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Validation of the Urdu version of the Measure of Criminal Social Identity within a  
sample of Pakistani incarcerated delinquents

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### Abstract

**Purpose:** The aim was to examine the dimensionality, composite reliability, and incremental validity of the Measure of Criminal Social Identity (MCSI) in a sample of Pakistani incarcerated delinquents ( $N = 315$ ) following translation of the measure into Urdu. **Design/methodology/approach:** Four alternative factor models, with uncorrelated measurement error terms, were specified and tested using confirmatory factor analysis and bifactor modelling techniques. **Findings:** Results indicated that a three factor model provided a better fit to the data than the alternative models tested. The reliability of the scale was established using composite reliability. Furthermore, structural equation modelling revealed that the three MCSI factors were differentially related with external variables, indicating that the MCSI measures substantially different domains. **Implications:** Implications for theory and future research are discussed. **Originality/Value:** The results add valuable evidence as to the cross-cultural applicability of the MCSI.

**Keywords:** Criminal Social Identity; Confirmatory Factor Analysis; Bifactor Modelling; Construct Validity; Pakistani Juvenile Delinquents; Translation

### **Introduction**

Social-identity reflects a particular component of an individual's overall self-concept that is derived primarily from group membership, and is generally regarded as arising from a need to belong (Baumeister & Leary, 1995; Tajfel, 1978; Tajfel & Turner, 1979). The development and significance of social-identity has received considerable attention in terms of religious, cultural, or demographic associations (e.g. Boatswain & Lalonde, 2000; Cameron & Lalonde, 2001; Obst, Smith, & Zinkiewicz, 2002), but has only recently been explored in terms of criminal identity (Boduszek & Hyland, 2011; Boduszek, Dhingra, & Debowska, 2016 a, b; Sherretts, Boduszek, & Debowska, 2016). The concept of CSI has important theoretical and practical implications because, according Boduszek and Hyland (2011), the development and activation of a criminal social identity (CSI) increases an individual's likelihood of engagement in criminal behaviour.

The most extensively applied measure of social identity to date was developed by Brown, Condor, Mathews, Wade, and Williams (1986). Researchers applying this measure typically report that social identity is a one-dimensional construct, with factor analytic studies demonstrating item directionality rather than construct dimensionality (Brown et al., 1986; Kelly, 1988). However, more recent research has provided support for the multidimensionality of social identity (Cameron & Lalonde, 2001; Cameron, 2004; Ellemers, Kortekaas, & Ouwerkerk, 1999; Hinkle, Taylor, Fox-Cardamone, & Crook, 1989; Jackson & Smith, 1999; Jackson, 2002; Obst & White, 2005). Ellemers et al. (1999) reported that three-factor solution most accurately characterised social identity; however, this research proposed a factor structure that consisted of group self-esteem (the evaluation of group membership), obligation to the group (the desire to remain a part of the group) and self-

categorisation (the awareness of group membership). Jackson's (2002) study provided further support for a multidimensional rather than one-dimensional construct.

Jackson's research outlined three aspects of social identity: self-categorisation (a cognitive factor of identity), evaluation of the group (an affective aspect of identity) and perception of solidarity, which was also referred to as in-group ties. More recently, Cameron (2004) proposed a three-factor measure of social identity which reflected three related aspects of identity: (a) cognitive centrality, (b) in-group affect, and (c) in-group ties. *Cognitive centrality* reflects the cognitive importance of belonging to a particular group, *in-group affect* describes the emotional valence of belonging to a given group, and *in-group ties* relates to the psychological perception of resemblance and emotional connection with other members of a particular group.

The theory of Criminal Social Identity (CSI) was developed by Boduszek and Hyland (2011) on the basis of Cameron's (2004) conceptual and empirical work to reflect three related aspects of criminal's identity: (a) cognitive centrality, (b) in-group affect, and (c) in-group ties. To empirically examine the predictions of CSI, Boduszek, Adamson, Shevlin, and Hyland (2012) developed the Measure of Criminal Social Identity (MCSI). Results of confirmatory factor analysis of data drawn from 312 male recidivistic Polish prisoners indicated that the three-factor solution proposed by Cameron (2004) was statistically superior to the alternative and theoretically derived one- and two-factor solutions tested. However, a limitation of this study was the failure to include a bifactorial conceptualisation of the MCSI as a comparison model. Reise, Moore, and Haviland (2010) contend that a bifactor model should always be used as a baseline comparison model rather than the traditional one-factor. This is because within a bifactorial modelling approach, covariation among items is presumed to be explained by both 'general factors' (the source of common variance

running through all measure items) and separate uncorrelated grouping factors that reflect the unique coherency among particular subgroups of items. Thus, the bifactor approach differs from the higher-order approach in that sub-factors are not subsumed by the general factor(s) but remain uncorrelated and distinct. Consequently, if a bifactor model is found to provide a statistically superior fit to the data than alternative models tested, this indicates that (1) the domain being modelled is saturated by one or more broad factor(s) that reflect common variance running through all scale items and (2) specific scales in the domain are also saturated by other specific (i.e. residual) uncorrelated factors that reflect additional common variance among clusters of items, typically, with highly similar content. Thus, in a bifactor model, each scale is a measure of the general factor(s), but some scales also index more specific constructs not thus accounted for. As noted by Hyland (2015), although application of bifactor models has increased dramatically in past 10 years (e.g., Boduszek & Dhingra, 2016; Hyland, Boduszek, Dhingra, Shevlin, & Egan, 2014; Hyland, Shevlin, Adamson, & Boduszek, 2014; Sharratt, Boduszek, Jones, & Gallagher, 2014), this approach is very rarely utilised in criminal psychology research. Thus, its use in the present study is important as it is possible that the underlying structure of the MCSI is best represented by a bifactor solution.

Research subsequent to the validation of the MCSI has provided further support for the three-factorial solution of the MCSI. Testing the prediction that prior to the acquisition of group beliefs and attitudes, a social identity should first be formed; Boduszek, Adamson, Shevlin, Hyland, and Bourke (2013a) examined the mediating effect of criminal social identity factors on the relationship between associations with criminal peers and criminal thinking styles. Results of structural equation modelling analysis indicated an indirect effect between associations with

antisocial friends on criminal thinking through in-group affect and in-group ties but not centrality.

In a follow-up study, Boduszek, Hyland, Bourke, Shevlin, and Adamson (2013b) found that increased levels of cognitive centrality positively predicted having committed a violent criminal offence, while increased levels of in-group affect were associated with having committed a non-violent criminal offence. Consequently, these results suggest that the distinct components of CSI may act as differential risk factors for various types of criminal acts. Support for this suggestion was found in another study, which indicated that association with criminal friends positively predicts centrality, in-group affect, and in-group ties (Boduszek, Adamson, Shevlin, Mallett, & Hyland, 2013).

### **Current study**

As the MCSI is a relatively new self-report measure to assess CSI, further investigation of its construct validity and dimensionality is warranted essential. Furthermore, although Boduszek *et al.* (2012) found empirical support for a three-factor model of CSI among Polish prisoners, it is possible that the same latent structure may not apply to more diverse samples (i.e., participants from other cultures and linguistic backgrounds and more diverse and extensive prison samples). The current study, therefore, seeks to provide a methodologically rigorous investigation of the construct validity of the MCSI among juvenile offenders in Pakistan by testing a series of four theoretically plausible competing models of the underlying structure of the MCSI, within an alternative models framework, including a novel bifactor model which has previously not been empirically tested.

Based on the results of previous research (Boduszek *et al.*, 2012; Cameron, 2004), it is hypothesised that a three-factor solution will represent the best fit to the

data. The current study will also assess the incremental validity of the MCSI by examining the relationship between the identified latent factors and offense type (violent or non-violent), period of confinement, and criminal friends, as well as provide a robust examination of the internal reliability of the scale through the application of composite reliability.

## **Method**

### **Participants and procedure**

Participants were 315 male prisoners incarcerated in prisons in Khyber Pakhtunkhwa (KPK) Pakistan. The respondents ranged in age from 11-18 years ( $M = 15.53$ ,  $SD = 1.93$ ). Most offenders came from rural areas (69.6%), were brought up in a single-parent home (53.3%), and reported having been imprisoned for non-violent crimes (74.7%). The duration of imprisonment reported by participants ranged from 1 to 36 months ( $M = 6.29$ ;  $SD = 5.93$ ).

The measures were administered in groups of up to 40 individuals by the lead researcher, an assistant researcher or prison superintendent. The assistant researcher and prison superintendent were instructed by the lead researcher about the procedures involved in conducting this study. Each participant was provided with a brief description of the study including the general area of interest, how to complete the questionnaire, and the general expected completion time. Participants completed an anonymous, self-administered, paper and pencil questionnaire, which was compiled into a booklet along with an instruction sheet and a consent form attached to the front of the booklet. Participants were assured about the confidentiality of their participation and informed that they could withdraw from the study at any time. The



participation was voluntary without any form of reward. On completion, participants were debriefed on the purpose of the study.

## **Materials**

***The Measure of Criminal Social identity*** (MCSI; Boduszek et al., 2012) 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 reflecting higher levels of criminal social identity. The measure included three subscales: in-group ties (three items: items 6-8) subscale measures the level of personal bonding with other criminals; cognitive centrality (three items; items 1-3) subscale measures the psychological salience of a criminal's group identity; and in-group affect (two items; items 4 and 5) subscale measures a criminal's felt attitude toward other in-group criminals.

***The Measure of Criminal Attitudes and Associates*** (MCAA; Mills & Kroner, 1999) is a two-part self-report measure of criminal attitudes and associates (only part A was used in the current research). Part A is a measure intended to quantify criminal associations before incarceration. Respondents are asked to recall the three adults with they spend most of their free time with (0%-25%, 25%-50%, 50%-75%, and 75%-100%). The respondent then answers four questions in relation to the degree of the criminal involvement of their associates: (a) "Has this person ever committed a crime?" (b) "Does this person have a criminal record?" (c) "Has this person ever been to jail?" and (d) "Has this person tried to involve you in a crime?" Part A was used to calculate two measures of criminal associates. The first, "Number of Criminal Friends," was calculated by adding up the number of friends to which the participant

had answered “yes” to any of the questions of criminal involvement. This meant the participant could indicate zero to three criminal associates. The second measure is the extent of exposure to criminal friends. 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 products is added together to produce the Criminal Friend Index. Overall scores for the Criminal Friend Index (CFI), therefore, range from 0 to 48, with higher scores reflecting an increased involvement with criminal associates. The MCAA was included in the present study to assess for differential relationships between the three MCSI factors and external variables.

***Demographic information*** was collected using an information sheet created for the present study. Data collected included participant age (continuous), location (urban or rural), period of confinement (in months), and offender types (violent or nonviolent).

All measures were translated from English into Urdu by the principal researcher and then sent to a group of academics to translate the Urdu versions back into English.

The translation of the scales, along with the original English versions, was then submitted to three experts who indicated appropriate changes.

### **Analysis**

The dimensionality of the MCSI was investigated through the use of traditional confirmatory factor analytic (CFA) techniques, and confirmatory bifactor modelling (see Reise, Morizot, & Hays, 2007). Four alternative model of the latent factor structure of the MCSI were specified and estimated using Mplus version 6.0 (Muthen & Muthen, 1998, 2010) with robust maximum likelihood (MLR) estimation. Three

models were estimated as CFA conceptualisations. Within these models items were restricted to load onto a single factor, while in the bifactor model each item was allowed to load onto a general factor (criminal social identity) and one grouping factor (cognitive, affective, or ties), as per recommendations (Reise et al., 2010). In all cases measurement error terms remained uncorrelated as suggested in previous research (Boduszek, Shevlin, Mallett, Hyland, & O’Kane, 2012; Boduszek et al., 2013; Hyland, Boduszek, Dhingra, Shevlin, & Egan, 2014).

Model 1 is a one-factor solution in which the 8 items of the MCSI load on a single latent variable. Model 2 is a correlated two-factor model which reflects the cognitive aspect of criminal social identity (centrality; items 1, 2, and 3) and the emotional relationships that exist within criminal social identity (items 4, 5, 6, 7, and 8). Model 3 is a correlated three-factor model in which the three latent variables are represented by cognitive centrality (items 1, 2, and 3), in-group affect (items 4 and 5), and in-group ties (items 6, 7, and 8). The specifications for each of these models were taken from the results of previous factor analyses (Boduszek et al., 2012; Cameron, 2004; Obst & White, 2005). Model 4 is a bifactor conceptualisation containing four latent factors; a single general factor of criminal social identity and three grouping factors represented by cognitive centrality, in-group affect, and in-group ties. Within this model, all 8 items load onto the general criminal social identity factor and also load on the three grouping factors (cognitive centrality, items 1, 2, and 3; in-group affect, items 4 and 5; and in-group ties, items 6, 7, and 8). Within a bifactor model the grouping factors are restricted to be uncorrelated with each other and uncorrelated with the general factor. For the purposes of model identification the variance of each factor is set to 1.0. The overall fit of each model and the relative fit between models were assessed using a range of goodness-of-fit

statistics and assessment of the appropriateness of the model parameters. The chi-square ( $\chi^2$ ) statistic assesses the sample and implied covariance matrix and a good fitting model is indicated by a non-significant result. However, the  $\chi^2$  statistic is strongly associated with sample size, and as such good models tend to be over-rejected. Tanaka (1987) suggested that a model should not be rejected simply on the basis of a significant  $\chi^2$  result. According to Kline (1994) models with a  $\chi^2$ -to-*df* ratio of less than 3:1 represent a good fitting model. The Comparative Fit Index (CFI; Bentler, 1990) and the Tucker Lewis Index (TLI; Tucker & Lewis, 1973) are measures of how much better the model fits the data compared to a baseline model where all variables are uncorrelated. For these indices values above .95 indicate good model fit (Bentler, 1990). In addition, two more absolute indices are presented; the standardized root mean-square residual (SRMR; Joreskog & Sorbom, 1981) and the root mean-square error of approximation (RMSEA; Steiger, 1990). Good fitting models are indicated by values less than .05 (Joreskog & Sorbom, 1993). Furthermore, Akaike Information Criterion (AIC; Akaike, 1974) was used to evaluate alternative models with the smaller value indicating the better fitting model. The CFI, RMSEA and the AIC all have explicit penalties for model complexity.

## Results

### Descriptive Statistics

Descriptive statistics including means (*M*), standard deviations (*SD*), and range for criminal social identity factors and period of confinement are presented in Table 1, together with Cronbach's Alpha reliability (Cronbach, 1951). The descriptive statistics indicate that the juvenile offenders reported high levels of in-group ties and centrality, and moderate levels of in-group affect.

Table 1. *Descriptive statistics for all Continuous Variables.*

Variable	<i>M</i>	<i>SD</i>	Range	Possible range	Cronbach's Alpha
In –group ties (T)	12.18	2.87	3-15	3-15	.81
In-group affect (A)	6.80	2.37	2-10	2-10	.91
Centrality (C)	11.03	2.08	4-15	3-15	.68
Criminal Friends	18.66	11.79	0-48	0-48	N/A
Period of Confinement	6.29	5.93	1-36	N/A	N/A

### Confirmatory Factor Analysis of the MCSI

Table 2 reports both absolute and comparative fit indices for each model. As shown in Table 2, all indices show improvement in the three-factor model. Although the chi-square is large in relation to the degree of freedom, and statistically significant Tanaka (1987) suggests that the model should not be rejected on this basis, since large sample sizes amplify the power of the test. Additionally, the CFI = .96, TLI = .93, RMSEA = .07 and RMSR = .05 indicate an adequate fit of data. The AIC value (8377.59) also shows that the three-factor model is a more parsimonious model compared to the

alternative models. The adequacy of this model can also be determined in relation to its parameter estimates. As can be seen in Table 3 all items displayed statistically significant ( $p < .001$ ) factor loadings on the respective factors. Factor loadings were all in the expected direction and all items displayed factor loadings above .5

Correlations between the three factors indicate that the components of criminal social identity are moderately statistically correlated. The strongest correlation existed between in-group affect and in-group ties ( $r = .62$ ), which is consistent with the theoretical view that these two factors reflect the emotional aspects of social identity. Both factors showed a weaker association with cognitive centrality,  $r = .53$  and  $r = .48$ , respectively.

Table 2. *CFA and Bifactor Model Fit Indices for Four Alternative Models of the MCSI*

	$\chi^2$	<i>df</i>	CFI	TLI	RMSEA	SRMR	AIC
<b>Models</b>							
1 Factor Model	255.88***	20	.71	.59	.17	.08	8982.83
2 Factor Model	164.19***	19	.84	.76	.14	.09	8514.78
3 Factor Model	55.35***	17	.96	.93	.07	.05	8377.59
Bifactor Model	245.09***	16	.75	.56	.19	.44	8552.41

*Note.*  $\chi^2$  = chi square goodness of fit statistic; *df* = degrees of freedom; RMSEA = Root-Mean-Square Error of Approximation; CI = Confidence Interval; AIC = Akaike Information Criterion; CFI = Comparative Fit Index; TLI = Tucker Lewis Index; SRMR = Standardized Square Root Mean Residual. \*\*\* Indicates  $\chi^2$  are statistically significant at  $P < .001$ .

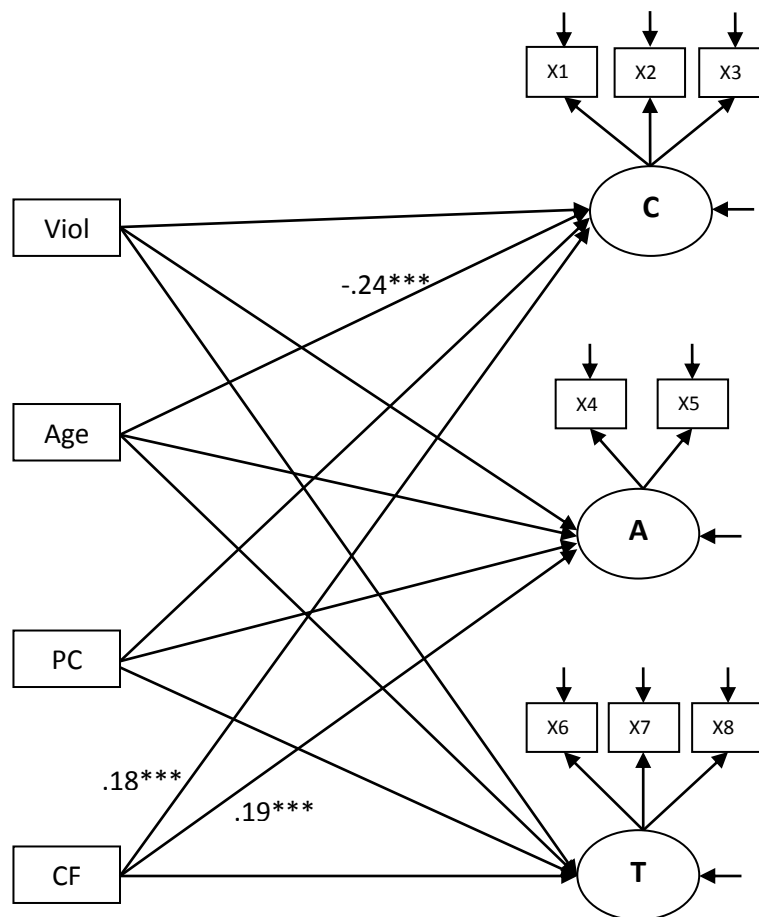
**Incremental Validity of the Three MCSI Factors**

Given the relatively strong degree of association between the MCSI factors, further analysis examined the relationships between the MCSI factors and external variables within a structural equation modelling framework to determine if these factors can be considered to measure substantially different constructs (Carmines & Zeller, 1979). The proposed structural equation model of CSI (Figure 1) was developed based on CFA results obtained above, and included three latent variables; criminal social identity measured by cognitive centrality, in-group affect, and in-group ties, and three observed variables: age, offender type (violent/non-violent), period of confinement (in years), and criminal friend index.

The overall fit of the specified model (Figure 1) provided an adequate fit to the data,  $\chi^2 = 88.20$ ,  $df = 37$ ,  $p < .001$ ; CFI = .95, TLI = .92; RMSEA = .06, SRMR = .04. Table 3 reports the standardized and unstandardized regression paths. As can be seen, age ( $\beta = -.24$ ,  $p < .001$ ) was significantly negatively related to centrality, while criminal friends was positively associated with both affective ties ( $\beta = .19$ ,  $p < .001$ ) and centrality ( $\beta = .18$ ,  $p < .001$ ). Consequently, although the three MCSI factors are moderately correlated, they can be considered to measure substantially different constructs.

*Figure 1*

*Structural Equation Model Examining the Relationship between the Three Criminal Social Identity Factors and External Variables (Offense Type, Participant Age, Period of Confinement, and Criminal Friend Index).*



*Note:* Viol = violent/non-violent offence, Age = participant age (in years), PC = period of confinement (months), CF = criminal friends, C = centrality, A = in-group affect, T = in-group ties; x1- x8 = items included in the Measure of Criminal Social Identity.



Table 3. *Standardized and unstandardized regression paths (with standard errors) for the specified structural model*

Item	B	$\beta$	SE
<b>Factor 1 (centrality)</b>			
1. Being a delinquent has little to do with how I feel about myself in general خظاکار ہونے کی حثیت سے میں اپنے بارے میں طور عام پر کم کرتا/کرتی ہوں۔ محسوس	1.00	.53***	.07
2. Being a delinquent is an important part of my self-image مے حصہ ام ای ککا۔ خظاکار ہونا میری ذات	1.41	.87***	.05
3. The fact I am a delinquent rarely enters my mind یہ حقیقت کے خظاکار ہوں کبھی کبھار میرے ذہن میں مے آتی۔ میں	.93	.51***	.06
<b>Factor 2 (in-group affect)</b>			
4. In general I'm glad to be a part of delinquent group عموم امیں خوش ہوتا / ہوتی ہوں کے میں خظاکاروں کے گروہ کا حصہ ہوں۔	1.00	.89***	.03
5. Generally I feel good about myself when I think about being a delinquent میں اپنے بارے میں یا سوچ کر اچھا محسوس کرتا/ کرتی ہوں کے خظاکار عموم امیں ہوں۔	1.09	.94***	.03
<b>Factor 3 (in-group ties)</b>			
6. I have a lot in common with other people who committed a crime مجھ میں بہت ساری باتیں مشترک ہیں خظاکار ہیں۔ میں لوگوں جو دوسرے	1.00	.83***	.03
7. I feel strong ties to other people who committed a crime میں ان تمام دوسرے لوگوں کے ساتھ مضبوطی سے جڑا ہوا محسوس کرتا ہوں جو ہیں۔ خظاکار	1.21	.87***	.03
8. I find it difficult to form a bond with other people who committed a crime. میرے لئے دوسروں لوگوں کے ساتھ تعلق نانا مشکل ہے جو کہ خظاکار ہیں۔	.85	.62***	.05
<b>Structural Level</b>			
Violent → centrality	.09	.08	.06
Age → centrality	-.06	-.24***	.06
Confinement → centrality	.01	.05	.07
Criminal friends → centrality	.01	.18***	.07
Violent → affect	.20	.07	.05
Age → affect	-.02	-.04	.05
Confinement → affect	.01	.01	.05
Criminal friends → affect	.02	.19***	.05
Violent → ties	.09	.05	.06
Age → ties	-.03	-.06	.05
Confinement → ties	-.01	-.03	.07
Criminal friends → ties	.01	.07	.06

**Reliability analysis**

The use of traditional measures of internal consistency have been criticised within a latent variable modelling context given the propensity to over- or under-estimate scale reliability (Raykov, 1998). In order to provide a rigorous assessment of the internal reliability of the MCSI items, composite reliability was performed. Values greater than .60 are generally considered acceptable (Bagozzi & Yi, 1988; Diamantopoulos & Winklhofer, 2001). Current results indicate that the in-group affect ( $\rho_c = .88$ ) and in-group ties ( $\rho_c = .71$ ) factor items possess good internal reliability ( $\rho_c = .79$ ). However, the internal reliability for centrality items was lower than expected ( $\rho_c = .54$ ).

### **Discussion**

The main aim of the present research was to provide a comprehensive evaluation of the dimensionality and construct validity of the Urdu version of the MCSI. As many researchers (e.g. Reise et al., 2010) have argued that a significant limitation of factor analytical research is the use of a traditional one-factor model when attempting to assess unidimensionality, the current research used both traditional CFA and confirmatory bifactor modelling procedures. Additionally, this study aimed to assess the incremental validity of the Urdu version of the MCSI by examining the relationship between the different MCSI factors and offence type, period of confinement, and criminal friends, while controlling for age. Finally, this research sought to determine the internal reliability of the scale through the application of composite reliability.

On the basis of the fit indices, the three-factor solution was considered to provide a better fit to the data than the alternative solutions tested. This finding supports earlier research by Boduszek et al. (2012), which found that the MCSI was a three-dimensional construct within a sample of Polish recidivistic prisoners. Inspection of the factor loadings provided further support for the three-factor conceptualisation of the MCSI. All 8 items loaded strongly onto their respective factors, with the majority of items displaying factor loadings in excess of .60, thus generally satisfying the criteria outlined by Hair, Anderson, Tatham, and Black (1998).

Following the identification of the underlying latent structure of the Urdu Version of the MCSI, the three factors were correlated with offense type (violent or non-violent), period of confinement, the criminal friends index and age within a structural equation model in order to investigate the scale's incremental validity.

Results of this analysis provided further empirical support for conceptualising CSI in terms of three factors. In-group affect and centrality were positively associated with criminal friend index, while age was negatively associated with centrality. The differential relationships between external factors and the three MCSI factors is an important finding as it indicates that the MCSI measures substantially different dimensions, despite the high level of correlation observed between the factors (see Carmines & Zeller, 1979). The finding is consistent with previous research by Boduszek and colleagues (2013a, b) and the proposition of Cameron (2004).

The positive relationship between the criminal friends index and both centrality and in-group affect in the present research is supportive of Boduszek et al.'s (2012) findings. However, inconsistent with the findings of Boduszek and colleagues, criminal friends index was not significantly associated with cognitive centrality. The reasons for this disparity are unclear, but may relate to the younger age of participants in the present sample. Also discrepant with previous research (Boduszek et al., 2013a), which found that increased levels of cognitive centrality positively related to having committed a violent criminal offence, while increased levels of in-group affect were associated with having committed a non-violent criminal offence. In the present study, none of the MCSI factors were associated with offense type. Again, the reasons for such a discrepancy are unclear, and this is something in need of further investigation. Age was negatively associated with cognitively centrality in the present study, which suggests that the cognitive importance of belonging to a criminal group decreases with age. This perhaps explains why desistance from crime has been associated with increasing age (Farrington, 1986).

A further aim of the present study was to provide a robust assessment of the internal reliability of the Urdu version of the MCSI. As traditional approaches to

establishing internal reliability such as Cronbach's alpha have been criticised within a latent variable context due to their tendency to over- or under-estimate scale reliabilities (Novick & Lewis, 1967; Raykov, 1998), composite reliability was performed to provide a more accurate assessment of internal reliability of the latent factors. Results indicated that the in-group affect and in-group ties MCSI subscales showed good reliability. However, the internal reliability for centrality items was lower than expected, but above the minimum acceptable level (Hatcher, 1994).

### **Limitations and Further Directions**

The results of the present study should be interpreted in light of several important limitations, some of which point towards important directions for future research. First, the sample of incarcerated juvenile delinquents was relatively homogenous, thereby limiting the generalisability of the results to more diverse samples of varying ages, ethnicities, and offender groups. Replication of these results with more heterogeneous samples is, therefore, needed. In particular, replication of the results in samples including female juvenile offenders is needed. Second, the use of self-report data also introduces several well-known limitations, such as response bias. Given the somewhat limited sample size, it was not possible to assess whether the factorial solution identified in the current sample remains invariant across different populations. Consequently, this remains an important direction for future research.

### **Conclusion**

In conclusion, the present study is the first to have used the MCSI in a sample of Urdu speaking participants, and to assess a bifactorial solution of CSI using the MCSI. The results indicated that the Urdu Version of the MCSI is best conceptualised as measuring three distinct dimensions: cognitive centrality, in-group affect, and in-group ties. Additionally, the results indicate that the three MCSI factors have

acceptable composite reliability and are differentially associated with age and criminal friends. Consequently, the results add valuable evidence as to the cross-cultural applicability of the MCSI.

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