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Assessing Callous-Unemotional Traits in a Spanish sample of Institutionalized Youths:

The Inventory of Callous-Unemotional Traits

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Abstract

Callous and unemotional traits (CU), considered as the hallmark of the construct of psychopathy, have shown their relevance in designating a specific subgroup of youths with a distinctive pattern of severe conduct problems and antisocial behavior. In order to improve the existing measures, the *Inventory of Callous Unemotional traits* (ICU) was developed to provide a reliable and valid measure of CU traits in youth populations. The present study aims to validate the Spanish self-reported version of the ICU in a sample of 324 institutionalized youths. Firstly, the factor structure of the ICU was tested in order to identify distinctive dimensions of CU traits. Secondly, the association of the ICU with other measures of personality and psychopathic traits, as well as with a set of external behavioral and psychosocial variables, was examined. Finally, the usefulness of CU traits measured through the ICU to designate a distinctive subgroup of antisocial youths was also investigated. After some scale refinement, results confirm the validity of the ICU as a reliable and efficient measure of CU traits in youth samples, provide some evidence as regards the dimensionality of the construct, and support its relevance in identifying a specific subgroup of youths showing a pattern of serious behavioral and psychosocial disadjustment.

Keywords: callous-unemotional traits, antisocial behavior, institutionalized, youths

Callous and unemotional traits (CU) have been increasingly used in describing a particular affective style in youth populations characterized by a lack of guilt and remorse, shallow or superficial expression of emotions, the callous use of others, an insensitivity for the feelings of others, and a lack of concerns regarding self-performance in relevant activities (Frick, 2009). Being considered as the hallmark of the construct of psychopathy (White & Frick, 2010), CU traits have been extensively analyzed in developmental models of youth conduct problems and antisocial behavior. At this regard, CU traits have been suggested as a potential identifier of a specific and distinctive subgroup of adolescents with a negative pattern of behavioral and psychosocial adjustment (e.g., Frick, Ray, Thornton, & Kahn, 2014; López-Romero, Romero, & Luengo, 2012). This has been supported by a wide body of research leading to the recent inclusion of a severity specifier based on the callous-unemotional conceptualization (i.e., “with low prosocial emotions”), for child and youth conduct disorders in the latest version of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5; American Psychiatric Association, 2013). Considering the relevance of CU traits for understanding antisocial and delinquent behavior, there was a need for efficient, reliable and valid instrument (Feilhauer, Cima, & Arntz, 2012). In an attempt to provide a more comprehensive measure of CU traits, overcoming some of the limitations identified on existing measures, Frick developed the 24-item Inventory of Callous-Unemotional traits (ICU; Frick, 2004). This measure was created on the basis of the four items of the Antisocial Process Screening Device (APSD; Frick & Hare, 2001) which consistently loaded on the Callous and Unemotional subscale in both community and clinical samples (Frick, Bodin, & Barry, 2000).

The factor structure of the ICU has been previously examined, with most of the studies supporting a three-factor bifactor model. That is, items loaded on a general CU factor as well as on three distinctive factors: *Callousness* (i.e., a callous attitude towards others expressed by lack of empathy, remorse and guilt), *Uncaring* (i.e., lack of caring about one’s own performance and for the feelings of others), and *Unemotional* (i.e., lack of emotional expression). This factor structure, initially found in a community sample of German Caucasian adolescents (Essau,

Sasagawa, & Frick, 2006), was then replicated in American samples of ethnically diverse detained youths and college students (Kimonis et al., 2008; Kimonis, Branch, Hagman, Graham, & Miller, 2013¹), in community samples of Greek and Belgian adolescents (Fanti, Frick, & Georgiou, 2009; Roose, Bijttebier, Decoene, Claes, & Frick, 2010), and also in young adult males (e.g., Byrd, Khan & Pardini, 2013). A similar three-factor structure, but represented in a hierarchical model, was also observed in a sample of Spanish preschoolers (Ezpeleta, Osa, Granero, Penelo, & Domènech, 2013), and school aged Italian children (Ciucci, Baroncelli, Franchi, Naz Golmaryami, & Frick, 2014). So far, one study has questioned the three-factor model for the 24-item ICU (Feilhauer et al., 2012). The authors proposed a five-factor structure since none of the initially tested models, including the three-bifactor model, showed an acceptable fit, a problem also observed in some previous studies. However, this new five-factor proposal has not been replicated in other samples yet, which restricts its generalizability and further acceptance. The need for scale refinement has been also raised in recent studies conducted using the self-reported version of the instrument with college students and young adult males (Byrd et al., 2013; Kimonis et al., 2013). In this line, Hawes et al. (2014) have developed a short form of the parent-reported ICU consisting in two factors (Callousness and Uncaring) by using 12 of the original 24 items. Moreover, whereas the global score includes equal numbers of positively and negatively worded items, most of the callousness items are negatively worded while all of the uncaring items are positively worded. Thus, some authors have questioned whether a potential method variance related to the keying of items, and not construct variance, may contribute to the grouping of the items (Byrd et al., 2013; Kimonis et al., 2013).

Some evidence supporting the construct validity of the ICU has also been reported in previous research. Therefore, prior validation studies have shown close associations with other measures specifically designed to tap psychopathic traits (e.g., Fink, Tant, Trembla, & Kiehl,

¹ In both studies, authors removed items 2 (“What I think is right and wrong is different from what other people think”) and 10 (“I do not let my feelings control me”) from the Callousness dimension, considering their low factor loadings and in order to improve the model fit (Kimonis et al., 2008).

2012), as well as with more general personality traits theoretically related to the psychopathic construct (e.g., sensation seeking, emotional reactivity, behavioral inhibition, empathic tendencies; Essau et al., 2006; Kimonis et al., 2013; Roose et al., 2010). Moreover, CU traits measured through the ICU have been positively associated with external criteria traditionally related with psychopathic personality (e.g., antisocial behavior, delinquency, aggression, Fanti et al., 2009; Roose et al., 2010), and negatively linked with variables measuring prosocial and adaptive functioning (Essau et al., 2006; Roose et al., 2010). Important differences were also observed across the three ICU subscales in their associations with the analyzed external criteria. Thus, whereas the unemotional subscale shows a distinctive pattern more specifically related to emotional functioning (e.g., Ezpeleta et al., 2013; Kimonis et al., 2008), the callousness and uncaring subscales tend to show a general pattern of association with similar behavioral and psychosocial correlates. When those correlations were examined in detail, a closer specific association emerged for callousness and behavioral problems (e.g., Byrd et al., 2013; Roose et al., 2010), and for uncaring and poor psychosocial functioning (e.g., Hawes et al., 2014; López-Romero, Romero, & Gómez-Fraguela, 2014).

Overall, previous studies have evidenced both the generalizability of the three-factor structure of the ICU, supporting the use of either a total ICU score or the subscales, and the usefulness of the instrument in assessing CU traits, considered a key dimension in the analysis of severe and persistent antisocial behavior. However, there is still a need for replication studies, in different contexts, languages and developmental stages, in order to (1) clarify the specific internal structure of the ICU, with three subscales structured in a bifactorial (e.g., Kimonis et al., 2008; Roose et al., 2010) or a hierarchical model (e.g., Ciucci et al., 2014; Ezpeleta et al., 2013), (2) meet the needs of scale refinement explicitly raised in previous research (e.g., Kimonis et al., 2013), and (3) examine whether method variance instead of construct variance is related to the grouping of the items (Byrd et al., 2013). Moreover, considering the differences observed across studies, there is a need for further clarifying the patterns of relationship among the three ICU subscales and theoretically meaningful constructs, in order to define commonalities and differences across them (Roose et al., 2001). In addition, since CU traits have shown their

predictive power for severe antisocial behavior (Frick et al., 2014), further validation studies of the ICU should go beyond the analysis of the association with problematic behavior and examine to what extent the instrument delineate a specific subgroup of severe antisocial youths (Kimonis, Fanti et al., 2014), even controlling for other variables relevant in defining subgroups of problematic youths. Similarly, given that the ICU has been developed on the basis of the CU scale of the APSD, testing the incremental validity of the ICU beyond the CU scale from the APSD would reinforce the value and usefulness of the instrument. Finally, even though the ICU has been validated in different studies also conducted beyond the US-based samples, its usefulness in the Spanish context, which represents a culturally distinctive setting, remains scarce. Since cultural issues might play an important role in the development of personality traits, carrying out similar studies in different contexts, with specific social and cultural backgrounds, would facilitate the generalization of the findings (Herpers, Rommelse, Bons, Buitelaar, & Scheepers, 2012), and support the practical use of the instrument. To our knowledge, there is only one validation study of the ICU in our context, conducted in a Spanish sample of preschoolers and using the teacher-reported version of the instrument, which has shown some differences in the internal structure with some problems related the widely accepted three-factor bifactor model (Ezpeleta et al., 2013). New validation studies, using other versions of the ICU in other relevant samples, are still needed in order to check whether the internal structure or the pattern of external associations can be further replicated in the Spanish context. This would support the use of this promising measure relevant to research purposes, risk assessment/management practices or intervention targets.

Based on the foregoing, this study has been proposed with the aim of examining the usefulness of the self-reported version of the ICU in a Spanish sample of institutionalized youths, a group scarcely analyzed in previous research (Berg et al., 2013). Therefore, different evidence supporting the validity of the ICU as a measure of CU traits were examined. Firstly, the factor structure of the ICU was tested, expecting a three-factor structure similar to those outlined and extensively replicated in previous research (e.g., Essau et al., 2006; Fanti et al., 2009; Roose et al., 2010). Secondly, we intended to further validate the instrument by analyzing

global and unique associations among ICU and its subscales with the APSD and other relevant personality measures theoretically related with CU traits (i.e., convergent validity; e.g., impulsiveness, empathy, sensation seeking and hostility, positive attitudes towards violence). Associations with external criteria traditionally related with psychopathic personality were also examined (i.e., criterion validity; e.g., antisocial behavior, antisocial peers, prosocial behavior, low cooperation on treatment, and age of violent behavior onset). Furthermore, considering that psychopathic traits have shown their usefulness in delimitating a specific subgroup of problematic youths (Fanti, 2013; López-Romero et al., 2012), we aimed to test the incremental validity of the ICU to discriminate a specific group of severe antisocial youths above and beyond other relevant factors in grouping antisocial youths (i.e., impulsiveness, sensation seeking, hostility and empathy; Marshall & Marshall, 2011; Murray & Farrington, 2010), as well as the CU factor of the APSD.

Method

Participants

Data was collected in a sample of 324 adolescents to young adults from the Juvenile Justice System. All of them were housed in several juvenile institutions in Galicia (NW Spain), including both correctional (for youths who have committed some delinquent act; 56.18%, with the 30.25% serving a probation measure), and guardianship centers from the foster care system (for problematic youths at-risk for future antisocial behavior; 43.82%). Participants ranged in age from 12 to 21, with a mean age of 16.13 (SD = 1.98), and 72.5% were males. Information was provided by 324 youths and 53 staff members from the centers.

Variables and measures

Self-reported measures

Callous and unemotional traits. CU traits were assessed with the Inventory of Callous-Unemotional traits (ICU; Frick, 2004), described in the Introduction section. The ICU is a 24-items scale rated on a fourth-point Likert scale from 0 (*Not at all true*) to 4 (*Definitely true*). Half of the items are positively worded and were reversed before carrying out the analyses, with

higher scores indicating greater presence of the construct. Information about its internal structure, reliability and validity in this sample are further provided in the Results section.

Psychopathic traits. Affective, interpersonal and behavioral psychopathic traits were examined using the Antisocial Process Screening Device (Frick & Hare, 2001). The APSD is a 20-item rating scale designed to assess psychopathic traits in a three-point scale ranging from 0 (*Not at all true*) to 2 (*Definitely true*). A three-factor structure has been previously proposed and further validated (Frick et al., 2000), comprising a six-item *Callous/Unemotional* ($\alpha = .43$; e.g., “Your emotions seem shallow”), a five-item *Impulsivity/Conduct problems* ($\alpha = .60$; e.g., “You act without thinking”), and a seven-item *Narcissism* dimensions ($\alpha = .64$; “You brag a lot about your abilities, accomplishments, or possessions”). The usefulness of the Spanish version of the APSD was supported by previous studies, which have shown good levels of internal consistency as well as significant positive associations with measures of externalizing conduct problems in community and institutionalized samples of children (e.g., López-Romero, Romero & Luengo, 2011; Romero, Luengo, Gómez-Fraguela, Sobral, & Villar, 2005).

Empathy. A 5-item subscale ($\alpha = .78$; e.g., “I get sad when I see other people suffering”, “Others’ feelings affect me easily”), created from the Affective Empathy subscale of the Basic Empathy Scale (BES; Jolliffe & Farrington, 2006) was used to assess self-reported affective empathy. Participants had to indicate how accurate each item defines them, using a 4-point Likert type scale ranging from 0 (*Not true*) to 3 (*Very true*).

Impulsiveness and Sensation seeking. Both variables were assessed using a short version of the Impulsiveness and Venturesomeness subscales from the I₇ (Aluja & Blanch, 2007). A 6-item subscale was used in order to assess adolescent impulsive tendencies ($\alpha = .76$; e.g., “I do things without thinking twice”), whereas sensation seeking behaviors were reported in a 7-item subscale ($\alpha = .66$; e.g., “I would like to do daring things”). Both subscales were rated using a 4-point scale ranging from 0 (*Not true*) to 3 (*Very true*).

Hostility. Difficulties in managing anger were examined through the SCR-90-R Hostility Scale (Derogatis, 2003), composed by 6 items ($\alpha = .84$; e.g., “I get annoyed easily”, “I often shout or throw things”) and scored in a 4-point scale from 0 (*Not true*) to 3 (*Very true*).

Positive attitudes towards violence. The Attitudes Towards Social Aggression Scale (Moral 2005) was used in order to rate youths' underlying attitudes towards violent and aggressive behavior. Composed by 12 items ($\alpha = .83$; e.g., "I get upset when I see others fighting", reverse scored, "Sometimes I imagine myself beating someone who deserves it"), participants scored each item in a 4-point Likert type scale ranging from 0 (*Not true*) to 3 (*Very true*).

Antisocial behavior. The Antisocial Behavior Questionnaire, short version (ABQ; Luengo, Otero, Romero, Gómez-Fraguela, & Tavares-Filho, 1999) was used in assessing the frequency of the adolescent's antisocial behavior over the past 12 months. The questionnaire was composed of 30 items scored in a four-point scale of 0 (*Never*), 1 (*Sometimes* – 1 to 5 times), 2 (*Often* – 5 to 10 times) and 3 (*Very often*, 10 times or more). All the items were grouped into five six-item subscales: a) *Aggressive behavior* ($\alpha = .88$; e.g., "Provoking fights"); b) *Rule-breaking* ($\alpha = .85$; e.g., "Staying outside overnight without permission"); c) *Vandalism* ($\alpha = .83$; e.g., intentional destruction of street furniture); d) *Thefts* ($\alpha = .90$; e.g., "Stealing things in stores when they are open"); e) *Drug problems* ($\alpha = .85$; e.g., "Having because of drug use at home, school, with friends..."). The *Total score* of the scale was also computed in order to have a global measure of antisocial behavior ($\alpha = .96$). The usefulness of this questionnaire and its subscales in analyzing adolescents' antisocial behavior has been proven in an extensive body of research conducted in different samples (e.g., Gómez-Fraguela, Luengo, Romero, Villar, & Sobral, 2006; Romero, Gómez-Fraguela, Luengo, & Sobral, 2003).

Antisocial peers. The presence of antisocial behaviors into the peers group were assessed through 3 items developed specifically for the present study ($\alpha = .80$; e.g., "My best friends gets into lots of trouble"), and rated in a four-point scale from 0 (*Completely disagree*) to 3 (*Completely agree*).

Prosocial behavior. Altruistic and prosocial behaviors were assessed through 10 items created *ad hoc* for the present study ($\alpha = .76$; e.g., "Giving up the seat to someone in a public transport"), and rated in a in a four-point Likert type scale of 0 (*Never*), 1 (*Sometimes* – 1 to 5 times), 2 (*Often* – 5 to 10 times) and 3 (*Very often*, 10 times or more).

School adjustment. Implication, performance and attitudes towards school and academic life were assessed with a 14-item scale ($\alpha = .75$; Luengo, Villar, Sobral, Romero, & Gómez-Fraguela, 2009) adapted from Berry, Phinney, Sam, and Vedder (2006). Participants who were attending school at the moment of the assessment rated each item in a dichotomous scale of 1 (*False*) and 2 (*True*) based on their feelings about going school, doing homework, the usefulness of the school or the difficulty of accepting established rules (e.g., “I would like to not have to study”, reverse scored; or “Most of the school rules are stupid and senseless”).

Staff reported measures

Low cooperation on treatment. The participants’ implication on treatment and intervention programs conducted at custody centers was assessed through 9 items especially developed for the present study ($\alpha = .85$; e.g., “He/she accepts the intervention proposed as treatment”, reverse scored, “He/she shows little interest in the intervention”). The center officers rated the items as *No* (0) or *Yes* (1), based on their current intervention experiences with each participating youth.

Age of onset. The age of participants’ violent behavior onset was reported through the question “If appropriate, age of the first violent act”, which was completed by the center staff based on the official file review.

Questionnaires without a previous Spanish version were adapted and translated according to guidelines widely accepted for successful translation (Brislin, 1970). Therefore, one bilingual translator, who was culturally informed, individually blindly translated the questionnaires from the original language (English) to the second language (Spanish). Another bilingual person translated it back to the original language (Spanish to English). Differences in the original and the back-translated versions were discussed and solved by joint agreement of both translators.

Procedure

All procedures, assents/consents, and instruments were approved by the Bioethics Committee at the University of Santiago de Compostela, the Regional Government (Xunta de Galicia), and the Ministry of Science and Technology of the Spanish Government.

Heads of the Galician Juvenile Justice System and participating centers were provided with a full description of the study. Qualified and trained psychologists were sent to the custody centers to explain the objectives, provide necessary instructions to participants, and supervise that the corresponding questionnaires were filled out correctly. Participants' assessment was conducted individually by using a web-based interface, and after obtaining a written informed consent from the participants' parents or legal caregivers, when corresponding. The participation was voluntary, and conditions of anonymity and confidentiality were totally guaranteed. Center staff also provided information about participants in a brief questionnaire, which was completed by reviewing the official reports as well as based on their current experience with the participating youths.

Statistical Analyses

Firstly, with the aim to test whether the proposed three-factor model of the ICU fitted the current data, Confirmatory Factor Analysis (CFA) was used (Amos 7.0). Weighted Least Squares (WLS) was initially considered as a method of model estimation since this estimator is highly recommended for use with ordinal items (Flora & Curran, 2004). However, WLS requires very large samples and is not considered a good estimator choice with categorical outcomes in small to moderate samples (Tabachnick & Fidell, 2007). Thus, the alternative Unweighted Least Squares (ULS) was finally selected (Brown, 2006). In order to estimate the error terms and the statistical significance of the parameters, which were not initially provided by the ULS, the bootstrapping procedure was included. This computationally intensive method, which does not impose the assumption of normality of the sample distribution, involves repeatedly sampling from the data set (one thousand; 95% CI), leading to calculation of the statistics of interest in multiple resamples of the data set (Preacher, Rucker & Hayes, 2007). The goodness of fit of each estimated model was assessed with the most common fit indices provided by the ULS method, including the χ^2 test statistic and the associated degrees of freedom and probability value, the root mean square residual (RMS), the goodness-of-fit statistic (GFI) the adjusted goodness-of-fit statistic (AGFI), and the normed-fit index (NFI). An acceptable fit is indicated by χ^2/df ratio 2:1 (Tabachnick & Fidell, 2007), and a RMR less than

.08 (Hu & Bentler, 1999), or preferably .05 (Byrne, 1998). GFI and AGFI larger than .90, and NFI values exceeding .90, or ideally .95, are also indicative of a good fit (Hooper, Coughlan, & Mullen, 2008; Hu & Bentler, 1999). Secondly, the association among CU traits assessed through the ICU and meaningful external measures were examined through zero-order and partial correlations, controlling for the shared variance of the other subscales, and the effect of antisocial behavior in subsequent analyses. The correlation coefficients were interpreted following the Cohen's guidelines (Cohen, 1988; i.e., weak = < .30, moderate = .30-.50, and strong = > .50). Finally, logistic regression analyses were conducted in order to examine the incremental validity of the ICU to discriminate, above and beyond other relevant factors and the CU scale of the APSD, a group of higher severe and versatile antisocial youths. Both correlations and logistic regression analyses were conducted on IBM SPSS Statistics 20.

Results

Preliminary analyses

Descriptive statistics, including means, standard deviations, and the current scale range of main study variables are reported in Table 1.

[Insert Table 1 around here]

Testing the factor structure of the ICU

In order to examine the factor structure of the ICU, three initial models were compared: a single factor model with all the items loading in a single CU factor (Model 1), which would represent the most parsimonious solution; a hierarchical three-factor model (Model 2), representing the subfactors as a correlated components of a higher-order construct (i.e., CU); and the three-factor bifactor model (Model 3), specifying that there is a general CU factor that underlies each of the items as well as three independent factors, each of which accounting for unique variance in their respective set of items, over and above variance accounted by the general factor.

[Insert Table 2 around here]

Fit indices showed an inadequate fit for the single factor model (Model 1). A three-factor hierarchical model (Model 2) showed a significant improvement with respect to Model 1,

$\Delta\chi^2(1) = 429.58, p < .001$, reaching an acceptable goodness-of-fit, as showed by the χ^2/df ratio, lower than 3, the RMR lower than .08, and all the GFI, AGFI and NFI values being higher than .90. Examining the three-factor bifactor model, it showed a good fit, with a significant improvement with respect to Model 2, $\Delta\chi^2(23) = 124.89, p < .001$, and the RMR reaching the ideally suggested .05. However, some of the parameters were found to be unsatisfactory, with some items showing an opposite sign than the expected according to the content of the item, and with factor loadings non-statistically significant for the Callousness and the Uncaring dimensions. This is not in line with the main premise of bifactor models that represent the items loading on a general CU dimension as well as on three distinctive factors, all of them accounting for unique variance. Considering these results, the hierarchical three-factor model was finally selected as the best fitting model, with all the item loadings being statistically significant ($p < .001$), and showing the expected sign according to the content of the item, with the exception of item 10 (-.26). Items 2, 10 and 12 did not exceed the recommended .40 value on their factor. The influence of those items on the factor solution was checked by independently omitting each one from the analysis, with no relevant changes in general structure from the model with each item included. However, after examining the internal consistencies of the general second-order factor (Total score) and the specific subfactors via Cronbach's alpha, mean interitem correlation (MIC), and corrected item-total correlation, item 10 demonstrated the lowest corrected item-total correlation with an unexpected negative sign (-.15). Moreover, removing item 10 improved both MIC and alpha for the corresponding subfactor ($\Delta MIC = .06, \Delta\alpha = .05$), with a slight improvement on the General factor ($\Delta MIC = .03, \Delta\alpha = .01$). The high and positive correlations between the three subfactors ($r_{\text{callousness-uncaring}} = .80, r_{\text{callousness-unemotional}} = .33$, and $r_{\text{uncaring-unemotional}} = .30; p < .001$) provided additional support for the hierarchical model as the best fitting model. Hence, the three-factor hierarchical model was again specified and tested with the item 10 deleted (Model 4).

[Insert Figure 1 around here]

The model specification of this revised three-factor hierarchical model is presented in Figure 1. As can be seen, there are three subfactors measuring *Callousness* (10 items; e.g., “I do not feel remorseful when I do something wrong”), *Uncaring* (8 items; e.g., “I try not to hurt other’s feelings”, reversely scored) and *Unemotional* traits (5 items; e.g., “I do not show my emotions to others”). All estimates for model parameters (i.e., factor loadings, variances, covariances of factors, etc.) were statistically significant. The factor loadings are displayed in Table 3. Assuming that those subfactors are represented as correlated factors of a higher-order construct (i.e., CU), a Total score of the ICU was also created for subsequent analyses (Essau et al., 2006). Cronbach’s alpha values for each scale were in the “acceptable” to “good” range. Specifically, the Total score and the Uncaring subscale showed an adequate internal consistency ($\alpha = .88$ and $.82$, MIC = $.25$ and $.27$, respectively), whereas it was acceptable for the Callousness and Unemotional subfactors ($\alpha = .76$ and $.78$, MIC = $.25$ and $.42$, respectively).

In addition, an alternative two-factor model with the positively and the negatively worded items loading onto separate latent constructs was also tested (Model 5) in order to examine whether potential method variance related with keying items may contribute to the grouping of the items (Burke, 1999; Kimonis et al., 2013). As can be seen in Table 2, this two-factor model inadequately fit the data, with no relevant improvements with respect to the previous tested models.

Examining associations with relevant external criteria

Assuming that the three subscales are intercorrelated, correlations were computed showing both zero-order and partial associations, controlling for the effect of the other two ICU subscales, when corresponding. This allows the analysis of the unique relation that each subscale holds with the analyzed measures. These results are presented in Table 4.

[Insert Table 4 around here]

As can be seen in Table 4, CU traits measured with the ICU are significantly related with psychopathic traits measured through the APSD. As expected, the strongest association is observed as regards the APSD CU scale. This specific association held for the three ICU subscales, even after partialling out the effect of two of them. However, as for APSD

Impulsivity/Conduct problems and Narcissism, only the Callousness subscale remained significantly related to them. The ICU global score was also significantly and positively related to Impulsiveness, Hostility and Sensation-seeking tendencies, which showed the weakest correlation coefficient. Those associations remained significant for the Callousness subscale, except Impulsiveness, once the other two factors were controlled for. On the contrary, as was expected, the association with Empathy was negative, remaining significant for the Callousness and the Uncaring subscales.

High levels of CU traits were also related to Positive attitudes towards violence, an Early onset of conduct problems, and with high levels of antisocial behavior represented by the implication in Aggressive and Rule-breaking behaviors, Thefts, Drug problems and the association with Antisocial Peers. Similarly, youths with high levels of CU traits reported low Prosocial behavior, Low school implication and showed Low cooperation on treatment and intervention programs. Those correlations remained significant for the Callousness subscale, with the exception of Prosocial behavior and School implication which only remained significantly and negatively related with the Uncaring dimension after partialling out the effect of the other two ICU subscales.

Considering the close relationship between CU traits and antisocial behavior, as well as the expected association between antisocial behavior and most of the external criteria analyzed, we intended to examine the unique association of ICU scales with personality and psychosocial external criteria controlling for the effect of antisocial behavior, measured through the global score of the ABQ. Thus, previous partial correlations were repeated for all the external criteria, with the exception of measures from the ABQ (i.e., Aggressive behavior, Rule-breaking behavior, Vandalism, Thefts, and Drug problems)². Results showed the same pattern of associations for the Uncaring and Unemotional subscales, an expected result since they showed a no significant association with antisocial behavior in previous partial correlations. In contrast, some relevant changes were observed for the ICU global score and the Callousness subscale.

² Results available upon request to the corresponding author

After controlling for antisocial behavior, the associations with Impulsivity, Sensation seeking, Age of onset and Antisocial peers did not reach statistical significance. On the contrary, the association between Callousness and Low cooperation on treatment emerged now as statistically significant (.14, $p < .05$).

Testing the ability of the ICU in identifying a problematic group

In order to examine the usefulness of the ICU in predicting the inclusion of youths in highly problematic groups, categories of problematic youths were created from the ABQ subscales, following an analytical scheme similar to one used in previous studies (e.g., Frick, Kimonis, Dandreaux, & Farrel, 2003). Since the sample grouped both delinquent and at-risk youths, it was expected that they were representative of different levels of antisocial behavior, as was observed in the wide range of scores in the ABQ global score and the subscales (see Table 1), and the homogenous distribution of participants across the continuum. Firstly, categories of Violent behavior (i.e., the ABQ Aggressive behavior subscale) and Non-Violent behavior (including the Rule-breaking, Theft and Vandalism ABQ subscales) were created. Secondly, using the median as a cutoff point (5.00 and 3.17 for Violent and Non-violent behavior respectively), two main groups were identified, namely: the Lower antisocial group, including 125 youths (49%) with scores under the mean in both Violent and Non-violent scales, and the Higher antisocial group, composed of 130 youths (51%) all of them with scores above the mean cutoff in both ABQ scales. Statistically significant differences were observed between the Lower and the Higher antisocial groups in all the ABQ subscales: Aggressive behavior ($t_{240} = -25.14, p < .001$), Rule-breaking ($t_{240} = -21.31, p < .001$), Vandalism ($t_{240} = -14.94, p < .001$), Thefts ($t_{240} = -15.09, p < .001$), and Drug problems ($t_{232} = -11.75, p < .001$). This new categorization intended to go beyond simply classifying youths as low or high on antisocial behavior since the current Higher antisocial category grouped youths with high levels of both violent (i.e., aggressive behavior) and non-violent antisocial behavior (i.e., rule-breaking behavior, theft and vandalism). Therefore, not only a severe but also a versatile antisocial group was then identified.

Then, a set of logistic regression analyses were conducted. Antisocial behavior groups were used as a categorical dependent variable, coded as 0 (Lower antisocial group) and 1 (Higher antisocial group). Given that the intention was to examine whether CU traits allowed the identification of a problematic group of youths above and beyond other well-known factors, age and gender were included as the first step, followed by personality and temperamental variables traditionally related with antisocial behavior: Impulsiveness, Hostility, Sensation-seeking and Empathy. Moreover, in order to test the incremental validity of the ICU beyond the CU subscale of the APSD, it was included as the third step. Finally, the ICU global score (Model A), and the three ICU subscales (Model B) were independently included as the fourth step.

[Insert Table 5 around here]

As Table 5 displays, CU traits measured through the ICU predicted the inclusion of youths in the Higher problematic group. That is, as the level of CU traits increase, the likelihood of showing high and versatile levels of antisocial behavior increases as well. At the subscale level, only the Callousness subscale emerged as significant predictor even above and beyond impulsiveness, hostility and sensation seeking tendencies, as well as beyond the APSD CU subscale. Both Model A and Model B correctly classified 86.6% and 86.1% of participants, respectively.

Discussion

Given the relevance of CU traits in predictive and developmental models of conduct disorders (Kahn, Frick, Youngstrom, Findling, & Youngstrom, 2012), the ICU has been proposed as an efficient, complete and reliable measure of CU traits in youth populations. In order to support this conception, the present study was developed with the aim to examine the usefulness of CU traits, measured through the self-reported version of the ICU, in a Spanish sample of institutionalized youths.

As the first objective, the factor structure of the instrument was examined. At this regard, a three-factor hierarchical model has emerged as the best fitting model, with items loading into three subscales (i.e., Callousness, Uncaring and Unemotional), which represent

correlated components of the higher-order CU construct. This result is in line with the structure outlined in the validation study of the ICU teacher-reported conducted in a Spanish sample of preschoolers (Ezpeleta et al., 2013). Moreover, most of previous studies have supported a three-factor structure for the ICU (e.g., Essau et al., 2006; Roose et al., 2010). However, they have primarily structured the three factors in a so called bifactor model, with a general CU factor underlying each of the items as well as three independent factors, each of which accounts for unique variance in their respective set of items, over and above variance accounted by the general factor (Kimonis et al., 2008). This specific model was also tested in the current study, showing an adequate fit following most of the indices but with some problems related to significance and the sign of factor loadings on the Callousness and Uncaring dimension. These problems did not support the main premise of bifactor models (Chen, West, & Sousa, 2006), and led us to consider the three-hierarchical model as the best fitting model. As occurs in some previous studies (Kimonis et al., 2008; Kimonis et al., 2013), item 10 should be removed since it showed a low factor loading with an opposite sign than the expected, the lowest corrected item-total correlation, and its removal increased internal consistency for both the Callousness and the Total score. Thus, the final 23 items, structured in a three-factor hierarchical model, was finally assumed as the best model, with acceptable fit values according to all the indices examined. Problems in reaching an ideal fit have been extensively observed when personality traits inventories are examined, including some of prior ICU studies (e.g., Byrd et al., 2013), probably given the inherent complexity of personality, and the difficulties related with measurement and application of CFA models (Hopwood & Donnellan, 2010). Notwithstanding the differences in specifying bifactorial and second-order models, these results supported the CU conception as a three-dimension construct, which has been similarly observed across different samples, contexts, languages and developmental stages (Ciucci et al., 2014; Essau et al., 2006; Ezpeleta et al., 2012; Fanti et al., 2009; Roose et al., 2010). The three ICU subscales showed acceptable-to good internal consistencies, even the Unemotional one, which has shown some problems at this regard in previous studies, probably related with the small number of items composing this subscale ($n = 5$; Kimonis et al., 2008).

Secondly, associations with external criteria theoretically and traditionally related with psychopathic personality suggested that the ICU may be a useful instrument to measure traits similar to those that define the affective component of psychopathy. As was observed in studies conducted with adult populations, with other psychopathic personality measures in children and adolescents, and even in previous ICU research, youths with high levels of CU traits tend to show higher levels of impulsiveness (e.g., White, Cruise, & Frick, 2009), sensation seeking behaviors (e.g., Essau et al., 2006) and low affective empathic tendencies (e.g., Kimonis et al., 2013). A significant association among CU traits and impulsiveness would not be primarily expected, given the closer relationship between impulsivity and the behavioral component of psychopathic personality (Snowden & Gray, 2011). However, it could be explained since the broader affective, interpersonal and behavioral dimensions of psychopathy are to some extent correlated. Thus, prior ICU studies, conducted in community-based samples, have supported the association between high levels of CU traits and a tendency to behave impulsively (López-Romero et al., 2014; Roose et al., 2010). The link between CU traits and high sensation seeking and low empathy could be interpreted in line with different developmental theories, suggesting that a temperamental fearless style, characterized by problems with behavioral inhibition, might restrain the normal development of conscience, guilt and empathy, which could be, in turn, a relevant precursor in the development of CU traits (Barker, Oliver, Viding, Salekin, & Maughan, 2011). Even considering the relevance of the observed associations and the tentative explanations provided, the associations between CU traits, impulsivity and sensation seeking may be partially influenced by the presence of antisocial behavior, at least in this sample of institutionalized youths. Further research, including different kinds of samples, should clarify and disentangle the unique association between CU traits and relevant personality variables closely involved in the development of antisocial behavior.

High levels of CU traits were also related with positive attitudes towards violence, an early onset of conduct problems, and multiple antisocial outcomes represented by aggression, vandalism, theft and rule-breaking behavior (McMahon, Witkiewitz, & Kotler, 2010), as well as an increased risk of drug consumption (Byrd et al., 2013). These results reinforce the evidence

regarding the relevant role that psychopathic traits, and particularly CU traits, may play as a key risk factor for severe conduct problems and antisocial behavior (Frick, 2012). Considering the prevalent antisocial style of youths with high levels of CU traits, it was expected that they also showed lower levels of prosocial behavior and school involvement (Ciucci et al., 2014; López-Romero et al., 2012). Low cooperation on treatment and intervention programs was also related with high CU traits. At this regard it seems that, as occurs in adult psychopathy, youths with conduct problems and CU traits would benefit less from traditional interventions than youths without CU traits (Kimonis, Bagner, Linares, Blake, & Rodriguez, 2014). These poor treatment outcomes may be related with the inherent characteristics of psychopathic personality (i.e., lack of guilt, lack of concern about performance in relevant activities, shallow affect), as well as with the failure to focus in those specific traits that make youths with high CU traits more resistant to intervention (Harris & Rice, 2006). New approaches examining the effectiveness of interventions with children with conduct problems and CU have been developed, with some promising results showing significant improvements in CU traits level (see Frick et al., 2014; Salekin, 2010). For instance, positive effects of parenting interventions on CU traits have been outlined (Somech & Elizur, 2012), particularly when components focusing on parental warmth and positive reinforcement are carefully targeted (e.g., Kimonis & Armstrong, 2012; McDonald, Dodson, Rosenfield, & Jouriles, 2011).

At the subscale level, distinctive associations with external meaningful constructs across the three ICU dimensions were observed, revealing that the observed correlation coefficients were largely due to the Callousness and the Uncaring dimensions. Some studies have shown that those dimensions showed a similar pattern of association with external behavioral variables, raising the usefulness of the Callousness-Uncaring combination (Berg et al., 2013; Ezpeleta et al., 2013). Although both Callousness and Uncaring dimensions shared some unique associations with variables such as empathy or positive attitudes towards violence, their current pattern of associations were to some extent distinctive, with Callousness more related to behavioral traits and antisocial outcomes, whereas the Uncaring subscale showed closer associations with psychosocial-like measures (Hawes et al., 2014; López-Romero et al., 2014).

Less clear was the external evidence related to the usefulness of the Unemotional dimension. In spite of the acceptable level of internal consistency and the clear item distribution on the scale, overflowing some of the limitations outlined in previous research (Essau et al., 2006; Kimonis et al., 2008), none of the correlations held for this scale after partialling out the effect of the other two ICU subscales. The exception was the CU traits measured with the APSD, which could be an expected result given that this specific subscale was on the basis of the ICU. According to previous research, the Unemotional subscale could probably be more related with measures of emotional functioning (Berg et al., 2013; Kimonis et al., 2013), but further research including those specific measures remains necessary in order to better clarify whether this subscale is really tapping a distinctive construct from the broader CU.

As was previously outlined, early manifested CU traits have allowed the better delimitation of child and adolescent conduct disorders, a construct marked by its heterogeneity in terms of etiology, prognosis and developmental patterns (White & Frick, 2010). The inclusion of psychopathic traits in developmental models of youth conduct problems has allowed the identification of a specific problematic subgroup of children (Frick, 2012), which tend to show an increasing risk pattern for long-lasting behavioral and psychosocial problems (Fanti, 2013). Therefore, CU traits in combination with conduct problems clearly distinguished severe, stable and aggressive antisocial youths (Kahn et al., 2012). Moreover, the predictive power of psychopathic traits has even emerged in children with conduct problems not developed yet (e.g., López-Romero et al., 2012), establishing CU traits, in a prospective way, as a potential precursors for future conduct disorders. At this regard, results of the logistic regression analyses have supported the relevance of CU traits in classifying youths as with more severe antisocial behavior, even above and beyond well-known temperamental factors traditionally related with severe conduct disorders and delinquency (i.e., impulsiveness, hostility, sensation seeking, empathy; Marshall & Marshall, 2011; Murray & Farrington, 2010), as well as over the original CU subscale of the APSD. Thus, the relevance of CU traits in distinguishing a high risk group of antisocial youths has been reinforced, while the usefulness of the ICU to address the core

affective component of the psychopathic personality, and identify a problematic group of adolescents, has been further supported.

In sum, the present study has provided clear evidence supporting the ICU as a valid measure of CU traits in a Spanish sample of institutionalized youths, a distinctive cultural group that has been scarcely addressed in previous research. Although our results have supported a three-factor model structured in a hierarchical rather than a bifactorial way, a result also observed in the unique study conducted in the Spanish context (Ezpeleta et al., 2013), current results have overall supported the three-dimensional structure of the ICU (Kimonis et al., 2013). Moreover, those results have highlighted the profits of the ICU as a promising measure in identifying a severe antisocial group. Hence, high levels of CU traits are not only related with high levels of behavioral and psychosocial disturbances, but they may also help to delimit a specific group of problematic youths showing a higher-risk profile. These results gain extreme relevance with respect to diagnostic classification and prevention and intervention programs, including risk assessment tools which have been extensively used as a standard practice in many juvenile justice jurisdictions (Upperton & Thompson, 2007). In order to be effective in preventing future disorders, even re-offending, interventions should focus on empirically supported risk factors (Mulder, Brand, Bullens, & Van Marle, 2010). Given the proven relevance of CU traits in identifying a group of youths at increased risk of problematic and antisocial behavior, the ICU might be included in broader assessment tools in order to better focus the intervention and, in turn, prevent, reduce and restrain the development of severe conduct disorders. At this regard, Kimonis, Fanti et al., (2014) have developed from the ICU a 4- and 9-item criteria set which have allowed the identification of youths at-risk of poor behavioral outcomes. After including a severity specifier in diagnostic manuals based on the CU conceptualization (e.g., DSM-5), the effectiveness of such promising criterion sets should be further examined in order to provide clinicians with a quick and reliable instrument useful for diagnostic classification (Frick et al, 2014).

However, properly interpreting those results should also entail the discussion of the following limitations. Firstly, in order to test the convergent and incremental validity of the ICU

new measures of psychopathic personality should be included in the external validation since the APSD was the instrument from which the ICU was developed. Secondly, most of the variables were self-reported, raising the possibility that the observed results were partly influenced by shared method variance. Thirdly, new longitudinal designs are needed to further clarify the predictive value of the ICU traits for future conduct disorders as well as for other negative outcomes, testing their incremental validity even over antisocial behavior or even interacting with antisocial behavior. Moreover, the ability of the ICU to discriminate the specific highest-risk group of antisocial youths should be further examined, with relevant implications in terms of diagnostic classification and more targeted intervention (Frick et al., 2014). Fourthly, at the subscale level some problems emerged, with the Callousness and Uncaring dimensions being highly correlated and with an item distribution not clearly distinctive. On the contrary, the Unemotional dimension showed a clear internal structure but an apparent independence from relevant external criteria traditionally related with psychopathic personality (Ezpeleta et al., 2012). Future studies should clarify the structure, distinctiveness and usefulness of the ICU subscales which, in turn, will lead to better understanding of the affective dimension of the adolescent psychopathic personality. At this regard, a new short version of the parent-rated instrument has been proposed (Hawes et al., 2014), using 12 of the original 24 items that load in two factors (i.e., Callousness and Uncaring). Since it has shown good psychometrical properties, as well as a good discrimination across the CU construct, new replication studies are needed including teacher and self-reported versions of the instrument. Finally, even though CU traits have showed their relevance as the hallmark of the construct of psychopathy (White & Frick, 2010), some authors have defended the study of psychopathic personality as a combination of affective, interpersonal and behavioral personality traits (Colins et al., 2014; Cooke & Michie, 2001), with controversies around the inclusion of antisocial behavior still under debate (Ribeiro da Silva, Rijo, & Salekin, 2012). Beyond the usefulness of the ICU as a valid and promising measure of CU traits, new studies are needed in order to better clarify the conceptualization of the construct and accurately address the psychopathic personality in youth populations.

To conclude, the ICU seems to be a promising measure to analyze CU traits in different samples of children, adolescents and even young adults. Its usefulness can be highlighted in terms of theoretical and practical implications, allowing the better understanding of developmental models of severe conduct problems, the identification of severe and persistent antisocial youths, and the improvement of prevention and intervention programs by focusing on these specific characteristics which put those children in a higher risk for behavioral and psychosocial maladjustment. Thus, these results support the usefulness of the ICU as a potentially relevant instrument in research, practical and forensic areas, promoting new interesting advances in terms of prevention and treatment.

References

- Aluja, A., & Blanch, A. (2007). Comparison of impulsiveness, venturesomeness and empathy (I₇) structure in English and Spanish samples: Analysis of different structural equation models. *Personality and Individual Differences, 43*, 2294-2305. doi: 10.1016/j.paid.2007.07.019
- American Psychiatric Association (2013). *Diagnostic and Statistical Manual for Mental Disorders* (5th ed.). Arlington, VA: American Psychiatric Association.
- Barker, E. D., Oliver, B. R., Viding, E., Salekin, R. T., & Maughan, B. (2011). The impact of prenatal maternal risk, fearless temperament and early parenting on adolescent callous-unemotional traits: a 14-year longitudinal investigation. *Journal of Child Psychology and Psychiatry, 52*, 878-888. doi:10.1111/j.1469-7610.2011.02397.x
- Berg, J. B., Lilienfeld, S. O., Reddy, S. D., Latzman, R. D., Roose, A., Craighead, L. W., et al. (2013). The Inventory of Callous and Unemotional traits: A construct-validated analysis in an at-risk sample. *Assessment, 20*, 532-544. doi:10.1177/1073191112474338
- Berry, J.W., Phinney, J.S., Sam, D. and Vedder, P. (Eds.) (2006). *Immigrant youth in cultural transition: Acculturation, identity and adaptation across national contexts*. Hillsdale: Erlbaum.
- Brislin, R. W. (1970). Back-translation for cross-cultural research. *Journal of Cross-Cultural Psychology, 1*, 185-216. doi: 10.1177/135910457000100301
- Brown, T. A. (2006). *Confirmatory factor analysis for applied research*. New York, NY: The Guilford Press.
- Burke, B. G. (1999). Item reversals and response validity in the Job Diagnostic Survey. *Psychological Reports, 85*, 213-219.
- Byrd, A. L., Kahn, R. E., & Pardini, D. A. (2013). A validation of the Inventory of callous-unemotional traits in a community sample of young adult males. *Journal of Psychopathology and Behavioral Assessment, 35*, 20-34. doi: 10.1007/s10862-012-9315-4

- Byrne, B. M. (1998). *Structural equation modeling with LISREL, PRELIS and SIMPLIS: Basic concepts, applications and programming*. Mahwah, New Jersey: Lawrence Erlbaum Associates.
- Chen, F. F., West, S. G., & Sousa, K. H. (2006). A comparison of bifactor and second-order models of quality of life. *Multivariate behavioral research, 41*, 189-225. doi: 10.1207/s15327906mbr4102_5
- Ciucci, E., Baroncelli, A., Franchi, M., Golmaryami, F. N., & Frick, P. (2014). The association between callous-unemotional traits and behavioral and academic adjustment in children: Further validation of the Inventory of Callous-Unemotional traits. *Journal of Psychopathology and Behavioral Assessment, 36*, 189-200. doi:10.1007/s10862-013-9384-z
- Cohen, J. (1988). *Statistical Power Analysis for the Behavioral Sciences* (2nd ed.). Hillsdale, NJ: Erlbaum.
- Colins, O. F., Andershed, H., Frogner, L., López-Romero, L., Veen, V., & Andershed, A. K. (2014). A new measure to assess psychopathic personality in children: The Child Problematic Traits Inventory. *Journal of Psychopathology and Behavioral Assessment, 36*, 4-21. doi: 10.1007/s10862-013-9385-y
- Cooke, D. J., & Michie, C. (2001). Refining the construct of psychopathy: Towards a hierarchical model. *Psychological Assessment, 13*, 171-188. doi: 10.1037/1040-3590.13.2.171
- Derogatis, L. R. (2003). *SCL-90-R: Cuestionario de 90 síntomas*. Madrid: TEA.
- Essau, C. A., Sasagawa, S., & Frick, P. (2006). Callous-unemotional traits in a community sample of adolescents. *Assessment, 20*, 1-16. doi:10.1177/1073191106287354
- Ezpeleta, L., de la Osa, N., Granero, R., Penelo, E., & Domènech, J. M. (2013). Inventory of Callous-Unemotional traits in a community sample of preschoolers. *Journal of Clinical Child and Adolescent Psychology, 42*, 91-105. doi: 10.1080/15374416.2012.734221
- Fanti, K. A. (2013). Individual, social and behavioral factors associated with co-occurring conduct problems and callous-unemotional traits. *Journal of Abnormal Child Psychology, 41*, 811-824.

- Fanti, K. A., Frick, P. J., Georgiou, S. (2009). Linking callous-unemotional traits to instrumental and non-instrumental forms of aggression. *Journal of Psychopathology and Behavioral Assessment, 31*, 285-298. doi:10.1007/s10862-008-9111-3
- Feilhauer, J., Cima, M., & Arntz, A. (2012). Assessing callous-unemotional traits across different groups of youths: Further cross-cultural validation of the Inventory of Callous-Unemotional traits. *International Journal of Law and Psychiatry, 35*, 251-262. doi: 10.1016/j.ijlp.2012.04.002
- Fink, B. C., Tant, A. S., Tremba, K., & Kiehl, K. A. (2012). Assessment of psychopathic traits in an incarcerated adolescent sample: A methodological comparison. *Journal of Abnormal Child Psychology, 40*, 971-986. doi: 10.1007/s10802-012-9614-y
- Flora, D. B., & Curran, J. P. (2004). An empirical evaluation of alternative methods of estimation for confirmatory factor analysis with ordinal data. *Psychological Methods, 4*, 466-491. doi:10.1037/1082-989X.9.4.466
- Frick, P. J. (2004). Inventory of callous-unemotional traits. Unpublished rating scale, University of New Orleans, New Orleans, LA.
- Frick, P. J. (2009). Extending the construct of psychopathy to youth: Implications for understanding, diagnosing, and treating antisocial children and adolescents. *Canadian Journal of Psychiatry, 54*, 803-812. <http://publications.cpa-apc.org/>
- Frick, P. J. (2012). Developmental pathways to conduct disorder: Implication for future directions in research, assessment, and treatment. *Journal of Clinical Child & Adolescent Psychology, 41*, 378-389. doi: 10.1080/15374416.2012.664815
- Frick, P. J., Bodin, S. D., & Barry, C. T. (2000). Psychopathic traits and conduct problems in community and clinic referred samples of children: Further development of the Psychopathy Screening Device. *Psychological Assessment, 12*, 382-393. doi: 10.1037//1040-3590.12.4.382
- Frick, P. J., & Hare, R. D. (2001). *Antisocial Process Screening Device*. Toronto: Multi-Health System.

- Frick, P. J., Kimonis, E. R., Dandreaux, D. M., & Farell, J. M. (2003). The 4-year stability of psychopathic traits in non-referred youth. *Behavioral Sciences and the Law*, *21*, 713-736. doi: 10.1002/bsl.568
- Frick, P. J., Ray, J. V., Thornton, L. C., & Kahn, R. E. (2014). Can callous-unemotional traits enhance the understanding, diagnosis, and treatment of serious conduct problems in children and adolescents? A comprehensive review. *Psychological Bulletin*, *40*, 1-57. doi: 10.1037/a0033076
- Gómez-Fraguela, J. A., Luengo, A., Romero, E., Villar, P., & Sobral, J. (2006). Estrategias de afrontamiento en el inicio de la adolescencia y su relación con el consumo de drogas y la conducta problemática. [Coping strategies in early adolescence and their association with drug consumption and problematic behavior]. *International Journal of Clinical and Health Psychology*, *6*, 581-597.
- Harris, G. T., & Rice, M. E. (2006). Treatment of psychopathy: A review of empirical findings. In C. Patrick (Ed.), *Handbook of psychopathy* (pp. 555-572). New York: Guildford Press.
- Hawes, S. W., Byrd, A. L., Henderson, C. E., Gazda, R. L., Burke, J. D., Loeber, R., & Pardini, D. A. (2014). Refining the parent-reported Inventory of Callous-unemotional traits in boys with conduct problems. *Psychological Assessment*, *26*, 256-266. doi: 10.1037/a0034718
- Herpers, P. C. M., Rommelse, N. N. J., Bons, D. M. A., Buitelaar, J. K., & Scheepers, F. E. (2012). Callous-unemotional traits as a cross-disorders construct. *Social Psychiatry and Psychiatric Epidemiology*, *47*, 2045-2065. doi: 10.1007/s00127-1012-0513-x
- Hooper, D., Coughlan, J., & Mullen, M. (2008). Structural equation modeling: Guidelines for determining model fit. *Electronic Journal of Business Research Methods*, *6*, 53-60.
- Hopwood, C. J., & Donellan, M. B. (2010). How should the internal structure of personality inventories be evaluated? *Personality and Social Psychology*, *14*, 332-346. doi: 10.1177/1088868310361240
- Hu, L. T., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling*, *6*, 1-55. doi:10.1080/10705519909540118

- Jolliffe, D., & Farrington, D. P. (2006). Development and validation of the Basic Empathy Scale. *Journal of Adolescence, 29*, 589-611. doi: 10.1016/j.adolescence.2005.08.010
- Kahn, R. E., Frick, P. J., Youngstrom, E., Findling, R. L., & Youngstrom, J. K. (2012). The effects of including a callous-unemotional specifier for the diagnosis of conduct disorder. *The Journal of Child Psychology and Psychiatry, 53*, 271-282. doi: 10.1111/j.1469-7610.2011.02463.x
- Kimonis, E. R., & Armstrong, K. (2012). Adapting Parent-Child Interaction Therapy to treat severe conduct problems with callous-unemotional traits: A case study. *Clinical Case Studies, 11*, 234-252.
- Kimonis, E. R., Bagner, D. M., Linares, D., Blake, C. A., Rodriguez, G. (2014). Parent training outcomes among Young children with callous-unemotional conduct problems with or at risk for developmental delay. *Journal of Child and Family Studies, 23*, 437-448. doi:10.1007/s10826-013-9756-8
- Kimonis, E. R., Branch, J., Hagman, B., Graham, N., Miller, C. (2013). The psychometric properties of the Inventory of Callous-Unemotional traits in an undergraduate sample. *Psychological Assessment, 25*, 84-93. doi:10.1037/a0029024
- Kimonis, E. R., Fanti, K., Goldberg, Marsee, M. A., Frick, P. J., & Cauffman, E. (2014). Callous and unemotional traits in incarcerated youths. *Psychological Assessment, 26*, 227-237. doi:10.1037/a0034585
- Kimonis, E. R., Frick, P. J., Skeem, J. L., Marsee, M. A., Cruise, K., Muñoz, L. C., et al. (2008). Assessing callous-unemotional traits in adolescent offenders: Validation of the Inventory of Callous-Unemotional traits. *International Journal of Law and Psychiatry, 31*, 241-252. doi:10.1016/j.ijlp.2008.04.002
- López-Romero, L., Romero, E., & Gómez-Fraguela, J. A. (2014). Delving into callous-unemotional traits in a Spanish sample of adolescents: Concurrent correlates and early parenting precursors. *Journal of Child and Family Studies*. Advanced online publication.
- López-Romero, L., Romero, E., & Luengo, M. A. (2011). La personalidad psicopática como indicador distintivo de severidad y persistencia en los problemas de conducta infanto-

- juveniles. [Psychopathic personality as a distinctive indicator of severity and persistence for child and youth conduct problems]. *Psicothema*, 23, 660-665.
- López-Romero, L., Romero, E., & Luengo, M. A. (2012). Disentangling the role of psychopathic traits and externalizing behavior in predicting conduct problems from childhood to adolescence. *Journal of Youth and Adolescence*, 41, 1397-1408.
doi:10.1007/s10964-012-9800-9
- Luengo, A., Otero, J. M., Romero, E., Gómez Fraguera, J. A. & Tavares-Filho, E. T. (1999). Análisis de ítems para la evaluación de la conducta antisocial. Un estudio transcultural. [Item analysis in evaluating antisocial behavior. A transcultural study].” *Revista Ibero-Americana de Evaluación Psicológica*, 1, 21-36.
- Luengo, A., Villar, P., Sobral, J., Romero, E., & Gómez-Fraguela, J. A. (2009). El consumo de drogas en adolescentes inmigrantes: implicaciones para la prevención. [Drug consumption in immigrant adolescents: Implications for prevention]. *Revista Española de Drogodependencias*, 34, 448-479.
- Marshall, L.E., & Marshall, W. L. (2011). Empathy and antisocial behavior. *Journal of Forensic Psychiatry & Psychology*, 22, 742-759. doi:10.1080/14789949.2011.617544
- McDonald, R., Dodson, M. C., Rosenfield, D., & Jouriles, E. N. (2011). Effects of a parenting intervention on features of psychopathy in children. *Journal of Abnormal Child Psychology*, 39, 1013-1023. doi: 10.1007/s10802-9512-8
- McMahon, R. J., Witkiewitz, K., & Kotler, J. S. (2010). Predictive validity of callous-unemotional traits measured in early adolescence with respect to multiple antisocial outcomes. *Journal of Abnormal Psychology*, 119, 752-763. doi: 10.1037/a0020796
- Moral, M. V. (2005). Actitudes socioconstruidas ante la violencia bullying en estudiantes de secundaria. [Attitudes towards bullying violence in secondary school students]. *Anuario de Psicología*, 36, 61-81.
- Mulder, E., Brand, E., Bullens, R., & Van Marle, H. (2010). A classification of risk factors in serious juvenile offenders and the relation between patterns of risk factors and recidivism. *Criminal Behavior and Mental Health*, 20, 23-28. doi: 10.1002/cbm.754

- Murray, J., & Farrington, D. P. (2010). Risk factors for conduct disorder and delinquency: Key findings from longitudinal studies. *The Canadian Journal of Psychiatry, 55*, 633-641.
- Preacher, K. J., Rucker, D. D., & Hayes, A. F. (2007). Addressing moderated mediation hypotheses: Theory, Methods, and Prescriptions. *Multivariate Behavioral Research, 42*, 185-227. doi:10.1080/00273170701341316
- Ribeiro da Silva, D., Rijo, D., & Salekin, R. T. (2012). Child and adolescent psychopathy: A state-of-the-art reflection on the construct and etiological theories. *Journal of Criminal Justice, 40*, 269-277. doi: 10.1016/j.jcrimjus.2012.05.005
- Romero, E., Gómez-Fraguela, J. A., Luengo, M. A., & Sobral, J. (2003). The self-control construct in the General Theory of Crime: An investigation in terms of Personality Psychology. *Psychology, Crime and Law, 9*, 61-86. doi: 10.1080/10683160308142
- Romero, E., Luengo, M. A., Gómez-Fraguela, J. A., Sobral, J., & Villar, P. (2005). Evaluación de la psicopatía infanto-juvenil: Estudio en una muestra de niños institucionalizados [Assessing child and youth psychopathy: A study in a sample of institutionalized children]. *Anuario de Psicología Jurídica, 15*, 23-37.
- Roose, A., Bijttebier, P., Decoene, S., Claes, L., & Frick, P. (2010). Assessing the affective features of psychopathy in adolescence: A further validation of the Inventory of Callous and Unemotional traits. *Assessment, 17*, 44-57. doi:10.1177/1073191109344153
- Salekin, R. T. (2010). Treatment of child and adolescent psychopathy: Focusing on change. In Salekin, R. T., & Lynam, D. T. (Eds.), *Handbook of child and adolescent psychopathy* (pp. 343-373). New York: The Guilford Press.
- Snowden, R. J., & Gray, N. S. (2011). Impulsivity and psychopathy: Associations between the Barrett Impulsivity Scale and the Psychopathy Checklist revised. *Psychiatry Research, 187*, 414-417. doi: 10.1016/j.psychres.2011.02.003
- Somech, L. Y., & Elizur, Y. (2012). Promoting self-regulation and cooperation in pre-kindergarten children with conduct problems: A randomized controlled trial. *Journal of the American Academy of Child and Adolescent Psychiatry, 51*, 412-422. doi: 10.1016/j.jaac.2012.01.019

- Tabachnick, B.G., & Fidell, L. S. (2007). *Using Multivariate Statistics* (5th ed.). New York: Allyn and Bacon.
- Upperton, R. A., Thompson, A. P. (2007). Predicting juvenile offender recidivism: Risk need assessment and juvenile justice officers. *Psychiatry, Psychology and Law, 14*, 138-146. doi: 10.1375/pplt14.1.138
- White, S. F., Cruise, K. R., & Frick, P. J. (2009). Differential correlates to self-report and parent-report of callous-unemotional traits in a sample of juvenile sexual offenders. *Behavioral Sciences & the Law, 27*, 910-928. doi: 10.1002/bsl.911
- White, S. F., & Frick, P. J. (2010). Callous-unemotional traits and their importance to causal models of severe antisocial behavior in youth. In R. T. Salekin & D. T. Lynam (Eds.), *Handbook of child and adolescent psychopathy* (pp. 135-155). New York: Guilford.

Table 1

Descriptive statistics (mean, standard deviation and current scale range) of main study variables

	<i>M</i>	<i>SD</i>	Min.	Max.
ICU-Callousness	12.95	5.48	0	28.60
ICU-Uncaring	7.01	2.98	0	13.75
ICU-Unemotional	13.94	5.85	0	24
ICU Total	31.37	11.06	2	62
APSD-CU	4.70	2.80	0	8.67
APSD-I/CP	4.11	2.89	0	10
APSD-Narcissism	4.95	3.57	0	12
Empathy	5.78	2.42	0	12
Impulsivity	7.95	3.86	0	18
Sensation seeking	9.76	4.53	0	21
Hostility	6.78	4.48	0	18
Positive attitude towards violence	14.52	6.94	1	33
ABQ-Aggressive behavior	6.32	5.01	0	18
ABQ-Rule-breaking behavior	6.32	4.52	0	15

	<i>M</i>	<i>SD</i>	Min.	Max.
ABQ-Vandalism	3.68	4.06	0	18
ABQ-Thefts	4.24	5.03	0	18
ABQ-Drug problems	5.39	4.97	0	18
ABQ-Global score	27.07	21.45	0	90
Antisocial peers	4.43	2.52	0	9
Prosocial behavior	14.17	5.43	1	29
School implication	23.11	2.83	15	28
Low cooperation on treatment	2.15	2.51	0	9
Age of onset	13.17	2.78	6	17

Note. M = Mean; SD = Standard deviation; ICU = Inventory of Callous and Unemotional traits; APSD = Antisocial Process Screening Device; ABQ = Antisocial Behavior Questionnaire

Table 2

Fit indices comparing the factor models tested for the Inventory of Callous-Unemotional traits (ICU)

	χ^2	df	χ^2/df	RMR	GFI	AGFI	NFI
Model 1 (one-factor model)	814.43	252	3.35	.092	.886	.865	.811
Model 2 (three-factor hierarchical)	414.85	251	1.65	.066	.942	.931	.904
Model 3 (three-factor bifactor)	289.96	228	1.27	.055	.960	.947	.919
Model 4 (Model 2 without item 10)	384.56	229	1.68	.066	.945	.933	.909
Model 5 (two-factor model)	824.57	252	3.27	.093	.885	.863	.809

Note. df = degrees of freedom; RMR = root mean square residual; GFI = Goodness-of-fit; AGFI = Adjusted goodness-of-fit; NFI = Akaike Normed-fit index.

Table 3

Factor loadings for the best fitting three-factor hierarchical model for the Inventory of Callous and Unemotional traits (ICU)

	Callousness	Uncaring	Unemotional
<i>Callousness</i>			
20. I do not like top up the time into doing things well	.69		
11. I do not care about doing things well	.66		
*8. I am concerned about the feelings of others	.59		
18. I do not feel remorseful when I do something wrong	.57		
9. I do not care if I get into trouble	.54		
*21. The feelings of others are important to me	.52		
7. I do not care about being on time	.51		
4. I do not care who I hurt to get what I want	.40		
2. What I think is “right” and “wrong” is different from what other people think	.32		
12. I seem very cold and uncaring to others	.27		
<i>Uncaring</i>			
*16. I apologize (“say I am sorry”) to persons I hurt		.75	
*15. I always try my best		.69	
*17. I try not to hurt others’ feelings		.64	
*5. I feel bad or guilty when I do something wrong		.60	
*23. I work hard on everything I do		.59	
*13. I easily admit to being wrong		.57	
*24. I do things to make others feel good		.57	
*3. I care about how well I do at school or work		.51	
<i>Unemotional</i>			
*19. I am very expressive and emotional			.85
*1. I express my feelings openly			.68
22. I hide my feelings from others			.68
6. I do not show my emotions to others			.61
*14. It is easy for others to tell how I am feeling			.48

Note: * = Reverse scored items.

Table 4

Zero-order and partial correlations^a between ICU scales and external personality, behavioral, and psychosocial variables

	ICU Total	Callousness	Uncaring	Unemotional
APSD-CU	.81***	.72***/.32***	.57***/.33***	.51***/.43***
APSD-I/CP	.41***	.42***/.27***	.32***/-.04	.23***/.11
APSD-Narcissism	.32***	.33***/.17**	.31***/.04	.11/.01
Empathy	-.51***	-.52***/-.23***	-.49***/-.14**	-.19**/-.01
Impulsivity	.28***	.26***/.08	.26***/.09	.14*/.06
Sensation seeking	.14*	.16**/.13*	.09/-.06	.09/.05
Hostility	.40***	.38***/.18***	.35***/.06	.22***/.11
Positive attitude towards violence	.56***	.57***/.26***	.54***/.16**	.22***/.03
Age of onset	-.20*	-.25**/-.21*	-.17/.06	-.05/.07
Aggressive behavior	.40***	.47***/.31***	.37***/.02	.09/-.08
Rule-breaking behavior	.36***	.41***/.27***	.31***/-.01	.09/-.04
Vandalism	.37***	.39***/.22***	.33***/.03	.15*/.02
Thefts	.35***	.40***/.24***	.34***/.04	.09-.07
Drug problems	.27***	.30***/.20***	.23***/-.03	.10/-.01

	ICU Total	Callousness	Uncaring	Unemotional
Antisocial peers	.27***	.32***/.25***	.22***/-.07	.10/-.01
Prosocial behavior	-.41***	-.32***/.08	-.44***/-.32***	-.23***/-.11
School implication	-.53***	-.48***/-.08	-.54***/-.28***	-.27***/-.10
Low cooperation on treatment	.27***	.26***/.11	.23***/.04	.15*/.08

Note. ICU = Inventory of Callous and Unemotional traits; APSD = Antisocial Process Screening Device; CU = Callous-unemotional traits; I/CP = Impulsivity/Conduct problems.

^a Partial correlations, controlling for other ICU scales if applicable, are presented after the tab .

* $p < .05$ ** $p < .01$ *** $p < .001$

Table 5

Logistic regression analyses predicting the inclusion in Lower antisocial vs. Higher antisocial groups

	Model A			Model B		
	Lower antisocial vs. Higher antisocial (A)			Lower antisocial vs. Higher antisocial (B)		
	B (SE)	OR	95% CI	B (SE)	OR	95% CI
Step 1						
Gender	1.89 (0.55)***	6.63	[2.24, 19.56]	1.67 (0.58)**	5.33	[1.73, 16.47]
Age	0.36 (0.12)**	1.43	[1.13, 1.81]	0.40 (0.12)***	1.49	[1.17, 1.90]
Step 2						
Impulsiveness	0.20 (0.07)**	1.22	[1.05, 1.40]	0.19 (0.07)**	1.20	[1.04, 1.39]
Hostility	0.16 (0.06)*	1.17	[1.03, 1.34]	0.14 (0.07)*	1.15	[1.01, 1.32]
Sensation seeking	0.21 (0.06)***	1.23	[1.09, 1.39]	0.23 (0.06)***	1.25	[1.11, 1.42]
Empathy	0.07 (0.11)	1.08	[0.87, 1.34]	0.17 (0.12)	1.17	[0.93, 1.48]
Step 3						
APSD_CU	-0.02 (0.15)	0.98	[0.76, 1.30]	0.01 (0.15)	1.00	[0.74, 1.35]
Step 4 (A)						
ICU Total	0.09 (0.04)*	1.09	[1.01, 1.18]			
Step 4 (B)						
Callousness				0.16 (0.08)*	1.17	[1.00, 1.37]
Uncaring				0.72 (0.72)	2.05	[0.50, 8.40]
Unemotional				-0.30 (0.37)	0.75	[0.36, 1.54]

Note. OR = Odd ratio; CI = Confidence interval. Gender was coded with 1 for boys and 2 for girls

Model A $\chi^2 = 131.39(8)$, $p < .001$; $R^2 = .48$ (Cox & Snell), $.64$ (Nagelkerke). Model B $\chi^2 = 137.50(10)$, $p < .001$; $R^2 = .50$ (Cox & Snell), $.66$ (Nagelkerke)
* $p < .05$ ** $p < .01$ *** $p < .001$

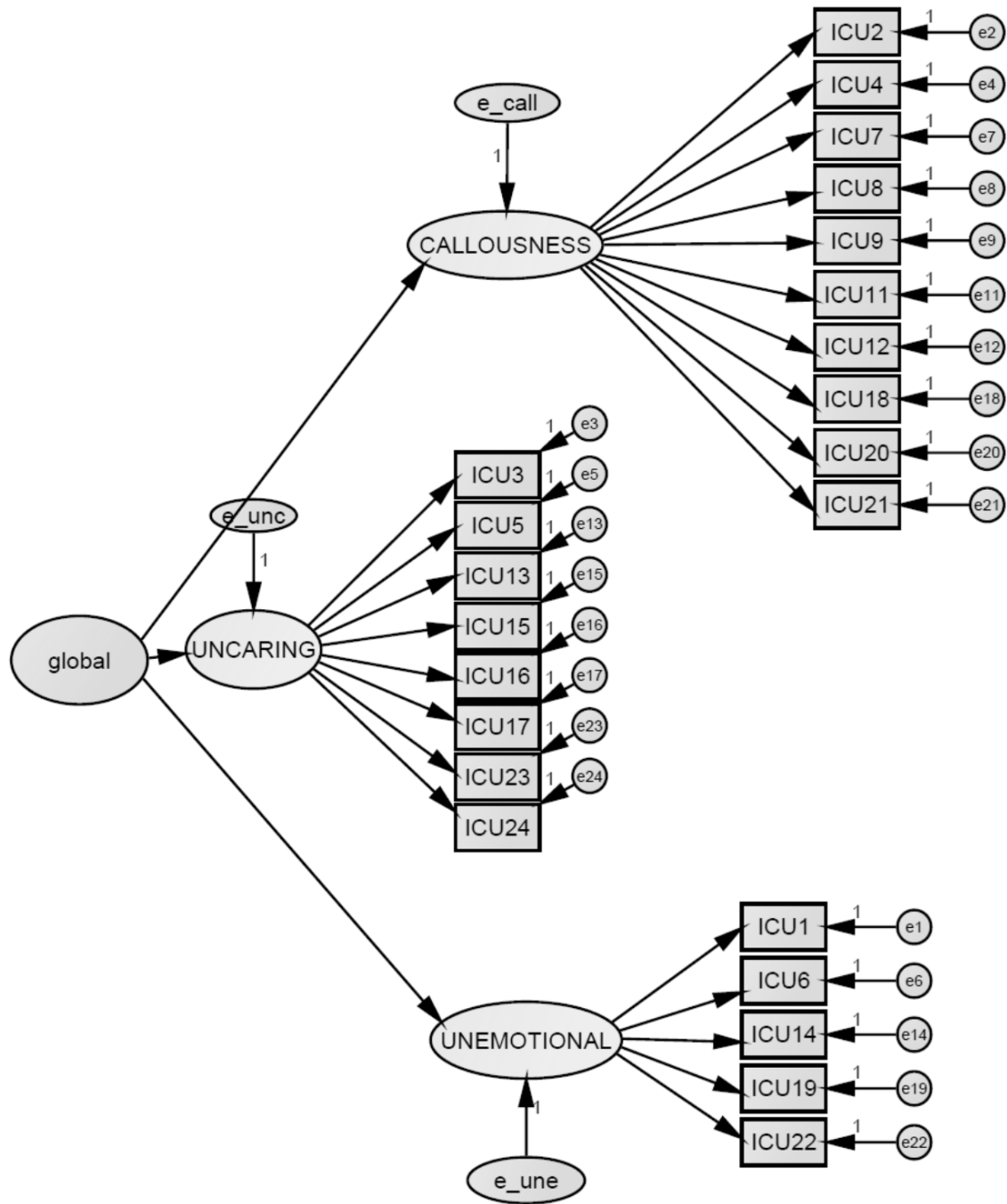


Figure 1. Visual representation of the three-factor hierarchical model, without item 10.