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EMPIRICAL ASSESSMENT OF CALLOUS-UNEMOTIONAL TRAITS IN PRESCHOOL: A COMPARISON OF CONFIRMATORY FACTOR ANALYSIS AND NETWORK ANALYSIS

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THESIS

A thesis submitted in partial fulfillment of the
requirements for the degree of Master of Science in the
College of Arts and Sciences at the University of Kentucky

By

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Lexington, Kentucky

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ABSTRACT OF THESIS

EMPIRICAL ASSESSMENT OF CALLOUS-UNEMOTIONAL TRAITS IN PRESCHOOL: A COMPARISON OF CONFIRMATORY FACTOR ANALYSIS AND NETWORK ANALYSIS

Callous – unemotional (CU) traits are a key factor in understanding the persistence and severity of conduct problems. The factor structure of CU traits has been primarily examined through confirmatory factor analysis (CFA) in childhood and adolescent samples, yet little research has examined the structure of CU traits in preschool. Further, current CFA models have yielded poor – to – marginally acceptable fit, suggesting the need for a more nuanced approach in understanding the structure of CU traits in early childhood using an interitem approach (i.e., network analysis). Within a sample of 109 preschool children (*M* age = 4.77, *SD* = 1.10), CFA results supported a two – factor structure of the ICU, comprised of "callous" and "uncaring" factors. Results of the network analysis identified *seems cold and uncaring* as most central to the CU network. Results from the CFA demonstrated that CU traits can be assessed in preschool children using 12 of the original 24 items from the ICU, which is consistent with a small portion of research. Further, results of the network analysis suggested that *seems cold and uncaring* may be useful in screening for psychopathic traits in preschool children. Clinical implications, including ICU measure refinement, are explored.

KEYWORDS: Callous-unemotional, network analysis, confirmatory factor analysis, antisocial, preschool

Pevitr Singh Bansal
12/20/2018

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12/20/2018

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Chapter One: Introduction

Conduct problems (CP) are an overarching category that encompass the diagnostic categories of Oppositional Defiant Disorder (ODD) and Conduct Disorder (CD; Frick & Morris, 2010). Individuals with CP display a wide array of disruptive and antisocial behaviors, such as defiance of authority figures, physical aggression, and destruction of property (Loeber, 1991; Webster-Stratton & Hammond, 1997). CP have been found in roughly 10% of school – aged children (Nock, Kazdin, Hiripi, & Kessler, 2006), and have been identified in samples as early as preschool (Keenan & Wakschlag, 2002, 2004; Keenan et al., 2007). They account for most referrals to youth mental health clinics (Loeber, Burke, Lahey, Winters, & Zera, 2000). The cost of children with CP has been estimated to be $70,000 more than the expenses for typically developing children (Foster, Jones, & The Conduct Problems Prevention Research Group, 2005). Thus, CP place a large financial burden on society and significant distress on individuals' daily and long-term development. Given these outcomes, as well previous findings suggesting that early identification of CP may contribute to improved prognoses (Hood & Eyberg, 2010), it is vitally important to thoroughly understand potential underlying mechanisms that may contribute to the development and even exacerbate the severity of CP.

One crucial factor that has been recognized in contributing to CP are callous – unemotional (CU) traits. CU traits designates a particularly severe and persistent form of CP (Frick & Ellis, 1999; Frick & Nigg, 2012), and thus have been recently integrated into the Fifth Edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) as a specifier for CD (e.g., "with limited prosocial emotion"; American Psychiatric Association, [APA], 2013). CU traits are characterized by a lack of remorse and guilt,

shallow/deficit affect and emotion, and a lack of care regarding personal performance (Frick & Nigg, 2012; Frick, Ray, Thornton, & Kahn, 2014b). Among other deficits, CU traits have been noted to be a specific precursor to adulthood psychopathy (Brinkley, Newman, Widiger, & Lynam, 2004; Christian, Frick, Hill, Tyler, & Frazer, 1997; Lynam, 1996). The exacerbation of CU traits on CP has been well – documented, such that those with combined CP and CU (CPCU) are at significant risk to engage in antisocial behaviors such as truancy and substance abuse, and have higher rates of police contact, arrests, and higher rates of violent recidivism (Christian et al., 1997; Frick, Ray, Thornton, & Kahn, 2014a; Frick et al., 2014b; McMahon, Witkiewitz, Kotler, & The Conduct Problems Prevention Research Group, 2010).

A sizable portion of research has found CU traits to negatively impact treatment outcomes, as children with CPCU remain significantly more aggressive and impaired relative to children with CP without CU traits (Frick et al., 2014b; Hawes, Price, & Dadds, 2014). Thus, more specialized treatments may be necessary for children with CPCU that focus on the development of a positive parent – child relationship (e.g., increased positive parenting, parental warmth, decreased physical and/or inconsistent punishment; Pardini, Lochman, & Powell, 2007). This highlights the critical importance of further examination of CU traits, particularly in young children who would stand to benefit most from early interventions that could save society substantial costs for later CP. This work is particularly important given that CU traits, like CP, have been found to be more amenable to treatment in early childhood (e.g., preschool) as compared to adolescence. For example, treatments delivered in early childhood have led to lasting improvements in CU traits (D. J. Hawes et al., 2014; McDonald, Dodson, Rosenfield, &

Jouriles, 2011; Somech & Elizur, 2012). However, treatments delivered in adolescence have found that children with CPCU show poorer outcomes relative to children with CP without CU traits (e.g., violent and/or sexual offenses, poorer social skills; Frick et al., 2014b). Therefore, earlier identification of children with high CU traits can lead to earlier intervention efforts and more promising outcomes across the lifespan.

One of the most widely used measures of CU traits in youth is the Inventory of Callous Unemotional Traits (ICU; Frick, 2004). The ICU is comprised of three subscales: the "callous" subscale (e.g., callous attitude towards others; "I don't care who I hurt to get what I want"), the "uncaring" subscale (e.g., showing a lack of care about performance; "I always try my best"), and the "unemotional" subscale (e.g., lacking emotional expression; "I express my feeling openly"). Most research assessing the utility of these subscales has focused on samples of older-aged children (e.g., $\geq$ 9.5 years; for review, see Waller et al., 2015; for exceptions, see Ezpeleta, de la Osa, Granero, Penelo, & Domènech, 2013; Kimonis et al., 2016; Willoughby, Mills-Koonce, Waschbusch, Gottfredson, & Family Life Project Investigators, 2015). Regarding the factor structure of the ICU, most studies of children ages nine years and older support the three – factor model consisting of "callous," "uncaring," and "unemotional" factors (Byrd, Kahn, & Pardini, 2013; Fanti, Frick, & Georgiou, 2009; Kimonis et al., 2008; for review, see Waller et al., 2015). Further, many of these studies support a three – factor bifactor approach, comprised of a general "CU" factor, along with the "callous," "uncaring," and "unemotional" factors. However, limitations exist for this model including poor model fit, limited internal consistency on the unemotional subscale, and the removal of items to increase model fit (Waller et al., 2015). In contrast, the two – factor model has some

limited support, in both clinical and community samples, with a "callous" and an "uncaring" factor emerging in these solutions (S. W. Hawes et al., 2014; Houghton, Hunter, & Crow, 2013). Results from past CFA studies, including two and three – factor models, have shown that the following items have the strongest relationship with the underlying factor: item 15 ("trying to always do one's best"), 16 ("apologies to person he/she has hurt"), and 17 ("tries not to hurt other's feelings"; Ezpeleta et al., 2013; Fanti et al., 2009; S. W. Hawes et al., 2014; Houghton et al., 2013; Waller et al., 2015). Coincidentally, all three items come from the "uncaring" subscale.

Although the factor structure of the ICU has been examined in older-aged children and adolescents, less research has been conducted within early childhood. This is a noteworthy shortcoming of past research, given that CU traits have been identified in children as early as preschool (Kimonis et al., 2016; Kimonis et al., 2006; Willoughby, Waschbusch, Moore, & Propper, 2011), and have been shown to be most amenable to treatment during this period of life (D. J. Hawes et al., 2014). Within early childhood, only three studies have examined the ICU's factor structure. In a first-grade sample, Willoughby and colleagues (2015) observed a two – factor model that was comprised of an "empathic – prosocial" factor (e.g., all positively worded items; "*Tries not to hurt others' feelings*," "*Always tries his/her best*," "*Easily admits to being wrong*") and a "CU" factor (e.g., all negatively worded items; "*Does not show emotions*," "*Does not care if he/she is in trouble*," "*Does not care about doing things well*") rather than the typical "callous" and "uncaring" factors. In preschool samples, Ezpeleta et al., (2013; *M* age = 3.0) found support for the three-factor model within a community sample, whereas Kimonis et al., (2016; *M* age = 4.7) found evidence for the two-factor model within a

combined community and high-risk sample. Despite the importance of measuring CU traits in preschool, given their treatment amenability during this age range, their factor structure during this period remains poorly understood.

Another salient limitation of past research examining the ICU is that all such past work has been conducted using confirmatory factor analysis (CFA; for review, see Waller et al., 2015). Yet, most CFA studies on the ICU have yielded poor-to-marginal fit indices (Byrd et al., 2013; Essau, Sasagawa, & Frick, 2006; S. W. Hawes et al., 2014; Kimonis et al., 2008; Waller et al., 2015). In some instances, researchers have tried to improve model fit by modeling the residual variance through, for example, correlating the residuals of related items (Byrd et al., 2013; Essau et al., 2006); other studies removed certain items from the analytic model due to poor factor loadings in order to achieve marginal fit (Essau et al., 2006; Houghton et al., 2013; Kimonis et al., 2008). This lack of good fit of CFA models of the ICU, combined with the lack of clarity regarding whether two – or three – factor models are best supported, and relative lack of examination in preschool, suggests a need for a more nuanced approach to examination of CU items and structure.

Although CFA has been the traditional method for model analysis, there is an innovative new method available for examination of more nuanced item – level relationships known as network analysis. Where CFA assumes that items or symptoms are manifestations of an underlying or latent variable (Brown, 2015), network analyses suggests that the direct associations between items may constitute the disorder itself (Borsboom & Cramer, 2013). Network analysis may provide important information compared to CFA for several reasons. First, network analysis allows for the idea that

items directly associate with one another in an active manner. For example, items such as "*Does not care who they hurt to get what they want*" and "*Seems cold and uncaring*" may, in fact, be correlated with each other. Yet, this correlation may not be because they are both caused by the same latent variable (callousness), but rather because hurting other people to get what they want and not caring about their feelings may directly influence one another via a vicious cycle to generate callous and unemotional manifestations of behavior. Further, unlike factor analysis, network analysis allows for the examination of centrality; in other words, it provides a visual representation of the symptoms that are most core or central to the psychological construct. Identifying these items through network analysis could inform screening procedures. That is, these items could be quickly assessed during pediatric office visits, with endorsed items signaling a need for further assessment and potential intervention.

Given this notion of centrality, the idea that certain items exhibit the greatest influence within a network, hypotheses can be formed to garner a better understanding as to the core features of CU traits. For example, based upon prior work (Ezpeleta, de la Osa, Granero, Penelo, & Domènech, 2013; Fanti et al., 2009; S. W. Hawes et al., 2014; Houghton et al., 2013; Waller et al., 2015), items 15 ("trying to always do one's best"), 16 ("apologizes to person he/she has hurt"), and 17 ("tries not to hurt other's feelings") could be predicted to be the most clinically relevant symptoms within the CU network, given that they have the highest relationship with the underlying "uncaring" subscale. Furthermore, based upon the theoretical underpinnings of CU traits, one might predict items 3 (uncaring; "cares about doing well at school"), 6 (unemotional; "does not show emotions"), 8 (callous; "is concerned about the feelings of others"), 12 (callous; "seems

very cold and uncaring"), and 18 (callous; "shows no remorse when he/she has done something wrong") to be central to the CU network, given that these items are core to the DSM-V "limited prosocial emotion" specifier (APA, 2013). Therefore, it seems that both empirical and theoretical approaches agree that certain items within the "callous" and "uncaring" subscales should be most core to the CU network.

Thus, the goal of the current study is to be the first to use both factor analysis and network analysis to provide a comprehensive analysis of the factor structure of CU traits in preschool children. Given prior CFA studies of the ICU, it is predicted that: (a) CFA will yield a marginally-fitting three-factor model of the ICU, consisting of the "callous," "unemotional," and "uncaring" subscales. In addition, this study will be the first to analyze CU traits within a network analysis framework. It is predicted that (b) each subscale will cluster together, but the "callous" and "uncaring" subscales will be more closely correlated relative to the "unemotional" subscale; and (c) items from the "callous" and "uncaring" subscales will be most core to the network, namely: items 3 (uncaring; "is concerned about schoolwork"), 15 (uncaring; "trying to always do one's best"), 16 (uncaring; "apologies to person he/she has hurt"), 17 (uncaring; "tries not to hurt other's feelings"), 8 (callous; "is concerned about the feelings of others"), 12 (callous; "seems very cold and uncaring"), 18 (callous; "shows no remorse when he/she has done something wrong"), along with item 6 from the unemotional subscale ("does not show emotions").

Chapter Two: Method

Participants

Table 1 presents the demographics for the total sample. Participants were 109 children ages three to six years old (M = 4.77, SD = 1.11). There were slightly more males (n = 64, 59%) than females (n = 45, 41%). The ethnic/racial make-up of the sample was primarily Caucasian (n = 73, 67%). Yearly income ranged from below $20k to above $100k, with an average income reported to be between $40k and $60k. Majority of ratings were completed by biological mothers only (n = 75, 69%). Twenty-eight children exhibited clinically significant CD symptoms (e.g., three or more symptoms); of those 28 with CD, 26 (93%) had a comorbid diagnosis of ODD, while 22 (79%) had a comorbid diagnosis of ADHD. Of the total sample, 18 (17%) children had an ODD diagnosis (without CD), while 43 (39%) exhibited ODD (without CD) comorbid with ADHD. Sixty-one children (56%) were diagnosed with ADHD (with or without comorbid ODD/CD). Lastly, of the total sample, 30 children (28%) did not meet diagnostic criteria for ADHD, ODD, or CD and served as controls to provide a more continuous measure of disruptive behavior symptoms.

Procedures

Participants were recruited from the surrounding areas (e.g., urban, suburban, and rural areas) of a medium – sized metropolitan city in the Southeastern area in the United States. Recruitment fliers were posted in various community areas, including physician offices, community centers, daycares, online, along with directly mailing fliers to families. Two sets of fliers were used; one set of fliers targeted children, ages three to six, with disruptive behavior and/or attention problems, and a second set of fliers targeted

children, ages three to six, without these problems (e.g., typically developing children). Interested families were contacted and participated within an initial phone screen to rule out children with various medical or psychological issues. Complete exclusion criteria included: (a) use of psychotropic medication; (b) neurological impairments (e.g., seizure issues, head injury with loss of consciousness); and (c) more severe forms of psychopathology (e.g., psychosis, autism spectrum disorders).

All families screened into the study at this point completed written and verbal informed consent procedures consistent with the university Institutional Review Board, the National Institute of Mental Health, and APA guidelines. After this initial phone screen, caregiver and teacher questionnaires were mailed out to the family a week prior to their scheduled lab visit. These ratings scales were completed and then mailed back to the university. During the lab visit, diagnostic information regarding disruptive and attention issues was collected using the Disruptive Behavior Rating Scale (DBRS; Barkley & Murphy, 2006). In addition, parents also completed the Kiddie Disruptive Behavior Disorders Schedule (K-DBDS; LeBlanc et al., 2008), a semi-structured diagnostic interview modeled after the Schedule for Affective Disorders and Schizophrenia for School-Aged Children (Orvaschel & Puig-Antich, 1995). Primary caregivers then completed the K-DBDS one year after the initial laboratory visit via telephone interviews with a trained graduate student clinician. Final diagnoses were determined by a licensed clinical psychologist. Consistent with best practice procedures for diagnosing CD, ODD, and ADHD (McMahon & Frick, 2005; Pelham Jr., Fabiano, & Massetti, 2005), diagnoses were made using multiple sources of information including parent ratings on the K-DBDS and teacher/caregiver ratings on the DBRS, when available.

Measures

Callous-Unemotional Traits. The 24-item ICU assesses CU traits in children and adolescents via parent report on a 4-point Likert scale ranging from 0 (“not at all true”) to three ("definitely true"; Frick, 2004). Table 2 lists each item’s description along with the corresponding subscale. The ICU contains both positively and negatively worded items. The 12 positively worded items are reversed scored and the summed with the rest of the items for a total score. The current study examined items within the total ($\alpha = .89$), callous ($\alpha = .81$), unemotional ($\alpha = .58$), and uncaring ($\alpha = .84$) subscales from the parent-reported preschool version of the ICU. Total and subscale scores on the ICU were computed and can be found in Table 1, although analysis makes use of individual items. As aforementioned, the ICU has been previously validated in samples of children and adolescents (Byrd et al., 2013; Fanti et al., 2009; S. W. Hawes et al., 2014; Houghton et al., 2013; Kimonis et al., 2008; for review, see Waller et al., 2015), with limited support in preschool samples (Ezpeleta et al., 2013; Kimonis et al., 2016).

Analytic Plan

To examine the proposed hypotheses, two separate analytic approaches were conducted. First, CFA was conducted using principal-axis factor analyses with an oblique rotation (i.e., promax) in Mplus version 8 (Muthén & Muthén, 2006). Model goodness-of-fit was evaluated using three different fit indices: chi-square fit statistics, root mean square error of approximation (RMSEA), and comparative fit index (CFI), as recommended by Hu & Bentler (1999). Overall, nonsignificant chi-square values, RMSEA values of .05 or less, and CFI values greater than or equal to .95 all indicate good fit (Hu & Bentler, 1999). In instances of disagreement between fit indices the

RMSEA was used as the primary fit index, having been highlighted as one of the more informative fit indices in past research (Diamantopoulos & Siguaw, 2000). To test the first hypothesis that CFA will support a three – factor model, data was fit to two different models, a two – factor (e.g., "callous" and "uncaring") and a three – factor model (e.g., "callous," "unemotional," and "uncaring"). It was predicted that the three – factor model would be best supported, yet would exhibit marginal fit (e.g., RMSEA of .08).

Next, network analysis of the ICU was conducted using the R package qgraph (Epskamp, Cramer, Waldorp, Schmittman, & Borsboom, 2012). Analysis followed procedures provided in the supplemental material from Borsboom and Cramer (2013). Networks were not specified to be directional, nor there any predetermination as to the number of paths or strength of correlation within the network. Each subscale of the ICU was computed and visualized using distinct colors to differentiate among the "callous," "unemotional," and "uncaring" subscales. Line thickness within the network represents the strength of correlation; the thicker the line, the stronger the correlation between symptoms or items. In addition, networks were also visually inspected to show tight clustering of individual symptoms and "bridge symptoms," or nodes that link symptom clusters together and are theorized to causally connect different facets of a construct.

Three indices were computed to measure centrality: "closeness," "betweenness," and "strength." Closeness represents the inverse of the sum of distance to all other nodes; higher numbers indicating that a node is more central to the network relative to other items. Betweenness represents how a given node mediates the relationship of other nodes in the network. Strength specifies the magnitude of the connection that an item has with other items within the network (Opsahl & Panzarasa, 2009). It was first predicted that

each subscale would cluster together, but the “callous” and “uncaring” subscales would be more closely associated relative to the “unemotional” subscale. Next, it was predicted that items primarily from the uncaring subscale (3, 6, 15, 16, and 17) and from the callous subscale (8, 12, and 18) would be most central to the network, along with a single item from the unemotional subscale (6). Figure 1 provides a visual aid to better understand the layout of the predicted CU network.

Table 1. Demographic Information and Intake CU Scores.

Variable		Total Sample
		N = 109
Age [*M* (*SD*)]		4.77 (1.10)
Gender [*n* (%) Male]		64 (59%)
Family Income [*M* (*SD*)][a]		2.94 (1.86)
Race [*n* (%)]		
	Caucasian	73 (67%)
	African – American	28 (26%)
	Latino	3 (3%)
	American – Indian/Alaskan Native	1 (1%)
	Mixed	4 (4%)
Completed Caregiver Ratings [*n* (%)]		
	Biological Mothers Only	75 (69%)
	Both Biological Mothers and Fathers	20 (18%)
	Biological Fathers Only	6 (6%)
	Other (Step-parents, adoptive parents)	5 (5%)
Diagnoses [*n* (% of total sample)]		
	ADHD	61 (56%)
	ADHD – Combined Type	29 (27%)
	ADHD (Hyperactive/Impulsive)	26 (24%)
	ADHD (Inattentive)	6 (6%)
	ADHD + ODD	43 (39%)
	ODD – Only	18 (17%)
	ODD + CD	26 (24%)
	CD + ADHD	22 (20%)
CU Ratings [*M* (*SD*)][b]		
	Total	21.03 (11.24)
	Callous	7.62 (5.71)
	Unemotional	3.2 (2.52)
	Uncaring	10.22 (5.16)

[a]Annual Family Income modes: 1 = Less than $20k; 2 = Between $20k - $40k; 3 = Between $40k - $60k; 4 = Between $60k - $80k; 5 = Between $80k - $100k; 6 = Above $100k.

[b]CU ratings were measured using the Inventory of Callous Unemotional Traits (Frick, 2004); items were reversed-scored prior to analysis.

Table 2. ICU Item Description and Corresponding Subscale.

Item	Description	Subscale
2	Does not seem to know “right from “wrong”	Callous
4	Does not care who he/she hurts to get what he/she wants	
7	Does not care about being on time	
8*	Is concerned about the feelings of others	
9	Does not care if he/she is in trouble	
10	Does not let feelings control him/her	
11	Does not care about doing things well	
12	Seems very cold and uncaring	
18	Shows no remorse when he/she has done something wrong	
20	Does not like to put the time into doing things well	
21	The feelings of others are unimportant to him/her	
1*	Expresses his/her feelings openly	Unemotional
6	Does not show emotions	
14*	It is easy to tell how he/she is feeling	
19*	Is very expressive and emotional	
22	Hides his/her feelings from others	
3*	Is concerned about schoolwork	Uncaring
5*	Feels bad or guilty when he/she has done something wrong	
13*	Easily admits to being wrong	
15*	Always tries his/her best	
16*	Apologizes to persons he/she has hurt	
17*	Tries not to hurt others’ feelings	
23*	Works hard on everything	
24*	Does things to make others feel good	

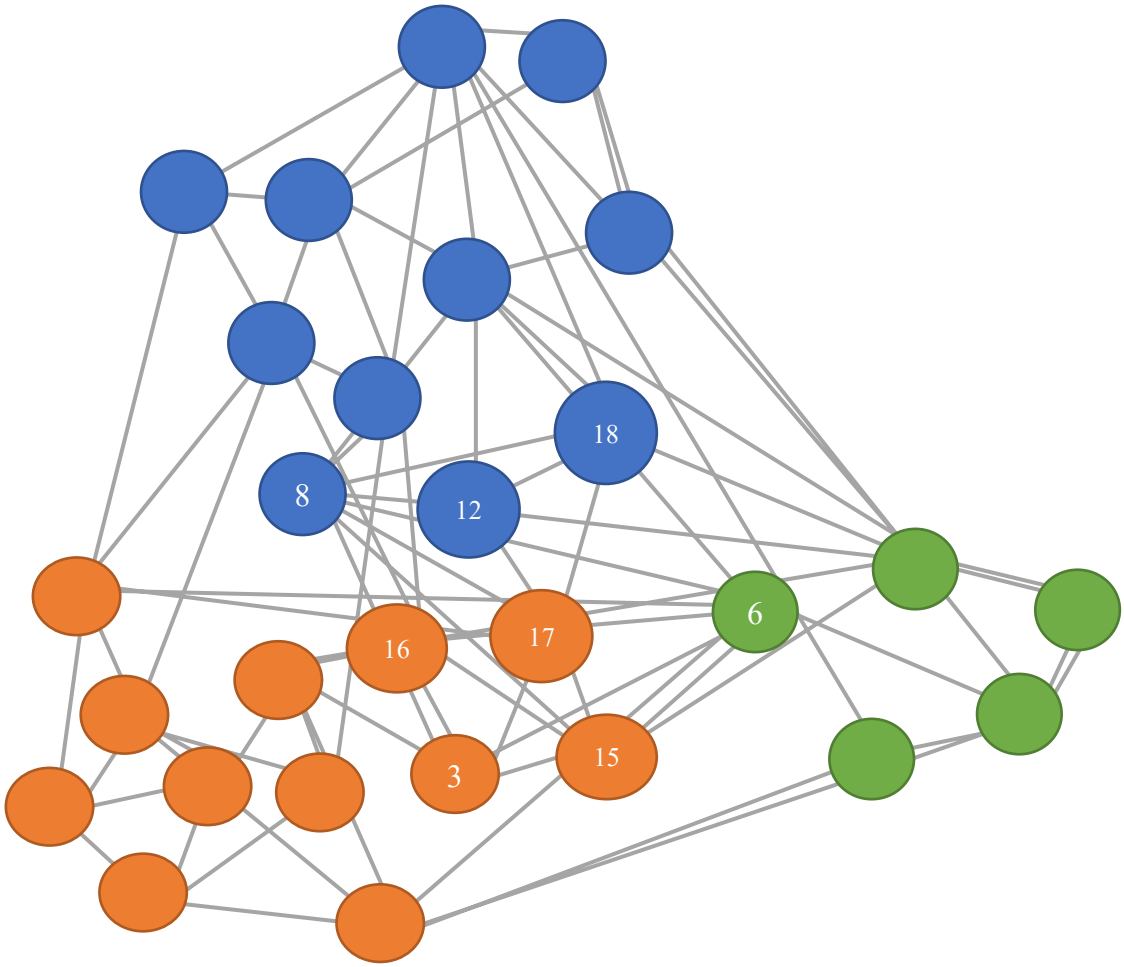
*Indicates reverse-scored item.

Figure 1. Predicted CU Network.

- Blue = Callous
  - Item 8 (“is concerned about the feelings of others”)
  - Item 12 (“seems very cold and uncaring”)
  - Item 18 (“shows no remorse when he/she has done something wrong”)

- Orange = Uncaring
  - Item 3 (“is concerned about schoolwork”)
  - Item 15 (“trying to always do one’s best”)
  - Item 16 (“apologies to person he/she has hurt”)
  - Item 17 (“tries not to hurt other’s feelings”)

- Green = Unemotional
  - Item 6 (“does not show emotions”)



Chapter Three: Results

All positively-worded items, as indicated by an asterisk in Table 2, were reversed-scored prior to analysis. Five of the total 109 subjects did not complete the ICU and were listwise deleted, leaving a sample of 104 participants available for analyses. Those that did not complete the ICU (M = .60, SD = .55) reported fewer total CD symptoms compared to those that did complete the ICU (M = 1.61, SD = 1.76; $p < .01$).

CFA

CFA was conducted in Mplus version 8, using principal-axis factoring with an oblique rotation (e.g., promax). Models were estimated using mean and variance adjusted weighted least squares (WLSMV) given that data were categorical. For all models that failed to reach adequate fit, modification indices that improved model fit by 20 units or more were utilized, a threshold used in past ICU factor analytic studies (Byrd et al., 2013; Essau et al., 2006). Modification indices were utilized if they were theoretically sound, consistent with past research, and did not change *a priori* loading patterns (e.g., items were retained on factors based on extant theory of CU; residual variance of items on different factors were not correlated).

Hypothesized Models

Two main models were tested: a three – factor model and several two – factor models. Model fit indices are provided in Table 3. The hypothesized marginally fitting three – factor model included "callous," "unemotional," and "uncaring" factors. As shown in Figure 2 and Table 3, results demonstrated that this model did not fit the data well (RMSEA = .096, CFI = .851), and there were no significant modification indices.

Next, several two – factor models were examined. The first model included a "callous" factor and "uncaring" factor using 12 of the original 24 items, along with a single item from the "unemotional" factor (*Does not show emotions*), in line with previous research (S.W. Hawes et al., 2014). As shown in Figure 3 and reported in Table 3, results for this 12 – item model demonstrated marginally acceptable fit (RMSEA = .086, CFI = .955); however, there were no significant modification indices. The next model also comprised of a "callous" factor and "uncaring" factor but used 16 of the original 24 items, in line with past research (Houghton et al., 2013). Despite utilizing modification indices greater than the 20 – unit threshold, including correlating the residual variance between items 3 and 23, 3 and 15, and 15 and 23, analyses demonstrated that this model did not fit the data well (RMSEA = .091, CFI = .929). Thus far, results support the 12 – item "callous" and "uncaring" model as best fitting, although fit was only marginally acceptable.

Post-Hoc Models

In addition to the hypothesized models, three pot – hoc models were tested. First, a modified two – factor model comprised of an empathic/prosocial factor (all positively worded items) and a CU factor (all negatively worded items) was tested. Fit indices (RMSEA = .083, CFI = .887)[1], along with weak factor loadings on items 7 (.262, p = .012) and 10 (.189, p = .04), demonstrated that this model did not fit the data well; removal of these two items did not improve model fit (RMSEA = .88, CFI = .895). Next, a single factor model was tested where all items load onto a general CU factor. Results for this model (RMSEA = .096, CFI = .86) indicated that it did not fit the data well, even

[1]Re-analysis of this two – factor model was done but did not reverse-score any positively-worded items, yielding the same model fit indices (RMSEA = .083, CFI = .887).

after using modifications above the 20 – unit threshold, including correlating the residuals of items 3 and 15. Lastly, a three – factor bifactor model was tested where items load onto a general CU factor along with the "callous," "unemotional," and "uncaring" factors. Results demonstrated that the bifactor model did not fit the data well (RMSEA = .088, CFI = .891). These indices were obtained despite making several modifications, including correlating the residual variances between items 20 and 23, deleting item 7 from the entire model, deleting item 10 from the general CU factor, deleting item 8 from the callous factor, deleting items 6 and 22 from the unemotional factor, and deleting items 5, 13, 16, 17, and 24 from the uncaring factor. It should be noted that a two – factor bifactor model could not be tested because it would be unidentified.

Thus, overall CFA results demonstrate that the best fitting model for the ICU was the marginally acceptable 12 – item, two – factor model comprised of a "callous" factor and "uncaring" factor (Figure 3). Internal consistency was good for both factors ($\alpha = .82$).

Network Analysis

One-hundred and four participants were included in the network analyses, given that five participants were completely missing ICU data and had to be eliminated. Networks were constructed in *R* using the *qgraph* package. A network comprised of 12 items stemming from two factors, "callous" and "uncaring," was constructed based upon the results of the CFA (see appendix A for 24 – item network). As shown in Figure 4, visual interpretation of the overall network suggested that symptoms clustered into "callous" and "uncaring" groups. *Seems cold and uncaring* was most central to the preschool CU network as indicated by having the highest values across the three centrality indices (Figure 5). Results also highlighted four symptoms that are less central

to the network, given lower values across the centrality indices: *Is concerned about the feelings of others*, *Feels bad or guilty when he/she has done something wrong*, *Does not show emotions*, and *Does not seem to know "right" from "wrong."*

Other relationships are noteworthy in the ICU network. For example, line thickness indicates the strength of the relationship between items – thicker lines indicate stronger relationships. Results demonstrated that the strongest related items within the preschool network were *apologizes to persons he/she has hurt* and *tries not to hurt others' feelings*, indicating a strong relationship between symptoms within the uncaring domain. In addition, two sets of symptoms were strongly related within the callous domain: *Does not show emotions* and *Does not care about doing well*; and *Does not care if he/she is in trouble* and *Shows no remorse when he/she has done something wrong*.

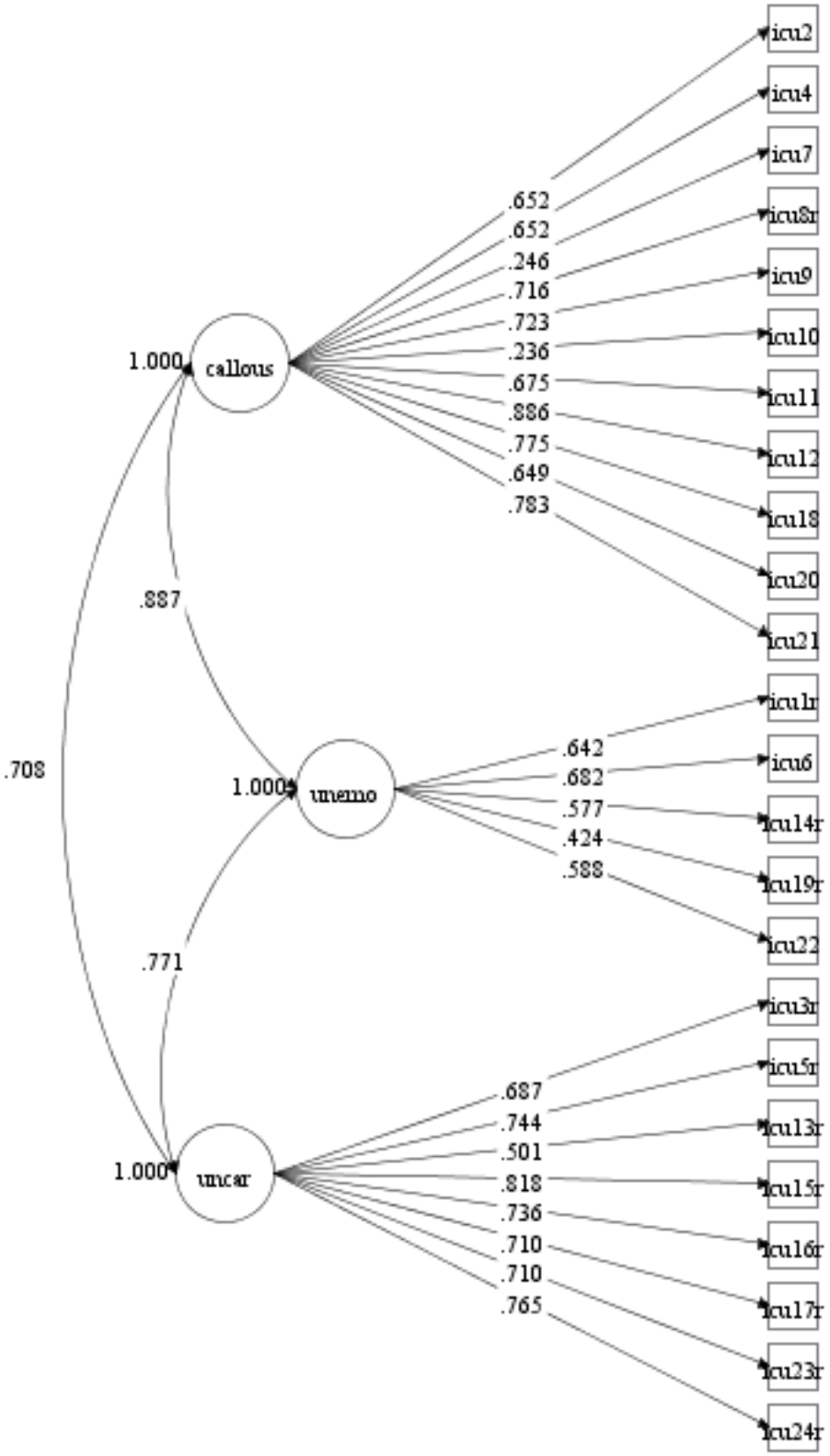
Overall, results from the network analysis demonstrated that the most central or core symptom to the preschool CU network is *seems cold and uncaring*.

Table 3. Confirmatory Factor Analysis Model Fit Indices.

ICU Model Type	Tested Factors	χ^2 (df)	RMSEA	CFI
3 – Factor	Callous, Unemotional, & Uncaring	486.156 (249)*	.096	.851
2 – Factor[a]	Callous & Uncaring (12 – item)	93.893 (53)*	.086	.955
2 – Factor[b]	Callous & Uncaring (16 – item)	186.657 (100)*	.091	.929
2 – Factor[c]	Empathic/Prosocial & CU	430.333 (251)*	.083	.887
1 – Factor	General CU	428.646 (229)*	.092	.860
3Factor – Bifactor	General CU + Callous, Unemotional, & Uncaring	390.505 (216)*	.088	.891

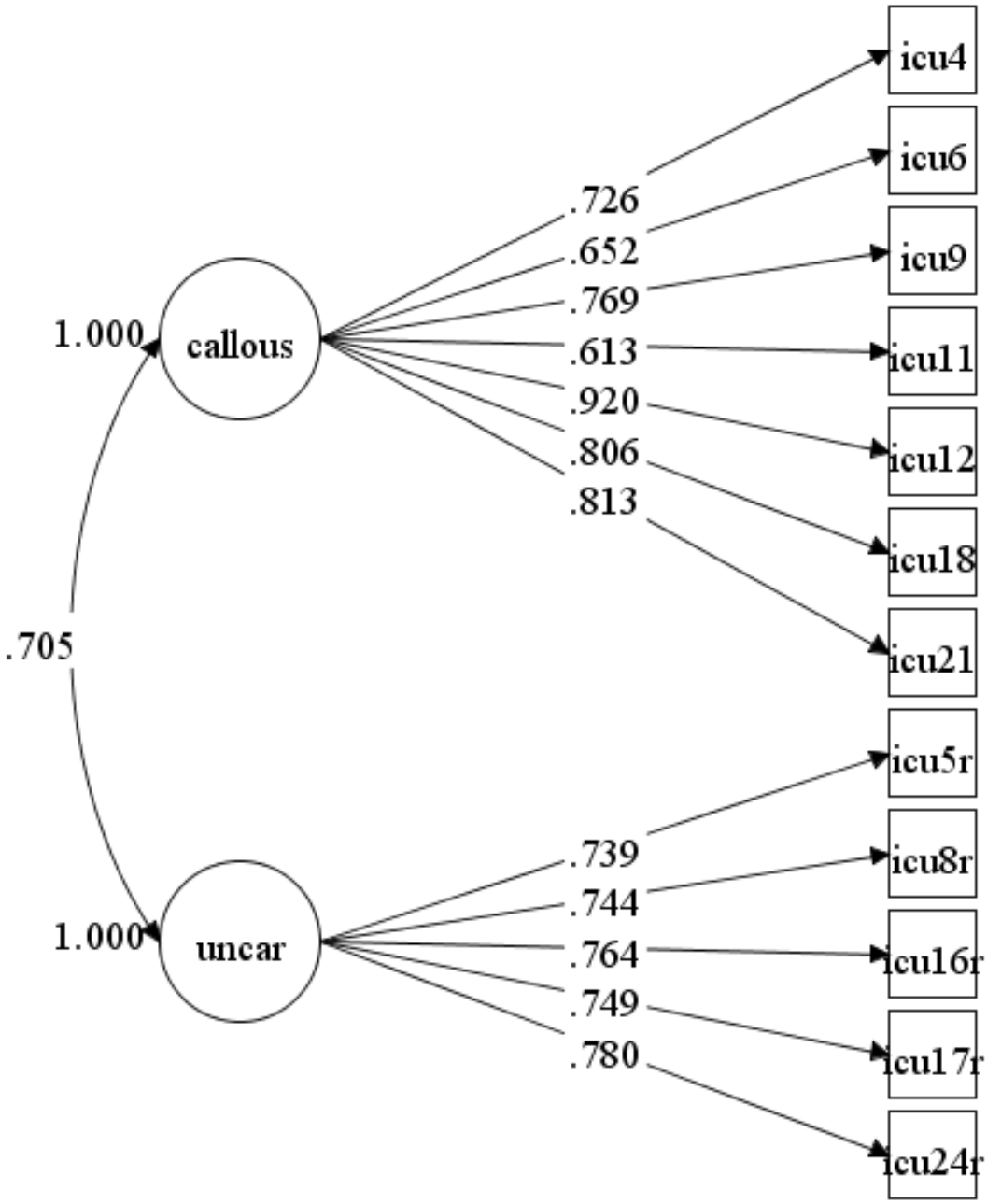
[a]Hawes et al., 2014; [b]Houghton et al., 2013; [c]Willoughby et al., 2015; χ^2 (df) = Chi-Square (Degrees of Freedom); RMSEA = Root Mean Square Error of Approximation; CFI = Comparative Fit Index; *$p < 0.001$.

Figure 2. Proposed Three – Factor ICU Model.



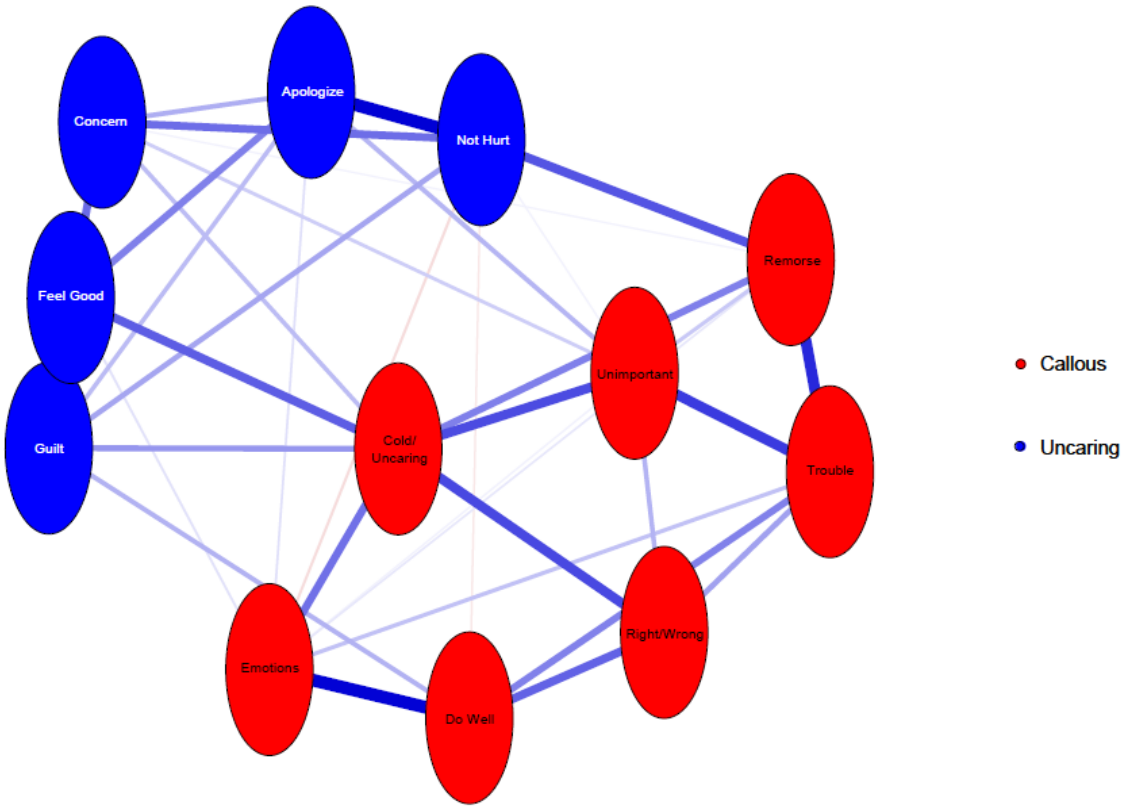
All *p*'s < .05.

Figure 3. Two – Factor, 12 – Item ICU CFA Model[a].



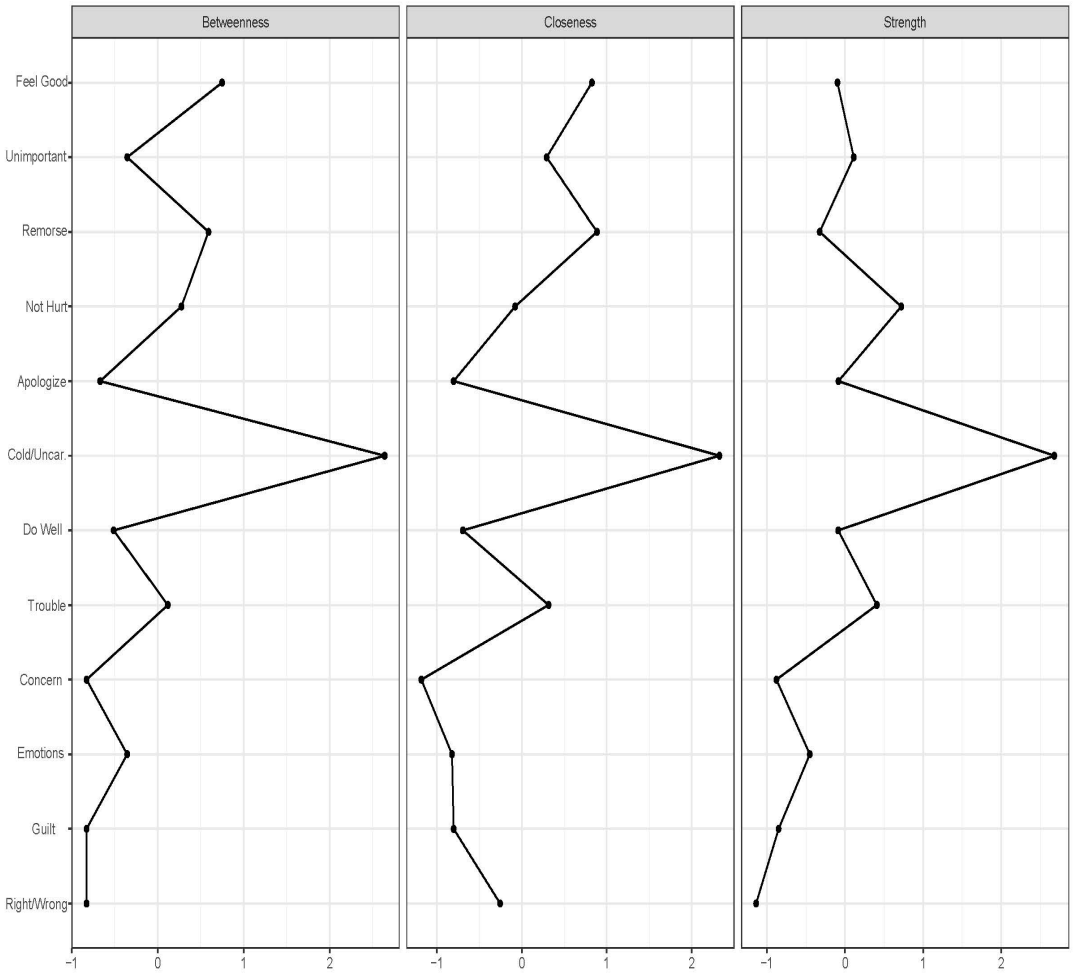
[a]Hawes et al., (2014) Two – Factor Model; All *p*'s < 0.001.

Figure 4. Two – Factor, 12 – Item ICU Network[a].



[a]Hawes et al., (2014) ICU Model; *Symptom key (Item #): *Concern* = (8) Is concerened about the feelings of others; *Feel Good* = (24) Does things to make others feel good; *Guilt* = (5) Feels bad or guilty when he/she has done something wrong; *Apologize* = (16) Apologizes to persons he/she has hurt; *Not Hurt* = (17) Tries not to hurt orthers' feelings; *Remorse* = (18) Shows no remorse when he/she has done something wrong; *Unimportant* = (21) The feelings of others are unimportant to him/her; *Trouble* = (9) Does not care if he/she is in trouble; *Cold/Uncaring* = (12) Seems very cold and uncaring; *Right/Wrong* = (2) Does not seem to know "right" from "wrong"; *Do Well* = (11) Does not care about doing things well; *Emotions* = (6) Does not show emotions.

Figure 5. Centrality Values for Two – Factor, 12 – Item ICU Network.



Chapter Four: Discussion

The purpose of the current study was to explore the structure of CU traits in a high – risk, preschool sample using the ICU, one of the most commonly used methods to assess CU traits. CFA was used to test the best fitting model of the ICU (e.g., two – vs. three – factor) and the study critically extended prior work by being the first to use network analysis to examine the relationships among items on the ICU. Results from the current study contribute to the limited CU preschool literature in two ways. First, factor analytic findings support the 12 – item, two – factor model of the ICU (S.W. Hawes et al., 2014), although the model only received modest support. Second, network analysis found that the most core or central item of CU traits in preschool children was *seems cold and uncaring*.

CFA

The first aim of the current study was to examine the factor structure of CU traits during preschool using a factor analytic approach. Multiple empirically supported models were tested, including: a single – factor model (e.g., CU); a 12 – item, two – factor model (S.W. Hawes et al., 2014); a 16 – item, two – factor model (Houghton et al., 2013); a 24 – item, two – factor model (Willoughby et al., 2015); and a three – factor/three – factor bifactor model (for review, see Waller et al., 2015). It was hypothesized that CFA would support a marginally – fitting three – factor model of the ICU, including: (a) a *callous* factor, representing a lack of empathy, guilt, and remorse for wrongdoings; (b) an *uncaring* factor, representing a lack of care in one's own personal performance (e.g., work, school) and for the feelings of others; and (c) an *unemotional* factor, representing an absence of emotional expression. This hypothesis was not supported, as results

indicated that the best fitting model was the 12 – item, two – factor model comprised of the "callous" and "uncaring" factors (S.W. Hawes et al., 2014). This model retained *Does not show emotion* from the "unemotional" factor (but was placed on the "callous" factor in the current study) as it is one of the original items from the Antisocial Process Screening Device (Frick & Hare, 2001), the measure used to develop the ICU. This suggests that children with CU traits may not overtly express their emotions; however, as discussed below, they may not be *unemotional* in nature. These results run counter to majority of the ICU factor analytic literature, which supports a three – factor or three – factor bifactor model (for review, see Waller et al., 2015). Despite this, they were consistent with another study that utilized a combined community and high – risk preschool sample (Kimonis et al., 2016).

One reason for the discrepnacy between current and past findings may be the type of samples used in past ICU factor analytic studies. More specifically, the majority of past studies of the ICU have used older – aged, community samples which have best supported the three – factor or three – factor bifactor model (for review, see Waller et al., 2015). In contrast, when clinical and high – risk early childhood samples have been used, as in the current study and past research (S.W. Hawes et al., 2014; Kimonis et al., 2016), the two – factor model has been supported. This may be due to the notion that early childhood samples may provide additional insight as to how certain psychopathology, such as CU traits, are represented. For example, these samples may be more emotionally dysregulated and may not endorse items on the "unemotional" subscale. Such an idea is speculative and deserves attention in future work.

Findings of the CFA from the current study also highlight the poor fitting structure of the "unemotional" factor. First, a number of past factor analytic studies of the ICU have deleted majority of the items on the unemotional subscale (e.g., "*Expresses his/her feelings openly*," "*It is easy to tell how he/she is feeling*," "*Is very expressive and emotional*," "*Hides his/her feelings from others*;" S.W. Hawes et al., 2014; Houghton et al., 2013; Kimonis et al., 2016). Several studies have also noted how the unemotional factor has shown the poorest reliability of the three subscales (Byrd et al., 2013; Essau et al., 2006; Fanti et al., 2009; S.W. Hawes et al., 2014; Houghton et al., 2013; Kimonis, Branch, Hagman, Graham, & Miller, 2013; Kimonis et al., 2016; Waller et al., 2015). Further, this factor has also shown to be statistically unrelated to external factors such as aggression (Essau et al., 2006; Fanti et al., 2009; S.W. Hawes et al., 2014), along with delinquency, psychopathology, and even psychopathy (Byrd et al., 2013), suggesting a weak association with expected correlates. It may be inaccurate to apply the term "unemotional" to children with psychopathic traits, which refers to an absence of overall emotional expression. Yet, research on samples ranging from early childhood to adolescence seems to suggest the opposite, where individuals with CU traits display higher rates of negative affect (e.g., anger, frustration, irritability) and experience greater difficulties in regulating this distress (S. W. Hawes et al., 2014; Kimonis, Frick, Skeem, & Goldwater, 2012; Willoughby et al., 2011). Therefore, youth with CU traits may be "callous" (e.g., lacking empathy, guilt for wrongdoings) and "uncaring" (e.g., lacking care regarding personal performance, feelings of others), yet may not be "unemotional." Rather, in accordance with Waller et al., (2015), they may exhibit a lack of prosocial emotion (e.g., anxiety, fear, guilt) rather than a lack of emotional expression. This may be

especially true of preschool children with CU traits, who have not yet reached a stage of complete emotional control, further reinforcing that notion they are not "unemotional." This warrants a discussion as to whether the "limited prosocial emotions" term, as used in the DSM – V should be used more frequently in place of CU, as it may be a better conceptualization of the construct in children (e.g., lacking prosocial emotions vs. being completely devoid of emotions).

Network Analysis

The second aim of the current study was to explore the structure of CU trait items via the ICU during preschool using network analysis. This is a highly innovative study goal as this was the first study to utilize network analysis in relation to the ICU. It was predicted that (a) items from each subscale would cluster together, but the "callous" and "uncaring" subscales would be more strongly clustered relative to the "unemotional" subscale and (b) items from the "callous" and "uncaring" subscales would be most core to the network. Hypotheses were only partially supported. First, based upon the results of the CFA, a 12 – item, two – factor ICU network was utilized rather than the complete 24 – item, three – factor network. Results of the network demonstrated that items clustered together in two groups resembling their corresponding factors. Further, of the eight items hypothesized to be most central to the ICU network, only *seems cold and uncaring* (item 12) from the "callous" subscale demonstrated consistently high centrality across the three indices (closeness, betweenness, and strength). This item primarily taps into the "callous" factor as it pertains to the lack of empathy one with CU exhibits. It also reflects the "uncaring" nature of the construct, where those with CU do not show concern for personal performance in facets of their life, nor for the well-being of other individuals.

Findings from this study map onto the results of two recent studies which used network analysis to examine the central aspects of psychopathy in adult offenders (Preszler, Marcus, Edens, & McDermott, 2018; Verschuere et al., 2017) using the Psychopathy Checklist – Revised (PCL – R; Hare, 2003). These studies also revealed affective items to be most core to the psychopathy network – *Lack of Remorse* (Prezler et al., 2018) and *Callousness/Lack of Empathy* (Verschuere et al., 2017). Taken together, these results seem to demonstrate the importance that "callousness" (e.g., lack of empathy, guilt, remorse) has on the development of psychopathic traits from early childhood to adulthood, across different measures (e.g., ICU, PCL – R). Further, results from the current study suggest that screening for lack of guilt or empathy may be a reliable way to assess for psychopathic traits in children as young as three years old.

Implications

The results of the study have significant clinical implications. CFA suggested that the structure of CU traits during preschool is comprised of a "callous" and "uncaring" factor. This model, consisting of 12 – items, has been supported by at least one other study during this period (Kimonis et al., 2016) and is half the length of the original 24 – item ICU. Thus, it might provide clinicians a more parsimonious and efficient method in assessing psychopathic traits during childhood. Further, network analyses results extend the findings of the CFA by identifying *seems cold and uncaring* as the most core feature of CU traits during this period. This item might be a viable candidate that could be utilized in multiple healthcare settings (e.g., hospitals, pediatric officers, mental health clinics) as a screener item. The endorsement of this affective item may suggest that a

child is at risk for developing psychopathic traits and other externalizing pathology with clinicians being able to conduct further assessments and implement treatment as needed.

Despite the possible clinical utility of these results, the current study also highlights limitations of the ICU. First, the ICU consists of an equal number of positively and negatively worded items (12 each). A large portion of research has demonstrated that this method fails to prevent response bias and leads to higher rates of respondent confusion, reduced scale reliability, and higher rates of method error (Garg, 1996; Johnson, Bristow, & Schneider, 2011; for review, see Sonderen, Sanderman, & Coyne, 2013; Woods, 2006). For example, all eight items on the ICU's uncaring subscale are positively worded; thus, instead of measuring the degree of how *uncaring* an individual is, the positively worded items on this subscale are measuring how much one cares, which directly opposes the underlying notion of CU traits. Therefore, reverse – scored items are likely not measuring the construct of interest (e.g., Conrad et al., 2004; Rodebaugh, Woods, & Heimberg, 2007). Second, items on the unemotional subscale may not be assessing the appropriate forms of affective deficits in individuals with CU traits. Results from the CFA included the single item *Does not show emotions* from the unemotional subscales. The inclusion of this item within the model highlights the importance of the affective aspect of psychopathy in children; however, as noted by S.W. Hawes et al. (2014), items on the unemotional subscale are likely assessing how well an individual conceals their emotions (e.g., *Does not show emotions*, *Is easy to tell how he/she is feeling*, *Hides his/her feelings*). Thus, future research should focus on reconceptualizing this facet to better describe the lack of positive emotions (rather than lack of complete emotional display) displayed by individuals with psychopathic traits.

Limitations

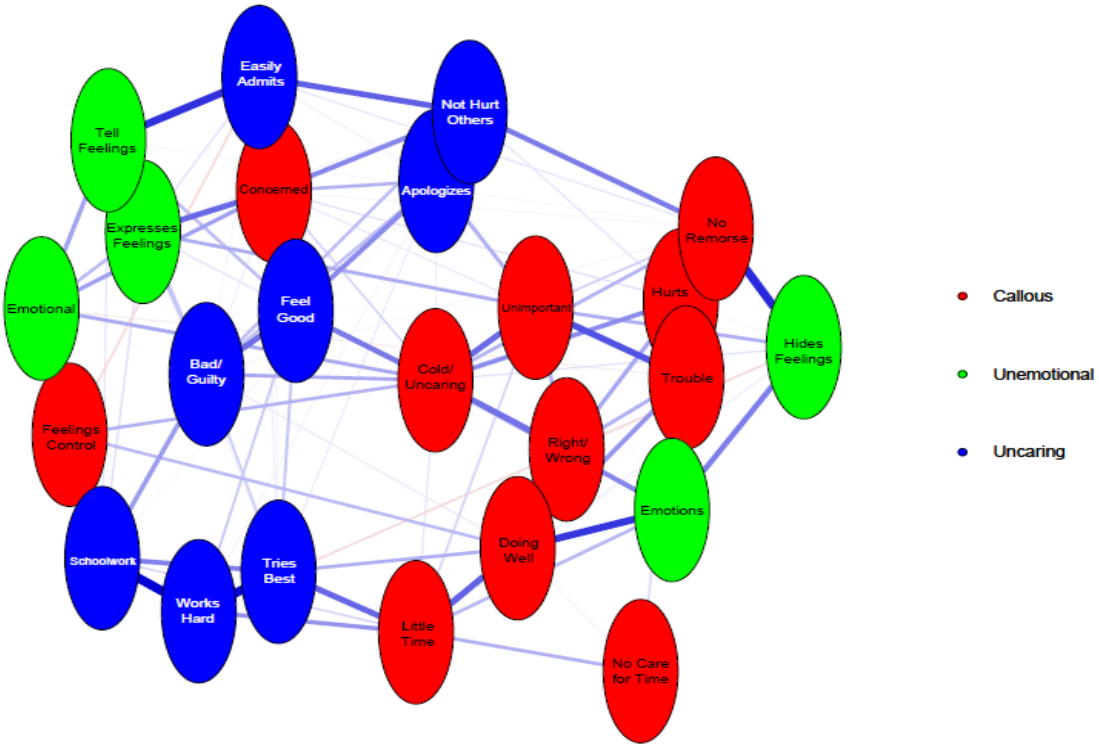
There are a few important limitations to consider when interpreting the results of the current study. First, the results of the CFA may have been impacted by the sample size which is smaller relative to several past ICU factor analytic studies (for review, see Waller et al., 2015). However, the sample size was comparable to past research that also utilized network analysis to examine the structure of impulsivity (Martel, Levinson, Lee, & Smith, 2017), ADHD (Martel, Levison, Langer, & Nigg, 2016), and ODD (Smith, Lee, Martel, & Axelrad, 2017) during preschool. In addition, network analysis assumes a correlational design, and therefore no causal statements can be made regarding the direction of relationships. Also, this study only used parent – reported data (although this was necessary given the age of the sample). Further, results of the network analysis are limited by a focus on preschool and thus do not provide insight as to how the structure of CU traits transforms throughout the lifespan. Lastly, results of the CFA and network analyses only generalize to other clinical preschool children from urban populations.

Conclusions

Despite these limitations, results of the current study provide support for existing factor analytic model results, particularly in clinical preschool populations (Kimonis et al., 2016) and extend the literature by being the first study to examine the structure and core components of CU traits during early childhood. Results demonstrated that 12 – items, loading onto a "callous" and "uncaring" factor, best fit the CFA model during preschool. Further, network analysis demonstrated that *seems cold and uncaring* was the most central item to the CU preschool network, which might allow for efficient screening of psychopathic traits in children if replicated in other samples. Future research should

aim to replicate these results in a larger sample using a multi – informant and longitudinal approach to examine how the structure of CU traits changes over time and differs across multiple informants.

Appendix A
Three – Factor, 24 – Item ICU Network.



*Symptom key (Item #): *Tell Feelings* = (14) It is easy to tell how he/she is feeling; *Expresses Feelings* = (1) Expresses his/her feelings openly; *Emotional* = (19) Is expressive and emotional; *Hides Feelings* = (22) Hides his/her feelings from others; *Emotions* = (6) Does not show emotions; *Easily Admits* = (13) Easily admits to being wrong; *Not Hurt Others* = (17) Tries not to hurt orthers' feelings; *Apologizes* = (16) Apologizes to persons he/she has hurt; *Feel Good* = (24) Does things to make others feel good; *Bad/Guilty* = (5) Feels bad or guilty when he/she has done something wrong; *Schoolwork* = (3) Is concerned about schoolwork; *Works Hard* = (23) Works hard on everything; *Tries Best* = (15) Always tries his/her best; *Concerned* = (8) Is concerened about the feelings of others; *Feelings Control* = (10) Does not let feelings control him/her; *Cold/Uncaring* = (12) Seems very cold and uncaring; *Unimportant* = (21) The feelings of others are unimportant to him/her; *No Remorse* = (18) Shows no remorse when he/she has done something wrong; *Hurts* = (4) Does not care who he/she hurts to get what he/she wants; *Trouble* = (9) Does not care if he/she is in trouble; *Right/Wrong* = (2) Does not seem to know "right" from "wrong;" *Doing Well* = (11) Does not care about doing things well; *Little Time* = (20) Does not like to put the time into doing things well; *No Care for Time* = (7) Does not care about being on time.

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Woods, C. M. (2006). Careless responding to reverse-worded items: Implications for confirmatory factor analysis. *Journal of Psychopathology and Behavioral Assessment, 28*(3), 189-194. doi:10.1007/s10862-005-9004-7

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EDUCATION

Philadelphia College of Osteopathic Medicine Philadelphia, PA
Master of Science, *Counseling & Clinical Health Psychology* July, 2015

Pennsylvania State University – Abington College Abington, PA
Bachelor of Arts, *Psychology* May, 2014

SCHOLARLY WORK

Peer Reviewed Manuscripts

Goh, P. K., Lee, C. A., Smith, T. E., **Bansal, P. S.**, & Martel, M. M. (Under Review). Personality traits exacerbate ADHD symptom comorbidity with depressive problems and rule-breaking behaviors during young adulthood. *Journal of Abnormal Psychology.*

Bansal, P. S., Waschbusch, D. A., Haas, S. M., Babinski, D. E., King, S., Andrade, B. F., & Willoughby, M. T. (In Press). Effects of intensive behavioral treatment on children with varying levels of conduct problems and callous-unemotional traits. *Behavior Therapy.*

Petrovic – Dovat, L. Kumar, M. G., & **Bansal, P. S.** (2018). Refining training opportunities for pediatric and psychiatric residents and fellows within an integrated healthcare model. *Journal of Psychiatry and Behavioral Sciences, 1006*(2), 1-3.

Petrovic – Dovat, L., Berlin Jr., C. M., **Bansal. P. S.**, & Fogel, B. N. (2018). Designing programs and educational opportunities to aid pediatricians in treating children with mental illness in an outpatient academic pediatric setting. *Journal of Psychology and Psychiatry, 2*(1), 1-3.

Babinski, D. E., Mills, S. L., & **Bansal, P. S.** (2018). The effects of behavioral parent training with adjunctive social skills training for a preadolescent girl with ADHD and borderline personality features. *Clinical Case Studies*, *17*(1), 21-37.

Petrovic-Dovat, L., Fausnight, T., White, A. M., Zeiger, T. S., **Bansal, P. S.**, Garg, N.,... & Bixler, E. O. (2016). Degree of anxiety in food allergic children in a tertiary care center. *Annals of Allergy, Asthma & Immunology*, *116*(6), 528-532.

Poster Abstracts

Bansal, P. S. & Martel, M. M. (2018, October). *Empirical assessment of callous – unemotional traits in preschool: A comparison of confirmatory factor analysis and*

network analysis. Poster presented at the 2018 National Conference in Clinical Child and Adolescent Psychology, Kansas City, MO.

Petrovic-Dovat, L., Kumar, M., **Bansal, P. S.,** & Mahr, F. S. (2018, October). *Expanding outpatient experience for psychiatry and pediatric residents during child and adolescent psychiatry rotation to meet challenges of the changing healthcare.* Poster presented at the American Academy of Child and Adolescent Psychiatry Annual Meeting, Seattle, WA.

Petrovic-Dovat, L., Fogel, B. N., Zeiger, T. S., **Bansal, P. S.**, Flynn, K. A., & Berlin Jr., C. M. (2017, September). *Increasing the rate of anxiety disorder screening and diagnosis in youth at a primary care clinic using evidenced-based practices.* Poster presented at the 2017 67th Annual Canadian Psychiatric Association Conference, Ottawa, ON.

Petrovic-Dovat, L., Fogel, B. N., Waxmonsky, J. G., Zeiger, T., Waschbusch, D. A., Iriana, S., **Bansal, P. S.**, & Berlin Jr., C. M. (2016, October). *Identifying pediatric patients with behavioral health disorders in a primary care outpatient clinic.* Poster presented at the American Academy of Child and Adolescent Psychiatry Annual Meeting, New York City, NY.

Bansal, P. S., Haas, S. M., King, S., Andrade, B. F., & Waschbusch, D. A. (2016, October). *Effects of a summer treatment program on children with conduct problems and limited prosocial emotion.* Poster presented at the 2016 National Conference in Clinical Child and Adolescent Psychology, Lawrence, KS.

Hameed, A., Qureshi, M., **Bansal, P. S.**, Hameed, U., & Bunce, S. C. (2016, June). *Relationship between depression and pregnancy in rural Guatemala: A pilot study.* Poster presented at the 2016 American Society of Clinical Psychopharmacology Annual Meeting, Scottsdale, AZ.

Verma R, B., Hillwig-Garcia, J., **Bansal, P. S.**, & Petrovic-Dovat, L. (2016, February). *Diagnostic challenges in a child with neuro-psycho-endocrinological Illness.* Poster presented at the 2016 Resident Research Day, Hershey, PA.

Wolper, V., Nissley – Tsiopinis, J., **Bansal, P. S.**, & Eiraldi, R. (2015, November). *Gender differences in ADHD comorbidity and functional impairments across childhood.* Poster presented at the Association for Behavioral and Cognitive Therapies Conference, Chicago, IL.

Bansal, P. S., Nissley – Tsiopinis, J., & Eiraldi, R. (2015, April). *Hostile attribution bias as a predictor of ODD in pediatric ADHD.* Presented at the Association for Psychological Sciences Conference, New York City, NY.

PRESENTATIONS AT SCIENTIFIC MEETINGS

Zeiger, T. S., **Bansal, P. S.**, Petersen, C. A., Fogel, B. N., Iriana, S. M.,…& Petrovic-Dovat, L. (2018). Integration and incorporation of pediatric behavioral health services within a tertiary care center. To be Presented at the 12th Annual International Conference on Psychology, 2018, Athens, Greece.

Nissley – Tsiopinis, J., Lawson, G., Mautone, J. A., **Bansal, P. S.**, Sheehan, A., & Power, T. J. (2017). Using goal attainment to measure patient-centered response to evidenced-base intervention administered in urban primary care. Presented at the Association for Behavioral and Cognitive Therapies 2017 Convention, San Diego, CA.

Haas, S. M., Waschbusch, D. A., Willoughby, M. T., **Bansal, P. S.**, Helseth, S., Crum, K. I.,…& Pelham Jr., W. E. (2017). The impact of standard and modified behavioral treatment on the behaviors of children with conduct problems and callous-unemotional traits. Presented at the 2017 Annual American Psychological Association Convention, Washington D.C.

SCIENTIFIC & JOURNAL REVIEWS

Ad Hoc Journal Reviewer: *Journal for Pediatric Neuropsychology*, *Journal of Abnormal Child Psychology*

RESEARCH EXPERIENCE

University of Kentucky, RISK Lab Lexington, KY
Department of Psychology, *Graduate Student* August, 2017 – Present
Supervisor: Michelle M. Martel, Ph.D.

Penn State Hershey Medical Center, College of Medicine Hershey, PA
Department of Psychiatry, *Human Research Technologist* August, 2015 – July, 2017
Supervisors: Edward O. Bixler, Ph.D. & Daniel A. Waschbusch, Ph.D.

Children's Hospital of Philadelphia Philadelphia, PA
Center for Management of ADHD, *Research Assistant* January, 2014 – August, 2015
Supervisors: Jenelle Nissley – Tsiopinis, Ph.D. & Thomas J. Power, Ph.D.

Pennsylvania State University – Abington College Abington, PA
Department of Psychology, *Research Assistant* January, 2013 – May, 2013
Supervisors: Jacob A. Benfield, Ph.D., & Michael J. Bernstein, Ph.D.