results indicate that there are two or at most three interpretable dimensions underlying retrospective adult reports of CD behaviors. When examining a two-factor structure,

we found evidence for Aggression and Rule Violation factors. These factors broadly mirror dimensions identified in child and adolescent samples, but also appear to differ from them in some ways. For example, in prior research with child and adolescent samples, behaviors such as running away from home overnight overlapped strongly with ratings of truancy and staying out late (Tackett et al., 2003), but aligned more closely with ratings of outward aggression here (e.g., damaged property, forced sexual acts) by loading strongly on Aggression from our two-factor structure. Several possibilities could explain these differences, including our use of retrospective ratings, differences in samples, and both our and prior investigations having to remove various CD ratings from analyses due to very low endorsement rates.

We also identified a three-factor EFA structure of Rule Violation, Aggression, and Theft, although the Rule Violation factor was defined strongly by only three items, one of which (i.e., item 1, “Bullied, threatened, intimidated others”) had a notable cross-loading on the Aggression factor. Solutions examined using EFA with four or more factors were untenable, as they yielded one or more poorly defined factors. In some ways, our EFA results align with *DSM-5* groupings of CD behaviors. For instance, both the *DSM-5* and our results underscore an emphasis on aggressive behaviors within criterion A: in the *DSM-5*, seven of 15 CD criterion A ratings are grouped within Aggression, and 10 of 14 CD ratings showed strong loadings on Aggression in our two-factor EFA structure. However, our results obviously indicate a less nuanced structure overall and suggest different interrelations amongst ratings of specific individual behaviors than does the *DSM*. For example, the *DSM-5* groups the behavior of “bullying, threatening, and intimidating others” under Aggression, but our two-, three-, and four-factor EFA structures suggest that retrospective reports of this behavior overlap most strongly with truancy and curfew

violations. It is understandable why these *DSM-5* groupings were made based on the content of the CD ratings, but our structural results differ in nature from these groupings in some key ways.

The Table 5 and Table 6 correlational results also were informative. As anticipated, CD dimensions associated most strongly with scores on the externalizing spectrum and its individual diagnostic subcomponents (e.g., ASPD, NPD). Subscales modeling the *DSM-5* groupings tended to show very similar patterns of correlates with one another, but our factor-based subscales displayed more divergent correlational patterns. For example, Aggression tended to correlate more strongly with externalizing indicators than did Rule Violation across sets of results for subscales modeling our two- and three-factor structures. The most interesting aspect of these correlational results may be that in many cases (a) CD composite scores, (b) subscales representing *DSM-5* groupings, and (c) subscales representing our emergent factors all showed correlations of the same approximate magnitude with manifestations of externalizing such as AUD, SUD, and NPD as they did with ASPD. Although these findings are consistent with research indicating the CD overlaps strongly with many externalizing disorders (Kotov et al., 2017), it is surprising that various CD ratings failed to show stronger specificity with ASPD traits given that a CD history is required for ASPD diagnosis. Next, we discuss how these results inform the retrospective assessment of externalizing behaviors, as well as key future directions in this research area.

Implications for Retrospectively Assessing and Classifying Externalizing Behavior

Although retrospective ratings of behavior pose assessment challenges, diagnosis of adult ASPD remains contingent on retrospectively determining a clear CD history. These results inform retrospective assessment of CD behavioral ratings in adults in several ways. First, although these CD ratings appear to define a common latent factor, our results also suggest that it

may be useful for researchers and clinicians to consider their heterogeneous nature when assessing them. For example, individuals reporting a history of primarily aggressive behaviors may be more likely to have higher levels of externalizing traits and to report a substance use history than individuals reporting mostly or only behaviors (e.g., curfew violations, truancy) that defined the Rule Violation dimensions in our factor analyses.

Our results also indicate that the CD behavior rating assessing having “harmed others physically” may not be particularly useful due to being rated as 0 (*not present*) for 99.7% of patients in our large sample. It was unfortunate that we could not include the item assessing this behavior in our analyses, but we believe that the lack of variation for ratings on this item is informative, as it suggests that ratings of this behavior may fail to capture useful information when retrospectively assessing CD in adult outpatient samples. We surmise that this lack of variation may be due to the very general nature of this rating. That is, ratings reflecting more specific acts of harming others (e.g., by initiating physical fights) appear somewhat more likely to be coded by clinicians, such that coding a more general rating of “harming others physically” may seem unnecessary if other more specific behaviors already are reported and rated.

The optimal method for accounting for the heterogeneity of CD behaviors likely will continue to represent a challenge in research and practice, as is the case for many other *DSM* disorders (Lahey & Waldman, 2012; Kotov et al., 2017). Our factor models did not neatly parallel the *DSM-5* groupings of CD behaviors, although specific counts of behaviors from one or more groupings are not required for CD diagnosis as is the case for diagnosing some other *DSM* disorders (e.g., depressed mood or anhedonia must be present to diagnose MDD; APA, 2013). Consistent with other evidence that behaviors comprising CD are manifestations of the externalizing spectrum (Kotov et al., 2017), our results also suggest that retrospective ratings of

CD do not map neatly onto current ASPD ratings, which is inconsistent in some ways with viewing a CD history as necessary to diagnose ASPD in the *DSM-5* Section II. Thus, we hope that future research will build from these and other related findings (e.g., McGonigal et al., 2019) to determine the extent to which a history of CD behaviors is a distinctive and specific precursor to ASPD in adulthood.

Limitations, Future Directions, and Conclusion

Although these results advance our understanding of the nature of retrospective CD ratings, there are several study limitations and related future directions that should be acknowledged.

First, our sample was mostly White/Caucasian, and many patients in this sample may not have been likely to report high levels of externalizing traits if they were seeking treatment primarily for concerns and impairment related to internalizing symptoms such as sadness and worry.

Related to this issue, few patients in our sample had histories of some specific CD behaviors (e.g., bullying/threatening others, harming others physically) and only a small percentage of our sample met criteria for some externalizing disorders such as NPD. Therefore, examining the extent to which our findings replicate in other sample types (e.g., samples of patients diagnosed with personality pathology, forensic samples) represents a key future direction.

Second, as discussed, associations between a CD history and later ASPD in adulthood would be best tested using longitudinal designs (e.g., studying trait and symptom trajectories from childhood into adulthood), in contrast to the cross-sectional, retrospective assessment approach used in the current study. However, we believe it was important to examine the factor structure and correlates of CD ratings in this manner here given that in many cases, diagnosticians may be forced to retrospectively assess CD traits. Relatedly, directly examining the degree of similarity for CD factor structures across different age groups (e.g., childhood versus adolescent versus

adult samples) also would be informative. We unfortunately were unable to address that issue here given that the set of CD ratings used in our analyses differed from the specific set of ratings used in prior studies (e.g., Tackett et al., 2003, 2005), which also differed from one another.

Additionally, it would have been informative to examine how the CD dimensions identified in our structural analyses were linked to basic personality and temperament dimensions, which inform hierarchical, dimensional classification models such as the HiTOP and other models that have been identified for studying externalizing psychopathology (Salekin, 2016; 2017). For example, it would have been interesting to examine if retrospective ratings of Aggression and Rule Violation showed comparatively stronger links with traits such as disinhibition (e.g., being impulsive, irresponsible) than with other externalizing traits such as antagonism (e.g., being callous, manipulative).

Acknowledging these limitations, this research sheds light on the structure of retrospective ratings of externalizing behaviors, the degree to which they align with the *DSM-5* CD diagnostic groupings, and how CD dimensions are associated with other psychopathology and impairment. We hope that future studies will advance this interesting area of research in the ways discussed to further our understanding of how a history of CD behaviors is associated with ASPD and other psychopathology in adulthood.

Compliance with Ethical Standards

Compliance with Ethical Standards and Conflict of Interest: The authors have no conflicts of interest to report, and there is no funding to report for this research.

Ethical Approval: This research received approval from the authors' relevant institutional review board. All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed Consent: Informed consent was obtained from all individual participants included in the study.

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Table 1

Percentage Frequencies of Clinician Ratings for Individual Conduct Disorder Behaviors

Conduct Disorder Rating	0 (<i>Not present</i>)	1 (<i>Subthreshold</i>)	2 (<i>Present</i>)	3 (<i>Strongly Present</i>)
1. Bullied, threatened, intimidated others	97.4	0.8	1.6	0.2
2. Initiated physical fights	93.4	2.6	2.8	1.2
3. Used a weapon that could cause serious harm	98.1	0.5	1.3	0.1
4. Harmed other people physically	99.7	0.2	0.1	0.1
5. Purposely hurt an animal	96.8	1.9	1.0	0.3
6. Stolen while confronting a victim	90.6	3.1	4.4	1.8
7. Forced someone into sexual activity	89.2	2.9	6.1	1.7
8. Intentionally started a fire	83.8	6.0	7.6	2.6
9. Deliberately damaged property	94.0	1.0	3.8	1.3
10. Broke into homes, buildings, cars	86.7	4.4	5.7	3.2
11. Often lied and conned others	82.1	8.0	8.3	1.6
12. Stole from stores or others	91.8	2.6	4.6	1.0
13. Curfew violations and staying out late	88.5	4.7	5.5	1.3
14. Ran away from home overnight	95.2	1.5	2.6	0.7
15. Skipped school/truancy	90.0	3.5	5.2	1.2

Note. $N = 1,793$ for all ratings. All ratings were obtained from the Structured Interview for *DSM-IV* Personality, and a criterion was rated as present for diagnostic purposes if it was rated as a 2 (*Present*) or 3 (*Strongly Present*). Items are paraphrased versions of the conduct disorder behavior descriptions.

Table 2

Two-Factor Structure of Items Assessing Conduct Disorder Behaviors

Item Content	I	II
13. Curfew violations and staying out late ^a	.99	-.15
15. Skipped school/truancy ^a	.78	.11
1. Bullied, threatened, intimidated others ^a	.67	.12
2. Initiated physical fights ^a	.35	.24
9. Deliberately damaged property ^b	-.07	.94
7. Forced someone into sexual activity ^b	.09	.76
12. Stole from stores or others ^b	-.07	.76
11. Often lied and conned others ^b	-.02	.72
3. Used a weapon that could cause serious harm ^b	.10	.70
10. Broke into homes, buildings, cars ^b	-.03	.66
6. Stole while confronting a victim ^b	.07	.57
14. Ran away from home overnight ^b	.26	.52
5. Purposely hurt an animal ^b	.19	.50
8. Intentionally started a fire ^b	.20	.41

Note. $N = 1,793$. Loadings $\geq |.35|$ are **bolded**. Factors I and II were labeled *Rule Violation* and *Aggression*, respectively. ^a = item used to create the Rule Violation subscale; ^b = item used to create the Aggression subscale.

Table 3

Three-Factor Structure of Items Assessing Conduct Disorder Behaviors

Item Content	I	II	III
13. Curfew violations and staying out late ^a	.89	-.07	.07
15. Skipped school/truancy ^a	.74	.00	.24
1. Bullied, threatened, intimidated others ^a	.55	.38	-.10
9. Deliberately damaged property ^b	-.17	.77	.38
11. Often lied and conned others ^b	-.11	.64	.26
2. Initiated physical fights ^b	.20	.66	-.27
7. Forced someone into sexual activity ^b	.01	.61	.33
3. Used a weapon that could cause serious harm ^b	.04	.53	.33
5. Purposely hurt an animal ^b	.10	.53	.14
8. Intentionally started a fire ^b	.15	.34	.20
12. Stole from stores or others ^c	-.01	.08	.76
10. Broke into homes, buildings, cars ^c	.03	.07	.65
6. Stole while confronting a victim ^c	.15	-.02	.63
14. Ran away from home overnight ^c	.23	.25	.39

Note. $N = 1,793$. Loadings $\geq |.35|$ are **bolded**. Factor I was labeled *Rule Violation*; Factor II was labeled *Aggression*; and Factor III was labeled *Theft*. ^a = item used to create the Rule Violation subscale; ^b = item used to create the Aggression subscale; ^c = item used to create the Theft subscale.

Table 4

Four-Factor Structure of Items Assessing Conduct Disorder Behaviors

Item Content	I	II	III	IV
13. Curfew violations and staying out late	.93	.02	-.11	.04
15. Skipped school/truancy	.71	.31	.17	-.22
1. Bullied, threatened, intimidated others	.55	-.11	.27	.16
12. Stole from stores or others	-.03	.78	.05	.01
6. Stole while confronting a victim	.14	.63	-.06	.03
10. Broke into homes, buildings, cars	.05	.64	-.06	.12
14. Ran away from home overnight	.20	.44	.24	.00
7. Forced someone into sexual activity	-.09	.45	.68	-.04
9. Deliberately damaged property	-.16	.42	.52	.25
2. Initiated physical fights	.16	-.20	.66	.05
5. Purposely hurt an animal	.10	.17	.37	.17
11. Often lied and conned others	-.08	.09	.11	.76
8. Intentionally started a fire	.21	.12	.01	.38
3. Used a weapon that could cause serious harm	.07	.30	.22	.35

Note. $N = 1,793$. Loadings $\geq |.35|$ are **bolded**.

Table 5

Correlations for DSM-Based Groupings of Conduct Disorder Traits

Diagnosis/Variable	CD Total	Aggression	Destruction	Theft	Rule Violation
<i>Externalizing</i>	.45	.39	.38	.35	.31
Antisocial Personality Disorder	.41	.36	.39	.30	.28
Substance Use Disorder	.40	.33	.32	.33	.25
Alcohol Use Disorder	.40	.34	.29	.33	.22
Narcissistic Personality Disorder	.31	.28	.23	.25	.26
Borderline Personality Disorder	.26	.23	.23	.19	.17
Intermittent Explosive Disorder	.13	.13	.07	.14	.06
<i>Internalizing</i>	.12	.09	.09	.10	.09
Posttraumatic Stress Disorder	.20	.17	.16	.18	.13
Panic Disorder	.06	.04	.01	.04	.08
Major Depressive Disorder	-.01	-.03	-.00	-.01	.01
Social Anxiety Disorder	.00	-.02	.01	.03	-.00
Generalized Anxiety Disorder	-.01	.00	-.00	-.02	.00
<i>Impairment</i>					
Number of Past Inpatient Hospitalizations	.18	.18	.08	.15	.13
Lifetime Number of Suicide Attempts	.12	.13	.05	.13	.03
Work Missed Over Past 5 Years	.11	.11	.08	.10	.05
Psychosocial Functioning Impairment	.11	.09	.08	.10	.08

Note. $N = 1,793$ for all correlations except those with the externalizing dimension and narcissistic personality disorder, for which the $N = 1,261$. Correlations $\geq |.25|$ are **bolded**; all correlations $\geq |.14|$ are significant at $p < .001$.

Table 6

Correlations for Subscales Modeling Factor Analytic Dimensions

Diagnosis/Variable	<u>Two-Factor Solution</u>		<u>Three-Factor Solution</u>		
	Rule Violation	Aggression	Rule Violation	Aggression	Theft
<i>Externalizing</i>	.33*	.43	.31	.44*	.30
Antisocial Personality Disorder	.28*	.40	.26	.42*	.27
Substance Use Disorder	.27*	.39	.24	.39*	.29
Alcohol Use Disorder	.23*	.40	.22*	.35	.32
Narcissistic Personality Disorder	.31	.27	.28	.30	.19*
Borderline Personality Disorder	.18	.25	.17	.24	.19
Intermittent Explosive Disorder	.07	.14	.05	.13	.11
<i>Internalizing</i>	.07	.12	.08	.09	.12
Posttraumatic Stress Disorder	.12*	.21	.13	.16	.19
Panic Disorder	.05	.05	.07	.01	.07
Major Depressive Disorder	-.01	-.01	-.01	-.03	.02
Social Anxiety Disorder	-.01	.01	-.01	-.00	.02
Generalized Anxiety Disorder	-.01	-.00	.01	-.01	-.01
<i>Impairment</i>					
Number of Past Inpatient Hospitalizations	.10*	.18	.11	.13	.19
Lifetime Number of Suicide Attempts	.03*	.14	.03	.09	.15
Work Missed Over Past 5 Years	.05	.12	.05	.10	.11
Psychosocial Functioning Impairment	.07	.12	.06	.10	.10

Note. $N = 1,793$ for all correlations except those with externalizing and narcissistic personality disorder, for which the $N = 1,261$. Correlations $\geq .25$ are **bolded**; all correlations $\geq .20$ are significant at $p < .001$. * = correlation was significantly different in magnitude at $p < .001$ from correlations in the same row for all other subscales representing factors from the same factor solution.