Modeling informant agreement in adolescents and parents: the example of callous-unemotional traits

Csilla Bozsik[1], Julia Gadoros[2], Judit-Inantsy Pap[1], Peter Vida[3] and Jozsef Halasz[2,4]
1. University of Debrecen, Institute of Psychology, Debrecen, Hungary
2. Vadaskert Child Psychiatry Hospital, Budapest, Hungary
3. Semmelweis University, School of Ph.D. Studies, Budapest, Hungary
4. Obuda University, Alba Regia Technical Faculty, Szekesfehervar, Hungary

bozsikcsilla@gmail.com
gadorosju@gmail.com
inantsy-pap.judit@arts.unideb.hu
fitz026@yahoo.co.uk
halasz.jozsef@amk.uni-obuda.hu

Abstract— ***Introduction.*** **According to literature data, informant agreement might have major importance in the interpretation of different psychological states. In the present paper, a model of informant agreement was established on callous unemotional traits in non-clinical adolescents.**
Methods. **The Inventory of Callous-Unemotional Traits (ICU) was assessed in 279 primary and secondary school adolescents (age range: 11-16 years; 14.2±1.5, mean±SD; girls: 132) after informed consent. Additional to socioeconomic measures, both the self-report and parent versions of the ICU was assessed. The study was part of the data collection series about externalization problems in adolescents, in a collaboration between University of Debrecen and Vadaskert Child Psychiatry Hospital.**
Results. **The Cronbach α of the Hungarian ICU self-report was similar to what has been observed in the parent report (0.768 vs. 0.818), and the internal structure was similar to what has been described earlier in other national reports. In spite of the similarities, latent differences between the structure of the two report types made the direct comparison of the three factors (callous, uncaring, unemotional) from two sources somewhat vulnerable. Neither the age, nor socioeconomic background was associated with the self-report scores, but a major gender effect was observed (girls scored less, $p<0.001$). Overall parent-report scores were significantly higher compared to self-report scores, irrespective to gender ($p<0.001$).**
Conclusions. **Results of Hungarian Inventory of Callous-Unemotional Traits analyses were almost identical with the results of foreign ICU analyses. Our data suggest that informant agreement in that particular case should focus on overall scores.**

Keywords: Adolescent, Callous, Informant agreement, Inventory of Callous-Unemotional Traits, Uncaring, Unemotional.

I. INTRODUCTION

A. *Informant agreement and Callous/Unemotional Traits in adolescents*

According to literature data, informant agreement might have major importance on the evaluation and further clinical treatment of patients [1,2]. This effect have marked consequences in the evaluation of mental health condition in the case of children and adolescents. In recent years, multiple informant sources (parent, teacher and self-report) were used to evaluate further treatment strategies in children and adolescents with clinical needs. E.g., the widely used Strengths and Difficulties Questionnaire served as a model for determining internalizing and externalizing symptoms both is clinical and non-clinical samples, but at present the usage of both the self-report and parent report versions seems indispensable. While parent scores were consistently higher in externalizing (conduct and hyperactivity scales) domains, higher emotional and peer problems scores were observed in the self-report versions; moreover, the clinical features were also differentially correlated [3,4].

A specific case also might be observed in informant agreement, where a consistent bias from both types of informants can be observed. Albeit the description of psychopathic traits has a long research line, the description of callous-unemotional traits in its present format was described by Frick and coworkers in recent years [5]. Literature data described a major importance of callous-unemotional traits in children and adolescents with conduct disorder, and the presence of trait has a marked effect in later antisocial development. Callous-unemotional traits are characterized by lack of remorse and guilt, shallow or superficial expression of emotions, a lack of concern for the feelings of others, and a lack of concern regarding performance in important activities [6,7]. Thus, additional to the behavioral pattern, marked alterations of the affective and cognitive domains can be observed in affected children and adolescents. The importance of the

trait was also outlined with the inclusion of callous-unemotional traits as specifier for conduct disorder into the DSM-5 (the current American diagnostic system) [8,9].

The presence of the Callous-unemotional traits has a robust impact on the relations of the adolescents. The consequences of the behavior of youth with conduct disorder and callous unemotional traits might cause behavioral and affective changes within the responder (parent, teacher, peers), and the problematic interpretation of the feedback signals (from parents, teachers and peers) create a specific double bias for the clinician [10]. In clinical terms, the value of informant agreement is mainly the proper outline of children and adolescents with clinical needs. Interestingly, in contrast with the previously mentioned Strengths and Difficulties Questionnaire, to our best knowledge, no comparable general cut off points were outlined within the Inventory of Callous-Unemotional Traits, in relation with informant agreement.

B. Aims

The aim of the present study was to delineate a model for informant agreement on callous-unemotional traits in non-clinical adolescents. Both parent and self-report information were assessed in children and adolescents with low-average risk for later antisocial behavior. Both responder and gender effects were expected.

II. METHODS

The study was approved by the Unified Psychological Ethical Committee (EPKEB). The sample consisted 279 (girls: 132, boys: 147) Caucasian non-clinical primary and secondary school students between the age of 11 and 16 years (14.2 ± 1.5 years, mean ± SD). The directors of the schools (primary and secondary schools from the County Borsod-Abauj-Zemplen were informed about the details of the study, then the parents were informed during the regular parent-teacher meetings. After informed consent of the students and the parents (98% of the parents agreed with the participation), socioeconomic data and the Hungarian version of the Inventory of Callous-Unemotional Traits (ICU) were assessed.

Both the self-report and parent report version of the questionnaire were used. The questionnaire contains 24 items, each of them can be evaluated by a Likert scale from 0 to 3 (0=”not at all true”; 3=”definitely true”). Across different languages and samples, the best fitting structure contains a general callous-unemotional core, and three factors (callousness, e.g.: “The feelings of others are unimportant to me”; unemotional, e.g.: “I hide my feelings from others”; uncaring, e.g.: “I try not to hurt the feelings of others” (inverted/reversed score item)). Altogether, the ICU contains 12 items with reversed scoring, and the original inventory was validated in several context [11-14]. The first preliminary data of the Hungarian ICU parent report was published in relation with subscales of the Strengths and Difficulties Questionnaire in non-clinical adolescents, where a positive correlation pattern between parent reported callous-unemotional traits and behavioral problems were described [15]. In another study involving Hungarian non-clinical children and adolescents, ICU self-report scores were positively correlated with self-reported proactive aggression in Hungarian non-clinical adolescents [16].

Statistical analysis. Statistica 7.0 and SPSS 20.0 program packages were used to analyze datasets. Cronbach α values were evaluated for both self-report and parent report versions to determine the internal consistency. For the exploratory factor analysis, principal component analysis was used with varimax rotation, with eigenvalue=1.6. Maximum number of factors was set at n=5. General Linear Model was used to assess gender and type of responder differences. Where necessary, Newman-Keuls post hoc comparisons were also run. Spearman correlations were used to describe correlation pattern between self-report and parent report ICU versions. The level of significance was set at p=0.05.

III. RESULTS

The internal consistency was high in both self-report and parent report questionnaires, albeit the parent version had somewhat higher Cronbach α values (Table 1).

Within the Inventory of Callous-Unemotional Traits, both gender and type of responder differences were present (gender: $F_{(1,277)}=35.467$, $p<0.001$; type: $F_{(1,277)}=7.819$, $p<0.01$), but the interaction between gender and type was not significant. The 90 percent values (indication for clinical condition) were also determined, according to gender and responder type (Table2). The effect of age and socioeconomic background was not significant.

The factor structure of the self-report and parent report ICU was similar, and three factors were delineated. Five items from the 24 items (Item 8, Item 10, Item 12, Item 21 and Item 24) had different subgroup position (Table 3 and Table 4). The exclusion of these factors did not significantly change factor weights.

The histograms of overall scores in gender split for self-report (Fig. 1), parent report (Fig. 2) and the comparison histogram for overall scores were also presented (Fig. 3).

Spearman correlations were also run between self-report and parent report overall scores. The correlation was higher in boys (Spearman R=0.47, p<0.0001) compared to girls (Spearman R=0.34, p<0.0001); and a positive correlation was also present in the whole population studied (Spearman R=0.47, p<0.0001). Neither the age, nor socioeconomic background was correlated significantly with the overall ICU scores.

Table 1. The internal consistency values (Cronbach α) of the Hungarian parent and self-report version of the Inventory of Callous/Unemotional Traits (ICU).

Population	Cronbach α	
	Parent	Self-report
Boys (n=147)	0.803	0.783
Girls (n=132)	0.798	0.709
Total (n=279)	0.818	0.768

Both the self-report and parent report showed a marked internal consistency in the presented population.

Table 2. Means and standard deviations (SD) of the Hungarian version of the ICU.

ICU total	Population	N	Mean	SD	Limit (90pc)
Self-report	Total	279	20.20#	7.2	
	Boys	147	21.97*#	7.5	32
	Girls	132	18.23#	6.3	26
Parent	Total	279	21.59	8.1	
	Boys	147	23.97*	7.7	35
	Girls	132	18.93	7.7	29

*Symbols indicate significant differences ($p<0.05$). ICU, Inventory of Callous/Unemotional Traits; *, significantly different compared with girls; #, significantly different compared with parent report. Limit was calculated as 90 percentile value.*

Table 3. Factor loadings, ICU self-report.

Items	Callousness	Uncaring	Unemotional
Item01*			0.50
Item02	0.33		
Item03*		0.74	
Item04	0.48		
Item05*		0.54	
Item06			0.47
Item07	0.52		
Item08*			0.65
Item09	0.52		
Item10	0.26		
Item11	0.45		
Item12	0.49		
Item13*		0.34	
Item14*			0.66
Item15*		0.70	
Item16*		0.49	
Item17*		0.43	
Item18	0.46		
Item19*			0.50
Item20	0.42		
Item21			
Item22			0.59
Item23*		0.72	
Item24*		0.36	

*With the exception of Item08, the structure is identical to what was described earlier by Essau et al (2006). In the case of Item08, a switch between Callousness and Unemotional factors occurred. In later studies, Item02 and Item10 were removed from the ICU (Kimonis et al, 2008; Ciucci et al, 2014). *, Inverted items.*

Table 4. Factor loadings, ICU parent report.

Items	Callousness	Uncaring	Unemotional
Item01*			0.62
Item02	0.42		
Item03*		0.80	
Item04	0.59		
Item05*		0.52	
Item06			0.67
Item07	0.41		
Item08*		0.48	
Item09	0.69		
Item10			0.16
Item11	0.63		
Item12			0.48
Item13*		0.32	
Item14*			0.60
Item15*		0.83	
Item16*		0.51	
Item17*		0.52	
Item18	0.44		
Item19*			0.30
Item20	0.58		
Item21	0.50		
Item22			0.72
Item23*		0.79	
Item24*			0.12

*With the exception of 3 items, the structure is identical to what was described earlier by Essau et al (2006) (Item08, Callous/Uncaring switch, Item12, Callous/Unemotional switch, Item24, Uncaring/Unemotional switch). Compared with the Hungarian ICU self-report, the above 3 items showed differences. In later studies, Item02 and Item10 were removed from the ICU (Kimonis et al, 2008; Ciucci et al, 2014). *, Inverted items.*

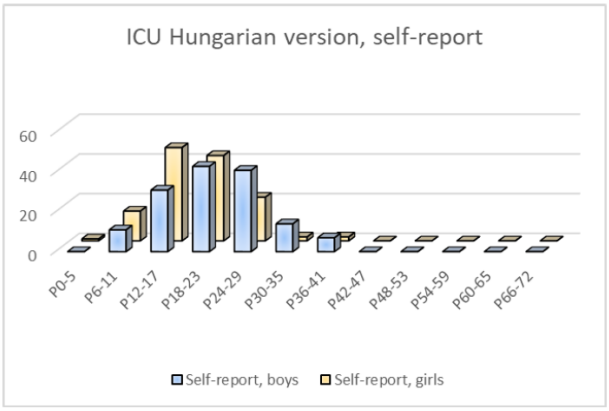

Fig. 1. Score histogram of the Hungarian version of the Inventory of Callous/Unemotional Traits, self-report. The theoretical maximum was 72 points. Axis X, score region values; axis Y, number of children.

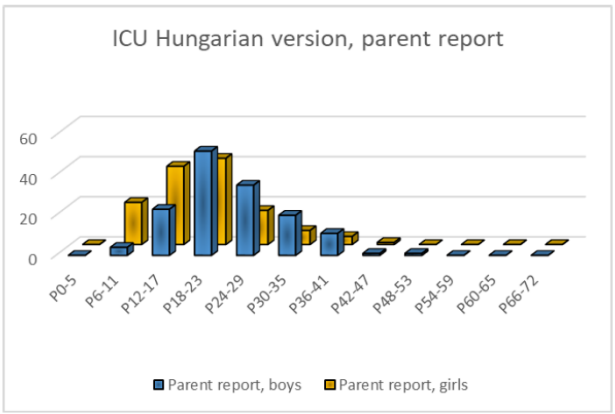

Fig. 2. Score histogram of the Hungarian version of the Inventory of Callous/Unemotional Traits, parent report. The theoretical maximum was 72 points. Axis X, score region values; axis Y, number of children.

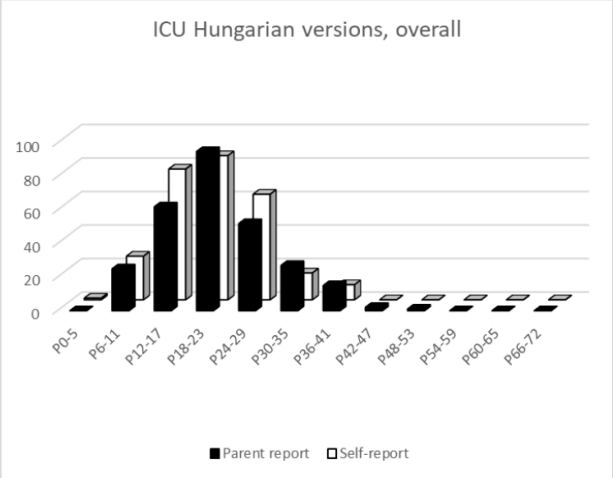

Fig. 3. Score histogram of the Hungarian version of the Inventory of Callous/Unemotional Traits, overall. The theoretical maximum was 72 points. Axis X, score region values; axis Y, number of children.

IV. DISCUSSION

The main results of the present study were the followings. First, in the present non-clinical population, similar factor structure of self-report and parent report ICU were observed. Second, parent report scores were significantly higher compared to self-report scores, and the scores of boys were significantly higher compared to girls, irrespective to the type of responder.

Callous-unemotional traits have major importance in the development of children with conduct disorder. Conduct disorder is not only more frequent in boys, but criminal involvement of boys with conduct disorder is also more prevalent [17-18]. Previous reports suggested a gender bias in incarcerated subjects, and a gender bias was also present in our study. Interestingly, the gender bias was observed in both the self-report and parent report results [10,12,14]. Most importantly, a more prominent correlation between the self-report and parent report scores were observed in boys.

Adolescents with conduct disorder and callous-unemotional traits are particularly vulnerable to later antisocial personality disorder. Unfortunately, no "A" treatment evidence is present in the case of antisocial personality disorder, thus the prevention of the condition has substantial importance [18]. Intervention based strategies in childhood and adolescence have major importance, and outline the relevance studying informant agreement in this particular condition.

The present non-clinical population can be considered as low-average risk study group in relation to antisocial development and considerably higher scores of callous-unemotional traits were described in incarcerated subjects or in a clinical population of adolescents with externalizing problems (e.g., compared to [12,14]). The present data were in line with the data of adolescents in low-average risk study groups [11].

The limitations of the study were the followings. First, the present study included only cross-sectional data, and the age-effect of informant agreement within the sample could have been analyzed by longitudinal data collection. Second, the lack of detailed analysis of symptoms and conditions via structured diagnostic interview excluded the possibility to connect informant agreement to specific latent or subthreshold alterations. To our best knowledge, subthreshold psychopathologies were not assessed so far in relation with callous-unemotional traits, not even in cross-sectional settings. Third, the present study addressed adolescents with low-average risk, and a direct comparison with incarcerated or clinical subjects could deliver important additional data. In future studies, these issues also should be addressed.

V. SUMMARY

In the present paper, the informant agreement on the self-report and parent report versions of the Hungarian ICU were assessed. The informant agreement have a major role in this particular question, as agreement might be vulnerable from both sides: while the parents might serve as targets, the adolescents might have only a partial knowledge and insight of their own behavior. This behavioral pattern has crucial importance of later antisocial development, and the "double vulnerability" (parent bias and adolescent bias) might have crucial importance in our understanding and the wise interpretation of the symptoms.

VI. ACKNOWLEDGMENT

The authors declare no conflict of interest. The authors would like to express their gratitude to those students and families who participated in the project, and to J.P. Frick for providing freely the Inventory of Callous-Unemotional Traits.

REFERENCES

[1] S. Vaz, R. Cordier, M. Boyes, R. Parsons, A. Joosten, M. Ciccarelli, M. Falkmer and T. Falkmer, "Is using the Strengths and Difficulties Questionnaire in a community sample the optimal way to assess mental health functioning?", *PLoS One,* doi 10.1371-0144039, 2016.

[2] L.L. Stone, R. Otten, R.C. Engels, A.A. Vermulst and J.M. Janssens, "Psychometric properties of the parent and teacher versions of the Strengths and Difficulties Questionnaire for 4- to 12-year-olds: a review", *Clin Child Fam Psychol Rev,* vol. 13, pp. 254–274, 2010.

[3] K. Cleridou, P. Patalay and P. Martin, "Does parent-child agreement vary based on presenting problems? Results from a UK clinical sample", *Child Adolesc Psychiatry Ment Health,* doi 10.1186-13034, 2017.

[4] B. van Roy, B. Groholt, S. Heyerdahl and J. Clench-Aas, "Understanding discrepancies in parent-child reporting of emotional and behavioural problems: Effects of relational and socio-demographic factors", *BMC Psychiatry,* doi 10.1186-1471-244, 2010.

[5] P.J. Frick, A.H. Cornell, C.T. Barry, S.D. Bodin and H.A. Dane, "Callous-unemotional traits and conduct problems in the prediction of conduct problem severity, aggression, and self-report of delinquency", *J Abnorm Child Psychol,* vol. 31, pp. 457–470, 2003.

[6] P.J. Frick and S.F. White, "The importance of callous-unemotional traits in the development of aggressive and antisocial behavior", *J Child Psychol Psychiatry,* vol. 49, pp. 359–375, 2008.

[7] P.J. Frick, J.V. Ray, L.C. Thornton and R.E. Kahn, "Annual Research Review: A developmental psychopathology approach to understanding callous-unemotional traits in children and adolescents with serious conduct problems", *J Child Psychol Psychiatry,* vol. 55, pp. 532–548, 2014.

[8] American Psychiatric Association, "Diagnostic and Statistic Manual of Mental Disorders, DSM-5", New York, American Psychiatric Publishing, 2013.

[9] E.R. Kimonis, K.A. Fanti, P.J. Frick, T.E. Moffitt, C. Essau, P. Bijttebier and M.A. Marsee, "Using self-reported callous-unemotional traits to cross-nationally assess the DSM-5 'with limited prosocial emotions' specifier", *J Child Psychol Psychiatry*, vol. 56, pp. 1249–1261, 2015.

[10] S.F. White, K.R. Cruise and P.J. Frick, "Differential correlates to self-report and parent-report of Callous-Unemotional Traits in a sample of juvenile sexual offenders", *Behav Sci Law,* vol. 27, pp. 910–928, 2009.

[11] C.A. Essau, S. Sasagawa and P.J. Frick, "Callous-unemotional traits in a community sample of adolescents", *Assessment,* vol. 13, pp. 464–469, 2006.

[12] E.R. Kimonis, P.J. Frick, J.L. Skeem, M.A. Marsee, K. Cruise, L.C. Munoz, K.J. Aucoin and A.S. Morris, "Assessing callous-unemotional traits in adolescent offenders: validation of the Inventory of Callous-Unemotional Traits", *Int J Law Psychiatry,* vol. 31, pp. 241–252, 2008.

[13] E. Ciucci, A. Baroncelli, M. Franchi, F.N. Golmaryami and P.J. Frick, "The association between Callous-Unemotional Traits and behavioral and academic adjustment in children: Further validation of the Inventory of Callous-Unemotional Traits", *J Psychopathol Behav Assess,* vol. 36, pp. 189–200, 2014.

[14] E.R. Kimonis, K. Fanti, A. Goldweber, M.A. Marsee, P.J. Frick and E. Cauffman, "Callous-unemotional traits in incarcerated adolescents", *Psychol Assess,* vol. 26, pp. 227–237, 2014.

[15] N. Pataky, A. Kormendy, C. Bozsik, J. Inantsy-Pap, J. Halasz and J. Gadoros, "Investigation of callous/unemotional traits and interpersonal characteristics among Hungarian adolescents – preliminary research results", *Psychiatria Hung,* vol. 26, pp. 427–433, 2011.

[16] C. Bozsik, A. Kormendi, J. Inantsy-Pap, N. Kormendi, J. Gadoros, J Halasz, "The relationship between reactive/proactive aggression, callous/unemotional traits and behavioural problems in Hungarian adolescents", *Psychiatria Hung,* vol. 28, pp. 48–56, 2013.

[17] P. Vida, J. Halasz and J. Gadoros, "Aggressive and prosocial behavior in childhood psychopathology", *Psychiatria Hung,* vol. 28, pp. 261–273, 2013.

[18] National Institute for Health and Care Excellence, "Antisocial behaviour and conduct disorder in children and young people. Recognition, intervention and management", British Psychological Society and The Royal College of Psychiatrists, *National Clinical Guideline Number 158,* pp. 1–468, 2013.