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What We Need to Know About Callous-Unemotional Traits: Comment on Frick et al. (2013)

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Abstract

Frick et al. (2013) presented a comprehensive and well-articulated review of studies relevant to the validity and utility of using callous-unemotional traits to subtype the diagnosis of conduct disorder. Like definitions of subtypes of conduct disorder in previous versions of the DSM, the available evidence on the validity of the new subtypes of conduct disorder in DSM-5 based on callous-unemotional traits is thin. Nonetheless, the target article makes a compelling argument for further study of callous-unemotional and related traits to better understand the heterogeneity of conduct disorder. In particular, the possibilities that callous-unemotional traits may facilitate understanding of etiology and psychobiological mechanisms, and help predict the prognosis and treatment outcomes of children with conduct disorder deserve greater study. Future research must be stronger than previous research, however, in using more appropriate samples of children with CD along with more informative designs, and in conducting analyses to directly test the incremental validity of callous-unemotional traits as a subtyping variable beyond the severity or aggressiveness of CD.

The occasion for the review of the validity callous-unemotional traits (CU) in the target article of Frick et al. (2013) is the publication of the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5). In this edition of the DSM, CU is a subtype modifier for the diagnosis of conduct disorder (CD). The review by Frick et al. provides invaluable insight into the evidence and thinking that led to the new subtyping criterion. Now that the difficult decisions have been made for DSM-5, my goal is to examine much the same evidence with an eye to what must be learned next about CU and its relation to CD. Each edition of the DSM freezes scientific thinking about psychopathology at a single moment during the ongoing accumulation and consideration of evidence. Because of its importance to human beings in need, each edition fortunately provides impetus for the next round of research. That is, each revised edition is the seed of its own revision—a

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This Commentary is an expansion of a blind review of an earlier version of the target article. I was the major professor of the first author of the target article and provide these comments in the greatest respect for the work of all of the authors of the article. My comments are meant to be part of the constructive dialectic of science among colleagues. I was a member of the Child Disorders Work Group of the Taskforce for DSM-IV and a consultant to committees involved in the development of some aspects of DSM-5. My comments are my own and do not necessarily reflect the opinions of the American Psychiatric Association.

process that begins before the ink is dry. In this context, what do we know and need to know about CU?

CU and Undersocialized Conduct Disorder

There have long been widely shared concerns that the diagnostic category of CD may be too heterogeneous in terms of etiology, mechanisms, and response to treatment to be useful to either researchers or clinicians. For this reason, DSM-III and DSM-III-R distinguished subtypes on the basis of whether or not the children with CD were “socialized” into antisocial behavior by others, especially peers. There was more to this subtyping scheme than the presence or absence of deviant peer influences, however. The undersocialized type also was characterized by personal deficits in affection for others, empathic concern, and social bonding, as well as a lack of remorse. Because no operational definition of “undersocialization” was ever provided, the DSM-IV work group replaced the socialized-undersocialized distinction with subtypes of CD based on age of onset. Based on theory (Moffitt, 1993) and the limited available evidence, the intent was for age of onset to capture essentially the same distinction as the socialized-undersocialized distinction, as the age of onset of the “undersocialized” group was thought to be younger than the “socialized” group (Lahey et al., 1998).

Callous or Callous-Unemotional?

Frick et al. (2013) are quite correct in stating that the distinction between subtypes of CD based on high or low CU in DSM-5 can be thought of as a clarification of the poorly articulated socialized-undersocialized distinction. Thus, the CU subtyping schema is a new idea with a long history. Notably, however, DSM-III and DSM-III-R did not refer to children and adolescents in the undersocialized subgroup as “unemotional,” except in terms of deficient social feelings.

Although the review by Frick et al. (2013) comprehensively addressed the literature most relevant to the questions they posed, a larger literature has long examined the robust correlation between child and adolescent conduct problems and child characteristics such as lack of concern for others and lack of guilt over misdeeds (Feshbach & Feshbach, 1969; Miller & Eisenberg, 1988). Because this correlation has been frequently replicated (Zahn-Waxler, Shirtcliff, & Marceau, 2008), there is little doubt that researchers should consider deficits in what Eisenberg and others have termed “dispositional sympathy” (Murphy, Shepard, Eisenberg, Fabes, & Guthrie, 1999) when attempting to understand the heterogeneity of antisocial behavior.

Although the CU construct is based partly on this broad literature on sympathetic concern for others, CU had its specific origins in an attempt to define a developmentally appropriate construct of psychopathy for children and adolescents (Frick, 2009). Because poverty of emotions is viewed as a hallmark of psychopathy, items referring to deficient and shallow emotions were included in the measures of CU along with items on deficits in sympathetic concern and remorse (Frick & Hare, 2001). One important value of the two measures of CU developed by Frick and others (Essau, Sasagawa, & Frick, 2006; Frick & Hare, 2001) is that they provided an operationalization of some key aspects of the deficits used to subtype CD

in DSM-III, DSM-III-R, and now DSM-5. These measures, and a series of papers on CU by Frick and colleagues, prompted other researchers to examine CU in relation to CD. These studies are reviewed in the target article because they are sources of information on subtyping CD based on CU.

The Antisocial Process Screening Device (APSD) (Frick & Hare, 2001) provided the first operational definition of CU. The CU factor of this scale includes items regarding manipulative charm, deficits in concern about others, lack of remorse or guilt, insufficient concern about school work, not keeping promises, not keeping friends, and not showing emotions (Frick & Hare, 2001). Subsequent studies generally confirmed the CU factor but found that items on unemotionality, manipulative charm, keeping friends, and keeping promises did not load strongly and consistently on the CU factor (Kotler & McMahon, 2005; Poythress, Dembo, Wareham, & Greenbaum, 2006; Vitacco, Rogers, & Neumann, 2003). Such findings raise questions about which items are sufficiently correlated to define the CU construct. Unfortunately, this is not a minor issue because it is pertinent to the operational definition of CU in DSM-5.

Frick and colleagues later introduced the Inventory of Callous-Unemotional Traits (ICUT) (Essau, et al., 2006). Factor analyses of the item pool of this instrument consistently extracted three factors: *Callousness* (items on lack of sympathetic concern for others, lack of remorse over misdeeds, and not doing responsible work in school and other settings), *uncaring* (other items on more active aspects of sympathetic concern for others, remorse over misdeeds, and doing responsible work), and *unemotional* (items on not expressing emotions) (Byrd, Kahn, & Pardini, 2013; Essau, et al., 2006; Fanti, Frick, & Georgiou, 2009; Kimonis et al., 2008). Thus, there is evidence that items on lack of sympathetic concern for others, lack of remorse, and lack of responsible work all load on the same factor, but it appears that this factor does not include items on unemotionality as implied by the term callous-unemotional traits.

Based on such evidence, Frick and colleagues (Fanti, et al., 2009; Roose, Bijttebier, Decoene, Claes, & Frick, 2010) proposed a multivariate approach to defining CU based on the ICUT using a *bifactor model* in confirmatory factor analysis (Brown, 2006). In a bifactor model, all items load a general bifactor and subsets of the same items also load on two or more specific factors. Thus, the bifactor defines a latent construct that reflects the correlations among all items, after correlations among items on the specific subfactors are covaried. In studies of the ICUT, the bifactor has been labeled CU and three subfactors have been labeled uncaring, callousness, and unemotional (Fanti, et al., 2009; Roose, et al., 2010). Thus, the bifactor model of the ICUT provides a potentially valid way to define a broad CU dimension made up of items reflecting callous disregard for others, lack of remorse, lack of responsible work, and unemotionality.

In my view, priority should be given to future research on the CU construct, the items that define it, and the psychological processes that these putative dispositional definitions reflect. Bifactors are easily interpreted as something akin to a “total score” when loadings on the bifactor are relatively consistent across items. It is not clear that this is the case for the CU bifactor based on the ICUT. For example, in correlated three-factor models of ICUT items

based on two different samples, the uncaring and callousness factors were found to be substantially correlated, but correlations of the unemotional factor with these two factors were modest (Fanti, et al., 2009; Roose, et al., 2010). More remains to be learned, but it may be that the items on unemotionality are too uncorrelated with other ICUT items to be part of a meaningful bifactor. That is, the modest correlation of unemotionality with callousness could mean that individual differences in the CU bifactor do not reflect a unitary psychobiological process. That would not necessarily be a bad thing for research on the heterogeneity of CD, of course. It could be that individual differences on two dispositional factors (one based on callousness, responsibility, and capacity for guilt, and another defined by unemotionality) would reveal more about the heterogeneous psychobiological processes underlying CD behaviors than one broad factor. To fully address this issue, future research must learn more about the correlates of both the general CU bifactor and the three subfactors. Such research must note that the meaning of subfactors is different when a bifactor is or is not specified, however.

To date, several studies have found that the CU bifactor of the ICUT is correlated with general antisocial behavior, bullying, proactive but not reactive aggression, arrests, and substance abuse (Byrd, et al., 2013; Fanti, et al., 2009; Roose, et al., 2010). This is encouraging because it suggests that the CU bifactor is associated with the severity of CD—perhaps with a proactively aggressive form of CD. Nevertheless, even if the CU bifactor is associated with the severity and quality of CD, it may not identify meaningful subtypes better than more parsimonious constructs, such as the severity of CD or levels of aggressiveness.

Another issue that should be addressed in future research is the wording of items that address poverty of emotions. It is possible that an important element of deficient emotions is closely related to sympathetic concern and capacity for guilt, but most of the items used in previous studies may not have been written to detect these deficits. For example, it could be that individuals low on sympathetic concern for others and capacity for guilt are unemotional both in the sense of exhibiting a cold insensitivity to the feelings and needs of others and in exhibiting calm reactions to the discovery of their misdeeds. Yet the same individuals may show a normal range of happiness when they get their way, anger when they are frustrated or disrespected, and other emotions. Thus, there may be low levels of only some forms of emotional responsiveness in the subset of children with CD who are characterized as callous and uncaring. In support of this possibility, the item “I seem very cold and uncaring to others” loads on the callousness factor in the ICUT (Kimonis, et al., 2008), whereas other items referring to shallow or deficit emotions load on the separate unemotional factor.

Are Children with CD and High CU Also Low in Anxiety and Fear?

An issue that may have influenced some members of the DSM-5 committees to include an item on impoverished emotions in the definition of CU is the widespread view that diminished anxiety and fearfulness are an inherent part of psychopathy, and CU by extension (Lopez, Poy, Patrick, & Molto, 2013; Lykken, 1995). If it is correct that low anxiety and fearfulness are reliable correlates of callousness in children and adolescents who

meet criteria for CD (Frick & Viding, 2009; Hipwell et al., 2007), it would be reasonable to describe such children as unemotional in this sense. Indeed, Frick et al. (2013) provided a review of the literature on this point to provide support for the validity of the CU construct. Most of the cited literature does support the hypothesis that children and adolescents high in CU are low in fearfulness and anxiety, but as Frick et al. fairly noted, there are inconsistent findings in the literature that cannot be easily dismissed. It also should be noted that most of the cited studies on fearfulness and anxiety did not actually compare children and adolescents who met criteria for CD but differed in their levels of CU as defined in DSM-5. This is not a general criticism of these studies, but only of their potential applicability to subtyping children who meet criteria for CD in DSM-5.

Thus, the correlation of callousness with fear and anxiety also deserves study, taking into consideration the cogent comments of Frick et al. (2013) on the complicated nature of this correlation, including the tricky issue of suppressor effects. In this new research, however, consideration must be given to the possibility of circularity: If one defines the CU subgroup of CD partly on the basis of unemotionality, this procedure may select individuals with both high callousness and low fear and anxiety. Furthermore, as Frick et al. note, such future studies also should consider the possibility that some youth who are callous may be low in fear and anxiety whereas other youth who are callous may be high in anxiety, similar to the distinction between primary and secondary psychopathy in adults (Lykken, 1995).

External Validity of the DSM-IV and DSM-5 Subtypes of CD

Each edition of the DSM is published to regularize the identification of persons who are in need of treatment, to facilitate accurate prognosis, and to select the best treatment when intervention is warranted. In the process that led to DSM-IV, decisions were made regarding the subtypes of CD on the basis of the available evidence (Lahey, et al., 1998), but almost 20 years later it is still not clear that subtyping CD on the basis of age of onset in DSM-IV is valid and useful. One problem is that the first studies of the validity of the age of onset subtyping criteria used retrospective reports of age of onset (Lahey, et al., 1998; McCabe, Hough, Wood, & Yeh, 2001), and such retrospective reports may not be reliable enough for either research or clinical practice (Sanford et al., 1999). To my knowledge, only one study has examined validity of the DSM-IV subtype scheme using prospective data on the age of onset of CD symptoms (Keenan, Wroblewski, Hipwell, Loeber, & Stouthamer-Loeber, 2011). That study found that 90% of girls with CD have a childhood age of onset, suggesting that the distinction may apply to few children with CD, even if it is valid. Thus, although the validity of the age of onset subtypes of CD has not been refuted and deserves further study, there were reasonable grounds for seeking a potentially better way to subtype CD in DSM-5.

Stipulating that there are never enough directly relevant data to make decisions regarding diagnostic criteria, how strong were the supporting data for the new DSM-5 subtyping scheme for CD based on CU? More constructively, what do we still need to learn about the subtyping criterion for CD used in DSM-5? Evidence cited by Frick et al. (2013) from studies of children and adolescents in which some, but not all, meet criteria for CD provides useful background on this issue, but the only studies directly relevant to the validity of the

DSM-5 subtyping scheme are studies in which youth who meet criteria for CD are compared on important external criteria as a function of their levels of CU. Frick et al. designated four of the studies they reviewed as being directly relevant to the validity of subtyping CD based on CU in this sense.

One relevant longitudinal study used the ASPD (Frick & Hare, 2001) to subtype children who met criteria for CD on the basis of CU (McMahon, Witkiewitz, & Kotler, 2010). The positive and negative predictive power for predicting dichotomized antisocial outcomes was calculated separately for the diagnosis of CD regardless of the level of CU ($n = 79$) and for the smaller subgroup who met criteria for CD and exhibited high levels of CU (CD+CU) ($n = 36$). For the unqualified diagnosis of CD, positive predictive power was .82 and for CD +CU it was .89. Negative predictive power was .60 for unqualified CD and was .53 for CD +CU. No formal comparisons of these small and inconsistent differences were made, however, making it impossible to evaluate the predictive validity of CU as a subtyping variable on the basis of these findings.

A second longitudinal study of a large population-based sample of children and adolescents found that about half of children who met criteria for CD in the first wave exhibited what the authors defined as high CU on the basis of items that were similar but not identical to the DSM-5 subtyping criteria for CU (Rowe et al., 2010). There were no concurrent differences between the two CD groups in impaired functioning after controlling for the number of CD symptoms. There were no differences in police contacts over the next three years between the two CD subgroups, but the odds of the CD+CU group meeting criteria for any mental disorder three years later was much higher than for the CD group without high CU, even after controlling the number of CD symptoms, $OR = 13.9$, 95% CI: 3.3 – 58.2. This difference in future diagnoses of mental disorders was mostly due to the greater odds of meeting criteria again for CD (Rowe, et al., 2010). Thus, although the definition of CU used in this study was not identical to that of the DSM-5 definition of CU, the validity of the DSM-5 subtyping criterion was supported by the finding that CU may identify a more persistent form of CD, controlling the severity of CD itself (Rowe, et al., 2010). It will be very important to attempt to replicate this key finding. It should be noted that controlling the number of CD symptoms in this study (Rowe, et al., 2010) addressed the important psychometric question of whether the DSM-5 CU subtyping criterion is incrementally valid beyond a simple count of the number of CD symptoms.

The third directly relevant paper was based on a large longitudinal study of a representative sample of 2500 girls (Pardini, Stepp, Hipwell, Stouthamer-Loeber, & Loeber, 2012). CU was assessed in childhood using four items from the ASPD (Frick & Hare, 2001) that were very similar to the DSM-5 criteria for CU. Children who met criteria for CD at 6-8 years of age were said to have the CU subtype based on the same cut-off as adopted for DSM-5 (i.e., at least 2 items). At baseline, the CD+CU group exhibited more bullying, lying to “con” others, and relational aggression than the CD group without high CU (CD-CU), and the CD +CU girls were reported to be more functionally impaired. The CD+CU group also was somewhat more likely to receive a diagnosis of CD again 6 years later than the CD-CU. Unfortunately the number of symptoms of CD was not controlled in these analyses, rendering the implications unclear.

Notably, there was not a significant difference in this study in the frequency at which girls in the CD+CU and CD-CU groups were classified as CU 6 years later (Pardini, et al., 2012). This raises an important question about the *stability* of the DSM-5 subtypes of CD. If individuals who meet criteria for a subtype of a mental disorder remain in the same subtype over time in a trait-like manner, it is likely that the subtype is related to stable characteristics of the individual and to unchanging genetic and environmental influences on the subtyping behaviors. Therefore, stable subtypes could facilitate research on heterogeneity in the time-invariant causes and psychobiological mechanisms of the subtyped disorder. In contrast, if individuals change subtypes over time, the subtype might reflect state-like variations in the behavior of individuals who meet criteria for CD rather than fixed differences. Note that the DSM-IV subtypes of ADHD were originally envisioned as reflecting trait-like characteristics of children with ADHD (Lahey et al., 1994), but later research revealed that those subtypes of ADHD were not stable over time (Lahey, Pelham, Loney, Lee, & Willcutt, 2005). This led to a change in the DSM-5 criteria for ADHD that describes the subtypes as *current presentations* of ADHD symptoms rather than stable subtypes. The findings of Pardini et al. indicate the need for additional longitudinal research to determine if the CU subtypes of CD are stable enough to be viewed as trait-like characteristics of subgroups of children with CD as portrayed in DSM-5.

The fifth directly relevant study reviewed by Frick et al. (2013) is an unofficial field trial of the DSM-5 subtypes of CD using data two cross-sectional samples, one representative and one clinical (Kahn, Frick, Youngstrom, Findling, & Youngstrom, 2012). Among children and adolescents who met criteria for CD, Kahn et al. tested the external validity of the exact DSM-5 definition of the callous-unemotional subtype: “shows two or more of the following CU traits persistently over 12 months in more than one relationship or setting: lack of remorse or guilt; callous-lack of empathy; unconcern about performance at school, work, or in other important activities; shallow or deficient affect.” (Association, 2013). Two findings of this study are of particular importance. First, children who met criteria for CD and high CU were reported to exhibit more symptoms of aggressive CD, oppositional defiant disorder, and attention-deficit/hyperactivity disorder in both samples, and exhibited greater cruelty in the clinic sample. These findings validate the DSM-5 CU criterion, but raise the question of whether it would be as useful to subtype CD on the basis of the number of aggression symptoms. Second, consistent with the factor analytic studies reviewed above, Kahn et al. (2012) found that the item on shallow or deficient affect was the only one with low positive predictive power for measuring the CU construct. Because shallow or deficient affect is one of only four criteria for CU in DSM-5, including an item in the definition of CU that is not highly correlated with the other items could influence which youth are said to exhibit CU to a considerable degree. Indeed, it may artificially bias the classification of CU toward youth with CD who are both callous and unemotional.

The official field trials conducted by the Task Force for DSM-5 also raised a concern about the callous-unemotional specifier. The short-term test-retest reliability of the subtype designation in children and adolescents who met criteria for CD was quite low, $K = 0.28$; 95% CI: $-0.05 - 0.54$ (Regier et al., 2013). Unfortunately, these field trials provided clinicians with criterion checklists, but not structured diagnostic interviews. Moreover, the

test and retest assessments were conducted by different clinicians. This is relevant to clinical practice, but virtually guarantees lower estimates of reliability than structured assessments would have provided.

Will CU Help Understand the Treatment, Etiology, and Pathophysiology of CD?

The evidence reviewed by Frick et al. (2013) that will perhaps evoke the greatest interest relates to the possible differential treatment response of children with CD with and without high CU. More remains to be learned, but the reviewed studies provided evidence that response to treatment for conduct problems is inversely related to levels of CU, even controlling for levels of conduct problems. No study has yet examined CU as a predictor of response to treatment among children whose conduct problems were serious enough to meet criteria for CD, while controlling for the severity of CD, however, which is the critical test for the DSM-5 subtype specifier.

Frick et al. (2013) also suggested that studies of CU among youth with CD will facilitate research on the etiology and psychobiological mechanisms of CD (Frick, 2012; Lahey & Waldman, 2003; Lahey, Waldman, & McBurnett, 1999). It seems plausible that, consistent with the assumptions of the Research Domains Criteria movement (Insel et al., 2010), genetic variants, maladaptive experiences, and atypical neural processes will “line up” better with specific psychological processes like callousness than with heterogeneous diagnostic categories. Frick et al. reviewed evidence on correlations of CU with a range of factors that may reflect the etiology of conduct problems. For example, there is evidence that harsh, inconsistent, and coercive discipline is correlated with CU among children with conduct problems. This evidence is very encouraging, but no studies have been published that examine these correlations among children whose conduct problems are severe enough to meet criteria for CD. New studies are sorely needed that can shed light on any differences in etiology and psychobiological processes between children with CD who do and do not exhibit high CU. This will be an essential step in testing the external validity of the DSM-5 subtypes. Future studies should go beyond correlations and use quasi-experimental and other designs that can allow a strong degree of causal inference regarding putative causal influences (D’Onofrio, Lahey, Turkheimer, & Lichtenstein, in press; Rutter, 2007). In particular, as pointed out by Frick et al., such future studies must consider the strong possibility of child effects on parenting when studying etiologic factors related to CU among children with CD (Munoz, Pakalniskiene, & Frick, 2011).

Which Other Dispositions Should We be Studying?

Other dispositional dimensions such as disinhibition or impulsivity may be as useful as callousness in understanding the psychobiological heterogeneity of CD. For example, Frick (2012) has hypothesized that children with CD who display high levels of negative emotionality are fundamentally different in etiology and nature from children with CD and high CU. Similarly, there is evidence that negative emotionality and callousness are both independently correlated with CD (Lahey et al., 2008; Lahey, Rathouz, Applegate, Tackett, & Waldman, 2010). These views are quite similar, except that the latter allows for the

existence of a proportion of youth with both high callousness and high negative emotionality. Although the boost that DSM-5 will give to the study of callousness and unemotionality is welcome, future studies should also consider other dispositional dimensions such as negative emotionality that also may help us understand the heterogeneous nature of CD.

CONCLUSIONS

There is encouraging evidence regarding the role of CU in understanding the heterogeneity of CD, but much remains to be learned. The publication of DSM-5 should not be viewed only as the culmination of a long process of developing and studying the construct of CU. Rather, it is an important intermediate step that hopefully will motivate future studies of the roles of dispositional constructs in the etiology, mechanisms, prevention, and treatment of the heterogeneous diagnostic category of CD. Two issues should be of paramount importance in future research on the external validity and clinical validity of CU and a subtyping variable for CD. First, because CU is positively correlated with the number of CD symptoms (or the number of aggressive CD symptoms), it is essential to determine if CU is related to important external criterion variables over and above measures of the severity of CD. The strong findings of Rowe et al. (2010) were encouraging on this point, but more such studies are needed that test the validity of CU among children with CD while controlling measures of severity. Second, if the DSM-5 subtypes do not prove to be substantially stable over time, it is unlikely that CU will help us identify fixed etiologic factors or enduring psychobiological mechanisms. Yet even if children with CD only pass through transient phases in which their levels of CU (and related characteristics such as aggression) wax and wane, CU could help us understand those fluctuating presentations of CD. We need to initiate longitudinal studies of CD and CU to gather enough information to how stable and valid CU is as a subtype criterion for CD.

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