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Child abuse and neglect profiles and their psychosocial consequences in a large
sample of incarcerated males

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Abstract

Research examining child abuse and neglect (CAN) profiles among adult offender populations is lacking. Therefore, the primary aim of the present study was to address this limitation by using latent class analysis (LCA) to identify meaningful classes of individuals who have experienced physical abuse, emotional abuse, sexual abuse, as well as neglect. Another aim was to estimate the association between CAN class membership and external criteria (psychopathy factors, self-esteem, attitudes towards male sexual violence in dating relationships, child sexual abuse myth acceptance, violent offending, and age). Data were collected among a large systematically selected sample of adult male inmates ($N = 1,261$). Based on LCA, three unique classes of CAN were distinguished, including a 'low abuse' group (43.4% of the sample), a 'high physical and emotional abuse' group (51.3%), and a 'poly-victimized' group (5.3%). The analysis revealed that the CAN classes were differentially associated with affective responsiveness, cognitive responsiveness, personal self-esteem, prison self-esteem, attitudes towards male sexual violence in dating relationships, and violent offending. Findings highlight the unique nature of CAN constellations among criminal justice involved participants. The significance of the present results is discussed in relation to past and future research. Potential contributions to treatment strategies are also presented.

Keywords: Child abuse and neglect (CAN); Adult male prisoners; Latent class analysis; Psychopathic traits; Attitudes towards sexual violence; Violent offending

Child abuse and neglect (CAN) is a global phenomenon which constitutes a major public health issue (Shaw & De Jong, 2012). It has been reported that each year, one per cent of children in the population come into the attention of child protection services (Gilbert *et al.*, 2009a). However, CAN is a crime which is likely to go underreported (Hershkowitz, Horowitz, & Lamb, 2005). Research indicates that per year between four and 16 per cent of children experience physical abuse, 10 per cent experience psychological abuse, between one and 15 per cent are neglected, and six per cent experience sexual abuse (Finkelhor, 1994; Gilbert *et al.*, 2009b; Matthews & Walsh, 2004).

The prevalence of CAN, however, appears to be increased for some types of samples, including offenders. Indeed, in one study, 90 per cent of youth offenders reported having experienced at least one traumatic event (Ford, Chapman, Connor, & Cruise, 2012). In a large UK cohort study with 3,849 prisoners, 62 per cent of respondents reported having experienced emotional abuse, 61 per cent experienced physical abuse, and 31 per cent experienced sexual abuse as a child (Williams, Papadopoulou, & Booth, 2012). Further, Weeks and Widom (1998) found that 68 per cent of 301 adult male prisoners drawn from a New York State medium-security facility, experienced some kind of childhood victimization. Violent offenders were more likely to report neglect but not more physical abuse than their non-violent counterparts; whereas sex offenders reported childhood sexual abuse more often than individuals convicted of non-sexual offenses. Similarly, in two recent meta-analytic studies, the prevalence of child sex abuse was found to be higher among sex-offenders than non-sex offenders, but the two groups did not differ significantly with regard to physical abuse history (Jespersen, Lalumière, & Seto, 2009; Seto & Lalumière, 2010).

Child maltreatment is associated with serious internalizing and externalizing problems, including depression, self-destructive behavior, antisocial behavior, aggression, educational underachievement, and inappropriate sexual behaviors (Dhingra, Boduszek, & Sharratt, 2015;

Jaffee, Caspi, Moffitt, & Taylor, 2004; Jones, Trudinger, & Crawford, 2004; Kendall-Tackett, Williams, & Finkelhor, 1993; Lahey, Moffitt, & Caspi, 2003; Margolin & Gordis, 2000; Vachon, Krueger, Rogosch, & Cicchetti, 2015). Research also reports that youngsters who have experienced abuse have fewer friends and lower self-esteem than their non-abused counterparts (Al-Fayez *et al.*, 2012; Oates, Forrest, & Peacock, 1985; Turner, Shattuck, Finkelhor, & Hamby, 2015). Additionally, being a victim to or witnessing violence increases the odds of offending, violent behavior, intimate partner violence, and arrest in adulthood (Brezina, 1998; Fagan, 2005; Forsman & Långström, 2012; Maxfield & Widom, 1996; Smith, Ireland, & Thornberry, 2005; Smith & Thornberry, 1995; Williams *et al.*, 2012). Thus, in line with the cycle of violence and social learning theories, it may be that violent behavior is acquired from observing and imitating aggressive adults (Bandura, 1978). Some other studies found a relationship between child maltreatment experiences and adult rape convictions and sexual aggression toward women (Dhawan & Marshall, 1996; Malamuth, Sockloskie, Koss, & Tanaka, 1991). Along similar lines, Debowska, Boduszek, Dhingra, Kola-Palmer, and Meller-Pruncka (2015) suggested that childhood exposure to violence is significantly associated with the acceptance of rape myths. In this study, however, an aggregate score for different types of experienced and witnessed violence was utilized, treating maltreatment as a unidimensional phenomenon.

Early exposure to violence may also disrupt psychological development and result in abnormal personality structures. To elaborate, Green *et al.*'s (2010) findings indicated that as much as 32.4 per cent of all DSM-IV disorders could have been explained by childhood adversity. Several empirical studies have also suggested that exposure to violence may lead to increased total psychopathy ratings (Lang, Af Klinteberg, & Alm, 2002; Marshall & Cooke, 1999). Poythress, Skeem, and Lilienfeld (2006), using the Psychopathy Checklist – Revised (PCL-R; Hare, 1991, 2003) to measure psychopathy and structural equation modeling to

analyze the data, found a significant direct effect of abuse on the erratic lifestyle dimension of psychopathy but not on the core interpersonal/affective traits. Despite the fact that the PCL-R consists of items pertaining to antisocial behavior, they were not included in the structural model. Of note, psychopathy is commonly conceptualized as a constellation of interpersonal, affective, lifestyle, and antisocial traits (Hare & Neumann, 2008); however, current research has indicated that criminality may be an outcome rather than an integral part of the condition and that egocentricity should be considered as a separate psychopathy dimension (see Boduszek & Debowska, 2016; Boduszek, Debowska, Dhingra, & DeLisi, 2016).

Although many studies have investigated psychosocial effects of child maltreatment, the strength of relationships reported could have been overestimated due to not controlling for the intercorrelations between different forms of CAN (Green *et al.*, 2010; Scott, Varghese, & McGarth, 2010). This is an important limitation because recent work suggests that various forms of violence tend to co-occur (Green *et al.*, 2010; Hamby & Grych, 2013) and interact “in a manner that is more detrimental to development than the influence of one type alone” (Wolfe & McGee, 1994, p. 168). Further, poly-victimization is deemed as particularly harmful (Turner, Shattuck, Finkelhor, & Hamby, 2016). As such, using traditional variable-centered statistical approaches, which focus on associations between study variables, appears redundant in this context. A more reliable information concerning the patterns of concomitance and effects of CAN types may be obtained using person-oriented techniques, such as latent class (LCA) and latent profile analysis (LPA), which examine the ways in which numerous characteristics are configured within individuals (De Fruyt & De Clercq, 2014).

Indeed, mixture modeling has been previously employed in child abuse research; providing information in regard to abuse intensity (quantitative differences) and variations of co-occurrence of abuse types (qualitative differences). For example, Nooner *et al.* (2010)

identified four meaningful classes of physical and sexual abuse among 795 pre-adolescent youths; including no physical/sexual abuse (85.1% of respondents), high physical and low sexual abuse (6.2%), no physical abuse and moderate sexual abuse (5.8%), as well as high physical/sexual abuse (2.9%) groups. Armour, Elklit, and Christoffersen (2014) investigated a broader spectrum of abuse forms, incorporating physical abuse, psychological maltreatment, neglect, and sexual abuse. Their sample consisted of a stratified random sample of 2,980 Danes (all aged 24 years). The LCA resulted in four latent typologies: psychologically maltreated class (9.7%), sexually abused class (2%), abused overall class (2.1%), and non-abused class (86.2%). Yet another LPA among 117 preschool children (3 – 6 years old) entering foster care placements, retrieved four latent profiles of physical abuse, sexual abuse, psychological maltreatment, supervisory neglect, and physical neglect. The greatest risk of both externalizing and internalizing problems was reported for children in the sexual abuse, physical abuse, psychological maltreatment, and neglect group; whereas the lowest risk of such problems was found for children classified in the supervisory neglect and emotional maltreatment group (Pears, Kim, & Fisher, 2008).

Studies utilizing exclusively male samples are rare in child abuse research. Given the differing abuse incidence reported for males and females (World Health Organization [WHO], 2016), however, it appears that profiling studies should focus on the two genders separately. Using a sample of 626 urban community men (M age = 24.6 years), Davis *et al.* (2015) identified four latent subtypes of childhood maltreatment: low maltreatment (80%), emotional and physical maltreatment (12%), emotional and sexual maltreatment (four per cent), as well as poly-victimized (4%). Subsequent analysis established that the emotional and physical maltreatment group had significantly higher intimate partner violence (IPV) perpetration rates than the low maltreatment group. Men in the poly-victimized class, in comparison to their low maltreatment counterparts, scored lower on income and education

level, as well as higher on incarceration history, and recent anxiety/depression symptoms. In another large-scale investigation, Burns, Lagdon, Boyda, and Armour (2016) also recovered a four-latent class profile. The majority of the sample belonged in a class characterized by low endorsement on all types of victimization (81.4%; $n = 12,736$); the least numerous group was the one with the highest endorsements on all victimization types (2.1%; $n = 237$). It must be noted here, however, that Burns *et al.* profiled respondents on interpersonal victimization across the life span.

Notably, CAN typologies can differ across populations and hence the above findings may not be directly generalizable to high-risk samples, such as criminal justice involved individuals. Indeed, although sparse, LCA studies with criminal samples suggest different best-fitting solutions to those cited in community-based research. To elaborate, Ford, Grasso, Hawke, and Chapman (2013) found three unique classes of adversity among 1,959 mixed gender youths (10 – 16 years old) admitted to juvenile detention. The best-fitting solution comprised of a poly-victim class (5%), a moderate adversity class (36%), and a low adversity class (59%). More recently, Aebi *et al.* (2015) assessed childhood emotional, physical, and sexual abuse in a sample of 260 detained male adolescent offenders (M age = 16.5 years). LCA yielded a three-class solution: no/mild trauma (class 1; 76%); emotional and physical trauma (class 2; 18%); emotional, physical, and sexual trauma (class 3; 8%). Compared with class 1, classes 2 and 3 associated with ADHD, affective and anxiety disorders, and suicidality; whereas respondents in class 3 had higher recidivism rates.

The current study

Profiling research has the power to reveal the patterns of co-occurrence of different types of childhood abuse and neglect – an information of paramount importance to child protection services. Although such studies are conducted mainly among community samples (e.g., Armour *et al.*, 2014; Burns *et al.*, 2016; Noonan *et al.*, 2010), some recent investigations have

inquired into CAN profiles within high-risk populations, such as juvenile offenders (e.g., Aebi *et al.*, 2015; Ford *et al.*, 2013). What is missing, however, are LCA studies with adult criminals. This is a significant void because long-term consequences of abuse, including its impact on personality structures, can only be determined by examining adult populations. In order to address this gap in the literature, the primary aim of the current study was to recover meaningful subtypes of CAN (incorporating physical abuse, emotional abuse, neglect, contact sexual abuse, and penetrative sexual abuse) in a systematically selected representative sample of adult male prisoners. Given the lack of past studies among similar respondents, we did not formulate any *a priori* hypotheses in regard to the number of CAN classes; however, we expected that a group with low scores on all types of abuse and a group with increased scores on all CAN items would be retrieved. Based on the extant research, we also predicted that the majority of participants would belong in the former class, whereas the latter class would be the least numerous. Another goal was to verify whether abuse typologies could be differentiated from one another based on psychopathic personality traits (affective responsiveness, cognitive responsiveness, interpersonal manipulation, and egocentricity), personal self-esteem, prison self-esteem, attitudes towards male sexual violence in dating relationships, child sexual abuse myth acceptance, violent offending, and age.

Method

Sampling procedure

The total prison population in the Republic of Poland consists of 76,145 inmates (according to the 2015 census data). There are 215 correctional units, including main prisons, remand prisons, and detention centers. For the purpose of this study, we focused exclusively on males from main maximum- and medium-security prisons. Systematic sampling procedure was employed to minimize sampling bias and maximize the generalizability of findings. Five maximum- and five medium-security prisons were randomly chosen for participation. Access

to the selected correctional institutions was granted by regional prison wardens. Next, we delivered printed self-report anonymous surveys to the prisons and provided training to all prison employees (psychologists and counsellors) facilitating data collection. The distribution of surveys followed a systematic procedure, and stratification was based on prison blocks. Data collection took place in prisoners' living units and was monitored by one trained prison staff on each block/wing. Given inmates' standing as a vulnerable population and the potential that they may feel compelled to participate, all participants were provided with (a) a description of the nature and purpose of the study, (b) an explanation that data collection was anonymous and voluntary, without any form of reward, and (c) a summary of the informed consent. This was done both in writing and verbally by the trained prison personnel. Prisoners were also informed verbally that they should not participate in the study if they could not read, but they were not asked to provide the specific reason for not participating. Respondents were instructed to place completed surveys in envelopes and return them to a data collector. An additional option of placing surveys in a correspondence box (available on each prison block) was provided in medium-security units. Finally, completed surveys were collected from all participating prisons by the research team and posted to the home university in the United Kingdom. Ethical approval for the study was granted by relevant institutional boards.

Participants

In total, 1,261 adult male inmates completed the full survey and were included in the analysis (age $M = 34.90$, $SD = 9.98$, $Mdn = 34$, $Mode = 35$, range 18 - 76). The completion rate (the percentage of respondents who completed the full survey) was 63% and the response rate (the percentage of all approached participants who completed the survey) was 45%. These rates are considered satisfactory by current survey research standards (Finkelhor, Vanderminden, Turner, Shattuck, & Hamby, 2016; Kohut, Keeter, Doherty, Dimock, & Christian, 2012).

Further, prior research did not demonstrate any significant relationship between response rates and non-response bias (Groves, 2006; Merkle & Edelman, 2002).

As for prison security level, 55.7% participants were from maximum- and 44.3% from medium-security prisons. Prisoners convicted of violent crimes (including assault, domestic violence, sex offenses, and homicide) constituted 49% of the sample; the remaining 51% inmates were sentenced for non-violent offenses (including theft, burglary, drug-related offenses, and financial crimes). Total time spent in prisons for the sample ranged from 1 to 468 months ($M = 71.45$, $SD = 71.46$, $Mdn = 48$, $Mode = 48$). Further, 67.8% of participants were raised by both parents, 18.6% by mother only, 2.9% by father only, 4.1% by relatives, 2.1% by foster parents, and 4.5% were raised in a child care home. Next, 26.5% of participating inmates reported having primary education (six years of schooling), 16.1% junior high education (nine years of schooling), 35.2% vocational qualifications (eleven years of schooling), 14% high school education (twelve years of schooling), 5.2% a technical college degree (thirteen years of schooling), and 3% a university degree (between fifteen and eighteen years of schooling). Finally, 54% of inmates reported being a parent.

Measures

Psychopathic Personality Traits Scale (PPTS; Boduszek *et al.*, 2016) is a personality-based self-reported 20-item scale measuring psychopathic traits. The scale does not contain any behavioral items and hence is well suited to be used among forensic and non-forensic populations. The inventory consists of four subscales: affective responsiveness (measures respondents' empathy and emotional depth of reactions; higher scores imply more deficits – composite reliability for this subscale was .85 in the current sample), cognitive responsiveness (assesses the ability to understand others' emotional states, mentally represent others' emotional processes, and engage with another person emotionally at a cognitive level; increased scores signify more deficits – composite reliability was .73), interpersonal

manipulation (measures participants' superficial charm, grandiosity, and deceitfulness; higher scores suggest more such traits – composite reliability was .85), and egocentricity (measures an individual's tendency to focus on own beliefs, attitudes, and interests; higher ratings imply increased egocentricity – composite reliability was .81). Each subscale consists of five items measured using “agree” (1) and “disagree” (0) format (i.e., a trait is either present or absent). Scores range from 0 to 20 (composite reliability for the entire scale was .94).

Self-Esteem Measure for Prisoners (SEM-P; Debowska, Boduszek, & Sherretts, in press) is an 8-item self-report measure assessing self-esteem among incarcerated adult populations. The measure consists of two subscales: prison-specific self-esteem (4 items – Cronbach's alpha = .74), looking at self-esteem in a specific context, and personal self-esteem (4 items – Cronbach's alpha = .78), inquiring into self-esteem in a context-free manner. Responses are indexed on a 4-point Likert scale (1 = “never”, 4 = “always”). Scores for the total scale range from 8 to 32, with higher scores indicating increased levels of self-esteem.

The Child Sexual Abuse Myth Scale (CSAMS; Collings, 1997) is a 15-item self-report scale measuring the level of child sexual abuse myth acceptance. It is composed of three subscales: blame diffusion subscale (six items) refers to the belief that persons other than the offender are to blame for the abuse; the denial of abusiveness subscale (five items) pertains to the beliefs that serve to minimize the abusive nature of child sexual abuse; and restrictive abuse stereotypes subscale (five items) inquires into the beliefs that serve to deny the reality of abuse or to deny the negative consequences of abuse. In the current study, responses were indexed on a 4-item Likert scale (1 = “disagree” to 4 = “agree”). Scores range from 15 to 60, with higher scores indicating a greater acceptance of abuse-related myths and stereotypes. Cronbach's alpha for this measure was .83 in the current sample.

Attitudes Towards Male Sexual Dating Violence (AMDV-Sex; Price, Byers, and the Dating Violence Research Team 1999) is one of three instruments, labelled the Attitudes Towards Dating Violence Scales, inquiring into the acceptance of physical (Attitudes Towards Male Physical Dating Violence; AMDV-Phys), psychological (Attitudes Towards Male Psychological Dating Violence; AMDV-Psyc), and sexual (AMDV-Sex) violence perpetrated by males in dating relationships. The AMDV-Sex is a 12-item instrument examining the extent to which respondents subscribe to views supportive of sexual violence against women in dating relationships. In the current study, all items were scored on a 4-point Likert scale (1 = “disagree”, 4 = “agree”). Scores ranged from 12 to 48, with higher scores indicating greater acceptance of sexual violence towards women in dating relationships. Cronbach’s alpha for this measures was .77 in the current sample.

Child Abuse and Neglect Questionnaire was developed for the purpose of the present research. It contains five items: physical abuse (“Did someone in your childhood physically hurt you in any way (e.g., hit, beat, kick)?”); emotional abuse (“Did someone in your childhood call you names, said mean things to you, or said you were worthless?”); neglect (“In your childhood, did you have to look after yourself because a parent drank too much alcohol, took drugs, or was completely uninterested in you?”); contact sexual abuse (“Did someone in your childhood touch your private parts when they shouldn’t have or make you touch their private parts?”); and penetrative sexual abuse (“Did someone in your childhood force you to have sex?”). Scoring was dichotomous (0 = “no”, 1 = “yes”).

Lie scale (Francis, Brown, and Philipchalk, 1992) is a 6-item subscale of the Eysenck Personality Questionnaire Revised-Abbreviated (EPQR-A) devised to control for social desirability bias. It is scored in a dichotomous fashion (0 = “no”, 1 = “yes”). Composite reliability for the scale was .72.

All questionnaires were translated to Polish by a professional translator. To ensure that the meaning of the original inventories has been retained, the Polish versions were translated back to English. Original translations and back-translations were then shown to three experts in translation who suggested minor changes.

Analytic procedure

Descriptive statistics (frequencies, percentages, *M*, *SD*, *Mdn*, mode, Cronbach's alpha) were calculated using SPSS version 23. Differences between participants incarcerated in medium- and maximum-security prisons were investigated using chi-square test for independence (categorical data) and independent samples *t*-test (continuous data) with Bonferroni correction. Additionally, composite reliability was calculated for the PPTS and the Lie scale due to dichotomous item coding (Raykov, 1997).

We used latent class analysis (LCA) with covariates to investigate the main objectives of the current study. Data were analyzed using *Mplus* version 7.4 (Muthén & Muthén, 1998-2015). LCA is a statistical method employed to ascertain the number of homogeneous groups (or classes) from categorical multivariate data. Commonly described as a categorical variant of factor analysis, LCA assumes that associations among a set of observed categorical variables can be explained by a finite number of mutually exclusive classes. LCA is well suited to the aims of this study as: (a) it is exploratory in nature and data-driven, thus *a priori* assumptions are not made in regard to the number of latent classes present; and (b) it does not assume independence among indicators.

There is no consensus concerning a single statistical index that identifies the most appropriate number of classes within a given population (Nylund, Asparouhov, & Muthén, 2007). Therefore, models with a successive number of classes are specified through an iterative process. Extraction of latent classes ceases when there is little empirical or substantive support for the inclusion of a further class. Model fit is evaluated on the basis of

goodness of fit statistical and parsimony considerations. Statistical indices reported in the present study include: Akaike Information Criterion (AIC; Akaike, 1974); Bayesian Information criterion (BIC; Schwarz, 1978); sample size adjusted BIC (SSABIC; Sclove, 1987); Lo–Mendell–Rubin likelihood ratio test (LMR-LRT; Lo, Mendell, & Rubin, 2001); and entropy (Ramaswamy, DeSarbo, Reibstein, & Robinson, 1993).

AIC, BIC and SSABIC are goodness of fit indices used for comparison across competing models. Lower values indicate better-fitting models and extraction of latent classes should cease when these indices reach their lowest values. Recent simulation studies suggest that BIC is one of the most reliable indicators of the correct number of latent classes (Nylund *et al.*, 2007). Another useful statistic for class enumeration is the LMR-LRT, which assesses the improvement in fit between competing models. A non-significant value ($p > .05$) suggests that the model with one fewer class provides a more parsimonious fit to the data. Based on the posterior class membership probabilities, entropy evaluates how well each of the classes is separated and represented by the data (values range from 0 to 1, with high values preferred). Selection of the best-fitting model was also based on whether the model reflected coherent, distinct, and conceptually meaningful subgroups and adequately accounted for the heterogeneity in the sample.

Following identification of the best-fitting latent class solution, covariates (affective responsiveness, cognitive responsiveness, interpersonal manipulation, egocentricity, personal self-esteem, prison self-esteem, attitudes towards male sexual violence in dating relationships, child sexual abuse myth acceptance, violent offending, age, and prison security level) were included in the model to help describe the heterogeneity in child abuse and neglect (CAN) and to substantiate the validity of the emergent classes or subtypes. Muthén (2003, p. 373) suggests that, “The estimated prediction of class membership is a key feature in examining predictions of theory. If classes are not statistically different with respect to

covariates that, according to theory, should distinguish classes, crucial support for the model is absent”. These associations were evaluated using odds ratios (ORs), accompanying confidence intervals (CIs), and Cohen’s *d* (for statistically significant results only). Odds ratios reflect the proportionate change in odds of membership of a given class, relative to the reference class, associated with a one-unit change in the covariate.

Results

Descriptive Statistics and Correlations

Descriptive statistics, including means (*M*), standard deviations (*SD*), medians (*Mdn*), modes, and minimum and maximum observed scores for all continuous variables are presented in Table 1, along with independent samples *t*-test results. There were no statistically significant differences between participants from medium- and maximum-security prisons on any psychological variables.

Prevalence of child abuse and neglect (CAN)

The proportion of participants endorsing each of the five CAN items is presented in Table 2. The majority of participants reported having experienced emotional abuse (61.7%) and physical abuse (54.3%). The experience of neglect in childhood, in turn, was reported by 39.6% prisoners. Finally, 4.8% of participants experienced contact sexual abuse, and 4.4% experienced penetrative sexual abuse. Chi-square test of independence showed statistically significant differences between participants from medium- and maximum-security prisons on physical abuse, neglect, and penetrative sexual abuse; however, the effect size (Phi) was very small.

Table 1. *Descriptive Statistics for All Participants (Total) and Differences Between Inmates from Medium and Maximum Security Prisons*

Variable	Total					Medium	Maximum	<i>t</i> value
	<i>M</i>	<i>SD</i>	<i>Mdn</i>	Mode	Observed Scores Min-Max	<i>M (SD)</i>	<i>M (SD)</i>	
Age	34.90	9.98	34	35	18-76	33.37 (10.03)	36.11 (9.78)	-4.87*
AR	1.18	1.36	1	0	0-5	1.11 (1.34)	1.24 (1.37)	-1.53
CR	1.54	1.34	1	0	0-5	1.47 (1.35)	1.59 (1.33)	-1.44
IPM	1.92	1.61	2	0	0-5	1.81 (1.53)	2.00 (1.67)	-1.85
Egocentricity	1.86	1.35	2	1	0-5	1.82 (1.39)	1.88 (1.31)	-.75
PPTS total	6.50	3.92	6	6	0-19	6.23 (3.96)	6.72 (3.87)	-2.04
CSAMS	29.74	8.91	29	27	15-60	29.97 (8.97)	29.56 (8.86)	.74
Personal self-esteem	13.41	2.15	14	16	4-16	13.52 (2.25)	13.32 (2.05)	1.49
Prison self-esteem	13.71	2.17	14	16	4-16	13.79 (2.26)	13.64 (2.10)	1.08
AMDV-Sex	19.58	6.14	18	12	12-48	19.66 (6.10)	19.51 (6.18)	.41

Note. AMDV-Sex = Attitudes towards Male Sexual Dating Violence; AR = Affective responsiveness; CR = Cognitive responsiveness; CSAMS = Child Sexual Abuse Myth Scale; IPM = Interpersonal Manipulation; PPTS total = Psychopathic Personality Traits Scale total score. Bonferroni correction (* $p < .005$)

Table 2. *Endorsement Rates of Abuse Items for all Prisoners (Total), Medium and Maximum Security Prisoners, and Chi-Square Test for Independence*

Item	Total Frequency (%)	Medium Frequency (%)	Maximum Frequency (%)	χ^2 (Phi)
Physical abuse	586 (54.3)	233 (47.6)	353 (50.2)	16.26* (.12)
Emotional abuse	667 (61.7)	292 (59.5)	375 (63.6)	1.89 (.04)
Neglect	427 (39.6)	169 (34.4)	258 (43.9)	10.01* (.10)
Contact sexual abuse	52 (4.8)	16 (3.3)	36 (6.1)	4.76 (.07)
Penetrative sexual abuse	47 (4.4)	11 (2.2)	36 (6.1)	9.64* (.09)

Note. Bonferroni correction (* $p < .01$); Phi = effect size statistic

Table 3. *Fit Indices for the Latent Class Analysis of Child Abuse and Neglect (CAN)*

Model	AIC	BIC	SSABIC	LRT	p	Entropy
1 class	5190.22	5215.15	5199.27	N/A	N/A	N/A
2 classes	4496.46	4551.30	4516.36	689.32	<.001	.75
3 classes	4291.76	4376.51	4322.52	211.65	<.001	.85
4 classes	4291.82	4406.06	4333.01	12.16	.12	.83

Note. AIC = Akaike information criterion, BIC = Bayesian information criterion, SSABIC = sample size adjusted BIC, LRT = Lo-Mendell-Rubin's adjusted likelihood ratio test.

Table 4. *Associations Between CAN Classes and Covariates*

Variable	Class 1 with Class 3 OR (95% CI)	Cohen's <i>d</i>	Class 2 with Class 3 OR (95% CI)	Cohen's <i>d</i>	Class 1 with Class 2 OR (95% CI)	Cohen's <i>d</i>
Age	1.02 (.98/1.05)		.98 (.96/1.01)		1.04 (1.01/1.09)	
Affective responsiveness	.82 (.63/1.06)		1.09 (.94/1.26)		.75* (.59/.97)	.16
Cognitive responsiveness	1.19 (.92/1.55)		.81** (.70/.94)	.12	1.48*** (1.16/1.91)	.22
Interpersonal manipulation	1.02 (.82/1.26)		1.03 (.92/1.16)		.99 (.79/1.23)	
Egocentricity	.96 (.75/1.24)		.99 (.85/1.15)		.98 (.77/1.25)	
CSAMS	1.01 (.97/1.05)		.99 (.97/1.01)		1.02 (.98/1.06)	
Personal self-esteem	.73*** (.61/.87)	.17	.77*** (.69/.86)	.14	.94 (.80/1.11)	
Prison self-esteem	.87 (.74/1.03)		.80*** (.71/.89)	.12	1.08 (.92/1.27)	
AMDV-Sex	1.15*** (1.09/1.21)	.08	1.01 (.97/1.04)		1.14*** (1.07/1.21)	.07
Violent offending	1.56* (1.01/3.27)	.25	1.48* (1.10/2.18)	.22	1.05 (.51/2.11)	
Prison security level (1 = maximum)	1.60 (.82/3.13)		1.42* (1.02/1.98)	.19	1.13 (.57/2.24)	

Note. Class 1 = High on all forms of child sexual abuse and neglect; Class 2 = High on physical and emotional abuse, moderate of neglect, no sexual abuse; Class 3 = Low on physical and emotional abuse and neglect, no sexual abuse. OR = Odds Ratio, 95% CI = Confidence Interval, Cohen's *d* = effect size (calculated only for statistically significant results. AMDV-Sex = Attitudes towards Male Sexual Dating Violence; CSAMS = Child Sexual Abuse Myth Scale. * $p < .05$; ** $p < .01$; *** $p < .001$

Estimation of the number of latent classes

Given non-significant *t*-test results on all psychological covariates, very small differences between the two groups of prisoners on all CAN items, and very small endorsement of sexual abuse items by participants incarcerated in medium-security prisons, the subsequent analysis was based on the entire sample.

A series of latent class models, ranging from one to four classes, were specified and estimated. The three-class solution was considered the best fitting model, based on a series of fit indices (Table 3) and the practical meaning of the latent classes. The AIC, BIC, and SSABIC were markedly lower for the three-class model compared to the two-class model. The non-significant LRT further confirmed that the four-class model was not a significant improvement over the three-class model. Further, the entropy measure (0.85) also suggests that the data was well captured by a three-class solution.

Latent profiles

A comparison of profile plots suggested that the three-class solution was conceptually meaningful. Individuals were assigned to each of the three latent classes on the basis of their response profile and the estimated probabilities of endorsing the five CAN items (physical abuse, emotional abuse, neglect, contact sexual abuse, penetrative sexual abuse). To facilitate interpretation, Figure 1 presents the endorsement probabilities associated with the three-class model. The three latent classes are primarily characterized by qualitative differences, indicating that they do not simply reflect a spectrum of severity of abuse.

Latent class 1 (5.3% of the sample) comprised of individuals who highly endorsed all CAN items, with item-response probabilities ranging from .79 for physical abuse/penetrative sexual abuse to .88 for emotional abuse. Of note, item-response probabilities are the probability of a particular observed response on a particular variable conditional on latent

class membership. Consequently, this class is best characterized as a 'poly-victimized' class. Members of class 2 (51.3% of the sample) had high item-response probabilities of endorsing physical abuse (.89) and emotional abuse (.95), a moderate probability of endorsing neglect (.64), as well as a low probability of endorsing contact sexual abuse (.01), and penetrative sexual abuse (.01). In considering the characteristics of this class, it was labelled the 'high physical and emotional abuse' group. Finally, class 3 (43.4% of the sample) was characterized by participants who reported relatively low endorsement of all CAN items. Highest endorsement rates in this class were reported for emotional abuse (.22), followed by physical abuse (.14), neglect (.08), contact sexual abuse (.00), and penetrative sexual abuse (.00). Thus, this class was considered as a 'low abuse' class.

Validity of the latent classes

To validate the measurement model and describe the heterogeneity in type of maltreatment, associations between the emergent latent classes and covariates were examined (affective responsiveness, cognitive responsiveness, interpersonal manipulation, egocentricity, personal self-esteem, prison self-esteem, attitudes towards male sexual violence in dating relationships, child sexual abuse myth acceptance, violent offending, age, and prison security level). Results indicate that inmates with lowered personal self-esteem (OR = .73, CI = .61/.87), increased acceptance of male sexual violence in dating relationships (OR = 1.15, CI = 1.09/1.21), as well as those who have engaged in violent offending (OR = 1.56, CI = 1.01/3.27), were more likely to belong to class 1 ('poly-victimized' class) compared with class 3 ('low abuse' class). Members of class 2 ('high physical and emotional abuse' class), in comparison with class 3 ('low abuse' class), had lower ratings on cognitive responsiveness psychopathy dimension (OR = .81, CI = .70/.94), personal self-esteem (OR = .77, CI = .69/.86), and prison self-esteem (OR = .80, CI = .71/.89). Violent offending (OR = 1.48, CI = 1.10/2.18) and being incarcerated in a maximum-security prison (OR = 1.42, CI = 1.02/1.98)

also increased the probability of belonging to this group. Comparisons between class 1 ('poly-victimized' class) and class 2 ('high physical and emotional abuse' class) indicated that low scores on affective responsiveness psychopathy factor (OR = .75, CI = .59/.97), as well as enhanced scores on cognitive responsiveness psychopathy factor (OR = 1.48, CI = 1.16/1.91) and acceptance of male sexual violence in dating relationships (OR = 1.14, CI = 1.07/1.21), significantly increased the probability of membership in class 1.

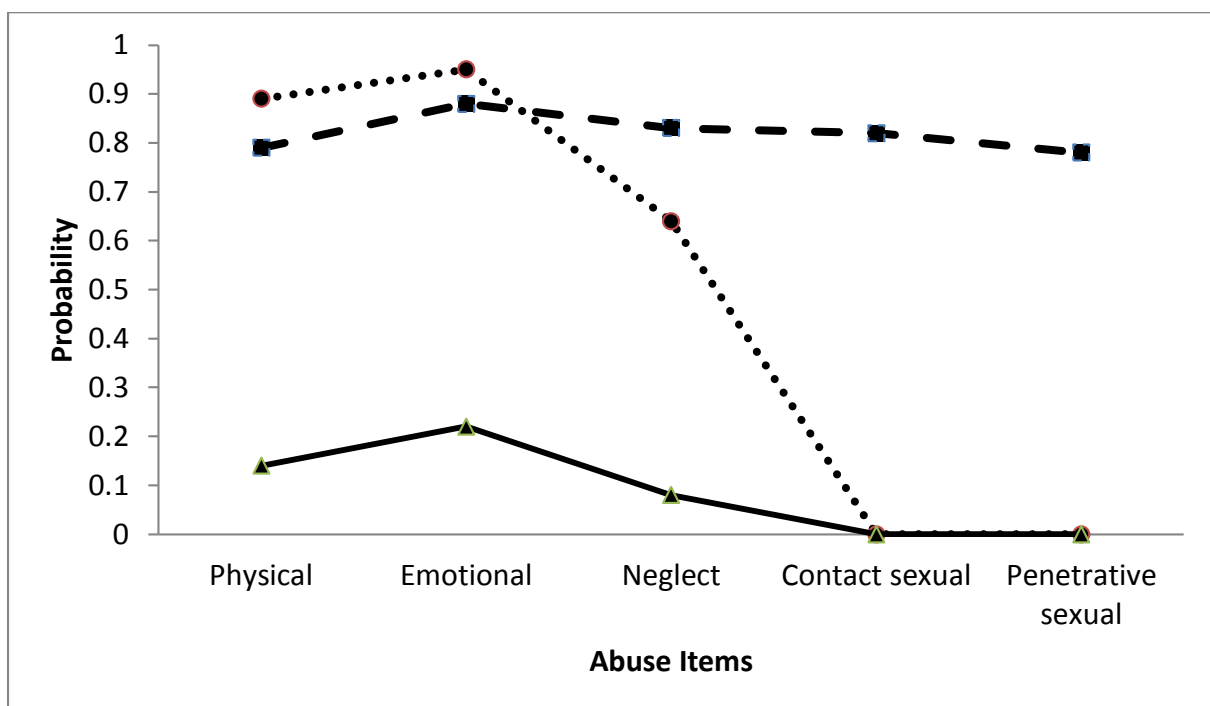


Figure 1. Latent profile plot of abuse. Class 3 (solid line) = 43.4% of participants; Class 2 (dotted line) = 51.3% of participants; Class 1 (dashed line) = 5.3% of participants.

Discussion

In spite of the fact that some prior studies employed person-oriented methodology to examine the patterns of co-occurrence of child abuse and neglect (CAN) types among community-based (e.g., Armour *et al.*, 2014; Burns *et al.*, 2006; Nooner *et al.*, 2010) and juvenile forensic samples (e.g., Aebi *et al.*, 2015; Ford *et al.*, 2013), such research within adult criminal

populations is lacking. Thus, the present study was the first to uncover CAN typologies among a systematically selected representative sample of adult male prisoners. Using latent class analysis (LCA), we identified three meaningful classes of CAN, including a ‘poly-victimized’ group, a ‘high physical and emotional abuse’ group, and a ‘low abuse’ group. Differential associations between CAN class membership and external criteria were also revealed.

Based on LCA, three CAN typologies emerged; suggesting that child maltreatment should be construed as a multidimensional phenomenon with differing patterns of co-occurrence. Although past research has consistently revealed the existence of four latent classes of abuse among community samples (e.g., Armour *et al.*, 2014; Burns *et al.*, 2016; Davis *et al.*, 2015; Nooner *et al.*, 2010; Pears *et al.*, 2008), child abuse experiences among forensic populations have been best captured by three distinct classes (e.g., Aebi *et al.*, 2015; Ford *et al.*, 2013), lending support to the current findings.

As hypothesized, we recovered a class with low endorsement of all forms of CAN, which has been termed the ‘low abuse’ group (class 3). This result is in agreement with previous research applying person-centered analytic techniques. For example, Armour *et al.* (2014) recovered a normative class whose members were the least likely to experience any form of abuse or neglect. Low maltreatment typologies were also found in studies utilizing exclusively male samples, regardless of whether profiles were based upon childhood abuse only (Davis *et al.*, 2015) or abuse across the life course (Burns *et al.*, 2016). Additionally, Nooner *et al.* (2010), in a study focusing solely on physical and sexual abuse, also found a group with no experiences of such trauma. Further, in line with previous research with forensic (e.g., Aebi *et al.*, 2015; Ford *et al.*, 2013) and non-forensic populations (e.g., Armour *et al.*, 2014; Burns *et al.*, 2016; Davis *et al.*, 2015; Nooner *et al.*, 2010), we anticipated that this particular class would be characterized by the highest membership. Contrary to this

assumption, however, the 'low abuse' group, consisting of 43.4 per cent of prisoners, was surpassed in this respect by class 2, incorporating 51.3 per cent of the sample. The discrepancy between prior and present findings may be attributable to the differences in the samples utilized, but more studies among more diverse adult forensic populations are warranted to verify this supposition.

Class 2 in the current study was characterized by high item-response probabilities of endorsing physical abuse and emotional abuse, a moderate probability of endorsing neglect, as well as a low probability of endorsing sexual abuse (both contact and penetrative). This group, labelled the 'high physical and emotional abuse', was the most numerous of all classes (51.3 per cent of inmates). Although corresponding typologies were not retrieved in community-based mixed gender research, Davis *et al.* (2015) found a latent group characterized by frequent emotional and physical maltreatment and virtually no sexual abuse in a study with urban community males. A similar class (emotional and physical trauma, lack of sexual trauma) also emerged for detained male adolescents (Aebi *et al.*, 2015). In considering the exclusive nature of this typology to male participants only, it appears that patterns of co-occurrence of CAN types differ across the two genders. Of note, Davis *et al.* as well as Aebi *et al.*'s classes, incorporating 12 and 18 per cent of participants respectively, were considerably less numerous than the 'high physical and emotional abuse' class in the present examination. This may highlight the increased incidence of CAN among adult prisoners (see Williams *et al.*, 2012); however cultural influences could also be accountable for this disparity. Finally, we found differences between individuals in class 2 and 3 regarding self-esteem (both personal and prison-specific), with those in class 2 scoring significantly lower. Additionally, members of class 2 were more likely to have engaged in violent offending and come from maximum-security prisons. This is in keeping with the literature, which indicates that victims of violence have lower self-esteem (Al-Fayez *et al.*,

2012; Turner *et al.*, 2015) and increased odds of violent behavior (e.g., Fagan, 2005; Maxfield & Widom, 1996; Smith *et al.*, 2005; Williams *et al.*, 2012). Unexpectedly, members of class 2 were found to have fewer deficits in cognitive responsiveness than their non-abused counterparts, suggesting that experiences of physical and emotional victimization may result in an enhanced ability to discriminate others' emotional states. One possible explanation of this is that repeatedly maltreated children develop the ability to recognize emotional expressions because this may help anticipate attacks, hence increasing chances of survival. Offering tentative support for this, some neurophysiological studies found that the experience of physical abuse may predispose youngsters to display hyper-sensitivity to anger cues (e.g., Pollak & Tolley-Schell, 2003; Shackman, Shackman, & Pollak, 2007).

Prior research among both criminal (Aebi *et al.*, 2015; Ford *et al.*, 2013) and non-criminal samples (e.g., Armour *et al.*, 2014; Davis *et al.*, 2015; Pears *et al.*, 2008) distinguished a CAN typology characterized by poly-victimization. The present results are in line with this past research. Specifically, we identified the 'poly-victimized' class (class 1) characterized by high endorsement of all CAN items, suggesting that sexual abuse exists concurrently with physical and emotional abuse and neglect. Additionally, as in all prior studies, this class recorded the lowest membership rate (5.3 per cent). This indicates that very few individuals experience multiple victimization, a finding consistent across populations. Subsequent logistic regression analysis revealed that the 'poly-victimized' class was distinguished from the 'low abuse' class by significantly lower personal self-esteem levels and increased odds of violent offending. Moreover, individuals in the 'poly-victimized' class were less cognitively but more affectively responsive to others, in comparison with members of the 'high physical and emotional abuse' class. Lastly, class 1, compared with classes 2 and 3, recorded enhanced acceptance of male sexual violence in dating relationships. It appears, therefore, that individuals who have been sexually abused are more likely to be accepting of

such abuse in adult relationships. Key to explaining this may be a tendency toward self-blame, which suggests that victims exaggerate the extent to which they are responsible for the negative events and may grow to perceive violence as morally right (Graham & Juvonen, 1998; Miller & Porter, 1983); suggesting disturbances at a cognitive but not emotional level. Indeed, prior research demonstrated that sexual victimization may result in sexual offending (Weeks & Widom, 1998). Debowska *et al.* (2015), on the other hand, found a positive association between total childhood victimization score and rape myth acceptance; yet, the current investigation suggests that such attitudes may be affected primarily by the experience of sexual abuse.

Worthy of note, although Armour *et al.* (2014), using a mixed gender sample, recovered an abuse typology characterized by high endorsement of sexual abuse items only, a similar class did not emerge in the current study, nor in other studies with male samples (e.g., Aebi *et al.*, 2015; Davies *et al.*, 2015; Ford *et al.*, 2013). This indicates that men are unlikely to experience child sex abuse without concurrently experiencing other types of abuse. This is an interesting finding because it implies differences in the victim-offender relationship across the two genders. More specifically, it appears that males might experience sexual abuse predominantly within the family context, which would explain the concomitance of other types of abuse. Girls, perceived as more vulnerable victims, may be also susceptible to sexual abuse outside the home – a supposition further corroborated by the higher overall sexual victimization rates reported by females (Al-Fayez, Ohaeri, & Gado, 2012; Finkelhor, Hotaling, Lewis, & Smith, 1990; WHO, 2016).

The present study should be interpreted in light of some limitations. First, the use of self-report data could have introduced several well-known limitations, such as response bias. Nonetheless, anonymous self-report questionnaires were earlier found to elicit more honest responses regarding child abuse experiences than face-to-face interviews (Burton, Ward, &

Artz, 2015). Second, we did not use a standardized measure of CAN. It is recommended that future research utilizes validated instruments to maintain methodological standards and facilitate comparisons between studies. Third, the current analysis did not account for the frequency and severity of abuse experiences. Since more adverse outcomes have been associated with enhanced severity of abuse (Litrownik *et al.*, 2005), it is advisable that future studies control for these aspects. Fourth, the present study used a sample of Polish male prisoners and hence it cannot be certain that the findings can be generalized to incarcerated populations in other cultures. Thus, research with more diverse forensic samples is needed to exclude the possibility that the CAN classes recovered were due solely to cross-cultural differences. However, no previous LCA research has focused on profiling CAN among adult offender populations; therefore, despite the aforementioned limitations, the results of the present study represent a contribution to the existing literature.

Further, the current results can be used to inform the development and provision of appropriate treatment programs for male inmates affected by childhood victimization. It is envisaged that prison-based maltreatment-focused prevention could entail benefits for both inmates and the society (see Williams *et al.*, 2012). In considering the existence of different CAN classes and their distinct association patterns with external criteria, it is vital that such programs consider the specific needs of individuals with various combinations of childhood abuse experiences. For example, it appears that strategies aiming to decrease violent re-offending rates, should focus on inmates who were subject to multiple victimization (but not only those who were poly-victimized) as the use of interpersonal violence may be a function of unresolved childhood trauma. Indeed, prior LCA research suggested that a combination of physical and emotional abuse is strongly associated with conduct-related problems (Berzenski & Yates, 2011). However, strategies concentrating on preventing sexual violence against female partners, ought to consider inmates' experiences of child sexual abuse in

combination with other abuse types. This is in keeping with previous research reporting higher child sexual abuse rates among sex offenders than non-sex offenders (e.g., Jespersen *et al.*, 2009; Seto & Lalumière, 2010). Finally, by providing new insights into the psychosocial consequences of CAN typologies, findings reported here may be of particular significance to professionals who undertake risk assessment in correctional facilities.

In summary, the present findings provide evidence for the existence of qualitatively distinct classes of CAN, which are differentially associated with affective responsiveness, cognitive responsiveness, personal self-esteem, prison self-esteem, attitudes towards male sexual violence in dating relationships, and violent offending. Although prior research has already utilized mixture modeling to similar ends, no previous investigations focused specifically on adult male prisoners. Interestingly, the classes retrieved here largely mirrored the classes found in Aebi *et al.*'s (2015) study with juvenile offenders, but not the typologies retrieved in community-based research; revealing a unique pattern of CAN types co-occurrence among criminal populations.

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