

**Capturing Callous Unemotional (CU) Traits and the Behavioral Inhibition/Activation Systems
(BIS/BAS) in Children: Development of Three Construct-Oriented
Scales in the Personality Inventory for Children—Second Edition (PIC-2)**

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**A Doctoral Project Submitted in Partial Fulfillment of
the Requirements for the Degree of Doctor of Psychology
in the Department of Psychology at Pace University**

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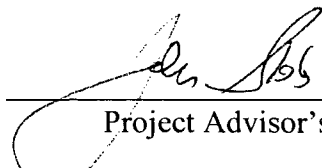
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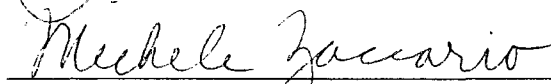
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PREVIEW

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PREVIEW

ABSTRACT

This study attempted to develop three rationally- and empirically-derived scales within the Personality Inventory for Children—Second Edition (PIC-2) capturing the constructs of Callout Unemotional (CU) Traits, the Behavioral Activation System (BAS), and the Behavioral Inhibition System (BIS). In developing additional personality scales within the PIC-2 that demonstrate psychometric integrity, clinicians are offered unique information that can enhance diagnostic and treatment efforts with a vulnerable subset of conduct problem youth. The study consisted of three phases: (a) Study 1: Scale Design; (b) Study 2: Validation in LD/OP Mental Health Sample, and (c) Study 3: Validation in Four Winds Grouping II Sample.

To design and psychometrically analyze the scales, information on children, ages 5 to 16 years, was gathered from three locations, including a private school for youngsters with learning disabilities (The Craig School), a summer-based outpatient program for clinic-referred youth (Family Services of Westchester Respite Program), and an inpatient psychiatric facility (Four Winds Hospital). Findings indicated that the 36-item PIC-2 CU, 10-item PIC-2 BAS, and 9-item PIC-2 BIS scales each demonstrated strong internal consistency within both the LD/OP and psychiatric inpatient settings (PIC- 2 CU LD/OP $\alpha = .95$ and Inpatient $\alpha = .92$; PIC-2 BAS LD/OP $\alpha = .80$ and Inpatient $\alpha = .75$; PIC-2 BIS LD/OP $\alpha = .83$; Inpatient $\alpha = .69$). Expected relationships amongst the three scales were found, with the PIC-2 CU scale demonstrating a strong correlation with the PIC-2 BAS ($r = .71$). Consistent with hypotheses, no significant relationship was found between the PIC-2 CU and PIC-2 BIS as well as the PIC-2 BAS and PIC-2 BIS scales.

An examination of each scale's validity in the LD/OP Mental Health Sample revealed significant correlations in the generally expected directions with gold-standard criterion measures, including the Antisocial Process Screening Device (APSD) and the Sensitivity to

Punishment and Reward Scales for Children (SPRSC). Convergent and discriminant validity were also established using parent-report of psychopathology on the Personality Inventory for Children—Second Edition (PIC-2) adjustment and subscales as well as the Devereux Scales of Mental Disorders (DSMD). Further, an analysis of each scale's relationship to DSMD items of increasing behavioral severity indicated that early to intermediate level conduct problem behavior was a function of elevations on both the PIC-2 CU and PIC-2 BAS, while advanced level behavior was more substantially a function of the former construct. Lastly, the PIC-2 CU, PIC-2 BAS, and PIC-2 BIS scales were independently related to therapist-report of psychopathology upon admission and discharge in accordance with intuitive and theoretical expectations. Limitations and directions for future research were discussed, as was the relevance of the current findings for the field of School-Clinical Child Psychology.

CHAPTER I

Oppositional Defiant Disorder (ODD) and Conduct Disorder (CD) continue to be the predominant childhood diagnoses seen in mental health and community clinics (Burke, Loeber, & Birmaher, 2002). Further, they are the most extensively studied forms of pathology in both child and adolescent populations. Literature on children with ODD and CD suggests that individuals subsumed under these respective diagnostic categories are a remarkably heterogeneous group (Loeber, Burke, Lahey, Winters, & Zera, 2000). In other words, a single diagnostic classification can originate from disparate pathways, produce diverse clinical presentations, and develop into various levels of pathological severity (Greene et al., 2002). Existing research has demonstrated that, within youth who show behavioral problems, there are likely to be more homogenous subgroups. More recently, subgrouping methodologies have expanded to include the identification of trait-like characteristics that, when co-occurring with conduct problems, influence symptom manifestation and continuation (Salekin & Frick, 2005). While several factors have been explored in the literature, this project will focus on two separate, yet interrelated, constructs: Callous Unemotional (CU) traits and Behavioral Inhibition/Activation Systems. Notably, CU features refer to a personality style marked by impaired empathy, shallow and constricted emotions, lack of guilt or remorse, and manipulative behavior for personal gains. The BIS system captures sensitivity to cues of punishment, while the BAS system reflects sensitivity to cues of reward.

The presence of CU traits, as part of one's personality configuration, has been viewed as essential to distinguishing a most psychologically and behaviorally compromised subgroup. Research endeavors have established that CU traits can be reliably assessed in childhood and adolescence (Dadds, Fraser, Frost & Hawes, 2005; Burke, Loeber, & Lahey, 2007). Further, they seem to reflect a stable dimension of personality across the lifespan. More important for

designating a unique etiological pathway, there is substantial evidence indicating CU traits are associated with more severe, aggressive, and chronic behavioral patterns. In an effort to provide additional support, distinct behavioral, neurocognitive, and affective correlates to CU have been identified. This research has been particularly helpful in explaining the unique clinical presentation and symptom trajectories in children with CU traits when compared to other conduct problem children without these characteristics (Frick & White, 2008).

Separately, psychobiological models of personality have been explored, which have influenced explanatory theories of childhood behavior problems. More recently, it has been hypothesized that Disruptive Behavior Disorders (DBD), such as ODD and CD, are “syndromes of disinhibition.” In accordance with this theory, children with behavioral difficulties possess unique approach-avoidance profiles that impact symptom manifestation and prognosis (Quay, 1988a). This model has been most aptly depicted by Gray’s Behavioral Inhibition/Activation Systems (BIS/BAS), which reflect sensitivity to punishment and reward, respectively. Similar to research on CU traits, the BIS and BAS mechanisms each show distinct correlates that elucidate the causal processes leading to maladaptive behavior (Gray, 1975; Quay, 1993).

In recent years, a growing body of research has demonstrated that CU, BIS, and BAS are independent, yet interrelated, constructs (O’Brien & Frick, 1996). Specifically, the temperamental style characterized by deflated BIS and elevated BAS are thought to relate to the development of CU traits (O’Brien & Frick, 1996). Moreover, where one falls on the continuum of approach-avoidance sensitivity may be equally as important as the level of CU traits that he/she possesses, in terms of diagnostic assignment, symptom manifestation, and prognosis (Frick, 1998). Exploring the link between these three constructs has enhanced our understanding of the affective and neurobehavioral manifestations in children with the most severe behavioral problems (Pardini, 2006). Further, it has provided important clinical information about differential treatment response patterns (Hawes & Dadds, 2005).

Identifying markers such as CU, BIS, and BAS, may be particularly important because they are not presently a part of the criteria for ODD or CD as represented in the *Diagnostic and Statistical Manual of Mental Disorders—4th Edition Text Revision (DSM-IV-TR; APA, 2000)*. Such information not only allows for theoretical expansion, but also aids the clinician attempting to diagnose and treat DBD's in children. The goal of enhancing diagnostic, prognostic, and treatment efforts compels the development of empirically based assessment measures that capture these explanatory constructs. To date, there are relatively few childhood assessment tools that measure CU traits as well as BIS/BAS features with adequate psychometric integrity (Kotler & McMahon, 2005).

The current study attempted to develop three scales that capture the aforementioned constructs within one of the most commonly used broadband assessment measures in clinical practice with children, the Personality Inventory for Children—Second Edition (PIC-2; Lachar & Gruber, 2001). Once established, the scales were cross-validated with currently established assessment tools purported to measure CU, BIS, and BAS. Subsequently, the correlational relationships between these constructs and parent-reported symptomatology were explored. Finally, the relationship between CU, BIS, BAS, and therapist-ratings of psychopathology were examined. Overall, information obtained from this study will facilitate theoretical and empirical advances by integrating current research findings, strengthening the assessment and identification process, and informing effective treatment plans in children with DBD's.

CHAPTER II

LITERATURE REVIEW

The literature review begins with a discussion of relevant features of Oppositional Defiant Disorder (ODD) and Conduct Disorder (CD), with particular emphasis on their proposed developmental relationship. Attempts to understand causal mechanisms via defining more homogenous subgroups within the diagnostic categories will be addressed. Focus will be given to a specific method that identifies dispositional traits co-occurring with conduct problems that impact clinical presentation and behavioral trajectory. Two variables that are well studied in a research capacity, yet clinically underutilized, will be explored; namely, Callous Unemotional (CU) traits and the Behavioral Inhibition/Activation Systems (BIS/BAS). For each construct, relevant theoretical conceptualizations and correlates will be presented. Subsequently, research examining the importance of their interrelationship for diagnostic accuracy, prognostic utility, and treatment implications will be reviewed. Finally, a critical discussion of current assessment procedures measuring these constructs will ensue, as will a proposal for the development of three new scales with enhanced psychometric integrity and clinical usefulness.

Oppositional Defiant Disorder and Conduct Disorder

Diagnostic Criteria

The conceptualization of ODD has undergone various shifts since its inception in the psychiatric literature in 1966, as suggested by the Group for Advancement in Psychiatry (AACAP, 2007). The disorder made its first appearance in the third edition of the *Diagnostic and Statistical Manual of Mental Disorders (DSM-III*; APA, 1980) as a distinguishable form of pathology characterized by a specific symptomatic constellation. The most current permutation, in the *DSM-IV-TR*, describes the essential features of ODD as “a recurrent pattern of negativistic, defiant, and hostile behavior towards authority figures that persists for at least six months,”

(APA, 2000, p. 100). Diagnostic classification requires that the child exhibit four of the following behaviors more frequently when compared to individuals of similar age and developmental level: loses temper, argues with adults, deliberately annoys people, actively defies or refuses to comply with adult requests or rules, blames others for personal mistakes or misbehaviors, is easily annoyed by others or touchy, is angry or resentful, and is spiteful/vindictive. In order to meet criteria, the behavior must cause clinically significant impairment in functioning, cannot occur exclusively during the course of a Psychotic or Mood Disorder, and cannot meet criteria for Conduct Disorder or Antisocial Personality Disorder (APD) (APA, 2000).

More severe in nature is the diagnostic classification of Conduct Disorder, which is characterized by a “repetitive and persistent pattern of behavior in which the basic rights of others or major-age appropriate societal norms or rules are violated as manifested by three (or more) of the following criteria in the past 12 months, with at least one criterion present in the past 6 months” (APA, 2000, p. 98). Conduct Disorder behaviors are categorized into four main criterion groupings: (a) aggressive behavior that causes or threatens physical harm to people or animals, (b) non-aggressive behavior that causes property loss or damage, (c) deceitfulness or theft, and (d) serious rule violations. There are two subtypes of CD outlined, and their diagnosis differs primarily according to the nature of the presenting problem and its developmental course. The first, childhood-onset, is defined by the onset of at least one characteristic criterion prior to age 10. The second, adolescent-onset, is used in the absence of any CD criteria before the age of 10. Similar to ODD, the pathological disturbance must cause clinically significant impairment in the child’s functioning. Further, if the individual is 18 years or older, criteria cannot be met for Antisocial Personality Disorder (APD) (APA, 2000).

Critical to *DSM* definitions for ODD and CD is that the behaviors must be present more frequently than would be expected given the child’s age, developmental level, and socio-cultural expectations. Many children at various ages occasionally demonstrate qualities associated with

ODD and CD. For example, children often engage in such behaviors including temper tantrums, non-compliance, lying, and destruction of property. Isolated acts of defiance and oppositionality can be developmentally appropriate, as evidenced by empirical studies of their prevalence in the general population. However, when the threshold of normality is crossed, impairments in social, academic, and occupational domains manifest (Achenbach, Howell, Quay, & Conners, 1991).

With ODD and CD subsumed under this category, Disruptive Behavior Disorders (DBD) are among the most commonly encountered clinical diagnoses in children and adolescents (Burke et al., 2002). While empirical evidence justifies the use of exclusive diagnostic criterion, the disorders share similar symptomatology that vary in the level of impairment (AACAP, 2007). Loeber, Burke et al. (2000) and Burke et al. (2002) conducted a comprehensive examination of empirical findings on oppositional and conduct disorders. Their report summarized a large body of literature, including major reviews and published books, from approximately the year 1990 to 2000. For the purpose of reflecting a comprehensive description and the most current scientific consensus, most of the information will be provided from these articles. Specifically, a brief review of epidemiology, comorbidity, and risk factors will be presented for both ODD and CD to allow for comparative analyses and set the stage for the remainder of the literature review.

Epidemiology

The prevalence rate of both ODD and CD in the community ranges from 1-16%, and this wide spread is attributable to the lack of precision in studying and categorizing the disorders. The onset of ODD, which is often the child's first diagnostic entry point into behavioral pathology, can occur as early as 4- or 5-years-old. In fact, there is evidence that more severe behaviors associated with ODD can be distinguished from normative child problem behaviors among preschool children in both clinical and community samples (Keenan & Wakschlag, 2004). However, children are most often diagnosed around 8-years-old, and the disorder rarely emerges later than early adolescence. The age of onset for CD reflects a wider range, given the presence of both child and adolescent onset subtypes. It may occur as early as age 5 or 6, but its initial

presentation more frequently appears during late childhood and early adolescence. Compared to CD, behaviors reflective of ODD tend to appear approximately two to three years earlier, on average (Loeber, Burke et al., 2000).

While the male excess of CD has been confirmed (e.g., 3:1 to 5:1), evidence for gender differences with regard to ODD has been inconsistent. Recent research suggests that ODD is more prevalent in pre-pubertal males than in pre-pubertal females, though this gap seems to decrease after puberty (Greene, 2006). Nonetheless, ODD remains the second most common psychiatric disorder diagnosed in females (Zoccolillo, 1993). The question remains as to whether the prevalence rates actually reflect real gender differences or are an artifact of diagnostic criteria that are not sensitive to sex differences in how conduct problems are expressed (Burke et al., 2002). Other confounding variables may also include observer biases and gender-based expectations regarding the more conspicuous behaviors as opposed to the less prominent ones (Zoccolillo, 1993).

No firm conclusions can be reached regarding the prevalence of ODD or CD as a function of age. Some studies suggest the occurrence of ODD increases from early to late childhood and subsequently falls. This decline might be attributable to classification changes that occur throughout the developmental span (e.g., an ODD diagnosis becoming child- or adolescent-onset CD). As expected, CD appears to increase during the middle childhood to adolescent years (Burke et al., 2002).

Risk Factors

Burke and colleagues (2002) identified several categories of shared risk factors common to both ODD and CD. They separated those largely intrinsic and biological, those observed in the functioning of the child, and those within the child's environment. As was evident in reviewing the literature, there is a high degree of complex interplay among the risk factors in all domains. Thus, it should be understood that the variables discussed are clearly not independent of each other and should not be considered direct causal mechanisms.

Biological factors including structural brain abnormalities (Davidson, Putnam, & Larson, 2000), neurotransmitter imbalances (Pliszka, 1999), exposure to neurotoxins (Lanphear, Weitzman, & Eberly, 1996), genetic predisposition to mental illness (Eaves et al., 2000), intergenerational transmission (Farrington, Jolliffe, Loeber, Stouthamer-Loeber, & Kalb, 2001), and underarousal of the autonomic nervous system (van Goozen et al., 1998) are recognized as contributory. A review of child functional factors suggests that temperament (Sanson & Prior, 1999), attachment (Pierrehumbert, Miljkovitch, Plancherel, Halfon, & Ansermet, 2000), socio-cognitive processes (Matthys, Cuperus, & Van Engeland, 1999), moral reasoning (Eisenberg, Carlo, Murphy, & Van Court, 1995), intelligence (Fagot & Leve, 1998), and academic performance (Maughan, Pickles, Hagell, Rutter, & Yule, 1995) were related to the development of disruptive behavior disorders. Lastly, psychosocial factors were recognized, including parenting styles (Deater-Deckard, 2000), peer rejection (Coie & Dodge, 1998), assortative mating (mating with someone who possesses a similar phenotype) (Farrington et al., 2001), neighborhood and socioeconomic variables (Wikstrom & Loeber, 2000), life stressors (Mathijssen, Koot, & Verhulst, 1999), and coping skills (Hastings, Anderson, & Kelley, 1996).

Comorbidities

The emergence of comorbid conditions may indicate different levels of clinical impairment, with the overlay of a second psychiatric disorder resulting in greater symptom severity and poorer prognosis. The literature on ODD's diagnostic comorbidities is confounded by several factors including the tendency for other disorders to appear later in development and the frequency with which studies have combined ODD and CD in their analyses. However, population-based studies have identified frequently co-occurring conditions such as Learning Disorders (LD), Attention Deficit Hyperactivity Disorder (ADHD), Major Depression, and Anxiety Disorders (Boylan, Vaillancourt, Boyle, & Szatmari, 2007). Concerning CD, the literature abounds with studies indicating comorbid relationships with all of the aforementioned disorders. Studies have also uniquely demonstrated a strong association with substance use

disorders. Regarding possible directions of influence, CD appears to precede or coincide with the onset of substance use. However, it is likely the relationship between the two conditions is reciprocal, meaning that CD can precede substance abuse and vice versa (Whitmore et al., 1997).

The Developmental Pathway

The relationship between the diagnostic categories of ODD and CD has been an important area of investigation in the literature on DBD's. Most of the research addressing their interrelationship has concluded that, for some youth, ODD acts as a developmental precursor to CD. Specifically, ODD is thought to be moderately stable over time; however, 67% of children will no longer qualify for the diagnosis after a 3-5 year period. Approximately 30% of individuals with early onset ODD will later develop CD, and about 40% of individuals with CD will progress to APD. However, which children desist from this progression is not clear based on current diagnostic criteria. Ultimately, extrapolations from studies indicate that approximately 10% of youngsters with a baseline diagnosis of ODD will be diagnosed with APD at some point in their lifetime (Loeber, Green, Frick, & McBurnett, 2000). This pattern is confirmed for males, but remains less clear for females given proposed differences in initial clinical presentation (Maughan, Rowe, Messer, Goodman, & Meltzer, 2004).

The Developmental Trends Study, initiated by Loeber and Lahey in the late 1980's, remains one of the most comprehensive longitudinal analyses of DBD's to date (Loeber, Green et al., 2000). Participants included 177 clinic-referred boys who were between the ages of 7 and 12 at the onset of the study. Using a multi-informant approach, participants, their caregivers, and teachers were interviewed on a yearly basis over the course of a decade. The measures designed to assess childhood psychopathology included the Diagnostic Interview Schedule for Children (DISC; Costello, Edelbrock, Dulcan, Kalas, & Klaric, 1987), the Child Behavior Checklist (CBCL; Achenbach, 1991a), and the Conners Comprehensive Behavior Rating Scale (CBRS; Conners, 1997). In an effort to determine the child's psychiatric diagnosis each year, data from the three informants were systematically combined in accordance with the "best estimate"