

**AN EXPLORATION OF FACTORS CONTRIBUTING
TO GANG-MEMBERSHIP**

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ABSTRACT

Attempts have been made to theoretically and empirically identify which factors drive gang-joining approaching a century, however a synthesis of the research which might guide future research is lacking, as is whether these are different to their non-gang counterparts. Perhaps more surprisingly, researchers have highlighted gender differences between gang-members but a large proportion of the research does not control for this. This thesis addresses the above points, specifically looking at individual risk factors for male gang-membership; violence, delinquency, personality, psychopathy, cognitive factors, externalizing and internalizing-behaviours, self-esteem, negative life-events, and limited opportunities. Statistical analysis evidenced factors which might be risk factors for (violence, delinquency, and externalizing-behaviours) and consequences of gang-membership (internalizing-behaviours), as well as those which may be exacerbated by gang-membership (violence and delinquency). This thesis highlights a need to shift the research focus to the negative consequences of gang-joining. A first of its kind, this thesis also examines the role of adult attachment within the gang showing that gang-members were less anxious in their friend attachments and therefore a possible protective function of the

gang, which will have implications for gang-desistence strategies. Inconsistency about the role of self-esteem in gang-membership appears to still remain, however this may be attributed to differences between implicit (unconscious) and explicit (unconscious) reporting of self-esteem, lack of clarity about whether it is high or low self-esteem that is associated with violence, uncertainty about whether the gang boosts or reduces self-esteem, as well as differences in study design. Unfortunately this thesis was not able to clarify this ambiguity, an attempt to explore the use of an implicit self-esteem measure suggests that this has preceded a reliable and valid definition of implicit self-esteem and some possible areas for future research.

OVERVIEW

The primary aim of this thesis was to identify individual risks factors associated with gang-membership, specifically whether these are different to those for their non-gang-offending counterparts. Chapter 2 looked at self-esteem, attachment, and personality in a sample of UK offenders aged 18-25 years. Comparisons were made between three methods of gang-membership; in this sample only official records were valid. Profiles were similar with the exception of gang-members being less anxious within their friend attachments.

Chapter 3 provided consistent evidence for there being higher rates of violence, delinquency, externalizing-behaviours and substance-use. Comparisons of cohort and cross-sectional studies provided evidence to suggest that gang-joining may be precipitated by externalizing-behaviours, and that delinquency, use of violence and substance-use is exacerbated by gang-membership. Gang-members reported higher levels of internalizing-behaviours which was not the case for violent-offenders. A number of risk-factors were either inconsistently defined (personality) or inconsistent in their conclusions (self-

esteem); and both of these were not strongly represented in the UK gang-research pool.

Due to bias with self-report, Chapter 4 presents a single case study of a UK gang-member. A treatment needs analysis and formulation indicated that for this particular offender low self-esteem was of particular significance. Attempts at overcoming self-report effects with an implicit self-esteem measure were unsuccessful.

Chapter 5 critiques an implicit self-esteem measure that can be used in conjunction with explicit self-esteem measures to counter self-report bias. Validity and reliability was stronger than other measures of implicit self-esteem, but on the whole did not reach that of more established explicit self-esteem measures. Findings also suggest that development of the tool has prematurely preceded a clearly defined and agreed upon definition of implicit self-esteem, and that this should be the focus of current research.

This thesis contributes to the growing evidence-base of psychological factors associated with gang-membership. Findings may call for the focus of gang-research to shift from the well-

established presence of violence and antisocial behaviours to the negative consequences of gang-membership, and perhaps interventions should follow suit.

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Chapter 1

THESIS INTRODUCTION

Word count including tables and figures: 651

1.0 INTRODUCTION

Why study "The Gang"?

Crime statistics for the 2011 London riots showed that one in five arrestees was a 'gang-member'. Gang-members were responsible for half of all shootings and 22% of serious violent crimes in London (Metropolitan Police Intelligence Bureau Research, 2011), and are prolific offenders with an average of 12 arrests each (Centre for Social Justice, 2009). The 2004 Offending, Crime and Justice Survey (Sharp, Aldridge & Medina, 2006) showed that 6% of 10-19 year olds were identified as 'gang-members', and they were responsible for committing 21% of 'core' offences (Table 1) that year.

Table 1: Core Offence Categories

<i>Property Related</i>	<i>Violent</i>	<i>Drug Selling</i>
Burglary	Robbery	Selling drugs
Vehicle-related thefts	Assault	
Other thefts		
Criminal damage		

(Sharp et al., 2006)

High levels of crime perpetrated by gang-members has widespread socioeconomic consequences; the cost of violent crime committed by all offenders in 2012 was estimated at £124 billion (UK Peace Index, 2013). This cost included criminal justice expenditure and lost productivity, but not the personal impact of violent crimes. With such high levels of crime being committed by gang-members it is important to understand the mechanisms, or risk-factors, which lead to gang-membership. However, perhaps a more appropriate starting point is to identify an agreed upon definition of 'a gang'.

What is "The Gang"?

Gang-definers have been studied internationally and the consensus is that these vary between cultures. The Eurogang Network was established to research youth-gangs in Europe with the objective of developing a:

"common framework for comparative research, based on standardised methodological instruments and a common research design".

(<https://www.umsl.edu/ccj/Eurogang/euroganghome.html>)

Their research found that American gang-definers could not be reliably applied to European street-gangs (Weerman, Maxson, Esbensen, Aldridge, Medina & van Gemert, 2009), and that even within one country these vary depending on factors such as being a city or rural gangs, and the ethnic make-up of the area being studied (Esbensen & Weerman, 2005) to name but two considerations. This was supported by Barrows and Huff (2009) who found that there were only two US states using the same gang-definers.

If policy makers and researchers are unable to clearly define the gang, this calls into question the validity of gang-research as participants could be inappropriately labelled. This could result in inaccurate identification of constructs studied in relation to gangs, which has consequences for the development of intervention programmes designed to prevent gang-joining and promote gang-desistence.

The Eurogang Network has attempted to rectify this problem by identifying a set of 'core gang-definers' based on European gang-research. The 'core-definers' were concluded to be a group of three

or more members, that meet consistently over a period of at least several months, that engages in and condones illegal activity, is street-orientated – i.e. spending a lot of time on the street or in public places, who are mostly between the ages of 12-25 years old, and who consider themselves to have a group identity. However the evidence-base for the reliability and validity of these in a UK adult prison population is scant; Chapter 2 of this thesis will aim to rectify this by testing the agreement between three gang-indices that research has determined are valid and reliable.

Why do people join gangs?

Returning to the need to identify the mechanisms of gang-joining in order to effect change, the Risk-Need-Responsivity model of offender assessment and rehabilitation (Andrews, Bonta & Hoge, 1990) highlights that the factors that are functionally related to offending-behaviour are those which should be targeted in intervention. In accordance with the 'Need' principle of the model it is important to identify whether the criminogenic needs of gang-members are different to those for violent-offenders. To date, only one study has looked at the differences in risk-factors for violent and gang-offenders (Esbensen, Peterson, Taylor & Freng, 2009).

More research needs to be conducted looking at these differences, Chapters 2 and 3 of this thesis will contribute to this by comparing characteristics of gang-members to non-gang-members.

Chapter 2

PRIMARY RESEARCH STUDY

***"Personality, self-esteem and attachment
in UK gang-members"***

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ABSTRACT

This study recruited 153 participants from a UK Category C prison to complete questionnaires examining whether there were differences in the personality, self-esteem and attachment style between gang and non-gang-member offenders. Information was also collected on family structure and offending. There were differences between the number of gang-members identified through the three identification methods used highlighting a need for further European research into reliable methods of gang-identification. Generally speaking there were no differences between the two groups, however gang-members were less anxious in their adult-attachment style to friends than non-gang-members, highlighting a possible protective function of the gang, and a need for gang-desistence interventions to take this into consideration.

2.0 INTRODUCTION

The 'gang problem' was discussed academically at least as early as 1927 in Social Disorganization Theory (Thrasher, 1927); the topic came to the fore more publicly in the UK as a result of the 2011 London riots following the fatal shooting of a suspected gang-member. There is evidence for high-rates of violence and weapon use in gang-members (Bennett & Holloway, 2004; Centre for Social Justice, 2009), with them also experiencing and witnessing higher levels of violence as a result of their lifestyle (Taylor, Freng, Esbensen & Peterson, 2008). Emerging evidence suggests this significantly affects their mental-health (Coid, Ullrich, Keers, Bebbington, DeStavola, Kallis, Yang, Reiss, Jenkins & Donnelly, 2013). We need to understand these individuals if we are to intervene.

Theories of Gang-membership

One of the earliest gang theories was Social Disorganization Theory (Thrasher, 1927) which suggests that during times of economic instability, social institutions (e.g. the school and family) are unable to meet the needs of youths thereby forcing them into the gang where stability can be established. One of the criticisms

of this theory is its focus on external factors, i.e. economic instability, the family and community, to explain gang-joining. If these factors were sufficient to explain the phenomenon then all juveniles in areas of economic instability would join gangs, which we know is not the case.

Strain Theory introduces the idea of psychological constructs which may account for individual differences in gang-joining. Each culture and subculture has goals to be achieved by all, however in reality only a limited number are able to achieve these. Obstacles may be external, e.g. poverty; or internal, e.g. psychological. Cohen (1955) theorised that gang-membership occurs as an expression of anger towards unobtainable societal norms, and regulates internal feelings of inadequacy, which may include anger or low self-esteem.

Common to both theories is that the person does not exist in isolation, and that individual differences may, at least in part, be mediated by the quality of our relationships with others.

Control Theory takes this into consideration (Gottfredson & Hirschi, 1990) suggesting that our attachment to others maintains positive social behaviours. Although not a 'gang theory', it could be argued that the quality of prospective gang-member attachments to primary-caregivers is poor, meaning positive behaviour may not be reinforced. The gang may be sought as an 'alternative family' (Social Disorganization Theory) where negative behaviour is reinforced as positive, and a more stable and personally acceptable sense of self can be maintained (Strain Theory).

The Current Research

Research into psychological factors associated with gang-membership in the UK is dwarfed by that conducted in the US, and the focus has remained largely on sociological and criminological factors. Differences between UK and US gangs highlighted by the Eurogang Network (Weerman et al., 2009) mean it would be irresponsible to rely on the evidence from US research. This research will seek to contribute to the developing evidence-base for psychological factors associated with UK gang-membership by empirically reviewing psychological constructs associated with the aforementioned gang theories that have been minimally

(personality and self-esteem) or not researched (adult attachment) in the UK. Research such as this contributes to our theoretical understanding of why an individual may join a gang, and consequently which factors would need to be taken into consideration in gang-desistence programmes.

Attachment

There are three main types of attachment in infancy: secure, avoidant, and disorganised (Ainsworth & Bell 1970). Those who experience a secure attachment hold a mental representation of their primary-caregiver as someone able to meet their basic needs in order to ensure survival. The infant is able to explore the world and is aware that the primary-caregiver will be available to soothe them when distressed (Main & Cassidy, 1988). Those with an avoidant attachment are consistently emotionally and physically independent of their primary-caregiver as a result of them consistently not meeting the needs of the infant. Those who form a disorganised attachment are unclear of the availability of their primary-caregiver; this develops through inconsistent responses to the infant's distress signals. Disorganised attachments are behaviourally observed in the infants' clinging behaviours when

the caregiver leaves, and rejection when available (Ainsworth & Bell 1970).

Research tells us that these early attachments provide a blueprint for future relationships; those with secure attachments generally go on to develop a positive sense of self, are able to form fulfilling relationships with others, and view the world as a safe place with opportunities (Jacobsen & Hoffman, 1997). Conversely, those with negative early attachments often develop a negative sense of self, view others as malevolent, and the world as a threatening place (Larose & Bernier, 2001). Building on Bowlby and Ainsworth's infant attachment theory, Bartholomew & Horowitz (1991) developed four categories of adult-attachment (Table 2) and a model which reflects patterns of relating to others (Figure 1). Adult attachment can be measured using Griffin & Bartholomew's (1994) Relationship Scale Questionnaire (RSQ). The RSQ was not developed to categorise people as having a particular attachment style, rather it is able to provide information relating to their orientation to a particular attachment style.

Table 2: Adult-attachment categories

<i>Secure</i>	Positive view of self, high self-esteem, experiences others as warm and accommodating, able to regulate emotions internally.
<i>Fearful</i>	Negative view of self and others, fears rejection but desires closeness to others, developed from negative abusive and rejecting parenting.
<i>Preoccupied</i>	Negative view of self and positive view of others, anxious in relationships and afraid of intimacy, develops as a result of contradictory or overinvolved parenting.
<i>Dismissing</i>	Positive view of self, negative view of others, values independence and is cynical about intimate relationships, develops as a result of detached and unresponsive parenting, has difficulty regulating emotions internally.

Figure 1: Bartholomew & Horowitz (1991) model of adult-attachment

		THOUGHTS OF SELF	
		POSITIVE	NEGATIVE
THOUGHTS OF PARTNER	POSITIVE	SECURE Comfortable with intimacy and autonomy	PREOCCUPIED Preoccupied with relationships
	NEGATIVE	DISMISSIVE Dismissing of intimacy Strongly independent	FEARFUL Fearful of intimacy Socially avoidant

If persons with insecure attachments develop an unstable sense of self and others, and a dangerous world view, it could be hypothesised that insecure attachments would be linked with violence in order to ensure survival. This has been supported by the evidence-base, to the extent that adult violent-offenders are more likely to have disorganised attachment styles (van Ijzendoorn, 1997; Fonagy, 1999). The role of attachment in gang-membership has been under-researched and the US evidence-

base has been inconsistent (Eitle, Gunkel & Van Gundy, 2004; Esbensen et al., 2009; Bell, 2007). These inconsistent findings may be explained by study-design; each of these studies used a different measure to capture strength of attachment which produced scaled data of strength of attachment but did not offer insight into how different attachment styles may be associated with gang-membership. UK gang-research shows that gangs do not provide stable relationships; there are frequent changes in leadership, high turnover, and moderate group cohesiveness (Aldridge, Medina & Ralphs, 2008), therefore attachment within the gang could be viewed as a dominance hierarchy in which violence is employed as a strategy within the gang to be the dominant figure.

All the research to date has focused on attachment to primary caregivers, to the best of the authors knowledge there has been no research published which has looked at adult attachment within the gang. This is surprising given that anecdotally gangs are often described as a 'surrogate family'. If Control Theory (Gottfredson & Hirschi, 1990) can be applied to gang-membership, where lack of healthy early attachments contribute towards development of gang-membership, it could be hypothesised that gang-members

have a more insecure adult-attachment style as our early attachments are considered fairly stable blueprints for later attachments. This assumption will be empirically tested here (Research Question 4).

This is of particular importance as gang-desistence can only be achieved by ending gang relationships in order to move away from a lifestyle associated with serious offending. This would be difficult for most, but is likely more significant for gang-members who may have become so entrenched in their lifestyle that they have sacrificed most of their non-gang attachments, or may face an on-going threat of serious violent attack by rival gangs who may not know, or care, that the individual has rescinded their gang identity. In these circumstances it could perhaps be reasonably assumed that the better option is for gang-membership to be maintained?

However, if it were the case that attachments alone were responsible for gang-joining then all those with insecure attachments would join gangs, but we know that this is not the case therefore there must be other individual differences which account for gang-joining. One such factor may be personality,

which it has been argued is not mutually exclusive from attachment (Shaver & Brennan, 1992); unstable attachments have been shown to be associated with maladaptive personality structures (Shaver & Brennan, 1992; Mickelson et al., 1997; Nofle & Shaver 2006).

Personality

Disposition and personality traits are a set of individual differences. Currently, the most widely used model of personality is the Five Factor Model (FFM; Costa & McCrae, 1992) which proposes five personality dimensions: openness to experience, conscientiousness, extraversion, agreeableness, and neuroticism.

Egan (2011) provided an overview of research examining personality characteristics associated with antisocial behaviour; the evidence-base points to the role of 'psychoticism'; i.e. high levels of tough-mindedness, hostility, aggressiveness, coldness, egocentricity, impulsivity, and low empathy (Eysenck & Eysenck, 1976; Miller & Lynam, 2001). Egan concluded that those high in psychoticism likely both cause and provoke conflict. He goes on to present findings from the FFM (Costa & McCrae, 1992) which has

also implicated lower agreeableness, openness and conscientiousness, and higher neuroticism and the excitement facet of extraversion in antisocial behaviours (Heaven, 1996; Miller, Lynam & Leukefeld, 2003; Samuels, Bienvenu, Cullen, Costa, Eaton & Nestadt, 2004).

In gang-research the focus has been on concepts which contributed more broadly to personality. Gang-members have been shown to; have less empathy (Olate, Salas-Wright, & Vaughn, 2012), experience less guilt (Friedman, Mann & Friedman, 1975; Deschenes & Esbensen, 1999; Taylor, Peterson, Esbensen & Freng, 2007; Esbensen et al., 2009), be less cooperative and attentive (Friedman et al., 1975), and hold more anti-authority values and belief in the importance of social status (Alleyne & Wood, 2010; Wood, Alleyne, Mozova & James, 2014). Gang-members are also more sanitising of their actions (Taylor et al., 2007; Esbensen et al., 2009; Alleyne & Wood, 2010), assertive (Cartwright, Howard & Reuterman, 1980) and present higher levels of trait hostility, aggression, irritability, and anger, and increased rumination after reporting negative events (Vasquez, Osman & Wood, 2012). Egan & Beadman (2011) found that antisocial personality, (consisting of high commitment to negative

peers, low self-control, low agreeableness, impulsiveness, low commitment to positive peers, high positive reinforcement from antisocial company, and low conscientiousness) predicted gang embeddedness.

More relevant to the sample here, Waugh & Glazebrook (unpublished) reviewed and synthesised the evidence for individual-factors associated with gang-membership in males aged 10-25. Five studies met the inclusion-criteria; of these, two considered psychopathy (King, 1997; Chu et al., 2014). The remaining studies were for concepts associated with personality: anger expression (Lemus & Johnson, 2008), psychoticism (Burch, 2014), and entitlement (Chu, Daffern, Thomas, Ang & Long, 2014). Psychopathy was weakly associated with gang-membership and personality only moderately associated. Some studies did not provide data that supported inclusion in their meta-analysis, this evidence-base was inconsistent (Horn, 1998; Deschenes & Esbensen, 1999; Chu, Daffern, Thomas & Lim, 2011; Weerman, 2012; Dmitrieva, Gibson, Steinberg, Piquero & Fagan, 2014).

When taken into consideration with the broader evidence-base it seems that personality is a key contributor to criminality, but possibly not gang-membership. This research will use an extension of the FFM, the HEXACO (Appendix I; Lee & Ashton, 2004); which has dimensions of Conscientiousness, Openness, Extraversion, Emotionality, Agreeableness vs. Anger, and 'Honesty and Humility', which is of particular interest in a forensic population as it is thought to be linked to offending. A full description of the HEXACO domains is in Appendix J.

Although the HEXACO is a relatively new measure that has not been used in gang-research, the honesty and humility domain in the HEXACO has been shown to be a stronger predictor of delinquent behaviours than the personality traits that form the more established FFM (Ashton, Lee & Son, 2000; Lee, Cizzarone & Ashton, 2003; Lee, Ashton & de Vries, 2005; Lee, Ashton, and Shin, 2005). Rolison, Hanoch & Gummerum (2009) found significant differences between offenders and non-offenders in five of the six HEXACO dimensions. Offenders were found to have higher levels of greed and were more likely to take advantage of others; they also experienced higher levels of fearfulness and anxiety than non-offenders. Offenders were less sociable, less

enthusiastic and optimistic, and also likely to be more confident and self-assured in social contexts. Based on their findings the authors concluded that the HEXACO would be a useful tool for studying and understanding offending populations. This research would be the first to use the HEXACO to study the personality profile of gang-members (Research Question 2).

Self-Esteem

Self-esteem is another individual construct which has been shown to be closely linked to attachment (Mickelson et al., (1997) as well as violence which has shown to be higher in gang-members than their non-gang counterparts (Metropolitan Police Intelligence Bureau Research, 2011).

Greenwald, Banaji, Rudman, Farnham, Nosek & Mellott (2002; pg. 5) defined self-esteem as "*the association of the concept of self with a valence attribute*". Self-esteem has been associated with both attachment (secure attachment = higher self-esteem; Mikulincer & Shaver, 2008) and personality (Robins, Tracy, Trzesniewski, Potter & Gosling, 2001). The lay view for the association between self-esteem and offending is that people

offend to boost low self-esteem. Research contradicts this; Baumeister, Smart & Boden (1996) concluded that violence is used to protect against threats to normal/high self-esteem, in keeping with Strain Theory.

The association between levels of self-esteem and gang-membership is ambiguous. It was not supported by Esbensen, Huizinga & Weiher (1993), Yoder, Whitbeck & Hoyt (2003) or Esbensen et al., (2009), however Dukes, Martinez & Stein (1997); Wood, Furlong, Rosenblatt, Robertson, Scozzari & Sosna (1997); Florian-Lacy, Jefferson & Fleming (2002); Kee, Sim, Teoh, Tian & Ng (2003); Winfree (2012); and Farmer & Hairston (2013) found that gang-members had lower self-esteem than non-gang-members. Perhaps interestingly, Dukes et al's., (1997) findings suggested that joining a gang temporarily improved self-esteem and that the negative associations of gang-membership led to further increase on gang-desistence, which may provide further support for Strain Theory.

Waugh & Glazebrook (unpublished) found three studies that could be included in their meta-analysis (Ferguson, 1997; Dukes & Stein,

2003; Corcoran, Washington & Meyers, 2005); a negligible association between self-esteem and gang-membership was found. However when looking at the studies which did not provide data that could be used in a meta-analysis, the evidence was inconsistent; five studies supported the association (Curry & Spergel, 1992; Wilson, 1996; Peters, 2002; Bjerregaard & Cochran, 2012; Dmitrieva et al., 2014), one provided partial support (Krohn, Schmidt, Lizotte & Baldwin, 2011), and four did not support the association (Bjerregaard & Smith, 1993; Cox, 1996; Eitle et al., 2004; Lemus & Johnson 2008).

As the gang-specific evidence base is inconsistent and there are high levels of violence reported in the gang, it might be wise to look to the violence-specific self-esteem evidence base. Unfortunately there is no clear agreement here as to whether low or high-self-esteem leads to aggression and violence. Historically, theories have associated aggression with high-self-esteem; however Salmivalli (2001) drew attention to inconsistencies with this view; for example, the critical, abusive and violent home environments and relationships that usually lead to development of aggressive behaviours are not those which usually foster high self-esteem. However she also highlighted that those who are

aggressive and violent are usually more prone to risk-taking behaviours; this is typically associated with high, not low self-esteem, which does not explain the use of violence and aggression in those with low self-esteem.

Salmivalli (2001) suggested that the association between violence and aggression and low self-esteem may be further explained by their victim group, e.g. those perceived to be weaker or more vulnerable. This suggests that violence and self-esteem is linked with status, and may explain the high-rates of violence in gang-members, e.g. territorial violence between rival gangs in order to achieve status. If this hypothesis were accurate, fluctuations in gang-members' self-esteem would be expected, e.g. low prior to joining, high if theirs is the dominant gang in their territory, and low if their gang is under threat. This hypothesis would be supported by the theorists who argue that violence and aggression are a result of threatened egotism, i.e. that violence and aggression in those with high self-esteem is mediated by challenges to an elevated self-belief (Baumeister et al., 1996; Baumeister, 1997; Bushman and Baumeister, 1998).

2.1 AIMS, RESEARCH QUESTIONS & HYPOTHESES

In light of existing research which shows little agreement between gang descriptors and identification (Esbensen, Winfree, He & Taylor, 2001; Esbensen & Weerman, 2005; Weerman, et al., 2009; Barrow & Huff, 2009) this study aimed to establish whether there was agreement in three validated methods of gang-identification: self-nomination, Eurogang core gang identifiers, and official records. Previous research specific to personality in gang-members (Egan & Beadman, 2011) has highlighted personality differences between gang-member and non-gang-member offenders, but has been less conclusive for self-esteem, which may be relating to factors such as prison status, greater collective protection, and clandestine means of boosting self-esteem through gang-activity. There is no known research to date looking at attachment within the gang. All of the aforementioned constructs have been minimally investigated, or not at all in UK gangs, this research aimed to contribute to the emerging evidence-base for the psychological profile of UK gang-members compared to their non-gang counterparts in prison.

Research Question 1: Is there agreement between the three gang-indices used in this research for a UK cohort?

Hypothesis 1: it is hypothesised that there will be low agreement between the three methods of gang-identification.

Research Question 2: Does the personality profile of gang-member offenders differ to their non-gang counterparts?

Hypothesis 2: It is hypothesised that there will be differences in the personality profile of gang-members compared to non-gang-members.

Research Question 3: Does the degree of self-esteem held by gang-members differ to their non-gang counterparts?

Hypothesis 3: it is hypothesised that gang-members will have higher levels of self-esteem than non-gang-members.

Research Question 4a & 4b: Does the adult-attachment style of gang-members to a parent/caregiver **(4a)** and friends **(4b)** differ to that of their non-gang counterpart?

Hypothesis 4a & 4b: It is hypothesised that there will be no difference between attachment styles of gang and non-gang-members to a parent/caregiver or friends.

2.2 METHOD

Sample

Participants were recruited from a Category C HMP/YOI prison in South East London (Table 3). The study site holds sentenced male offenders, (<https://www.justice.gov.uk/contacts/prison-finder/isis>).

The inclusion-criteria for the study were: male, aged 18-25 years old, and with a sufficient understanding of the English language to complete the questionnaires. The English language criterion was determined by the offender.

Table 3: Participant Demographics

	<i>GM</i> <i>(n=56)</i>	<i>NGM</i> <i>(n=71)</i>	<i>F</i>	<i>Fisher's</i> <i>Exact</i>
<i>Age (mean, SD)</i>	21.82 (1.82)	21.91 (2.08)	2.22	
<i>Ethnicity (%)</i>				7.83
<i>Black Caribbean</i>	31.25	16.44		
<i>Caucasian</i>	22.92	24.66		
<i>Black African</i>	16.67	26.03		
<i>Mixed Race</i>	10.42	16.44		
<i>Asian</i>	6.25	10.96		
<i>Black Other</i>	6.25	1.37		
<i>Other</i>	6.25	4.11		
<i>Parentage (%)</i>				1.63
<i>Separated/divorced</i>	34.62	33.33		
<i><10</i>				

Parents married	32.69	28.99
Raised by mother alone	23.08	26.09
Separate/divorced >10	5.77	10.14
Raised by father alone	3.85	1.45
Index Offence (%)		14.54*
Drugs	32.65	25.35
Violent	28	40.85
Weapons	14.29	2.82
Property	10.20	11.27
Other	6.12	0
Murder/Manslaughter	4.08	5.63
Acquisitive	4.08	11.27
Driving	0	2.82

Total Previous Offences	8.49	7.98	.28
(mean, SD)	(11.85)	(12.22)	
Drugs	1.79	.68	7.78
	(3.22)	(1.55)	
Violent	1.74	1.34	1.58
	(2.25)	(4.00)	
Property	.71	.42	3.56
	(1.31)	(.91)	
Driving	.58	.25	5.99
	(1.65)	(.68)	
Other	.39	.77	1.86
	(1.03)	(3.37)	
Acquisitive	.36	.78	3.53
	(.74)	(2.27)	
Weapons	.16	.38	3.33
	(.37)	(1.30)	
Murder/Manslaughter	.03	.00	5.92
	(.16)	(.00)	

<i>Sexual</i>	.00	.02	.97
	(.00)	(.14)	

*p<.05

Procedures and Measures

The study received ethical approval from the University of Nottingham Research and Ethics Committee (REF: I09102014 14029 SoM PAPsych DForenSci) in October 2014, and the National Offender Management Service (REF: 2014-318) in January 2015.

Seven of the eight spurs in the prison were used to recruit in this study. The induction spur was excluded on the advice of prison staff. Posters were placed on each spur advertising the study one week prior to the primary researcher approaching participants.

Participants were introduced to the researcher by a prison officer representing the "Safer Custody" or "Equality and Diversity" departments. At this first meeting a brief verbal description of the study, the requirement of participants, and information relating to anonymity and confidentiality were given; all participants were

made aware that their participation would be anonymous and confidential in order to protect against stigma associated with gang-membership, but that this would be broken in the event that information came to light regarding the participant breaking prison rules, that a crime had been committed by the study participant that the authorities were not aware of, or that harm was to come to the study participant or another person (Appendix AA). Participants were also advised that their participation or non-participation would not impact on their time in prison. Concerns were risen by the prison about the potential for prison unrest amongst those who took part in the study as a result of the potentially sensitive nature of some of the questions included in the study packs. The participant information sheet (Appendix AA) clearly stated that some of the questions were related to past relationships or experiences and that questions were general requiring participants to give a rating score to say how much this applies to them and there is no expectation of participants to describe specific events that might be upsetting. Participants were also directed to and provided contact details for the appropriate Listener on their spur, the Samaritans, or their Safer Custody Officer, and were offered debrief with the researcher. Participants were given at least 24 hours to consider participation. The

researcher visited participants a second time to obtain informed consent (Appendix AB) from those who agreed. A study pack containing two self-report measures of gang-membership (self-nomination and the Eurogang core gang-definers), and four questionnaires (see '*Independent Variables*') were left for participant to complete in their cell. Those who did not consent were asked if they had any concerns they wished to raise, and were thanked for their time. The primary researcher returned a third time, to collect completed study packs, to ask if they had any concerns, and thank persons for their participation. Of those approached, 45% either did not consent (36%) or did not return their study packs (19%).

Dependent Variable

Gang-membership (Appendix A): Two self-report measures were used; Eurogang core gang-definers (Matsuda, Esbensen & Carson, 2012) and self-nomination. The Eurogang core-definers used were (1) a group of three or more members, (2) that meet consistently over a period of at least several months, (3) that engages in (4) and condones illegal activity, (5) is street-orientated – i.e. spending a lot of time on the street or in public places, (6) who are

mostly between the ages of 12-25 years old, (7) and who consider themselves to have a group identity. Self-nomination was determined by responding 'yes' to the question "*are you in a gang?*". Both have been empirically tested as reliable measures (Medina, Aldridge, Shute & Ross, 2013; Esbensen et al., 2001). Official prison records were used as a third identifier, aimed at overcoming the bias of self-report measures.

Independent Variables

Attachment (Appendix B & C): The Relationship Scales Questionnaire (RSQ; Griffin & Bartholomew, 1994) is a 30 item questionnaire in which respondents indicate on a five-point Likert scale how much a statement about close relationships applies to them. Mean scores are calculated for each attachment category. The RSQ was used as it can be applied to non-romantic relationships. Participants completed an RSQ for parent/caregiver and friends. Examples of questions include: "*I find it difficult to depend on other people*" and "*it is very important to me to feel independent*". The RSQ has moderate internal-consistency, alpha levels range from .41 for the secure attachment style, to .70 for the dismissing attachment style (Griffin & Bartholomew, 1994).

Self-Esteem (Appendix D): The Rosenberg Self-Esteem Scale (RSE; Rosenberg, 1965) is a 10-item measure of global self-esteem. Respondents rate how strongly they agree with a statement on a 4-point Likert scale. Examples of questions include: *"I am able to do things as well as most other people"* and *"I feel I do not have much to be proud of"*. Previous studies have reported good internal reliability, alpha levels range from .72 to .88 (Gray-Little, Williams & Hancock, 1997).

Personality (Appendix E & F): The HEXACO-60 (Ashton & Lee, 2009) is a 60 item questionnaire that uses a five-point Likert scale for respondents to indicate how strongly they agree with statements of self-representation. Scores are calculated for the six personality dimensions. Examples of questions include: *"I would be quite bored by a visit to an art gallery"* and *"Having a lot of money is not especially important to me"*. The scale has been validated for use in an offending population, alpha levels range from .62 to .84 (Rolison et al., 2013). The HEXACO-60 is a relatively new tool being used in offender research, which may be

a limitation in itself, however it has been shown to be valid and reliable for use in an offending population.

Analysis

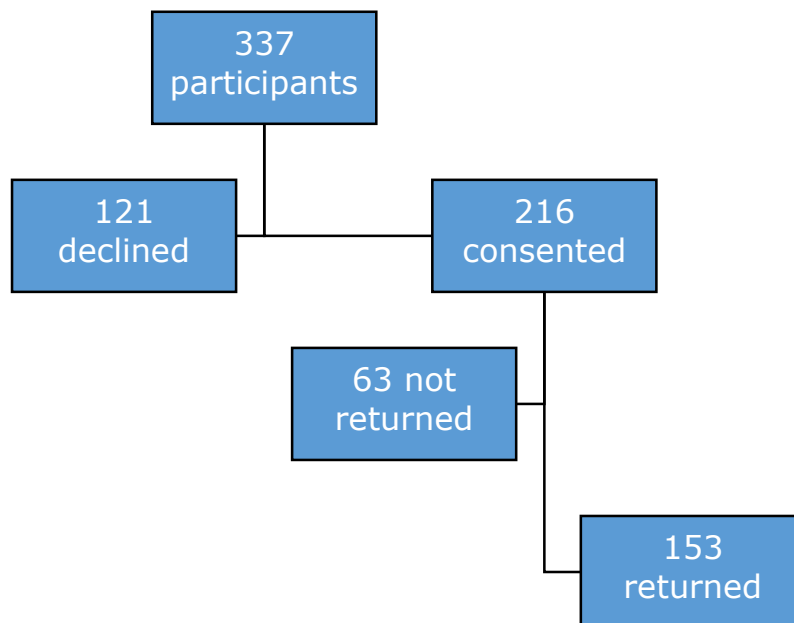
A priori power calculations were conducted using appropriate conventions for multivariate analysis of variance. At an alpha level of .05 with 80% power, a total of 52 participants were required to detect a statistically significant difference between groups with a large effect-size ($f = .40$).

Statistical analysis was carried out using a computer run Statistical Package for the Social Sciences (IBM SPSS Statistics Version 22). Effect-sizes were calculated based on means and standard deviations of group and control participants (Field, 2000).

2.3 RESULTS

Of the 337 potential participants approached, 64% consented to participate, of which 70.8% returned completed questionnaires, which was just under half (45%) of the total potential cohort (Figure 2).

Figure 2: Participant Movement



The most frequent scale not completed was the RSQ for friends (41% not completed). As questionnaires were always in the study pack with the RSQ for friends behind the RSQ for parent/caregiver, it is likely participants thought this had been

erroneously duplicated. Other rates of completion were 95% (RSE), and 92% (RSQ Parent/Caregiver and HEXACO-60).

Where less than 10% of the data was missing, data was imputed using linear interpolation. This was the case for the RSE, RSQ parent/caregiver subscales, and the HEXACO subscales.

Reliability

Reliability analysis for the independent variables was conducted using alpha reliability (Table 4). Several of the measures and subscales used did not meet the threshold for being 'acceptable' for use here, however there is argument for this being justified due to theoretical importance of the research (Tavakol & Dennick, 2011).

Table 4: Reliability of Measures Used

<i>Measure</i>	<i>Cronbach's Alpha</i>	<i>Interpretation</i>
<i>RSE</i>	.56	Poor
<i>RSQ</i>	.64	Questionable
<i>Parent/Caregiver</i>		
<i>RSQ Friend</i>	.69	Acceptable
<i>HEXACO Honesty- Humility</i>	.55	Poor
<i>HEXACO Emotionality</i>	.68	Acceptable
<i>HEXACO Extraversion</i>	.71	Good
<i>HEXACO</i>	.70	Good
<i>Agreeableness</i>		
<i>HEXACO</i>	.76	Good
<i>Conscientiousness</i>		
<i>HEXACO Openness to Experience</i>	.69	Acceptable

RESEARCH QUESTION 1: AGREEMENT OF GANG IDENTIFIERS

Fleiss' Kappa was run to determine if there was agreement between the three methods of gang-membership. There was minimal agreement between the three methods, Fleiss' Kappa = -.05. Only seven participants self-nominated as a gang-member so this was determined an unreliable method of gang-identification. As both self-report measures of gang-membership were unsuccessful, subsequent analysis was conducted with only gang-members identified by official records coded as gang-members, and all other participants were coded as non-gang-members.

Tests of Normality

Normality was determined by calculating kurtosis and skewness for each independent variable. Values of ≤ 2.0 are acceptable to assume normal distribution (George & Mallery, 2010). All values were ≤ 2.0 therefore data was assumed to be normally distributed and parametric statistical analyses were conducted.

Table 5: Descriptive Statistics of Measures Used

<i>Measure</i>	<i>Mean (SD)</i>
<i>RSE</i>	18.03 (5.20)
<i>RSQ Parent/Caregiver Secure</i>	3.68 (.93)
<i>RSQ Parent/Caregiver Fearful</i>	2.90 (.89)
<i>RSQ Parent/Caregiver Preoccupied</i>	2.26 (.68)
<i>RSQ Parent/Caregiver Dismissing/Avoidant</i>	3.68 (.71)
<i>RSQ Friend Secure</i>	3.16 (.58)
<i>RSQ Friend Fearful</i>	2.96 (.88)
<i>RSQ Friend Preoccupied</i>	2.31 (.74)
<i>RSQ Friend Dismissing/Avoidant</i>	3.66 (.65)
<i>HEXACO Honesty-Humility</i>	2.94 (.58)
<i>HEXACO Emotionality</i>	2.62 (.60)
<i>HEXACO Extraversion</i>	3.44 (.60)
<i>HEXACO Agreeableness</i>	3.00 (.40)
<i>HEXACO Conscientiousness</i>	3.47 (.64)
<i>HEXACO Openness to Experience</i>	3.16 (.68)

Demographics (Table 3)

There were 56 (42%) gang-members and 76 (58%) non-gang-members recruited. Gang-identification was missing for 21 participants; their data was not included in further analysis. There was no significant difference in age. Independent samples t-tests and Fisher's Exact analysis were used to determine whether there were significant differences between gang and non-gang-members in each of the demographic items. There were no significant differences between groups with the exception of category of index offence committed by gang and non-gang-member offenders; $\chi^2 (7, N=120) = 14.54, p < .05$. This was controlled for in the subsequent analysis.

RESEARCH QUESTION 2: DIFFERENCES IN PERSONALITY CONSTRUCT

A multivariate analysis of variance (MANOVA) was conducted to determine whether there were significant differences between gang-members and non-gang-member offenders in each of the six HEXACO domains, controlling for index offence committed. No significant differences were found between personality traits of gang and non-gang-members (Table 6).

Table 6: Differences Between Gang-Members & Non-Gang-Members in HEXACO Scores

	<i>Mean (SD)</i>		<i>F</i>
	<i>GM</i>	<i>NGM</i>	
	<i>(n=49)</i>	<i>(n=71)</i>	
<i>Honesty-Humility</i>	2.99 (.47)	2.88 (.60)	.78
<i>Emotionality</i>	2.65 (.53)	2.63 (.65)	.06
<i>Extraversion</i>	3.46 (.60)	3.38 (.61)	.14
<i>Agreeableness</i>	3.06 (.65)	2.97 (.62)	.37
<i>Conscientiousness</i>	3.55 (.58)	3.39 (.66)	1.85
<i>Openness to Experience</i>	3.12 (.60)	3.17 (.74)	.68

*p<.05

RESEARCH QUESTION 3: DIFFERENCES IN SELF-ESTEEM

An analysis of variance (ANOVA) was conducted to determine whether there were significant differences between gang-member and non-gang-member offenders in levels of self-esteem, controlling for index offence committed. No significant differences were found between levels of global self-esteem for

gang and non-gang-members (Table 7), both groups had healthy self-esteem levels.

Table 7: Differences Between Gang-Members & Non-Gang-Members in Rosenberg Self-Esteem Scale Scores

	<i>Mean (SD)</i>		<i>F</i>
	<i>GM (n=49)</i>	<i>NGM (n=70)</i>	
<i>Self-Esteem</i>	17.92 (5.43)	18.29 (5.30)	.18

*p<.05

RESEARCH QUESTION 4: DIFFERENCES IN ATTACHMENT STYLES

A multivariate analysis of variance (MANOVA) was conducted to determine whether there were significant differences between gang-members and non-gang-member offenders in attachment orientation to both primary-caregiver and friends, controlling for index offence committed. There were no significant differences between gang and non-gang-members in attachment to primary-caregiver (Table 8). However there was a significant difference between gang and non-gang-members in attachment to friends. Gang-members had significantly less fearful

attachments to their friends compared to non-gang-members (Table 8) with an effect-size approaching moderate (Cohen's $d = .45$).

Table 8: Differences Between Gang-Members & Non-Gang-Members in Relationship Scale Questionnaire Scores

	<i>Parent/Caregiver</i>			<i>Friends</i>		
	<i>Mean (SD)</i>		<i>F</i>	<i>Mean (SD)</i>		<i>F</i>
	<i>GM</i>	<i>NGM</i>		<i>GM</i>	<i>NGM</i>	
	<i>(n=49)</i>	<i>(n=71)</i>		<i>(n=35)</i>	<i>(n=39)</i>	
<i>Secure</i>	3.52 (.85)	3.74 (.94)	1.24	3.22 (.60)	3.17 (.63)	.35
<i>Fearful</i>	2.90 (.81)	2.96 (.95)	.27	2.72 (.81)	3.09 (.85)	4.40*
<i>Preoccupied</i>	2.31 (.62)	2.18 (.70)	.34	2.42 (.60)	2.33 (.74)	.15
<i>Dismissing/ Avoidant</i>	3.63 (.76)	3.69 (.72)	.64	3.51 (.57)	3.70 (.71)	1.65

* $p < .05$

Based on the differences observed within groups in attachment style a repeated measures MANOVA was conducted to determine whether these were significant between and within groups and within groups (gang vs non-gang). Results showed no significant differences between groups in attachment style; Wilks Lambda (2, 80) = .99; $F = .44$, $p > .05$. There were also no significant differences in attachment style within groups when comparing gang-members to non-gang-members; Wilks Lambda (6, 76) = .96; $F = .50$, $p > .05$. However there were significant differences within groups in attachment style; Wilks Lambda (2, 80) = (6, 76) = .32; $F = 26.91$, $p < .001$.

2.4 DISCUSSION

In this study three gang-indices were tested to distinguish gang-member from non-gang-member offenders. Poor agreement was found between the self-report indices so official records were used for gang-identification here. Analysis showed the measures included were meaningful. Potential differences in the psychological profiles of gang and non-gang-member offenders were examined, looking specifically at personality, adult-attachment to a parent/caregiver and friends, and self-esteem. Broadly speaking, there were no differences between

the two groups with the exception of adult-attachment to friends, with gang-member offenders being less fearful in their attachments.

Although previous research has shown self-nomination (Esbensen et al., 2001) and the Eurogang method (Medina et al., 2013) as valid and reliable methods of gang-identification, this was not the case here. Only 12.5% of those officially recorded as gang-members by the prison self-nominated, and it is known that some of these were not officially recorded gang-members. 43% of those officially recorded by the prison as gang-members were also identified through the Eurogang method.

Lack of agreement between the gang-indices may be a result of lack of agreement between offenders and official bodies in what constitutes a 'gang-member'. Gang-members may not view themselves as being in a gang, rather they view the group as their friends. Respondents may have been erroneously labelled a gang-member as a result of gang-stereotypes, alternatively these individuals are in a gang but do not agree with the gang-label as a result of the negative consequences, e.g. stigmatisation. An alternative explanation may be the sample

used; gang-members in prison may not want to identify themselves as a gang-member because of perceived negative consequences, e.g. restrictions imposed as a result of increased security risks. Statistics have shown the ages of gang-member to range from 10-19 (Sharp et al., 2006) and 12-25 (Mares, 2000), therefore it is possible that the gang-members in this study may represent gang elders with a more entrenched gang-lifestyle that have moved towards serious organised gang crimes, therefore gang identifiers such as being street-oriented do not apply.

This research has been the first to look at adult attachment style within the gang and findings here suggest that gang-members are more trusting of their friends, more likely to perceive their friends as being able to provide them with physical safety, and to meet their emotional needs compared to non-gang-member offenders. This suggests that the gang may provide a protective function and fulfilling relationship. Research is beginning to focus on the victimisation and mental-health consequences of gang-membership (Taylor et al., 2008; Coid et al., 2014). Gang-membership may be reinforced through its protective function, particularly in view of likely increasing isolation from prosocial society. If the gang is protective, interventions aimed

at gang-desistance should focus on identifying and strengthening other attachments which would ensure safety and emotional needs can be met as well as within the gang. This would be in accordance with the 'What Works' in offender rehabilitation literature, which advocates a 'Good Lives' approach (Ward & Brown, 2004) model which views offending as a maladaptive means of achieving goals.

The attachment profile for gang and non-gang-members in this sample were similar; both gang and non-gang-members were more likely to be secure or dismissing/avoidant in their attachment to both primary-caregiver and friends. Those with a secure attachment style tend to view themselves in a positive light, have high self-esteem, experience warmth and reciprocation in their relationships, and are able to regulate their emotions internally. Those with a dismissing/avoidant attachment style also have a positive view of the self, however they have a negative view of others, are cynical about the need for relationships or dependence on others, and they also have difficulty in regulating their emotions internally. The findings in this sample for dismissing/avoidant attachment styles is in keeping with the evidence-base for that of violent-offenders (van Ijzendoorn, 1997; Fonagy, 1999). Focusing specifically on

gang-members as is the scope of this thesis, these findings suggest that, at least for some gang-members, the gang is not to be fully trusted and may be reflective of a dominance hierarchy in which violence is used within the gang in order to maintain a higher status. The orientation towards secure attachments in this sample is perhaps surprising, it is possible that this is reflective of only some elements of the secure attachment style, e.g. high self-esteem and viewing the self in a positive light, which are features of both secure and dismissing/avoidant attachment styles, and is less reflective of how the sample relates to others. A final alternative explanation common to research with offenders may be response bias, i.e. wanting to present the self as being without difficulties.

2.5 LIMITATIONS

This study was conducted with a restrictive sample, therefore these findings may not be applicable to offenders outside of this age range, or female offenders.

There are limitations to the gang identification approaches used here. Some of the Eurogang core-definers such as '*spends time in public spaces*' may not be applicable to the older gang-members represented in this study. These are more likely to be

core gang-members and it is the younger fringe gang-members who are more likely to be involved in street based activity such as drug dealing. Self-nomination is open to bias, in particular when used in prison research as there may be consequences to identifying as a gang-member e.g. increased security risks associated with these prisoners perceived by the prison and therefore additional restrictions put in place to maintain safety and security in the prison. Official records may over-identify gang-members, e.g. those who do not have gang affiliation but are with their friends who are gang-members at the time a crime is committed and are therefore considered 'gang-member by association'; for example, under 'joint enterprise'. Reliance on using official records could also erroneously exclude gang-members who have yet to come into contact with official bodies, this could include those entrenched gang 'elders' who are at the top of the gang hierarchy and are therefore removed from the day-to-day 'gang business' which may result in attention from criminal justice agencies, or this may include those who operate on the fringe of the gang and have yet to become so involved in the aforementioned gang activities which would attract the attention of criminal justice professionals.

Limitations to the RSQ include the transparency of the measure, i.e. that it measures conscious awareness of attitudes and behaviours relating to attachment, and therefore respondents may introduce bias by wanting to present their relationships as being healthier than they are. An alternative to this self-report questionnaire method which may overcome some bias would be an interview style measures such as the Adult Attachment Interview (George, Kaplan & Main, 1985). The benefit of this approach is that respondents are asked to describe specific events from their childhood with the interview then being coded for the quality of their description content, including the coherence of recalled events. However there are major practicalities with regard to using this approach in a prison sample, this includes the additional security clearance required to use the required recording equipment in prison, as well as the requirement of a private room with which to hold the interviews, and the subsequent need to move prisoners around the prison for the purpose of research which may not be in the best interests of the running of the prison. Finally, interview approaches such as this have approximately a one hour time requirement from prisoners. Taking into consideration all of these factors it was not within the scope of this research to use an interview approach to measuring adult attachment.

Whilst the RSE is a scale that rates amongst the highest in terms of validity and reliability in self-esteem measures, it is still open to self-report bias which is particularly problematic when conducting research with an offending population who may wish to present themselves in a more desirable light. This could have been overcome with the use of a measure which included a measure of response style, e.g. the Culture Free Self-Esteem Inventory (Battle, 1992) as this includes a 'lie scale' which indicates whether respondents are being accurate in their responding. Although this would not have prevented deception, it may have acted as an indicator of how reliable responses were. This risk of bias also applies to use of the self-report HEXACO-60 measure of personality.

Some sample attrition may not include deeply entrenched gang-members who choose to maintain a code of silence and non-engagement. The length of questionnaires may have contributed to this; efforts were made to select shorter questionnaires but the time commitment sought from participants meant drop-out was inevitable. There may have been characteristics of non-completers which contributed to findings; unfortunately it was not possible to obtain this data.

Despite the limitations reported, including difficulties retaining participants, it was possible to recruit a large sample to investigate a controversial topic. This research has contributed to the ongoing European research on the reliability of gang-identification. Although broadly speaking no significant differences were found, gang-members were less anxious in their attachments to their friends suggesting a protective function of the gang. This research has contributed to the existing evidence-base, providing a psychological profile of offenders that supports the use of interventions which advocate for using a strengths based approach.

Chapter 3

META-ANALYSIS

***"Individual-factors associated with gang-membership:
A systematic-review and meta-analysis"***

Word count including tables and figures: 9268

ABSTRACT

This systematic-review and meta-analysis aims to report on the strength of association between 'individual' risk-factors and gang-membership. 43 studies were included in total; standardised mean differences for ten individual risk-factors were calculated in 16 studies: delinquency, violence, substance-use, personality, internalizing and externalizing-behaviours, psychopathy, self-esteem, negative life-events, and limited opportunities. Comparisons were also made between cohort and cross-sectional study-designs. Overall, violence, delinquency and substance-use had the strongest associations with gang-membership; in cohort-studies strength of association for externalizing-behaviours increased, however delinquency and violence decreased, and substance-use was no longer associated. Conversely in cross-sectional studies this decreased for externalizing-behaviours, and increased for delinquency and violence. These findings highlight those factors which may be considered 'true' risk-factors for gang-membership, and those which are likely exacerbated by gang-joining.

3.0 BACKGROUND

How do we identify "The Gang"?

The Eurogang network developed a set of key questions corresponding to the core-definers obtained from European gang research that can be used independently of their measure, the 'Youth Survey', to identify gang-members in research. Medina et al., (2013) empirically tested the validity of the Eurogang definition and were able to identify a homogeneous delinquent youth group within their sample that could be classified as a gang, whose characteristics corresponded highly with the Eurogang core-definers and high-moderately with Eurogang descriptors (supplementary elements that may characterise the specifics of the individual gang, e.g. wearing a particular colour). The authors proposed that these definers may be a more valid method of detecting gang-members for the purpose of research than the alternative method of self-selection, i.e. "are you a member of a gang?"

Self-selection seems to be the most commonly used approach; the validity of this was researched by Esbensen et al., (2001); participants were asked (1) "*have you ever been in a gang?*" and (2) "*are you now in a gang?*" The authors found that those

who self-nominated as gang-members engaged in significantly more antisocial behaviour, and concluded that self-selection was a valid measure of gang-membership.

An alternative approach is official records, however, both the Eurogang Network and Esbensen et al., (2001) highlighted the problems associated with this approach. For example, official bodies have different priorities to gang-researchers and so may not always record a crime as gang-related, resulting in gang-members not being consistently captured in crime statistics. An example of this was provided by Esbensen et al., (2001); where a 'gang task force' and researchers identified different numbers of female gang-members in the same group of individuals (none vs. approximately half respectively). That is not to say that official-reports should not be used to identify gang-members, they may be useful in identifying duplicitous gang-members who do not want to cooperate with research, however official-reports might be best used as supplementary information.

Why do people join gangs?

Risk-factors are personal or situational characteristics that can render an individual more likely to develop an outcome. To be

a true risk-factor, a variable must act independently to increase the likelihood of, and be present prior to the development of an outcome. This review focuses on individual risk-factors; these include biological and psychological factors which may account for youth-gang-membership, drawing comparisons between gang-members and violent-offenders, to identify whether there are different mechanisms which precipitate gang-joining to those associated with violence.

O'Brien, Daffern, Chu & Thomas (2013) drew these comparisons in their review of risk and protective factors for gang-membership. However a scoping exercise for this review, identified additional individual risk-factors. This review also takes the additional step of conducting a meta-analysis, which will synthesise the results of the studies included in the review and provide a more reliable estimate of the weight of each of the risk-factors in predicting gang-membership. These findings will then be compared to the findings from Hawkins, Herrenkohl, Farrington, Brewer, Catalano & Harachi's (1998) review of predictors of violent-offending to identify whether there are any differences in the individual risk-factors for gang-membership and violence.

Existing Systematic-reviews

Klein & Maxson (2006) conducted a systematic-review of risk-factors for gang-membership in all five risk domains (individual, school, peer, family, and community) with both males and females; gang-membership was identified by self-selection. The individual risk-factors identified are in Table 9. Risk-factors included in fewer than three studies were excluded. This may explain why some of the individual risk-factors identified in the scoping exercise for the present review and in Howell & Egley's (2005) non-systematic-review were not included in their review. They concluded that non-delinquent, problem behaviours (e.g., reactivity, aggressiveness, and impulsivity), which can also be referred to as 'externalizing-behaviours', and negative life-events were the most supported individual risk-factors for gang-membership. The evidence for delinquent beliefs as a risk-factor was 'mostly supported'; the remaining risk-factors were either 'inconclusive' or 'mostly not supported'.

O'Brien et al's., (2013) systematic-review included both male and female gang-members, employing a systematic search criterion. The authors did not explicitly state how the variable of gang-membership was defined, however they did highlight definitional issues and referred to both 'self-selection' and the

Eurogang definition as valid methods of gang-identification. A number of individual risk-factors for gang-membership were identified (Table 9); however their review of the literature did not include a number of the individual risk-factors that were identified by Howell & Egley (2005). Howell & Egley (2005) did not report a threshold for the number of studies that determined inclusion in their review, so it is unclear as to whether this explains the differences in risk-factors included.

Neither Klein & Maxson (2006) nor O'Brien et al., (2013) reported statistical analysis of effect-sizes for risk-factors based on their synthesis.

Table 9: Existing reviews of 'individual' risk-factors

<i>Klein & Maxson (2006)</i>	<i>O'Brien et al., (2013)</i>	<i>Howell & Egley (2005)</i>
Negative life-events ¹	Negative life-events*	Life stressors
Self-Esteem ⁴	Self-Esteem	
Delinquent beliefs ²	Delinquent beliefs*	Antisocial or delinquent beliefs
Attitudes towards the future ³	Attitudes towards the future	
Internalizing-behaviours ³ (anxiety, withdrawal, depression)	Internalizing-behaviours (anxiety, withdrawal)	Depression
	General delinquency involvement	General delinquency involvement
Limited involvement in conventional activities ³	Limited involvement in conventional activities	
	Violence involvement	Violence involvement
		Aggression or fighting

	Conduct Disorder
Non-delinquent problem behaviours ¹	Non-delinquent problem behaviours* Externalising behaviours (disruptive, antisocial, or other conduct disorders)
	Early dating
	Precocious sexual activities
	Hyperactivity
	Alcohol or drug use
	Early marijuana use and early drinking
	Poor refusal skills

* O'Brien et al., (2013) indicate good support from previous research.

¹ consistently supported

³ inconclusive

² mostly supported

⁴ mostly not supported

3.1 AIMS & OBJECTIVES

In order to develop effective interventions, it is important to identify the risk-factors associated with gang-membership, and whether any of these are unique to gang-members compared to non-gang-members who engage in delinquent behaviours as this would indicate different criminogenic needs.

This review will:

- (1) Synthesise the evidence identifying which individual risk-factors have been associated with gang-membership.
- (2) Compare the synthesised findings to Hawkins et al., (2000) to identify similarities and differences between individual risk-factors for gang-membership and violence.

3.2 METHOD

Inclusion-criteria

The inclusion and exclusion-criterion (Table 10) for this review were applied to all articles identified in the systematic search by reading the article abstract. If sufficient information was not obtained from this to make an informed decision, the sample,

methods, and measures were cross-checked against the inclusion and exclusion-criteria. Only studies that met all of the inclusion-criteria and none of the exclusion-criteria were assessed for risk of bias. The review was restricted to male gang-members to control for potential differences between male and female gang-members (Bjerregaard & Smith, 1993; Dukes & Stein, 2003).

Table 10: Inclusion and exclusion-criteria

<i>POPULATION</i>	Male
	Aged 10-25 years
<i>EXPOSURE</i>	Gang-membership
<i>COMPARATOR</i>	Non-gang-member offenders
	Non-gang-member non-offenders
<i>OUTCOME</i>	Attitudes towards the future
	Delinquency
	Externalizing-behaviours
	Internalizing-behaviours
	IQ
	Limited involvement in conventional activities
	Mental disorder

	Negative life-events
	Personality
	Self-Esteem
	Substance-use
	Violence
<i>STUDY-DESIGN</i>	Cohort/Longitudinal
	Cross-sectional
<i>LANGUAGE</i>	English language
<i>DATE OF</i>	No restrictions
<i>PUBLICATION</i>	
<i>EXCLUSIONS</i>	Qualitative study-design
	Cross-sectional survey only reporting prevalence of risk-factors
	Studies without a comparator group

Cohort-studies are the 'gold-standard' for studying risk-factors as it is possible to identify a temporal relationship between the exposure (risk-factors) and the outcome (gang-membership). In order to widen the number of studies that met the inclusion-criteria, cross-sectional studies that compared the presence of risk-factors in gang to non-gang-members were also included. A comparison of the two study-designs was made to identify if there were differences in the risk-factors identified in

longitudinal and cross-sectional studies as recommended by Klein & Maxson (2006) in their systematic-review.

Although the Eurogang Network definition of a youth-gang indicates membership between the ages of 12 and 25 years, there is research suggesting that youths as young as 10 years old have been identified as gang-members (Centre for Social Justice, 2009). Therefore the review included studies of gang-members aged between 10 and 25 years.

Studies without a comparison group were not included as they do not demonstrate differences in risk-factors between the two groups.

Only studies in the English language were included.

No date restrictions were placed on the search as reviews of gang theory date back to 1927 (Social Disorganization Theory, 1927).

Sources of literature

Electronic Bibliographic Databases

A search of the following databases was conducted using the following search terms to identify existing systematic-reviews:

a) Cochrane Library completed on 07/07/2014

“Gangs” – 2 identified, neither relevant.

b) Campbell Library completed on 07/07/2014

“Gangs” – 2 identified, neither relevant.

c) EPPI centre library completed on 07/07/2014

“Gangs” – 1 identified, not relevant

As none of the systematic-review databases identified an existing review that warranted discontinuation of this review a search of the following databases was conducted:

d) OVID: PsycINFO (1806 to July Week 2 2014, completed 14/07/2014)

e) Elsevier: Science Direct; Nursing and Health Profession, Psychology, Social Sciences (All dates to present, completed 14/07/2014)

f) Thomson Reuters: MEDLINE, Web of Science (All dates to present, completed 22/09/2014)

- g) OVID: EMBASE (1980 to 2014 Week 38, completed 22/09/2014)
- h) ProQuest: NCJRS; (All dates to present, completed 20/10/2014).

Systematic-reviews

Two systematic-reviews (Klein, & Maxson, 2006; O'Brien et al., 2013) and one non-systematic-review (Howell & Egley, 2005) were identified from the database search. The references of these reviews were cross-checked against the systematic search conducted in this review to identify any other research that met the inclusion-criteria for this review.

Experts in Gang-research

Professor F-A Esbensen (University of Missouri-St. Louis), Dr F van Gemert (VU University), Professor C Maxson (University of California, Irvine), Dr F Weerman (Netherlands Institute for the Study of Crime and Law Enforcement), Dr J Aldridge (University of Manchester), Dr J Medina (University of Manchester), Dr D Pyrooz (College of Criminal Justice), and Dr A Higginson (Institute for Social Science Research) were contacted via email as experts in the field to obtain unpublished publications. One

article was suggested for inclusion; this had already been identified in the systematic search.

Search Strategy (search terms)

("Gangs" or "Youth gangs" or "Troublesome Youth Groups" or "Delinquent Youth Groups" or "Juvenile Gangs")

AND

("Attitudes towards the future")

OR

("Delinquency" or "Juvenile Delinquency" or "Delinquent Belief" or "General Delinquency")

OR

("Externalizing Behaviour" or "Externalizing Behavior" or "Externalising Behaviour" or "Externalising Behavior" or "Externalizing" or "Externalising" or "Hyperactivity" or "Hyperactive" or "Impulsivity" or "Impulsive" or "Aggression" or "Aggressive")

OR

("Internalizing Behaviour" or "Internalizing Behavior" or "Internalising Behaviour" or "Internalising Behavior" or

“Internalizing” or “Internalising” or “Anxiety” or “Anxious” or
“Withdrawal” or “Withdrawn” or “Depression” or “Depressed”)

OR

("IQ" or "Intelligence Quotient" or "Intellectual Functioning" or
"Intelligence" or "Intellectual Impairment")

OR

("Limited involvement in conventional activities")

OR

("Mental Disorder" or “Psychosis” or “Schizophrenia” or
"Personality Disorder" or "Conduct Disorder" or "Psychopathy"
or "Psychopathic Personality")

OR

("Negative life event\$" or “Stress” or “Victimisation” or
“Victimization”)

OR

("Personality" or "Personality traits" or "Five Factor Model of
Personality")

OR

("Self-Esteem" or "Self-concept")

OR

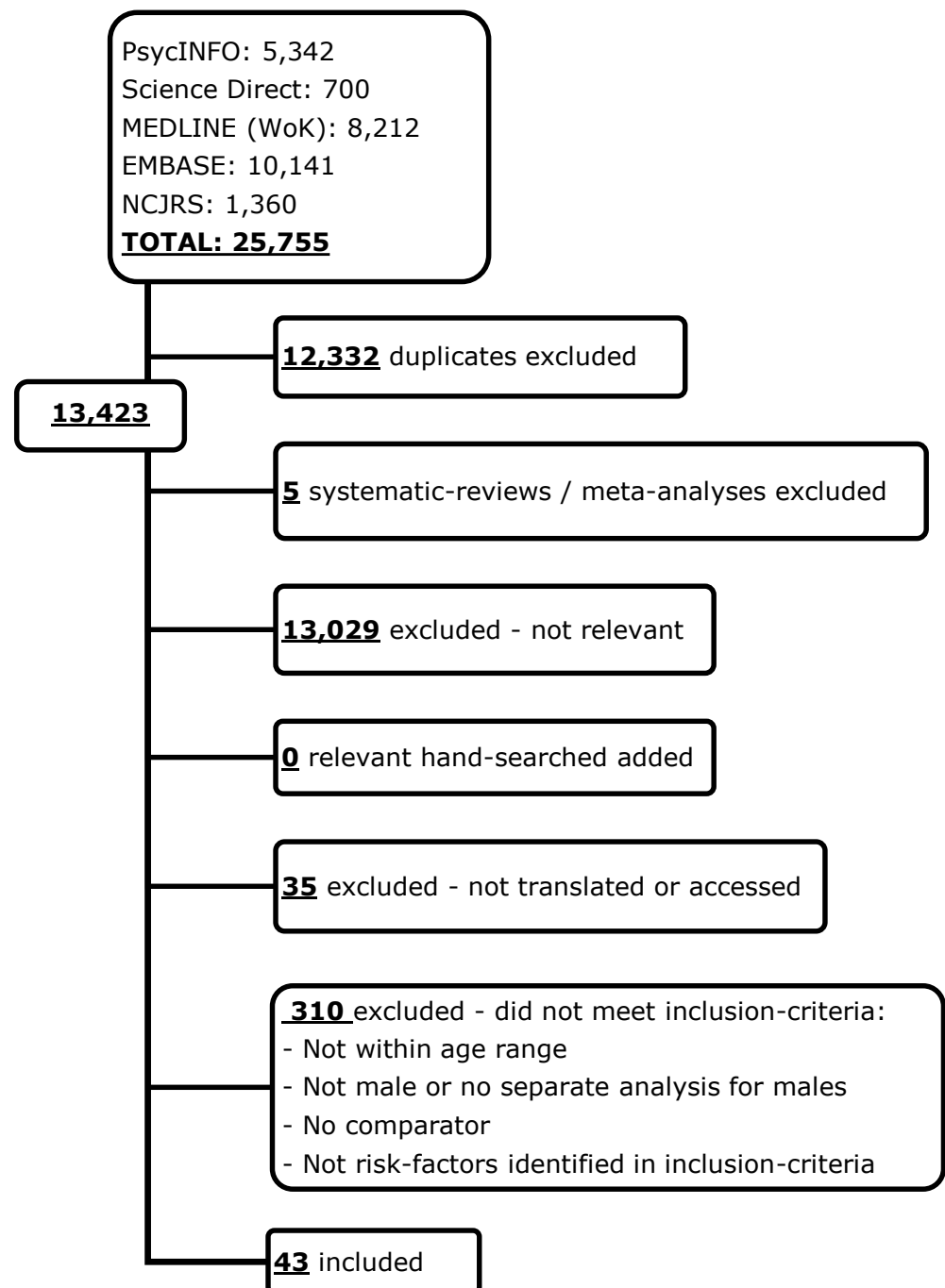
("Substance Misuse" or "Alcohol" or "Drug\$")

OR

("Violence" or "Violent Behaviour")

Searches returned the results in Figure 3.

Figure 3: Study selection



Risk of Bias

Included studies (n=43) that met all of the inclusion-criteria and none of the exclusion-criteria underwent assessment for risk of bias (Appendix G).

Risk of bias forms for cohort and cross-sectional studies were based on a Cochrane Collaboration Risk of Bias Assessment Tool: for Non-Randomized Studies of Interventions (ACROBAT-NRSI; Sterne et al., 2014). This was determined for sampling-bias, attrition-bias, measurement-bias and reporting-bias. Low risk of bias was marked green, unclear or moderate was marked amber, and high was marked red.

Sampling-bias was assessed from the sample recruited, e.g. how broad was the age range and ethnic representation of study participants, did the study recruit from an offending or community population? Studies that recruited from an offending population were determined to have a higher level of bias than those recruited from the community or schools. This is based on the vast evidence-base for the association between the risk-factors included in this review and general offending/antisocial behaviours. Sampling-bias also considered whether enough

participants were recruited to detect a significant difference at an appropriate power level, e.g. 80%, as is statistical convention (Gelman & Hill, 2007). In the event that a power calculation was not reported, 65 participants was deemed acceptable as this is a sufficient 'n' per group to detect a difference of half a standard deviation away from the mean. This criterion was only applicable to the systematic-review as sample-sizes are pooled in a meta-analysis.

Attrition-bias was determined by the number of participants recruited to the study from those approached, and the number that withdrew from the study. According to Evans (1991) a response rate of 80% is desired, all studies with a recruitment rate $\geq 80\%$ were deemed low attrition-bias risk.

Measurement-bias was assessed against whether the measures used for the target exposure and outcome variables were reliable. This was determined by conventions for alpha levels, i.e. Cronbach's alpha $\geq .70$ were considered reliable, $\geq .60$ were considered questionable, and $\leq .59$ were considered unacceptable (George & Mallery, 2003). In the event that reliability and validity were not reported, measurement-bias was rated as unclear.

Reporting-bias was determined by analysis used (based on study-design and sample-size), whether the authors had controlled for extraneous variables (e.g. multivariate analysis), whether studies had a large proportion of missing data ($\geq 20\%$) and how this had been managed, and whether the conclusions made were appropriate based on the statistical findings and study characteristics (e.g. reporting cause and effect in a cross-sectional study would be considered reporting-bias as it is not possible to determine a temporal relationship using this study-design). Generalising conclusions to the wider gang population when the study sample was of one ethnicity and a restrictive age group would be another example of reporting-bias. Less weight was given to reporting-bias as this does not impact on the data obtained from the study which is being commented on in this review and analysis.

Inter-rater reliability of the tool was assessed by cross-referencing 10% of those included with an independent-rater who was familiar with research and study-design.

Data-extraction (Appendix J¹) was performed prior to inputting data into RevMan (2014), a computer based meta-analysis programme, which calculated standardised mean differences, 95% confidence intervals and aggregated effect-sizes.

3.3 RESULTS

Description of Studies

Appendix I provides an overview of all of the studies that met the inclusion-criteria for this review (see Appendix H for a full list of studies and their corresponding study ID). Overall, 43 studies were included; 16 provided sufficient data to be included in a meta-analysis.

Most of the studies were conducted in America (80%), with only three (8.6%) being conducted in a non-Western country. The review will therefore not be generalizable to non-Western countries. The studies conducted in America were conducted with participants of Caucasian, African-American and Hispanic/Latino-American origin, which improves

¹ Data-extraction was only performed for variables identified in the review inclusion-criteria

generalisability within Western countries. For a full description of the sample and measures used see Appendix J.

This review included both cohort and cross-sectional studies (n=33) because a limited number of cohort-studies were available (n=10).

Following review of the evidence that met the inclusion-criteria, changes were made to the categorisation of variables from the initial protocol. 'Conduct Disorder' was collapsed into the 'externalizing-behaviours' category, 'psychopathy' became one category, and 'delinquency' included all offending-behaviour with the exception of violent-offending. Violence included 'violence' as a term and offences categorised as 'offences against the person'. 'IQ' became 'cognitive', 'personality' included factors associated with the broader construct of personality; examples include 'anger', 'locus-of-control', and 'psychoticism' (see corresponding data-extractions in Appendix J for full descriptions).

As the variables included in this review were collapsed into categories it was sometimes the case that a single study had

more than one set of data for an individual review category, e.g. frequency of 'non-violent-offending' and 'general delinquency' measures would both be classified in the review category 'delinquency'.

11 'cohort' data sets as opposed to original datasets were identified in this review. Of these the Rochester Youth Development Survey was used in three studies, a '1984' longitudinal study was used in three studies, the Ministry of Community Development referrals were cited in two studies, and a cohort of Nevada state adjudicated youth in 1994 was used twice. To my knowledge, all other cohorts were used only once. No data from the same cohort were used in the meta-analysis twice.

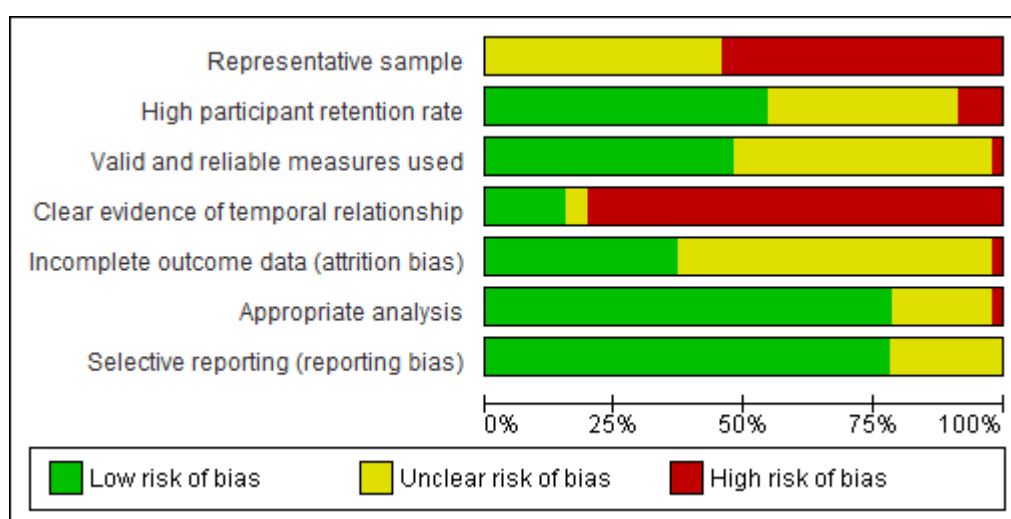
In the instance that a cohort reported risk-factor variables at more than one time point, the time point farthest away from first measurement of gang-membership was used.

Quality of Included Studies

No studies were excluded from the review or meta-analysis based on quality-assessment as this would be introducing bias

to the field. However individual study quality has been taken into consideration when reviewing the overall evidence. Figure 4 provides an overview of the review author's (AW) judgements about each risk of bias item presented as percentages across all included studies.

Figure 4: Percentage of risk of bias



A scoring system was applied following quality-assessment (Table 11); studies were awarded one point for every risk of bias domain that was green, two points for amber, and three points for red, therefore these scores could range 3-21, the mid-point being 12.

The hierarchy of research evidence applies more weight to cohort-studies than cross-sectional studies in epidemiological research as it is possible to determine a temporal relationship. However of the cohort-studies that met the inclusion-criteria only seven (Thornberry, Krohn, Lizotte & Chard-Wierschem, 1993; Lahey, Gordon, Loeber, Stouthamer-Loeber & Farrington, 1999; Lacourse, Nagin, Tremblay, Vitaro & Claes, 2003; Eitle et al., 2004; Dishion, Nelson & Yasui, 2005; Krohn et al., 2011; Dmitrieva et al., 2014) provided clear evidence of the risk-factor being present prior to gang-membership, or reported analysis that would control for this.

Table 11: Risk of bias hierarchy

Cohort/Longitudinal Studies

	RED	AMBER	GREEN	TOTAL
<i>Bjerregaard & Smith (1993)</i>	0	2	4	8
<i>Dishion et al., (2005)</i>	0	2	5	9
<i>Dmitrieva et al., (2014)</i>	1	1	5	10
<i>Krohn et al., (2011)</i>	0	3	4	10
<i>Lahey et al., (1999)</i>	0	3	4	10
<i>Eitle et al., (2004)</i>	1	2	4	11

<i>LaCourse et al., (2003)</i>	1	2	4	11
<i>Thornberry et al., (1993)</i>	0	4	3	11
<i>Gatti, Tremblay, Vitaro & McDuff (2005)</i>	1	3	3	12
<i>Craig, Vitaro, Gagnon & Tremblay (2002)</i>	3	1	3	14

Cross-Sectional Studies

	RED	AMBER	GREEN	TOTAL
<i>Zhang, Welte, Wieczorek (1999)</i>	1	1	5	10
<i>Amato & Cornell (2003)</i>	1	2	4	11
<i>Bjerregaard & Cochran (2012)</i>	2	0	5	11
<i>Chu et al., (2011)</i>	2	0	5	11
<i>Fernandez (2001)</i>	2	0	5	11
<i>Davis (2003)</i>	1	3	2	11
<i>Evans, Albers, Macari & Mason (1996)</i>	2	1	4	12
<i>Evans & Mason (1996)</i>	2	1	4	12
<i>Chu, Daffern, Thomas & Lim (2012)</i>	2	1	4	12
<i>Ferguson (1997)</i>	1	3	3	12
<i>Horn (1998)</i>	2	1	4	12
<i>Weerman (2012)</i>	1	3	3	12
<i>Friedman, Mann & Adelman (1976)</i>	1	3	3	12
<i>Cox (1996)</i>	2	1	4	12

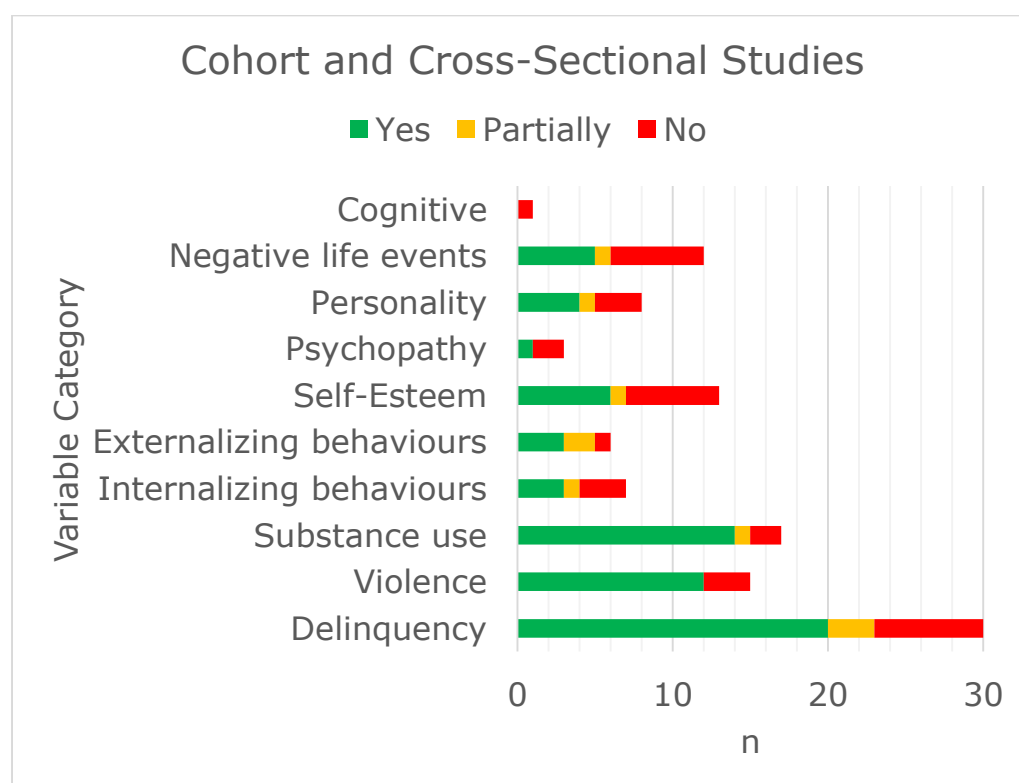
<i>King (1997)</i>	2	1	4	12
<i>Wood (1997)</i>	2	1	4	12
<i>Chu et al., (2014)</i>	2	2	3	13
<i>Dukes & Stein (2003)</i>	1	4	2	13
<i>Lemus & Johnson (2008)</i>	1	4	2	13
<i>Savitz, Lalli & Rosen (1997)</i>	1	4	2	13
<i>Corcoran et al., (2005)</i>	2	2	3	13
<i>Curry & Spergel (1992)</i>	2	2	3	13
<i>Lyon, Henggeler & Hall (1992)</i>	2	3	2	14
<i>Cabrera (2002)</i>	2	3	2	14
<i>Lanier, Pack & Akers (2010)</i>	3	1	3	14
<i>Varano, Huebner & Bynum (2011)</i>	3	1	3	14
<i>Burch (2014)</i>	2	3	2	14
<i>Thomas, Holzer & Wall (2003)</i>	2	3	2	14
<i>Wilson (1996)</i>	3	2	2	15
<i>Adams (2004)</i>	1	6	0	15
<i>Escobedo (2000)</i>	2	5	0	16
<i>Curry (2000)</i>	2	5	0	16

Descriptive Data Synthesis

There was considerable variance for the number of studies representing each variable that met the inclusion-criteria (Figure 5). These findings suggest that delinquency, violence

and substance-use were most consistently associated with gang-membership.

Figure 5: Variables supported by research



Delinquency

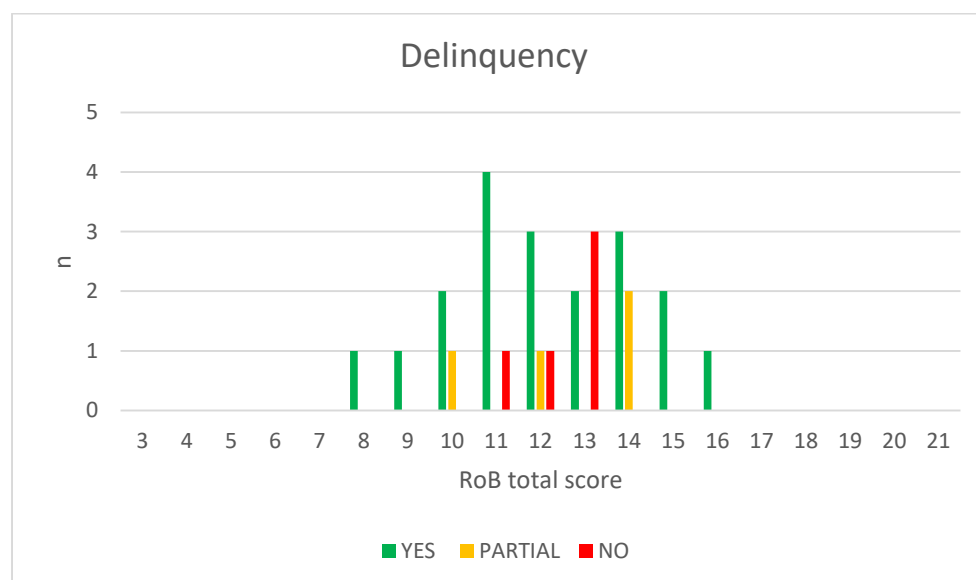
30 studies explored the association between delinquency and gang-membership, of which 20 (seven cohort; Lyon et al., 1992; Bjerregaard & Smith, 1993; Thornberry et al., 1993; Cox, 1996; Wilson, 1996; Lahey et al., 1999; Zhang et al., 1999; Curry, 2000; Cabrera, 2002; Amato & Cornell, 2003; Dukes &

Stein, 2003; Thomas et al., 2003; Adams, 2004; Eitle et al., 2004; Corcoran et al., 2005; Dishion et al., 2005; Gatti et al., 2005; Krohn et al., 2011 (African-American only); Bjerregaard & Cochran, 2012; Weerman, 2012) studies found higher levels of delinquency in gang compared to non-gang-members. Cohort-studies were those with the highest overall quality, and all either supported (Bjerregaard & Smith, 1993; Lahey et al., 1999; Dishion et al., 2005) or partially supported (Krohn et al., 2011) the association (Figure 6).

Curry (2000) had the highest risk of bias (16) but supported the association between delinquency and gang-membership. This evidence comes with the caveat of the study having a low recruitment retention rate, not being clear if all measures used were valid and reliable, not using a representative sample, and appearing to have an insufficient sample-size to detect a difference at 80% power. The mid-point for risk of bias was 12, focusing solely on those above this point, just over half used an offending and therefore non-representative sample. Measures were either not valid/reliable, or it was not clear if this was the case for seven studies (Savitz et al., 1977; Lyon et al., 1992; Dukes & Stein, 2003; Thomas et al., 2003; Adams, 2004; Corcoran et al., 2005; Chu et al., 2014), it was not possible to

establish a temporal relationship in Savitz et al., (1977), Curry & Spergel (1992), Lyon et al., (1992), Wilson (1996), Cabrera (2002), Craig et al., (2002), Dukes & Stein (2003), Thomas et al., (2003), Adams (2004), Corcoran et al., (2005), Varano et al., (2011), or Chu et al., (2014). There were high-rates of participant drop-out or low recruitment rates in ten studies (Savitz et al., 1977; Curry & Spergel, 1992; Lyon et al., 1992; Wilson, 1996; Cabrera, 2002; Craig et al., 2002; Dukes & Stein, 2003; Thomas et al., 2003; Adams, 2004; Varano et al., 2011) and there was a high-rate of incomplete data and/or inappropriate/unclear management of this in ten studies (Savitz et al., 1977; Curry & Spergel, 1992; Lyon et al., 1992; Wilson, 1996; Craig et al., 2002; Dukes & Stein, 2003; Thomas et al., 2003; Adams, 2004; Corcoran et al., 2005; Chu et al., 2014). Additionally, it appeared as though Cabrera (2002) and Adams (2004) had not recruited enough participants in each group to detect a significant difference. Less weight should be given to the evidence from these studies, however this does not greatly impact on the support for the association between delinquency and gang-membership.

Figure 6: Delinquency risk of bias distribution

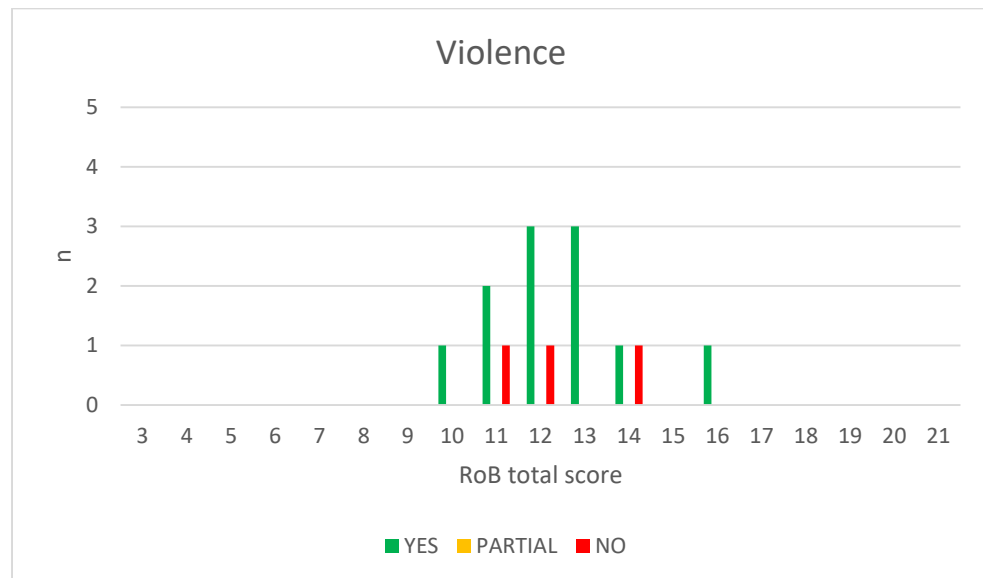


Violence

15 studies explored the association between violence and gang-membership, of which 12 (four cohort; Thornberry et al., 1993; Ferguson, 1997; Lahey et al., 1999; Curry, 2000; Amato & Cornell, 2003; Dukes & Stein 2003; Lacourse et al., 2003; Thomas et al., 2003; Corcoran et al., 2005; Gatti et al., 2005; Chu et al., 2012; Chu et al., 2014) studies found increased violence in gang compared to non-gang-members. This was with the exception of frequency of current sexual offences in Chu et al., 2014 which was significantly higher in the non-gang offender control-group compared to gang-members. A similar distribution of risk of bias was observed for violence (Figure 7), again with three cohort-studies having the lowest risk of bias

(Lahey et al., 1999; Lacourse et al., 2003; Thornberry et al., 1993) and supporting this association.

Figure 7: Violence risk of bias distribution



Again Curry (2000) had the highest risk of bias and supported the association between violence and gang-membership. Of the remaining studies above the midpoint of risk of bias (≥ 13), 50% used an offending population so are not generalisable to a non-offending population. Measures were either not valid/reliable, or it was not clear if this was the case for four studies (Dukes & Stein, 2003; Thomas et al., 2003; Corcoran et al., 2005; Chu et al., 2014). It was not possible to establish a temporal relationship in Craig et al., (2002), Dukes & Stein (2003),

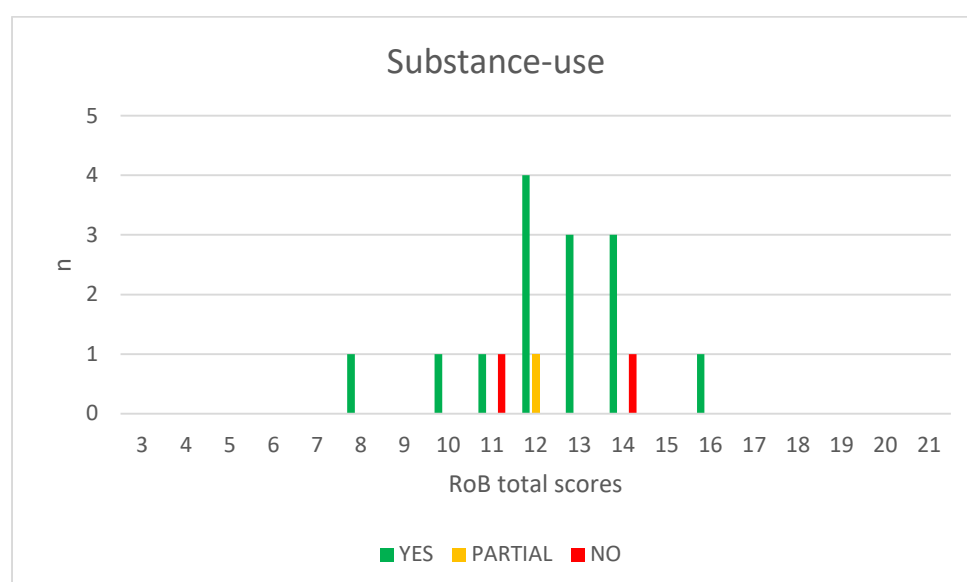
Thomas et al., (2003), Corcoran et al., (2005), or Chu et al., (2014). There were high-rates of participant drop-out or low recruitment rates in three studies (Craig et al., 2002; Dukes & Stein, 2003; Thomas et al., 2003) and there was a high-rate of incomplete data and/or inappropriate/unclear management of this in five studies (Craig et al., 2002; Dukes & Stein, 2003; Thomas et al., 2003; Corcoran et al., 2005; Chu et al., 2014). Whilst these studies appear to be less robust, even with their exclusion from this review the evidence favours a positive association between violence and gang-membership.

Substance-use

16 studies explored the association between substance-use and gang-membership, of which 12 (three cohort; Lyon et al., 1992; Bjerregaard & Smith, 1993; Thornberry et al., 1993; Cox, 1996; Evans & Mason, 1996; Zhang et al., 1999; Curry, 2000; Dukes & Stein, 2003; Gatti et al., 2005; Lanier et al., 2010 (not crack cocaine); Varano et al., 2011; Chu et al., 2012 (historical only); Chu et al., 2014) studies reported higher levels of substance-use in gang compared to non-gang-members. Curry (2000) reported a significant difference between gang and non-gang-members, but with higher levels of substance-use in non-gang-members. Chu et al., (2014) also reported significantly less

sedative use in gang compared to non-gang-members. Figure 8 shows the risk of bias distribution for substance-use studies. Although most studies support this association, the distribution of studies is skewed in the direction of a higher risk of bias than is the case for delinquency and violence.

Figure 8: Substance-use risk of bias distribution



The study with the highest risk of bias was Curry (2000), (see above delinquency paragraph): this may account for the unexpected finding that substance-use was higher in non-gang compared to gang-members. Focusing on the remaining studies above the midpoint of risk of bias (≥ 13), 63% of the studies used an offending population so are not generalisable to

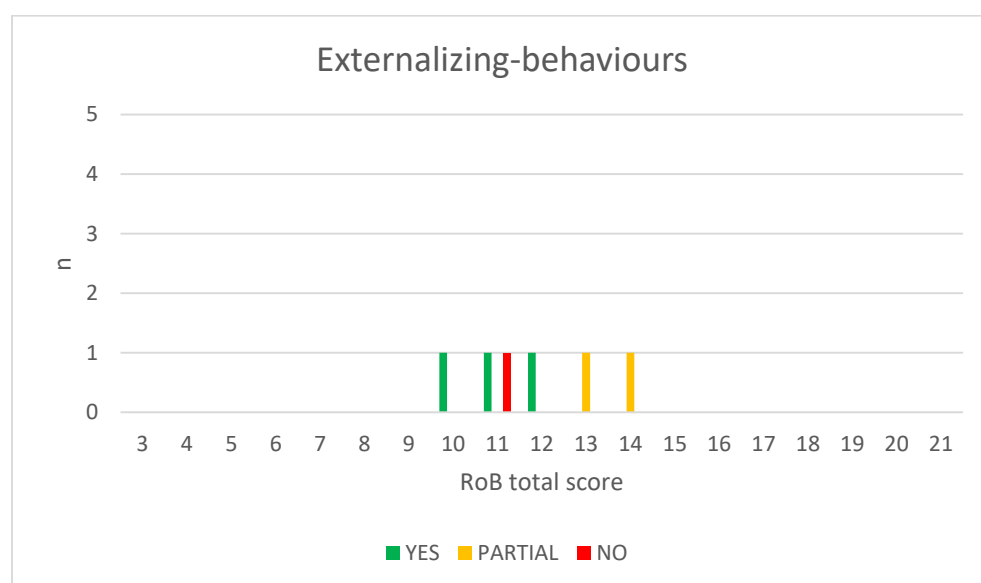
a non-offending population. Measures were either not valid/reliable, or it was not clear if this was the case for five studies (Lyon et al., 1992; Dukes & Stein, 2003; Corcoran et al., 2005; Lanier et al., 2010; Chu et al., 2014), it was not possible to establish a temporal relationship in Lyon et al., (1992), Craig et al., (2002), Dukes & Stein (2003), Corcoran et al., (2005), Lanier et al., (2010), Varano et al., (2011), or Chu et al., (2014). There were high-rates of participant drop-out or low recruitment rates in four studies (Lyon et al., 1992; Dukes & Stein, 2003; Eitle et al., 2004; Varano et al., 2011) and there was a high-rate of incomplete data and/or inappropriate/unclear management of this in six studies (Lyon et al., 1992; Craig et al., 2002; Dukes & Stein, 2003; Corcoran et al., 2005; Lanier et al., 2010; Chu et al., 2014). Less weight should perhaps be given to these studies, however even after this consideration, a positive association between substance-use and gang-membership remains.

The evidence was mixed for externalizing and internalizing-behaviours, self-esteem and negative life-events.

Externalizing-behaviours

Six studies explored the association between externalizing-behaviours and gang-membership, of which three (one cohort; Lahey et al., 1999; Davis, 2003; Weerman, 2012) studies reported higher levels of externalizing-behaviours in gang compared to non-gang-members. Figure 9 shows that studies with a positive association have a lower risk of bias than those which partially supported the association.

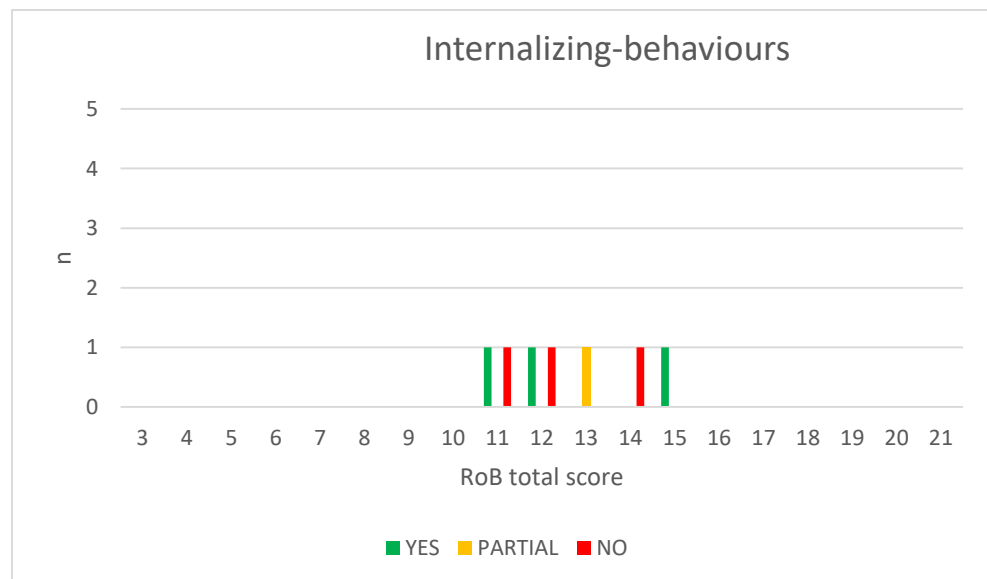
Figure 9: Externalizing-behaviours risk of bias distribution



Internalizing-behaviours

Seven studies explored the association between internalizing-behaviours and gang-membership, of which three (none cohort; Evans et al., 1996; Fernandez, 2001; Adams, 2004) studies reported higher levels of internalizing-behaviours in gang compared to non-gang-members. Figure 10 shows that the proportion of risk of bias for internalizing-behaviours is similar for those studies which support, and those which do not support, the association with gang-membership.

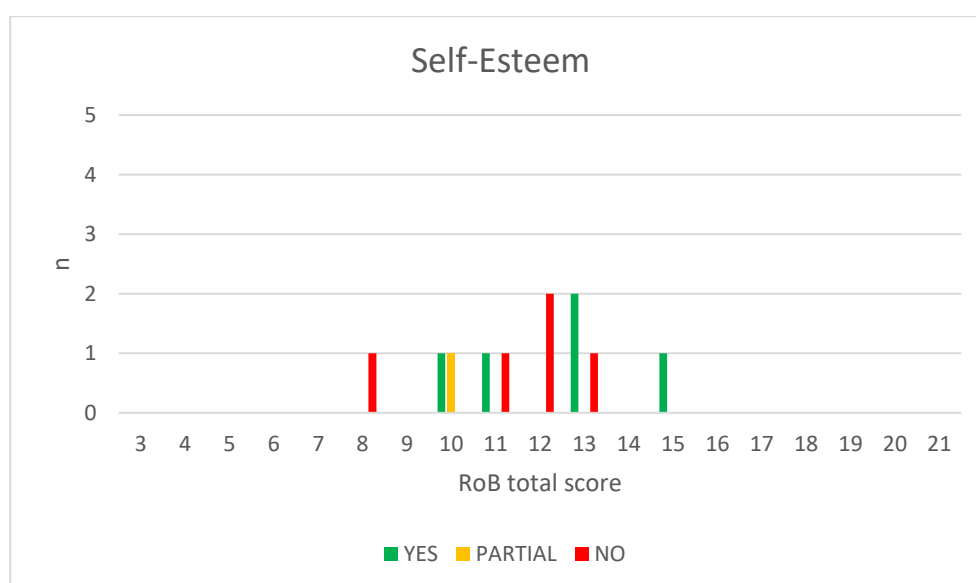
Figure 10: Internalizing-behaviours risk of bias distribution



Self-Esteem

11 studies explored the association between self-esteem and gang-membership, of which six (two cohort; Curry & Spergel, 1992; Wilson, 1996; Dukes & Stein, 2003; Eitle et al., 2004 (African American only); Bjerregaard & Cochran, 2012; Dmitrieva et al., 2014 (low level versus non-member) studies reported lower levels of self-esteem in gang compared to non-gang-members. Much like substance-use, the studies that found a positive association between gang-membership and self-esteem are skewed towards a higher risk of bias (Figure 11), however there was a similar profile for those studies which did not support the association.

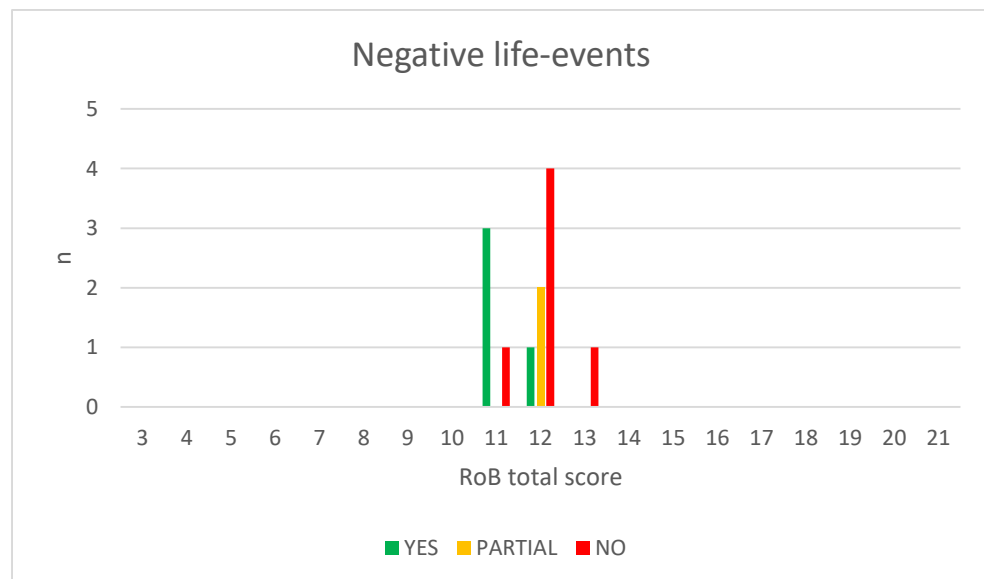
Figure 11: Self-Esteem risk of bias distribution



Negative Life-events

12 studies explored the association between negative life-events and gang-membership, of which five (one cohort; Friedman et al., 1976; Evans et al., 1996; Davis, 2003; Eitle et al., 2004; Bjerregaard & Cochran, 2012) studies reported gang-members as having significantly more negative life-events than non-gang-members. The distribution of risk of bias for negative life-events (Figure 12) was closely bunched around the midpoint, however those that supported the association with gang-membership had a lower risk of bias than those which did not.

Figure 12: Negative life-events risk of bias distribution



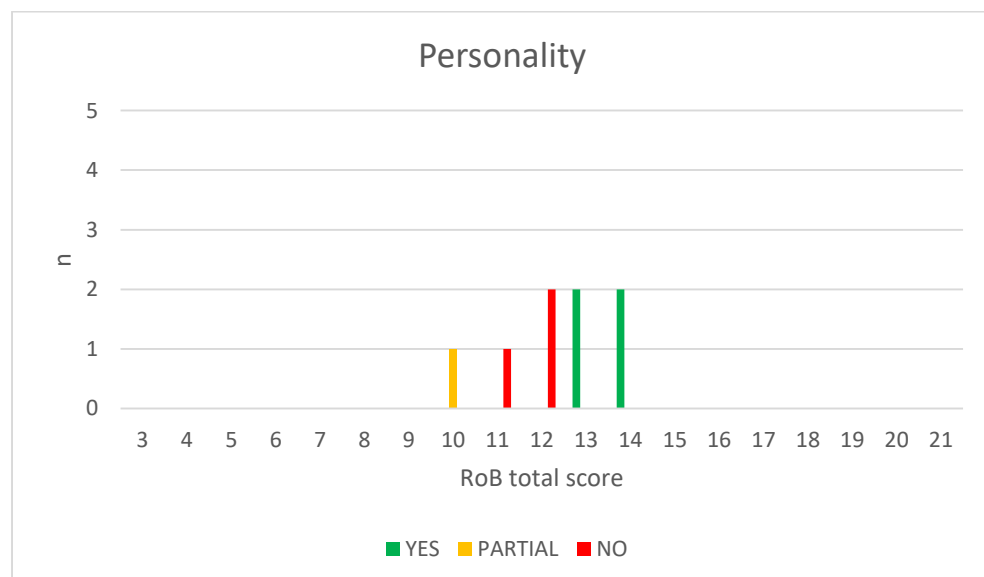
Evidence was less favourable for the role of personality and psychopathy, although these variables were under-represented which may have affected findings.

Personality

Eight studies explored the association between personality and gang-membership, of which four (none cohort; Cabrera, 2002; Lemus & Johnson, 2008; Burch 2014; Chu et al., 2014) studies found increased problematic personality features in gang-members. The four studies which supported the association between personality (Figure 13) and gang-membership had a higher risk of bias than those which did not or partially supported the association; three of these studies were unpublished doctorate research, this is compared to three empirical studies published in a peer review journal that did not support the association (Horn, 1998; Chu et al., 2011; Weerman, 2012). Dmitrieva et al., (2014) was the only cohort-study, and had the lowest total risk of bias score of all of the studies included in the personality category. Dmitrieva et al., (2014) inconsistently supported the association between personality and gang-membership. 75% of these studies used an offending and therefore non-representative sample; however these studies also used an offending control-group.

Other concerns include a small n (Cabrera, 2002), not reporting incomplete datasets (Horn, 1998; Lemus & Johnson, 2008; Weerman, 2012), not reporting recruitment rates and those lost to follow-up (Lemus & Johnson, 2008), and not being clear if using valid and reliable measures for the population being studied (Lemus & Johnson, 2008; Burch, 2014).

Figure 13: Personality risk of bias distribution

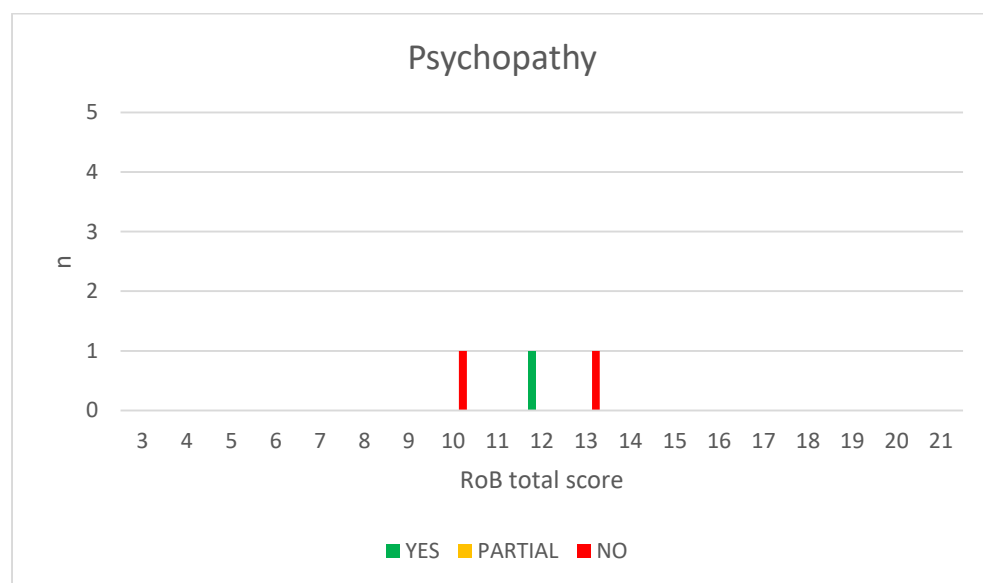


Psychopathy

Three studies explored the association between psychopathy and gang-membership; one cross-sectional study (King, 1997) reported gang-members as having significantly more psychopathic traits than non-gang-members. Closer inspection

of risk of bias (Figure 14) shows that all three studies (King, 1997; Chu et al., 2014; Dmitrieva et al., 2014) recruited their sample from an offending population so are not generalisable to a non-offending population. Two studies (King, 1997; Chu et al., 2014) were cross-sectional and so it was not possible to determine a temporal relationship, however it is possible to comment on an association between the factors. There were gang-members present at baseline in Dmitrieva et al., (2014), however their analysis controlled for this. Perhaps of note, King (1997), which was the only study which supported the association between psychopathy and gang-membership, was conducted in 1997; it could be argued that this is outdated and has been superseded by Chu et al., (2014) and Dmitrieva et al., (2014). King (1997) is also unpublished doctorate research, whilst Chu et al., (2014) and Dmitrieva et al., (2014) are empirical research published in peer reviewed journals.

Figure 14: Psychopathy risk of bias distribution



Cognitive

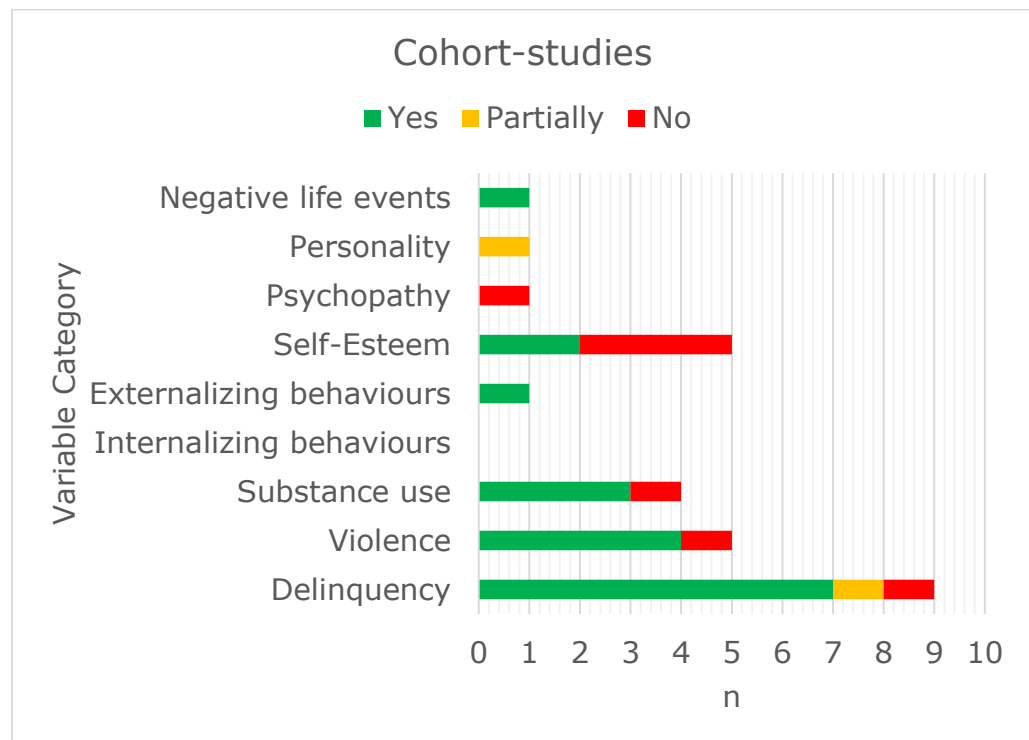
One cross-sectional study explored the association between cognitive factors and gang-membership; no association was found. This may be because the variable was under-represented (n=1; Escobedo, 2000). This study was also identified as having the joint highest risk of bias of studies included in this review (16), including a high risk of bias in two domains (a non-representative sample, no temporal relationship established) and a medium risk of bias in five domains (participant retention rate not reported, validity and reliability of measures used not consistently reported, number of incomplete datasets and how managed not reported, sample-size suggests underpowered and is not reported in discussion), which may also have

impacted on results. All of these factors should be taken into consideration when determining the weight Escobedo (2000), the sole representative of cognitive factors, is awarded in this review.

Cohort-studies

It is possible to establish a temporal relationship with the 'gold standard' cohort-studies, and therefore whether a variable is a 'true risk-factor'. Figure 15 shows a similar profile for the role of self-esteem, substance-use, violence and delinquency as in Figure 5 (all studies). It would be improper to place too much weight on the role of negative life-events, personality, psychopathy or externalizing-behaviours as they are represented by one study each. No cohort-studies looked at internalizing-behaviours.

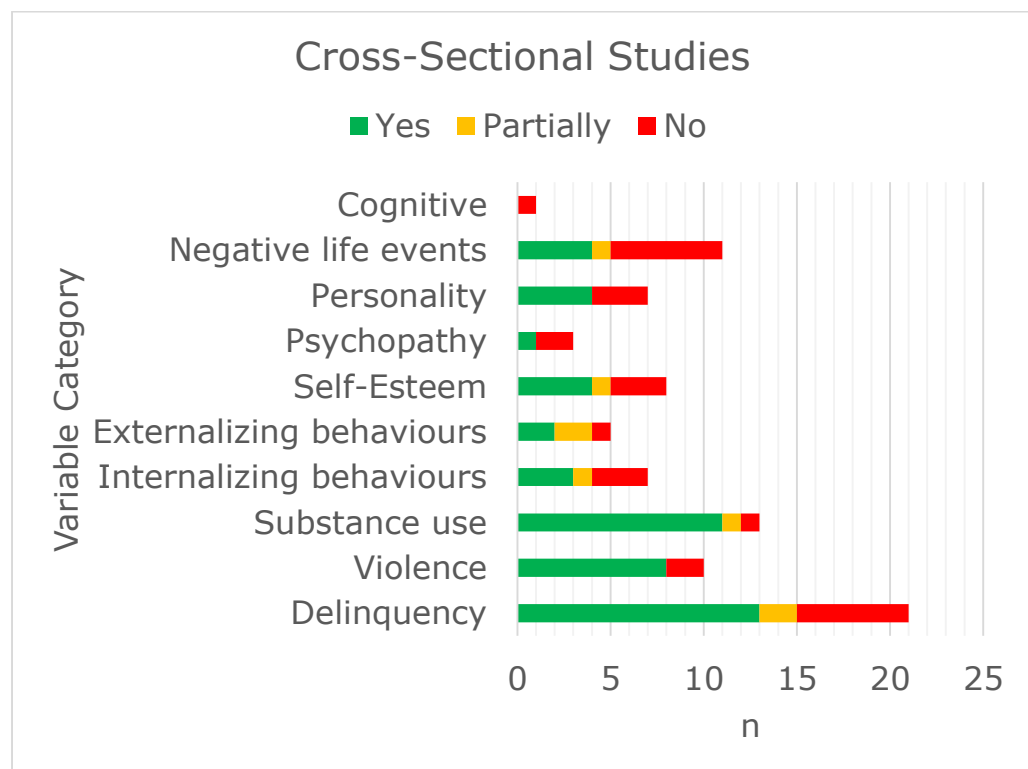
Figure 15: Variables supported by cohort studies



Cross-sectional studies

Cross-sectional studies do not provide us with information about temporal relationships; however it is possible to identify an association. Again, the profile of associations (Figure 16) is very similar to that in Figure 15.

Figure 16: Variables supported by cross-sectional studies



A systematic-review informs whether an association is supported based on the available research; however it does not inform about the strength of the association. Where possible it is beneficial to conduct a meta-analysis, as effect-sizes, (the magnitude of an association), are influenced by sample-size. A meta-analysis combines individual samples and by standardising measures of effect, is able to produce an aggregated effect-size.

3.4 Meta-Analysis

Calculation of Effect-sizes

16 studies (Lyon et al, 1992; Ferguson, 1997; King, 1997; Horn, 1998; Lahey et al., 1999; Curry 2000; Craig et al., 2002; Amato & Cornell, 2003; Dukes & Stein, 2003; Thomas et al., 2003; Corcoran et al., 2005; Gatti et al., 2005; Lemus & Johnson, 2008; Varano et al., 2011; Burch, 2014; Chu et al., 2014) reported their sample-size, and variable means and standard deviations, which were used to calculate a standardised mean difference. This is the difference between the mean of gang and non-gang-members divided by the standard deviation of all included studies. Hedges' correction was used to correct for bias that arises with studies of less than 20 participants, the result being an unbiased effect-size (DeCoster, 2004).

In the instance that a cohort-study reported risk-factors at multiple time points, the time farthest away from first measurement of gang-membership was used. Data for gang-membership and risk-factors were positively identified at time one in two cohort-studies (Craig et al., 2002; Gatti et al., 2005); as it was not possible to determine a clear temporal relationship in these studies, these were classified as cross-sectional studies

when comparing risk-factors for cohort and cross-sectional studies.

Cohort & Cross-sectional-studies

Figures 17 to 26 provide forest plots of effect-sizes and 95% confidence intervals for each variable included. Gang-members had higher levels of delinquency, violence, substance-use, problematic personality characteristics, internalizing-behaviours, externalizing-behaviours, psychopathy, self-esteem, fewer future opportunities, and more negative life-events. Using conventions for Cohen's d effect-size, where values ≥ 0.3 are considered small, 0.3 to 0.8 medium, and ≤ 0.8 large (Cohen, 1988), aggregated effect-sizes range from large to small (Table 13).

Looking more closely at individual variables, only one (Lyon et al., 1992) found lower delinquency scores for gang than non-gang-members, therefore 98% of delinquency measures supported delinquency as a risk-factor for gang-membership. All of the studies reported gang-members being more violent, having more problematic personality characteristics, displaying more externalizing-behaviours, and having more psychopathic

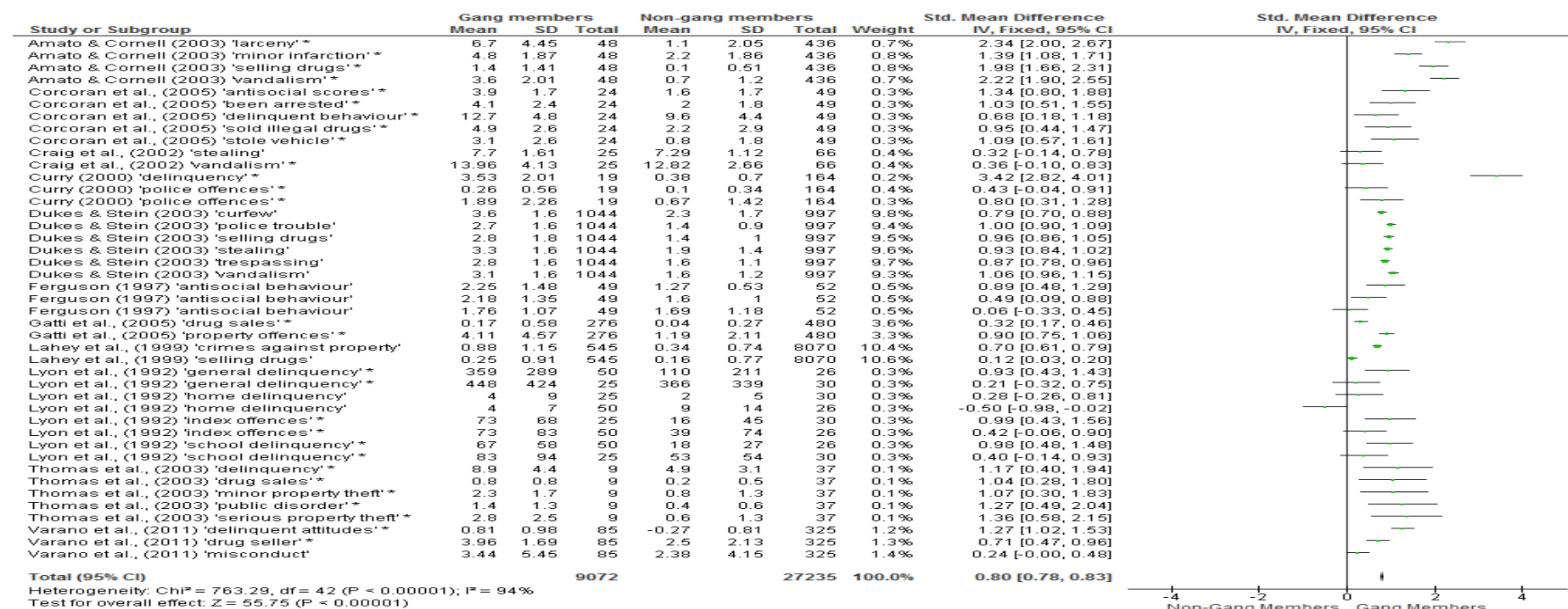
traits. 89% supported higher rates of substance-use, 88% supported more internalizing-behaviours, 67% supported higher self-esteem, and 33% supported more negative life-events. Table 12 shows the number of these which found a significant differences between gang and non-gang-members for the variables included in this meta-analysis; these are denoted by a * in Figures 17 to 26.

Table 12: Significant vs non-significant findings

Variable	Studies with significant differences	Studies with non-significant differences	% significant
Delinquency	43	15	74.14%
Personality	4	2	66.67%
Violence	9	5	64.29%
Psychopathy	3	4	42.86%
Externalizing- behaviours	2	5	28.57%
Substance- use	6	22	21.43%

Internalizing-behaviours	0	16	0%
Self-Esteem	0	6	0%
Limited opportunities	0	6	0%
Negative life events	0	3	0%

Figure 17: Delinquency effect-sizes (all studies) ^{2 3 4}

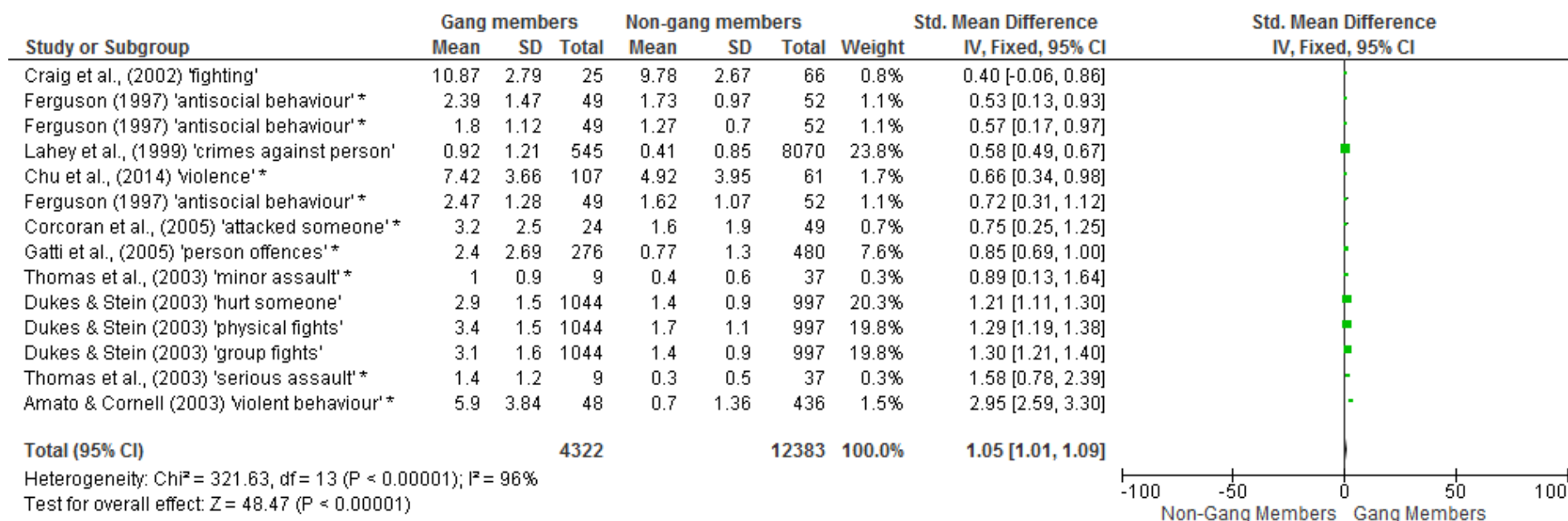


² Total = number of participants

³ Dukes & Stein (2003) did not report significance

⁴ *p<.05

Figure 18: Violence effect-sizes (all studies) ^{5 6 7}

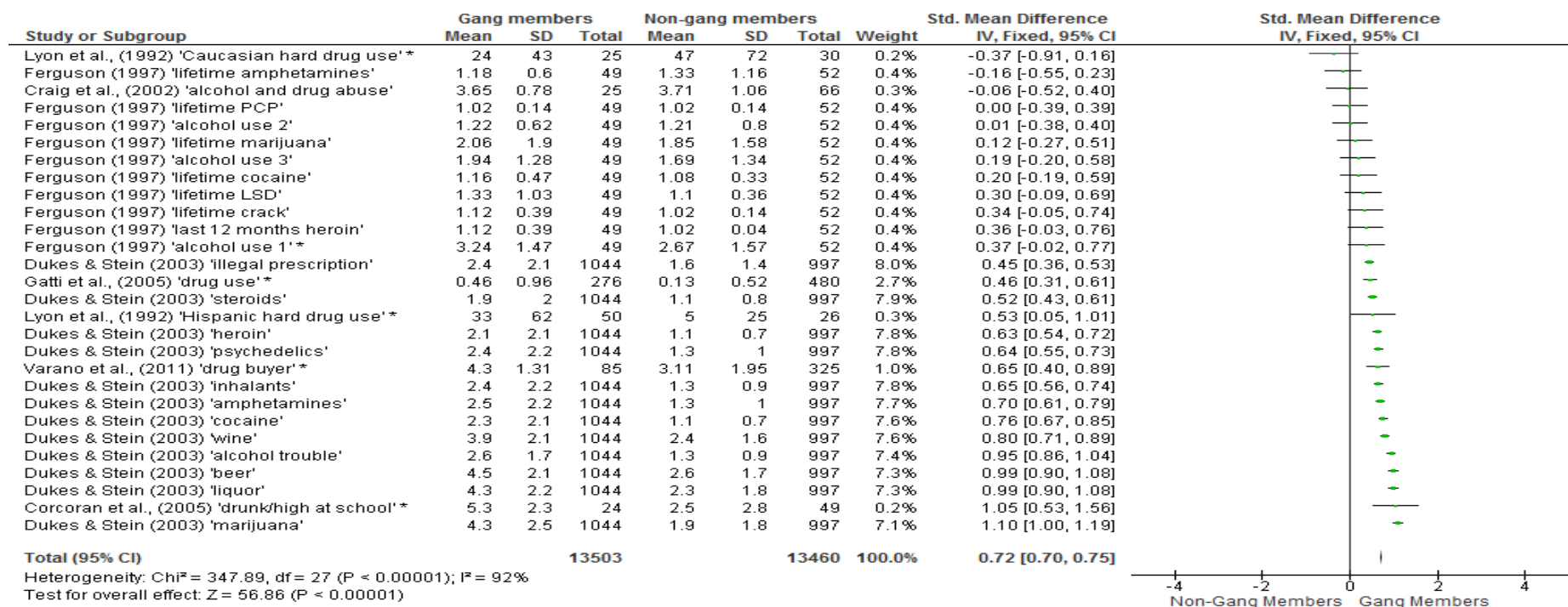


⁵ Total = number of participants

⁶ Dukes & Stein (2003) did not report significance

⁷ * $p < .05$

Figure 19: Substance-use effect-sizes (all studies) ^{8 9 10}

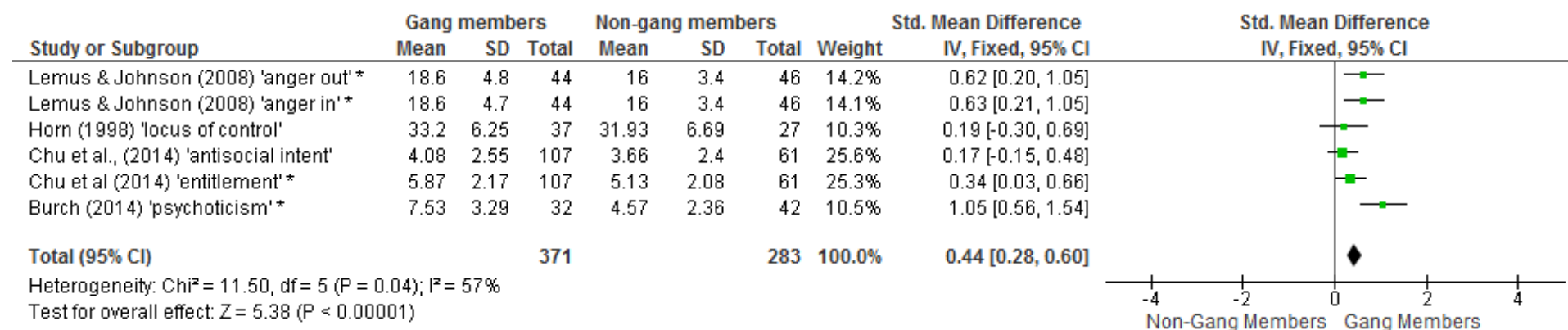


⁸ Total = number of participants

⁹ Dukes & Stein (2003) did not report significance

¹⁰ *p<.05

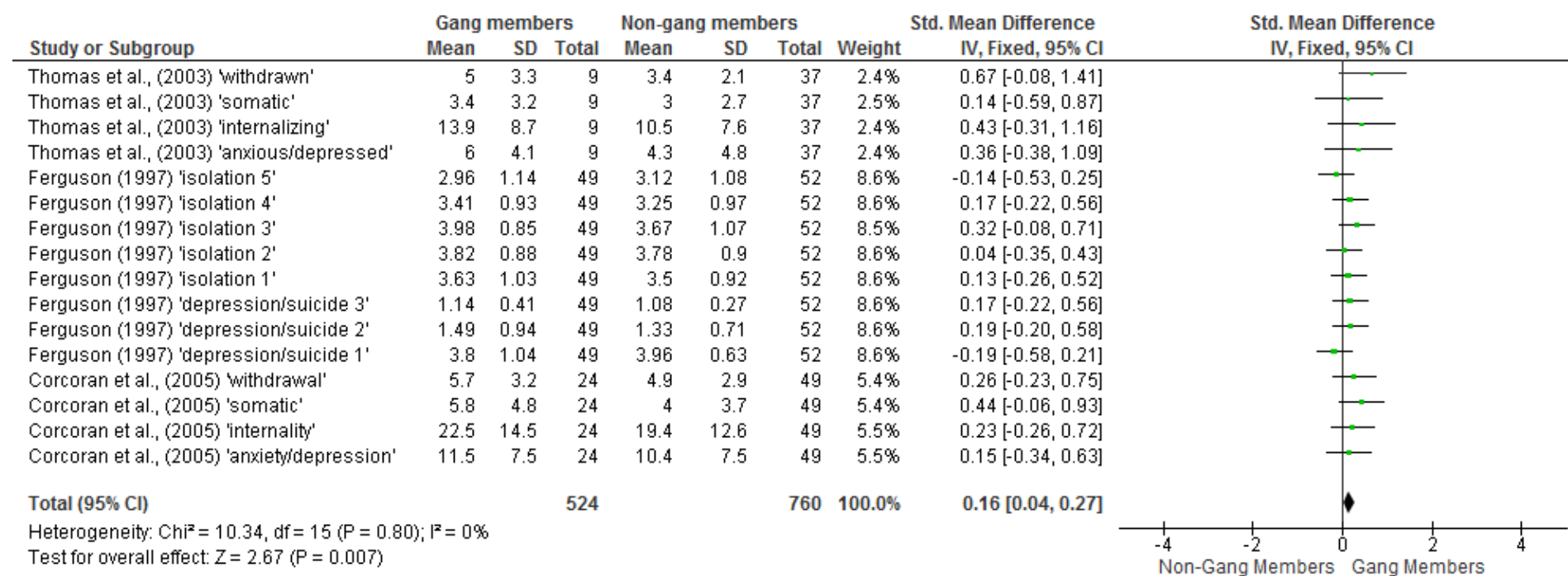
Figure 20: Personality effect-sizes (all studies) ^{11 12}



¹¹ Total = number of participants

¹² * $p < .05$

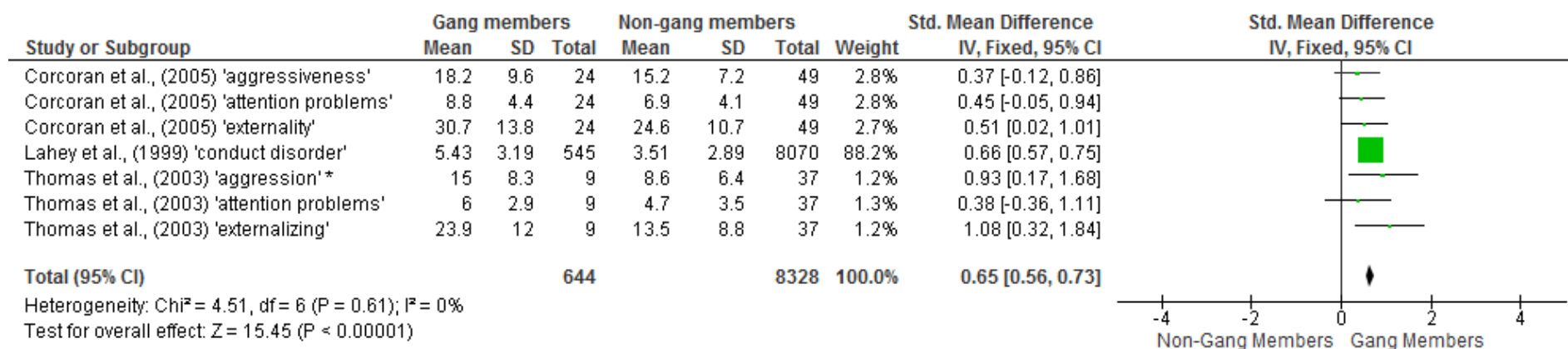
Figure 21: Internalizing-behaviours effect-sizes (all studies) ^{13 14}



¹³ Total = number of participants

¹⁴ * $p < .05$

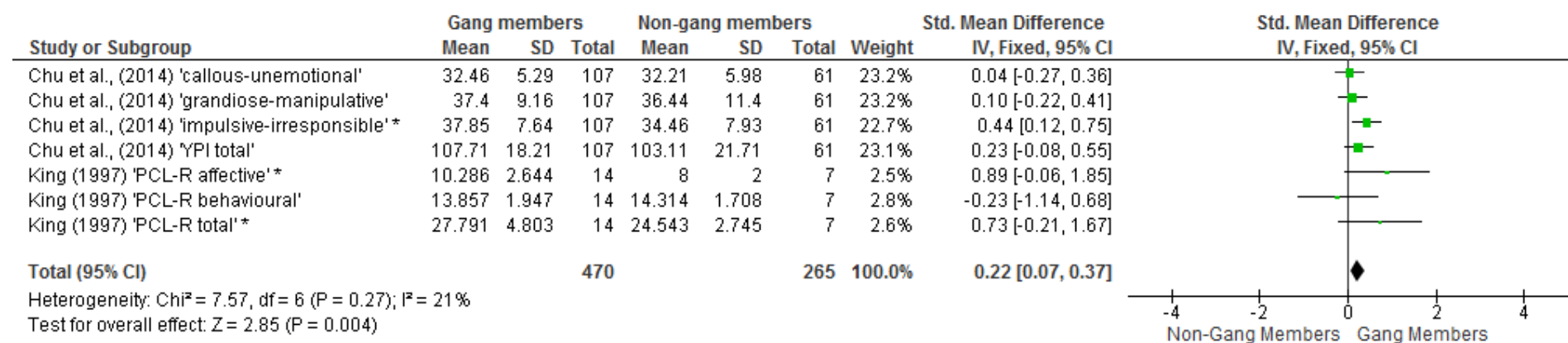
Figure 22: Externalizing-behaviours effect-sizes (all studies) ^{15 16}



¹⁵ Total = number of participants

¹⁶ * $p < .05$

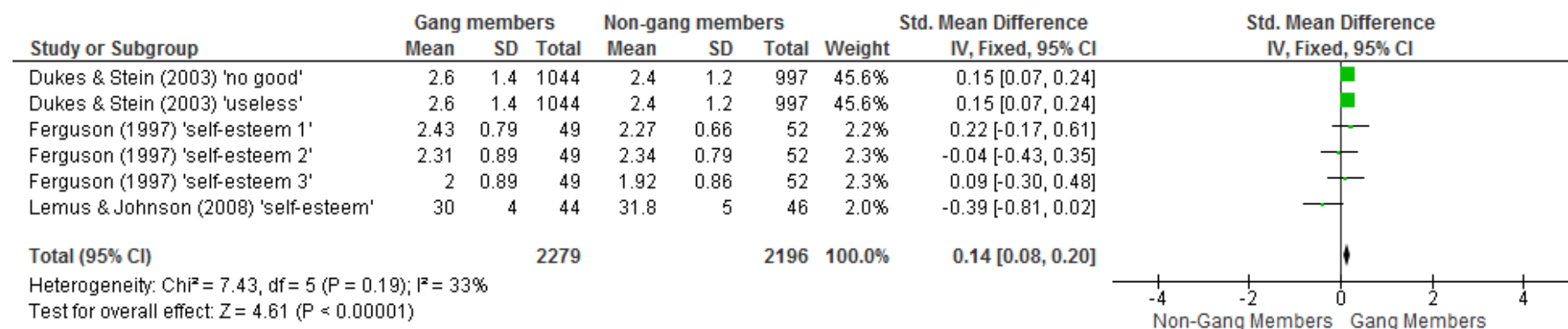
Figure 23: Psychopathy effect-sizes (all studies) ^{17 18}



¹⁷ Total = number of participants

¹⁸ * $p < .05$

Figure 24: Self-Esteem effect-sizes (all studies) ¹⁹ ²⁰ ²¹

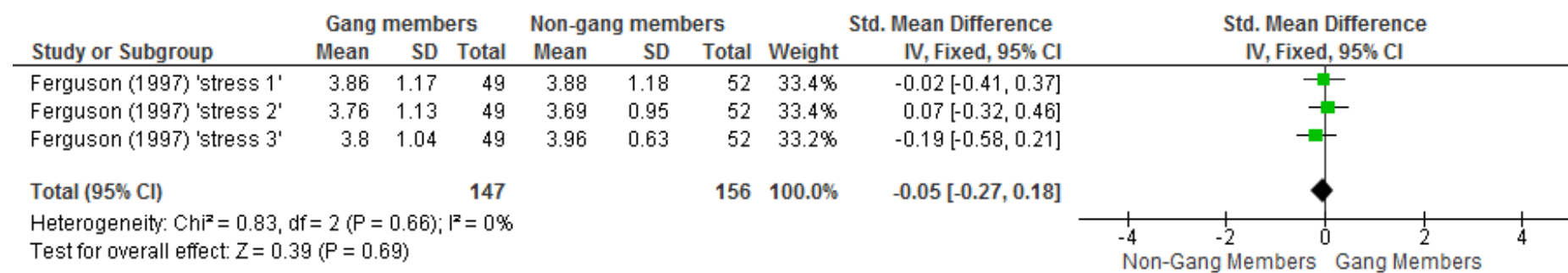


¹⁹ Total = number of participants

²⁰ * $p < .05$

²¹ Dukes & Stein (2003) did not report significance

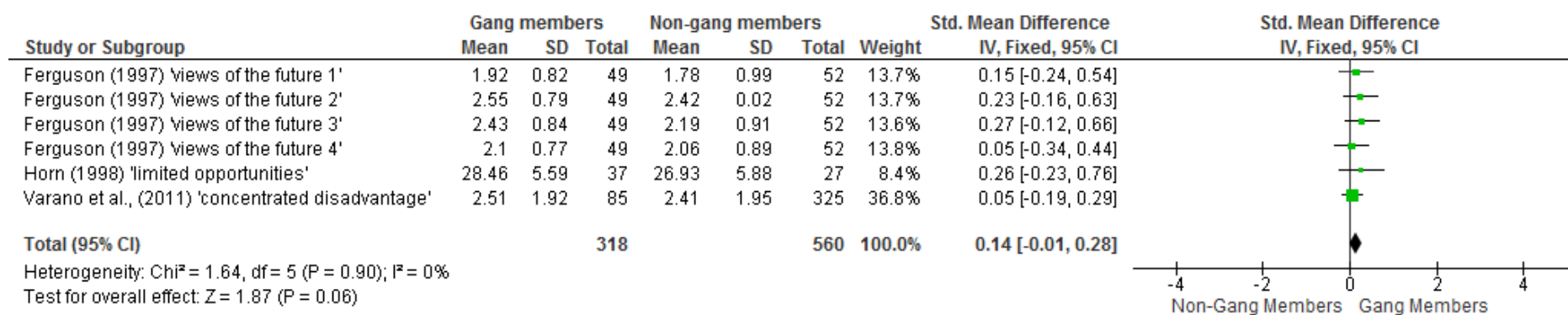
Figure 25: Negative life-events effect-sizes (all studies) ²² ²³



²² Total = number of participants

²³ * $p < .05$

Figure 26: Limited Opportunities effect-sizes (all studies) ²⁴ ²⁵



²⁴ Total = number of participants

²⁵ * $p < .05$

Table 13: Effect-sizes for all included studies

<i>Variable</i>	<i>n</i>	<i>Sample-</i>	<i>Effect</i>	<i>Effect-</i>
	<i>studies</i>	<i>size</i>	<i>Estimate</i>	<i>size</i>
			<i>(95% CI)</i>	
<i>Violence</i>	9	16,705	1.05 (1.01, 1.09)	Large
<i>Delinquency</i>	11	36,328	.80 (.78, .83)	Large
<i>Substance-use</i>	7	26,963	.72 (.70, .75)	Medium- Large
<i>Externalizing-behaviours</i>	3	8,972	.65 (.56, .73)	Medium- Large
<i>Personality characteristics</i>	4	654	.44 (.28, .60)	Medium
<i>Psychopathy</i>	2	735	.22 (.07, .37)	Small
<i>Internalizing-behaviours</i>	3	1,284	.16 (.04, .27)	Small
<i>Self-esteem</i>	3	4,475	.14 (.08, .20)	Small
<i>Limited opportunities</i>	3	878	.14 (-.01, .28)	Small

<i>Negative life-</i>	1	303	-.05	Small
<i>events</i>			(-.27, .18)	

The heterogeneity of studies included was measured using the I^2 statistic, which describes the amount of variation that is attributable to differences between studies other than the sample, e.g. study-design (Higgins & Thompson, 2002). Delinquency, violence, and substance-use had very high levels of heterogeneity (94%, 96% and 92% respectively); personality heterogeneity was lower (57%) but significant nonetheless. This may be explained by the use of different methods to measure the concepts, which seems likely given that these variables had the most studies included in analysis.

Cohort-studies

Data was available for delinquency, violence, and externalizing-behaviours. The evidence supports higher rates of delinquency, violence, and externalizing-behaviours in gang-members. Aggregated effect-sizes ranged from large to medium (Table 14); all were significant. One study was included here (Lahey et al., 1999), and this study was published in 1999; although it had one of the lowest risk of bias scores in this review (10), this study is 16 years old and so could be considered outdated.

Table 14: Effect-sizes for cohort-studies

<i>Variable</i>	<i>n</i>	<i>Sample-</i>	<i>Effect</i>	<i>Effect-</i>
	<i>studies</i>	<i>size</i>	<i>Estimate</i>	<i>size</i>
			<i>(95% CI)</i>	
<i>Externalizing-behaviours</i>	1	8,615	.87 (.78, .95)	Large
<i>Violence</i>	1	8,615	.58 (.49, .67)	Medium
<i>Delinquency</i>	1	17,230	.41 (.34, .47)	Medium

It was not necessary to calculate heterogeneity for this analysis as only one study was used.

Cross-Sectional Studies

Analyses of cross-sectional studies only also support higher rates of delinquency, violence, and externalizing-behaviours in gang-members. One variable (Lyon et al., 1992) supported lower delinquency in gang-members, therefore 98% supported higher levels of delinquency. However these findings should be considered with the caveat that two thirds of the studies included in this analysis (Lyon et al., 1992; Curry, 2000; Craig

et al., 2003; Thomas et al., 2003; Corcoran et al., 2005) were above the mid-point for risk of bias, one of which (Dukes & Stein, 2003) had a total risk of bias of 13, and accounted for 72.4% of the variance. Similarly, 72% of violence studies were above the risk of bias mid-point, and 78.5% of the variance was accounted for by the same study (Dukes & Stein, 2003). The same was true of substance-use, again, with the same study accounting for 91.3% of the variance. The areas of concern highlighted by the risk of bias were the number of non-responses to questionnaires, not commenting on the reliability and validity of measures used, not commenting on the number of incomplete datasets and how managed, and having a partially representative sample. Both of the studies (Thomas et al., 2003; Corcoran et al., 2005) included in the externalizing-behaviours analysis were above the mid-point for risk of bias.

Aggregated effect-sizes ranged from large to medium (Table 15); all were significant.

Table 15: Effect-sizes for cross-sectional studies

Variable	<i>n studies</i>	Sample	Effect	Effect-
		-size	Estimate	size
			(95% CI)	
Violence	8	8,090	1.20 (1.15, 1.25)	Large
Delinquency	10	19,098	.91 (.88, .94)	Large
Substance-	7	26,963	.72 (.70, .75)	Medium-
use				Large
Externalizing-	2	357	.55 (.31, .78)	Medium
behaviours				

The heterogeneity of cross-sectional studies was also significant for delinquency ($I^2 = 91\%$) and violence ($I^2 = 93\%$), indicating that variability in study-design may have impacted on findings. There was 0% heterogeneity for externalizing-behaviours ($n=2$).

A comparison of the effect-sizes for all studies to cohort and cross-sectional studies provides useful insight into likely causes and consequences of gang-membership (Table 16). Although

the differences between study-designs are not overwhelming, comparison suggests that delinquency and violence are present prior to gang-joining, but also increase as a consequence of gang-behaviours. Perhaps surprisingly, the evidence for externalizing-behaviours suggests that this is present prior to gang-joining and decreases slightly as a result of gang-membership.

Table 16: Study-design comparisons of effect-sizes

<i>Variable</i>	<i>All</i>	<i>Cohort</i>	<i>Cross- Sectional</i>
<i>Delinquency</i>	Large	Medium	Large
<i>Violence</i>	Large	Medium	Large
<i>Substance-use</i>	Medium- Large	N/A	Medium- Large
<i>Externalizing- behaviours</i>	Medium- Large	Large	Medium

Risk-factors for Gang-membership vs. Violence

The individual-factors from the meta-analysis that were associated with gang-membership were compared to those identified for violence by Hawkins et al., (1998; Table 17).

Broadly speaking, the findings were the same, interestingly internalizing-behaviours was negatively associated with violence but positively associated with gang-membership. Internalizing behaviours, consisting of withdrawal, isolation, somatising, anxiety, depression, and suicidal ideation was only represented by cross-sectional study designs in the meta-analysis here and may be reflective of the consequences of being a gang-member, e.g. hypervigilance as a result of fear of serious violent attack from a rival gang, which would not be the case for non-gang-member offenders.

Table 17: Comparison between the correlation of risk-factors with gang-membership and violence

	<i>Gang- membership</i>	<i>Violence</i>
Internalizing-behaviours	Positive	Negative
Externalizing-behaviours/ Aggression	Positive	Positive
Early use of violence/ Violence	Positive	Positive
Delinquency/ Antisocial behaviours	Positive	Positive

Delinquent/ Antisocial beliefs	Not included	Positive
Substance-use	Positive	Not reported
Personality	Positive	Not reported
Psychopathy	Positive	Not reported
Self-Esteem	Positive	Not reported

3.5 DISCUSSION

This review set out to establish the strength of association between individual risk-factors and gang-membership, to establish whether there were differences between cohort and cross-sectional studies, and to comment on whether findings were different to the evidence-base for violent-offending.

Systematic-review

Delinquency, violence and substance-use were the most consistently supported as being positively associated with gang-membership. Internalizing and externalizing-behaviours, self-esteem and negative life-events were inconsistently supported. Psychopathy and personality were weakly associated and no association was found for cognitive factors, although only one

study met the inclusion-criteria for this. At a glance, study-design did not appear to impact on the associations in the systematic-review.

Meta-Analysis

The analysis for all studies showed violence to have the association of the largest magnitude, followed by delinquency. Changes were observed to the strength of these associations when comparing analysis for cohort and cross-sectional study-designs, with both risk-factors reporting a medium effect-size in cohort-studies, and a large effect-size for cross-sectional studies. These findings may be indicating that youths who display delinquent and violent behaviours are at a moderately increased risk of gang-joining, but that behaviours associated with gang-membership increase these on gang-joining. This is perhaps no surprise given what crime statistics tell us about the proportion of crime committed by gang-members (Centre for Social Justice, 2009; Metropolitan Police Intelligence Bureau, 2011), however research such as this provides an evidence-base from which evidence-based practice can be developed.

Substance-use and externalizing-behaviours both had medium-large associations with gang-membership. It was not possible to draw a comparison between study-designs for substance-use, but this was possible for externalizing-behaviours. The magnitude of externalizing-behaviours, consisting of hyperactivity, impulsivity, aggression, and conduct disorder, was larger in cohort-studies. This suggests that those with externalizing-behaviours are at an increased risk of joining gangs, but that these behaviours are reduced somewhat as a result of gang-membership. This is an interesting observation, one explanation may be that behaviours associated with the gang-lifestyle, e.g. substance-use and violence, may be offering gang-members with externalizing disorders "treatment".

It should be acknowledged that there is an overlap in the behaviours associated with conduct disorder and delinquency and violence. The DSM-V (2013) diagnostic criterion for conduct disorder includes physical altercations with others, use of weapons, offending, and antisocial behaviours. It may be that the behaviours in the externalizing-behaviours category which are contributing to gang-membership are those which would be classified as delinquency or violence, and that impulsivity, hyperactivity, and aggression are not associated with gang-

membership. However, the decision to include conduct disorder in this category was based on the classification of conduct disorder in the DSM-V in a category with disruptive and impulse conduct disorders (DSM-V, 2013).

Of the three studies included in this category, one looked at conduct disorder (Lahey et al., 1999), and two looked at attention problems, aggression, and externalizing-behaviours (Thomas et al., 2003; Corcoran et al., 2005). Although there is only one study looking at conduct disorder, based on sample-size this contributes to approximately 50% of the variance, and has a smaller confidence interval (meaning there is a smaller range within which the true value lies). Additionally, this is a cohort-study and has a lower total risk of bias score than the other two studies, so should be awarded more weight. Only five studies included in this review and analysis examined the association between externalizing-behaviours and gang-membership, but the magnitude of effect in the meta-analysis suggests that this may be an area for future research. One explanation for the presence of this association may be the gang provides an outlet for the characteristics of externalizing disorders, e.g. thrill-seeking, impulsivity, and extraversion

through offending, violent behaviour and the social engagement of being in a gang.

Self-esteem was inconsistently supported in the systematic-review, and the studies which reported significant differences in the review showed gang-members to have lower self-esteem than non-gang-members. Conversely the meta-analysis showed higher levels of self-esteem in gang-members. Findings from the review may have been influenced by small sample-sizes, which would not have impacted on the meta-analysis. All of the studies included were cross-sectional (Ferguson, 1997; Dukes & Stein, 2003; Corcoran et al., 2005) so it is not possible to determine whether this is a risk-factor for or an artefact of gang-membership. Whilst there was a significant difference, the magnitude of this was small. The proportion of variance that may be related to study-design was moderate (33%), but the quality of the studies included was unclear, with studies using non/partially-representative samples, and not reporting reliability and validity for all of the measures used to capture variables in their study. In summary, the evidence for the association between self-esteem and gang-membership based on this review is far from conclusive.

Results for psychopathy were similar to those for self-esteem. Both studies were cross-sectional (King, 1997; Chu et al., 2014), the difference was significant but the magnitude of this was small, and the proportion of variance that could be attributed to factors outside of the sample was small (21%), which suggests that the slightly higher rates of psychopathy in gang-members were likely attributable to differences between groups rather than study-design. Looking more closely at the individual studies included, both studies reported a total psychopathy score, but also reported individual scores for the factors which make up the construct of psychopathy. Chu et al., (2014) reported a greater mean difference for the behavioural facet, and King (1997) reported a greater mean difference for the affective facet. The total psychopathy score was not the greatest contributor in either study, which suggests that it may be either the affective *or* behavioural elements of psychopathy that are associated with gang-membership. When the quality-assessment tool used in this review was applied to both studies, King (1997) was the "better quality" study, however this study only accounted for 7.9% of the variance reported in the meta-analysis. It was not reported if the psychopathy measured used in Chu et al., (2014) was valid for use in their sample. All studies included used an offending and therefore non-representative sample.

It is acknowledged that the personality category here is not homogeneous as is reflected in the significant amount of variance attributable to factors external to the sample (57%); however significant differences were found, with an overall medium magnitude. Concepts classified within the personality construct were anger (Lemus & Johnson, 2008), psychoticism (Burch, 2014), and entitlement (Chu et al., 2014). Higher levels of each were found in gang-members compared to non-gang-members, but as a result of the heterogeneity in the category it is not possible to report any conclusive findings other than that there may be certain problematic personality traits that are more prevalent in gang-members than non-gang-members. These findings indicate a need to identify and then robustly define personality characteristics of interest prior to researching the association between personality characteristics and gang-membership.

Findings for internalizing-behaviours (consisting of depression, anxiety and withdrawal) were similar to those for self-esteem and psychopathy; the standardised mean differences were significant but the magnitude of this effect was small. All of the studies were cross-sectional so can only be viewed as

associated with gang-membership. Positively, the proportion of variance that could be explained by factors other than the sample was 0%. The association was not in the direction one would expect given the gang profile, as gang-members had more internalizing-behaviours than non-gang-members. This may be evidence for the negative personal consequences of gang-membership, i.e. isolation from pro-social society as gang-membership becomes more embedded, heightened anxiety as a result of fear of attack from rival gangs, withdrawal as a protective consequence of this, and ultimately depression as a result of their circumstances.

Only seven studies met the inclusion-criteria for internalizing-behaviours and negative life-events, compared to 67 for the categories which represent problematic behaviours perpetrated by gang-members (delinquency, violence, substance-use, externalizing-behaviours). Taken into consideration with the findings from this meta-analysis, this perhaps signals a need to shift from viewing gang-members purely as perpetrators, and to acknowledge their possible victimisation and a need for more research in this regard.

3.6 LIMITATIONS

There are differences between the review and the meta-analysis, which have been discussed above. This may have introduced bias in this meta-analysis, and if all studies could be included in the meta-analysis, results would likely be different.

Some artificial effects may have arisen as a result of collapsing some variables into a single category; this may have particularly been the case for externalizing-behaviours and personality. However in the instance of personality, this review has not purported to say that personality as a single construct is associated with increased risk of gang-membership, rather it has highlighted that some of the concepts which may make up the broader construct of personality seem to be associated with gang-membership and warrant further research.

Delinquency and violence were studied as separate variable categories, however the self-reported delinquency scale (Elliot, Huizinga & Heton, 1985), which was used as a measure of delinquency in three included studies (Lahey et al., 1999; Thomas et al., 2003; Adams, 2004) provides subscale scores of various delinquent behaviours including violence. Thomas et al.,

(2003) reported individual subscale scores so it was possible to separate behaviours for the 'delinquency' and 'violence' categories reported. Unfortunately this was not possible for Lahey et al., (1999) and Adams (2004) as these studies reported a total delinquency scale score. This may have impacted on findings here, however removal of these studies would likely not change the outcome due to the overwhelming evidence in favour of these associations. However, perhaps other measures of delinquency used here report a total delinquency score which also includes a measure of violent behaviour.

Whilst this review highlights a fairly consistent attempt to understand why youths join gangs spanning 38 years, it was perhaps hampered by the wide variability in the number of suitable studies for each category (ranging from one study of cognitive factors to 30 studies of delinquency), and the limited number suitable for meta-analysis. As there is consistent support here for the relationship between violence, delinquency, substance-use and gang-membership, this review may highlight the need to focus our research efforts on the variables where findings were mixed, e.g. internalizing and externalizing-behaviours, and self-esteem.

The inclusion-criterion for this review has impacted on the generalisability of the findings. This review should only be applied to male gang-member, 10- 25 years old. Whilst not a restriction imposed in this review, the bias towards Western, mainly American, research also indicates that this research may not be applicable outside of these regions, or to non-developed countries.

The quality-assessment tool applied here highlighted problems with studies not recruiting representative samples. Most of those with high-risk of this bias recruited their sample from an offending population. Whilst this does maximise opportunities for researching a rare outcome, these samples may reflect those more entrenched gang-members whose lifestyle has repeatedly attracted the attention of the criminal justice system; conversely it may neglect those at the top of the gang hierarchy who may orchestrate gang activities through younger, less entrenched members, thus evading arrest themselves. Additionally, only ten studies were cohort-studies, and of those only seven reported a clear temporal relationship between gang-membership and their target risk-factors. This review is

therefore mostly limited to reporting on the associations between the identified risk-factors and gang-membership.

12 of the studies included here were unpublished dissertations obtained from ProQuest (Wilson, 1996; Ferguson, 1997; King, 1997; Wood, 1997; Horn, 1998; Escobedo, 2000; Fernandez, 2001; Cabrera, 2002; Davis, 2003; Adams, 2004; Burch, 2014); some researchers argue that grey literature such as this is of a lower quality than published research, however with the rationale for non-publication not being known, this cannot categorically be determined. These were included in order to prevent continuation of non-publication bias, however this is a caveat to hold in mind when considering the weight given to these studies.

Despite every effort being made to contact authors via ResearchGate and obtain texts from libraries, it was not possible to obtain a full text within the time frame for 31 studies identified in the systematic search; it is not known whether these would have met the inclusion-criteria, however it is possible that this has introduced bias.

3.7 Conclusions

There are some differences in the strength of associations when study-design is taken into consideration. This has highlighted factors which are likely to be risk-factors (externalizing-behaviours), and those which seem to be associated with and exacerbated by gang-joining (delinquency and violence). There were no differences between risk-factors for gang-membership and violence, however internalizing-behaviours, which were not a risk-factor for violence, were demonstrated to be associated with gang-membership, which may highlight the personal negative impact of gang-membership.

Chapter 4

SINGLE CASE STUDY

TREATMENT NEEDS ANALYSIS

"Self-Esteem in Gang-members:

A Single Case Study Treatment Needs Analysis"

Word count including tables and figures: 6077

ABSTRACT

The role of compensatory self-esteem in gang-research is inconclusive. This case study provides an overview of the available evidence-base for the role of self-esteem in gang-membership, and as a result of the paucity of this, violence and aggression. A hypothetical unified theory of gang-membership and desistance guides the formulation and treatment needs analysis of a 28 year old male gang-member detained in a medium secure NHS Therapeutic Community for offenders with personality disorder (PD). Measurement using the Rosenberg Self-Esteem Scale showed that he had low self-esteem. In line with the evidence-base, a multi-systemic approach is recommended to reduce offence paralleling gang-behaviours and to promote development of healthy self-esteem, with consideration given to responsivity issues. Limitations included the reliability of using an explicit self-esteem measure, his complex psychopathology, and difficulties measuring gang-desistance treatment success with an offender serving an Indefinite Sentence for Public Protection.

Chapter 2 showed no differences between gang and non-gang-member offenders in self-esteem, however inconsistencies about the role of self-esteem in gang-membership were present in Chapter 3. It could be argued that due to the high prevalence of gang-membership in the study site that gang-members were in prison with their fellow gang-members, and therefore in keeping with Dukes et al's., (1997) research suggesting that gang-membership improves self-esteem, that these gang-members are still active prison gang-members and their compensatory self-esteem was still intact. It is also possible that these findings are a result of offenders being prone to under-reporting difficulties as a means of 'saving face'. This second consideration hold significance because there may be a discrepancy between a gang-member's conscious (explicit) and subconscious (implicit) appraisal of their self-esteem, it therefore would be useful to use a measure of implicit self-esteem in conjunction with an explicit self-esteem measure to highlight any discrepancies.

4.0 INTRODUCTION

UK crime statistics show that street-gang-members are responsible for more crimes, specifically violent weapons offences, than their non-gang counterparts (Metropolitan Police Intelligence Bureau Research, 2011), which has widespread socio-economic and personal consequences for victims. A recent meta-analysis looking at individual characteristics of male gang-members aged 10-25 (Waugh & Glazebrook, unpublished) highlighted the negative consequences of gang-membership for members, with them showing higher levels of internalising behaviours (e.g., depression, anxiety and withdrawal). The authors acknowledged that the magnitude of this relationship was small, but speculated that:

"isolation from pro-social society as gang-membership becomes more embedded, [may lead to] heightened anxiety as a result of fear of attack from rival gangs, withdrawal as a protective consequence of this, and ultimately depression as a result of their circumstances".

Aldridge et al., (2008) highlighted concerns about gang-research including further stigmatising communities, ethnicities and individuals stereotyped as being 'gang related', reinforcing gang-connections, increasing the disconnect from 'society', and

the use of punitive approaches by policymakers to manage the 'gang problem'. However, it is arguable that without research into why individuals join gangs it will not be possible to break the gang cycle, and the negative consequences to both society and gang-members. It is hoped that research such as Waugh & Glazebrook's (unpublished) meta-analysis and this single case study treatment needs analysis will challenge some of the stigma attached to gang-membership.

Self-Esteem

Self-esteem is broadly defined as a global evaluation of the self with an affective quality, i.e. evaluating the self either positively or negatively (Salmivalli, 2001; Burhmester et al., 2011).

A synthesis of his research in male gang members aged 10-25 has shown self-esteem to be inconsistently associated with gang-membership. This has not been widely studied with UK gang members despite their being evidence of cultural differences in gangs (Weerman et al., 2009). Previous researchers have hypothesised that gang-members have lower self-esteem than non-gang-members (Bjerregaard & Smith, 1993; Dukes & Stein, 2003; Dmitrieva et al., 2014). However, evidence to date has been inconsistent; the former study did

not support an association whilst the latter two did. In Waugh & Glazebrook's (unpublished) meta-analysis, 11 studies looking at the association between gang-membership and self-esteem met the inclusion-criteria (male gang-members, aged 10-25), of which six supported the hypothesis that gang-members have lower levels of self-esteem than non-gang-members. Dukes & Stein (2003) carried out gender comparisons of members and non-members and found that male gang-members had lower self-esteem than their non-gang counterparts, whilst gang and non-gang females had similar levels of self-esteem. The authors hypothesised that membership boosts self-esteem for female gang-members. Although their findings for male gang-members would not support this hypothesis, this explanation may be extended to other research which has not shown an association between gang-membership and self-esteem.

As Waugh & Glazebrook's (unpublished) meta-analysis highlighted, the published evidence-base for the association between gang-membership and self-esteem is considerably smaller than other factors associated with gang-membership such as violence and delinquency. As gang-members are responsible for more violent offences than their non-gang counterparts (Metropolitan Police Intelligence Bureau Research,

2011), it seems logical to look to the evidence-base for the association between violence and self-esteem to attempt to hypothesise the role of self-esteem in gang-membership.

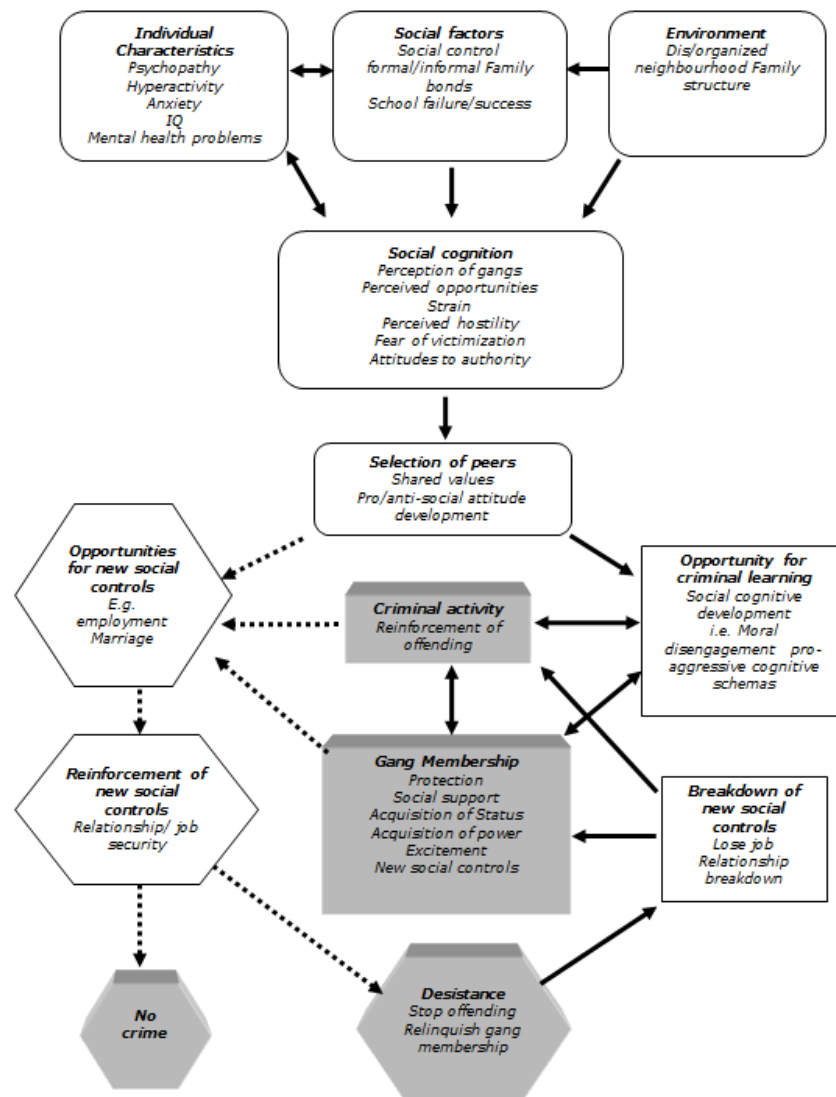
As already discussed in Chapter 2, unfortunately there is no clear agreement here either; is it low or high-self-esteem that leads to aggression and violence? The lay view may be that it is low self-esteem that leads to aggression as a means of boosting self-esteem. Salmivalli (2001) supported this by highlighting the environments and relationships which generally support development of aggressive behaviours as being critical, abusive and violent. She also proposed that the victim may be a clue as to the role of self-esteem in violence and aggression; does the selected victim support a boost to self-esteem, i.e. defeating someone who may be more powerful or a threat to status? This may be important to the interplay of gangs and self-esteem as gangs often face threats to their status from rival gangs. It is possible that at least for some gang-member's their self-esteem is hinged on the success of the gang, this hypothesis would be supported by the theorists who argue that violence and aggression are a result of threatened egotism, i.e. that violence and aggression in those with high self-esteem is mediated by

challenges to an elevated self-belief (Baumeister et al., 1996; Baumeister 1997; Bushman and Baumeister, 1998).

Whilst the focus of this case study is self-esteem, it would be remiss to maintain this at the expense of other factors. Cox (1996) drew attention to the need for multidimensional models of adolescent problem behaviours, including gang-membership and consequently, the need for multi-systemic approaches to addressing these problem behaviours.

More recently, based on a review of the literature to date, Wood & Alleyne (2010) proposed a 'Unified Theory of Gang-membership' (Figure 27), which they called "*a very preliminary framework of the processes leading to and from gang-membership*". As argued for by Cox (1996), the model is multi-systemic and includes psychological, criminological, and societal/environmental factors that lead to gang-membership, hypothesises why some exposed to these vulnerabilities follow a non-gang pathway, and also provides a hypothetical pathway of gang-desistance. The authors argued that these transient pathways are what distinguish the model from existing models of gang-membership.

Figure 27: A Unified Theory of Gang-membership



Wood & Alleyne (2010; pg. 108)

This complex model has not been empirically tested, however it provides a useful framework from which to assess and formulate treatment needs for gang-members in order to promote and maintain desistance.

Gang-members Interventions

As argued by Cox (1996), if the pathway into problem behaviours, such as gang-membership, is multi-systemic, then so too should be the interventions facilitating the pathway out of problem behaviours. A multi-systemic approach targets the individual characteristics whilst simultaneously considering them within their external context, e.g. family, school, community, and peer group.

A search identified two systematic-reviews (Hodgkinson, Marshall, Berry, Newman, Reynolds, Burton, Dickson, & Anderson, 2009; McMahon 2013) comparing comprehensive (i.e. multi-systemic) to targeted (e.g. violence reduction programmes) interventions for gang-members. Outcomes included reduction in crime, change in subject behaviour, change in community attitudes (Hodgkinson et al., (2009) and reduction in gang-related youth violence (McMahon, 2013).

In their meta-analysis Hodgkinson et al., (2009) first looked at effect-sizes for individual targeted interventions. When taking into consideration only the highest quality studies and

discounting outliers/those with high heterogeneity, the authors concluded that mechanisms of change were when the local community had involvement in planning and delivery of interventions; interventions were personalised and holistic; expertise was shared between agencies (all significant and positive effect-sizes); interventions were problem solving focused; resources were pooled across multiple agencies; there was a combination of incentives and punitive approaches; decisions were shared between agencies; interventions were publicity based; and information was shared between agencies (all non-significant but positive effect-sizes). The authors compared these to comprehensive programmes and concluded there is evidence to suggest that comprehensive interventions may be more effective than single interventions, but that as a result of the comprehensive studies including the same comprehensive programme (all of which were included individually in the single intervention analysis), it is not possible to identify whether the findings are a result of a single or a combination of components. This research comes with an additional caveat that it included only US research, and therefore may not be applicable to UK street-gangs.

McMahon (2013) conducted a synthesis of the evidence-base for London-based gang intervention strategies. Caution should be exercised when interpreting these findings, as impact was mostly measured by attitudinal change; only two studies were based on measures of behavioural change. Findings were similar to Hodgkinson et al., (2009); positive but not conclusive. McMahon (2013) also found that interventions aimed at specific indicators of gang-membership, e.g. violence reduction programmes, had a positive effect on attitudinal measures. The author highlighted that this evidence could be strengthened by studies taking into consideration behavioural measures.

Although the evidence-base is far from conclusive, with ambiguity largely attributable to study-design variation, these reviews indicate that research is consistently demonstrating a greater positive effect of comprehensive, multi-systemic approach; i.e. multiple agencies, information sharing, providing interventions targeting risk-factors and enhancing protective factors (McMahon, 2013).

Based on the aforementioned models and using available clinical assessments and reports, a treatment needs analysis and formulation developed for a single gang-member detained

under Section 47/49 of the Mental Health Act (1983) in a medium secure NHS setting is presented, with the evidence discussed here on effective interventions for gang-members informing treatment recommendations.

4.1 'MS'

MS is a 28 year old, Caucasian Afro-Caribbean male serving a life sentence with a tariff of 14 years for the murder of his mother. He is currently detained in a specialist therapeutic community in a medium secure NHS forensic service for male offenders with PD.

Reason for Referral

MS was referred for a review of his formulation and offending needs, specific to gang-membership, grouped offending, and maladaptive pairings as part of his ongoing care and treatment in his current placement.

4.2 ASSESSMENT, ANALYSIS & FORMULATION

Assessment

Psychosocial Background

MS was born to a Jamaican father and a Caucasian mother; they were never married and separated after his birth. MS's father was described as a "yardie" and was a crack cocaine, cocaine, and cannabis dealer, who kept company with prostitutes. He was a violent man who shot his own brother and spent time in prison for robberies. MS's mother was estranged from her own family, but her father was allegedly linked to a paedophile ring. After separating from MS's father she had two children with another Caucasian male. Two children she had born before MS were adopted prior to MS's birth due to their neglect and abuse.

MS and his siblings were placed on the at risk register when he was seven years old due to behavioural concerns, including aggression, lying and stealing. Social Services concluded that the children had been subject to maternal neglect and physical abuse. MS's mother had made him responsible for the care of her younger children. After investigation by Social Services the children were placed in foster care.

MS presented with learning, emotional and behavioural difficulties; his learning was several years behind that of his peers, and he had speech problems. He was bullied in mainstream school and was placed in a special needs school where he made some progress but truanted.

MS had several foster care placements, which often failed as a result of his aggressive behaviours and offending, including stealing from the family. When he was 16 years old he left care and resumed contact with his mother. He was placed in his own flat but said he left this property following death threats from a cousin. He initially moved to a hostel, then returned to living with his mother approximately one year before his index offence.

MS disclosed that his mother had sexually abused him from the age of six or seven. He reported she used to masturbate him, and forced him to have oral and sexual intercourse with her. She also exposed him to pornographic material.

MS had his first sexual relationship when he was 13 years old, with a 15 year old girl in foster care. When he was 17 years old

he had a yearlong relationship with the daughter of his mother's then boyfriend which was thought to have ended his mother's relationship; she is said to have held MS responsible. They had a daughter and lived together as a family for three months before Social Services said that he could not stay because of allegations that he had sexually abused his younger siblings (possibly being forced to do so by his mother).

There is documentation of MS being the victim of domestic violence in another relationship.

MS's next girlfriend was his co-defendant in the index offence. The couple moved in together with his mother and were engaged shortly after meeting. She was 15 years old and MS was 20.

MS presents with evidence of complex post-traumatic stress disorder (PTSD); his symptoms included persistent dysphoria, self-injury, dissociation, disrupted relationships, and persistent distrust.

MS meets the diagnostic threshold for Antisocial and Borderline PD (ASPD and BPD); he also presents with traits of Paranoid PD. A diagnosis of personality traits is given when an individual holds several of the personality traits, but these are sub-threshold for official classification of the disorder (DSM-V, 2013; ICD-10, 1992).

Forensic History

MS has six convictions for seven offences: possessing an article with blade or point in a public place (2005), robbery (2006), causing/inciting a female child under 16 to engage in sexual activity - no penetration, and failure to surrender to custody (2007), failing to surrender to, and breach of suspended sentence. He has also received three cautions for three offences: theft - shoplifting, being carried in a motor vehicle taken without consent, and damaging property.

MS has given at least two accounts of the robbery to professionals. Firstly, that his father threatened him at knifepoint if he did not carry out the offence, and secondly that it was in the context of gang initiation and members threatened violence if he did not commit the offence.

The sexual offence occurred in the context of MS being at his mother's house and lying on a bed with the victim and removing clothing from her upper body before putting his hand on her breast. He admitted to sending her messages subsequently about wanting to have sex with her.

Index Offence

MS's index offence was the murder of his mother; his co-accused was his then girlfriend. MS later reported that the sexual abuse perpetrated by his mother was still ongoing at that time, and that she had threatened to evict his girlfriend if he did not have sex with her. The OASys case summary states that his mother had been hit on the head with a hammer approximately eight times, and had received 101 stab wounds to her body, which was then hidden in a cupboard for two weeks until found by police. The offence was uncovered when MS showed the body to an associate who told his mother, who notified the police.

Psychometric Measures

Wechsler Adult Intelligence Scale - Fourth Edition

The Wechsler Adult Intelligence Scale, 4th edition (WAIS-IV; Wechsler, 2008) is an individually administered clinical instrument for assessing the cognitive functioning of adults. The WAIS-IV contains several subtests, each measuring a different facet of intelligence. MS completed the ten core subtests of the WAIS-IV and his scores are in Table 18.

Table 18: MS WAIS-IV

Index	WAIS-IV score	95% Confidence Interval	Ability
Verbal Comprehension	85	80-91	Low Average
Perceptual Reasoning	81	76-88	Low Average
Working memory	86	80-94	Low Average
Processing Speed	71	66-82	Borderline
Full Scale IQ	77	73-82	Borderline

It was concluded that standard prison interventions may not be suitable for MS as these require that the participant has a FSIQ $\geq$ 80.

Psychopathy Checklist: Screening Version

The Hare Psychopathy Checklist: Screening Version (PCL:SV; Hart, Cox & Hare, 1995) is an abbreviated version of the Hare Psychopathy Checklist-Revised (PCL-R) and is highly correlated with the full measure. It is an effective screening test for psychopathy that can be used with general, forensic, or psychiatric populations. There are two factors; Factor 1 refers to interpersonal affective features, comprising items tapping superficiality, grandiosity, deceitfulness, lack of remorse, lack of empathy and lack of acceptance of responsibility; Factor 2, labelled a socially deviant lifestyle, comprises items tapping impulsivity, poor behavioural controls, lack of goals, irresponsibility and criminality.

MS was assessed using the PCL:SV to determine whether a full PCL-R was warranted (Appendix K) as part of the admission assessment process. MS was assessed as scoring 10 in each of Factors 1 and 2, resulting in a total PCL:SV score of 20. According to the PCL:SV manual "*scores of 18 or higher offer a*

strong indication of psychopathy and warrant further evaluation with the full PCL-R” (Hart et al., 1995; pg. 22).

It was proposed that MS may benefit from interventions that take into consideration treatment responsivity in psychopathy. Psychopathic traits such as being prone to boredom, having a grandiose sense of self-worth, and failure to accept responsibility may be manifest in a belief that treatment is beneath them, and refusal to take responsibility for offending or changing future behaviours, as well as maintaining interest in any intervention (Bennett, 2014). Additionally research has shown that certain intervention approaches can make psychopathy worse, e.g. insight orientated interventions (Dolan & Coid, 1993; Losel, 1998).

Rosenberg Self-Esteem Scale

The Rosenberg Self Esteem Scale (RSE; Rosenberg, 1965) is a 10 item measure of explicit global self-esteem. Respondents rate how strongly they agree with a statement on a four point Likert scale. Previous studies have reported good internal reliability with alpha levels ranging from .72 to .88 (Gray-Little et al., 1997). Scores range from 0 to 30, with scores reflecting low self-esteem falling within a range of 0 to 14, healthy self-

esteem falling within a range of 15 to 25, and scores higher than this considered to reflect high self-esteem.

A RSE conducted with MS resulted in a score of 11 out of 30, suggesting that he has low self-esteem (Appendix L).

Implicit Association Test: Self-Esteem

The Implicit Association Test (IAT; Greenwald & Farnham 2000) is a computer based reaction time task that measures non-conscious associations with the self-versus others using pleasant and unpleasant words. The IAT for self-esteem has been shown to have excellent internal-consistency in two studies, with alpha levels $\geq .90$ (Robinson & Wilkowski, 2006; Richetin, Xaiz, Maravita, & Perugini, 2012).

As the IAT is a reaction time task, slow responses and high error rates result in the IAT being uninterpretable. Unfortunately despite two attempts to complete the IAT with MS the results were uninterpretable. He declined further attempts to complete the IAT. This, and other difficulties associated with self-esteem IAT are discussed further in Chapter 5.

Formulation

A Royal College of Psychiatrists document (1996) cited by Logan & Doyle (undated publication) stipulates that:

"a formulation should be made based on risk-factors and all other items of history and mental state... the formulation should, so far as possible, specify factors likely to increase the risk of dangerous behaviour and those likely to decrease it".

The '5 P's' is one approach to case formulation (Weerasekera, 1996) consisting of **p**redisposing factors (vulnerabilities), **p**roblem behaviours, **p**recipitating factors (triggers), **p**erpetuating (maintaining) factors, and **p**rotective factors (i.e. those factors likely to decrease dangerous or problem behaviours). A good formulation provides an understandable narrative of the life course, making links between past, present and future, is linked to evidence-based psychological theory, provides a logical understanding for how problem behaviours have developed, and has good predictive power of future behaviours (Hart, Sturmey, Logan, & McMurrin, 2011).

This formulation focuses on the development of MS's gang-membership and grouped offending, and offence paralleling behaviours on the ward, specifically his tendency to form

antisocial pairings, using the 5 P's, with links made to Wood & Alleyne's Unified Theory of Gang-membership (Table 19).

Table 19: MS 5 P's formulation

<i>Predisposing Factors (Vulnerability)</i>	Repeated unstable/ruptured attachments. Father's criminality. Victim of sexual, psychological and physical victimisation, and neglect. Loss of bonds to conventional institutions. Learning difficulties. Personality structure (ASPD, BPD, possible presence of psychopathy).
<i>Problem Behaviours</i>	Gang-membership. Grouped offending. Unstable attachments. Offence paralleling behaviours in the therapeutic community (paired antisocial behaviours).
<i>Precipitating Factors (Triggers)</i>	Distal: Low self-esteem and poor self-concept.

Unstable attachments (seeking belonging).

Pro-violent attitudes (problem solving).

Limited opportunities.

Identity confusion.

Proximal:

Fear of victimisation.

Attack on attachment.

Loss of control.

Perpetuating

Factors

(Maintaining)

Personality structure (ASPD, BPD, possible presence of psychopathy).

Antisocial lifestyle and attitudes.

Attachments to those with shared values, e.g. pro antisocial/maladaptive behaviours.

Acceptable identity and status achieved in the group and reinforced by grouped antisocial behaviours.

Protective Factors

Exploring identity in the therapeutic community.

Adaptive behaviour reinforced in the therapeutic community (work, education).

Opportunity to develop bonds to
conventional institutions.

Opportunity to build healthy
attachments.

From an early age MS was exposed to physical, psychological and sexual abuse and neglect from his primary attachment figure. Such an environment does not support development of secure, healthy attachments in which an infant can anticipate consistent and appropriate levels of protection to support survival. His father's criminal lifestyle likely impacted on his ability to be a consistent alternative parent or protector in early years, and this attachment was ruptured when his father left the family home when he was three years old. MS took responsibility for his younger siblings from a young age which would likely have restricted his access to the social activities of his peers, thereby preventing development of healthy peer attachments. It could be hypothesised that in this abusive and neglectful environment explicit learning occurred that those in positions of authority cause harm, and implicit learning occurred of the self as unworthy of care, resulting in development of poor sense of self-worth and self-esteem, as well as limited identity development beyond being a carer for his younger siblings.

The disrupted attachments in early life will have provided a blueprint for future attachments, which were reinforced at school where he was bullied. His own maladaptive survival strategies (violence and theft) resulted in sanctions, but these likely reinforced MS's world view of others being abusive and unable to protect him. Being singled out as the "*bad child*" at school would also likely have reinforced his explicit and implicit understanding of himself and contributed to the development of an "*antisocial identity*". This cycle was maintained in numerous foster care placements, and the multiple associated disrupted attachments.

It could be hypothesised that these experiences resulted in a lack of attachment to conventional social institutions, as his previous learning had been that these are unreliable, unavailable to him, and/or abusive. These factors possibly contributed to MS's subsequent gang-membership, with the gang providing MS with an ego-systonic identity in which he was no longer the victim. The gang likely supported and reinforced antisocial behaviours such as substance-use and violence, so that these behaviours became the way in which MS achieved

identity validation. Accordingly, conventional social bonds likely weakened further.

Although MS has not provided a consistent narrative for his offending-behaviours, a common precipitant to each narrative is fear of further victimisation (which would activate the ego-dystonic identity) and threatened loss of attachment. With limited scripts for other adaptive means of problem solving when his schemas for anticipating abandonment and abuse in relationships are activated, MS responds using learnt behaviours of violence that were reinforced by the gang. These strategies are perpetuated by his personality construct of ASPD and BPD, and possible presence of psychopathy which are all behaviourally manifest in impulsivity, violence and poor behavioural controls, as well as pro-antisocial norms specific to ASPD and psychopathy, and dysregulation of identity specific to BPD.

4.3 RECOMMENDATIONS (PROTECTIVE FACTORS)

MS currently receives treatment in a therapeutic community in which formulations inform development of treatment-targets, these are used to identify a clear treatment pathway adhering to the risk-need-responsivity model of offender rehabilitation

(Andrews et al., 1990); treatment is matched to their offending risk-factors e.g. violent-offending (risk principle); targets the factors which are functionally related to their offending e.g. personality disorder (need principle); and is delivered in a style that will maximise engagement with treatment, e.g. overcoming barriers to and enhancing engagement with treatment (responsivity principle); this model has been shown to be effective in reducing reoffending in an offender population. Based on the above formulation and the evidence-base for gang-interventions (Hodgkinson et al., 2009; McMahon, 2013) the following gang specific treatment-targets would be beneficial to MS:

Expertise Shared & Resources Pool

The therapeutic community is part of the Offender Personality Disorder Strategy, a joint National Offender Management Service (NOMS) and NHS initiative. Within this strategy the case is managed by the Offender Manager (NOMS), with consultation and support to develop formulation-based sentence planning from psychologists and PD specialist probation officers.

Local community involvement in planning and delivery

As MS is not eligible for parole until 2023, it is not possible to adhere strictly to this recommendation, however MS is currently detained in a therapeutic community, so adaptations could be made which may support implementation of this recommendation. The therapeutic community has a comprehensive therapeutic programme, including educational, recreational, occupational and therapeutic (psychological and medical) approaches facilitated by appropriately trained professionals in a community model. Individual treatment-targets are shared with all members of the community, including other service users who are expected to offer feedback for reflection of problem behaviours. One example of the community approach to treatment is the expectation that service users provide reports for each other, alongside professional reports at clinical review meetings. The therapeutic community can therefore act as the community involved in intervention planning and delivery.

Personalised and Holistic

MS was historically assessed as presenting with evidence of PTSD, MS may benefit from another assessment of PTSD, and if indicated, an intervention to address this in order to support

meaningful engagement in other elements of the therapeutic programme. The treatment programme at The Westgate Service, at HMP Frankland, a promising model of treatment for psychopathic offenders (Tew, Dixon, Harkins & Bennett, 2012), acknowledges that some offenders develop strong defence mechanisms in the form of repressing memories which may have contributed to the development of their offending-behaviours; Eye Movement Desensitisation and Reprocessing (EMDR) is used to improve focus and enhance engagement with the unit's therapy programme. If PTSD was indicated, MS might benefit from a referral for EMDR in order to increase engagement and responsivity.

Taking into consideration the responsivity issues in relation to treating psychopathic offenders, and in accordance with the *personalised and holistic* principle of gang offender rehabilitation, a 'Good Lives' approach could also be used with MS. The Good Lives Model (GLM; Ward & Brown, 2004) of offender rehabilitation is a strengths based approach focusing on eleven 'primary goods'. The theory posits that offending is a maladaptive means of acquiring these goods. The GLM is used in rehabilitation by identifying deficiencies and providing offenders with the skills to acquire these goods in an adaptive

way. In offenders with psychopathic traits a 'Good Lives' approach is beneficial as it enables offenders to identify "*personally relevant treatment goals*" (Bennett, 2014) which is thought to overcome responsivity issues related to psychopathy, e.g. it would be unlikely that an intervention focusing on the consequences to victims would be effective in reducing harmful behaviours in offenders with psychopathic traits due to Factor 1 traits such as 'lack of empathy'.

Following this, MS could be referred to 'The Self-Change Programme' (SCP), a violence reduction programme delivered in four stages, for two hours, three to four times per week. Similar to the 'Good Lives' model the SCP supports violent-offenders in identifying non-violent means of having a fulfilling life. Phases include:

- Engagement Phase - designed to motivate participants' engagement.
- Core Phase – designed to enhance participants insight into factors which trigger and maintain their use of violence, consisting of four steps:

Step 1: Learn to observe your own thoughts, feelings and personal rules

Step 2: Learn to see the connection between your internal behaviour and your use of aggression/violence

Step 3: Strengthening 'New Me'

Step 4: Future 'New Me' (relapse prevention plan).

- Transition Phase – designed to support participants in shifting from reliance on support from facilitators to a greater level of independence in implementing new skills.
- Consolidation Phase – delivered at key points during the participant's sentence to support reintegration into the community. This is achieved by reviewing relapse prevention plan effectiveness and making adjustments which support positive change.

(SCP Facilitator Manual, 2013)

The group would enable MS to identify non-criminal means of achieving his 'goods', for example, achieving connectedness through means other than gang-membership. The SCP programme may target the self-esteem needs of gang-members in the following ways:

1. Learning to observe your own thoughts, feelings and personal rules would allow members to develop insight into their personal gang values.

2. Learning to see the connection between your internal behaviour and your use of aggression/violence would allow members to develop insight into the fragility of their self-esteem and their propensity to use violence when under attack by an outside threat to their status.

3. Strengthening the “new me” would allow members to identify new rules for living which would build an identity, mastery and self-esteem independent of the gang.

In accordance with the ‘Responsivity’ principle of the Risk-Need-Responsivity Model (Andrews et al., 1990) consideration should be given to reducing the length of sessions to one hour as MS’s intellectual ability falls within the borderline range, and to reducing boredom which is common in those with psychopathic traits. As MS’s performance was most impaired in the processing speed domain, he may require additional time and support to process group material. There were concerns about how genuine MS’s engagement was with his treatment programme as there seemed to be little spontaneous engagement in group settings, and little behavioural change. This may be a responsivity issue relating to his personality construct, e.g. superficiality associated with psychopathy, but also might be related to his intellectual functioning, and an

inability to generalise learning. He may benefit from support in the form of additional individual formulation based schema therapy to form a comprehensive understanding of the historical development of his rules for living (schemas) and how they are being maintained now. This would support development of new rules for living (*Problem Solving Focus*).

In their Unified Theory of Gang-membership, Wood & Alleyne (2010) hypothesised a pathway to gang-desistance through opportunities for new social controls (e.g. employment and marriage) and reinforcement of new social controls (e.g. relationship and job security). There are opportunities for this pathway to gang-desistance in the therapeutic community as both vocational and educational opportunities are available to MS, and the treatment model focuses on developing adaptive relationships. Involvement in employment and education should therefore form part of MS's treatment-targets.

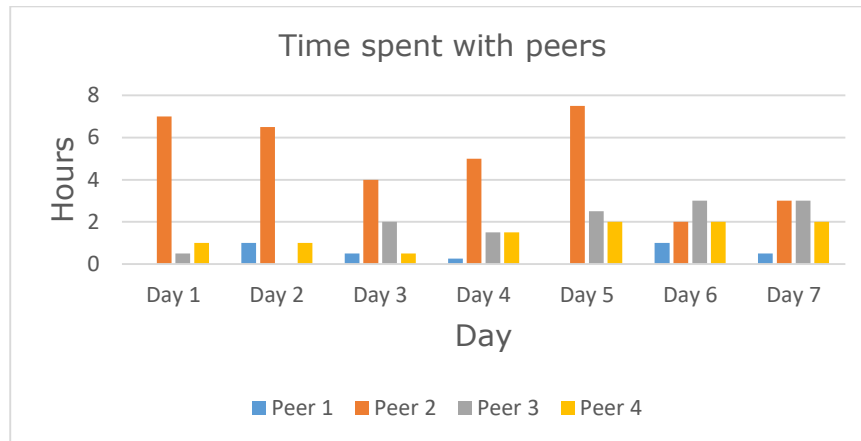
Measuring Outcomes

Desired outcomes for MS would be: a reduction in offence paralleling gang-behaviours in the therapeutic community, an increase in self-esteem, and long term gang-desistance.

A triangulated approach to measuring reduction in offence paralleling behaviours should be used in order to overcome the risk of bias introduced by self-report measures (Yin, 2014). Clear observable behavioural descriptions of offence paralleling behaviours being targeted, e.g. 'speaks exclusively to peer XX in unstructured time' would need to be developed. A questionnaire could be used where MS indicates how true each behavioural descriptor of his offence paralleling behaviours is at that time; observer reports could also be collected from peers and staff using the same questionnaire. Questionnaires could be collected on a weekly basis and the data presented in a graph showing how present each offence paralleling behaviour is over time. If consistency was observed between MS's self-report and the observer reports this would indicate that MS is being honest about his actions and choices.

Another more robust observer report may come from behavioural observations whereby each offence paralleling behaviour is monitored, e.g. how often MS speaks to each member of the community each hour. Such behaviours could be monitored daily and plotted on a graph to show change, Figure 28 provides an example of this.

Figure 28: Example of Behavioural Change



Changes to self-esteem could be measured through completion of a psychometric on a pre-determined basis, e.g. weekly or monthly. In order to overcome report-bias it may be beneficial to consider using the Culture Free Self-Esteem Inventory (CFSEI; Battle, 1992), which also includes a lie scale designed to detect those who are responding in a manner the respondent deems to be more socially acceptable. This would be particularly important in someone with MS's personality (deception associated with psychopathy). Additional benefits include the "tools" subscales which provide measures of self-esteem in different domains: general, social, peer, and personal self-esteem. This is beneficial as one of the criticisms of inconsistencies in self-esteem research is the broadness of the term 'self-esteem', as will be discussed in Chapter 5.

4.4 LIMITATIONS

The Rosenberg Self-Esteem Scale (RSE) does not include a scale that would act as an indicator of deception, and no contingency was used with another measure, e.g. the Paulhus Deception Scale (Paulhus, 1998), a self-report measure designed to identify individuals likely to distort their responses when completing assessments. Given MS's personality construct and proneness to deception this was likely an error, and MS's presentation of low self-esteem may not be reliable.

When the RSE was conducted with MS he had been engaged in treatment in a therapeutic for approximately one year; prior to this he had been in prison for approximately seven years and we do not have a clear understanding of his experiences in prison. It is therefore arguable that MS's current self-esteem is not reflective of his gang status. Although there have been offence paralleling behaviours during his time in the therapeutic community, it cannot be concluded that this is true of his time in prison. Additionally, MS's low self-esteem may be a product of his incarceration, and awareness of the limitations his index offence may have on any future opportunities. As MS has been in intensive treatment in a therapeutic community for

approximately one year, and this will remain the case for at least another eight months (unless he is recalled to prison), it is not possible to say whether other elements of the treatment programme not mentioned here may be responsible for any therapeutic change.

4.4 CONCLUSIONS

The ultimate test of whether these interventions have been effective at promoting gang-desistance would be whether MS returns to gang-membership or grouped offending on release. As his first parole window will not be until 2023, it will not ever be possible to measure this for the current case study. Additionally, due to the complexities of MS's psychopathology, he is likely not the "average gang-member" that the interventions reviewed in Hodgkinson et al., (2009) and McMahon (2013) were targeting, and perhaps his gang-behaviours are not currently the primary treatment need. Stephenson et al., (2013) argued the case for treatment sequencing as an addition to the Risk-Need-Responsivity Model, in which offenders are offered interventions that meet their treatment readiness, e.g. if an offender is in denial of a problem it would render any intervention offered to target this pointless. Stephenson et al., (2013) drew attention to treatments such as

Dialectical Behaviour Therapy (Linehan, 1993) which have a hierarchy of treatment needs: first life threatening behaviours are tackled, then those which may be seen as treatment interfering, before embarking on the rest of the programme. MS's gang-membership behaviours are perhaps not his most harmful, and therefore should not be prioritised for intervention. It may be more appropriate for his treatment needs as a gang-member to be revisited closer to his release and that for now the treatment focus be related to his personality functioning, specifically the difficulties he experiences in his interpersonal relationships.

Chapter 5

PSYCHOMETRIC CRITIQUE

Implicit Association Test:

Self-Esteem

Word count including tables and figures: 5949

ABSTRACT

To overcome the risk of bias in self-report measures, researchers have developed implicit measures designed to tap the same constructs. One such test is the self-esteem implicit association test (IAT; Greenwald & Farnham 2000). Research has demonstrated inconsistent findings relating to validity and reliability of the measure, some of which can be accounted for by study-design. However in light of research demonstrating validity and reliability in other IATs, including a recent meta-analysis showing that the self-esteem IAT has the lowest validity of the available IATs, it is likely that inconsistency in self-esteem IAT validity and reliability is attributable to the concept of implicit self-esteem, rather than the IAT. This psychometric critique reviews 74 empirical studies that have tested the psychometric properties of the self-esteem IAT, using explicit self-esteem measures as a comparator, and also considers the advantages and limitations to a computer based assessment of implicit self-esteem.

5.0 INTRODUCTION

Psychometric Testing

Psychometric tests are valuable in aiding understanding of an individual's personality and the difficulties they may encounter, however they should not be used in isolation. Groth-Marnat (2003) highlighted the importance of clinicians being central to considering assessment outcomes within the wider context, e.g. cultural or lifestyle factors. Responsible practitioners will have a good understanding of these factors and also consider the available research regarding psychometric properties of a tool.

Psychometric properties include the reliability and validity of a tool, the populations for which it has been developed for use (e.g. age, culture, gender), and the appropriate normative scores against which individual scores should be compared. Other considerations include ensuring administrators have the appropriate qualifications to administer and interpret the test, and can integrate tests scores, psychological theory and clinical presentations to give an accurate description of an individual. All of these considerations reflect the British Psychological Society (BPS, 2010) code of practice for the administration of psychometric tests.

With the advancement in technology and advantages in more efficient and reliable scoring and administration, some methods of assessment are now considered well suited to being computer based (Groth-Marnat, 2003).

Computer Based Assessments

Guidelines published by the British Psychological Society (2002) provide practitioners with clear guidance on the appropriate use and administration of computer based assessment (CBA) psychometric tests. Whilst the same principles apply, additional caution must be exercised when selecting a CBA, e.g. it is harder to monitor and govern the companies that develop these tools, who may prioritise finances over test integrity and ethical matters (BPS, 2002).

Full guidelines for the development and administration of CBAs are provided in Appendix M, but key principles include:

"Should provide clear documentation of what is being measured, for whom such an assessment is appropriate, and how computer based assessment supports valid meaningful psychological assessment."

"Should state clearly the principles underlying the scoring and interpretation of the computer based assessment, and the research evidence supporting the validity of scores and interpretations."

Self-Esteem

Self-esteem is defined by Greenwald et al., (2002; pg. 5) as *"the association of the concept of self with a valence attribute"*, with valence attribute being an emotional evaluation, therefore explicit self-esteem can be defined as a conscious affective evaluation of the self, for example *"on the whole, I am satisfied with myself"* (Rosenberg Self-Esteem Scale; Rosenberg, 1965). Researchers draw a distinction between implicit and explicit self-esteem, with implicit self-esteem thought to be a sub-conscious process of evaluating the self. However there seems to be a lack of definitional consensus regarding implicit self-esteem (Buhrmester, Blanton & Swann Jr, 2011). In their review, Buhrmester et al., (2011) drew attention to Epstein's (2006; pg. 69) definition of implicit self-esteem as *"preconscious, automatic, nonverbal, associative, rapid, effortless, concrete, holistic, and intimately associated with affect"*, supporting the proposal that implicit self-esteem is a process distinct from explicit self-esteem. Buhrmester et al.,

(2011; pg. 366) defined implicit self-esteem as a "*global self-evaluation that people are unable or unwilling to report*", where implicit self-esteem accesses the same processes as explicit self-esteem, but does so through a non-conscious path which avoids the filtering that may be possible from conscious process. If implicit self-esteem is a non-conscious process, this cannot be tested through explicit measures.

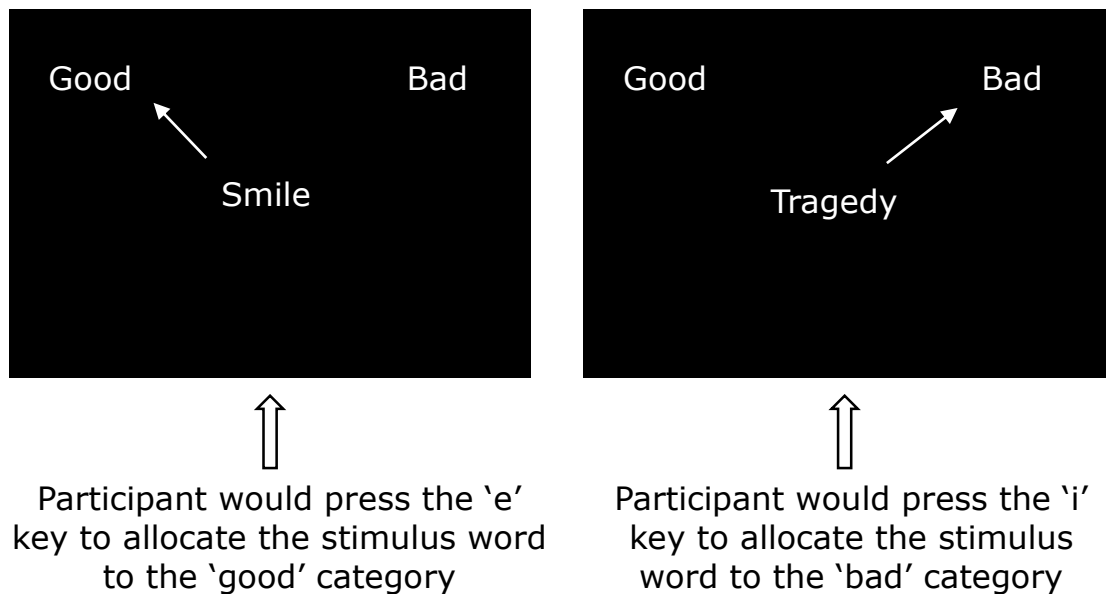
The Implicit Association Test

The IAT is a CBA based on the principle that humans are able to form non-conscious associations between stimuli, (e.g. flowers are pleasant). When a task requires us to pair flowers with a stimulus we have an implicit positive association with, we are able to perform better than when required to pair to a stimulus for which we make no, or negative, emotional associations. This is based on the theory that positive evaluations attract positive and repel negative evaluations (Banaji & Greenwald, 2013).

In the self-esteem IAT, users are presented with a display screen which provides written instructions for the test prior to testing. Users hold their fingers above the 'e' and the 'i' keys during testing and press the 'e' key to assign the word to the

category on the top left of the screen, and the 'i' key to assign the word to the category on the top right of the screen (Figure 29). Users are instructed to respond as quickly and accurately as possible. Slow responses and high error rates result in the IAT being uninterpretable. In all trials, if an error is made users are told their response is incorrect and to try again.

Figure 29: IAT method of allocation



Tables 20 & 21 show the stimulus words and seven trials used in the Greenwald & Farnham (2000) self-esteem IAT.

Table 20: Implicit Association Test stimulus

Self	Other	Positive	Negative
Myself	Other	Rainbow	Pain
Mine	Then	Happy	Death
Me	Their	Smile	Poison
My	They	Joy	Grief
Self	Them	Warmth	Agony

Table 21: Implicit Association Test trials

	Category Labels	Sample Item	Category Labels
Step 1:	NOT ME		ME
Practice block		SELF	✓
(20 trials)	✓	OTHER	
Step 2:	UNPLEASANT		PLEASANT
Practice block		JOY	✓
(20 trials)	✓	VOMIT	
Step 3:	UNPLEASANT		PLEASANT
Practice block	<i>OR</i>		<i>OR</i>
(20 trials)	<i>NOT ME</i>		ME
Test block		SELF	✓

(40 trials)		JOY	✓
	✓	OTHER	
	✓	VOMIT	
Step 4:	PLEASANT		UNPLEASANT
Practice block (20 trials)	✓	JOY	
		VOMIT	✓
Step 5:	UNPLEASANT		PLEASANT
Practice block (20 trials)	<i>OR</i> ME		<i>OR</i> NOT ME
Test block (40 trials)	✓	SELF	
		JOY	✓
		OTHER	✓
	✓	VOMIT	

Scoring the Implicit Association Test IAT

There are two methods of scoring the IAT; the original 'conventional' scoring algorithm (Greenwald, McGhee & Schwartz., 1998) and an improved 'D' scoring algorithm which was found to outperform the conventional method (Greenwald, Nosek & Banaji 2003). 46 of the articles included in this critique (Appendices N & O) used the improved d-scoring algorithm, six used the conventional scoring algorithm (four of which were

published the year of or after the improved d-scoring algorithm had been published), 19 did not report scoring procedures, and three articles were not primary research (meta-analysis, systematic-review and review articles).

Since the tools' development there have been several primary research studies and reviews of the psychometric properties of the self-esteem IAT. This critique reviews 74 articles from a literature search of the evidence-base, and will consider the validity and reliability of the tool.

5.1 VALIDITY

Construct-validity

An accurate definition of the construct being measured is the starting point for any psychometric tool (Buhrmester et al., 2011). Construct-validity is the degree to which the test measures the theoretical construct it purports to measure.

In the original self-esteem IAT paper Greenwald & Farnham (2000) fitted two models for implicit self-esteem, the first considered implicit self-esteem as a unitary concept with explicit

self-esteem. The second placed implicit self-esteem as an independent but related concept to explicit self-esteem. Results showed that the latter was a better fit. More recently, Klavina, Schröder-Abé, & Schütz (2012) found that implicit self-esteem could best be described as a four facet model, with each facet correlated with its reciprocal facet in the explicit self-esteem measure. These findings may explain discrepancies in the self-esteem IAT reliability and validity research body, i.e. the measure may not be tapping all implicit self-esteem dimensions.

Karpinski (2004) researched this by looking at the significance of the 'other' in the self-esteem IAT, specifically whether using a known vs. unknown 'other' impacts on self-esteem IAT scores. Implicit self-esteem was higher when the 'other' was unknown, with a large effect-size of .82. These findings indicate perhaps a social element to implicit self-esteem, in keeping with Klavina et al's (2012) four factor model.

Karpinski (2004) also looked at whether the 'known' other would also have the same affect when it was not a significant figure in an individual's life. Results confirmed previous findings, but interestingly the implicit self-esteem scores for 'Hitler' were

similar to those for the unknown 'other' and those for 'Santa' were similar to those for the known 'other'. These findings indicate an affective component to the construct of implicit self-esteem.

Taken together, these findings suggest that the theoretical explanations for implicit self-esteem offered by Epstein (2000) and Buhrmester et al., (2011) are perhaps too simplistic, and not an appropriate starting point from which to develop measures of implicit self-esteem. However the alternative model proposed by Klavina et al., (2012) was also empirically tested (Falk et al., 2015), and did not support the model. This is not to say that these theories should be abandoned, but that either the self-esteem IAT is not able to accurately assess these domains, or the domains that are currently theoretically thought to make up the construct of implicit self-esteem are not entirely accurate. This caveat should be held in mind when considering the following discussions about the validity and reliability of the self-esteem IAT as the empirical evidence suggests that a definition has not yet been agreed upon.

Note:

For the remaining tests of validity and reliability, effect-sizes were calculated using an online effect-size calculator (http://www.campbellcollaboration.org/resources/effect_size_input.php) based on sample-size and correlation coefficients. Effects sizes may be more informative of the magnitude of the tool's utility as these take into consideration sample-size, so they will be reported in the body of this critique. Original correlation coefficients for all tests are available in the corresponding Appendix item. Most of the research used $p < .05$, meaning there was a less than 5% possibility that the observed difference was a result of chance, however some used $p < .10$. Less weight should be given to this research as there is a greater possibility that their findings could be attributed to chance (10%).

Convergent-validity (Appendix P)

Convergent-validity is the degree to which a measure correlates with other measures that purport to measure the same or associated constructs. Only the significant findings will be discussed here.

Table 22: Significant convergent-validity

<i>Study</i>	<i>Sample- size</i>	<i>Test²⁶</i>	<i>Fisher's Zr</i>	<i>95% CI</i>	<i>Interpretation</i>
<i>Dentale et al., (2010)</i>	304	IAT Evaluative vs Affective	.47	.36, .59	Medium
<i>Falk et al., (2015)</i>	406	IAT SC	.15	.05, .25	Small
<i>Falk et al., (2015)</i>	406	IAT SC	.16	.06, .26	Small
<i>Falk et al., (2015)</i>	406	IP/NLT	.17	.07, .27	Small
<i>Falk et al., (2015)</i>	406	IP/NLT	.08	-.02, .18	Small
<i>Falk et al., (2015)</i>	406	GNAT SP	.15	.05, .25	Small
<i>Falk et al., (2015)</i>	406	GNAT SP	.30	.20, .40	Small

²⁶ IAT SC = IAT single category; IP/NLT - initial preference/ name letter task; GNAT SP = go/no-go self-pleasant; APT = affective priming task; BIAT = brief IAT; ID-EAST = identification extrinsic affective Simon task; CISE = collective ISE

<i>Study</i>	<i>Sample- size</i>	<i>Test²⁷</i>	<i>Fisher's Zr</i>	<i>95% CI</i>	<i>Interpretation</i>
<i>Falk et al., (2015)</i>	406	APT	.16	.06, .26	Small
<i>Greenwald & Farnham (2000)</i>	144	IAT Evaluative vs Affective	.46	.30, .63	Medium
<i>Gregg & Sedikides (2010)</i>	206	GNAT	.12	.01, .29	Small
<i>Karpinski (2004) Study 2</i>	54	IAT unknown vs Santa	.27	.01, .54	Small
<i>Karpinski (2004) Study 2</i>	54	IAT unknown vs Hitler	.40	.13, .67	Medium
<i>Krause et al., (2011)</i>	101	BIAT	.31	.11, .51	Medium
<i>Krause et al., (2011)</i>	101	APT	-.19	-.39, .01	Small
<i>Krause et al., (2011)</i>	101	ID-EAST	.20	.00, .40	Small

²⁷ IAT SC = IAT single category; IP/NLT - initial preference/ name letter task; GNAT SP = go/no-go self-pleasant; APT = affective priming task; BIAT = brief IAT; ID-EAST = identification extrinsic affective Simon task; CISE = collective ISE

<i>Study</i>	<i>Sample- size</i>	<i>Test²⁸</i>	<i>Fisher's Zr</i>	<i>95% CI</i>	<i>Interpretation</i>
<i>Stieger et al., (2012)</i>	154	IP/NLT	.20	.04, .36	Small
<i>Szeto et al., (2009)</i>	278	CISE	.47	.35, .59	Medium

²⁸ IAT SC = IAT single category; IP/NLT - initial preference/ name letter task; GNAT SP = go/no-go self-pleasant; APT = affective priming task; BIAT = brief IAT; ID-EAST = identification extrinsic affective Simon task; CISE = collective ISE

Table 22 highlights that caution should be exercised when examining the convergent-validity of the self-esteem IAT. Only 25% of the tests of convergent-validity were significant, and all but one of these correlations (Krause, Back, Egloff & Schmukle 2011; APT) demonstrated that the self-esteem IAT is associated with other measures of implicit self-esteem. 12 tests produced a small effect-size and only five had a medium effect-size.

Of particular concern is the inconsistency of the convergent-validity of the self-esteem IAT when measured against variations of itself. Greenwald & Farnham (2000), Karpinski (2004), Dentale, San Martini, De Coro & Di Pomponio (2010), and Krause et al., (2011) reported the highest and most significant levels of convergent-validity (although this was only moderate) when comparing the affective and evaluative self-esteem IAT and the original self-esteem IAT with variations on the 'other'. Other studies using a version of the IAT as a comparator demonstrated non-significant (Kesting & Lincoln, 2013) and poor (Falk, Heine, Takemura, Zhang & Hsu, 2015) convergent-validity. This is concerning, as one would expect that the IAT would have the strongest associations with itself. It may be that the studies reporting adequate convergent-validity are demonstrating convergence between similar

processes, but that this process may not be implicit self-esteem. An alternative explanation may be variations in study-design, including order effects, and the 'other' (known vs. unknown etc.). Karpinski (2004) demonstrated the significance of the familiarity and evaluative quality of the 'other' in studies using variations of the 'other' (known vs. unknown vs. Santa vs. Hitler).

Perhaps reflective of the state of all self-esteem IAT measures, Bosson, Swann & Pennebaker (2000) reported that none of the seven implicit self-esteem measures they tested correlated with each other. They concluded that their results show that the measures do not capture implicit self-esteem, or at best only some of the measures capture different elements of implicit self-esteem. Whilst the convergent-validity of the implicit self-esteem does not reach the levels reported for measures of explicit self-esteem, Bosson et al., (2000) suggested that high convergence validity in explicit self-esteem measures is actually capturing similarities in biases in conscious self-presentation rather than explicit self-esteem, which would not be possible to capture in implicit measures due to their capturing sub-conscious processes and being less vulnerable to conscious manipulation.

A closer look at whether study-design may have impacted on the findings here was carried out by comparing studies with significant correlations to those with no significant correlations. The only observable difference was that in 80% of significant studies, the self-esteem IAT was delivered after participants were primed by an explicit self-esteem measure, whereas studies with no significant differences were self-esteem IAT without explicit self-esteem priming. This is an interesting observation which may hint at bias in use of the self-esteem IAT, as the explicit self-esteem measure may have “given the game away” prior to the implicit measure being administered. An alternative view is the incidence of more unconscious priming effects, which supports the view of implicit self-esteem as state-like, and explicit self-esteem as trait-like. Any explanation here is purely speculative, but the evidence points towards validity of the self-esteem IAT being compromised to the point of not being valid without completion of an explicit self-esteem measure first.

Taken into consideration with the broader picture of the remaining 75% of studies that did not find significant

correlations between implicit measures, the evidence suggests that convergent-validity of the IAT is poor to moderate at best.

Discriminant-validity (Appendix Q)

Discriminant-validity is the degree to which a measure differs from other measures or constructs which are thought to be theoretically different. Table 23 shows the significant findings.

Table 23: Significant discriminant-validity

<i>Study</i>	<i>Sample-size</i>	<i>Test²⁹</i>	<i>Fisher's Zr</i>	<i>95% CI</i>	<i>Interpretation</i>
Bosson et al., (2000)	84	RSE	.22	.00, .44	Small
Bosson et al., (2000)	84	SAQ	.20	-.02, .42	Small
Bosson et al., (2000)	84	SL	.20	-.02, .42	Small
Bosson et al., (2000)	84	SC	.20	-.02, .42	Small
Buhlmann et al., (2008)	35	RSE	.52	.18, .87	Large
Creemers et al., (2013)	95	RSE	.23	.03, .44	Small
Glen et al., (2004) TIME 1	64	SL	.26	.00, .51	Small
Glen et al., (2004) TIME 1	64	SLSC	.27	.02, .52	Small

RSE = Rosenberg SE scale; SAQ = self-attributes questionnaire; SL = self-liking subscale of the self-liking and competence scale; SC = self-competence scale of the self-liking and competence scale; SLSC = self-liking and competence scale; SD = semantic differential; T = thermometer; CSES = collective SE scale (T = total, M = membership, PR = private, I = identity)

<i>Study</i>	<i>Sample-size</i>	<i>Test³⁰</i>	<i>Fisher's Zr</i>	<i>95% CI</i>	<i>Interpretation</i>
Greenwald & Farnham (2000) AFF	144	SAQ	.28	.12, .45	Small
Greenwald & Farnham (2000) AFF	144	SD	.18	.01, .35	Small
Greenwald & Farnham (2000) AFF	144	T	.20	.04, .37	Small
Greenwald & Farnham (2000) EVAL	144	SAQ	.20	.03, .36	Small
Greenwald & Farnham (2000) EVAL	144	SD	.20	.04, .37	Small
Krause et al., (2011)	101	RSE	.21	.02, .41	Small
Oakes et al., (2008) SPECIFIC	97	SL	.28	.07, .48	Small
Oakes et al., (2008) GLOBAL	97	SL	.28	.07, .48	Small
Park et al., (2014) MANIC	19	RSE	.66	.17, 1.52	Large
Richetin et al., (2012) Study 1	44	RSE	.34	.03, .65	Medium

RSE = Rosenberg SE scale; SAQ = self-attributes questionnaire; SL = self-liking subscale of the self-liking and competence scale; SC = self-competence scale of the self-liking and competence scale; SLSC = self-liking and competence scale; SD = semantic differential; T = thermometer; CSES = collective SE scale (T = total, M = membership, PR = private, I = identity)

<i>Study</i>	<i>Sample-size</i>	<i>Test³¹</i>	<i>Fisher's Zr</i>	<i>95% CI</i>	<i>Interpretation</i>
Steinberg et al., (2007)	181	RSE	.21	.07, .36	Small
Szeto et al., (2009) CANADIAN	188	CSES-T	.19	.04, .34	Small
Szeto et al., (2009) CANADIAN	188	CSES-M	.16	.02, .31	Small
Szeto et al., (2009) CANADIAN	188	CSES-PR	.19	.05, .34	Small
Szeto et al., (2009) CANADIAN	188	CSES-I	.15	.00, .30	Small

RSE = Rosenberg SE scale; SAQ = self-attributes questionnaire; SL = self-liking subscale of the self-liking and competence scale; SC = self-competence scale of the self-liking and competence scale; SLSC = self-liking and competence scale; SD = semantic differential; T = thermometer; CSES = collective SE scale (T = total, M = membership, PR = private, I = identity)

All of the effect-sizes (Fisher's Z_r) are positive. This supports the models proposed by Greenwald & Farnham (2000) and Klavina et al., (2012) of implicit self-esteem being a related but distinct concept to explicit self-esteem. However these findings should be put in perspective; only 17% of the analysis of discriminant-validity was significant, and 87% of these significant findings only had a small effect-size.

Looking specifically at Bosson et al., (2000), order effects were present and significant differences only held for those who completed the explicit self-esteem measure before the self-esteem IAT compared to a self-esteem IAT then explicit self-esteem condition, further highlighting the potential priming effect of explicit self-esteem measures on implicit self-esteem. This was supported by LeBel (2013) who demonstrated that, although not statistically significant, the relationship between implicit self-esteem and explicit self-esteem was moderated by response times on the explicit self-esteem (faster response time = higher correlation).

Criterion-validity (Appendix R)

Criterion-validity is how well the measure is able to predict other concepts that are known to be related to that concept. For

example, research has shown that explicit self-esteem is able to predict subjective well-being (Bosson et al., 2000; Schimmack & Diener, 2003) and is associated with personality (Robins, Tracy, Trzesniewski, Potter & Gosling, 2001). Both Greenwald & Farnham (2000) and Klavina et al., (2012) have empirically demonstrated their models of implicit and explicit self-esteem as two distinct but related concepts. If this is the case, it is expected that some of the concepts that are associated with explicit self-esteem will also be associated with implicit self-esteem.

Criterion-validity would be indicated by significant positive correlations. Table 24 shows significant findings. Most of the criterion-validity here was measured against facets of the broader concepts of mood and personality.

Table 24: Significant criterion-validity

<i>Study</i>	<i>Sample- size</i>	<i>Test</i>	<i>Fisher's Zr</i>	<i>95% CI</i>	<i>Interpretation</i>
Falk et al., (2015)	406	Positive Affect	.40	.11, .69	Medium
Pavlickova et al., (2014)	69	Negative Affect	-.10	-.25, .05	Small
Robinson & Meier Study 1 (2005)	54	Negative Affect	.38	.22, .54	Medium
		Negative Affect			
Robinson & Meier Study 1 (2005)	54	(self-report)	.05	.00, .10	Small
Creemers et al., (2013)	95	Anxiety	-.37	-.61, -.12	Medium
Creemers et al., (2013)	1806	Anxiety	-.33	-.57, -.09	Medium
Park et al., (2014) Bipolar Manic	60	Anxiety	-.23	-.38, -.09	Small
Robinson & Meier Study 2 (2005)	54	Anxiety	.23	.05, .41	Small

<i>Study</i>	<i>Sample- size</i>	<i>Test</i>	<i>Fisher's Zr</i>	<i>95% CI</i>	<i>Interpretation</i>
Stieger et al., (2012) Female	1641	Anxiety	-.33	-.57, -.09	Medium
Buhlmann et al., (2008)	35	Depression	-.21	-.31, -.12	Small
Cai et al., (2011)	154	Depression	-.40	-.64, -.16	Medium
Robinson et al., (2006) Study 2	101	Depression	.30	.20, .40	Small
Robinson & Wilkowski (2006)	181	Depression	.09	-.01, .19	Small
Stieger et al., (2012) Female	154	Depression	-.37	-.61, -.12	Medium
Vater et al., (2013)	125	Depression	.40	.11, .69	Medium
Campbell et al., (2007) Study 2	95	Loneliness	-.21	-.45, .03	Small
Glashouwer et al., (2013)	69	Mood	-.31	-.58, -.04	Medium
Grumm & von Collani (2007)	50	Cooperativeness	.28	.02, .53	Small

<i>Study</i>	<i>Sample- size</i>	<i>Test</i>	<i>Fisher's Zr</i>	<i>95% CI</i>	<i>Interpretation</i>
Glashouwer et al., (2013)	69	Avoidance	-.44	-.71, -.16	Medium
Glashouwer et al., (2013)	64	Extraversion (implicit)	-.29	-.56, -.01	Small
Grumm & von Collani (2007)	106	Extraversion	-.26	-.51, .00	Small
Buhlmann et al., (2009)	63	Modesty	.30	.20, .40	Small
Steinberg et al., (2007) HR Time 1	181	Multidimensional jealousy	-.40	-.64, -.16	Medium
Steinberg et al., (2007) HR Time 2	154	Interpersonal jealousy	-.21	-.45, .03	Small
Buhlmann et al., (2009)	59	Narcissism	.09	-.01, .19	Small

<i>Study</i>	<i>Sample- size</i>	<i>Test</i>	<i>Fisher's Zr</i>	<i>95% CI</i>	<i>Interpretation</i>
Falk et al., (2015)	406	Narcissism	1.02	.53, 1.51	Large
van Tuiji et al., (2014) Time 1	1641	Narcissism	.37	.11, .62	Medium
Glen et al., (2004) Time 1	50	Neuroticism (implicit)	-.33	-.61, -.06	Medium
Ritter et al., (2013)	54	Neuroticism	.40	.24, .55	Medium
Robinson & Meier Study 2 (2005)	54	Neuroticism	.06	.12, .11	Small
van Tuiji et al., (2014) Time 1	121	Negative thinking	.27	-.02, .55	Small
de Jong et al., (2012) Overall	406	Pride Authentic	.27	-.02, .55	Small
Falk et al., (2015)	406	Pride Heubristic	.40	.20, .58	Medium
Hedrick & Berlin (2012)	213	Self-efficacy (social)	.33	.07, .59	Medium

<i>Study</i>	<i>Sample- size</i>	<i>Test</i>	<i>Fisher's Zr</i>	<i>95% CI</i>	<i>Interpretation</i>
Falk et al., (2015)	69	Agoraphobia	-.28	-.52, -.04	Small
Glashouwer et al., (2013)	69	Fear	-.42	-.70, -.15	Medium
Falk et al., (2015)	406	Social phobia	-.31	-.57, -.05	Medium
Buhlmann et al., (2008)	63	Beliefs about appearance	.13	.03, .23	Small
Verplanken et al., (2007)	35	Beliefs about appearance	.40	.20, .58	Medium
Krizen & Suls (2009) Study 3	19	Mania	-.09	-.29, .11	Small
Robinson & Meier Study 2 (2005)	61	Somatic symptoms	-.29	-.46, -.11	Small

<i>Study</i>	<i>Sample- size</i>	<i>Test</i>	<i>Fisher's Zr</i>	<i>95% CI</i>	<i>Interpretation</i>
Somatic symptoms					
Robinson et al., (2006) Study 2	61	(informant)	-.21	-.31, -.11	Small
Robinson et al., (2006) Study 2	61	Somatic symptoms	.13	.03, .22	Small
de Jong et al., (2012) Girls	1806	Parental Bond	.37	.11, .62	Medium
Father caring					
Falk et al., (2015)	406	Parental Bond	.28	.14, .41	Small
Father over-caring					

Much like for explicit self-esteem, the criterion-validity for the self-esteem IAT and measures of anxiety and depression were the most supported, however findings were mixed in terms of negative and positive correlations, and effect-sizes were small. Measures of narcissism, negative affect and somatising were also significantly associated with the self-esteem IAT (n=3 studies in each group). Effect-sizes were small to medium, and perhaps provide encouraging findings in the validity of the self-esteem IAT, but also provide support for the proposed model of explicit and implicit self-esteem as related but distinct concepts. However this implicit measure of self-esteem has a long way to go before it can match the criterion-validity of explicit self-esteem, e.g. Buhrmester et al., reported a criterion-validity of .62 for psychological wellbeing.

5.2 RELIABILITY

When deciding whether a tool is reliable, it is important to make a distinction between being reliable for research, and being reliable for clinical purposes. When using assessments in research, we are interested in the differences between groups of people, whereas in a clinical setting we want to identify individual differences, therefore these tools must be more

robust whilst retaining their sensitivity in order to know we are picking up true differences. Acceptable reliability estimates are generally .90 for clinical purposes and .70 for research (Groth-Marnat, 2003). IATs have been proposed to overcome problems with self-report when assessing clients.

Internal-consistency

Internal-consistency was measured using Cronbach's Alpha. This measures the degree to which the items within a psychometric are measuring the same construct.

Table 25: Implicit Association Test internal-consistency

<i>Cronbach's Alpha</i>	<i>Internal- consistency</i>	<i>Study</i>	<i>Other implicit self-esteem measures</i>
≥.90	Excellent	Richetin et al., (2012; study 2) Robinson & Wilkowski (2006)	
.90-.80	Good	Bosson et al., (2000) Gebauer et al., (2008) Kesting & Lincoln (2013) Laws & Rivera (2012; study 1b) Oakes (2008; neutral and specific SEIAT) Richetin et al., (2012; study 1)	SRIRT (Kestling & Lincoln, 2013)

Schreiber et al., (2012; SAD patients)

Schröder-Abé et al., (2007)

Szeto et al., (2009)

.79-.7

Acceptable

Laws & Rivera (2012; study 1a & 3)

GNAT (Gregg & Sedikides, 2000)

LeBel (2009)

Oakes et al., (2008; global SEIAT)

Rudolph et al., (2010)

Steinberg et al., (2007)

.69-.6

Questionable

Laws & Rivera (2012; study 2)

Sava et al., (2011)

Schreiber et al., (2012; controls)

Based on the included studies which reported internal-consistency, there is some evidence to suggest that the self-esteem IAT possesses alpha levels comparable to those of explicit self-esteem measures such as the Rosenberg Self-Esteem Scale (Sinclair, Blais, Gansler, Sandberg, Bistis & LoCicero, 2010). Alpha levels reported in 11 studies here exceed .80, however many were not so satisfactory suggesting the tool is possibly more suited to research than clinical use.

Split-Half Reliability

This is a measure of consistency reported as Spearman-Brown's split-half correlation coefficient. This is measured by comparing scores from half of the measure to the other half. If a tool has good split-half reliability then this is an indication of all parts of the tool measuring the same construct.

The split-half reliability scores reported here (Table 26) reflect a similar distribution to that of the internal-consistency reported above.

Table 26: Split-half reliability

<i>Spearman's-Brown Split-Half r</i>	<i>Internal- consistency</i>	<i>Study</i>	<i>Other implicit self-esteem measures</i>
$\geq .90$	Excellent	Robinson & Meier (2005)	
.90-.80	Good	Glen et al., (2004) Glashouwer et al., (2013) Grumm & van Collani (2007) Ritter et al., (2013; controls) Robinson et al., (2006; study 1) Röhner et al., (2011; x4 trials) Rudolph et al., (2008)	

.79-.7

Acceptable

Glen et al., (2004; time 2)

GNAT (Gregg & Sedikides, 2000)

Ritter et al., (2013; SAD patients)

Robinson et al., (2006; study 2)

Röhner et al., (2011; baseline)

Steiger et al., (2012)

Van Tuiji et al., (2014)

.69-6

Questionable

Creemers et al., (2013)

NLT (Gregg & Sedikides, 2000)

Dentale et al., (2010; affective)

IL/BPT (Rudolph et al., 2008;

Krizen & Suls (2009)

Study 2)

Greg & Sedikides (2010)

ID-EAST (Rudolph et al., 2008;

Ratliffee & Oishi (2003; study 1, 4, Study 2)

5)

Schreiber et al., (2012; controls)

.59-5	Poor	Alessandri et al., (2013)	ISES (Bosson et al., 2000)
		Dentale et al., (2010; evaluative)	IL/BP (Bosson et al., (2000)
		Dentale et al., (2012; affective and	NLT (LeBel, 2009)
		evaluative)	IL/BPT (Rudolph et al., 2008;
		Ratliff & Oishi (2003; study 2)	Study 1)
≤.49	Unacceptable	Bos et al., (2010)	SAPT (Bosson et al., 2000)
			Stroop (Bosson et al., 2000)
			NLT (Krizen & Suls, 2009)
			EAST (Rudolph et al., 2008; Study
			1)

Test-Retest Reliability

Test-retest reliability is the degree to which scores will remain the same if the same user completed the measure at different time points. When assessing test-retest reliability, conditions from the first test period should be replicated as closely as possible at the second time of testing, which should be carried out six weeks later (Fogarty, 1999). Retesting after this may result in learning being retained from the first test, and increases the risk of life-events between testing, both of which may impact on retesting scores.

Three of nine studies reported a significant test-retest correlation coefficient for the self-esteem IAT (Table 27), but none of these studies consistently used a time frame of six weeks between testing (Fogarty, 1999), and half of the sample used by Greenwald & Farnham (2000) completed these on the same day. Based on their findings, Greenwald & Farnham (2000) acknowledged that the self-esteem IAT could not be considered a reliable tool to capture individual differences; however they did argue the case for its suitability in research.

Table 27: Test-retest reliability

	Correlation Coefficient	Time lapsed Mean (Range)
<i>Bosson et al., (2000)</i>	.69*	31.23 days (22-38)
<i>Buhrmester et al., (2011) REVIEW</i>	.69	
<i>Glen et al., (2004)</i>	.61	10.44 days (7-27)
<i>Gregg & Sedikides (2010)</i>	.31 to .51	
<i>Greenwald & Farnham (2000)</i>	.52***	8 days; 50% same day
<i>Kesting & Lincoln (2013) SYSTEMATIC- REVIEW</i>	.69	
<i>Krause et al., (2011)</i>	.54**	4 weeks
<i>Rudolph et al., (2008)</i>	.54	7 days

*p<.05 **p<.01 ***p<.0005

Bosson et al., (2000) reported the highest significant test-retest correlation coefficient (albeit to a level only suitable for research purposes); this may be a result of more robust test-retest

procedures, including conducting retesting at the same time of day. Limited methodology reporting in the remaining studies makes it difficult to ascertain whether it is the self-esteem IAT that is responsible for low test-retest reliability, or the research methodology.

In their review of implicit self-esteem measures, Burhmester et al., (2011) reported inconsistent test-retest reliabilities, arguing that this may be evidence for implicit self-esteem being state-like, and subject to situational manipulation. Again, none of these studies reported any life changes in the test-retest period that might have contributed to any changes in levels of implicit self-esteem.

5.3 CONCLUSIONS

Practical Considerations

In addition to the evidence-base suggesting that the self-esteem IAT is not suitable beyond research purposes, it may also not be suitable for some client groups. Experimental tasks with computer keyboard interfaces may not be appropriate for people with difficulty with fine motor movement, or who have pathologies such as schizophrenia or depression which are

known to impact on cognitive abilities (Mohamed, Paulsen, O'Leary, Arndt & Andreason, 1999; Austin, Mitchell & Goodwin, 2001). As a result of IAT scoring methods outlined above, any individual quality that impacts on performance speed may result in uninterpretable results. Of particular concern with a concept that is thought to be state-like and correlated with affective states (Buhrmester et al., 2011), trepidation about test performance may also impact on performance, calling into question the validity of such results.

Practical considerations regarding test administration surround its use in secure environments which restrict access to electronic devices. This limits the ability to research use of the self-esteem IAT in certain population. Implicit self-esteem research has now begun to focus on the significance of implicit/explicit self-esteem discrepancies rather than individual differences, e.g., in narcissism (Zeigler-Hill, 2006; Campbell, Bosson, Goheen, Lakey & Kernis, 2007; Vater, Ritter, Schröder-Abé, Schütz, Lammers, Bosson & Roepke, 2013) and paranoid delusions (Kesting & Lincoln, 2013). Forensic services would likely be a valuable source of participants in such research that would contribute to empirical testing of theoretical

understandings of these pathologies. However a valid and reliable paradigm to supersede self-report remains outstanding.

Strengths

CBAs are able to standardise administration and scoring, and CBAs that score the tests for administrators also eliminate risk of human error which means that the data collected to develop norms and for research purposes are more robust.

Limitations

When reviewing the evidence here, a number of variations in study-design were apparent which seemed to be mostly a result of researchers wanting to develop more robust means of testing as the self-esteem IAT has developed. These included use of affective vs. evaluative stimulus words, stimulus words being self-selected (i.e. familiar) compared to standardised, using a known, unknown, neutral or "I am not/Not me" other word, and variation in the order of implicit self-esteem and explicit self-esteem test administration.

Self-esteem researchers have demonstrated that implicit and explicit self-esteem can best be described as related but

different constructs. When testing the convergent/divergent validity of implicit self-esteem measures, researchers must take into account order effects and vary delivery of implicit/explicit measures. Not varying the order seems to have impacted on findings here. It may be that using explicit self-esteem measures artificially creates support for the criterion-validity of the self-esteem IAT, or it may be that this is genuine. Either way, in order to test and control for priming effects researchers must be aware of this and factor it into study-design.

The differences in study-design did not seem to impact on findings when merely observing the differences; it may be useful to conduct more robust research with the focus being on the “other effect” (Karpinski, 2004; Riketta, 2005; Oakes, Brown & Cai, 2008; and Falk et al., 2015), or the valence of stimulus words’ (Yu, Wang, Wang & Bastin, 2012), which has already been commenced by the aforementioned authors. Additionally, as highlighted by Bosson et al., (2000), neither study took into consideration external factors that may have contributed to state implicit self-esteem scores, e.g. exam stress, that are common in a student population. Finally, the majority of the research reported here was conducted with a psychology student sample, these demographics are not typical

of the clinical population with whom this tool may be useful, and therefore these findings are not replicable to a clinical population.

Unfortunately the evidence-base for self-esteem IAT is inconsistent. Research tells us that the IAT for other psychological concepts is both reliable and valid, so inconsistencies in the self-esteem IAT suggests that the problem may be specific to the definition of self-esteem itself. Implicit self-esteem involves self-representations – and we have different self-representations in different situations, e.g. social, academic, family (Falk et al., 2015). However Falk et al's., (2015) recent attempt to address this failed to improve the validity of the self-esteem IAT. A number of recommendations for further research/uses with the self-esteem IAT have been made, but these should only be considered when we have a clear understanding and definition of implicit self-esteem as a concept.

In Chapter 4 the question was raised as to whether gang-membership and the violence associated with this is protection against threatened egotism. Until a definition of implicit self-

esteem has been empirically tested and been shown to be both valid and reliable for use in this population, it is not appropriate to use an implicit measure of self-esteem in such a controversial area of research, therefore the question as to whether gang-membership is a protection against threatened egotism cannot yet be reliably empirically tested.

Chapter 6

THESIS DISCUSSION

Word count including tables and figures: 2482

6.0 CONCLUSIONS

This thesis aimed to synthesise the evidence base to date for individual risk-factors for male gang-membership, and to identify whether these were different to those of their non-gang violent offender counterparts. A first of its kind, this thesis also aimed to explore the role of adult attachment within the gang, to provide an empirical underpinning to the anecdotal argument that gangs are a 'surrogate family'. Although research tells us that there are differences between US and UK gangs (Weerman et al., 2009), the UK evidence base for psychological factors associated with gang membership lags behind that of the US, and the role of self-esteem is not fully understood with some suggesting that it low self-esteem that drives gang-joining, and some arguing the case for high self-esteem. This thesis drew a spotlight on this ambiguity to attempt to understand the role of self-esteem in gang-membership.

An appropriate starting point is the lack of agreement between the three gang-indices used. This has been a widely debated area in gang research and researchers have concluded that the two self-report approaches used in this study are reliable methods of gang identification. Unfortunately this was not the case in this research and this may be a result of using an

incarcerated population who may perceive greater consequences to gang identification than a community sample. Specific to the Eurogang method of gang identification, this may also reflect different characteristics of older gang-members, e.g. not being street-orientated as a result of a move to more serious organised crime and therefore the identifiers in the tool not being applicable to an older gang population. These findings indicate that perhaps more research needs to be conducted to develop a more reliable means of gang identification in gang-members that demographically match the sample used here.

This thesis aimed to provide an overview of individual risk-factors which may be associated with gang-membership, and whether these are different to those for their non-gang-offending counterparts. This is the first attempt to do so through meta-analysis, and findings here differ to Esbensen et al's., (2009) empirical study which did the same, as the authors found that impulsivity and risk-taking (externalizing behaviours) were predictors of individuals becoming violent-offenders but not gang-members. This thesis found that externalizing behaviours were associated with both violent offending and gang-membership.

This thesis also found higher rates of internalizing-behaviours in gang-members which was not the case for their non-gang counterparts. However there are limitations to this finding due to the cross-sectional study design used in the included studies, therefore a temporal relationship cannot be established, however this finding is in keeping with the emerging evidence for high-rates of victimisation in gang-members (Taylor et al., 2008; Coid et al., 2013) and it could be hypothesised are a result of high levels of violence and trauma exposure as a consequence of gang-activity. This thesis has highlighted a need for researchers to shift their focus from antisocial behaviours to the negative consequences which will have long-term detriment to their mental-health which will also incur a public health cost.

It is not feasibly within the scope of this thesis to address every biopsychosocial factor associated with gang-membership, however the inclusion of a measure of adult-attachment has proved useful. Chapter 2 supports the existing US evidence base for there being no association between attachment to the family and gang-membership (Bjerregaard & Smith, 1993; Eitle, 2004; Esbensen, 2009). However this thesis has provided empirical evidence for the role of attachment within the gang which is different to that of their non-gang counterparts,

suggesting a possible protective function of the gang. This is the first known research to date to look at this association and should prompt other researchers to follow suit so that we can better understand the role of attachment within the gang as this may be key to gang-desistence.

The existing evidence base for the association between self-esteem and gang-membership has been inconsistent, with some authors finding no association (Esbensen & Weiner, 1993; Yoder & Hoyt, 2003; Esbensen et al., 2009) and others finding that low self-esteem is associated with gang membership (Dukes et al., 1997; Wood et al., 1997; Florian-Lacy et al., 2002; Kee, 2003; Winfree, 2012; Farmer & Hairston, 2015). Inconsistency remains within this thesis, although there were no significant differences between gang and non-gang members in Chapter 2, their levels of self-esteem were healthy, conversely in Chapter 4 self-esteem was low. However it is arguable that the gang-member in Chapter 4 was of a more complex presentation, had more severe personality pathology, and that as he was serving a life sentence, realistically his future outcomes were less optimistic than those in the prison sample which likely had impacted on his self-esteem. Additionally, with high-rates of gang-activity in the Chapter 2 study site it is

perhaps realistic to conclude that gang-member participants were in prison with other members of their gang and their 'gang self-esteem' was still intact. Conversely MS was in a 16-bedded NHS therapeutic community away from his gang, so gang protection and the associated 'gang self-esteem' was absent.

Unfortunately it was not possible to conduct the self-esteem IAT designed to counter the potential effects of self-report bias associated with explicit self-esteem measures. However, the psychometric critique here has highlighted that in the absence of an agreed upon evidence-based definition of implicit self-esteem, this would have been a premature use of the tool in a controversial group of individuals to research.

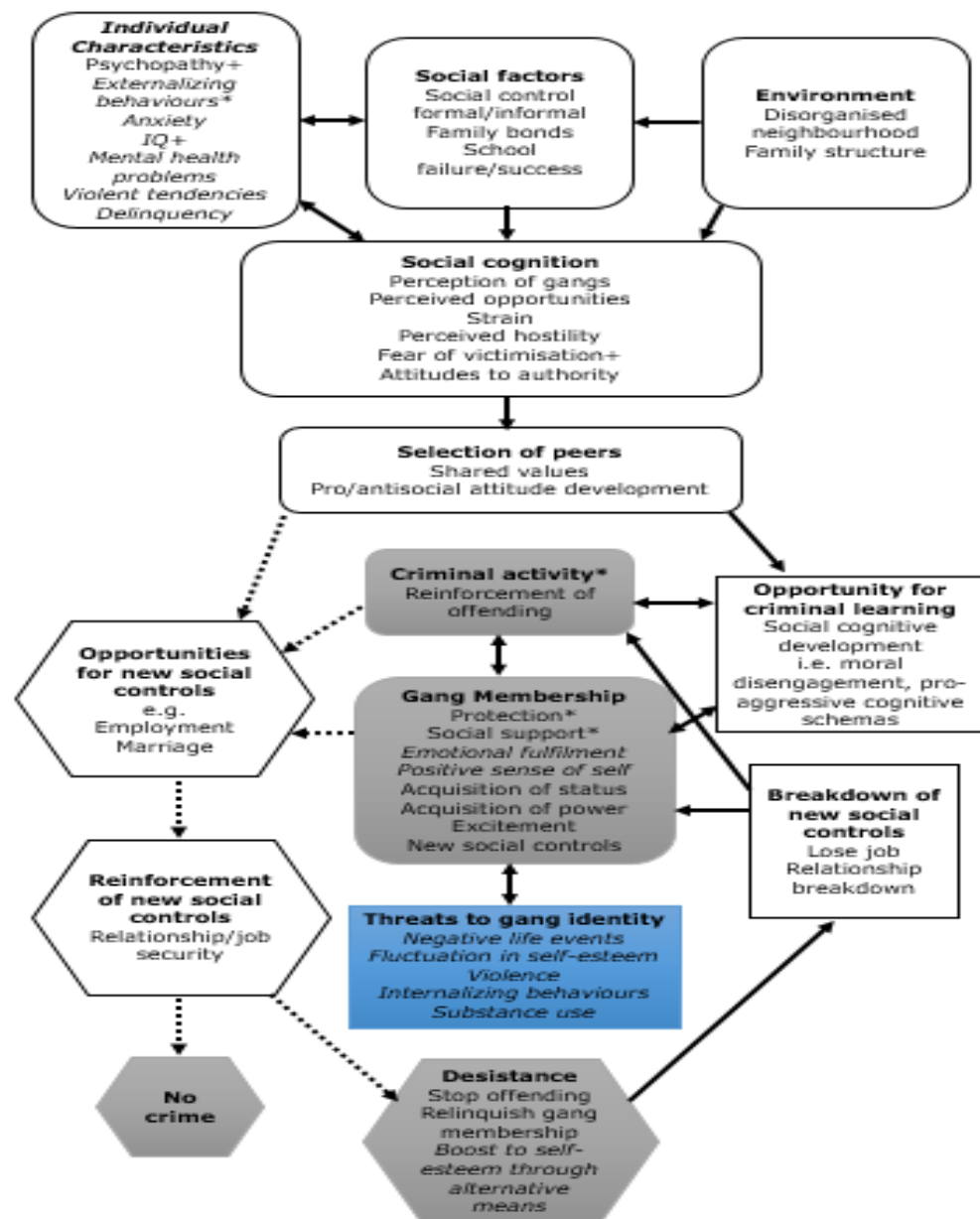
This thesis has shown that factors which are considered to be associated with the broader psychological construct 'personality' are associated with gang membership (Chapter 3), however that these may not be unique to gang members compared to violent offenders (Chapter 2). Personality encompasses many concepts and all those that may be relevant to gang-joining have not been discussed in this thesis. As recently highlighted by Pauwels & Hardyns (2016), it is perhaps surprising that associated concepts such as 'locus of control' have not been

studied in relation to gang-joining. Although the authors found no direct association between external locus of control and gang-joining when other factors were taken into consideration, they did find a moderate association between the two and concluded that this could not be ignored, and I would argue the same. Research into violent offenders with an external locus of control has shown that these are less likely to engage in treatment due to a belief that they are not responsible for their offending behaviours and as such have no power to change themselves. Conversely, those with an internal locus of control are more likely to engage in treatment programmes due to a belief that they control their world and have an ability to change their behaviours (Chambers et al., 2008). Applied to gang-desistence, it could be reasonably assumed then that those with an external locus of control would be unlikely to believe that they have the power to change their life-course and so would remain entrenched within the gang. This concept has not been widely studied in relation to gang-membership, and we should not be satisfied that we have exhausted all areas associated with personality based on those identified in this thesis.

Wood & Alleyne (2010) developed a model of gang-membership which showed pathways into and out of gang-membership.

Although not the primary aim of this thesis, it has contributed to the necessary empirical testing of elements of this model as called for by Wood & Alleyne (2010), and based on the findings here, it has also been possible to propose development of the model (Figure 29).

Figure 29: Amended Unified Theory of Gang-Membership³²



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'*' denotes support from the thesis of a factor proposed by Wood & Alleyne

'+' denotes items which would benefit from further research-based on this thesis.

Items written in italics have been proposed to be included in the model based on this thesis.

Wood and Alleyne proposed that individual factors are important starting points for gang-joining, and that these may account for why those from organised social and community structures can go on to join gangs. Chapters 3 and 4 of this thesis showed inconsistent and weak support for psychopathy; I would argue that this association warrants further research as only three studies met the inclusion criteria in Chapter 3, and Chapter 4 was a single case treatment needs analysis. The same applies to IQ; which was not associated but only represented by one study in Chapter 3, whilst 'MS' in Chapter 4 did present with intellectual difficulties. Presence of hyperactivity prior to gang-joining was supported in Chapter 3, but has been expanded in this model to include all 'externalizing behaviours' as was the term used in Chapter 3. It could be hypothesised that gangs provide those with presence of externalizing behaviours a means of 'treatment' through gang activity, e.g. violence to reduce hyperactivity and aggression, and substance-use to self-medicate restlessness and hyperactivity. This may be a finding of great value, as if this is the case then early assessment and intervention when these youths are still engaged with organised social and community structures may reduce the number of youths who then go on to join gangs. Empirical research is needed in this area focusing on the presence of these

behaviours prior to and during gang-membership to establish if these do reduce after gang-joining. Based on findings from Chapter 3, violent tendencies and delinquency have also been included as being present prior to gang-joining, suggesting that gangs attracts those who are already involved in a deviant lifestyle (Thornberry 1998; Gatti et al., 2005; Zhang et al., 1999). This has important implications for gang prevention strategies, as those who are involved in these behaviours from a young age tend to have weakened bonds with conventional societal institutions as well as their families, and seek out bonds with those who would support their behaviours (Control Theory; Gottfredson & Hirschi, 1990), in the case of gang-members this reinforcement comes from the gang. In order to prevent these individuals from moving towards gang-joining it is pivotal for conventional societal institutions and the family to maintain their bond with the delinquent child.

Chapter 3 of this thesis has highlighted a bias in gang research towards the negative behaviours of gang-members. Positively, efforts are being made to address this bias, including in this thesis. However the role of 'negative life events' for male gang-members aged 10-25 remains unclear. Does this belong as precipitant to gang-joining (social cognition), or is this a

consequence of being a gang-member? Or perhaps both are applicable. Chapter 3 has shown inconsistent support for the association between gang-membership and 'negative life events' (including fear of victimisation), however these were all cross-sectional studies where it has not been possible to identify a temporal relationship, indicating a need for further research here, ideally using a longitudinal approach so that a temporal relationship can be established. Although only cross-sectional evidence is available here and this is inconsistent, these findings cannot be ignored, and I would argue that these findings may in part be due to the lack of available research here, therefore negative life events has been included in additional domain of this model 'threats to gang identity' as part of a group of deleterious factors which may maintain gang-membership and would warrant empirical testing.

The domain 'threats to gang identity' seems to be the appropriate place for an interplay of violence, substance-use, internalizing behaviours and fluctuations in self-esteem. It could be hypothesised that as a result of becoming increasingly entrenched in an antisocial lifestyle that gang-members become isolated from conventional society, and that as limited conventional opportunities are available to them, internalizing

behaviours emerge, and substance-use may be used as a means to self-medicate for disorders such as depression and anxiety. Alongside this, there is an ever present threat of loss of the gang as a result of gang rivalries, and in keeping with self-esteem and violence research, any threat to the gang which promotes explicit self-esteem, may also be a threat to low implicit self-esteem. This supports use of violence above and beyond that of their non-gang counterparts (Centre for Social Justice, 2009) in order to protect against this threat to self-esteem. Therefore part of the route to gang desistence may include self-esteem being achieved through engagement with new social controls. This addition to the model suggests that gang-membership is, at least in part, therefore maintained in defence of the deleterious consequences of and threats to the gang identity.

This research is the first to look at attachment within the gang; Chapter 2 has provided a valuable insight into the attachment of gang-members to other gang-members, with them being less fearful in their attachments to their friends than their non-gang counterparts. This supports Wood & Alleyne's proposal that gang-membership provides protection and social support; and according to adult attachment theory, they may also experience

more emotional fulfilment in their relationships with their fellow gang-members (Bartholomew & Horowitz, 1991). This has serious consequences for any gang-desistence programme, as it is likely that the attachment function of the gang will need to be replicated through non-gang means in order for desistence to be achieved. The deeply engrained nature of attachment mean that it is unlikely that time spent in prison will result in any meaningful change. Supporting gang-members in finding other means of having their attachment needs met outside of the gang may help to increase desistence from gang-membership.

A key time for intervention with these individuals may be when they are in prison. We know that punishment alone and forcing offenders to 'desist' rather than them choosing to do so does not work (National Institute of Justice, 1998; Northern Ireland Office, 2008). "Through the gate" work may be key for maintenance of change when the offender returns to the community, with gang-members being supported in planning for and setting up engagement with conventional societal bonds which would support development of new prosocial attachments that might fulfil the attachment role of the gang whilst they are still in prison. Unfortunately this is not the norm, with only one

prison providing this in London. Research such as this signals the need for change in that regard.

This thesis has been valuable in synthesising the existing evidence-base for individual factors associated with gang-membership in males aged 10-25; it has also been the first of its kind to investigate relationships within the gang. This has resulted in the empirical testing of areas of a new and hypothetical model of gang-joining and desistance, and has also enabled development of the model based on findings here. By better understanding the function of the gang, it will be possible to develop psychologically informed, evidence-based approaches to gang-prevention and gang-desistance. However there are a number of areas which will need to be prioritised for further research before these can be reliably developed, in particular in the UK given the differences shown by the Eurogang Network between UK and US gangs (Weerman et al., 2009).

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APPENDICES

Appendix AA: Participant Information Sheet

Participant Information Sheet
(Draft Version 1.4 Date: 18/08/14)

Title of Study: A Cross Sectional Study of Personality, Attachment, and Self-Esteem in UK Gangs in prison

Name of Researcher(s): Principle Investigator – Vincent Egan
Primary Researcher – Alison Waugh

We would like to invite you to take part in our research study. Before you decide we would like you to understand why the research is being done and what it would involve for you. One of our team will go through the information sheet with you and answer any questions you have. Talk to others about the study if you wish. Ask us if there is anything that is not clear.

What is the purpose of the study?

The study is designed to find out whether people's personality type, relationship style and levels of self-esteem predict whether they are likely to join a social group that commits crimes as part of that social group.

Why have I been invited?

You are being invited to take part because we want to look at certain characteristics of different groups of men. We particularly want to compare men who have offended to men of a similar background who do not offend. Of the men who offend, we want to look at those who commit crimes as part of a social group they spend a lot of time with to those who do not offend as part of their social group. In total we are inviting 159 participants to take part. We are inviting you to take part because we think that you might fall into one of those groups.

Do I have to take part?

It is up to you to decide whether or not to take part. If you do decide to take part you will be given this information sheet to keep and be asked to sign a consent form. If you decide to take part you are still free to withdraw at any time and without giving a reason. This would not affect your legal rights.

What will happen to me if I take part?

If you decide that you would like to take part in the study then you will be asked to complete 5 questionnaires which will take approximately 45 minutes to complete in total. The researcher will give you a study pack with all of the questionnaires inside them. The researcher will come to collect the study pack from you 7 days later, and answer any questions you have about the questionnaires you have completed or the study.

One questionnaire will be about your relationship with either your mother or father, and you will be asked to answer the same questions about your relationship with your friends. This questionnaire consists

of 30 questions, examples of the types of questions you will be answering are: "I find it difficult to depend on other people" and "it is very important to me to feel independent". The third questionnaire you will complete will be about self-esteem which looks at how you feel about yourself. The questionnaire consists of 10 questions, examples of the types of questions you will be answering are: "I am able to do things as well as most other people" and "I feel I do not have much to be proud of". The fourth questionnaire will be about your social group in the community and has 7 questions. The types of questions you will be asked are: "Do people in your group actually do illegal things together?" and "Does this group spend a lot of time together in public places like the park, the street, shopping areas, or the neighbourhood?" The fifth questionnaire looks at what type of personality you have. It consists of 60 questions, examples of the types of questions are: "I would be quite bored by a visit to an art gallery" and "Having a lot of money is not especially important to me"

Information will also be gathered about your age, ethnicity, any mental health diagnosis you have and your offending history from prison records, these will be kept in a secure location.

Expenses and payments

Participants will not be paid to participate in the study

What are the possible disadvantages and risks of taking part?

Some of the questions you are answering might make you feel unhappy about some of the relationships that you have or some of the experiences that you have had. The questionnaires ask general questions which you give a rating score to say how much this applies to you, you do not ask you to describe specific events that might be upsetting to you. If this is the case please speak to a Listener or contact the Samaritans. There are posters on your spur that will tell you who your Listeners are. Alternatively you can contact the Samaritans; there is a direct line number for you to do this in the prison. Alternatively you can speak with a Safer Custody Officer.

As part of this study we want to see whether there are differences in people who are in gangs and people who are not in gangs. Some people may feel that there is a stigma attached to being in a gang such as getting negative responses from others because of their gang status. All responses in this study are confidential, they will not be shared with the prison service or anyone else. The only people who will have access to the responses are the research team. Your name is not featured on any of the questionnaires so it will not be possible from looking at the questionnaire to identify who is and is not in a gang.

What are the possible benefits of taking part?

We cannot promise the study will help you but the information we get from this study may help in the future to reduce the problems that people who join certain social groups might experience. In the long term it might help us to develop interventions to prevent people from

joining social groups where they are likely to get in trouble in the future.

What if there is a problem?

If you have a concern about any aspect of this study, you should ask to speak to the researchers who will do their best to answer your questions. The researchers contact details are given at the end of this information sheet. If you remain unhappy and wish to complain formally, you can do this by writing a letter of complaint to:

HM Inspectorate of Prisons
Victory House
6th floor
30-34 Kingsway
London
WC2B 6EX

Will my taking part in the study be kept confidential?

We will follow ethical and legal practice and all information about you will be handled in confidence.

If you join the study, some parts of prison records and the data collected for the study will be looked at by authorised persons from the University of Nottingham who are organising the research. They may also be looked at by authorised people to check that the study is being carried out correctly. All will have a duty of confidentiality to you as a research participant and we will do our best to meet this duty.

All information which is collected about you during the course of the research will be kept **strictly confidential**, stored in a secure and locked office, and on a password protected database. Any information about you which leaves the prison will have your name and address removed (anonymised) and a unique code will be used so that you cannot be recognised from it.

Your name will be kept for 1 year after the end of the study so that we are able to contact you about the findings of the study and possible follow-up studies (unless you advise us that you do not wish to be contacted). If you are released from prison within that time then it will not be possible for us to contact you unless you provide us with your contact details. You can do this by writing to Alison Waugh at the address at the bottom of this information sheet. All research data will be kept securely for 7 years. After this time your data will be disposed of securely. During this time all precautions will be taken by all those involved to maintain your confidentiality, only members of the research team will have access to your personal data.

The only time we would break confidentiality and anonymity would be if you break prison service rules (any behaviour that would result in an adjudication), tell the research team about a crime that the

authorities do not know about, or if you tell us that you are going to do something that will harm you or someone else. If any of the above applies we will follow the appropriate reporting procedure in the prison. If we are going to break confidentiality we will tell you that this is going to happen.

What will happen if I don't want to carry on with the study?

Your participation is voluntary and you are free to withdraw at any time, without giving any reason, and without your legal rights being affected. This also means that if you decide you do not want to take part that this will not affect your time in prison. If you withdraw then the information collected so far cannot be erased and this information may still be used in the project analysis.

Involvement of the General Practitioner/Family doctor (GP)

Your GP will not be contacted for the purpose of this study.

What will happen to the results of the research study?

All of the information you give me will be anonymised so no one will be able to see who completed the questionnaires. These will be kept in a locked cabinet at the university and will only be accessed by the research team. As we are interested in looking at groups of people no one's information will be looked at independently. The information given will be discussed with the supervisor of this project (Dr Vince Egan) and the academic supervisor.

The information we receive will be written up for publication in a Psychology journal and will contribute towards a doctorate in Forensic Psychology. This will be in around August 2015. We will not be able to discuss your individual results with you, but will write a short report of our findings which we will give to all study participants who are still contactable when these results are ready for distribution.

Who is organising and funding the research?

This research is being organised by the University of Nottingham and has no funded component as it is student research.

Who has reviewed the study?

All research in the NHS is looked at by independent group of people, called a Research Ethics Committee, to protect your interests. This study has been reviewed and given favourable opinion by the University of Nottingham, Faculty of Medicine Research Ethics Committee.

Further information and contact details

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Appendix AB: Consent Form

CONSENT FORM

A Cross-Sectional Study of Personality, Attachment, and Self-Esteem in UK Gangs in prison.

Draft 1.4 Final Version 1.0

18/08/2014

REC ref: I09102014 14029 SoM PAPsych DForenSci

Name of Researcher: Alison Waugh

Name of Participant:

Please initial box

1. I confirm that I have read and understand the information sheet version number dated..... for the above study and have had the opportunity to ask questions.
2. I understand that my participation is voluntary and that I am free to withdraw at any time, without giving any reason, and without my prison treatment or legal rights being affected. I understand that should I withdraw then the information collected so far cannot be erased and that this information may still be used in the project analysis.
3. I understand that relevant sections of my prison records and data collected in the study may be looked at by authorised individuals from the University of Nottingham, the research group and regulatory authorities where it is relevant to my taking part in this study. I give permission for these individuals to have

☐☐☐

access to these records and to collect, store, analyse and publish information obtained from my participation in this study. I understand that my personal details will be kept confidential.

4. I agree to take part in the above study.

☐

_____	_____	_____
Name of Participant	Date	Signature
_____	_____	_____
Name of person taking consent	Date	Signature

Appendix A: Eurogang Questionnaire

		YES	NO
1	Some people have a certain group of friends that they spend time with, doing things together or just hanging out. Do you have a group of friends like that?		
2	About how many people, including you, belong to this group?		
	2		
	3-10		
	11-20		
	21-50		
	51-100		
	More than 100		
3	Which one of the following best describes the ages of people in your group?		
	Under 12		
	Twelve to fifteen		
	Sixteen to eighteen		
	Nineteen to twenty five		
	Over twenty five		
4	Does this group spend a lot of time together in public places like the park, the street, shopping areas, or the neighborhood?		
5	How long has this group existed?		
	Less than three months		
	Three months to less than one year		
	One to four years		
	Five to ten years		
	Eleven to twenty years		
	More than twenty years		
6	Is doing illegal things accepted by or okay for your group?		
7	Do people in your group actually do illegal things together?		

Do you consider yourself to be in a gang?

Yes

No

Do others consider you to be in a gang?

Yes

No

Appendix B: Relationship Scale Questionnaire (Parent/Caregiver)

Relationship Style Questionnaire

Please read each of the following statements and rate the extent to which you believe each statement best describes your feelings about relationships with your Mother/Father.

		Not at all like me		Somewhat like me		Very much like me
1.	I find it difficult to depend on other people.	1	2	3	4	5
2.	It is very important to me to feel independent.	1	2	3	4	5
3.	I find it easy to get emotionally close to others.	1	2	3	4	5
4.	I want to merge completely with another person.	1	2	3	4	5
5.	I worry that I will be hurt if I allow myself to become too close to others.	1	2	3	4	5
6.	I am comfortable without close emotional relationships.	1	2	3	4	5
7.	I am not sure that I can always depend on others to be there when I need them.	1	2	3	4	5
8.	I want to be completely emotionally intimate with others.	1	2	3	4	5
9.	I worry about being alone.	1	2	3	4	5
10.	I am comfortable depending on other people.	1	2	3	4	5
11.	I often worry that my Mum/Dad doesn't really love me.	1	2	3	4	5
12.	I find it difficult to trust others completely.	1	2	3	4	5
13.	I worry about others getting too close to me.	1	2	3	4	5
14.	I want emotionally close relationships.	1	2	3	4	5

15.	I am comfortable having other people depend on me.	1	2	3	4	5
		Not at all like me		Somewhat like me		Very much like me
16.	I worry that others don't value me as much as I value them.	1	2	3	4	5
17.	People are never there when you need them.	1	2	3	4	5
18.	My desire to merge completely sometimes scares people away.	1	2	3	4	5
19.	It is very important to me to feel self-sufficient.	1	2	3	4	5
20.	I am nervous when anyone gets too close to me.	1	2	3	4	5
21.	I often worry that my Mum/Dad won't want to stay with me.	1	2	3	4	5
22.	I prefer not to have other people depend on me.	1	2	3	4	5
23.	I worry about being abandoned.	1	2	3	4	5
24.	I am somewhat uncomfortable being close to others.	1	2	3	4	5
25.	I find that others are reluctant to get as close as I would like.	1	2	3	4	5
26.	I prefer not to depend on others.	1	2	3	4	5
27.	I know that others will be there when I need them.	1	2	3	4	5
28.	I worry about having others not accept me.	1	2	3	4	5
29.	My Mum/Dad often want me to be closer than I feel comfortable being.	1	2	3	4	5
30.	I find it relatively easy to get close to others.	1	2	3	4	5

Appendix C: Relationship Scale Questionnaire (Friend)

Relationship Style Questionnaire

Please read each of the following statements and rate the extent to which you believe each statement best describes your feelings about relationships with your friends.

		Not at all like me		Somewhat like me		Very much like me
1.	I find it difficult to depend on other people.	1	2	3	4	5
2.	It is very important to me to feel independent.	1	2	3	4	5
3.	I find it easy to get emotionally close to others.	1	2	3	4	5
4.	I want to merge completely with another person.	1	2	3	4	5
5.	I worry that I will be hurt if I allow myself to become too close to others.	1	2	3	4	5
6.	I am comfortable without close emotional relationships.	1	2	3	4	5
7.	I am not sure that I can always depend on others to be there when I need them.	1	2	3	4	5
8.	I want to be completely emotionally intimate with others.	1	2	3	4	5
9.	I worry about being alone.	1	2	3	4	5
10.	I am comfortable depending on other people.	1	2	3	4	5
11.	I often worry that my friends don't really like me.	1	2	3	4	5
12.	I find it difficult to trust others completely.	1	2	3	4	5
13.	I worry about others getting too close to me.	1	2	3	4	5
14.	I want emotionally close relationships.	1	2	3	4	5
15.	I am comfortable having other people depend on me.	1	2	3	4	5

		Not at all like me		Somewhat like me		Very much like me
16.	I worry that others don't value me as much as I value them.	1	2	3	4	5
17.	People are never there when you need them.	1	2	3	4	5
18.	My desire to merge completely sometimes scares people away.	1	2	3	4	5
19.	It is very important to me to feel self-sufficient.	1	2	3	4	5
20.	I am nervous when anyone gets too close to me.	1	2	3	4	5
21.	I often worry that my friends won't want to stay with me.	1	2	3	4	5
22.	I prefer not to have other people depend on me.	1	2	3	4	5
23.	I worry about being abandoned.	1	2	3	4	5
24.	I am somewhat uncomfortable being close to others.	1	2	3	4	5
25.	I find that others are reluctant to get as close as I would like.	1	2	3	4	5
26.	I prefer not to depend on others.	1	2	3	4	5
27.	I know that others will be there when I need them.	1	2	3	4	5
28.	I worry about having others not accept me.	1	2	3	4	5
29.	My friends often want me to be closer than I feel comfortable being.	1	2	3	4	5
30.	I find it relatively easy to get close to others.	1	2	3	4	5

Appendix D: Rosenberg Self-Esteem Scale

Rosenberg Self-Esteem Scale

Instructions: Below is a list of statements dealing with your general feelings about yourself. If you strongly agree, tick in the **STRONGLY AGREE COLUMN**. If you agree with the statement, tick in the **AGREE** column. If you disagree, tick in the **DISAGREE** column. If you strongly disagree, tick in the **STRONGLY DISAGREE** column.

		Strongly Agree	Agree	Disagree	Strongly Disagree
1	On the whole, I am satisfied with myself.				
2*	At times, I think I am no good at all.				
3	I feel that I have a number of good qualities.				
4	I am able to do things as well as most other people.				
5*	I feel I do not have much to be proud of.				
6*	I certainly feel useless at times.				
7	I feel that I'm a person of worth, at least on an equal plane with others.				
8*	I wish I could have more respect for myself.				
9*	All in all, I am inclined to feel that I am a failure				
10	I take a positive attitude toward myself.				

Appendix E: HEXACO-60



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HEXACO-PI-R

© Kibeom Lee, Ph.D., & Michael C. Ashton, Ph.D.

DIRECTIONS

On the following pages you will find a series of statements about you. Please read each statement and decide how much you agree or disagree with that statement. Then write your response in the space next to the statement using the following scale:

- 5 = strongly agree
- 4 = agree
- 3 = neutral (neither agree nor disagree)
- 2 = disagree
- 1 = strongly disagree

Please answer every statement, even if you are not completely sure of your response.

Please provide the following information about yourself.

1	I would be quite bored by a visit to an art gallery.
2	I plan ahead and organize things, to avoid scrambling at the last minute.
3	I rarely hold a grudge, even against people who have badly wronged me.
4	I feel reasonably satisfied with myself overall.
5	I would feel afraid if I had to travel in bad weather conditions.
6	I wouldn't use flattery to get a raise or promotion at work, even if I thought it would
7	I'm interested in learning about the history and politics of other countries.
8	I often push myself very hard when trying to achieve a goal.
9	People sometimes tell me that I am too critical of others.
10	I rarely express my opinions in group meetings.
11	I sometimes can't help worrying about little things.
12	If I knew that I could never get caught, I would be willing to steal a million dollars.
13	I would enjoy creating a work of art, such as a novel, a song, or a painting.
14	When working on something, I don't pay much attention to small details.
15	People sometimes tell me that I'm too stubborn.
16	I prefer jobs that involve active social interaction to those that involve working alone.
17	When I suffer from a painful experience, I need someone to make me feel
18	Having a lot of money is not especially important to me.
19	I think that paying attention to radical ideas is a waste of time.
20	I make decisions based on the feeling of the moment rather than on careful thought.
21	People think of me as someone who has a quick temper.
22	On most days, I feel cheerful and optimistic.
23	I feel like crying when I see other people crying.
24	I think that I am entitled to more respect than the average person is.
25	If I had the opportunity, I would like to attend a classical music concert.
26	When working, I sometimes have difficulties due to being disorganized.
27	My attitude toward people who have treated me badly is "forgive and forget".
28	I feel that I am an unpopular person.
29	When it comes to physical danger, I am very fearful.
30	If I want something from someone, I will laugh at that person's worst jokes.

Continued...

31	I've never really enjoyed looking through an encyclopedia.
32	I do only the minimum amount of work needed to get by.
33	I tend to be lenient in judging other people.
34	In social situations, I'm usually the one who makes the first move.
35	I worry a lot less than most people do.
36	I would never accept a bribe, even if it were very large.
37	People have often told me that I have a good imagination.
38	I always try to be accurate in my work, even at the expense of time.
39	I am usually quite flexible in my opinions when people disagree with me.
40	The first thing that I always do in a new place is to make friends.
41	I can handle difficult situations without needing emotional support from anyone else.
42	I would get a lot of pleasure from owning expensive luxury goods.
43	I like people who have unconventional views.
44	I make a lot of mistakes because I don't think before I act.
45	Most people tend to get angry more quickly than I do.
46	Most people are more upbeat and dynamic than I generally am.
47	I feel strong emotions when someone close to me is going away for a long time.
48	I want people to know that I am an important person of high status.
49	I don't think of myself as the artistic or creative type.
50	People often call me a perfectionist.
51	Even when people make a lot of mistakes, I rarely say anything negative.
52	I sometimes feel that I am a worthless person.
53	Even in an emergency I wouldn't feel like panicking.
54	I wouldn't pretend to like someone just to get that person to do favors for me.
55	I find it boring to discuss philosophy.
56	I prefer to do whatever comes to mind, rather than stick to a plan.
57	When people tell me that I'm wrong, my first reaction is to argue with them.
58	When I'm in a group of people, I'm often the one who speaks on behalf of the group.
59	I remain unemotional even in situations where most people get very sentimental.
60	I'd be tempted to use counterfeit money, if I were sure I could get away with it.

Appendix F: HEXACO descriptors

<i>Honesty-Humility</i>	High scorers tend to be more imaginative, creative, original, curious, liberal, and express preference for variety.
<i>Emotionality</i>	High scorers tend to be hardworking, well organised, punctual, ambitious, and display perseverance when confronted with obstacles.
<i>Extraversion</i>	High scorers tend to be affectionate, sociable, talkative, active, fun-loving and passionate.
<i>Agreeableness vs Anger</i>	High scorers tend to forgive transgressions, are less judgemental, and are able to negotiate and compromise.
<i>Conscientiousness</i>	High scorers tend to experience fear of physical danger, experience anger in response to stressors, experience empathy and are both able to form and desire attachments with others.
<i>Openness to new experiences</i>	High scorers tend to avoid manipulating others and rule breaking, are not entitled and are less interested in material wealth.

<http://hexaco.org/scaledescriptions>

Appendix G: RoB templates

Tool to assess RoB in cohort studies

Reviewer:

Title:

Lead Author:

Year:

Criteria rating:

Fully met: 2

Partially met/Unclear: 1

Not met: 0

*: Reverse score

	Yes	No	Partial/Unclear	Comment
SCREENING QUESTIONS				
1. Are the sample: a. Male b. Aged 10-25 years				
2. Does the analysis compare differences between gang members and non-gang members?				
3. Does the analysis look for a relationship between the risk factors identified in the inclusion criteria and gang membership				
IF ANSWER IS NO TO ANY OF THE ABOVE SCREENING QUESTIONS THEN DISCONTINUE				

	Yes	No	Partial/Unclear	Rating	Comment
STUDY DESIGN					
1. Was a cohort design appropriate for the research question?					

SAMPLING BIAS & ATTRITION BIAS

	Yes	No	Partial/Unclear	Rating	Comment
SAMPLE					
1. Were gang members and non-gang members recruited from the same cohort?					
2. Were the gang members representative of the wider population?					
3. Were all of the cohort included?					
4. Were a large proportion of the cohort lost to follow-up?*					
5. Was a power calculation reported?					
6. Were there enough cases and controls recruited according to the power calculation?					

7. Did the authors comment on the characteristics of those who were lost to follow up?					
a. Could this have impacted on the findings?*					
RISK OF SAMPLING BIAS TOTAL: /8	LOW		MEDIUM		HIGH
RISK OF ATTRITION BIAS TOTAL: /8	LOW		MEDIUM		HIGH

MEASUREMENT BIAS

	Yes	No	Partial/Unclear	Rating	Comment
MEASUREMENT					
1. Was valid measure of gang membership used?					
2. Were valid measures of the risk factors identified in the meta-analysis inclusion criteria used?					
3. Is there clear evidence that the risk factors were present prior to gang membership?					

4. Was gang membership measured at an appropriate age according to existing research on gang membership (over 10 years old)?					
5. Were variables measured at the same time point for those included in the study?					
6. Were all of those included in the study assessed for the outcome and exposure?					
RISK OF MEASUREMENT BIAS TOTAL: /12	LOW		MEDIUM		HIGH

REPORTING BIAS

	Yes	No	Partial/Unclear	Rating	Comment
ANALYSIS					
1. Was the analysis used appropriate for the research question and study design?					

2. Have the authors listed all possible confounding factors and controlled for these in their analysis?					
3. Were more than 20% of individual response variables missing?*					
4. Did the authors comment on how they handled missing data (e.g. plugging)?					
a. Could this have impacted on the findings?*					
5. Did the authors comment on how they dealt with those who were lost to follow up?					
6. Did the authors comment on the factors associated with those who were lost to follow up					
a. Could these have impacted on findings?*					
7. Do the authors report an effect size?					

	Yes	No	Partial/Unclear	Rating	Comment
RESULTS					
1. Were the conclusions made appropriate based on the study design and analysis used?					
2. Were the conclusions made appropriate based on the results? a. e.g. effect size reported, level of significance					
3. Are the results generalizable to the gang member population?					
RISK OF REPORTING BIAS TOTAL: /24	LOW		MEDIUM		HIGH

Tool to assess RoB in cross-sectional studies

Reviewer:

Title:

Lead Author:

Year:

Criteria rating:

Fully met: 2

Partially met/Unclear: 1

Not met: 0

*: Reverse score

	Yes	No	Partial/Unclear	Comment
SCREENING QUESTIONS				
1. Are the sample: a. Male b. Aged 10-25 years				
2. Does the analysis compare differences between gang members and non-gang members?				
3. Does the analysis look for a relationship between the risk factors identified in the inclusion criteria and gang membership				
IF ANSWER IS NO TO ANY OF THE ABOVE SCREENING QUESTIONS THEN DISCONTINUE				

	Yes	No	Partial/Unclear	Rating	Comment
STUDY DESIGN					
1. Was a cross-sectional design appropriate for the research question?					

SAMPLING BIAS & ATTRITION BIAS

	Yes	No	Partial/Unclear	Rating	Comment
SAMPLE					
8. Were gang members and non-gang members recruited from the same population?					
9. Were the gang members representative of the wider population of gang members? e.g. only reporting from one gang/ethnicity					
10. Did the authors exclude any participants prior to approaching for recruitment?*					

11. Did the authors exclude any participants post completion of measures?*					
12. Was a power calculation reported?					
13. Were there enough cases and controls recruited according to the power calculation?					
14. Was there a high non-response rate?*					
15. Did the authors comment on the characteristics of those who did not consent to take part in the study?					
a. Could this have impacted on the findings?*					
RISK OF SAMPLING BIAS TOTAL: /8	LOW	MEDIUM		HIGH	
RISK OF ATTRITION BIAS TOTAL: /10	LOW	MEDIUM		HIGH	

MEASUREMENT BIAS

	Yes	No	Partial/Unclear	Rating	Comment
MEASUREMENT					
1. Was valid measure of gang membership used?					
2. Were valid measures of the risk factors identified in the meta-analysis inclusion criteria used?					
3. Was gang membership measured at an appropriate age according to existing research on gang membership (after 10 years old)?					
4. Were all of those included in the study assessed for the outcome and exposure?					
RISK OF MEASUREMENT BIAS TOTAL: /8	LOW		MEDIUM		HIGH

REPORTING BIAS

	Yes	No	Partial/Unclear	Rating	Comment
ANALYSIS					
8. Was the analysis used appropriate for the research question and study design?					
9. Have the authors listed all possible confounding factors and controlled for these in their analysis?					
10. Were more than 20% of individual response variables missing?*					
11. Did the authors comment on how they handled missing data (e.g. plugging)?					
a. Could this have impacted on the findings?*					
12. Do the authors report an effect size?					

	Yes	No	Partial/Unclear	Rating	Comment
RESULTS					
4. Were the conclusions made appropriate based on the study design and analysis?					
5. Were the conclusions made appropriate based on the results? a. e.g. effect size reported, level of significance					
6. Are the results generalisable to the gang member population? a. Cultural validity? b. Age? c. Core vs outer gang members? d. Gender – do they say the findings could be applied to female gang members?					
RISK OF REPORTING BIAS TOTAL: /18	LOW		MEDIUM		HIGH

Appendix H: Study Key

<i>Study Design</i>	<i>Lead Author</i>	<i>Year</i>	<i>Code</i>
<i>Cohort</i>	Bjerregaard	1993	C001
<i>Cohort</i>	Dmetrieva	2014	C002
<i>Cohort</i>	Dishion	2005	C003
<i>Cohort</i>	Eitle	2004	C004
<i>Cohort</i>	Krohn	2005	C005
<i>Cohort</i>	Craig	2002	C006
<i>Cohort</i>	Gatti	2005	C007
<i>Cohort</i>	LaCourse	2003	C008
<i>Cohort</i>	Lahey	1999	C009
<i>Cohort</i>	Thornberry	1993	C011
<i>Cross Sectional</i>	Amato	2003	CS01
<i>Cross Sectional</i>	Bjerregaard	2012	CS02
<i>Cross Sectional</i>	Chu	2011	CS03
<i>Cross Sectional</i>	Chu	2014	CS04
<i>Cross Sectional</i>	Dukes	2003	CS06
<i>Cross Sectional</i>	Evans	1996 (a)	CS07
<i>Cross Sectional</i>	Evans	1996 (b)	CS08
<i>Cross Sectional</i>	Chu	2012	CS09
<i>Cross Sectional</i>	Ferguson	1997	CS10
<i>Cross Sectional</i>	Fernandez	2001	CS11
<i>Cross Sectional</i>	Horn	1998	CS12
<i>Cross Sectional</i>	Weerman	2012	CS13
<i>Cross Sectional</i>	Zhang	1999	CS14
<i>Cross Sectional</i>	Lyon	1992	CS15
<i>Cross Sectional</i>	Friedman	1976	CS16
<i>Cross Sectional</i>	Cox	1996	CS17
<i>Cross Sectional</i>	Cabrera	2002	CS18
<i>Cross Sectional</i>	Davis	2003	CS19
<i>Cross Sectional</i>	Escobedo	2000	CS20

<i>Cross Sectional</i>	King	1997	CS21
<i>Cross Sectional</i>	Lanier	2010	CS22
<i>Cross Sectional</i>	Lemus	2008	CS23
<i>Cross Sectional</i>	Varano	2011	CS25
<i>Cross Sectional</i>	Wilson	1996	CS26
<i>Cross Sectional</i>	Adams	2004	CS27
<i>Cross Sectional</i>	Burch	2014	CS28
<i>Cross Sectional</i>	Savitz	1977	CS29
<i>Cross Sectional</i>	Curry	2000	CS31
<i>Cross Sectional</i>	Corcoran	2005	CS32
<i>Cross Sectional</i>	Smith	1996	CS33
<i>Cross Sectional</i>	Wood	1997	CS34
<i>Cross Sectional</i>	Thomas	2003	CS35
<i>Cross Sectional</i>	Curry	1992	CS36

Appendix I: Characteristics of included studies

Study ID	Year	Study Design	Sample	Analysis	GM definer	Variable	Supported?
CO01	1993	Longitudinal	USA Students	Uni & multivariate	Self-report	Self-Esteem	No
						Delinquency ³³	Yes
						Substance use ³⁴	Yes
CO02	2014	Longitudinal	USA Offenders	Multivariate	Self-report	Self-Esteem	Yes
						Psychopathy ³⁵	No
						Personality ³⁶	Partial
CO03	2005	Longitudinal	USA Students	Multivariate	Self, peer, teacher, and counsellor report ³⁷	Delinquency ³⁸	Yes

³³ Serious delinquency, moderate delinquency, minor delinquency

³⁴ Alcohol use and marijuana use

³⁵ YPI grandiose-manipulative subscale, YPI callous-unemotional subscale, YPI impulsive-irresponsible subscale

³⁶ Psychosocial maturity (temperance, responsibility, and perspective)

³⁷ Self-report only used in this review

³⁸ Antisocial behaviour

CO04	2004	Longitudinal	USA Students	Uni & multivariate	Self-report	Delinquency ³⁹ Negative life events ⁴⁰ Self-Esteem ⁴¹	Yes Yes No
CO05	2005	Longitudinal	USA Students	Multivariate	Self-report	Self-Esteem Delinquency ⁴²	Hispanic: No African American: Yes Caucasian: No African American: Yes
CO06	2002	Longitudinal	Canada	Multivariate	Self-report	Violence ⁴³	Age 10: No

³⁹ Early deviance

⁴⁰ Victimization and pre-teen stress exposure

⁴¹ Self-derogation

⁴² General delinquency, serious delinquency and drug sales

⁴³ Fighting

Community

Age 11: Yes

Age 12: Yes

Age 13: Yes

Age 14: Yes

Delinquency⁴⁴

Age 10:

Partial

Age 11: No

Age 12: Yes

Age 13: No

Age 14: Yes

Substance use⁴⁵

Age 10: No

Age 11: No

Age 12: No

Age 13: Yes

Age 14: Yes

⁴⁴ Stealing and vandalism

⁴⁵ Alcohol and drug abuse

CO07	2005	Longitudinal	Canada Community	Uni & multivariate	Self-report	Violence ⁴⁶ Delinquency ⁴⁷ Substance use ⁴⁸	Age 14: Yes Age 15: Yes Age 16: Yes Age 14: Yes Age 15: Yes Age 16: Yes Age 14: Yes Age 15: Yes Age 16: Yes
CO08	2003	Longitudinal	Canada Students	Multivariate	Self-report	Violence ⁴⁹	Yes
CO09	1999	Longitudinal	USA Community	Uni & multivariate	Self-report	Externalizing ⁵⁰ Delinquency ⁵¹	Yes Yes

⁴⁶ Person offences

⁴⁷ Property offences and drug sales

⁴⁸ Drug use

⁴⁹ Self-reported violent behaviours

⁵⁰ Conduct disorder

⁵¹ Crimes against property and drug selling

						Violence ⁵²	Yes
CO11	1993	Longitudinal	USA Students	Uni & multivariate	Self-report	Delinquency ⁵³ Violence ⁵⁴ Substance use ⁵⁵	Yes Yes Yes
CS01	2003	Cross- Sectional	USA Students	Multivariate	Gang identifier questions	Violence ⁵⁶ Delinquency ⁵⁷	Yes Yes
CS02	2012	Cross- Sectional	USA Students	Uni & multivariate	Self-report	Delinquency Self-Esteem ⁵⁸ Negative life events ⁵⁹	Yes Yes Yes

⁵² Crimes against the person

⁵³ General delinquency, property offences, and drug sales

⁵⁴ Person offences

⁵⁵ Drug use

⁵⁶ Violent behaviour

⁵⁷ Larceny, minor infraction, selling drugs, vandalism

⁵⁸ Self-concept

⁵⁹ Personal victimisation

CS03	2011	Cross- Sectional	Singapore Offenders	Univariate	Self-report and official records	Violence ⁶⁰	No
						Delinquency ⁶¹	No
						Internalizing ⁶²	No
						Negative life events ⁶³	No
						Externalizing ⁶⁴	No
						Personality ⁶⁵	No
						Substance use ⁶⁶	No
CS04	2014	Cross- Sectional	Singapore Offenders	Uni & multivariate	Self-report and official records	Delinquency ⁶⁷	No
						Violence ⁶⁸	Yes (current)

⁶⁰ History of violence, early initiation to violence, stress and poor coping

⁶¹ Past supervision/intervention failure, prior or current offences/dispositions

⁶² History of suicide/self-harm attempt

⁶³ Exposure to violence at home, childhood history of maltreatment

⁶⁴ Risk taking/impulsivity, attention deficit/hyperactivity difficulties

⁶⁵ Negative attitudes, anger management, low empathy/remorse, poor compliance, personality/behaviour, attitudes/orientation

⁶⁶ Substance use, substance abuse

⁶⁷ Prior offense history, prior nonviolent nonsexual offenses, index nonviolent nonsexual offenses

⁶⁸ Prior violent offences, prior sexual offences, index violent offences, index sexual offences, MCAA violence subscale

						Substance use ⁶⁹	Yes
						Psychopathy ⁷⁰	No
						Personality ⁷¹	Yes
CS06	2003	Cross- Sectional	USA Students	Multivariate	Self-report	Substance use ⁷²	Yes
						Violence ⁷³	Yes
						Delinquency ⁷⁴	Yes
						Self-Esteem ⁷⁵	Yes
CS07	1996a	Cross- Sectional	USA Offenders	Uni & bivariate	Self-report	Internalizing ⁷⁶	Yes
						Negative life events ⁷⁷	Yes

⁶⁹ History of any substance use, history of alcohol use, history of cannabis use, history of cocaine use, history of amphetamine use, history of inhalant use, history of sedative use, history of hallucinogen use, history of opioid use

⁷⁰ YPI total score, YPI callous-unemotional, YPI grandiose-manipulative, YPI impulsive-irresponsible

⁷¹ Entitlement, antisocial intent

⁷² Beer, wine, liquor, marijuana, amphetamines/barbiturates, psychedelics, cocaine, heroin, steroids, inhalants, illegal prescription drugs, alcohol trouble

⁷³ Physical fight, group fight, hurt someone

⁷⁴ Stealing, vandalism, trespassing, selling drugs, police trouble, curfew

⁷⁵ “no good”, “useless”

⁷⁶ Suicide ideation, suicide attempts

⁷⁷ Sexual abuse, physical abuse

CS08	1996b	Cross- Sectional	USA Offenders	Uni & multivariate	Self-report	Negative life events ⁷⁸ Violence ⁷⁹ Substance use ⁸⁰	Partial No Yes
CS09	2012	Cross- Sectional	Singapore Offenders	Uni & multivariate	Self-report and official records	Negative life events ⁸¹ Substance use ⁸² Delinquency ⁸³ Violence ⁸⁴	No Yes (historical) No Yes
CS10	1997	Cross- Sectional	USA Students	Univariate	Official records	Self-Esteem ⁸⁵	No

⁷⁸ Sexual abuse, physical abuse

⁷⁹ Violent crime

⁸⁰ Drunk/high during crime

⁸¹ History of physical/sexual abuse

⁸² History of substance use, index substance use offences

⁸³ Has prior offence history, index theft/fraud offences, index illegal sale offences

⁸⁴ History of violence against others, index violent offenses, index sexual offenses

⁸⁵ Peer self-esteem, school self-esteem

						Internalizing ⁸⁶	No
						Negative life events ⁸⁷	No
						Substance use ⁸⁸	Mixed
						Delinquency ⁸⁹	Mixed
						Violence ⁹⁰	Yes
CS11	2001	Cross-Sectional	USA Offenders	Univariate	Case files	Internalizing ⁹¹	Yes
CS12	1998	Cross-Sectional	USA Offenders	Univariate	Gang identification scale	Personality ⁹²	No
						Negative life events ⁹³	No

⁸⁶ Social isolation

⁸⁷ Stress, views of the future

⁸⁸ Alcohol, lifetime marijuana/hashish use, lifetime cocaine use, lifetime crack use, lifetime amphetamine use, lifetime PCP use, lifetime LSD use, last 12 months heroin or other narcotic use,

⁸⁹ Stolen something from a store, gotten into trouble with the police, committed an act of vandalism

⁹⁰ Hit or beat someone up, hurt someone badly enough to require bandages or doctor, used a knife, gun or some other thing to get something from a person, taken part in a fight where a group of friends were against another group

⁹¹ Depression

⁹² Locus of control

⁹³ Awareness of limited opportunities

CS13	2012	Cross- Sectional	Netherlands Students	Uni & multivariate	Eurogang youth survey	Delinquency ⁹⁴ Externalizing ⁹⁵ Personality ⁹⁶	Yes Yes No
CS14	1999	Cross- Sectional	USA Community	Uni, bi & multivariate	Self-report	Delinquency Substance use ⁹⁷	Yes Yes
CS15	1992	Cross- Sectional	USA Offenders	Uni & multivariate	Gang violence suppression unit criteria	Delinquency ⁹⁸ Substance use ⁹⁹	Yes Yes
CS16	1976	Cross- Sectional	USA Offenders (student controls)	Univariate	Self-report and official records	Negative life events	Mostly

⁹⁴ Previous offending

⁹⁵ Self-control (consisting of three subscales: impulsivity, risk seeking, and anger)

⁹⁶ Morality

⁹⁷ Self-report drug use

⁹⁸ General delinquency, index offences, home delinquency, school delinquency

⁹⁹ Hard-drug use

CS17	1996	Cross- Sectional	USA Offenders	Uni & bivariate	Demographic risk index	Self-esteem Substance use Delinquency ¹⁰⁰	No Yes Yes
CS18	2002	Cross- Sectional	USA Community	Uni and bivariate	Gang involvement questions (Crowley, 1996)	Delinquency ¹⁰¹ Personality ¹⁰²	Yes Yes
CS19	2003	Cross- Sectional	USA Students	Bivariate	Gang identifiers	Negative life events ¹⁰³ Externalizing ¹⁰⁴	Yes Yes
CS20	2000	Cross- Sectional	USA Offenders	Uni & multivariate	Official reports	Cognitive factors ¹⁰⁵	No

¹⁰⁰ Prior arrests

¹⁰¹ Antisocial behaviours

¹⁰² Femininity and masculinity

¹⁰³ School, family/community, peer and personal stress

¹⁰⁴ Externalizing subscale of the 'Youth Self-Report'

¹⁰⁵ IQ, neuropsychological assessment, motor speed and attentional processes, abstract behaviour

CS21	1997	Cross- Sectional	USA Offenders	Uni & bivariate	Gang membership identification checklist	Psychopathy ¹⁰⁶	Yes
CS22	2010	Cross- Sectional	USA Offenders	Univariate	Self-report questions	Substance use ¹⁰⁷	Yes (not crack)
CS23	2008	Cross- Sectional	USA Youths at risk and students	Uni & multivariate	Gang involvement scale	Self-Esteem Personality ¹⁰⁸	No Yes
CS25	2011	Cross- Sectional	USA Offenders	Uni & multivariate	Self-report questions	Delinquency ¹⁰⁹ Substance use ¹¹⁰	Mixed Yes
CS26	1996	Cross- Sectional	USA	Bi & multivariate	Self-report and case	Self-Esteem	<u>Correlation</u> Yes

¹⁰⁶ PCL-R total score, PCL-R Factor 1, PCL-R Factor 2

¹⁰⁷ Use ever of alcohol, marijuana, crack, powder cocaine; use in the past year of alcohol, marijuana, crack, powder cocaine; use in the past three days of alcohol, marijuana, crack, powder cocaine

¹⁰⁸ Anger expression

¹⁰⁹ Misconduct (serious offences), drug seller, delinquent attitudes

¹¹⁰ Drug buyer

			Delinquent youths referred for services		worker identification	Delinquent behaviour ¹¹¹ Delinquent attitudes Self-Esteem	Yes No <u>Model</u> Mixed
CS27	2004	Cross-Sectional	USA Delinquent youths accessing services	Bi & multivariate	Self-report delinquency scale	Delinquency ¹¹² Internalizing ¹¹³	Yes Yes
CS28	2014	Cross-Sectional	USA Youths accessing	Uni & multivariate	Self-report questions	Personality ¹¹⁴	Yes

¹¹¹ Self-report and official records of felony arrests, misdemeanour arrests, felony convictions, misdemeanour convictions, police contacts without arrests, probationary status

¹¹² General delinquency, serious delinquency, moderate delinquency, minor delinquency, violent delinquency

¹¹³ Emotional numbing

¹¹⁴ Psychoticism

services at
residential
treatment
facility

CS29	1977	Cross- Sectional	USA Students	Univariate	Gang identifiers	Negative life events ¹¹⁵ Delinquency	No No
CS31	2000	Cross- Sectional	USA Students	Uni & multivariate	Self-report	Violence ¹¹⁶ Delinquency ¹¹⁷ Substance use ¹¹⁸	Yes Yes Yes
CS32	2005	Cross- Sectional	USA Offenders	Uni & bivariate	Self-report	Internalizing ¹¹⁹ Externalizing ¹²⁰	Partial Partial

¹¹⁵ Victimization (has been robbed, assaulted, or extorted)

¹¹⁶ Self-reported violence

¹¹⁷ Delinquent offences, self-reported property delinquency, police offences, police offences pre 1988, police offences 1988-1992

¹¹⁸ Self-reported substance abuse

¹¹⁹ Internality, withdrawal, somatising, anxiety, depression

¹²⁰ Externality, attention problems, aggressiveness

						Delinquency ¹²¹	Yes
						Violence ¹²²	Yes
						Substance use ¹²³	Yes
CS33	1996	Cross- Sectional	USA Offenders (student controls)	Uni & bivariate	Gang identifiers (Morales, 1991)	Personality ¹²⁴	No
CS34	1997	Cross- Sectional	USA Offenders	Bi & multivariate	Gang affiliation index	Negative life events ¹²⁵	No
CS35	2003	Cross- Sectional	USA Offenders	Univariate	GANGS gang survey	Internalizing ¹²⁶ Externalizing ¹²⁷	No Partial

¹²¹ Antisocial scale scores, sold illegal drugs, been arrested, delinquent behaviour, stole a vehicle,

¹²² Attacked someone

¹²³ Drunk or high at school

¹²⁴ Locus of control

¹²⁵ Physical punishment

¹²⁶ Withdrawn, somatic, anxious/depressed, internalizing

¹²⁷ Attention problems, aggression, externalizing

						Delinquency ¹²⁸	Yes
						Violence ¹²⁹	Yes
CS36	1992	Cross- Sectional	USA Students	Multivariate	Gang identifier questions	Delinquency ¹³⁰ Self-Esteem ¹³¹	No Yes

¹²⁸ Delinquency, public disorder, minor property theft, serious property theft, drug sales

¹²⁹ Minor assault, serious assault

¹³⁰ Official and self-report measures of self-esteem combined, resulting in a single interval-level measure of delinquency

¹³¹ Peer self-esteem

Appendix J: Data extraction

Name of researcher performing data extraction	Alison Waugh
Date of data extraction	27/07/2015
Record number	CO01
Author	Bjerregaard, Smith
Title	Gender differences in gang participation, delinquency and substance use
Type of publication	Primary research
Country of origin	USA
Source of funding	Office of Juvenile Justice and Delinquency Prevention The National Institute on Drug Abuse The National Science Foundation
Study aims	To empirically examine the patterns and nature of female gang membership, and compare it to the patterns and nature of male gang membership
Study design	Cross Sectional Case Study <u>Cohort</u>
Inclusion criteria	Not reported
Exclusion criteria	Not reported

Recruitment procedure	All students enrolled in the 7 th and 8 th grade in Rochester public schools in the Spring of 1988.	
Recruited from	Rochester public schools Rochester Youth Development Survey	
n	Gang	Control
	133	571
n withdrew	Gang	Control
	Not reported	Not reported
Age range	13-15 years	
Gender	Male and female, male analysis reported separately	
Ethnicities	Caucasian, African American, Hispanic	
Socio-economic status	Not reported	
Exposure	Self-Esteem	
Exposure measured by	Self-Esteem: A nine item scale derived from the Rosenberg Self-Esteem Scale	
Outcome	Gang membership, Delinquency, Substance use	

Outcome measured by	Gang membership: Self-report Delinquency and Substance use items adapted from the National Youth Survey and modified by the Denver Youth Survey		
Statistical analysis used	Prevalence and frequency of delinquency and substance use in gang and non-gang members (reports significant differences and incidence ratio) Logistic regression		
Outcome means and (SDs) SD not reported *<p.05	Variable	Gang	Control
	Serious delinquency*	6.5	0.3
	Moderate delinquency*	14.2	2.9
	Minor delinquency*	21.9	3.2
	Alcohol use*	14.5	2.8
	Marijuana use*	13.8	2.3
	Logistic regression results (parameter estimate, standard error, probability): Self-Esteem: -0.05. 0.04 (-0.01)		
Measure of effect used	Incidence ratio		

Effect size and CI CI not reported	Serious delinquency: 25.1 Moderate delinquency: 4.9 Minor delinquency: 6.9 Alcohol use: 5.2 Marijuana use: 5.9

Name of researcher performing data extraction	Alison Waugh
Date of data extraction	31/07/2015
Record number	CO02
Author	Dmitrieva, Gibson, Steinberg, Piquero, Fagan
Title	Predictors and consequences of gang membership: comparing gang members, gang leaders and non-gang affiliated adjudicated youth
Type of publication	Primary research
Country of origin	USA
Source of funding	The Office of Juvenile Justice and Delinquency Prevention National Institute of Justice John D and Catherine T MacArthur Foundation William T Grant Foundation Robert Wood Johnson Foundation William Penn Foundation Centres for Disease Control National Institute on Drug Abuse

	Pennsylvania Commission on Crime and Delinquency Arizona Governor's Justice Commission	
Study aims	Examines how self-esteem, psychopathy, and psychosocial maturity relate to gang status and whether changes in gang status predict changes in these psychosocial outcomes.	
Study design	Cross Sectional	Case Study <u>Cohort</u>
Inclusion criteria	Male adjudicated offenders, age 14-17	
Exclusion criteria	Not reported	
Recruitment procedure	Participants identified based on age and adjudication, approached for consent.	
Recruited from	Youths adjudicated in the juvenile or adult court system in Maricopa County, AZ or Philadelphia County PA.	
n	Gang	Control
	435	919
n withdrew	Gang	Control
	Not reported	Not reported
Age range	14-17	

Gender	Male
Ethnicities	"mainly of non-white (44% African American , 29% Hispanic)"
Socio-economic status	Low SES
Exposure	Offending Self-Esteem Psychopathy Psychosocial maturity
Exposure measured by	Offending: Self-report of Offending scale Self-Esteem: 4 items adapted from the Rosenberg Self-Esteem Scale Psychopathy: Youth Psychopathic Traits Inventory Temperance: Weinberger Adjustment Inventory Responsibility: Psychosocial Maturity Inventory, and Resistance to Peer Influence Inventory Perspective: Weinberger Adjustment Inventory, and Future Outlook Inventory
Outcome	Gang membership
Outcome measured by	Self-report

Statistical analysis used	Hierarchical linear modeling	
Mean (SD)	Gang	Control
	Not reported	Not reported
Measure of effect used	Odds ratio	
Effect size and CI *p<.01	<u>Low level vs non member</u> Self-Esteem**: .57 (.38 to .85) Grandiose-Manipulative: .99 (.96 to 1.02) Callous-Unemotional: 1.03 (.98 to 1.09) Impulsive-Irresponsible: 1 (.96 to 1.04) Temperance: .74 (.50 to 1.10) Perspective: .89 (.60 to 1.33) Responsibility: .49 (.32 to .74) <u>Leader vs non member</u> Self-Esteem**: .46 (.27 to .77) Grandiose-Manipulative: .99 (.95 to 1.04) Callous-Unemotional: 1.05 (.97 to 1.13) Impulsive-Irresponsible: 1.04 (.98 to 1.11)	

	Temperance: .60 (.41 to 1.02) Perspective: .89 (.52 to 1.54) Responsibility: .49 (.29 to 84)

Name of researcher performing data extraction	Alison Waugh
Date of data extraction	06/08/2015
Record number	CO03
Author	Dishion, Nelson & Yasui
Title	Predicting early adolescent gang involvement from middle school adaptation
Type of publication	Primary Research
Country of origin	USA
Source of funding	National Institute on Drug Abuse at the National Institutes of Health
Study aims	To establish the role of sixth grade peer relationships, academic adaptation, peer relations, and antisocial behaviour in relation to early-adolescent gang involvement
Study design	Cross Sectional Case Study <u>Cohort</u>
Inclusion criteria	European American African American

	Sixth grade	
Exclusion criteria	Not reported	
Recruitment procedure	Participants from randomised intervention study testing the effectiveness of the Adolescent Transitions Program. Paid \$20 for participation at each assessment wave	
Recruited from	Three middle schools in the Northwest region of the United States	
n	Gang	Control
	Male only not reported	Male only not reported
n withdrew	Gang	Control
	Not reported	Not reported
Age range	11-13	
Gender	Male and female	
Ethnicities	European American and African American	
Socio-economic status	Not reported	
Exposure	Antisocial behaviour	
Exposure measured by	Student survey developed by the Oregon Research Institute	

Outcome	Gang membership
Outcome measured by	Self-report
Statistical analysis used	Structural equation modelling to test a model predicting eighth-grade gang membership from sixth grade adjustment
Means (SD)	Not reported
Measure of effect used	Model does not report effect size for antisocial behaviour separate from other variables
Effect size and CI (for each exposure)	N/A

Name of researcher performing data extraction	Alison Waugh
Date of data extraction	06/08/2015
Record number	C004
Author	Eitle, Gunkel, Gundy
Title	Cumulative exposure to stressful life events and male gang membership
Type of publication	Primary research
Country of origin	USA
Source of funding	National Institute on Drug Abuse
Study aims	To evaluate the role of early exposure to stressful life events in predicting joining a gang, controlling for other risk factors.
Study design	Cross Sectional Case Study <u>Cohort</u>
Inclusion criteria	All male students due to enter 6 th and 7 th grade in Miami-Dade's 48 middle schools in 1990.
Exclusion criteria	Not reported
Recruitment procedure	Not reported
Recruited from	48 Miami-Dade middle schools

n	Gang	Control
	43	788
n withdrew	Gang	Control
	Not reported	Not reported
Age range	18-23 (in final cohort)	
Gender	Cohort consisted of male and female participants originally, only one female reported gang membership so the final sample included only male participants.	
Ethnicities	Hispanic, African-American, Non-Hispanic White	
Socio-economic status	Not reported	
Exposure	Pre-teen stress exposure Self-derogation Early deviance Victimization (analysis and measurement not reported)	
Exposure measured by	Stress: sum of events reported to have occurred prior to age 12 Self-derogation: Self-derogation scale	

	Early deviance: self-report inventory about involvement in 7 types of deviant behaviour		
Outcome	Gang membership		
Outcome measured by	Self-report		
Statistical analysis used	Differences between means Logistic regression (model)		
Mean (SD) *p<.05 **p<.01 ***p<.10 SD not reported	Variable	Gang	Control
	Early deviance**	1.41	1.28
	Self-derogation	1.65	1.58
	Pre-teen stress exposure***	1.79	1.38
	Victimization	Not reported	Not reported
Measure of effect used	Odds ratio		
Effect size and CI (for each exposure)	Victimization: 3.86 (CI not reported)		

Name of researcher performing data extraction	Alison Waugh
Date of data extraction	24/08/2015
Record number	CO05
Author	Krohn
Title	The impact of multiple marginality on gang membership and delinquent behaviour for Hispanic, African American, and White male adolescents
Type of publication	Primary research
Country of origin	USA
Source of funding	The Office of Juvenile Justice and Delinquency Prevention
Study aims	To examine whether there are differences in the variables that represent the key constructs in Vigil's multiple marginality theory, to determine if there are differences in those that significantly predict gang membership for Hispanic, African American and White youth.
Study design	Cross Sectional Case Study <u>Cohort</u>

Inclusion criteria	7 th and 8 th grade students in Rochester, New York	
Exclusion criteria	Not reported	
Recruitment procedure	A stratified sample was identified to ensure the entire school population was represented, but high risk youths were over-represented (males, from areas of the city that offenders lived)	
Recruited from	Dataset from the Rochester Youth Development Survey. A sample of 1,000 7 th and 8 th grade students identified from the Rochester, New York public school system.	
n	Gang	Control
	199	441
n withdrew	Gang	Control
	Not reported	Not reported
Age range	14-18	
Gender	Male and female in initial male sample, then male only as a result of too few female participants	
Ethnicities	Hispanic, Caucasian, African American	
Socio-economic status	Not reported	
Exposure	Self-esteem	

	General delinquency Serious delinquency Drug sales						
Exposure measured by	Self-esteem: A 9-item scale, not named Delinquency and drug sales: frequency within a set time period						
Outcome	Gang membership						
Outcome measured by	Self-report						
Statistical analysis used	Not named – significant differences between groups						
Mean (SD) SD not reported *p<.05	Variable	Gang			Control		
		H	AA	W	H	AA	W
	Self-esteem	2.83	3.05*	2.92	2.97	3.19	3.05
	General delinquency	193.47*	167.20*	79.74	33.47	40.97	53.38
	Serious delinquency	17.77*	16.32*	7.95*	.35	.071	1.68
	Drug Sales	30.82*	38.46*	2.21	4.53	9.19	8.28

Measure of effect used	Odds ratio
Effect size and CI (for each exposure)	Self-esteem only, CI not reported, *p<.05 Hispanic, Spanish not spoken at home: .96 Hispanic, Spanish spoken at home: .63 African American: .51* White: 1.99

Name of researcher performing data extraction	Alison Waugh
Date of data extraction	24/08/2015
Record number	CO06
Author	Craig, Vitaro, Gagnon, Tremblay
Title	The road to gang membership: characteristics of male gang and non-gang members from ages 10 to 14
Type of publication	Primary research
Country of origin	Canada
Source of funding	Conseil Québécois de la recherche social Fonds de la recherche en sante du Québec Social Science and Humanities Research Council
Study aims	To describe the frequency of gang membership during the preadolescent and early adolescent periods (at ages 11, 12, 13 and 14). To examine the stability of belonging to a gang at ages 11, 12, 13 and 14. To compare the behavioural, peer and school profiles of boys who belong to aging and boys who do not belong to a gang at ages 11, 12, 13 and 14.

Study design	Cross Sectional	Case Study	<u>Cohort</u>
Inclusion criteria	Parents born in Canada Parents mother tongue French Complete data sets in original longitudinal study (1034 boys studied in kindergarten in 1984)		
Exclusion criteria	Not reported		
Recruitment procedure	Not reported		
Recruited from	Low socio-economic area of a large metropolitan city in Quebec		
n	Stable Gang	Unstable Gang	Control
	25	51	66
n withdrew	Gang	Control	
	Not reported	Not reported	
Age range	11-14		
Gender	Male		
Ethnicities	Not reported		
Socio-economic status	Low SES		

Exposure	Fighting, oppositional behaviour, inattention, hyperactivity, anxiety-withdrawal, prosocial behaviour Delinquency Aggression, social withdrawal, likeability			
Exposure measured by	Fighting, oppositional behaviour, inattention, hyperactivity, anxiety-withdrawal, prosocial behaviour: Social Behaviour Questionnaire (Tremblay, Vitaro, Gagnon, Piché & Royer, 1991) Delinquency: Self-Reported Delinquency Questionnaire (Biron, Caplan & LeBlanc, 1975) Aggression, social withdrawal, likeability (Peer Evaluation Inventory (Pekarik, Prinz, Liebert, Weintraub & Neale, 1976)			
Outcome	Gang membership			
Outcome measured by	Self-report, teacher report, parent report			
Statistical analysis used	MANOVA			
Mean (SD)	Self-report aged 10			
	Variable	Stable Gang	Unstable Gang	Control

	Fighting	10.87 (2.79)	10.91 (2.58)	9.78 (2.67)
	Stealing*	13.96 (4.13)	13.18 (2.10)	12.82 (2.66)
	Vandalism	7.70 (1.61)	7.60 (1.34)	7.29 (1.12)
	Alcohol and drug abuse	3.65 (.78)	3.75 (.85)	3.71 (1.06)
	Self-report aged 11			
	Variable	Stable Gang	Unstable Gang	Control
	Fighting*	10.13 (3.00)	9.53 (2.35)	8.89 (2.94)
	Stealing	13.39 (3.60)	12.66 (2.80)	12.87 (3.71)
	Vandalism	7.30 (2.16)	6.73 (1.32)	6.78 (1.43)
	Alcohol and drug abuse	3.91 (1.59)	3.69 (1.26)	3.57 (1.40)
	Self-report aged 12			
	Variable	Stable Gang	Unstable Gang	Control
	Fighting*	11.65 (4.05)	8.76 (1.86)	8.35 (1.56)
	Stealing*	14.39 (3.53)	12.49 (2.54)	11.98 (1.82)

	Vandalism*	7.61 (2.52)	6.47 (.99)	6.43 (.96)
	Alcohol and drug abuse	3.87 (1.10)	3.71 (.92)	3.33 (.59)
	Self-report aged 13			
	Variable	Stable Gang	Unstable Gang	Control
	Fighting*	12.35 (3.80)	9.56 (2.73)	8.22 (1.66)
	Stealing*	14.83 (4.10)	13.44 (3.00)	11.94 (1.48)
	Vandalism*	7.74 (1.54)	7.09 (1.70)	6.70 (1.49)
	Alcohol and drug abuse*	4.91 (1.88)	4.36 (1.76)	3.90 (1.26)
	Self-report aged 14			
	Variable	Stable Gang	Unstable Gang	Control
	Fighting*	13.32 (4.70)	9.67 (2.49)	8.53 (1.92)
	Stealing*	17.40 (5.56)	14.40 (3.96)	12.27 (1.74)
	Vandalism*	9.65 (3.75)	7.09 (1.87)	6.65 (1.01)
	Alcohol and drug abuse*	6.35 (2.90)	5.21 (2.28)	4.27 (1.58)

Measure of effect used	Not used
Effect size and CI (for each exposure)	N/A

Name of researcher performing data extraction	Alison Waugh
Date of data extraction	24/08/2015
Record number	CO07
Author	Gatti, Tremblay, Vitaro, McDuff
Title	Youth gangs, delinquency and drug use: a test of the selection, facilitation, and enhancement hypotheses
Type of publication	Primary research
Country of origin	Canada
Source of funding	Québec's CQRS and FCAR funding agencies Canada's Research Chair Program NHRDP and SSHRC funding agencies Canadian Institute for Advanced Research Molson Foundation
Study aims	To establish whether gang members display a higher level of delinquency and drug use than youths who do not belong to gang.

	To test whether any greater involvement of gang members could be explained by the selection, facilitation or enhancement models To ascertain whether the higher levels of delinquency was related with belonging to a gang, or whether it was due to the fact that these youths had personal, family and social problems and deficiencies before joining the gang To establish the extent to which gang membership findings from prior research can be generalised to white French-speaking Canadian males	
Study design	Cross Sectional	Case Study <u>Cohort</u>
Inclusion criteria	Parents born in Canada Parents' mother tongue French Complete data sets in original longitudinal study (1034 boys studied in kindergarten in 1984)	
Exclusion criteria	Not reported	
Recruitment procedure	Not reported	
Recruited from	Low socio-economic area of a large metropolitan city in Quebec	
n	Gang	Control

	276	480
n withdrew	Gang	Control
	Not reported	Not reported
Age range	10-16	
Gender	Male	
Ethnicities	Caucasian	
Socio-economic status	Low SES	
Exposure	Person offences, property offences, drug sales, drug use	
Exposure measured by	Self-report frequency	
Outcome	Gang membership	
Outcome measured by	Self-report	
Statistical analysis used	t-test, ANOVA, MANOVA	
Mean (SD)	Variable	Control
	14 years old	
	Person offences*	.77 (1.30)
	Property offences*	1.19 (2.11)

	Drug sales*	.17 (.58)	.04 (.27)
	Drug use*	.46 (.96)	.13 (.52)
	15 years old		
	Person offences*	2.93 (2.72)	.70 (1.25)
	Property offences*	5.32 (5.13)	1.22 (2.15)
	Drug sales*	.53 (.82)	.06 (.31)
	Drug use*	1.14 (1.45)	.27 (.71)
	16 years old		
	Person offences*	2.70 (2.54)	.61 (1.17)
	Property offences*	5.42 (5.06)	1.36 (2.47)
	Drug sales*	.69 (1.01)	.17 (.53)
	Drug use*	1.41 (1.59)	.53 (.86)
Measure of effect used	Not reported		
Effect size and CI (for each exposure)	N/A		

Name of researcher performing data extraction	Alison Waugh
Date of data extraction	24/08/2015
Record number	C008
Author	LaCourse, Nagin, Tremblay, Vitaro, Claes
Title	Developmental trajectories of boys' delinquent group membership and facilitation of violent behaviors during adolescence
Type of publication	Primary research
Country of origin	Canada
Source of funding	National Science Foundation grant to the National Consortium on Violence Quebec's CQRS and FCAR funding agencies Canada's NHRDP and SSHRC funding agencies Canadian Institute for Advanced Research Molson Foundation
Study aims	To identify the different developmental trajectories of delinquent group membership

	To estimate the proportion of adolescents following these different trajectories from ages 11 through 17 To track variations in rate of violent behaviours with delinquent group developmental trajectories To assess if being part of a delinquent group at any point in time will contribute to an increase in violent behaviours regardless of developmental pathways	
Study design	Cross Sectional	Case Study <u>Cohort</u>
Inclusion criteria	Parents born in Canada Parents' mother tongue French Complete data sets in original longitudinal study (1034 boys studied in kindergarten in 1984)	
Exclusion criteria	Not reported	
Recruitment procedure	Not reported	
Recruited from	53 schools of low SES areas of Montreal (Canada)	
n	Gang	Control
	Not reported	Not reported

n withdrew	Gang	Control
	Not reported	Not reported
Age range	11-17	
Gender	Male	
Ethnicities	Not reported	
Socio-economic status	Low SES	
Exposure	Violent behaviours	
Exposure measured by	Self-report frequency responses to behaviour items	
Outcome	Gang membership	
Outcome measured by	Self-report	
Statistical analysis used	Trajectory model	
Mean (SD)	Descriptive statistics not reported	
	Violence significantly associated with gang membership	
Measure of effect used	Not reported	
Effect size and CI (for each exposure)	Not reported	

Name of researcher performing data extraction	Alison Waugh
Date of data extraction	24/08/2015
Record number	C009
Author	Lahey, Gordon, Loeber, Stouthamer-Loeber, Farrington
Title	Boys who join gangs: a prospective study of predictors of first gang entry
Type of publication	Primary research
Country of origin	USA
Source of funding	None reported
Study aims	To replicate early findings that future gang entry is predicted by both the youth's antisocial behaviour prior to gang entry and family and neighbourhood characteristics
Study design	Cross Sectional Case Study <u>Cohort</u>
Inclusion criteria	Not reported
Exclusion criteria	Not reported
Recruitment procedure	Not reported
Recruited from	The second cohort of the Pittsburgh Youth Survey

n	Gang	Control
	95	252
n withdrew	Gang	Control
	Not reported	Not reported
Age range	12-14 (wave 1) and 18-21 (final wave)	
Gender	Male	
Ethnicities	Hispanic white and African American	
Socio-economic status	"Limited economic resources"	
Exposure	Conduct disorder behaviours Delinquency	
Exposure measured by	CD behaviours: Child Behavior Checklist, Teacher's Report Form, Youth Self-Report (Achenbach, 1991) Delinquency: Self-Report Delinquency Scale (Elliot, Huizinga & Ageton, 1985)	
Outcome	Gang membership	
Outcome measured by	Self-report	
Statistical analysis used	Cox proportional hazard model	

Mean (SD)	Variable	Gang (n=25)	Control (n=158)
	Wave prior to final wave		
	CD baseline	5.60 (3.13)	3.86 (3.24)
	CD prior to final wave	4.94 (2.64)	2.09 (2.81)
	Crimes against person	1.17 (1.50)	.56 (.96)
	Crimes against property	.77 (1.15)	.28 (.69)
	Selling drugs	.35 (1.01)	.31 (1.02)
	Variable	Gang (n=545)	Control (n=8070)
	All months at risk prior to final wave		
	Variable	Gang (n=545)	Control (n=8070)
	CD baseline	5.43 (3.19)	3.51 (2.89)
	CD prior to final wave	4.63 (2.94)	2.50 (2.42)
	Crimes against person	.92 (1.21)	.41 (.85)
	Crimes against property	.88 (1.15)	.34 (.74)
	Selling drugs	.25 (.91)	.16 (.77)
Measure of effect used	Hazard ratio		

Effect size and CI (for each exposure) CI not reported **p<.01 *p<.05	<u>African-American serious gang membership predictors</u> CD behaviour rating (baseline): 1.17** CD behaviour rating (prior year): 1.25** Crimes against person: 1.75** Crimes against property: 1.51** Selling drugs: 1.36*

Name of researcher performing data extraction	Alison Waugh
Date of data extraction	24/08/2015
Record number	CO11
Author	Thornberry, Krohn, Lizotte, Chard-Wierschem
Title	The role of juvenile gangs in facilitating delinquent behavior
Type of publication	Primary research
Country of origin	USA
Source of funding	Office of Juvenile Justice and Delinquency Prevention Office of Justice Programs US department of Justice National Institute on Drug Abuse National Science Foundation
Study aims	To identify which model best fits the higher rates of serious and violent crime amongst gang members and non-gang members
Study design	Cross Sectional Case Study <u>Cohort</u>
Inclusion criteria	Not reported

Exclusion criteria	Not reported	
Recruitment procedure	Not reported	
Recruited from	Public schools in Rochester, New York (part of the Rochester Youth Development Study)	
n	Gang	Control
	175	488
n withdrew	Gang	Control
	Not reported	Not reported
Age range	11-15	
Gender	Males and females originally recruited, females dropped from analysis as gang females under-represented	
Ethnicities	Not reported	
Socio-economic status	Not reported	
Exposure	Gang membership	
Exposure measured by	Self-report	
Outcome	Delinquency	
	Drug use	

Outcome measured by	Delinquency: National Youth Survey (Elliott, Huizinga & Ageton, 1985) Drug use: National Youth Survey (Elliott, Huizinga & Ageton, 1985)		
Statistical analysis used	t-test		
Mean (SD) SD not reported	Variable	Gang	Control
	Time 1 general delinquency**	18.16	4.68
	Time 1 person offences**	11.58	2.69
	Time 1 property offences**	4.83	1.44
	Time 1 drug sales*	1.75	.55
	Time 1 drug use*	4.58	1.35
	Time 2 general delinquency**	15.37	3.74
	Time 2 person offences**	8.61	2.31
	Time 2 property offences**	3.17	.85
	Time 2 drug sales**	3.59	.58
	Time 2 drug use**	8.52	2.02
	Time 3 general delinquency**	14.89	5.09
	Time 3 person offences**	7.82	3.37

	Time 3 property offences*	2.64	.83
	Time 3 drug sales**	4.44	.90
	Time 3 drug use**	7.00	2.17
Measure of effect used	Not reported		
Effect size and CI (for each exposure)	N/A		

Name of researcher performing data extraction	Alison Waugh
Date of data extraction	27/07/2015
Record number	CS01
Author	Amato, Cornell
Title	How do youth claiming gang membership differ from youth who claim membership in another group, such as crew, clique, posse or mob?
Type of publication	Primary research
Country of origin	USA
Source of funding	Not reported
Study aims	To investigate the differences between youth claiming gang membership, and youth claiming membership to another group
Study design	<u>Cross Sectional</u> Case Study Cohort
Inclusion criteria	9 th to 12 th grade students
Exclusion criteria	Not reported

Recruitment procedure	All students present in school on that day invited to take part through questionnaire distribution by teachers.		
Recruited from	A single high school in an ethnically and socioeconomically diverse suburb of Washington.		
n	Gang (male only)	Crew (male only)	No affiliation (male only)
	48	169	436
n withdrew	Gang	Control	
	Not reported	Not reported	
Age range	9 th to 12 th grade		
Gender	Male and female, separate analysis for genders reported		
Ethnicities	(Including) Asian American, African American, European American, Latino, 'mixed' background		
Socio-economic status	'Socioeconomically diverse'		
Exposure	Gang membership		
Exposure measured by	Self-nomination, responded to key gang identifier questions		

Outcome	Delinquent behaviour, measured by violent behaviour, larceny, minor infarction, selling drugs, vandalism			
Outcome measured by	Modified version of the Delinquency Scale from the National Longitudinal Study of Adolescent Health			
Statistical analysis used	MANCOVA			
Means and (SDs) *p<.001	Variable	Gang	Crew	No affiliation
	Violent behaviour*	5.9 (3.84)	1.8 (2.75)	0.7 (1.36)
	Larceny*	6.7 (4.45)	2.9 (3.66)	1.1 (2.05)
	Minor infarction*	4.8 (1.87)	3.8 (1.93)	2.2 (1.86)
	Selling drugs*	1.4 (1.41)	0.5 (1.02)	0.1 (0.51)
	Vandalism*	3.6 (2.01)	1.4 (1.78)	0.7 (1.20)
Measure of effect used	Eta squared			
Effect size and CI	Does not report male only effect size			

Name of researcher performing data extraction	Alison Waugh
Date of data extraction	27/07/2015
Record number	CS02
Author	Bjerregaard, Corcoran
Title	The role of school related bonding factors and gender: correlates of gang membership among adolescents
Type of publication	Primary research
Country of origin	USA
Source of funding	Not reported
Study aims	To explore the relevance of school-related social bond elements in explaining gang involvement. To examine those relationships in order to test the hypothesis of gender invariance
Study design	<u>Cross Sectional</u> Case Study Cohort
Inclusion criteria	8 th grade students that had completed GREAT during the previous 2 years
Exclusion criteria	Students that had not completed GREAT

Recruitment procedure	Not reported	
Recruited from	42 schools from multiple states and cities: Phoenix, Arizona; Torrance, California; Orlando, Florida; Pocatello, Idaho; Will County, Illinois; Kansas City, Missouri; Omaha, Nebraska; Las Cruces, New Mexico; Philadelphia, Pennsylvania; Providence, Rhode Island; Milwaukee, Wisconsin	
n	Gang	Control
	11.5% Approximately 304	Approximately 2336
n withdrew	Gang	Control
	Not reported	Not reported
Age range	11-18	
Gender	Male and female with separate gender analysis	
Ethnicities	Only reports number of Caucasian participants (approximately 40%)	
Socio-economic status	Not reported	
Exposure	Conventional beliefs Delinquency	

	Self-concept Personal victimization		
Exposure measured by	Conventional beliefs: index of nine items (not named) Individual delinquency: Prevalence measure derived from an index of 11 frequency measures of delinquent activities Self-concept: An index summarising the extent to which the student beliefs that he or she is a person of worth (not named) Victimization: the number of times in the past year the person was attacked and/or robbed		
Outcome	Gang membership		
Outcome measured by	Self-report		
Statistical analysis used	Correlation Logistic regression		
Means (SD) Male only means and SDs for gang members vs non gang members not reported.	Variable	Correlation (without covariates)	Regression (with covariates)
	Conventional beliefs	-.0343**	-0.084**
	Delinquency	0.150**	1.141*

*p<.05	Self-concept	-0.082**	0.008
p<.01	Personal victimisation	-0.250	0.085**
Measure of effect used	Odds ratio		
Effect size and CI (for each exposure)	Conventional beliefs (OR: 0.919, 0.895-0.944) probability -0.008		
Model with covariates	Delinquency (OR: 3.131, 1.245-7.877) probability 0.173		
	Self-concept (OR: 1.008, 0.971-1.046 probability 0.001		
	Personal victimization (OR: 1.089, 1.052 -1.128) probability 0.009		

Name of researcher performing data extraction	Alison Waugh
Date of data extraction	06/08/2015
Record number	CS03
Author	Chu, Daffern, Thomas, Ang, Long
Title	Elucidating the treatment needs of gang-affiliated youth offenders
Type of publication	Primary research
Country of origin	Singapore
Source of funding	Not reported
Study aims	To elucidate the criminogenic needs of gang-affiliated youth offenders and compare these with those of non-gang affiliated youth offenders
Study design	<u>Cross Sectional</u> Case Study Cohort
Inclusion criteria	Not reported
Exclusion criteria	Not reported
Recruitment procedure	Data obtained from case file psychological assessments

Recruited from	Referrals to the Clinical and Forensic Psychology Branch of the Ministry of Community Development, Youth and Sports, Singapore between January 2004 and December 2005	
n	Gang	Control
	58	107
n withdrew	Gang	Control
	Not reported	Not reported
Age range	12-18	
Gender	Male	
Ethnicities	Chinese, Malay, Indian, 'Other'	
Socio-economic status	Not reported	
Exposure	History of violence History of non-violent offending Early initiation to violence Past supervision/intervention failure History of suicide/self-harm Exposure to violence at home	

	Childhood history of maltreatment Stress and poor coping Negative attitudes Risk taking/impulsivity Substance use difficulties Anger management Low empathy/remorse Attention deficit/hyperactivity difficulties Poor compliance Prior or current offences/dispositions Substance abuse Personality/behaviour Attitudes/orientation
Exposure measured by	Structured Assessment of Violence Risk in Youth (SAVRY) Youth Level of Service/Case Management Inventory (YLS/CMI)
Outcome	Gang membership
Outcome measured by	Self-report

	Official records		
Statistical analysis used	Histograms to check for skewed distribution Chi-squared test of association to compare differences between gang and non-gang members Bonferroni adjustments to correct for possible Type I errors arising from multiple adjustments		
Means (SD) NB: Means and SD not reported, prevalence (%)	Variable	Gang	Control
	History of violence	44/56 (78.6)	71/107 (66.4)
	History of non-violent offending	44/56 (78.6)	99/107 (92.5)
	Early initiation to violence	31/56 (55.4)	40/107 (37.4)
	Past supervision/intervention failure	18/56 (32.1)	25/107 (23.4)
	History of suicide/self-harm attempt	5/56 (8.9)	8/107 (7.5)
	Exposure to violence at home	9/56 (16.1)	21/107 (19.6)

	Childhood history of maltreatment	14/56 (25)	19/107 (17.8)
	Stress and poor coping	34/56 (60.7)	74/107 (69.2)
	Negative attitudes	43/56 (76.8)	83/107 (77.6)
	Risk taking/impulsivity	49/56 (87.5)	97/107 (90.7)
	Substance use difficulties	22/56 (39.3)	30/107 (28)
	Anger management	33/56 (58.9)	55/107 (51.4)
	Low empathy/remorse	38/56 (67.9)	72/107 (67.3)
	Attention deficit/Hyperactivity difficulties	1/55 (1.8)	5/107 (4.7)
	Poor compliance	27/56 (48.2)	51/107 (47.7)
	Prior or current offences/dispositions	22/58 (37.9)	43/107 (40.2)
	Substance abuse	21/58 (36.2)	24/107 (22.4)
	Personality/behaviour	42/58 (72.4)	75/107 (70.1)
	Attitudes/orientation	55/58 (94.8)	98/107 (91.6)
Measure of effect used	Not used		

Effect size and CI (for each exposure)	N/A

Name of researcher performing data extraction	Alison Waugh
Date of data extraction	31/07/2015
Record number	CS04
Author	Chu
Title	Criminal attitudes and psychopathic personality attributes of youth gang offenders in Singapore
Type of publication	Primary research
Country of origin	Singapore
Source of funding	Not reported
Study aims	To describe the differences in criminal attitudes and gang-related attitudes between groups, as well as to examine the psychopathic personality traits in gang and non-gang affiliated youth offenders within a non-Western context
Study design	<u>Cross Sectional</u> Case Study Cohort
Inclusion criteria	Not reported
Exclusion criteria	Not reported

Recruitment procedure	Not reported	
Recruited from	Singapore Boys' Home and Singapore Boys' Hostel – Singapore youth correctional services that provide rehabilitation to male youth offenders	
n	Gang	Control
	107	61
n withdrew	Gang	Control
	Not reported	Not reported
Age range	13-18	
Gender	Male	
Ethnicities	Chinese, Malay, Indian, 'Other'	
Socio-economic status	Not reported	
Exposure	Offending history History of violent offending History of sexual offending History of non-violent non-sexual offending Current violent offending Current sexual offending	

	Current non-violent non-sexual offending History of 'any' substance use History of alcohol use History of cannabis use History of cocaine use History of amphetamine use History of inhalant use History of sedative use History of hallucinogen use History of opiate use
Exposure measured by	Measures of criminal attitudes and associates (MCCA) Youth psychopathic trait inventory (YPI)
Outcome	Gang membership
Outcome measured by	Self-report Official records
Statistical analysis used	Chi square for categorical data Two tailed independent t-tests for continuous data

	Logistic regression model for significant variables.		
Means (SD) NB: Means and SD not reported, prevalence (%) *p<.05	Variable	Gang	Control
	Offending history	59/107 (55.1)	27/61 (44.3)
	History of violent offending	8/107 (7.5)	2/61 (3.3)
	History of sexual offending	2/107 (1.9)	3/61 (4.9)
	History of non-violent non-sexual offending	51/107 (47.7)	24/61 (39.3)
	Current violent offending*	40/107 (37.4)	12/61 (19.7)
	Current sexual offending*	3/107 (2.8)	7/61 (11.5)
	Current non-violent non-sexual offending	83/107 (77.6)	46/61 (75.4)
	History of 'any' substance use*	107/107 (100)	56/61 (91.8)
	History of alcohol use*	100/107 (93.5)	50/61 (82)
	History of cannabis use*	15/107 (14)	1/61 (1.6)
	History of cocaine use	1/107 (0.9)	0/61 (0)

	History of amphetamine use	22/107 (20.6)	5/61 (8.2)
	History of inhalant use	46/107 (43)	20/61 (32.8)
	History of sedative use*	31/107 (29)	6/61 (9.8)
	History of hallucinogen use*	20/107 (18.7)	3/61 (4.9)
	History of opiate use	23/107 (21.5)	8/61 (13.1)
Mean (SD) *p<.05	Violence*	7.42 (3.66)	4.92 (3.95)
	Entitlement*	5.87 (2.17)	5.13 (2.08)
	Antisocial intent	4.08 (2.55)	3.66 (2.40)
	YPI total	107.71 (18.21)	103.11 (21.71)
	Callous-unemotional	32.46 (5.29)	32.21 (5.98)
	Grandiose-manipulative	37.40 (9.16)	36.44 (11.40)
	Impulsive-irresponsible*	37.85 (7.64)	34.46 (7.93)
Measure of effect used	Odds ratio		
Effect size and CI (for each exposure)	MCAA violence: 1.06 (.95 to 1.19) MCAA entitlement: 1.08 (.90 to 1.29) YPI total: .99 (.94 to 1.05)		

Name of researcher performing data extraction	Alison Waugh
Date of data extraction	31/07/2015
Record number	CS06
Author	Dukes, Stein
Title	Gender and gang membership: a contrast of rural and urban youth on attitudes and behaviour
Type of publication	Primary research
Country of origin	USA
Source of funding	National Institute on Drug Abuse
Study aims	To investigate the relationships of gender and gang membership to latent variables of psychosocial characteristics, drug use, delinquency, weapons possession and fear within rural and urban school districts in Colorado.
Study design	<u>Cross Sectional</u> Case Study Cohort
Inclusion criteria	Not reported
Exclusion criteria	Not reported

Recruitment procedure	Passive parental consent – parents informed of study several weeks before the surveys were distributed. Each school selected a day within a set period of time in which surveys were distributed by teachers and completed within school time. All students present on the selected day were invited to take part.	
Recruited from	29 middle schools, junior high schools, and high schools in four school districts within the city limits of Colorado Springs, Colorado	
n	Gang	Control
	1044	997
n withdrew	Gang	Control
	Not reported	Not reported
Age range	7 th to 12 th grade	
Gender	Male and female (separate analysis	
Ethnicities	American Indian, African American, Hispanic, Asian-Pacific Islander, White, Mixed, Unknown	
Socio-economic status	Not reported	

Exposure	Drug use Violence Delinquent behaviour Self-derogation		
Exposure measured by	Survey developed for the purpose of the study		
Outcome	Gang membership		
Outcome measured by	Self-report		
Statistical analysis used	Structural equations modelling Goodness of fit Confirmatory factor analysis		
Means (SD) Significant differences not reported	Variable	Gang	Control
	Beer	4.5 (2.1)	2.6 (1.7)
	Wine	3.9 (2.1)	2.4 (1.6)
	Liquor	4.3 (2.2)	2.3 (1.8)
	Marijuana	4.3 (2.5)	1.9 (1.8)
	Amphetamines	2.5 (2.2)	1.3 (1.0)

	Psychedelics	2.4 (2.2)	1.3 (1.0)
	Cocaine	2.3 (2.1)	1.1 (0.7)
	Heroin	2.1 (2.1)	1.1 (0.7)
	Steroids	1.9 (2.0)	1.1 (0.8)
	Inhalants	2.4 (2.2)	1.3 (0.9)
	Illegal prescription	2.4 (2.1)	1.6 (1.4)
	Physical fights	3.4 (1.5)	1.7 (1.1)
	Group fights	3.1 (1.6)	1.4 (0.9)
	Hurt someone	2.9 (1.5)	1.4 (0.9)
	Stealing	3.3 (1.6)	1.9 (1.4)
	Vandalism	3.1 (1.6)	1.6 (1.2)
	Trespassing	2.8 (1.6)	1.6 (1.1)
	Selling drugs	2.8 (1.8)	1.4 (1.0)
	Police trouble	2.7 (1.6)	1.4 (0.9)
	Curfew	3.6 (1.6)	2.3 (1.7)
	Alcohol trouble	2.6 (1.7)	1.3 (0.9)

	"no good"	2.6 (1.4)	2.4 (1.2)
	"useless"	2.6 (1.4)	2.4 (1.2)
Z scores Gang vs non gang *p<.001	Common drugs		24.87*
	Hard drugs		15.27*
	Delinquent behaviour		25.41*
	Fear of violence		15.05*
	Self-derogation		4.48*
Measure of effect used	Not reported for male gang member vs non gang member		
Effect size and CI (for each exposure)	N/A		

Name of researcher performing data extraction	Alison Waugh
Date of data extraction	06/08/2015
Record number	CS07
Author	Evans, Albers, Macari, Mason
Title	Suicide ideation, attempts, and abuse among gang and non-gang delinquents
Type of publication	Primary research
Country of origin	USA
Source of funding	Nevada Agricultural Experiment Station
Study aims	To investigate suicide ideation and attempts as well as reported levels of physical and sexual abuse among gang and non-gang involved incarcerated youths
Study design	<u>Cross Sectional</u> Case Study Cohort
Inclusion criteria	Incarcerated youth in Nevada
Exclusion criteria	Not reported

Recruitment procedure	Survey administered to all incarcerated youth in state supported facilities in Nevada, administered during regularly scheduled study periods.	
Recruited from	State supported facilities in Nevada	
n	Gang	Control
	194	201
n withdrew	Gang	Control
	Not reported	Not reported
Age range	12-18	
Gender	Male and female (separate analysis)	
Ethnicities	Caucasian/White, African American/Black, Chicano/Latino/Hispanic, Native American, Asian-American, Multi-ethnic, 'other'	
Socio-economic status	Not reported	
Exposure	Gang membership	
Exposure measured by	Self-report	
Outcome	Suicide ideation Suicide attempts Sexual and physical abuse	

Outcome measured by	Survey developed for the purpose of this research	
Statistical analysis used	Chi squared analysis to examine differences between gang membership, suicide ideation, and physical and sexual abuse. ANOVA to compare gang and non-gang youths on frequency of suicide attempts	
Means (SD) NB: Mean and SD not reported. Gang members reported significantly higher levels No significant differences for physical abuse (analysis not reported)	Suicidal ideation	Chi squared = 8.67, df = 2, $p < .01$
	Suicide attempts	F = 5.826, $p < .01$
	Sexual abuse	Chi squared = 3.96, df = 1, $p < .05$
Measure of effect used	Not reported	
Effect size and CI (for each exposure)	N/A	

Name of researcher performing data extraction	Alison Waugh
Date of data extraction	07/08/2015
Record number	CS08
Author	Evans, Mason
Title	Factors associated with gang involvement among incarcerated youth
Type of publication	Primary research
Country of origin	USA
Source of funding	Nevada Agricultural Experiment Station
Study aims	To investigate factors associated with gang involvement among incarcerated juvenile offenders
Study design	<u>Cross Sectional</u> Case Study Cohort
Inclusion criteria	Adjudicated youth
Exclusion criteria	Not reported
Recruitment procedure	1 st wave of data used from a longitudinal study looking at the relationship between drug use and delinquency

Recruited from	All adjudicated youth in Nevada state supported facilities over a period of 4 weeks in 1994	
n	Gang	Control
	194	201
n withdrew	Gang	Control
	Not reported	Not reported
Age range	12-18	
Gender	Male and female (separate analysis)	
Ethnicities	Caucasian/White, African American/Black, Chicano/Latino/Hispanic, Native American, Asian-American, Multi-ethnic, 'other'	
Socio-economic status	Not reported	
Exposure	Global self-worth Emotional adjustment Risky behaviours Suicide attempts Sexual/physical abuse Substance use	

Exposure measured by	Global self-worth: Self Perception Profile for Adolescents Emotional adjustment: Not named Risky behaviours: Not named Suicide attempts: Frequency in previous 12 months Sexual/physical abuse: Questions developed for this research (Yes/No responses) Substance use: Frequency 6 months prior to incarceration – alcohol, marijuana, cocaine/crack cocaine	
Outcome	Gang membership	
Outcome measured by	Self-report	
Statistical analysis used	ANOVA and chi square to test for between group differences	
Means (SD) NB: Mean and SD not reported.	Variable	Chi square, df, p value
	Sexual abuse	3.93, 1, .04
	Physical abuse	.94, 1, .33
	Violent crime	.93, 1, .33

	Drunk/high during crime	9.18, 1, .00
Measure of effect used	Not used	
Effect size and CI (for each exposure)	N/A	

Name of researcher performing data extraction	Alison Waugh
Date of data extraction	31/07/2015
Record number	CS09
Author	Chu, Daffern, Thomas, Lim
Title	Violence risk and gang affiliation in youth offenders: a recidivism study
Type of publication	Primary research
Country of origin	Singapore
Source of funding	Not reported
Study aims	To explore: (1) socio-demographic similarities and differences between gang affiliated and non-gang affiliated youth offenders; (2) the risk ratings and level of criminogenic needs in gang affiliated and non-gang affiliated youth offenders; and (3) the relationship between gang affiliation and criminal recidivism.
Study design	<u>Cross Sectional</u> Case Study Cohort
Inclusion criteria	Not reported
Exclusion criteria	Not reported

Recruitment procedure	File data	
Recruited from	Youths charged and convicted of offences, currently on probation, referred for psychological evaluation and/or treatment at the Clinical and Forensic Psychology Branch of the Ministry of Community Development, Youth and Sports, Singapore.	
n	Gang	Control
	58	107
n withdrew	Gang	Control
	Not reported	Not reported
Age range	12-18	
Gender	Male	
Ethnicities	Chinese, Malay, Indian, 'Other'	
Socio-economic status	Not reported	
Exposure	History of physical/sexual abuse History of substance use Offending history History of violence against others	

	History of weapon use Index offence violence Index offence sexual Index offence theft/fraud Index offence substance use Index offence illegal sales		
Exposure measured by	Structured assessment of violence risk in youth (SAVRY) Youth level of service/case management inventory (YLS/CMI)		
Outcome	Gang membership		
Outcome measured by	Self-nomination and/or official records indicating gang membership		
Statistical analysis used	Chi square for categorical data Two tailed independent t-tests for continuous data Forward stepwise logistic regression model for significant variables. AUC to test goodness of fit		
Means (SD) NB: Means and SD not reported, prevalence (%)	Variable	Gang	Control
	History of physical/sexual abuse	15/58 (25.9)	17/107 (15.9)

* significant difference	History of substance use*	37/58 (63.8)	30/107 (28)
	Prior offending history	11/58 (19)	22/107 (20.6)
	History of violence against others*	50/58 (86.2)	63/107 (58.9)
	History of weapon use*	20/58 (34.5)	9/107 (8.4)
	Index offence violent offence*	31/58 (53.4)	29/107 (27.1)
	Index offence sexual offence	9/58 (15.5)	26/107 (24.3)
	Index offence theft/fraud	22/58 (37.9)	59/107 (55.1)
	Index offence substance use	5/58 (8.6)	3/107 (2.8)
	Index offence illegal sales	5/58 (8.6)	1/107 (0.9)

Measure of effect used	OR
Effect size and CI (for each exposure)	Violence history = 2.80; 95% CI = 1.14-6.90 SU = 3.13; 95% CI = 1.50-6.54

Name of researcher performing data extraction	Alison Waugh
Date of data extraction	20/07/2015
Record number	CS10
Author	Ferguson
Title	The relationship between ninth grade Latino male gang and non-gang members in attitudes and behaviors
Type of publication	Dissertation
Country of origin	USA
Source of funding	None reported
Study aims	To identify differences in attitudes and behaviours between gang members and non-gang members.
Study design	<u>Cross Sectional</u> Case Study Cohort
Inclusion criteria	Ninth grade Latino males
Exclusion criteria	Not reported
Recruitment procedure	Two schools identified as having the most Latino gang members enrolled. Researcher contacted district office to get a list of Latino males at the

	schools. District gang intervention team identified gang members from this list. Remaining males were classified as non-gang.	
Recruited from	2 California high schools	
n	Gang	Control
	49	52
n withdrew	Gang	Control
	Not reported	Not reported
Age range	Ninth grade, range not reported	
Gender	Male	
Ethnicities	Latino	
Socio-economic status	Low SES	
Exposure	Loneliness Views of the future Alcohol Drugs Stress, depression, suicide Antisocial behaviour	

	Self-esteem		
Exposure measured by	Profiles of Student Life: Attitudes and Behaviors		
Outcome	Gang membership		
Outcome measured by	Official records		
Statistical analysis used	Independent samples t-test Chi square Mann-Whitney U Kolmogorov-Smirnov		
Means (SD) *p<.05 ♦ question relating to use of violence, included in violence analysis	Variable	Gang	Control
	Self-esteem	2.43 (.79)	2.27 (.66)
		2.31 (.89)	2.34 (.79)
		2.00 (.89)	1.92 (.86)
	Views of the future	1.92 (.82)	1.78 (.99)
		2.55 (.79)	2.42 (.02)
		2.43 (.84)	2.19 (.91)

		2.10 (.77)	2.06 (.89)
	Isolation	3.41 (.93)	3.25 (.97)
		2.96 (1.14)	3.12 (1.08)
		3.98 (.85)	3.67 (1.07)
		3.63 (1.03)	3.50 (.92)
		3.82 (.88)	3.78 (.90)
	Stress	3.86 (1.17)	3.88 (1.18)
		3.76 (1.13)	3.69 (.95)
		3.80 (1.04)	3.96 (.63)
	Alcohol use	3.24 (1.47)	2.67 (1.57)*
		1.22 (.62)	1.21 (.80)
		1.94 (1.28)	1.69 (1.34)
	Lifetime marijuana	2.06 (1.90)	1.85 (1.58)
	Lifetime cocaine	1.16 (.47)	1.08 (.33)
	Lifetime crack	1.12 (.39)	1.02 (.14)
	Lifetime amphetamines	1.18 (.60)	1.33 (1.16)

	Lifetime PCP	1.02 (.14)	1.02 (.14)
	Lifetime LSD	1.33 (1.03)	1.10 (.36)
	Last 12 months heroin	1.12 (.39)	1.02 (.04)
	Depression/suicide	3.80 (1.04) 1.49 (.94) 1.14 (.41)	3.96 (.63) 1.33 (.71) 1.08 (.27)
	Antisocial behaviour	1.76 (1.07) 2.18 (1.35) 2.39 (1.47)♦ 2.25 (1.48) 1.80 (1.12)♦ 2.47 (1.28)♦	1.69 (1.18) 1.60 (1.00)* 1.73 (.97)*♦ 1.27 (.53)* 1.27 (.70)*♦ 1.62 (1.07)♦
Measure of effect used	Not reported		
Effect size and CI (for each exposure)	Not reported		

Name of researcher performing data extraction	Alison Waugh
Date of data extraction	20/07/2015
Record number	CS11
Author	Fernandez
Title	Incarcerated adolescents and young adults: examining gang membership status, type of crime committed, offence history, and length of incarceration as predictors of depression
Type of publication	Dissertation
Country of origin	USA
Source of funding	Not reported
Study aims	To examine the relationships between offence histories, gang membership stats, types of crime committed, length of incarceration and depression among male adolescents and young adults.
Study design	<u>Cross Sectional</u> Case Study Cohort
Inclusion criteria	Male, aged 15-23
Exclusion criteria	Released within a 6 month period

	Sex offenders	
Recruitment procedure	Researcher met with residents in the residential cottages to explain the nature of the study and to sign up to the study.	
Recruited from	California Youth Authority residential facility	
n	Gang	Control
	27	124
n withdrew	Gang	Control
	Not stated	Not stated
Age range	15-23	
Gender	Male	
Ethnicities	Latino, African-American, Euro-American, Asian-Pacific Islander, Multi-ethnic, Native American	
Socio-economic status	Not stated	
Exposure	Gang membership	
Exposure measured by	Case file	
Outcome	Depression	

Outcome measured by	Child Depression Inventory	
Statistical analysis used	ANOVA Levene's test of homogeneity of variance	
Means (SD) NB: Not reported ANOVA reported	Gang	Control
	Not reported	Not reported
	Depression	F (1,144) = 4.44, p<.04
Measure of effect used	Cohen's d	
Effect size and CI (for each exposure)	.55 (CI not reported)	

Name of researcher performing data extraction	Alison Waugh
Date of data extraction	20/07/2015
Record number	CS12
Author	Horn
Title	Causal attributions of Latino gang membership
Type of publication	Dissertation
Country of origin	USA
Source of funding	Not reported
Study aims	To compare gang members and non-gang members on perception of blocked opportunities, causal attributions, and sense of anomia.
Study design	<u>Cross Sectional</u> Case Study Cohort
Inclusion criteria	Gang member inclusion criteria: Latino, male, 14-17 years old, gang membership as determined by self-nomination, official records, participation in delinquent activity.
Exclusion criteria	Not reliably identifying self as gang member, insufficient understanding of English language, not meeting age range or ethnicity in inclusion criteria.

Recruitment procedure	Not clearly stated	
Recruited from	Holding units at the Fresno county juvenile hall	
n	Gang	Control
	37	27
n withdrew	Gang	Control
	Not reported	Not reported
Age range	14-17	
Gender	Male	
Ethnicities	Mexican, Hispanic, Mexican Native Americans, Hispanic Americans, Mexican Americans, Puerto Rican	
Socio-economic status	Mean education level of ninth grade Other socioeconomic data collected but not responded to reliably – not reported	
Exposure	Locus of control Awareness of limited opportunities	
Exposure measured by	Brown Locus of Control Scale Awareness of Limited Opportunities Scale	

Outcome	Gang membership		
Outcome measured by	Gang Identification Scale		
Statistical analysis used	Independent samples t-test Levene's test for equality of variances		
Means (SD)	Variable	Gang	Control
	Locus of control	33.2 (6.25)	31.93 (6.69)
	Limited opportunities	28.46 (5.59)	26.93 (5.88)
Measure of effect used	Not reported		
Effect size and CI (for each exposure)	Not reported		

Name of researcher performing data extraction	Alison Waugh
Date of data extraction	23/07/2015
Record number	CS13
Author	Weerman
Title	Are the correlates and effects of gang membership sex-specific? Troublesome youth groups and delinquency among Dutch girls.
Type of publication	Primary research
Country of origin	Netherlands
Source of funding	Not reported
Study aims	To obtain insight on the extent to which girls are involved in gangs according to the Eurogang definition in a country that is representative of Europe and to analyse whether such gang membership affects delinquent behaviour among girls to the same extent as is does among boys.
Study design	<u>Cross Sectional</u> Case Study Cohort
Inclusion criteria	Not reported

Exclusion criteria	Not reported	
Recruitment procedure	Pre-existing dataset from cohort study – not reported	
Recruited from	11 secondary schools in the Netherlands	
n	Gang	Control
	83	915
n withdrew	Gang	Control
	Not reported	Not reported
Age range	11-18	
Gender	Male and Female	
Ethnicities	All not reported 11% Surinamese 7% Turkish 6% Moroccan	
Socio-economic status	Not reported, oversampled low SES	
Exposure	Delinquency Self-Control Morality	

Exposure measured by	Delinquency – Self-report on 12 offences (if committed and how often during a set time period)		
	Self-Control – Not named, author Grasmick et al., (1993)		
	Morality – Not named, author not named		
Outcome	Gang membership		
Outcome measured by	Eurogang Youth Survey		
Statistical analysis used	Ratio?		
	Logistic regression		
Means (SD) NB: Self-Control and morality only reports logistic regression (SE) *p<.001	Variable	Gang	Control
	Delinquency (ratio 4.15)	3.57	0.86
	Self-control	-.719 (.173)*	
	Morality	-.308 (.177)	
Measure of effect used	Ratio (not specific which ratio) only for delinquency		
Effect size and CI (for each exposure)	Delinquency: 4.15 (confidence interval not reported)		

Name of researcher performing data extraction	Alison Waugh
Date of data extraction	07/08/2015
Record number	CS14
Author	Zhang, Welte, Wieczorek
Title	Youth gangs, drug use, and delinquency
Type of publication	Primary research
Country of origin	USA
Source of funding	National Institute on Alcoholism and Alcohol Abuse
Study aims	To address the relationship among youth gangs, drug use, and delinquency, focusing on: (1) the effects of prior drug use and delinquency on gang membership; (2) the effect of gang membership on drug use and delinquency; (3) the interaction effects of prior drug use and delinquency with gang membership on drug use and delinquency.
Study design	<u>Cross Sectional</u> Case Study Cohort
Inclusion criteria	Not clearly stated Males aged 16-19?

Exclusion criteria	Not reported	
Recruitment procedure	Pre-existing data set from Buffalo Longitudinal Survey of Young Men Recruitment procedure not reported	
Recruited from	The area surrounding Buffalo, New York	
n	Gang	Control
	178	445
n withdrew	Gang	Control
	Not reported	Not reported
Age range	16-19	
Gender	Male	
Ethnicities	White and non-white	
Socio-economic status	Low, medium and high	
Exposure	Delinquency Substance misuse	
Exposure measured by	Delinquency: self-report of delinquency (Elliott, Huizinga, Agent, 1985). Reported frequency of engagement in delinquent activities. Substance misuse: Reported frequency of use of particular substances.	

Outcome	Gang membership	
Outcome measured by	Self-report	
Statistical analysis used	Frequency Correlation Logistic regression	
Mean (SD) Mean and SD not reported * < .01	Variable	Correlation coefficient
	Prior delinquency	.43*
	Current delinquency	.31*
	Prior substance use	.29*
	Current substance use	.26*
		Regression (b, t-ratio)
	Prior delinquency	.07, 5.03*
	Prior substance use	.15, 1.27
Measure of effect used	Not reported	
Effect size and CI (for each exposure)	N/A	

Name of researcher performing data extraction	Alison Waugh
Date of data extraction	13/08/2015
Record number	CS15
Author	Lyon, Henggeler & Hall
Title	The family relations, peer relation, and criminal activities of Caucasian and Hispanic-American gang members
Type of publication	Primary research
Country of origin	USA
Source of funding	Not reported
Study aims	To assess whether juvenile offenders who are gang members report more frequent and serious criminal activity than offenders who do not belong to gangs. To examine the unique family and peer correlates of gang membership, and whether such correlates are mediated by ethnicity.
Study design	<u>Cross Sectional</u> Case Study Cohort
Inclusion criteria	Male, 13-18, Caucasian or Hispanic-American
Exclusion criteria	Not reported

Recruitment procedure	Adjudicated minors recently referred to a county Assessment Centre that serves several juvenile detention facilities were screened for ethnicity. A researcher (and mental health professional) met with the eligible youths (either individually or in pairs) to explain the purpose of the study. The researcher stressed that participation was completely voluntary and would have no bearing on services by the Centre. If agreeable, the participants signed the consent form and were administered an assessment battery.		
Recruited from	A county Assessment Centre that serves several juvenile detention facilities		
N Hispanic		Gang	Control
	Hispanic	50	26
	Caucasian	25	30
n withdrew	Gang		Control
	Not reported		Not reported
Age range	13-18		
Gender	Male		
Ethnicities	Caucasian and Hispanic-American		

Socio-economic status	Mean social status score 34 reflecting skilled craft workers, clerical, and sales workers		
Exposure	Gang membership		
Exposure measured by	Based on criteria of the county Gang Violence Suppression Unit		
Outcome	Criminal activity		
Outcome measured by	Self-Report Delinquency (Elliott & Ageton, 1980) scale used in the National Youth Survey		
Statistical analysis used	ANCOVA MANCOVA		
Means (SD) Hispanic	Variable	Gang	Control
	General delinquency	359 (289)	110 (211)*
	Index offences	73 (68)	16 (45)*
	Home delinquency	4 (9)	2 (5)
	School delinquency	67 (58)	18 (27)*
	Hard drug use	33 (62)	5 (25)*
Means (SD) Caucasian	Variable	Gang	Control
	General delinquency	448 (424)	366 (339)*

	Index offences	73 (83)	39 (74)*
	Home delinquency	4 (7)	9 (14)
	School delinquency	83 (94)	53 (54)*
	Hard drug use	24 (43)	47 (72)*
Measure of effect used	Not reported		
Effect size and CI (for each exposure)	N/A		

Name of researcher performing data extraction	Alison Waugh
Date of data extraction	13/08/2015
Record number	CS16
Author	Friedman, Mann, Adelman
Title	Juvenile street gangs: the victimization of youth
Type of publication	Primary research
Country of origin	USA
Source of funding	Not reported
Study aims	To elucidate the nature and extent of victimisation of gang affiliated youths in comparison with non-gang control subjects.
Study design	<u>Cross Sectional</u> Case Study Cohort
Inclusion criteria	Not reported
Exclusion criteria	Not reported
Recruitment procedure	Sampling of the public high school students was by intact advisory classes. Sampling of the correctional institutions and the community based job training program was by consecutive admissions.

Recruited from	Three residential, correctional institutions One community based job training program for “hard-core” unemployed One local inner-city public high school	
n	Gang	Control
	270	216
n withdrew	Gang	Control
	Not reported	Not reported
Age range	15-18	
Gender	Male	
Ethnicities	Black and white	
Socio-economic status	Lower social strata	
Exposure	Gang membership	
Exposure measured by	Self-report cross-referenced against the gang control unit of the Philadelphia Police Department	
Outcome	Victimization	
Outcome measured by	Questionnaire developed for this research based on acts gang members have been forced to do.	

Statistical analysis used	Chi-squared			
Mean (SD)	Item	Gang (%)	Control (%)	Chi-square (%)
Not reported	1	17	16	.3
NB: All items included as victimisation as respondents indicated being forced to commit act by gang members.	2	21	13	4.5*
	3	22	14	5.2*
	4	32	16	16.9**
	5	15	10	3.3
	6	44	21	28.9**
	7	29	12	21.2**
	8	22	10	11.9**
	9	25	9	20.7**
	10	7	8	0
	11	38	14	33.4**
	12	4	3	.5
	13	27	13	13.8**
	14	38	18	22.9**

	15	25	9	20.0**
	16	20	15	2.0
	17	24	13	4.9*
	18	24	33	4.9*
	19	7	6	0
	20	26	9	24.6**
	21	20	12	6.1*
	22	30	15	15.7**
Measure of effect used	Not reported			
Effect size and CI (for each exposure)	N/A			

Name of researcher performing data extraction	Alison Waugh
Date of data extraction	13/08/2015
Record number	CS17
Author	Cox
Title	An exploration of the demographic and social correlates of criminal behaviour among adolescent males
Type of publication	Primary research
Country of origin	USA
Source of funding	Not reported
Study aims	To explore multivariate correlates of adolescent crimes.
Study design	<u>Cross Sectional</u> Case Study Cohort
Inclusion criteria	Adolescent males aged 15-18 detained for criminal offences
Exclusion criteria	Not reported
Recruitment procedure	The study's purpose and procedures for approaching the residents were discussed with the Juvenile Detention Officers who worked with the adolescents. All residents that met the inclusion criteria were approached

	by research assistants who explained the study. Participants were assured that participation was voluntary and would have no effect on the outcome of their court hearing. No payment was provided to participants.	
Recruited from	A multicounty secure juvenile detention centre in one south eastern metropolitan city in the USA.	
n	Gang	Control
	69	132
n withdrew	Gang	Control
	Not reported	Not reported
Age range	15-18	
Gender	Male	
Ethnicities	African American (other ethnicities included but not reported)	
Socio-economic status	Not reported	
Exposure	Gang membership	
Exposure measured by	Demographic risk index created for this study	
Outcome	Self-esteem	
	Substance use	

	Prior arrests		
Outcome measured by	Self-esteem: Rosenberg Self-Esteem Scale Substance use, previous arrests and previous convictions: Demographic risk index		
Statistical analysis used	Chi-square t-tests Correlations		
Means (SD)	Variable	Gang	Control
SDs not reported	Self-Esteem	4.47	4.54
SU reports chi square analysis only	Substance use	Chi squared = 6.42, p=.04*	
Prior arrests reports t-test only	Prior arrests	t=4.17, df=110.32, p<.0001	
Measure of effect used	Not reported		
Effect size and CI (for each exposure)	N/A		

Name of researcher performing data extraction	Alison Waugh
Date of data extraction	17/08/2015
Record number	CS18
Author	Cabrera
Title	Psychological and behavioral correlates of adolescent gang involvement
Type of publication	2002
Country of origin	USA
Source of funding	City of Houston Mayor's Anti-Gang Office Executive Office for Weed and Seed
Study aims	To examine gang involvement and its relationship to social alienation, mistrust, antisocial behaviours, and masculinity
Study design	<u>Cross Sectional</u> Case Study Cohort
Inclusion criteria	11-15 Youth in the Gulfton community (77081 zip code)
Exclusion criteria	Not reported

Recruitment procedure	Not reported	
Recruited from	An eight week summer youth development programme in Gulfton, Houston	
n Total n=66	Gang	Control
	Not reported	Not reported
n withdrew	Gang	Control
	Not reported	Not reported
Age range	11-15	
Gender	Male and female (separate analysis)	
Ethnicities	Latino, African American, Asian, Caucasian, 'Mixed'	
Socio-economic status	Not reported	
Exposure	Antisocial behaviour Alienation Faith in others Gender roles	
Exposure measured by	Antisocial behaviour: Antisocial Behaviors Scale Alienation: Alienation Scale (Jessor & Jessor, 1977)	

	Faith in others: Faith in Other People Scale (Rosenberg, 1957) Gender roles: Children's Sex Role Inventory (Boldizar, 1991)	
Outcome	Gang membership	
Outcome measured by	Gang Involvement Questionnaire (Crowley, 1996)	
Statistical analysis used	t-test Correlation	
Mean (SD)	Variable	Analysis
	Antisocial behaviour	$t(64) = -2.27, p < .05$
	Femininity	$t(64) = 2.84, p < .01$
	Masculinity	$t(64) = 2.42, p < .05$
Measure of effect used	Not reported	
Effect size and CI (for each exposure)	N/A	

Name of researcher performing data extraction	Alison Waugh
Date of data extraction	17/08/2015
Record number	CS19
Author	Davis
Title	The role of family support, mentor support, peer behavior and gang involvement in predicting externalizing behavior for inner city youth
Type of publication	Dissertation
Country of origin	USA
Source of funding	Not reported
Study aims	
Study design	<u>Cross Sectional</u> Case Study Cohort
Inclusion criteria	Not reported
Exclusion criteria	Not reported
Recruitment procedure	Two psychology doctorate students announced the project during class time, answered student questions and distributed parent consent forms. Consent forms were also mailed directly to some parents (per school

	recommendation). School administrators chose active or passive consent procedures. Students whose parents consented to the study were given a description of the study's purpose and assurances related to confidentiality, right to answer only the questions they were comfortable to, and voluntary nature of the study.	
Recruited from	Seven inner city public elementary schools in Chicago, USA	
n	Gang	Control
	24	234
n withdrew	Gang	Control
	Not reported	Not reported
Age range	11-14	
Gender	Male and female (separate analysis)	
Ethnicities	African American, White non-Hispanic, Biracial, American Indian	
Socio-economic status	"majority experienced familial poverty"	
Exposure	Gang membership Stressful life events Major life events and daily hassles	

	Exposure to community violence (victimization)	
Exposure measured by	Gang membership – Yes/no questions developed for study Stressful life events – Urban Adolescent Life Experiences Scale (Allison et al., 2000) Major life events and daily hassles - Urban Adolescent Life Experiences Scale (Allison et al., 2000) Exposure to community violence – The Screening Survey of Children’s Exposure to Community Violence (Richters & Martinez, 1993)	
Outcome	Externalizing behaviours	
Outcome measured by	Youth Self Report – externalizing subscale (Achenbach, 1991)	
Statistical analysis used	Correlation	
Mean (SD) * p<.001	Variable	Correlation coefficient
	Daily hassles	.29*
	Major life events	.41*
	Exposure to violence	.50*
	Externalizing	.32*

Measure of effect used	Not reported
Effect size and CI (for each exposure)	Not reported

Name of researcher performing data extraction	Alison Waugh
Date of data extraction	17/08/2015
Record number	CS20
Author	Escobedo
Title	Neuropsychological correlates in adolescent minorities diagnosed with conduct disorder
Type of publication	Dissertation
Country of origin	USA
Source of funding	Not reported
Study aims	To study the interaction between culture and the measurement of neuropsychological deficits in conduct-disordered adolescents.
Study design	<u>Cross Sectional</u> Case Study Cohort
Inclusion criteria	Conduct disorder
Exclusion criteria	Axis I diagnosis
Recruitment procedure	Random interviewing of potential participants to see if they met the inclusion criteria

Recruited from	Convicted juveniles serving a sentence at Juvenile hall, Fresno	
n	Gang	Control
	18	22
n withdrew	Gang	Control
	Not reported	Not reported
Age range	13-17	
Gender	Male	
Ethnicities	Caucasian, Hispanic	
Socio-economic status	Not reported	
Exposure	Gang membership	
Exposure measured by	Official reports	
Outcome	Neuropsychological factors	
Outcome measured by	Raven's Progressive Matrices Bender-Gestalt Test (Bender, 1938) Trail Making Test (Reitan, 1958) Wisconsin Card Sorting Test (Berg, 1948)	

Statistical analysis used	Chi-square, MANOVA			
Mean (SD) Only proportions and chi squared reported for: Raven Progressive Matrices Bender-Gestalt Test Trail Making Test *p<.05	Variable	Gang	Control	Chi squared
	RPM superior	.00	.00	4.22
	RPM above average	.00	.05	
	RPM average +	.17	.23	
	RPM average -	.17	.05	
	RPM average --	.11	.27	
	RPM below average	.39	.27	
	RPM intellectually impaired	.17	.14	
	BGT Borderline	.44	.46	.00
	BGT Critical	.56	.54	
	TMT A normal	.94	.91	.18
	TMT A mild/moderately impaired	.06	.09	
	TMT B normal	.56	.68	.70

	TMT B mild/moderately impaired	.33	.23	
	TMT B moderately/severely impaired	.11	.09	
	WCST total correct	70.06 (12.74)	75.91 (7.57)	
	WCST total errors	92.50 (17.33)	101.18 (12.08)	
	WCST non perseverative errors*	90.50 (17.26)	102.77 (11.00)	
	WCST perseverative errors	97.28 (16.03)	99.45 (15.10)	
	WCST total perseverative responses	98.94 (15.55)	99.27 (15.33)	
	WCST total categories	5.00 (1.75)	5.45 (1.14)	
Measure of effect used	Not reported			
Effect size and CI	Not reported			

Name of researcher performing data extraction	Alison Waugh
Date of data extraction	17/08/2015
Record number	CS21
Author	King
Title	Adolescent males in a secure setting: the relationship between psychopathy and gang affiliation
Type of publication	Dissertation
Country of origin	USA
Source of funding	Not reported
Study aims	To investigate the relationship between gang membership and psychopathy
Study design	<u>Cross Sectional</u> Case Study Cohort
Inclusion criteria	Not reported
Exclusion criteria	English as a second language
Recruitment procedure	Random selection from 110 youths incarcerated at study site.

Recruited from	A locked, secure care facility for adjudicated adolescent males in south west Arizona	
n	Gang	Control
	14	7
n withdrew	Gang	Control
	Not reported	Not reported
Age range	13-17	
Gender	Male	
Ethnicities	Not reported	
Socio-economic status	Not reported	
Exposure	Gang membership	
Exposure measured by	Assessment by officials using the Gang Membership Identification Checklist (1995)	
Outcome	Psychopathy	
Outcome measured by	Psychopathy Checklist Revised (Hare, 1991)	
Statistical analysis used	One tailed t-test Correlation	

Mean (SD)	Variable	Gang	Control
	PCL-R total*	27.791 (4.803)	24.543 (2.745)
	PCL-R affective*	10.286 (2.644)	8.00 (2.00)
	PCL-R (behavioural)	13.857 (1.947)	14.314 (1.708)
Measure of effect used	Not reported		
Effect size and CI (for each exposure)	N/A		

Name of researcher performing data extraction	Alison Waugh
Date of data extraction	17/08/2015
Record number	CS22
Author	Lanier, Pack, Akers
Title	Epidemiological criminology: drug use among African American gang members
Type of publication	Primary research
Country of origin	USA
Source of funding	National Institutes of Mental Health Office on AIDS
Study aims	To identify rates of illicit substance use among incarcerated African American adolescent male gang members and non-gang members
Study design	<u>Cross Sectional</u> Case Study Cohort
Inclusion criteria	African American Minority males
Exclusion criteria	Not reported

Recruitment procedure	All males entering a youth detention centre were asked to complete a risk behaviour interview.		
Recruited from	Youth detention centre in a south eastern US city		
n	Current Gang	Former Gang	Control
	95	30	158
n withdrew	Gang		Control
	Not reported		Not reported
Age range	16 (mean)		
Gender	Male		
Ethnicities	African American		
Socio-economic status	Not reported		
Exposure	Alcohol use		
	Drug use		
Exposure measured by	Self-report frequency		
Outcome	Gang membership		
Outcome measured by	Self-report questionnaire developed for the purpose of this research		

Statistical analysis used	ANOVA Chi-square Prevalence				
Mean (SD) Not reported % (Chi square)	Variable	Current gang	Former gang	Control	Chi Square
	Alcohol ever*	95.8	93.3	83.1	10.1
	Marijuana ever*	95.8	90.0	84.2	7.9
	Crack ever	3.2	3.3	0.6	-
	Cocaine ever*	18.9	26.7	8.2	10.4
Measure of effect used	Odds ratio				
Effect size and CI (for each exposure)	Current or former gang member vs control Alcohol ever: 4.0 (1.6-10.1) Marijuana ever: 3.2 (1.3-7.6) Cocaine ever: 2.9 (1.4-6.0)				

Name of researcher performing data extraction	Alison Waugh
Date of data extraction	17/08/2015
Record number	CS23
Author	Lemus & Johnson
Title	Relationship of Latino gang membership to anger expression, bullying, ethnic identity and self-esteem
Type of publication	Primary research
Country of origin	USA
Source of funding	Not reported
Study aims	To identify whether there are any differences between Latino gang members and non-gang members on psychological constructs of anger, bullying, self-esteem and ethnic identity.
Study design	<u>Cross Sectional</u> Case Study Cohort
Inclusion criteria	Not reported
Exclusion criteria	Not reported

Recruitment procedure	A flyer announcing a raffle for ten \$20 gift cards was distributed to at risk youth to community and after school centres. Youth interested in taking part were asked to complete the Youth Participation Questionnaire	
Recruited from	Three community centres in the Washington metropolitan area	
n	Gang	Control
	44	46
n withdrew	Gang	Control
	Not reported	Not reported
Age range	14-18	
Gender	Male	
Ethnicities	Hispanic, Latino	
Socio-economic status	Not reported	
Exposure	Gang membership	
Exposure measured by	Gang Involvement Scale	
Outcome	Self-Esteem	
	Anger	
Outcome measured by	Self-Esteem: Rosenberg Self-Esteem Scale (Rosenberg 1965)	

	Anger: Anger Expression Scale (Spielberger et al., 1995)		
Statistical analysis used	Independent samples t-test Chi square MANCOVA		
Mean (SD) * p<.05	Variable	Gang	Control
	Anger (in)*	18.6 (4.7)	16.0 (3.4)
	Anger (out)*	18.6 (4.8)	16.0 (3.4)
	Self-esteem	30.0 (4.0)	31.8 (5.0)
Measure of effect used	Not reported		
Effect size and CI (for each exposure)	N/A		

Name of researcher performing data extraction	Alison Waugh
Date of data extraction	17/08/2015
Record number	CS25
Author	Varano, Huebner, Bynum
Title	Correlates and consequences of pre-incarceration gang involvement among incarcerated youthful felons
Type of publication	Primary research
Country of origin	USA
Source of funding	US Bureau of Justice Statistics
Study aims	To document the prevalence and variation in types of pre-incarceration gang membership among a sample of incarcerated felons, and to consider if and how pre-incarceration gang involvement effects institutional behaviour.
Study design	<u>Cross Sectional</u> Case Study Cohort
Inclusion criteria	17-25

	Incarcerated for less than 18 months as of the date of original data collection		
Exclusion criteria	Not reported		
Recruitment procedure	Not reported		
Recruited from	Prisons in Midwestern state of the US		
n	Unorganised Gang	Organised Gang	Control
	94	85	325
n withdrew	Gang		Control
	Not reported		Not reported
Age range	17-25		
Gender	Male		
Ethnicities	Not reported		
Socio-economic status	Not reported		
Exposure	Concentrated disadvantage Drug buyer Drug seller Gun carrying behaviour		

	Delinquent attitudes			
Exposure measured by	Questions in survey developed for this study			
Outcome	Gang membership			
Outcome measured by	Questions in survey developed for this study			
Statistical analysis used	ANOVA Logistic regression			
Mean (SD) *p<.001	Variable	Unorganised Gang	Organised Gang	Control
	Misconduct	2.79 (3.67)	3.44 (5.45)	2.38 (4.15)
	Drug buyer*	3.84 (1.68)	4.30 (1.31)	3.11 (1.95)
	Drug seller*	3.66 (1.94)	3.96 (1.69)	2.50 (2.13)
	Delinquent attitudes*	.20 (.99)	.81 (.98)	-.27 (.81)
	Concentrated disadvantage	2.61 (2.04)	2.51 (1.92)	2.41 (1.95)
Measure of effect used	Odds ratio			

Effect size and CI (for each exposure)	Unorganised gang	Organised gang
p<.001	Concentrated disadvantage: 1.05 Drug buyer: 1.01 Drug seller: 1.16 Gun carrying: .53 Delinquent attitudes: 1.27	Concentrated disadvantage: .90 Drug buyer: 1.11 Drug seller: 1.04 Gun carrying: .47 Delinquent attitudes: 2.05

Name of researcher performing data extraction	Alison Waugh		
Date of data extraction	17/08/2015		
Record number	CS26		
Author	Wilson		
Title	An integrated theoretical framework of juvenile and gang delinquency causation: a structural equation model		
Type of publication	Dissertation		
Country of origin	USA		
Source of funding	Office of Juvenile Delinquency prevention		
Study aims	To test whether juvenile and gang delinquency is best explained by an integration of self-esteem motivation theory, strain theory, social control theory, social learning and differential association theories, family theories, multiple marginality and other integrated theories of delinquency causation.		
Study design	<u>Cross Sectional</u>	Case Study	Cohort

Inclusion criteria	Not reported	
Exclusion criteria	Not reported	
Recruitment procedure	Non probability availability sampling of youths referred to a programme for youths at various stages of delinquency	
Recruited from	Youths referred to El Nido services	
n	Gang	Control
	Not reported	Not reported
n withdrew	Gang	Control
	Not reported	Not reported
Age range	12-17	
Gender	Male	
Ethnicities	Latino, African-American, Asian/Pacific Islander, White	
Socio-economic status	91.4% salaries less than the community median	
Exposure	Self-esteem	
Exposure measured by	Shortened version of the Self-Esteem Inventory (Coopersmith, 1967)	
Outcome	Gang membership	

	Delinquent behaviours Delinquent attitudes	
Outcome measured by	Gang membership: Self-report and caseworker/supervisor consensus Delinquent behaviours: modified version of the Delinquent Behavior Checklist (Kulik, Stein & Sarbin, 1968) and official records Delinquent attitudes: Delinquency Scale (PN version; Peterson, Quaye & Tiffany, 1961)	
Statistical analysis used	Structural Equation Model Correlation	
Mean (SD) Not reported	Variable	Correlation coefficient
	Self-esteem	.313
	Delinquent behaviour	.559
	Delinquent attitudes	-.431
Measure of effect used	Correlation coefficient	
Effect size and CI (for each exposure)	As above, no confidence intervals reported	

Name of researcher performing data extraction	Alison Waugh
Date of data extraction	17/08/2015
Record number	CS27
Author	Adams
Title	The relationship between childhood traumatic experiences and gang-involved delinquent behaviour in adolescent boys
Type of publication	Dissertation
Country of origin	USA
Source of funding	Not reported
Study aims	To evaluate the extent to which both traumatic life experiences and resiliency factors contribute to gang-involved delinquent behaviour in adolescent males
Study design	<u>Cross Sectional</u> Case Study Cohort
Inclusion criteria	Juvenile delinquent or person in need of supervision petition status Trauma exposed
Exclusion criteria	Students referred only for academic difficulties

Recruitment procedure	Residents and parents received a description of the study and either an assent or informed consent form	
Recruited from	St Mary's Children and Family Services	
N Total n = 130	Gang	Control
	Not reported	Not reported
n withdrew	Gang	Control
	Not reported	Not reported
Age range	14-17	
Gender	Male	
Ethnicities	Not reported	
Socio-economic status	Not reported	
Exposure	Gang membership Resiliency	
Exposure measured by	Self-Report Delinquency Scale (Elliot, Huiziga & Ageton, 1985) Behaviour Assessment System for Children (Reynolds & Kamphaus, 1998)	
Outcome	Traumatic experiences	
Outcome measured by	Trauma Symptom Checklist for Children (Briere, 1996)	

	Traumatic Life Events Questionnaire (Kubany et al., 2000) Distressing Events Questionnaire (Kubany et al., 2000)	
Statistical analysis used	Correlation MANOVA	
Mean (SD) * p<.01	Variable	Correlation coefficient
	Delinquency	.47*
	Emotional numbing	.47*
Measure of effect used	Eta squared	
Effect size and CI (for each exposure)	Resiliency: eta squared = .03, observed power .61 (alpha level .05)	

Name of researcher performing data extraction	Alison Waugh
Date of data extraction	17/08/2015
Record number	CS28
Author	Burch
Title	Effects of age, personality and gang affiliation on the self-reported false confessions of adjudicated male youth
Type of publication	Dissertation
Country of origin	USA
Source of funding	Not reported
Study aims	None reported
Study design	<u>Cross Sectional</u> Case Study Cohort
Inclusion criteria	Not reported
Exclusion criteria	Not reported
Recruitment procedure	Consent obtained from parents, guardians and/or case workers through each student's family service worker.

	Information about study provided orally no the day of testing to those who had expressed interest in participating. Study information sheet was also provided, participants indicated willingness to participate by marking agreement on the study information sheet.	
Recruited from	Non-secure residential treatment facility in south central Michigan.	
n	Gang (current and former)	Control
	32	42
n withdrew	Gang	Control
	Not reported	Not reported
Age range	11-18	
Gender	Male	
Ethnicities	White, Black, Hispanic, Asian, American Indian, 'Other'	
Socio-economic status	Not reported	
Exposure	Gang membership	
Exposure measured by	Gang membership – self-report yes/no item on demographic information form	

Outcome	False confession Personality Blame taking		
Outcome measured by	False confession - self-report items on demographic information form Personality - Junior Eysenck Personality Questionnaire (Eysenck & Eysenck, 1975) Blame taking - Motivation for Taking Blame Scale (Gudjonsson, Sigurdsson & Einarsson, 2007)		
Statistical analysis used	One tailed Z test MANOVA One tailed independent samples t-test		
Mean (SD)	Variable	Gang	Control
	Psychoticism*	7.53 (3.29)	4.57 (2.36)
Measure of effect used	Difference between two proportions Cohen's d		
Effect size and CI (for each exposure)	Psychoticism (CI not reported numerically): 1.05		

Name of researcher performing data extraction	Alison Waugh
Date of data extraction	24/08/2015
Record number	CS29
Author	Savitz, Lalli, Rosen
Title	Victimization, fear of crime and gang membership
Type of publication	Primary research
Country of origin	USA
Source of funding	Law Enforcement Assistance Administration, U. S. Department of Justice, under the Omnibus Crime Control and Safe Streets Act of 1968, as amended
Study aims	To discover how educational aspirations, social values, "quality of life," fear of crime, victimization, family structure, father-son interaction, social attachments, and gang affiliation affected the development of delinquent behaviour measured by police contacts and arrests.
Study design	<u>Cross Sectional</u> Case Study Cohort

Inclusion criteria	Born in 1957 African American White Enrolled in public school	
Exclusion criteria	Private school attenders	
Recruitment procedure	Not reported	
Recruited from	Public schools	
n	Gang	Control
	'Black structural' 52	400
	'Black functional' 198	254
	'White structural' 69	433
	'White functional' 325	177
n withdrew	Gang	Control
	Not reported	Not reported
Age range	13	
Gender	Male	
Ethnicities	White and African American	

Socio-economic status	Middle class, working class and lower class		
Exposure	Gang membership		
Exposure measured by	Comparison to gang definition developed in this study		
Outcome	Victimization Delinquency		
Outcome measured by	Victimization: Self-report prevalence Delinquency: Official court/police records prevalence		
Statistical analysis used	Prevalence , significant differences reported		
Mean (SD) Not reported *p<.05	Variable	Gang %	Control%
		Black structural	
	Robbed	44	28
	Assaulted	27	17
	Extorted	6	8
		Black functional	
	Robbed	30	30
	Assaulted	22	15

	Extorted	7	8
		White structural	
	Robbed	33	24
	Assaulted	33	22
	Extorted	6	6
		White functional	
	Robbed	24	26
	Assaulted	24	21
	Extorted	6	6
		Black structural	
	Delinquent*	51	32
		Black functional	
	Delinquent	35	34
		White structural	
	Delinquent	23	13
		White functional	

	Delinquent	15	14
Measure of effect used	Not reported		
Effect size and CI (for each exposure)	N/A		

Name of researcher performing data extraction	Alison Waugh
Date of data extraction	25/08/2015
Record number	CS31
Author	Curry
Title	Self-reported gang involvement and officially recorded delinquency
Type of publication	Primary research
Country of origin	USA
Source of funding	Administration for Youth and Family Services Bureau, US Department of Health and Human Services
Study aims	To examine the correlation between self-reported gang involvement and offending and gang related offending as measured by police
Study design	<u>Cross Sectional</u> Case Study Cohort
Inclusion criteria	Not reported
Exclusion criteria	Not reported
Recruitment procedure	All attending 6 th to 8 th grade male students surveyed

Recruited from	Socialization to Gangs dataset – 4 middle schools in a low income neighbourhood in NW Chicago.	
n	Gang	Control
	19	164
n withdrew	Gang	Control
	Not reported	Not reported
Age range	12-14	
Gender	Male	
Ethnicities	Hispanic and African American	
Socio-economic status	Not reported	
Exposure	Delinquency Violence Property delinquency Substance abuse	
Exposure measured by	Police records and self-report frequency	
Outcome	Gang membership	
Outcome measured by	Self-report	

Statistical analysis used	ANOVA Logistic Regression		
Mean (SD) (gang involved non-member group not reported here) *p<.001	Variable	Gang (1987)	Control (1987)
	Delinquent offence pre 1988 frequency (%)*	4 (21.1)	15 (9.1)
	Delinquent offences 1988-1992 frequency (%)*	13 (68.4)	49 (29.9)
	Violence 1987 frequency (%)*	15 (78.9)	37 (22.6)
	Property delinquency 1987 frequency (%)*	12 (63.2)	14 (8.5)
	Substance abuse 1987 frequency (%)*	10 (52.6)	14 (8.5)
	Mean delinquency (SD)*	3.53 (2.01)	.38 (.70)
	Mean police offences (SD) pre 1988*	.26 (.56)	.10 (.34)

	Mean police offences (SD) 1988-1992*	1.89 (2.26)	.67 (1.42)
Logistic regression model (SE) *p<.001	<u>Model with delinquency:</u> Self-reported delinquency 1987 -.033 (.285) Delinquency offences pre 1988 1.552 (.084)* <u>Model without delinquency:</u> Delinquency offences pre 1988 1.526 (.277)		
Measure of effect used	Not reported for gang membership		
Effect size and CI (for each exposure)	N/A		

Name of researcher performing data extraction	Alison Waugh
Date of data extraction	25/08/2015
Record number	CS32
Author	Corcoran, Washington & Meyers
Title	The impact of gang membership on mental health symptoms, behavior problems and antisocial criminality of incarcerated young men
Type of publication	Primary research
Country of origin	USA
Source of funding	Not reported
Study aims	To determine if gang members differed from non-gang members on mental health and behaviour problems, and to ascertain the impact of mental health on antisocial criminality.
Study design	<u>Cross Sectional</u> Case Study Cohort
Inclusion criteria	Male
Exclusion criteria	Not reported
Recruitment procedure	\$2 paid to correctional programme activities per completed survey

Recruited from	A secure facility in Oregon, USA	
n	Gang	Control
	24	49
n withdrew	Gang	Control
	Not reported	Not reported
Age range	13-19	
Gender	Male	
Ethnicities	Not reported	
Socio-economic status	Not reported	
Exposure	Gang membership	
Exposure measured by	Self-report	
Outcome	Mental health symptoms Behaviour problems Criminality or antisocial behaviour	
Outcome measured by	Mental health symptoms: Oregon Mental Health Referral Checklist (Corcoran in press) Behaviour problems: Child Behavior Checklist (Achenbach, 1991)	

	Criminality or antisocial behaviour: 8 item subscale of Catalano & Hawkins (1996) social development model of static risk and protective factors		
Statistical analysis used	t-test Correlation		
Mean (SD) *p<.05	Variable	Gang	Control
	OMHRC*	14.3 (9.3)	9.2 (6.4)
	CBCL Externality	30.7 (13.8)	24.6 (10.7)
	CBCL Internality	22.5 (14.5)	19.4 (12.6)
	CBCL Withdrawal	5.7 (3.2)	4.9 (2.9)
	CBCL Somatic	5.8 (4.8)	4.0 (3.7)
	CBCL Anxiety/depression	11.5 (7.5)	10.4 (7.5)
	CBCL Attention problems	8.8 (4.4)	6.9 (4.1)
	CBCL Delinquent behaviour*	12.7 (4.8)	9.6 (4.4)
	CBCL Aggressiveness	18.2 (9.6)	15.2 (7.2)
	Antisocial scale Scores*	3.9 (1.7)	1.6 (1.7)
	Sold illegal drugs*	4.9 (2.6)	2.2 (2.9)

	Stole vehicle*	3.1 (2.6)	.8 (1.8)
	Been arrested*	4.1 (2.4)	2.0 (1.8)
	Attacked someone*	3.2 (2.5)	1.6 (1.9)
	Drunk or high at school*	5.3 (2.3)	2.5 (2.8)
Correlation	Externality	.24**	
	Somatic complaints	.19*	
	Attention problems	.20*	
	Delinquent behaviour	.31***	
	Antisocial scale Scores	.50***	
	Sold illegal drugs	.38***	
	Stole vehicle	.42***	
	Been arrested	.43***	
	Attacked someone	.29***	
	Drunk or high at school	.38***	
Measure of effect used	Not reported		
Effect size and CI	N/A		

Name of researcher performing data extraction	Alison Waugh
Date of data extraction	25/08/2015
Record number	CS33
Author	Smith
Title	Latino gang male youth and risk factors: time preference, time perception and locus of control
Type of publication	Dissertation
Country of origin	USA
Source of funding	Not reported
Study aims	To compare Latino male gang youth to Latino non-gang male youth with respect to their time preferences time allocations and perceptions of time, locus of control and background variables
Study design	<u>Cross Sectional</u> Case Study Cohort
Inclusion criteria	Not reported
Exclusion criteria	Not reported

Recruitment procedure	School participants selected by school officials from classes which were deemed to least disturb study through participation – volunteers were requested by school officials Incarcerated participants recruitment procedure not reported.	
Recruited from	A Youth Authority Facility Los Angeles County High Schools of Odyssey and South Gate, and South Gate Junior High School	
n	Gang	Control
	100	94
n withdrew	Gang	Control
	Not reported	Not reported
Age range	12-18	
Gender	Male	
Ethnicities	Latino	
Socio-economic status	Lower strata	
Exposure	Gang membership	

Exposure measured by	Identifiers developed by Morales (1991)		
Outcome	Time preference, time perception and locus of control		
Outcome measured by	Time preference: Time Allocation Portfolio (Bruno, 1993) Appendix A, B, and C Time perception: spatial time conceptualisation: Circles Test (Cottle, 1967) Locus of Control: Locus of Control Survey (Rotter, 1966)		
Statistical analysis used	Univariate and bivariate analysis Correlation t-test Chi-square		
Mean (SD) Does not report other variables as not significant differences between groups	Variable	Gang	Control
	LoC (Mean and SD not reported)	"not significant"	
Measure of effect used	Not reported		
Effect size and CI (for each exposure)	N/A		

Name of researcher performing data extraction	Alison Waugh
Date of data extraction	25/08/2015
Record number	CS34
Author	Wood
Title	The relationship between exposure to multiple forms of chronic violence and psychological mediators of violent behavior among incarcerated adolescents
Type of publication	Dissertation
Country of origin	USA
Source of funding	The Wellness Foundation Violence Prevention Initiative
Study aims	To explore the relationship between multiple forms of chronic violence exposure and a number of hypothesised SIP mediators of violent behaviour in a sample of incarcerated male and female adolescents.
Study design	<u>Cross Sectional</u> Case Study Cohort
Inclusion criteria	Latino, African American

Exclusion criteria	Not reported	
Recruitment procedure	Random selection of 4 out of 11 possible study sites Prospective participants introduced to the interviewer by a member of camp staff – nature of study explained and participants were asked if they wanted to participate.	
Recruited from	Four camps administered by the Los Angeles County Probation Department	
n	Gang	Control
	100 total male participants	
n withdrew	Gang	Control
	0	0
Age range	14-18	
Gender	Male and female, some separate male and female analysis	
Ethnicities	Latino, African American	
Socio-economic status	Not reported	
Exposure	Gang membership	
Exposure measured by	Gang Affiliation Index	

Outcome	Physical punishment Anger proneness Aggressive beliefs Self-efficacy Violent behaviour	
Outcome measured by	Physical punishment: Assessing Environments III (Knutson, 1988) Anger proneness: Novaco Provocation Index (Novaco, 1975) Aggressive beliefs (Slaby and Guerra (1988) Self-efficacy: Children's Perceived Self-Efficacy (Cowen, Work, Hightower, Wyman, Parker & Lotyczewski, 1991) Violent behaviour: frequency	
Statistical analysis used	Correlation only for separate male gang vs non-gang analysis Hierarchical regression	
Mean (SD) Not reported	Variable	Correlation co-efficient
	Physical punishment	.01
Measure of effect used	Not reported	

Effect size and CI (for each exposure)	N/A

Name of researcher performing data extraction	Alison Waugh
Date of data extraction	25/08/2015
Record number	CS35
Author	Thomas, Holzer, Wall
Title	Serious delinquency and gang membership
Type of publication	Primary research
Country of origin	USA
Source of funding	Moody Foundation of Galveston John D. and Catherine T. MacArthur Foundation
Study aims	To study the delinquent behaviour associated with gang membership
Study design	<u>Cross Sectional</u> Case Study Cohort
Inclusion criteria	At least 1 conviction for a violent offence or a conviction for any offence with a history of at least two additional offences.
Exclusion criteria	Placements outside of the home

Recruitment procedure	Prospective participants were referred by juvenile probation after sentencing. A member of research staff met with prospective participants after their first meeting with the probation officer. The study was explained, and written consent was gathered from those who agreed to take part.		
Recruited from	Delinquent youths in the community		
n	Current Gang	Past Gang	Control
	37	15	9
n withdrew	Gang	Control	
	Not reported	Not reported	
Age range	12-17		
Gender	Male (female dropped from analysis as insufficient n)		
Ethnicities	White, African American, Hispanic, 'Other'		
Socio-economic status	Not reported		
Exposure	Delinquency		
Exposure measured by	Self-reported delinquency scale (Elliot, Huizinga & Ageton, 1985) Child behaviour checklist (Achenbach, 1991)		

	Supplement questions to the child behaviour checklist (Loeber et al., 1991)			
Outcome	Gang membership			
Outcome measured by	GANGS (gang survey) developed for this study by the authors			
Statistical analysis used	ANOVA			
Mean (SD) *p<.05 (sig dif with current gang members)	Variable	Current Gang	Past Gang	Control
	Withdrawn	5.0 (3.3)	3.5 (2.5)	3.4 (2.1)
	Somatic	3.4 (3.2)	2.4 (2.2)	3.0 (2.7)
	Anxious/depressed	6.0 (4.1)	3.9 (4.5)	4.3 (4.8)
	Attention problems	6.0 (2.9)	4.2 (2.3)	4.7 (3.5)
	Internalizing	13.9 (8.7)	9.7 (7.3)	10.5 (7.6)
	Delinquency	8.9 (4.4)	4.3 (2.4)*	4.9 (3.1)*
	Aggression	15.0 (8.3)	7.7 (5.1)*	8.6 (6.4)*
	Externalizing	23.9 (12.0)	12.1 (6.4)*	13.5 (8.8)*
	Total problems	60.4 (28.9)	38.3 (15.4)*	38.9 (24.1)*
	Status	1.3 (1.0)	.9 (.6)	.6 (.7)*
	Public Disorder	1.4 (1.3)	.8 (.9)*	.4 (.6)*

	Minor property theft	2.3 (1.7)	.7 (.8)*	.8 (1.3)*
	Serious property theft	2.8 (2.5)	.5 (.7)*	.6 (1.3)*
	Minor assault	1.0 (.9)	.3 (.6)*	.4 (.6)*
	Serious assault	1.4 (1.2)	.7 (.8)*	.3 (.5)*
	Drug Sales	.8 (.8)	.3 (.6)	.2 (.5)*
	Total SRDS	11.8 (8.3)	4.5 (3.7)*	3.9 (4.5)
Measure of effect used	Not reported			
Effect size and CI (for each exposure)	N/A			

Name of researcher performing data extraction	Alison Waugh
Date of data extraction	04/09/2015
Record number	CS36
Author	Curry & Spergel
Title	Gang involvement and delinquency among Hispanic and African American adolescent males
Type of publication	Primary research
Country of origin	USA
Source of funding	US Department of Education, Office of the Assistant Secretary for Educational Research Office of Juvenile Justice and Delinquency Prevention, Office of Justice Programs, US Department of Justice
Study aims	To model early socialization differences as possible precursors to gang membership, using information on individual youths, family and school contexts, and the community
Study design	<u>Cross Sectional</u> Case Study Cohort

Inclusion criteria	Male, 6 th – 8 th grade students	
Exclusion criteria	Not reported	
Recruitment procedure	Not reported	
Recruited from	4 Chicago public middle schools identified as having a gang problem Socialization to Gangs dataset	
n	Gang	Control
	Not reported	Not reported
n withdrew	Gang	Control
	Not reported	Not reported
Age range	11-15	
Gender	Male	
Ethnicities	Hispanic and African American	
Socio-economic status	Not reported	
Exposure	Self-Esteem	
Exposure measured by	Self-Esteem: Not reported	

Outcome	Gang membership Delinquency (including substance use and violence)	
Outcome measured by	Gang identifier questions developed for this study Self-report frequency and official records of delinquency	
Statistical analysis used	Least square regression model Rasch model	
Mean (SD) Only regression analysis reported *p<.001	Variable	b, Beta
	Peer self-esteem*	1.045, .348
	School self-esteem*	-1.357, -.442
Rasch model	Variable	Chi-square, probability
	Delinquency (Hispanic)	21.17, .001
	Delinquency (African-American)	20.51, .000
Measure of effect used	Not reported	
Effect size and CI (for each exposure)	Not reported	

Appendix K: MS PCL:SV

PCL:SV

Evidence Rating Score Sheet

Resident: MS – XX Ward, X Unit
Collateral Alison Waugh
Rater: (Trainee Forensic Psychologist)
CH Forensic Psychologist
Date: August 2015
Scored by: SH Forensic Psychologist
Alison Waugh
(Trainee Forensic Psychologist)

The Hare Psychopathy Checklist: Screening Version (PCL:SV) is an abbreviated and highly correlated version of the Hare Psychopathy Checklist–Revised (PCL–R. It is an effective screener for psychopathic personality disorders that can be used with general, forensic, or psychiatric populations. This instrument determines whether specific cut off scores warrant administration of the full PCL–R. There are two factors. Factor 1 refers to interpersonal affective features. This comprises items that tap superficiality, grandiosity, deceitfulness, lack of remorse, lack of empathy and a lack of acceptance of responsibility. Factor 2, labelled a socially deviant lifestyle, comprises items, which tap impulsivity, poor behavioural controls, lack of goals, irresponsibility and criminality.

Sources of Evidence:

- HCR-20 risk assessment completed by the MDT in January 2015
- OASys assessment dated July 2014

- Initial psychiatric assessment report completed by Dr CT dated August 2014
- MDT formulation report (no date)
- June 2015 CPA reports
 - Psychology report written by Dr SH
 - Nursing report written by CG, DT, PO-A
 - Occupational Therapy report
 - Medical report written by Dr CT
 - Social Work report written by ME
 - Small group report written by NJ
- December 2014 CPA reports
 - Psychology report written by Dr SH
 - Nursing report
 - Occupational Therapy report written by NC
 - Medical report written by Dr CT
 - Social Work report written by CF
 - Clay group report written by JC

Item 1: Superficial

2

This item describes an individual whose interactional style appears superficial (i.e. glib) to others. Usually, the individual tries to make a favourable impression on others by “shamming” emotions, telling stories that portray him/her in a good light, and making unlikely excuses for undesirable behaviours.

For

There are indications that MS embellishes stories in order to present himself in a light that he views as beneficial to him. *“He often portrayed himself to his social worker as a dangerous criminal. The impression of his social worker was that he was a vulnerable boy who was crying for help, had no sense of*

identity, immature, highly suggestible, and getting into fights with everyone, had been involved with gangs; this took the form of them coming after him. He would often make up stories e.g. having serious kidney problems, brain damage” (MDT formulation, 2015).

Since his admission to the X Unit MS has been engaged in treatment, however it is felt that this is often superficial with him attending the groups with minimal active and genuine participation.

Against

Since his admission to the X Unit MS has demonstrated the capacity to appear sincere in some forums, however his behaviour often undermines this at a later time.

Item 2: Grandiose

1

Individuals who score high on this item are often described as grandiose or braggarts. They have an inflated view of themselves and their abilities... If they are in hospital or prison, they attribute their unfortunate circumstances to external forces (bad luck, the “system”) rather than themselves. Consequently they are relatively concerned about their present circumstances and worry little about the future.

For

MS self-reports being involved in a gang, however there is little evidence to suggest that his role was more than being a “look out” on the periphery of the gang to alert core gang members of police presence.

MS has described his father as a 'yardie' who was heavily involved in the criminal world including drug dealing and violence. However there is no evidence to corroborate the truth of this, and it is possible that MS has constructed an image of his father that serves to boost his own self-esteem.

Against

This item also refers to individuals who externalise responsibility for their being in hospital/prison and worry little about their future. MS has spoken about being concerned about how he will explain his past to people when he is released from prison, suggesting a degree of insight into the reality of his situation.

Although MS can present as grandiose at times, it seems that this is fragile which warrants the scoring of this item as 1.

Item 3: Deceitful

2

People with this characteristic commonly engage in lying, deception, and other manipulations in order to achieve their own personal goals... They lie and deceive with self-assurance and no apparent anxiety.

For

MS has a conviction for robbery against a lone female. He informed a psychiatrist acting for the court that he had carried out this offence because his father had threatened him at knife point to do so. However he told another doctor that he had carried out this offence because members of his gang said they would "smash his head in" if he did not carry out the offence, which he described as a sort of gang initiation. His OASys assessment does not support either of his explanations for this offence. Regarding MS's gang involvement, MS reports being a

member of a violent gang, however it appears that his involvement was more on the periphery as a "look out". In his HCR-20 formulation it states that *"MS's narrative of offending is often quite embellished and it is possible that his account of his involvement in committing violence is more severe than in reality"*.

In assessments MS has described memories of his father, who he describes as a violent gangster. Other reports indicate that MS's mother had little or no contact with his father after MS's birth – it is therefore unclear as to how true MS's reports of his father are.

MS's social worker reported that *"the stories he told would change from day to day: for example, first he had kidney problems, then brain damage"* (Dr CT admission assessment report, 2014).

MS has a child who lives in Scotland; he lived with the mother of his child for three months after the birth until social services said that he could not stay with them. It is thought that this is likely because of the allegations that MS had sexually abused his siblings, however MS told the court appointed psychiatrist that he left because he had an argument with the mother of his child.

There are also discrepancies in MS's accounts of his substance use. He has told one doctor that he smoked cannabis from the age of seven, and told another doctor that he had only used cannabis and never drank heavily. However his OASys assessment indicates that MS has drank heavily in the past as well as having used drugs including smoking heroin and cocaine.

After his index offence MS maintained for two weeks to neighbours that his mother had gone to visit her children. Attempts were also made to cover up the blood in the house by washing and painting the walls and ceiling. In the MDT formulation it is written that MS's *"account of post-index offence events are not consistent with CPS documentation (e.g. that people came to the house and took pictures of the body).*

In his nursing CPA report (June 2015) it is written *"there is a sense that MS is dishonest in some areas, for instance, he has spoken about to lying in order to avoid getting caught during the mobile phone incident and has collected restricted items for peer CH when he knows that he cannot share these items. It has been apparent that expressing truthful feelings and behaving in an honest manner are still areas to work on. When this has been mentioned to MS he appears to listen and agree, but then returns to the same behaviours".*

During this admission to the X Unit MS tricked a female visitor into unknowingly bringing a mobile phone into the unit that was hidden in a bar of soap, despite being aware of the consequences of this.

Against

MS has not lied about the commission of his offences when confronted with them; however the degree to which he is truthful about the details of these offences is unclear. This and the evidence presented above warrants the scoring of this item as 2.

High scores on this item are given to individuals who appear to lack the capacity for guilt... Some of these individuals will verbalise remorse but in an insincere manner; others will display little emotion about their own actions to the impact they had on others and will focus instead on their own suffering.

For

Whilst MS has spoken tearfully about missing his mother, it is not clear whether he is remorseful for his index offence. MS demonstrates a propensity to be compliant and also presents as superficial which can make it difficult to identify whether displays of remorse are sincere, e.g. with regard to an incident in which his then female companion unknowingly bought a mobile phone into the unit for MS. Following this incident MS demonstrated little sincere concern for the consequences of his actions for her.

"[MS] Lies frequently and with ease. He has said that he does so because he does not care enough about the consequences. He also acknowledges that he is more likely to be deceptive if he thinks he can get away with not being caught" (MDT formulation, 2015).

Against

Since completion of offending behaviour programmes in prison MS has been able to speak about how his offence has impacted on his siblings.

Item 5: Lacks Empathy

2

This item describes individuals who have little affective bonding with others and are unable to appreciate the emotional consequences (positive or negative) of their actions.

For

MS had a relationship with an older female who he tricked into bringing a mobile phone into the unit, he does not seem to have concern over the consequences for her.

Whilst MS justifies some of his behaviours on the unit as seeing himself as a 'protector' of those who are more vulnerable than him, he has been involved in incidents that have been dangerous for the more vulnerable peers which possibly indicates a lack of emotional depth to how he views their relationship.

Against

Following a robbery he committed against a female MS reported that he had difficulty sleeping because he had visions of the female.

Item 6: Doesn't Accept Responsibility

1

People who score high on this item avoid taking personal responsibility for their harmful actions by rationalizing their behaviour, greatly minimizing the consequences for others, or even denying the actions altogether.

For

MS has a conviction for robbery when he was 19 years old. He has offered two explanations for this offence (see Item 3 –

Deceitful) that may be seen as him not accepting responsibility for the offence.

MS presents as ambivalent regarding regret for the index offence, at times being tearful about it, but at other times focusing on the abuse that he experienced at the hands of his mother.

During this admission to the X Unit MS has repeatedly broken boundaries and has externalised responsibility for this with various explanations for the breaches.

Against

Although MS identifies his mother's victimisation of him as a motivation for the offence, he does seek to justify his actions as would be expected in this item. MS also underplayed the involvement of his co-defendant in the index offence, taking this responsibility himself.

MS has been involved in a number of security/boundary breaches since his admission to the X Unit. Although when confronted with these MS appears to lack concern with the consequences and demonstrates superficial compliance with rule reinforcement, when confronted with these he has admitted his involvement.

Item 7: Impulsive

1

This item describes people who act without considering the consequences of their actions... Consequently they lead a life characterised by instability in school, relationships, employment, and place of residence.

For

MS has a history of impulsive violent behaviours when in the community, both towards himself and others.

Early in his admission MS presented with a low tolerance for frustration or waiting for his needs to be met.

Against

His boundary breaches in the X Unit have also been indicative of being well planned.

Although MS has presented with impulsivity in the community, this does not appear to be pervasive. His unstable home environment and use of illicit substances may both have been contributory factors towards his impulsivity. This and the significant reduction in his impulsivity since admission may evidence for MS's impulsivity being state not trait, as he has demonstrated the capacity to not be impulsive.

Item 8: Poor Behavioural Controls

1

This item describes people who are easily angered or frustrated... They are frequently verbally abusive... and physically abusive.

For

MS *"told his probation officer that he never planned on killing his mother, only to hurt her; he was scared she was going to kick his girlfriend out and "just reacted". This is to some extent supported by the lack of planning in getting rid of his mother's body: he kept it in a cupboard for two weeks"* (HCR-20, 2015). MS told Dr CT in her admission assessment that he had wanted

to exact revenge against his mother for her victimisation of him, but that he had "lost control".

"MS acknowledges that his capacity for extreme violence "scares" him. In particular he has spoken about not feeling able to safely express negative emotion (e.g. anger, sadness, and anxiety) in a manner which is controllable and proportionate to the situation" (MDT formulation, 2015)

Against

There is evidence to suggest that there was a degree of planning in the offence as there is CCTV footage of the victim withdrawing money from a cash machine on the day she was murdered. As well, MS has demonstrated a tendency to "pair up" or engage in group behaviours which are not indicative of poor behavioural control.

Item 9: Lacks Goals

2

High scores on this item are given to those who do not have realistic long term plans and commitments. Such people tend to live their lives "day-to-day", not thinking of the future.

For

In the community MS appears to have not identified any personal goals, rather it appears that he was heavily entwined with the two females that he had significant romantic relationships (with the mother of his child and his co-defendant) with. He has never worked or had his own accommodation.

Against

MS's lack of goals in the community should be considered within the context of his upbringing, which was characterised by physical, sexual and psychological victimisation, and lacked structure and containment. Since his admission to the X Unit it has been noted that he appears to struggle with a lack of identity, evidenced by his exploration of various interests available to him through the OT department, and changes to his name and physical appearance – however this might be evidence to suggest that he is beginning to take steps to identify goals. These would appear to be realistic given the reality of his situation serving a life sentence with the earliest eligibility for a parole hearing being in 2022.

Item 10: Irresponsible

2

This item describes people who exhibit behaviour that frequently causes hardship to others or puts others at risk. They tend to be unreliable as a spouse or parent; they lack commitment to relationships, fail to care adequately for their children, and so forth. Also their job performance is inadequate.

For

MS has a daughter that lives in Scotland – he does not provide her with financial support. He has never worked.

Since his admission to the X Unit MS has engaged in behaviours that have put his peers at risk seemingly without regard for the consequences to them.

Although MS describes some enmeshed relationships, he had a relationship with an older female who he tricked into bringing

banned items into the unit, seemingly without concern for the consequences to her.

Against

MS has held a successful term of being vice chair in the X Ward community meetings. He has also held other ward jobs since his admission.

MS alerted staff to the risk of a peer's self-harming behaviour when this peer confided in him, which is demonstrative of acting responsibly.

Item 11: Adolescent Antisocial Behaviour

2

People who score high on this item had serious conduct problems as an adolescent. These problems were not limited to only one setting (i.e. they occurred at home, or school, and in the community) and were not simply the result of childhood abuse or neglect.

For

MS self-reports setting fire to his mother's bed as a child whilst she was asleep. He frequently engaged in fights in school and was eventually excluded for attempting to attack a girl in his class with a knife. When he was of school age MS reportedly truanted from school. He also self-reports engaging in gang activity from a young age - including selling cannabis and committing robberies (HCR-20, 2015).

MS has misused cannabis from the age of seven. He self-reports using ecstasy on one occasion but said that this made him violent – there was an incident where he beat someone up to the extent that they had a broken nose and needed two

operations. His OASys assessment states that he used drugs and alcohol excessively through his teenage years and that he has smoked heroin and cocaine in the past.

MS had several foster placements that were disrupted as a result of his delinquent behaviour, this included stealing from his foster mother, threatening people with a toy gun, attempted robbery, theft and fighting.

MS received three cautions prior to the age of 18 and no convictions. These cautions were 1 x offence against property (2004) and 2 x theft and kindred offences (2003).

Although he has not received convictions for these offences, there are allegations that MS sexually abused his younger siblings. This was in the context of his mother's victimisation of him.

Against

None

Item 12: Adult Antisocial Behaviour

2

This item describes people who frequently violate formal, explicit rules and regulations. They have legal problems as an adult, including charges or convictions for criminal offences.

For

MS had received six convictions for:

2008 – Murder

2007 – Breach of suspended sentence, failure to surrender to bail, failing to surrender to custody at appointed time, sexual activity with a female child under 16.

2005 – Robbery, possessing article with blade or point in public place

Early on in the sentence for his index offence MS displayed aggressive behaviours in prison. He received an adjudication in 2012 when he threatened to “slash or kill” another inmate. He also received an IEP for being verbally abusive to prison staff when challenged and set fire to his prison cell.

Since his transfer to X Ward MS has subverted security through organising for a mobile phone to be sent into the unit, repeatedly being in his peers bedrooms, smoking in prohibited areas and using illicit substances.

Against

None

Total score = 20

Score Breakdown:

Factor 1 – Interpersonal and Affective (Items 1-6) = 10

Factor 2 – Lifestyle & Antisocial (Social Deviance; Items 7-12)
= 10

Total PCL:SV scores of 13 and above are considered indicative of possible psychopathy and warrant administration of the full PCL-R.

Appendix L: MS Rosenberg Self-Esteem Scale

Rosenberg Self-Esteem Scale (Rosenberg, 1965)

The scale is a ten item Likert scale with items answered on a four point scale - from strongly agree to strongly disagree. The original sample for which the scale was developed consisted of 5,024 High School Juniors and Seniors from 10 randomly selected schools in New York State.

Instructions: Below is a list of statements dealing with your general feelings about yourself. If you strongly agree, circle SA. If you agree with the statement, circle A. If you disagree, circle D. If you strongly disagree, circle SD.

1.	On the whole, I am satisfied with myself.	SA	A	<u>D</u>	SD	1
2.*	At times, I think I am no good at all.	SA	<u>A</u>	D	SD	1
3.	I feel that I have a number of good qualities.	SA	<u>A</u>	D	SD	2
4.	I am able to do things as well as most other people.	SA	<u>A</u>	D	SD	2
5.*	I feel I do not have much to be proud of.	SA	<u>A</u>	D	SD	1
6.*	I certainly feel useless at times.	<u>SA</u>	A	D	SD	1
7.	I feel that I'm a person of worth, at least on an equal plane with others.	SA	A	<u>D</u>	SD	1
8.*	I wish I could have more respect for myself.	SA	<u>A</u>	D	SD	1
9.*	All in all, I am inclined to feel that I am a failure.	SA	<u>A</u>	D	SD	1
10.	I take a positive attitude toward myself.	SA	A	D	<u>SD</u>	0

Scoring: SA=3, A=2, D=1, SD=0. Items with an asterisk are reverse scored, that is, SA=0, A=1, D=2, SD=3. Sum the scores for the 10 items. The higher the score, the higher the self esteem.

The scale may be used without explicit permission. The author's family, however, would like to be kept informed of its use:

The Morris Rosenberg Foundation
c/o Department of Sociology
University of Maryland
2112 Art/Soc Building
College Park, MD 20742-1315

References

References with further characteristics of the scale:

Crandall, R. (1973). The measurement of self-esteem and related constructs, Pp. 80-82 in J.P. Robinson & P.R. Shaver (Eds), **Measures of social psychological attitudes. Revised edition.** Ann Arbor: ISR.

Appendix M: Computer based assessment guidelines

Guidelines Section 2



ASSESSMENT
DELIVERY

How is the assessment undertaken?

DEVELOPERS

- Should provide a clear description of the hardware and peripheral devices required to administer the CBA.
- Should ensure that:
 - Screen information, text, graphics and auditory information is clearly legible.
 - Screen displays giving information on time, question or task labels, feedback on performance, paging and help facilities are logical and compatible with the purpose of assessment.
 - Interfaces such as keyboards, touch screens and light pens should be logical and compatible with the sequence of actions required to respond to the CBA.
 - Screen displays and interfaces do not disadvantage members of the target population for which the CBA was designed.
- Should provide clear descriptions of the environmental conditions (e.g. work area, lighting) required for administration of the CBA.

USERS

- Should ensure that the knowledge, understanding and skills required to evaluate the hardware, software and environmental requirements of the CBA are reviewed and understood.
- Should ensure that documentation of administrative (hardware, software, environments) requirements are reviewed and understood.
- Should ensure that CBA displays and interfaces do not unnecessarily impede test taker's with disabilities and special needs.
- Should ensure that the knowledge, understanding and skills required for competent administration of the CBA, including procedures for operating CBA equipment and software, are available and applied.
- Should ensure that the knowledge, understanding and skills for managing CBA use and maintaining the CBA for ongoing use are available and applied.

Guidelines Section 3

ASSESSMENT SCORING AND INTERPRETATION



How is the assessment scored and interpreted?

DEVELOPERS

- Should state clearly the principles underlying the scoring and interpretation of the CBA, and the research evidence supporting the validity of scores and interpretations.
- Should state the knowledge, understanding and skills required for competent interpretation of CBA scores.
- Should state clearly the procedures for operating CBA scoring and interpretation software (CBTIs), including any diagnostic information on the validity of a test taker's responses to the CBA.
- Should provide advice on appropriate use of CBA scores in supporting decisions regarding those assessed.

USERS

- Should ensure that the principles underlying the scoring of the CBA, and the research evidence supporting those principles are reviewed and understood.
- Should ensure that the knowledge, understanding and skills required for competent use of the CBA scoring and interpretation software are available and applied.
- Should ensure that the knowledge, skills and understanding required for competent interpretation of CBA scores, including validity checks on test takers scores, and for the provision of score interpretations to a third party are available and applied.
- Should review and ensure the understanding of appropriate use of CBA scores and interpretations in making decisions and recommendations about those assessed.

Appendix N: Study characteristics

	COUNTRY	GENDER		ETHNICITY			AGE (mean)	CHARACTERISTICS
		Male	Female	Caucasian	Asian	Other		
Alessandri et al., (2013)			388					Students – introductory to psychology course in exchange for course credit
Baccus et al., (2004)	Canada	36	82				19.1	Students
Bos et al., (2010)	Netherlands	112	152				13.92	Pre-vocational secondary school
Bosson et al., (2000)	USA	40	44					Students – in exchange for course credit
Brauhardt et al., (2014)	Germany	15	63					Community - compensated
Buhlmann et al., (2008) (Controls)	Germany	3 (4)	12 (16)				24.8 (23.8)	Diagnosis of body dysmorphic disorder. Controls recruited through posted flyers and adverts

	COUNTRY	GENDER		ETHNICITY			AGE (mean)	CHARACTERISTICS
		Male	Female	Caucasian	Asian	Other		
Buhlmann et al., (2009)	Germany/ Switzerland							Body dysmorphic disorder patients
BDD		1	20				28.2	Controls recruited through posted flyers and adverts
Sub-BDD		3	18				28.2	
Control		3	18				27.5	
Buhrmester et al., (2011)								
REVIEW								
Cai et al., (2011)	China	10	49					University students
Study 1								
Study 2								
Campbell et al., (2007)			154					
Study 1			114					
Study 2								
Cheng et al., (2012)		26	119					Undergraduate students in exchange for course credit
Cicero & Kerns (2011)	USA	186		91.4%	1.4%	7.2%	18.90	College students as part of course requirements
		59% female						

	COUNTRY	GENDER		ETHNICITY			AGE (mean)	CHARACTERISTICS
		Male	Female	Caucasian	Asian	Other		
Creemers et al., (2013)	Netherlands	0	95				21.2	Undergraduate college students
de Jong et al., (2012)	Netherlands	813	993				13.6	Year 2 secondary school students
Dentale et al., (2010)	Italy	73	231				20.5	Students in exchange for course credit 6 participants did not report gender
Dentale et al. (2012)	Italy	33	112				20.4	Psychology students in exchange for course credit
Egenolf et al., (2013)		11	14				25	
Falk et al., (2015)	Canada		77.57% Caucasian 74.33% Asian 32.14% Japanese	107	187	112		Caucasian = Euro-Canadian Asian = Asian-Canadian Other = Japanese Student in exchange for course credit or monetary compensation

	COUNTRY	GENDER		ETHNICITY			AGE (mean)	CHARACTERISTICS
		Male	Female	Caucasian	Asian	Other		
<i>Gebauer et al., (2008)</i>	USA, South America, Europe, Australia	37	89				25.98	Online survey
<i>Glashouwer et al., (2013)</i>	Netherlands	SAD: 28 PD: 11	SAD: 17 PD: 13				SAD: 31.47 PD: 37.46	45 Controls (gender not specified) SAD = Social Anxiety Disorder PD = Personality Disorder
<i>Glen et al, (2004)</i>	Germany	9	55				24	Psychology students in exchange for course credits
<i>Greenwald & Farnham (2000)</i>	USA	51	93	86	52	6		Students – introductory to psychology course in exchange for course credit
<i>Gregg & Sedikides (2010)</i>	UK	206		94%			20.5	Students in exchange for course credit or £30

	COUNTRY	GENDER		ETHNICITY			AGE (mean)	CHARACTERISTICS
		Male	Female	Caucasian	Asian	Other		
Grumm & von Collani (2007)	Germany	24	26				34.36	Volunteer acquaintances of the study author
Hedrick & Berlin (2012) (Controls)		71 (35)					BPD: 33.00 DPD: 34.67 Controls: 34.66	Psychiatric outpatients (Borderline PD, Depersonalization disorder) Controls recruited through adverts/flyers
Hu et al., (2013)	China	70	43				20.01	Students – Small financial compensation
Jordan et al., (2003)		16 12 17	41 31 16					Studies 1-3: Students – introductory psychology course in exchange for course credit
Study 1								
Study 2								
Study 3								
Karpinski (2004)	USA	36 10	77 44					Students – introductory psychology course in exchange for course credit
Study 1								
Study 2								

	COUNTRY	GENDER		ETHNICITY			AGE (mean)	CHARACTERISTICS
		Male	Female	Caucasian	Asian	Other		
Kesting & Lincoln (2013)	SYSTEMATIC REVIEW							
Klavina et al., 2012)	Germany	52	171				24.5	Psychology students – in exchange for course credit
Krause et al., (2011)	Germany	23	78				23.5	Students – in exchange for research participation credit or monetary compensation
Krizen & Suls (2009) Study 2	USA	288 (74% female)					20	Students to satisfy course requirements
Study 3	USA	213 (58% female)					19.8	Students to satisfy course requirements
Laws & Rivera (2012) Study 1a		10	73	25%	11%	63%	23.8	Participants in exchange for extra credit
Study 1b		14	32	20%	37%	43%	20	
Study 2		15	71	30%	5%	65%	24	
Study 3		19	68	16%	21%	63%	20	

	COUNTRY	GENDER		ETHNICITY			AGE (mean)	CHARACTERISTICS
		Male	Female	Caucasian	Asian	Other		
LeBel (2009)	Canada	47	153				20.9	Undergraduate students – in exchange for course credit
Mackinnon et al., (2011)	UK	22	14				PD: 41.69 Control: 29.50	Cross-sectional design Persecutory delusions n=22 Controls n= 20 (8 students, 12 university employees)
Oakes et al., (2008)	USA	30	67					Students
Olson et al., (2007)			71					Students – participation required in order to fulfil psychology course requirements
Park & Roeder John (2011)								
Study 1			96					Undergraduate students
Study 3			137					Undergraduate students
Study 4			136					Undergraduate students
Park et al., (2014)	Korea							Psychiatric patients

	COUNTRY	GENDER		ETHNICITY			AGE (mean)	CHARACTERISTICS
		Male	Female	Caucasian	Asian	Other		
Pavlickova et al., (2014) (Control)	UK	13 (11)	17 (19)	29 (27)	0 (3)	1 (0)	15.90 (16.07)	Children of community mental health patients Controls advertised at University, word of mouth Monetary compensation
Ratliff & Oishi (2003) Study 1	USA	32	32				18.9	Study 1 & 2: All students in exchange course money or in order to fulfil partial course requirements
Study 2	Netherlands	23	99					Study 3 & 4: Project Implicit
Study 4	USA	93	236	73.3%	7.3%	19.4%	28.4	
Study 5	USA	191	137	78%	5.8	16.2%	30.7	
Richetin et al., (2012) Study 1	Italy	23	21				23.43	
Study 2	Italy	25	12				26.46	
Riketta (2005)	Germany	30	69					Students in exchange for course credit or 12 euros. 57 psychology students 39 'other' students 3 course unknown

	COUNTRY	GENDER		ETHNICITY			AGE (mean)	CHARACTERISTICS
		Male	Female	Caucasian	Asian	Other		
Ritter et al., (2010) (Controls)	Germany	12 (12)	22 (23)				34.55 (38.57)	Psychiatric patients Controls recruited from advertisements and flyers
Robinson & Meier (2005)	USA	31	23					Students in exchange for course credit
Robinson et al., (2006) Study 1	USA	43	53					Students in exchange for extra credit and \$20
Study 2	USA	36	25					
Robinson & Wilkowski (2006) Study 2	USA	45	56					Students in exchange for course credit
Röhner et al., (2011)		10	64				22.4	Students in exchange for personal feedback and partial course credit
Rudman et al., (2001)	USA	28	34					University students from introductory psychology course – in exchange for course credit

	COUNTRY	GENDER		ETHNICITY			AGE (mean)	CHARACTERISTICS
		Male	Female	Caucasian	Asian	Other		
<i>Rudolph et al., (2008) Study 1</i>		22	80				22.7	Students
<i>Rudolph et al., (2008) Study 2</i>		49	11				22.4	Students
<i>Rudolph et al., (2010)</i>		12	37				22.8	Students
<i>Sava et al., (2011)</i>		117					20.2	Convenience sampling – undergraduate students
<i>Schreiber et al., (2012)</i>		7	13				17.5	Adolescent psychiatric outpatients Control group n=20, matched for age and gender Paid 10 euros for participation
<i>Schröder-Abé et al., (2007)</i>		24	55				23.73	Students, 25.3% psychology students who took part in exchange for partial course credit, remaining students paid 5 euros

	COUNTRY	GENDER		ETHNICITY			AGE (mean)	CHARACTERISTICS
		Male	Female	Caucasian	Asian	Other		
Steinberg et al., (2007)		71	110					Students – introduction to psychology
Stieger et al., (2012)	Germany	154 (58.2% male)					34.3	Volunteers
Szeto et al., (2009)278	Canada	39	149				18.98	Canada – psychology students, participation required in order to fulfil course requirements. Japan – psychology students, voluntary at request of course professor
	Japan	22	68				19.94	
van Tuiji et al., (2014)	Netherlands	767	874				13.14	
Vater et al., (2013)	Germany							Narcissistic Personality Disorder and Borderline Personality Disorder psychiatric outpatients Control – newspaper adverts
NPD							34.50	
BPD							28.67	
Controls							29.09	
Verplanken et al., (2007)	USA	46	79					University students in exchange for course credit

	COUNTRY	GENDER		ETHNICITY			AGE (mean)	CHARACTERISTICS
		Male	Female	Caucasian	Asian	Other		
Wegener et al., (2015)	Germany		51				Range 20-65	Hospital inpatients diagnosed with depression
Yu et al., (2012)	China	28	28					University students in exchange for 15 Yen
Zeigler-Hill (2006)		37	83					Introductory psychology students in exchange for course credit

Appendix O: Study design

	<i>IAT</i>		<i>Stimulus Words</i>		<i>Other</i>			<i>Order</i>		<i>Scoring Algorithm</i>		
	<i>Affective</i>	<i>Evaluative</i>	<i>Given</i>	<i>Self-Select</i>	<i>Known</i>	<i>Unknown</i>	<i>Neutral</i>	<i>I am not/ Not me</i>	<i>IAT/ ESE</i>	<i>ESE/ IAT</i>	<i>Conventional</i>	<i>D</i>
<i>Alessandri et al., (2013)</i>		✓	✓			✓						✓
<i>Baccus et al., (2004)</i>	✓		✓			✓				✓		
<i>Bos et al., (2010)</i>		✓	✓			✓				✓		✓
<i>Bosson et al., (2000)</i>	✓			✓				✓	✓	✓	✓	
<i>Brauhardt et al., (2014)</i>		✓	✓			✓				✓		✓
<i>Buhlmann et al., (2008)</i>		✓	✓			✓			✓			✓
<i>Buhlmann et al., (2009)</i>		✓	✓			✓			✓			✓
<i>Buhrmester et al., (2011)</i>												
<i>REVIEW</i>												

<i>Cai et al., (2011)</i>								✓				✓
	IAT		Stimulus Words		Other				Order		Scoring Algorithm	
	Affective	Evaluative	Given	Self- Select	Known	Unknown	Neutral	I am not/ Not me	IAT/ ESE	ESE/ IAT	Conventional	D
<i>Campbell et al., (2007)</i>	✓		✓									
<i>Study 1</i>		✓										
<i>Study 2</i>												
<i>Cheng et al., (2012)</i>	✓		✓			✓			✓			✓
<i>Cicero & Kerns (2011)</i>												✓
<i>Creemers et al., (2013)</i>		✓	✓					✓	✓			✓
<i>de Jong et al., (2012)</i>		✓	✓			✓			✓			✓
<i>Dentale et al., (2010)</i>	✓	✓	✓				✓			✓		✓

Dentale et al., (2012)	✓	✓	✓				✓		✓		✓
Egenolf et al., (2013)			✓				✓				✓
Falk et al., (2015)		✓		✓	✓			✓	✓		
Gebauer et al., (2008)		✓		✓	✓		✓				✓
Glashouwer et a., (2013)		✓	✓				✓				✓
Glen et al., (2004)		✓		✓				✓	✓		✓
Greenwald & Farnham (2000)	✓	✓		✓			✓		✓	✓	

	<i>IAT</i>		<i>Stimulus Words</i>		<i>Other</i>			<i>Order</i>		<i>Scoring Algorithm</i>		
	<i>Affective</i>	<i>Evaluative</i>	<i>Given</i>	<i>Self-Select</i>	<i>Known</i>	<i>Unknown</i>	<i>Neutral</i>	<i>I am not/Not me</i>	<i>IAT/ESE</i>	<i>ESE/IAT</i>	<i>Conventional</i>	<i>D</i>
<i>Gregg & Sedikides (2010)</i>		✓	✓					✓		✓		✓
<i>Grumm & von Collani (2007)</i>			✓			✓						✓
<i>Hedrick & Berlin (2012)</i>	✓		✓			✓						✓
<i>Hu et al., (2013)</i>												
<i>Jordan et al., (2003)</i>	✓		✓				✓			✓	✓	
<i>Karpinski (2004)</i>		✓	✓	✓	✓	✓			✓		✓	
<i>Kesting & Lincoln (2013) SYSTEMATIC REVIEW</i>												
<i>Klavina et al., (2012)</i>	✓		✓					✓	✓			✓

Study 1	✓	✓	✓			✓	✓		
Study 2									
Krause et al., (2011)			✓		✓			✓	✓
Krizen & Suls (2009)		✓	✓		✓				✓
Laws & Rivera (2012)							✓	✓	
Study 1a-3									
LeBel, E.P. (2009)	✓		✓		✓		✓	✓	✓

	<i>IAT</i>		<i>Stimulus Words</i>		<i>Other</i>			<i>Order</i>		<i>Scoring Algorithm</i>		
	<i>Affective</i>	<i>Evaluative</i>	<i>Given</i>	<i>Self-Select</i>	<i>Known</i>	<i>Unknown</i>	<i>Neutral</i>	<i>I am not/ Not me</i>	<i>IAT/ ESE</i>	<i>ESE/ IAT</i>	<i>Conventional</i>	<i>D</i>
<i>MacKinnon et al., (2011)</i>		✓	✓			✓			✓			✓
<i>Oakes et al., (2008)</i>	✓	✓	✓					✓	✓	✓	✓	
<i>Olson et al., (2007)</i>	✓			✓		✓			✓			✓
<i>Park & Roeder John (2011) Study 1 & 3</i>			✓			✓						✓
<i>Park et al., (2014)</i>		✓	✓			✓			✓			✓
<i>Pavlickova et al., (2014)</i>		✓	✓					✓				✓
<i>Ratliff & Oishi (2003)</i>		✓	✓			✓			✓	✓		✓
<i>Richetin et al., (2012)</i>			✓			✓						✓
<i>Riketta (2005)</i>	✓		✓				✓		✓			✓

Ritter et al., (2013)		✓	✓		✓		✓		✓
Robinson & Meier (2005)	✓		✓			✓	✓		✓
Robinson et al., (2006)	✓					✓			
Robinson & Wilkowski (2006)	✓		✓			✓			
Röhner et al., (2011)	✓		✓				✓		✓

	IAT		Stimulus Words		Other			Order		Scoring Algorithm		
	Affective	Evaluative	Given	Self-Select	Known	Unknown	Neutral	I am not/ Not me	IAT/ ESE	ESE/ IAT	Conventional	D
Rudman et al., (2001)	✓		✓			✓			✓			
Rudolph et al., (2008) Study 1 & 2		✓						✓	✓			✓
Rudolph et al., (2010)	✓		✓			✓			✓			
Sava et al., (2011)			✓			✓				✓		✓
Schreiber et al., (2012)			✓			✓			✓			✓
Schröder-Abé et al., (2007)	✓		✓					✓				✓
Steinberg et al., (2007)		✓		✓		✓						✓
Stieger et al., (2012)			✓			✓				✓		✓

Szeto et al., (2009)	✓		✓		✓		✓		✓
van Tuiji et al., (2014)		✓	✓		✓		✓		✓
Vater et al., (2013)			✓			✓			✓
Verplanken et al., (2007)		✓	✓			✓	✓		✓
Wegener et al., (2015)	✓		✓		✓		✓		✓
Yu et al., (2012)	✓	✓	✓		✓				✓
Zeigler-Hill, V. (2006)	✓		✓			✓	✓		✓

Appendix P: Convergent validity

	'Other' ISE	IAT: SA vs SE	IAT: Unknown	IAT: Santa	IAT: Hitler	IAT SC SB	SAPT1	SAPT2	Stroop	ISES	CISE
Bosson et al., (2000)							-.14	-.10	.04	-.07	
Dentale et al., (2010)		.44*									
Falk et al., (2015) Euro Canadians						.05 .08				.10	
Asian Canadians						.15* .11				-.07	
Japanese						.16* .07				-.13	
Greenwald & Farnham (2000)		.432****									
Karpinski (2004) Study 1 IAT: Known				-.03							

	'Other' ISE	IAT: SA vs SE	IAT: Unknown	IAT: Santa	IAT: Hitler	IAT SC SB	SAPT1	SAPT2	Stroop	ISES	CISE
Karpinski (2004) Study 2 IAT: Unknown IAT: Santa IAT: Hitler				.26~	.38^						
			.26 ~		.03						
			.38^	.03							
Kestling & Lincoln (2013) SYSTEMATIC REVIEW	-.14 to .04										
Rudolph et al., (2008)						(SC) .09					
Szeto et al., (2009)											.44°
Zeigler-Hill, V. (2006)										-.01	

	<i>IP/NLT</i>	<i>FNNL</i>	<i>SNL</i>	<i>FNNL</i>	<i>GNAT SU/SP</i>	<i>BP</i>	<i>BIAT</i>	<i>APT</i>	<i>ID- EAST</i>	<i>EAST</i>
<i>Bosson et al., (2000)</i>	.061					-.11				
<i>Falk et al., (2015)</i>										
<i>Euro Canadians</i>	.09/.12				.03/.09	.01		.04		
<i>Asian Canadians</i>	.17*				.00/.15*	-.08		.16*		
<i>Japanese</i>	.08*				-.20/.29*	.02		-.02		
<i>Gebauer et al., (2008)</i>	-.06									
<i>Gregg & Sedikides (2010)</i>	.11				.15*					
<i>Krause et al., (2011)</i>							.27 to .30^	-.19~	.20~	
<i>Rudolph et al., (2008)</i>										
<i>Time 1</i>	-.07									-.08
<i>Time 2</i>	.06									-.09
<i>Rudolph et al., (2008)</i>	-.07								-.03	
<i>Schreiber et al., (2012)</i>								.09		

	<i>IP/NLT</i>	<i>FNNL</i>	<i>SNL</i>	<i>FNNL</i>	<i>GNAT</i> <i>SU/SP</i>	<i>BP</i>	<i>BIAT</i>	<i>APT</i>	<i>ID-EAST</i>	<i>EAST</i>
Steiger et al., (2012)										
First/Last										
Male	.02/.20~									
Female	.16/.13									
Steinberg et al., (2007)										
High risk	-.02									
Low risk	.07									
Wegener et al., (2015)										
Pre	.0									
Post	.00									
Zeigler-Hill, V. (2006)	-.05									

^p<.01 ~p<.10 *p<.05 **p<.005 ***p<.0005 ****p<.00005

IAT: SA = Implicit Association Test Self-Affect; IAT: SE = Implicit Association Test Self-Evaluation; IAT SC, SB = Implicit Association Test Single Category, Single Block; SAPT1 = Supraliminal Attitude Prime Task; SAPT2 = Subliminal Attitude Prime Task; ISES = Implicit Self Evaluation Survey; IP/NLT = Initial Preference/Name Letter Task; FNNL = First Name Name-Liking; SNL = Surname Name-Liking; FNNL = Full Name Name-Liking BP = Birthday Preference; BIAT = Brief Implicit Association Test; APT = Affective Priming Tasks; ID-EAST = Identification Extrinsic Affective Simon Task; GNAT, SU, SP = Go/No-Go Self-Unpleasant, Self-Pleasant; CISE = Collective Implicit Self-Esteem

Appendix Q: Discriminant validity

	<i>RSE</i>	<i>SAQ</i>	<i>SL</i>	<i>SC</i>	<i>CSWQ</i>
<i>Bos et al., (2010)</i>	.02				.01
<i>Bosson et al., (2000)</i>	.22~	.20~	.20~	.20~	
<i>Brauhardt et al., (2014)</i>	-.13				
<i>Buhlmann et al., (2008)</i>	.48°				
<i>Buhlmann et al., (2009)</i>	-.21				
<i>Buhrmester et al., (2011)</i>	.13*	.21^	.11	.11	
<i>Cai et al., (2011)</i>	-.03				
°p<.001 ^p<.01 ~p<.10 *p<.05 **p<.005 ***p<.0005 ****p<.00005					

	<i>RSE</i>	<i>SL</i>	<i>SC</i>	<i>SLSC</i>	<i>SE (agg)</i>
<i>Cheng et al., (2012)</i>	.09				
<i>Cicero & Kerns (2012)</i>	-.08	-.072	-.04		
<i>Creemers et al., (2013)</i>	.23*				
<i>de Jong et al., (2012)</i>					
<i>Boys</i>	-.058				
<i>Girls</i>	-.026				
<i>Overall</i>	-.038				
<i>Dentale et al., (2010)</i>	.14				
<i>Dentale et al (2012)</i>	.03				
<i>Egenolf et al., (2013)</i>	.26				
<i>Glen et al., (2004)</i>					
<i>Time 1</i>	.20	.25*	.19	.26*	.25
<i>Time 2</i>	.00	.03	.04	.05	.03
°p<.001 ^p<.01 ~p<.10 *p<.05 **p<.005 ***p<.0005 ****p<.00005					

	<i>RSE</i>	<i>SAQ</i>	<i>SD</i>	<i>T</i>
Greenwald & Farnham (2000)				
<i>IAT (affect)</i>				
<i>IAT (evaluative)</i>	.130	.273**	.178*	.198*
	.105	.197*	.201*	.105
Gregg & Sedikides (2010)	.00			
Grumm & von Collani (2007)	.20			
Hu et al., (2013)	.03			
Jordan et al., (2003)				
<i>Study 1</i>	.01			
<i>Study 2</i>	.13			
<i>Study 3</i>	.24			
Karpinski (2004)				
'Unknown other'	-.07		-.01	-.06
'Known other'	-.01		-.09	-.09
Karpinski (2004)				
'Unknown other'	.03		.12	-.14
'Santa other'	-.06		-.04	-.08
'Hitler other'	.01		.06	-.06

^op<.001

[^]p<.01

[~]p<.10

*p<.05

**p<.005

***p<.0005

****p<.00005

	<i>RSE</i>	<i>SL</i>	<i>SC</i>	<i>MSES</i>
Klavina et al., (2012) META ANALYSIS				.13
Krause et al., (2011)	.21*			
Kestling & Lincoln (2013) SYSTEMATIC REVIEW	.22			
Krizen et al., (2009)	.06			
LeBel, E.P. (2009)	.11			
MacKinnon et al., (2011) Persecutory Delusions Controls	.016 .304			
Oakes et al., (2008) IAT Neutral IAT Specific IAT Global		.11 .27^ .27^	.10 .09 .12	
°p<.001 ^p<.01 ~p<.10 *p<.05 **p<.005 ***p<.0005 ****p<.00005				

	<i>RSE</i>	<i>SL</i>	<i>SC</i>	<i>T</i>	<i>TR</i>	<i>SERS:SF</i>
<i>Olson et al., (2007)</i>	-.12			-.09	-.06	
<i>Park & Roeder John (2011)</i>						
<i>Study 1</i>	.06					
<i>Study 3</i>	.13					
<i>Study 4</i>	-.04					
<i>Park et al., (2014)</i>						
<i>Bipolar Manic</i>	.58[^]					
<i>Bipolar Euthymic</i>	.16					
<i>Control</i>	-.19					
<i>Pavlickova et al., (2014)</i>						
<i>Index</i>						
<i>Control</i>						-.10
<i>Both</i>						.23
						.06
<i>Richetin et al., (2012)</i>						
<i>Study 1</i>	.33*					
<i>Study 2</i>	.00					
<i>Riketta (2005)</i>		.13				
<i>Ritter et al., (2013)</i>	.11					
^o p<.001 [^] p<.01 [~] p<.10 *p<.05 **p<.005 ***p<.0005 ****p<.00005						

	<i>RSE</i>	<i>SES</i>	<i>MSES</i>
<i>Robinson & Meier (2005)</i>			
<i>Study 1</i>	.16		
<i>Study 2</i>	.15		
<i>Rudman et al., (2001)</i>		.04	
<i>Rudolph et al., (2008)</i>			
<i>Time 1</i>			.14
<i>Time 2</i>			-.06
<i>Rudolph et al., (2008)</i>			-.04
<i>Rudolph et al., (2010)</i>			-.07
<i>Sava et al., (2011)</i>	.00		
<i>Schröder-Abé et al., (2007)</i>			
<i>Study 1</i>			-.010
<i>Study 2</i>			.136
<i>Steiger et al., (2012)</i>			
<i>Male</i>	.11		
<i>Female</i>	-.13		
<i>Steinberg et al., (2007)</i>			
<i>High risk</i>	.21*		
<i>Low risk</i>	.14		

[°]p<.001 [^]p<.01

[~]p<.10 *p<.05 **p<.005 ***p<.0005 ****p<.00005

	RSE	SLSC	MSES	CSES				
				T	M	Pr	Pu	I
Szeto et al., (2009)								
Canadian								
Japanese	.03			.19[^]	.16*	.19*	.07	.15*
	.12			-.02	.00	-.19	.12	.11
van Tuiji et al., (2014)								
Time 1								
Time 2	-.01							
	.05							
Vater et al., (2013)			.13					
Verplanken et al., (2007)		.065						
Wegener et al., (2015)								
Pre								
Post	.03							
	.03							
Zeigler-Hill, (2006)	.01							

[^]p<.001

[^]p<.01

[~]p<.10

*p<.05

**p<.005

***p<.0005

****p<.00005

RSE = Rosenberg Self-Esteem Scale; SAQ = Self-Attributes Questionnaire; SL = Self Liking (Self-Liking and Competence Scale; SLC); SC = Competence (Self-Liking and Competence Scale; SLC); SD = Semantic Differential; T = Thermometer; SES = Self-Esteem Scale; MSES = Multidimensional Self-Esteem Scale; TR = Trait Ratings; CSES = Collective Self-Esteem Scale (T = total; M = Membership; Pr = Private; Pu = Public; I = Identity); SERS:SF = Self-Esteem Rating Scale: Short Form; CSWQ = Contingent Self-Esteem

Appendix R: Criterion validity

	PBI MC MO	PBI FC FO	PA	NA	PRIDE-A PRIDE- H	Na	AS	FS	EOT
Bosson et al., (2010)							-.04	.11	
Campbell et al., (2007) Study 1 Study 2						.13 .21*			
Cicero & Kerns (2011)						-.11 to -.05			
Dentale et al., (2010)									-.11
Falk et al., (2015) Euro Canadians	.17 .10	.16^ .06	.05	-.08	.27^ -.15	-.08			
Falk et al., (2015) Asian Canadians	.07 -.02	.03 -.05	-.21^	.09	-.12 .13~	-.04			
Falk et al., (2015) Japanese	-.13 -.03	-.11 .29^	-.10	-.23*	-.03 .04	.09			
p<.001 ^p<.01 P<.10~ *p<.05 **p<.005 ***p<.0005 ****p<.00005 significance not reported									

	PA	NA	Na	Op	Co	Ex	Ag	N	SE G	SE S
Gregg & Sedikides (2010)			-.04							
Grumm & von Collani (2007) (Implicit)						.23 (.26*)		-.22 (.38^)		
Krizan & Suls (2009)										
Study 2	-.01	.04		-.03	.09	-.03	-.01	.07		
Study 3				.08	.02	.27*	.13	.01		
(Peer report)				(.01)	(.02)	(.08)	(.13)	(-.09)		
Park et al., (2014)										
Bipolar Manic									.34	.77*
Bipolar Euthymic									-.12	-.08
Control									-.13	.13
Robinson & Meier (2005)										
Study 1		-.40*						-.41*		
Study 2		-.30*						-.32*		
(Self-report)		-.28*								
p<.001 ^p<.01 P<.10~ *p<.05 **p<.005 ***p<.0005 ****p<.00005 significance not reported										

	PA	NA	Na	Op	Co	Ex	Ag	N	SE G	SE S
Robinson & Wilkowski (2006) Study 2							.19			
Vater et al., (2013)			.23*							
Zeigler-Hill, V. (2006)			.03							
p<.001 ^p<.01 P<.10~ *p<.05 **p<.005 ***p<.0005 ****p<.00005 significance not reported										

	Dep	Anxiety	A	EI	PH	CSE	PLE	PF	PI	RESE
Bos et al., (2010)	.05	.04								
Buhlmann et al., (2008)	.39**									
Buhlmann et al., (2009)	.36^									
Buhrmester et al., (2011) REVIEW	-.14			-.17	-.08	-.01	.11	.11	-.04	.02
Creemers et al., (2013)	-.23*									
de Jong et al., (2012)										
Boys	-.023	-.018								
Girls	-.058	-.079*								
Overall	-.041	-.049*								
Dentale et al., (2010)			.00 to .07							
p<.001	^p<.01	P<.10~	*p<.05	**p<.005	***p<.005	****p<.00005				significance not reported

	Dep	Anxiety	Mood	A	SIAS	Stress	Self-Efficacy
Glen et al., (2004) Time 1 Time 2			.35^ .06				.09 .10
Krizan & Suls (2009) Study 2 Study 3 (peer report)	-.02						
MacKinnon et al., (2011) Persecutory Delusions Controls	-.122 -.137	.114 -.028			.163 -.196	-.132 -.179	
	p<.001	^p<.01	P<.10~	*p<.05	**p<.005	***p<.0005	****p<.00005
							significance not reported

	Dep	HADS	Anxiety	ATQ	SIAS
Pavlickova et al., (2014)					
Index	-.05				
Control	.10				
Both	-.31				
Ritter et al., (2013)	-.08		-.27~ to -.18		
Robinson et al., (2006)					
Study 2			.27*		
Steinberg et al., (2007)					
High risk Time 1	-.23*				
High risk Time 2	-.10				
Low risk Time 1	.16				
Low risk Time 2	.12				
van Tuiji et al., (2014)					
Time 1	.05*		.06*		
Time 2	.02		,.01		
Vater et al., (2013)		-.12			
Verplanken et al., (2007)				-.279°	-.012
Wegener et al., (2015)					
Pre		.13			
Post		-.10			

p<.001 ^p<.01 P<.10~ *p<.05 **p<.005 ***p<.0005 ****p<.00005 significance not reported

	Lo	SI	Mania	EP	SU	DB	TA	A-I	A-O	AC
Bos et al., (2010)				-.01	-.03	.02				
Buhlmann et al., (2008)										
Cicero & Kerns (2011)										
Creemers et al., (2013)	-.24*	.05								
Hedrick & Berlin (2012)										
Hu et al., (2013)	-.15									
Pavlickova et al., (2014)										
Index			-.29							
Control			-.35							
Both			-.30*							
Schröder-Abé et al., (2007)							-.093	.047	-.011	

p<.001 ^p<.01 P<.10~ *p<.05 **p<.005 ***p<.0005 ****p<.00005 significance not reported

	AttS	Nerv	I H	BAA	Coo
Bos et al., (2010)					
Buhlmann et al., (2008)				.28*	
Cicero & Kerns (2011)	-.11 to .03				
Creemers et al., (2013)					
Hedrick & Berlin (2012)					.372^s
Hu et al., (2013)					
Pavlickova et al., (2014)					
Index Control Both					
Schröder-Abé et al., (2007)	.067	-.025	-.095		

p<.001 ^p<.01 P<.10~ *p<.05 **p<.005 ***p<.0005 ****p<.00005 significance not reported

	Par	ND	SS	SPAI: SP	SPAI: AG	LSAS: F	LSAS: Av	Con	PWR	NFA	DWC	RAS
Cicero & Kerns (2011)	-.01											
Dentale et al., (2012)								-.04	-.10	-.12	.01	.11
Glashouwer et al., (2013)				-.38^	-.21*	-.35^	-.32^					
Grumm & von Collani (2007) (Implicit)												
Robinson et al., (2006) Study 1												
Study 2 (informant)			.21* -.25* (.32*)									
Robinson & Wilkowski (2006) Study 2		-.07	-.09									

p<.001 ^p<.01 P<.10~ *p<.05 **p<.005 ***p<.0005 ****p<.00005 significance not reported

	MJS	IJS	SJS	Mod	NE	BDD-YBOCS	FEPA	GSI
Buhlmann et al., (2009)						.24	.33*	
Cai et al., (2011)				.29*				
Steiger et al., (2012)								
Male	.04	.10	-.11					
Female	.38^	.36^	.09					
Steinberg et al., (2007)								
High risk					-.09			
Low risk					.19			
Vater et al., (2013)								-.06
^o p<.001	[^] p<.01	P<.10~	*p<.05	** p<.005	*** p<.0005	**** p<.00005	^s level of significance not reported	

PBI MC, MO = Parental Bonding Index Mother's Caring, Mother's Overcaring; PBI FC, FO = Parental Bonding Index Father's Caring, Father's Overcaring; PA = Positive Affect; NA = Negative Affect (SR= Self-Report); PRIDE-A, H = Authentic and Hubristic Pride; Na = Narcissism; AS = Ambiguous Statements; FS = Feedback Seeking; N = Neuroticism; A = Alexithymia; EOT = Externally Oriented Thinking; SE G = Self-Efficacy General; SE S = Self-Efficacy Social; Dep = Depression; EI = Emotional Instability; PH = Physical Health Problems; CS = Contingent Self Esteem; PLE = Positive Life Events; PF = Preference or Positive Feedback; PI = Positive Interpretation of Ambiguity; RESE = Rater Evaluation of Self-Esteem; HINT = Habit Index of Negative Thinking; ATQ = Automatic Thoughts Questionnaire; SIAS = Social Interaction Anxiety Scale; Lo = Loneliness; SI = Suicidal Ideation; EP = Eating Problems; SU = Substance Use; DB = Disruptive Behaviour; TA = Trait Anger; A-I = Anger-In; A-O = Anger-Out; AC = Anger Control; AttS = Attributional Style Nerv = Nervousness; IH = Days of Impaired Health; BAA = Beliefs About Appearance; Coop = Cooperativeness; Op = Openness; Co = Conscientiousness; Ex = Extraversion; Ag = Agreeableness; Par = Paranoia; ND = Trait Neurotic Distress; SS = Somatic Symptoms; SPAI: SP = Social Phobia and Anxiety Inventory: Social Phobia; SPAI: A = Social Phobia and Anxiety Inventory: Agoraphobia; LSAS: F = Liebowitz Social Anxiety Scale: Fear; LSAS: A = Liebowitz Social Anxiety Scale:

Avoidance; Con = Confidence; PWR = Preoccupation with Relationships; NFA = Need for Approval; DWC = Discomfort with Closeness; RAS = Relationships as Secondary; MJS = Multidimensional Jealousy Scale; IJS = Interpersonal Jealousy Scale; SJS = Sexual Jealousy Scale; MOD = Modesty; NE = Negative Events; BDD-YBOCS = Body Dysmorphic Disorder of the Yale-Brown Obsessive-Compulsive Scale; FEPA = Beliefs About Appearance Scale; GSI = General Psychiatric Impairment
NB: Observer Report

