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**Exposure to criminal environment and criminal social identity in a sample  
of adult prisoners: The moderating role of psychopathic traits**

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### **Abstract**

The purpose of this study was to investigate the role of period of incarceration, criminal friend index (a retrospective measure intended to quantify criminal associations before first incarceration), and four psychopathy factors (interpersonal manipulation, callous affect, erratic lifestyle, and antisocial behavior) in criminal social identity (CSI) while controlling for age and gender. Participants were a sample of 501 incarcerated offenders (males  $n = 293$ ; females  $n = 208$ ) from three prisons located in Pennsylvania State. Moderated regression analyses indicated no significant direct association between period of incarceration and CSI or between criminal friend index and CSI. However, a significant moderating effect of interpersonal manipulation on the relationship between period of incarceration and CSI was observed. Period of incarceration was significantly positively correlated with CSI (particularly with in-group ties subscale) only for those offenders who scored high (1 SD above the mean) on interpersonal manipulation and significantly negatively correlated for those who scored low (1 SD below the mean) on interpersonal manipulation. Also, criminal friend index was positively significantly associated with in-group ties for high levels (1 SD above the mean) of callous affect. The main findings provide evidence for the claim that prisoners are likely to simulate changes in identity through the formation of bonds with other offenders and that this can be achieved using interpersonal manipulation skills.

*Keywords:* Criminal social identity; Psychopathic traits; Incarcerated offenders; Moderated regression analysis

Exposure to criminal environment and criminal social identity in a sample of adult prisoners:

The moderating role of psychopathic traits

Identity is composed of meanings that an individual assigns to the roles they play in different social contexts and can be renegotiated in the process of interaction with others as and when needed (Stryker & Burke, 2000). Turner (1982) distinguished between two types of identities: personal and social. Personal identity accentuates an individual's uniqueness and is most resistant to change. Behavior which arises as a function of personal identity is largely guided by psychological variables. Social identity, on the other hand, is determined by category-based processes, stresses an individual's similarities with the reference group, and positions them "within structured social arrangements" (Vryan, Adler, & Adler, 2003, p. 371).

Social Identity Theory (SIT; Tajfel & Turner, 1979) is concerned with the latter and was developed to explain prejudice, discrimination, and behavior in intergroup relations (Hogg & Reid, 2006). SIT posits that people strive to attain a positive social identity in order to protect their self-esteem and that this can be achieved through favorable comparisons between in-group and out-group members - a process referred to as in-group favoritism (Tajfel & Turner, 1979). Since positive social identity is the source of self-enhancement, in the event of an unsatisfactory outcome of such an evaluation, individuals may choose to leave their reference group or distance themselves from its members (Hogg & Reid, 2006). Another conceptual framework, Self-Categorization Theory (SCT; Turner, Hogg, Oakes, Reicher, & Wetherell, 1987), derived from SIT, focuses on social cognitive processes which influence people's identification with certain groups, the propensity towards construing oneself in group terms, and the readiness to manifest group behaviors. SCT identities self-categorizations to be central in the formation of both personal and social identities. To

elaborate, people tend to classify themselves and others into certain social categories, such as gender, nationality, or religious affiliation, which provides an important cognitive structure helpful in ordering the social environment. The process of categorization affects one's self-concept, feelings, and behaviors (Hogg & Reid, 2006).

The concepts of SIT and SCT have formed the basis for the development of Criminal Social Identity (CSI; Boduszek & Hyland, 2011) theory and its updated version, the Integrated Psychosocial Model of Criminal Social Identity (IPM-CSI; Boduszek, Dhingra, & Debowska, in press), which explain the etiology and consequences of identity within a specific social group. Based on Cameron's (2004) earlier research into the factor structure of the measure of social identity, the model of CSI was proposed to be composed of three dimensions, namely cognitive centrality, in-group affect, and in-group ties. Cognitive centrality stresses the cognitive importance of belonging to a particular group. Criminal identity for individuals scoring high on this aspect of CSI is seen as central to their self-concept, which renders them more likely to endorse the group norms and act accordingly even in the absence of other group members. In-group affect refers to the positive emotional valence of belonging to a criminal group and is argued to be developed to reduce anxiety associated with the discrepancy between ideal and actual self. The final factor, in-group ties, pertains to the psychological perception of resemblance and emotional connection with other members of a particular group. Individuals with strong in-group ties are persistently readier to display behaviors condoned by the group in order to demonstrate their conformity (Boduszek, Adamson, Shevlin, & Hyland, 2012a; Boduszek, Adamson, Shevlin, Mallett, & Hyland, 2013b; Boduszek, O'Shea, Dhingra, & Hyland, 2014).

Socio-psychological processes which influence the emergence of criminal identity include associations with criminal friends, perceptions of self-esteem, and childhood experiences (e.g., peer rejection and dysfunctional family environment) (Boduszek & Hyland,

2011; Boduszek *et al.*, 2013b). Moreover, the higher the degree of identification with antisocial friends, the greater the likelihood of developing criminal cognitive structures and engaging in criminal behavior (Boduszek & Hyland, 2012; Boduszek, Hyland, Pedziszczak, & Kielkiewicz, 2012c; Holsinger, 1999; Simourd, 1997, 1999). To date, research in the area of CSI has been conducted with male samples only, however, some studies have suggested that females are more likely to form stronger bonds and identification with in-group members because of the greater need to belong (e.g., Brown, Condor, Matthews, Wade, & Williams, 1986; Brown & Lohr, 1987; Kiesner, Cadinu, Poulin, & Bucci, 2002; Newman, Lohman, & Newman, 2007). Women were also reported to have wider social networks from which they garner help and encouragement (Friborg, Barlaug, Martinussen, Rosenvinge, & Hjendal, 2005; Friborg, Hjendal, Rosenvinge, & Martinussen, 2003). As such, it appears that female prisoners may be more susceptible to group socialization processes.

CSI was also found to have important psycho-social and mental health implications. Specifically, criminal identity was reported to predict criminal thinking style (Boduszek, Adamson, Shevlin, Hyland, & Bourke, 2013a; Boduszek, Shevlin, Adamson, & Hyland, 2013d). Cognitive centrality correlated significantly with violent criminal behavior, whereas increased in-group affect was associated with non-violent criminal behavior (Boduszek, Hyland, Bourke, Shevlin, & Adamson, 2013c). Using a sample of 415 incarcerated juvenile offenders, Shagufta, Boduszek, Dhingra, and Palmer (2015) found high in-group affect to serve as a protective factor against suicide ideation.

It has been indicated that environmental factors, such as being subject to incarceration, can affect an individual's cognitive processes (Clemmer, 1940). For example, Rhodes (1979) found that incarcerated offenders, due to the constant exposure to other prisoners, tend to develop deviant attitudes while serving their sentence. In another study with Polish male prisoners and a sample of males drawn from the general population, a

positive significant effect of imprisonment on cognitive distortions pertaining to rape and rape victims was found (Debowska, Boduszek, Dhingra, & DeLisi, in press). Consequently, prisoners seem to be subject to group socialization processes akin to those found among community-based groups and may develop an identification with the group's values. Importantly, since SIT predicts that, prior to the acquisition of group attitudes, social identity must be formed (Boduszek *et al.*, 2013a; Tajfel & Turner, 1979), a similar effect of incarceration on CSI can be expected. Indeed, Boduszek *et al.* (2014) found a significant effect of the number of arrests on CSI within a sample of male recidivistic offenders. A more recent empirical investigation among 126 male juvenile offenders incarcerated in prisons in Khyber Pakhtunkhwa (Pakistan) aimed to examine how primary psychopathy (incorporating affective and interpersonal features, as indexed by the Levenson Self-report Psychopathy Scale, Levenson, Kiehl, & Fitzpatrick, 1995) may interact with period of confinement to predict Criminal Social Identity (CSI) scores, while controlling for covariates (Boduszek, Dhingra, & Debowska, 2016). The results demonstrated that period of confinement had a significant positive effect on the formation of criminal identity but only for those participants who scored higher (1 SD above the mean) on primary psychopathy.

Indeed, it appears that personality traits should be examined in relation to the formation of criminal identity. Using a sample of Irish ex-prisoners, Boduszek, McLaughlin, and Hyland (2011) found psychoticism to be a strong predictor of criminal cognitions. Two personality traits (Extraversion and Psychoticism) were also reported to form significant associations with criminal thinking style, a construct strongly related with criminal social identity (Boduszek, Adamson, Shevlin, & Hyland, 2012b). Importantly, the Integrated Psychosocial Model of Criminal Social Identity (IPM-CSI; Boduszek *et al.*, in press) posits that exposure to criminal environment before first incarceration (such as having criminal friends) may affect the development of CSI, especially in the presence of certain personality

moderators (e.g., psychopathic traits). Therefore, given the theoretical framework and previous empirical findings, the paucity of research into the role of personality traits in CSI appears to be an important omission which ought to be addressed.

Furthermore, although identities can be re-constructed, people are motivated to keep their self-conceptions stable in order to maintain harmony (Weigert & Gecas, 2003). For the purpose, they are likely to employ the strategy of selective affiliation, i.e. interacting with similar others (Swann, 1987). However, selective affiliation is not available in all social contexts, for example in prison settings, where membership is not voluntary. Consequently, should prolonged discrepancies between self-concept and environment appear, new self-relevant meanings can be created, which leads to identity change (Burke, 2006). Nevertheless, it is important to note here that identity change due to social adaptation is not simply a passive response to environmental stimuli (Bakker, 2005). Instead, people are likely to *manipulate* this change by recognizing what they want, establishing a goal, and deciding on an appropriate course of action which would bring them closer to the desired object (Blumer, 1966). In line with Tajfel and Turner's (1979) assumption that positive social identity is necessary for self-enhancement, Goffman (1963, 1990) argued that self manages impressions of others and attempts at self-presentation which elicits positive evaluations. In light of this argument, it appears that criminal identity can be developed if categorizing self as a part of criminal group is seen as *advantageous*. Based on previous research findings by Boduszek *et al.* (2016), it may also be suggested that those more skilled at interpersonal manipulation, will be more likely to adapt to social norms provided by prison settings and develop a criminal identity. Even though the researchers considered interpersonal (e.g., grandiosity, deceitfulness, and superficial charm) and affective (e.g., low empathy, lack of remorse, emotional shallowness, and a failure to accept personal responsibility) features of psychopathy as a single dimension, other empirical studies demonstrated that those traits



correlate differently with external variables, such as reactive aggression, rape myth acceptance, as well as self-injurious thoughts and behavior (e.g., Debowska, Boduszek, Kola, & Hyland, 2014; Debowska, Mattison, & Boduszek, 2015; Debowska & Zeyrek Rios, 2015; Dhingra, Boduszek, Palmer, & Shevlin, 2015). Accordingly, in order to test the hypothesis that interpersonal manipulation and callous affect may be significantly related to the formation of criminal identity, future research in the area of CSI should include interpersonal and affective dimensions of psychopathy as separate components.

### **Current study**

Given the evidence that interaction between incarceration and psychopathic traits may lead to the intensification of CSI within a youth offending sample from Pakistan (Boduszek *et al.*, 2016), it appears crucial that the concept is further examined within adult Western prison population. Although research in the area is growing, still little is understood about the psycho-social factors having an impact on CSI in prison populations. Further, there is a lack of research looking at personality traits in relation to social identity in prison contexts. Thus, in the current study, we examine the effect of period of incarceration, criminal friend index (a retrospective measure intended to quantify criminal associations before first incarceration), and four psychopathy facets (interpersonal manipulation, callous affect, erratic lifestyle, and antisocial behavior) on CSI while controlling for gender and age. Based on theory and previous studies, we expected to find a significant positive effect of criminal friends and period of incarceration on CSI, however, we also predicted that the associations would be moderated by psychopathic traits.

## Method

### Participants

The opportunistic sample included 501 offenders incarcerated in three prisons in Pennsylvania State (male maximum security prison  $n = 131$ , male medium security prison  $n = 161$  and female maximum security prison  $n = 208$ ). The sample consisted of 141 first time offenders, 266 repeated offenders, 80 with life sentence and 14 on death row. In the final analysis the sample size was further reduced to 458 after pairwise deletion of missing data (data were missing at random, Little's MCAR test; chi-square = 254.40,  $df = 234$ ,  $p = .17$ ). The respondents ranged in age from 19 to 76 ( $M = 39.53$ ,  $SD = 11.79$ ). Most offenders (56.8%) come from urban areas. Participants were Caucasian (55.7%), African American (26.1%) or Hispanic (5.5%; other = 12.7%). The frequency of imprisonment reported by offenders ranged from 1 to 22 times ( $M = 3.76$ ;  $SD = 4.97$ ).

### Procedure

Ethical approval was granted by the Pennsylvania Department of Corrections review board. Authors in collaboration with the Prison Service selected three prisons for participation in the study (male maximum security prison, male medium security prison, and female maximum security prison). Surveys were posted to all blocks within selected prisons and distributed to inmates using opportunistic method. Given inmates' standing as a vulnerable population and the potential that they may feel compelled to participate, it was made clear both in the consent form and verbally (by the prison personnel) that participation is voluntary without any form of reward. In addition, inmates were informed that they should not participate in the study if they cannot read, however, they did not have to inform data collectors of the specific reason for not participating in the study. Inmates consenting to participate were told that all

information they provided in this study was anonymous and that they could withdraw from the study at any time until the survey submission.

## **Materials**

*The Measure of Criminal Social Identity* (MCSI; Boduszek *et al.*, 2012a) consists of eight items and is based on Cameron's (2004) Three-dimensional Strength of Group Identification Scale. Each item is scored on a 5-point Likert scale (1 = *strongly disagree* to 5 = *strongly agree*). Scores range from 8 to 40, with higher scores indicating higher levels of criminal social identity. The scale is composed of three subscales: cognitive centrality (three items) subscale measures the psychological salience of a criminal's group identity; in-group affect (two items) subscale measures a criminal's felt attitude toward other in-group criminals; and in-group ties (three items) subscale measures the level of personal bonding with other criminals. In the present sample, Cronbach's alphas were all acceptable (cognitive centrality = .69; in-group affect = .71; and in-group ties = .72)

*Self-Report Psychopathy Scale-Short Form* (SRP-SF; Paulhus, Neumann, & Hare, in press) was used to assess self-reported psychopathic traits. The original SRP-III, generated on the basis of the Psychopathy Checklist-Revised (PCL-R; Hare, 1991), is a 64-item measure that yields a total score as well as four subscale scores. Paulhus *et al.* (in press) also developed a shortened, 29-item form of the scale (SRP-SF) in order to reduce the administration time. For the purpose of the current study, the abbreviated version of the measure was used. The scale consists of four subscales: interpersonal manipulation (IPM;  $\alpha = .78$ ), callous affect (CA;  $\alpha = .70$ ), erratic lifestyle (ELS;  $\alpha = .72$ ), and antisocial behavior (ASB;  $\alpha = .68$ ). Items are scored on a 5-point Likert scale (1 = *strongly disagree* to 5 = *strongly agree*). Scores for IPM, CA, and ELS subscales range from 7 to 35 and from 8 to 40 for ASB subscale, with higher scores reflecting higher levels of psychopathic traits. Previous

factor analytic work revealed a good fit for the four-factor model of the SRP-SF (e.g., Declercq, Carter, & Neumann, 2015; León-Mayer, Folino, Neumann, & Hare, 2015).

*Criminal Friend Index* (CFI; Mills & Kroner, 1999) is a measure intended to quantify criminal associations. Respondents are asked to recall three friends they spent most of their free time with before first incarceration (0%-25%, 25%-50%, 50%-75%, 75%-100%). Additionally, participants are asked to answer four questions in relation to the degree of the criminal involvement of their friends: (1) Has this person ever committed a crime?; (2) Does this person have a criminal record?; (3) Has this person ever been to prison; (4) Has this person tried to involve you in a crime?. This measure is calculated by assigning a number of one to four to the percentage of time options available for each identified associate. That number is then multiplied by the number of *yes* responses to the four questions of criminal involvement. Each of the resulting scores is added together to produce the Criminal Friend Index (possible range of scores from 0 to 48).

## **Analysis**

Descriptive statistics, Pearson product-moment correlation coefficients, and regression analysis were calculated using SPSS 22. A hierarchical moderated multiple regression analyses, as the recommended method for testing interaction effects (Cohen & Cohen, 1983), were applied in order to investigate the moderating role of four psychopathy factors in the relationship between time in prison and CSI total score and criminal friend index and CSI total score (as well as three dimensions of CSI: cognitive centrality, in-group affect, and in-group ties), while controlling for gender of offenders and age. Simple slopes for the relationship between time in prison and CSI, as well as criminal friend index and CSI were investigated for low (1 SD below the mean), medium (mean), and high (1 SD above the

mean) levels of psychopathic traits (interpersonal manipulation) using ModGraph 3.0 (Jose, 2013). Only standardized solution was reported.

## **Results**

### **Descriptive statistics and correlations**

Bivariate correlations and descriptive statistics including means (*M*) and standard deviations (*SD*) for interpersonal manipulation, callous affect, erratic lifestyle, antisocial behavior, time in prison, criminal friends, cognitive centrality, in-group affect, in-group ties, and age are presented in Table 1. Prisoners in the current sample revealed moderate levels of criminal social identity and psychopathy, with the highest scores on the antisocial behavior and erratic lifestyle dimensions of psychopathy.

Table 1

*Descriptive statistics (M and SD) and correlations (r with associated 95% Confidence Interval) for all continuous variables*

Variable	ELS	ASB	CA	IPM	TP	CFI	C	A	T	Age
Erratic Lifestyle (ELS)	1									
Antisocial Behaviour (ASB)	.59*** (.53/.65)	1								
Callous Affect (CA)	.58*** (.52/.64)	.51*** (.44/.58)	1							
Interpersonal Manipulation (IPM)	.58*** (.52/.64)	.57*** (.51/.63)	.62*** (.56/.67)	1						
Time in Prison (in months; TP)	.09 (-.01/.18)	.14** (.05/.23)	-.02 (-.11/.07)	-.02 (-.11/.07)	1					
Criminal Friend Index (CFI)	.31*** (.23/.39)	.37*** (.29/.45)	.22*** (.13/.31)	.27*** (.18/.35)	-.03 (-.12/.06)	1				
Cognitive Centrality (C)	.06 (-.03/.15)	.14** (.05/.23)	.01 (-.08/.10)	.10* (.01/.19)	-.01 (-.10/.08)	.06 (-.03/.15)	1			
In-group Affect (A)	.11* (.02/.20)	.22*** (.13/.31)	.16*** (.07/.25)	.19*** (.10/.28)	.11* (.02/.20)	.03 (-.06/.12)	.04 (-.05/.13)	1		
In-group Ties (T)	.40*** (.32/.47)	.36*** (.28/.44)	.26*** (.17/.34)	.37*** (.29/.45)	-.10* (-.19/-.01)	.28*** (.19/.36)	.12* (.03/.21)	.29*** (.20/.37)	1	
Age	-.31*** (-.39/-.23)	-.15*** (-.24/-.06)	-.18*** (-.27/-.09)	-.10* (-.19/-.01)	.50*** (.43/.57)	-.29*** (-.37/-.20)	.03 (-.06/.12)	.08 (-.01/.17)	-.24*** (-.32/-.15)	1
<i>M</i>	18.09	20.91	14.95	14.18	122.41	11.45	7.91	2.59	7.40	39.53
<i>SD</i>	5.42	5.82	4.58	4.90	109.09	11.24	2.55	1.25	2.63	11.79

*Note:* \*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$ . *M* = mean; *SD* = standard deviation

### **Moderated regression analysis with CSI as outcome variable**

Hierarchical moderated regression analysis was performed to investigate the moderating effect of four psychopathy dimensions scores on the relationship between time spent in prison and CSI total score, as well as criminal friend index and CSI total score, while controlling for gender of offenders and age. Preliminary analyses revealed no violation of the assumptions of normality, linearity, multicollinearity, and homoscedasticity.

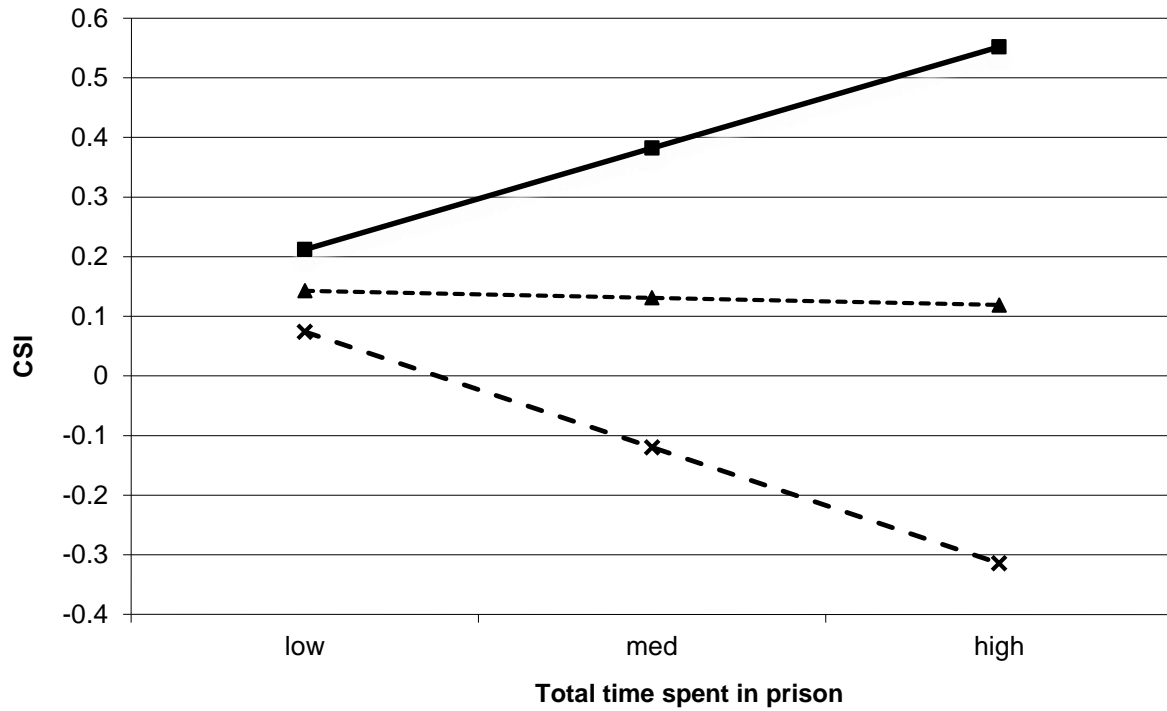
In the first step of the analysis, six predictors were entered: time spent in prison, criminal friend index, erratic lifestyle, antisocial behavior, callous affect, and interpersonal manipulation. This model (model 1) was statistically significant ( $F_{(6, 421)} = 15.39, p < .001$ ) and explained 18% ( $R^2 = .18$ ) of variance in CSI. Two psychopathy facets, antisocial behavior and interpersonal manipulation, made a significant unique contribution to the model (see Table 2). However, no significant relationship between either total time spent in prison and CSI or criminal friend index and CSI was observed.

The second step consisted of entering interaction terms, coding the interaction between time spent in prison and four psychopathy factors, and criminal friend index and four psychopathy factors, while controlling for gender of offenders and age. After entering the interaction terms and covariates, an additional 4% of variance in CSI was explained ( $R^2 \text{ Change} = .04, p = .038$ ), and the final model (model 2) as a whole explained 22% of variance in CSI ( $R^2 = .22; F_{(16, 411)} = 7.12, p < .001$ ). Just as in model 1, antisocial behavior and interpersonal manipulation formed statistically significant direct relationship with CSI. Gender of offenders was negatively directly correlated with CSI scores, suggesting that males were significantly less likely to report CSI. Importantly, there was no significant direct relationship between time in prison and CSI scores. However, the relationship between interaction term (time in prison by interpersonal manipulation) and CSI was statistically

significant, indicating that the effect of time spent in prison on CSI depends on the level of interpersonal manipulation psychopathy factor.

In order to investigate this moderating effect further, simple slopes for the relationship between time in prison and CSI were investigated for low (1 SD below the mean), medium (mean), and high (1 SD above the mean) levels of interpersonal manipulation (see Bate, Boduszek, Dhingra, & Bale, 2014; Boduszek *et al.*, 2012b; Cohen & Cohen, 1983). For a graphical representation of moderating effects see Figure 1. Time in prison was positively significantly associated with CSI for high levels (+1 SD) of interpersonal manipulation ( $\beta = .18$ , 95% CI = .09/.27,  $SE = .09$ ,  $p < .05$ ). A negative significant association between time in prison and CSI was found for low levels (-1 SD) of interpersonal manipulation ( $\beta = -.20$ , 95% CI = -.21/-.11,  $SE = .09$ ,  $p < .05$ ). The association between time in prison and CSI for medium (mean) levels of interpersonal manipulation was negative yet statistically non-significant ( $\beta = -.01$ , 95% CI = -.11/.09,  $SE = .06$ ,  $p > .05$ ). Therefore, the results suggest that the relationship between time spent in prison and CSI depends on levels of interpersonal manipulation while controlling for other covariates in the model.





*Figure 1.* Moderating role of interpersonal manipulation in relationship between time spent in prison and CSI (criminal social identity) total score. Solid line with square markers = high (+1SD) interpersonal manipulation; dotted line with triangle markers = medium (mean) interpersonal manipulation; dashed line with cross markers = low (-1SD) interpersonal manipulation.

Table 2. *Moderated regression analyses with CSI total score and three subscales (cognitive centrality, in-group affect, and in-group ties) as outcome variables*

Model	Variable	Criminal Social Identity	Cognitive Centrality	In-group Affect	In-group Ties
		$\beta$ (95% CI)	$\beta$ (95% CI)	$\beta$ (95% CI)	$\beta$ (95% CI)
1	Erratic Lifestyle (ELS)	.09 (-.03/.21)	-.03 (-.16/.11)	-.07 (-.20/.06)	.20 (.08/.32)***
	Antisocial Behaviour (ASB)	.22 (.09/.34)***	.16 (.03/.29)*	.17 (.05/.30)**	.14 (.03/.26)*
	Callous Affect (CA)	-.11 (-.22/.01)	-.12 (-.24/.01)	.05 (-.07/.18)	-.08 (-.19/.04)
	Interpersonal Manipulation (IPM)	.22 (.10/.34)***	.10 (-.03/.23)	.12 (-.01/.25)	.19 (.07/.31)**
	Time in Prison (TP)	-.06 (-.15/.03)	-.04 (-.13/.06)	.08 (-.02/.17)	-.09 (-.18/.01)
	Criminal Friend Index (CFI)	.07 (-.02/.17)	.01 (-.10/.11)	-.05 (-.15/.05)	.11 (-.01/.23)
2	Erratic Lifestyle (ELS)	.08 (-.05/.20)	-.01 (-.15/.12)	-.07 (-.20/.07)	.17 (.05/.29)**
	Antisocial Behaviour (ASB)	.21 (.08/.33)***	.14 (.01/.28)*	.18 (.05/.32)**	.14 (.02/.26)*
	Callous Affect (CA)	-.10 (-.22/.03)	-.13 (-.26/.01)	.05 (-.07/.18)	-.06 (-.17/.06)
	Interpersonal Manipulation (IPM)	.23 (.10/.36)***	.11 (-.04/.25)	.14 (.01/.27)*	.19 (.07/.32)**
	Time in Prison (TP)	-.01 (-.13/.11)	-.02 (-.15/.11)	.01 (-.11/.13)	-.01 (-.11/.11)
	Criminal Friend Index (CFI)	.05 (-.05/.15)	.01 (-.10/.11)	-.03 (-.14/.07)	.08 (-.01/.18)
	<i>Interaction term</i> TP by ELS	-.01 (-.14/.12)	.09 (-.04/.23)	-.13 (-.27/.01)	-.08 (-.20/.04)
	<i>Interaction term</i> TP by ASB	.07 (-.06/.19)	.03 (-.10/.16)	.08 (-.05/.20)	.04 (-.08/.15)
	<i>Interaction term</i> TP by CA	-.12 (-.26/.02)	-.11 (-.25/.04)	-.05 (-.20/.09)	-.06 (-.19/.07)
	<i>Interaction term</i> TP by IPM	.19 (.05/.33)**	.09 (-.06/.24)	.14 (-.01/.29)	.16 (.03/.29)*
	<i>Interaction term</i> CFI by ELS	.08 (-.04/.21)	.05 (-.08/.18)	-.07 (-.20/.06)	.12 (-.01/.23)
	<i>Interaction term</i> CFI by ASB	.03 (-.10/.15)	.09 (-.04/.22)	-.03 (-.16/.10)	-.04 (-.16/.07)
	<i>Interaction term</i> CFI by CA	-.05 (-.17/.07)	.04 (-.09/.17)	.07 (-.05/.20)	-.14 (-.25/-.03)*
	<i>Interaction term</i> CFI by IPM	.04 (-.08/.15)	-.06 (-.19/.06)	.01 (-.11/.13)	.11 (-.01/.22)
	Age	.02 (-.09/.13)	.06 (-.06/.18)	.08 (-.03/.20)	-.09 (-.20/.01)
Gender (males = 1)	-.24 (-.43/-.05)*	-.10 (-.31/.11)	.02 (-.19/.22)	-.21 (-.39/-.03)*	

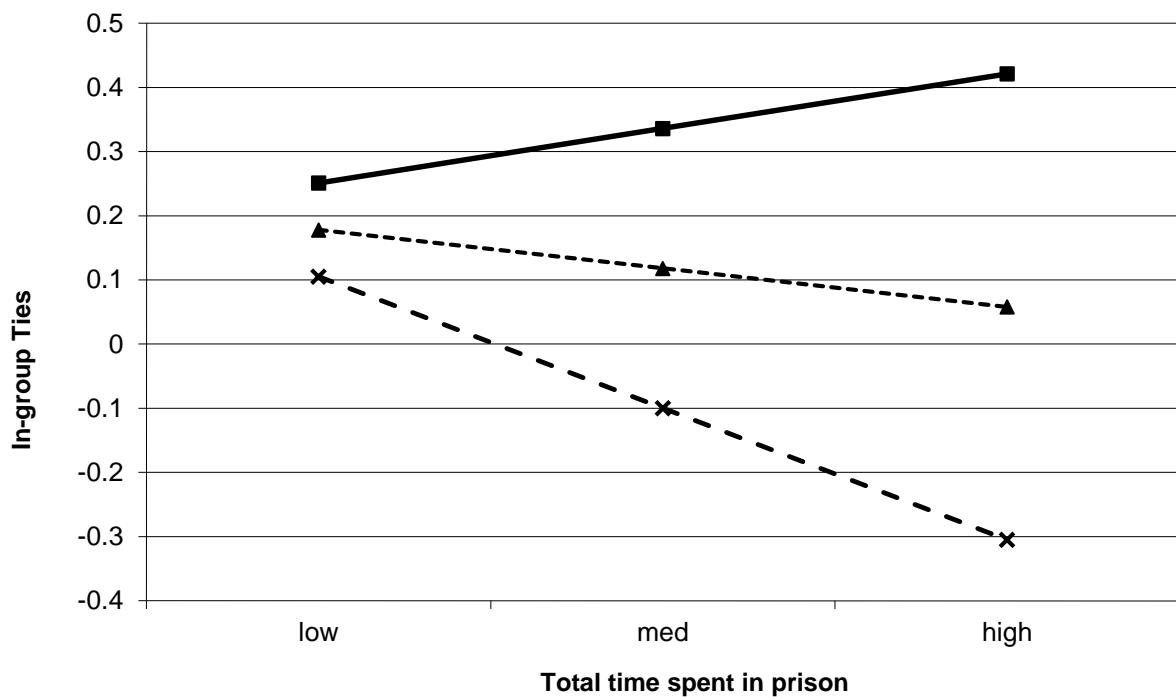
Note: \*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$

**Moderated regression analyses with three subscales of CSI as outcome variables**

Given previous research indicating that three CSI facets can form differential associations with external factors (Boduszek *et al.*, 2012b), additional moderated regression analyses using the same predictor variables, interaction terms, and covariates were performed for three CSI subscales separately (see Table 2, last three columns). In the first step of hierarchical multiple regression, the main effect of four psychopathy dimensions, time in prison and criminal friend index on cognitive centrality, in-group affect, and in-group ties were examined. All these analyses (models 1 in Table 2) were statistically significant: in-group affect ( $R^2 = .07$ ;  $F_{(6, 433)} = 5.26$ ,  $p < .001$ ), in-group ties ( $R^2 = .23$ ;  $F_{(6, 433)} = 21.03$ ,  $p < .001$ ), and cognitive centrality ( $R^2 = .03$ ;  $F_{(6, 428)} = 2.16$ ,  $p = .04$ ). Antisocial behavior was found to be a significant predictor of all three outcome variables. Additionally, erratic lifestyle and interpersonal manipulation were positively correlated with in-group ties.

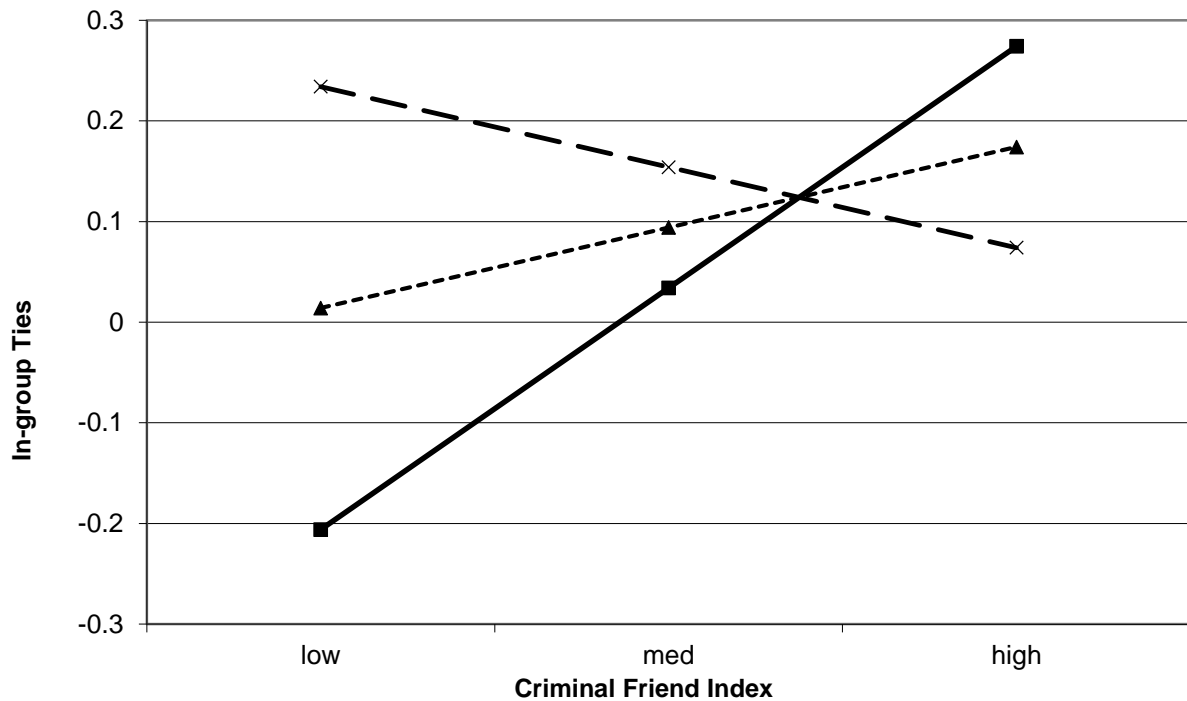
In the second step of the analyses, interaction terms between time in prison and four psychopathy facets, and criminal friend index and four psychopathy facets were entered, while controlling for covariates. This model was statistically non-significant for cognitive centrality ( $F_{(16, 418)} = 1.71$ ,  $p = .07$ ) and explained 6% of variance ( $R^2 = .06$ ;  $R^2$  Change = .03,  $p = .15$ ). Antisocial behavior remained the only significant predictor of cognitive centrality. Model 2 for in-group affect was significant ( $F_{(16, 423)} = 2.65$ ,  $p < .001$ ) and explained 9% of variance ( $R^2 = .09$ ), however, adding interaction terms and controlling for covariates did not contribute significantly to the model ( $R^2$  Change = .02,  $p = .38$ ). Two psychopathy dimensions, antisocial behavior and interpersonal manipulation, were significantly directly associated with in-group affect. Model 2 was also significant for in-group ties ( $F_{(16, 423)} = 9.75$ ,  $p < .001$ ) and explained 27% of variance ( $R^2 = .27$ ;  $R^2$  Change = .04,  $p < .01$ ). Erratic lifestyle, antisocial behavior, and interpersonal manipulation were positively directly correlated with in-group ties. There was a significant negative association between gender of

offenders and in-group ties. No significant direct relationship between either time in prison and in-group ties and criminal friend index and CSI was established, however, the relationship between interaction term (time in prison by interpersonal manipulation) and in-group ties was statistically significant. This suggested that the relationship between time spent in prison and in-group ties depends on the level of interpersonal manipulation psychopathy factor. Simple slopes for this relationship were investigated for low (1 SD below the mean), medium (mean), and high (1 SD above the mean) levels of interpersonal manipulation (see Figure 2). Time in prison was positively significantly associated with in-group ties for high levels (+1 SD) of interpersonal manipulation ( $\beta = .15$ , 95% CI = .06/.24,  $SE = .09$ ,  $p < .05$ ). The simple slope for low levels (-1 SD) of interpersonal manipulation indicated a negative significant association between time in prison and in-group ties ( $\beta = -.17$ , 95% CI = -.26/-.08,  $SE = .09$ ,  $p < .05$ ). There was a non-significant association between time in prison and in-group ties for medium (mean) levels of interpersonal manipulation ( $\beta = -.01$ , 95% CI = -.1/.09,  $SE = .05$ ,  $p > .05$ ).



*Figure 2.* Moderating role of interpersonal manipulation in relationship between time spent in prison and in-group ties subscale of CSI. Solid line with square markers = high (+1SD) interpersonal manipulation; dotted line with triangle markers = medium (mean) interpersonal manipulation; dashed line with cross markers = low (-1SD) interpersonal manipulation.

Moreover, the relationship between interaction term (criminal friend index by callous affect) and in-group ties was statistically significant. This suggested that the relationship between criminal friend index and in-group ties depends on the level of callous affect traits. Simple slopes for this relationship were investigated for low (1 SD below the mean), medium (mean), and high (1 SD above the mean) levels of callous affect (see Figure 3). Criminal friend index was positively significantly associated with in-group ties for high levels (+1 SD) of callous affect ( $\beta = .24$ , 95% CI = .15/.33,  $SE = .07$ ,  $p < .001$ ). The simple slope for low levels (-1 SD) of callous affect indicated a negative non-significant association between criminal friend index and in-group ties ( $\beta = -.08$ , 95% CI = -.17/.02,  $SE = .07$ ,  $p > .05$ ). There was a non-significant association between criminal friend index and in-group ties for medium (mean) levels of callous affect ( $\beta = .08$ , 95% CI = -.02/.17,  $SE = .04$ ,  $p > .05$ ).



*Figure 3.* Moderating role of callous affect in relationship between criminal friend index and in-group ties subscale of CSI. Solid line with square markers = high (+1SD) callous affect; dotted line with triangle markers = medium (mean) callous affect; dashed line with cross markers = low (-1SD) callous affect.

## Discussion

Very few studies with sound methodological designs have examined the influence of the period of incarceration, criminal friend index, and psychopathic traits on the amplification of criminal identity. Additionally, to date, no known study has explored the influence of different psycho-social processes on the three CSI components (cognitive centrality, in-group affect, and in-group ties). Further, most previous empirical investigations have utilized male samples only. The main purpose of the present study, therefore, was to address those limitations by examining the role of the period of incarceration and psychopathic traits in CSI total score and three CSI dimensions, while controlling for gender and age.

Boduszek *et al.* (2014) found the number of arrests to be significantly positively associated with CSI. Additionally, previous research demonstrated a significant effect of imprisonment on deviant attitudes (Rhodes, 1979) and cognitive distortions (Debowska *et al.*, in press). Consequently, it appears that prisoners are subject to group socialization processes and may develop an identification with the group values. Further, given that social identity must be formed prior to the acquisition of group attitudes (Tajfel & Turner, 1979), a significant correlation between imprisonment and CSI could be predicted. However, although inconsistent with those past findings, the lack of *direct* effect of period of incarceration on CSI in the present study was not entirely unexpected. This is because this association was previously found to be moderated by primary psychopathy scores (Boduszek *et al.*, 2016). Along similar lines, the significant effect of incarceration on cognitive distortions pertaining to rape in Debowska *et al.*'s (in press) study was only revealed after having controlled for background characteristics (including four psychopathy factors) using propensity score matching technique. Therefore, it seems that the effect of incarceration alone is weak or not sufficient to explain the intensification of both CSI and cognitive distortions in prison contexts.

In support of the above, the present study found that high interpersonal manipulation scores (1 SD above the mean) combined with period of incarceration lead to the increase in CSI scores. Although Boduszek *et al.* (2016) reported that the relationship between time in prison and CSI is moderated by primary psychopathy scores, the current results provide an evidence that this association is affected by interpersonal, rather than affective, psychopathic traits and that these two psychopathy facets should be treated as separate dimensions. One possible explanation for the current finding is that psychopaths with strong manipulative tendencies are likely to form CSI as an adaptation strategy (Blackburn, 2006). Previous research also found that dispositionally selfish individuals may show concern for in-group

members due to the benefits this may entail (De Cremer & Van Vugt, 1999). Therefore, it may be that inmates with high interpersonal manipulation scores develop a criminal identity in order to increase their survival chances. Moreover, our results reveal that high interpersonal manipulation scores affected the relationship between time in prison and in-group ties, but not between time in prison and cognitive centrality or in-group affect. Therefore, the depth and genuineness of such a transformation appears questionable. Indeed, Schmid and Jones (1991) proposed that prisoners can construct inauthentic temporary identities in order to hide their vulnerabilities.

Interestingly, the association between time spent in prison and CSI total score as well as in-group ties score for those low in interpersonal manipulation (1 SD below the mean) was significantly negative, indicating that the direction of the slopes changes between those high and low in interpersonal manipulation. This finding provides further evidence for the claim that individuals are likely to simulate changes in identity through the formation of strong bonds with other offenders and that this can be achieved using interpersonal manipulation skills. According to Cooley's (1998) conception of the looking-glass self, the way a person sees themselves is reflective of what others think of them. Therefore, using impression management, one may be able to elicit positive evaluations from others, leading to the maintenance of positive self-esteem (Goffman, 1963, 1990). It seems thus that self-concepts of prisoners lacking in interpersonal manipulation skills may be negatively affected by incarceration, however, this claim remains to be tested.

Criminal friends index was found to have a significant effect on in-group ties, but only for those individuals scoring high on callous affect (1 SD above the mean). This is partly supportive of research by Boduszek *et al.* (2013b) which reported a direct link between antisocial friends and the formation of criminal identity, however, those prior analyses failed to examine the moderating effects of psychopathy factors. As such, our study is the first to



demonstrate that as the degree of involvement with criminal associates before first incarceration increases, so does the strength of in-group ties in prison environment; but only for inmates with elevated callous affect scores. It may be that emotionally shallow individuals create bonds with other criminals because having associates helps in the commission of crimes both outside of and inside a prison. Indeed, 40% of inmates were reported as chronic/extreme career offenders whilst incarcerated (DeLisi, 2003). Additionally, they were found to be responsible for the occurrence of most serious crimes (such as murder, rape, and aggravated assaults), and violent offending was previously associated with increased factor 1 (affective/interpersonal) psychopathy scores (Serin, 1996). Interestingly, this moderating effect of callous affect is not extended to in-group affect (which requires emotional engagement with other group members) or cognitive centrality (for which the criminal identity needs to be perceived as salient). Accordingly, it seems that the involvement with criminal associates and elevated callous affect scores do not influence identity change at a deeper, i.e. emotional and cognitive, level.

Significant associations between two behavioral dimensions of psychopathy and CSI total score as well as CSI factors scores were also found. Firstly, erratic lifestyle had a direct positive effect on in-group ties. This finding is not entirely clear, however, it may be that the need for constant stimulation evidenced by individuals with erratic lifestyle pattern cannot be satisfied in the constraints of prison settings. Such inmates, hence, may be drawn to other people in an attempt to find an alternative source of stimulation. Further, antisocial behavior facet correlated significantly with CSI total score and three CSI factors. Although speculative at this stage, it appears that antisocial tendencies may be a consequence rather than an integral part of a psychopathic personality (see Boduszek & Debowska, 2016; Boduszek, Dhingra, Hyland, & Debowska, 2015; Skeem & Cooke, 2010a, b). That is, individuals with a criminal identity are likely to engage in antisocial behavior because actions are largely

congruent with the identities assumed (Hewitt, 2003). Given the cross-sectional nature of our study, however, this suggestion must be further explored using longitudinal data.

Finally, we also found a relationship between female gender and CSI scores as well as in-group ties scores. Although studies on CSI among females are missing, prior research suggested that women are more likely to form stronger bonds and identification with in-group members because of the greater need to be an accepted and supported member of a group (e.g., Brown *et al.*, 1986; Brown & Lohr, 1987; Kiesner *et al.*, 2002; Newman *et al.*, 2007). This finding has an important practical implication. Specifically, female inmates may benefit from having additional support provisions, such as an increased amount of visits to preserve family bonds and enhance the chances of successful return to society after release from prison.

There are some limitations of the study that need to be acknowledged. First, the use of self-report data within a sample of prisoners whose command of language may be poor could have introduced several well-known limitations, such as response bias. This aspect of the study, however, could not be controlled by the researchers. Second, the study did not control for participants' self-esteem scores. It is therefore unknown whether the intensification of CSI reported here was due to the need for self-enhancement. Third, the MCSI consists of only eight items which reflect three factors of CSI (with only acceptable Cronbach's alpha). In order to increase internal reliability of the measure and provide a better coverage of the theoretical construct, the MCSI should be extended (see Hair *et al.*, 2010). Additionally, longitudinal studies are needed in order to examine the direction of the relationships among variables. Previous research on CSI used male samples only and failed to analyze CSI dimensions separately, thus, despite the aforementioned limitations, the results of the present study expand the current understanding of CSI.

Overall, findings of the current research provide a substantial contribution to the understanding of the etiology of criminal identity in prison settings. The present results revealed that the relationship between period of incarceration and CSI is moderated by both high and low levels of interpersonal manipulation and hence a high- and low-risk group was identified. Additionally, criminal friend index was associated with in-group ties for high levels of callous affect. Given that actions are consistent with identities assumed (Hewitt, 2003), studies examining inmates' self-conceptions can also bring an important insight into their behavior within prison contexts.

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