



## Using the Interpersonal Reactivity Index to Assess Empathy in Violent Offenders

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### Abstract

The Interpersonal Reactivity Index (IRI), developed by Davis (1980), provides an excellent multidimensional measure of empathy for the general adult population, the domain for which it was developed. Its use has subsequently expanded into other areas, for example criminal psychology. In this domain empathy is a critical variable in theoretical accounts of criminality and particularly of violence. For many researchers within the field of criminal psychology, the IRI has become the instrument of choice for the assessment of empathy. However, the psychometric properties of the scale, when used with a criminal population, have not been investigated. This paper reports the results of an investigation into the reliability and component structure of the IRI using a sample of violent offenders. The Personal Distress subscale was found not to be reliable when used in an offender population. Furthermore, when used to assess offenders, principle components analysis did not confirm the four-subscale structure of the IRI. Possible explanations for these findings are discussed in relation to offender assessment in general.

**Keywords:** Offenders; Psychometrics; Empathy; IRI

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### INTRODUCTION

Theoretical developments in the field of empathy research have yielded two broad positions regarding the nature of empathy, namely affective and cognitive theories (see Davis, 1994, for an extensive review). Theories that emphasize the affective nature of empathy have maintained that empathy is revealed in an individual's vicarious emotional response, which arises as a direct result of witnessing another's emotion (Stotland, 1969). The relationship of this vicarious emotional response to the observed emotion has been a topic of debate. Some researchers suppose that in order to be an empathic response, the observer's emotional response must be the same as that of the observed

other (Eisenberg & Miller, 1987). Other researchers argue that any emotional response to another's distress qualifies as an empathic response, even if that emotional experience differs from the emotion exhibited by the target (Stotland, 1969). Rather than emphasising affect, another school of thought has viewed empathy as a cognitive activity. Those who hold this point of view have emphasised an individual's capacity to accurately perceive and understand another's plight (Dymond, 1949).

Some researchers (eg. Davis, 1994; Pithers, 1994), have called for empathy to be seen as a multidimensional construct, consisting of both

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affective and cognitive components. In addition, Pithers has called for a behavioural component to be included in the construct.

Davis (1994) has proposed a model of multidimensional empathy, designed to include both affective and cognitive components of empathy, as well as addressing the relationship between these components and behaviour. Additionally, Davis has developed a self-report measure of empathy, the Interpersonal Reactivity Index (IRI) to reflect both cognitive and affective components of empathy. Many studies of empathy now report using the IRI. Indeed, the IRI is possibly the most widely used self-report measure of empathy currently available.

#### *Empathy and Aggression*

Violent offenders are often described as having a lack of empathy. Empathy and aggression have been seen as incompatible (Baron, 1983), and an empathic response by an aggressor to an individual in distress appears to reduce displays of aggression towards that person (Miller & Eisenberg, 1988). Feshbach (1964) attempted to explain the mechanisms underlying this connection between empathy and aggressive behaviour. According to Feshbach, seeing the consequences of aggression elicits distress in an empathic observer, even if that observer is the aggressor. In these circumstances, the distress experienced becomes an unpleasant consequence of the aggressive behaviour. Empathy, therefore, was hypothesized by Feshbach to act as an inhibitor of aggression and violence.

Empathy has also been viewed as an intervening variable. The empathic distress experienced by the aggressor, as a result of witnessing the other's emotional distress, is thought to be a precursor to the development of feelings of guilt (Baumeister, 1997). Although similar to Feshbach's theory, according to this explanation empathic distress does not reduce aggression directly, rather it facilitates feelings of guilt.

Regardless of the mechanisms underlying the apparent relationship between aggression and empathy, the assessment of the empathic capacities of offenders continues to be included in many routine assessments conducted within prisons and training in empathy often constitutes part of treatment programs for both sexual and non sexual violent offenders.

#### *The Interpersonal Reactivity Index*

The IRI has become the measure of choice for investigation into the empathic ability of offenders (for instance, it is recommended for use by Polaschek & Reynolds (2001)). Four subscales are contained within the IRI: Perspective Taking (Cognitive), Fantasy (Cognitive), Empathic Concern (Affective), and Personal Distress (Affective). The Perspective Taking (PT) subscale is purported to measure an individual's dispositional tendency to adopt another's perspective, although it does not provide an indication of the accuracy of that perspective taking activity (Davis, 1994). The Fantasy Subscale (FS) is intended to provide an indication of an individual's propensity to become imaginatively involved with fictional characters and situations. The Empathic Concern (EC) subscale measures an individual's self-reported tendency to experience feelings of concern for others, and the Personal Distress (PD) subscale was designed to measure the extent to which an individual feels distress as a result of witnessing another's emotional distress. Unlike the other subscales of the IRI, Personal Distress has been shown to correlate positively with measures of antisocial behaviour and aggression (Davis).

#### *Psychometric Properties Of The Interpersonal Reactivity Index*

When the IRI was initially validated, it produced internal consistency indices ranging from .70 to .78 (Davis, 1994). Further reports of reliabilities of the IRI confirmed these figures for at least three of the four subscales (Christopher, Owens & Stecker 1993: PT = .74, EC = .76, PD = .70, the reliability of the Fantasy subscale was not reported). However, these studies were undertaken using university samples.

The assessment of offenders poses particular psychometric concerns. Primarily, many of the scales currently in use have not been validated for use with this population (Gudjonsson, 2001). Changes in recorded reliabilities may occur when instruments are moved from one population to another and a reduction in the internal consistency of a scale seriously calls into question the instrument's validity. This is particularly true if the target population has excesses or deficits that interfere with successful psychological measurement. Offenders represent such a population, in that they can be distinguished on a range of variables that can adversely impact on

assessment (Gudjonsson). It cannot, therefore, be assumed that the reliability of the IRI is the same in both the general and offender populations.

In order to overcome these difficulties associated with offender assessment, researchers and clinicians need to routinely assess and report the properties of scales used in the assessment of offenders. However, as many as 87% of investigators fail to report the reliability of scales in relation to their own samples (Vacha-Haase, 1998), and offender assessment appears to experience the same problem. One of the most effective ways of accumulating evidence of scale performance with this population would be for researchers to consistently report obtained reliability indices as part of their studies. For instance, some evidence exists to suggest that the internal consistency of some of the IRI's subscales may decline considerably with an offender sample. For example, Ireland (1999) used the IRI in her study on bullying behaviour in an incarcerated offender sample. The reliabilities reported in this study were lower than those reported for the general population (PT = .70, FS = .64, EC = .43, PD = .52).

The stability of Davis' (1980) four subscale structure may also be questionable when the IRI is used to assess different populations. Yarnold, Bryant, Nightingale and Martin (1996) assessed the factor structure of the Index with both student and physician samples. Neither sample reproduced the original four subscales. Further, the factor structures in these two samples were not equivalent. The factor structure of the IRI has yet to be evaluated using an offender sample.

The aim of this study was to investigate the psychometric properties of the IRI in a population of incarcerated violent offenders. In particular, the reliability and component structure of the IRI was examined, along with the scale's ability to discriminate between offenders and previously reported non-offender means. Specifically, offenders were expected to demonstrate lower levels of Empathic Concern and Perspective Taking on the other hand offenders were expected to demonstrate higher levels of Personal Distress.

## METHOD

### *Participants*

Data was obtained from 88 violent offenders incarcerated in maximum-security prisons in Western Australia for non-sexual violent index offences (homicide, armed

robbery, arson, aggravated assault). The offenders ranged in age from 21 to 64 years with a mean age of 34 years. Sentence lengths ranged from 3 years to life. All offenders had been identified as having a high risk of re-offending, based on the Level of Service Need Inventory (LOSNI). The LOSNI has a predictive accuracy for violent recidivism of between .72 to .76 with an offender population, and targets six recidivism predictors: level of drug use; level of alcohol use; age at first offence; history of generalised offending; highest degree of personal injury occurring in index; and past violent offences (Ward & Dockerill, 1999).

### *Materials*

#### The Interpersonal Reactivity Index:

The scale consists of 28 items constituting four subscales of seven items each (Davis, 1980). Each of the 28 items was rated using a five point Likert scale, ranging from 0 (does not describe me well), to 4 (describes me very well).

#### The Criminal Sentiments Scale:

The Criminal Sentiments Scale provides an assessment of both pro-social and anti-social cognitions, attitudes and sentiments (Andrews & Wormith, 1984). This measure has three subscales; Law, Courts Police, which assesses the level of positive attitudes an individual has to the criminal justice system; Tolerance for Law Violations, which provides an indication of the degree to which individuals accept the use of illegal means to gain their needs, and; Identification with Criminal Others, which assesses the level of identification with criminal peers.

#### Karolinska:

Two subscales of the Karolinska (Schalling, Asberg, Edman, Oreland, 1987) were utilised, Impulsivity and Socialisation. Low scores on the Socialisation scale are purported to indicate psychopathy (Blackburn, 1993), while high scores on Impulsivity provide an indication of an individual's tendency to act impulsively.

### *Procedure*

Offenders who had been identified as having a high risk of re-offending, based on their LOSNI scores, completed an assessment battery prior to inclusion in a treatment program for violent offending. The reported scales constituted part of this assessment

battery. Staff psychologists administered all assessments.

RESULTS

*Comparison Of The Offender Sample To Previously Reported Non-Offender Means*

In order to determine the IRI's capability to discriminate offender groups from the general

population, single sample t-tests were used to compare the data from the offender sample to means obtained from a sample of non-offender male factory workers (means reported by Davis, 1980). Male factory workers were chosen as the comparison group so as to match on gender and approximate education levels. Descriptive statistics for each of the four subscales are presented in Table 1.

Table 1  
*Mean Interpersonal Reactivity Index subscale scores for offender and non-offender samples.*

	Personal Distress	Perspective Taking	Empathic Concern	Fantasy
Offenders	10.14 (4.46)	12.99 (5.00)	12.83 (4.71)	9.28 (5.44)
Non -Offenders	18.35 (4.40)	20.19 (4.25)	13.4 (6.30)	11.09 (5.73)

*Note.* SD in parentheses

To further examine the internal consistency of the subscales, corrected item-total correlations (CITC) were also examined. CITCs provide an indication of the level of consistency that each item has with the rest of the subscale. DeVellis (1991) suggested that CITC above .30 indicates that the item is

contributing toward internal consistency. The analysis of the CITCs enabled the identification of individual items that may be reducing a scale's reliability index. As can be seen from Table 2, the internal consistency of each of the four subscales was being adversely affected by the reversed items.

Table 2  
*The Corrected Item-Total Correlations (CITC) for each item of each of the four subscales of the Interpersonal Reactivity Index. An asterisk indicates reversed items.*

Empathic	Concern	Perspective	Taking	<u>Fantasy</u>	Personal	Distress	
IRI Item Number	CITC	IRI Item Number	CITC	IRI Item Number	CITC	IRI Item Number	CITC
2	0.39	8	0.47	1	0.39	6	0.51
9	0.52	11	0.61	5	0.47	10	0.36
20	0.48	21	0.57	16	0.56	17	0.42
22	0.39	25	0.50	23	0.45	24	0.33
4*	0.25	28	0.52	26	0.62	27	0.47
14*	0.04	3*	0.01	7*	0.27	13*	0.15
18*	0.20	15*	-0.12	12*	0.16	19*	0.02

*Component Structure*

Particular caution was used with the component analysis given the low  $n$  to item ratio. Principle components analysis (PCA) was used to analyse the subscale structure as this method is more robust to both errors of under-extraction and over-extraction (Fava & Velicer, 1996). Additionally, extracting all components with an eigenvalue greater than one tends to result in too many components being extracted, whereas the scree plot criterion tends to

provide a more accurate solution (Tzeng, 1992). Consequently, the scree plot criterion for the number of components extracted was used here, which indicated a three-component solution.

As the components were not correlated (all component correlations were less than  $-.15$ ), an orthogonal varimax rotation was used (see Table 3).

Table 3  
*Interpersonal Reactivity Index item loadings for offender data (n=88) resulting from Principle Components extraction with Varimax Rotation.*

IRI Subscale	IRI Item Number	Component Number		
		1	2	3
EC	2	.747		
PT	28	.724		
FS	26	.721		
PT	11	.706		
PT	21	.706		
PT	25	.695		
EC	20	.683		
PT	8	.666		-.367
EC	9	.649		
FS	5	.635		
EC	22	.595		
PD	10	.543		.361
FS	16	.528		
FS	23	.519		
PD	17	.377	.365	.370
EC	* 14		.751	
EC	* 18		.694	
PT	* 15		.634	
FS	* 7		.542	
FS	* 12		.508	
PD	* 13		.461	
FS	1		.431	
EC	* 4		.392	
PT	* 3		.365	
PD	24			.741
PD	6			.674
PD	27			.632
PD	* 19	.489		-.514

Note. \* = Reversed items; Component loadings  $< .3$  have been suppressed.

As can be seen from Table 3, Component 2 contained all but one of the reversed items, together with one positively worded item from the Fantasy Subscale. This positively worded item was, "I daydream and fantasise, with some regularity, about things that might happen to me". Several authors have observed factor structures which separate positively and negatively worded items, (e.g. Knight, Chisholm, Marsh, Godfrey, 1988), however, this effect becomes most distinct with subjects who have poor reading levels (Dunbar, Ford, Hunt & Der, 2000). Given the lengthy nature of the positively worded item, along with the remaining negatively worded items, it seems plausible that component 2 represents higher reading difficulty.

Component 3 consisted of all items that contained the word 'emergency' or 'emergencies'. Item 19,

which loaded on this component, was a reversed item that also contained the word 'emergency'. However, after reversal this item was negatively associated with the remaining 'emergency items'. This may be explained by offenders responding to the word emergency in the same way for each item, regardless of the intended direction of the item. Component 1, which was the largest component, consisted of all the remaining items. No apparent pattern could be identified within this component. Although this analysis should be interpreted with caution, the results certainly did not appear to support the four subscale structure of the IRI.

Subscale scores for the IRI were generated and analysed against other scale scores by means of Pearson's Correlation. The correlation results are presented in Table 4.

Table 4  
*Inter-correlations between each of the four IRI subscales, CSS subscales, and the Impulsivity and Socialisation scales from the Karolinska for the offender sample.*

	EC	FS	PD	LCP	TLV	ICO	Imp	Soc
PT	.56 <sup>b</sup>	.21	-.11	.53 <sup>b</sup>	-.53 <sup>b</sup>	-.59 <sup>b</sup>	-.41 <sup>a</sup>	.40 <sup>a</sup>
EC		.22	-.04	.59 <sup>b</sup>	-.49 <sup>a</sup>	-.50 <sup>b</sup>	-.16	.23
FS			.10	.03	-.03	-.22	.10	-.04
PD				-.07	.14	.15	-.03	-.10
LCP					-.82 <sup>c</sup>	-.72 <sup>c</sup>	-.59 <sup>b</sup>	.53 <sup>b</sup>
TLV						.80 <sup>c</sup>	.42 <sup>a</sup>	-.42 <sup>a</sup>
ICO							.44 <sup>a</sup>	-.35
Imp								-.67 <sup>c</sup>

Note. PT = Perspective Taking; EC = Empathic Concern; FS = Fantasy Scale; PD = Personal Distress; LCP = Law, Courts & Police; TLV = Tolerance of Law Violations; ICO = Identification with Criminal Others; Imp = Impulsivity; Soc = Socialisation.

<sup>a</sup> p < .05; <sup>b</sup> p < .01; <sup>c</sup> p < .001.

Perspective Taking and Empathic Concern both produced correlation results that were consistent with their assessment of positive empathic constructs. Specifically, an individual's tendency to attempt to perceive another's plight (PT) was associated with positive attitudes to the criminal justice system (LCP), and with higher levels of Socialisation. Low levels of Perspective Taking were associated with Tolerance of Law Violations and Identification with Criminal Others. A low dispositional tendency to attempt to understand

another's situation was associated with high levels of impulsivity. An individual's tendency to have feelings of concern for others in need was associated with positive attitudes to the criminal justice system, and high levels of Socialisation, but was negatively associated with Tolerance for Law Violations and Identification with Criminal Others. The Personal Distress and the Fantasy scales, however, failed to be significantly associated with any of the other measures.

## DISCUSSION

The comparison between the offender sample means and the reported non-offender means for each of the IRI subscales does indicate that the scale is capable of discriminating between offenders and non-offenders. For the Empathic Concern, Perspective Taking and Fantasy subscales the directions of the observed differences were as predicted. However, contrary to expectations, offenders scored lower than non-offenders on the Personal Distress subscale. This is theoretically important, as it is the Personal Distress subscale that has been suggested to be related to levels of aggression and violence (Davis, 1994). Given the relative homogeneity of the sample (all participants were identified as high risk violent offenders), the results suggest that Empathic Concern and Perspective Taking are important variables in the study of violence and aggression. Thus at first glance, these results appear to support the use of the IRI to discriminate offender and non-offender samples for at least three of the four subscales. However, further examination of the psychometric qualities of the IRI appears to indicate that the scale is in fact unreliable with this population.

The psychometric qualities of the IRI were examined and the results of this analysis indicated that the reliability of three of the subscales was unacceptable, particularly for the Personal Distress subscale. These results confirmed earlier findings of a lack of reliability of the IRI when used to assess offenders (Ireland, 1999). It may be that this lack of reliability in the IRI subscales is specific to offender populations, particularly since acceptable reliability results have been obtained when the Index has been used to assess other populations.

The measurement of empathy in violent offenders poses unique difficulties. Davis (1994, p 52) has argued that it is the "greater verbal skill and insight of adults" that has made self-report assessment of empathy possible. The psychometric properties of self-report measures of empathy may, therefore, be dependent upon the verbal skill and insight of the population in which they are being used. Verbal skills may be viewed either in terms of general verbal intelligence, or more specifically, in terms of literacy skills. The literature has identified a consistent verbal intelligence deficit in offender populations (Blackburn, 1993). For instance, 70% of recidivists demonstrate a verbal intelligence deficit (Haynes & Bensch, 1981). In regard to more specific literacy deficits, it has been estimated that

literacy deficits exist within around 20% of the offender population (Caddick & Webster, 1998). These deficits may pose a serious threat to valid, reliable self-report assessments. In sum, offender samples may produce unacceptable reliability indices on the subscales of the IRI due to deficits in verbal intelligence, literacy, and insight, which are considered necessary for self-report measurements of empathy. Without the required levels of insight and verbal skills, respondents may rate items based on aspects such as specific words or phrases. This appears to have been the case in this study. From the component analysis, it appears that items that contain the word emergency, or emergencies, were rated by respondents in a similar fashion regardless of the direction of the item. Another component derived from the analysis consisted of the reversed items (except the reversed 'emergency' item), along with one positively worded item. Negatively worded sentences require longer processing time (Clark, & Chase, 1972) suggesting that they require greater literacy skills. One explanation of these items all loading onto this component is that these items required greater literacy skills than the offenders possessed.

The Perspective Taking subscale is purported to provide an indication of an individual's dispositional tendency to attempt to understand another's plight. It is a cognitive measure that can be thought of as representing a positive empathic construct. As expected, this measure was associated with higher levels of socialisation and pro-social attitudes. Antisocial attitudes and higher levels of impulsivity were associated with lower levels of Perspective Taking. Empathic Concern assesses an individual's tendency to experience feelings of concern for another's plight, and represents an affective positive empathic construct. Again, correlation results supported this notion. Empathic Concern was positively associated with higher levels of Socialisation and pro-social attitudes, and negatively associated with higher levels of anti-social attitudes.

The remaining two subscales, Personal Distress and Fantasy, failed to demonstrate any significant correlations with the other measure. This was particularly surprising for the Personal Distress subscale given that it was expected that Personal Distress would be associated with higher levels of anti-social attitudes (Davis, 1994), and possibly

lower levels of Socialisation, however those relationships were not observed.

While the IRI is recommended for use as an assessment tool with offenders (Polaschek & Reynolds, 2001), the results of this study suggest that this scale should be used with caution in this population. Perspective Taking and Empathic Concern were found to discriminate between offenders and non-offenders in the expected direction; however, the Personal Distress subscale results were in the contrary direction to that expected. Additionally, Personal Distress produced an internal consistency that was far below acceptable and failed to demonstrate any relationships with any of the other measures.

The IRI has been in use, without alteration, since its inception, however, it is suggested that the index requires some alteration for use with offenders. Specifically, the Perspective Taking and Empathic Concern subscales should be examined in terms of their readability levels. Increasing the readability levels of these subscales may help to improve their internal consistency, making them more suited to an offender sample. Additionally, it is recommended that the Personal Distress subscale not be used to assess offenders. It is unclear exactly what this subscale is measuring, particularly given its low reliability and counterintuitive results.

In terms of theory development, it is especially disappointing to lose the Personal Distress subscale. The assessment of an empathic construct which is believed to be associated with antisocial behaviour may provide much needed clarity to the theoretical relationship between empathy and aggression / violence. Further research should examine more effective ways of assessing Personal Distress in offender samples along with the nature of the relationship between experiences of personal distress and aggression.

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