

**LITERATURE REVIEW**

Title: The Relationship between Maternal Sensitivity in Infancy, and Actual and Feared Separation in Childhood, on the Development of Adolescent Antisocial Behaviour

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Abstract

Research suggests that adolescent antisocial behaviour is related to less favourable longer-term outcomes, including; poor peer competence, lower academic attainment, adulthood criminality and a higher risk of adult mental health problems.

It is hypothesised that a secure early infant attachment can protect against the development of adolescent antisocial behaviour, as it supports the child's development of empathy and emotional-regulation; which are associated with prosocial behaviour.

This article reviews the theoretical and empirical evidence supporting the association between early infant attachment and adolescent antisocial behaviour. In more specific terms, it looks at attachment through early attachment indicators (attachment style and maternal sensitivity), and the effect of attachment disruptions during infancy (separation from caregiver and separation anxiety).

The review concludes by highlighting the use of cross-sectional research which is limited in terms of inferring causation and concluding a longitudinal relationship. Thus highlighting areas for the research evidence to be further developed.

Keywords: antisocial behaviour; attachment; maternal sensitivity; separation

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1. Introduction

The application of attachment theory to clinical thinking is recognised as a fundamental contributing factor when assessing and formulating psychological difficulties (Zeanah, Berlin & Boris, 2011). Attachment theory suggests that a secure infant attachment relationship between a mother and child is a protective factor against the development of adolescent antisocial behaviour (Bowlby, 1969). Conversely, an insecure attachment relationship and disruptions in attachment during infancy and childhood, has been found to adversely affect behaviour in childhood, adolescence and cause adjustment problems into adulthood (Bowlby, 1944; MacDonald, 1985). The theoretical underpinnings of this relationship highlight the importance of the development of two key mechanisms; empathy and self-regulation. Empirical evidence supports that both empathy and self-regulation (emotional and behavioural) are associated with prosocial behaviour (Eisenberg, 2000), and correlated with a positive infant attachment (Thompson & Gullone, 2008), with an insecure attachment in infancy increasing a child's vulnerability to developing antisocial behaviour in adolescence.

This literature review seeks to critically evaluate the theoretical and empirical evidence, for and against attachment predictors in infancy and childhood, affecting antisocial behaviour in adolescence. In more specific terms, to answer the question; does the literature support a longitudinal relationship between early attachment and adolescent antisocial behaviour, and is this relationship affected by the experience of separations during childhood? It concludes with identifying limitations in the existing research literature, and future directions for study.

2. Method

2.1 Search Strategy

Studies included in this literature review were identified utilising search criteria outlined by Petticrew & Roberts (2006). The literature search used five electronic

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databases; Applied Social Sciences Index and Abstracts (ASSIA); Sciencedirect; Psycharticles EBSCO host; Web of Knowledge; and British Medical Journals. Abstract and/or title searches were used, with search terms relevant to the key areas of interest: adolescent antisocial behaviour, attachment, maternal sensitivity, separations and separation anxiety (see Appendix 1). Articles identified were reviewed independently by the researcher and assessed for relevance to the search terms; based primarily on the review of the article abstract, and widened to the article content when needed. In terms of exclusion criteria, articles reviewed as unrelated to the research question, articles not in English, and secondary references, were removed.

2.2 Results

The articles identified in this literature review are shown in Appendix 1, 87 of the articles underwent an abstract review, resulting in 46 key articles, summarised in Table 1.

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Table 1

Summary Table of Key Articles

<u>Reference</u>	<u>Design</u>	<u>Sample</u>	<u>Key Findings</u>
Ainsworth, 1989	Theoretical		Attachment theory is a basis for further research in relation to sexual pair bonds, kinship bonds and friendships.
Baker, 2006	Empirical	CD	Antisocial behaviour causes significant burden to service, challenges for teachers and professionals, long-term outcomes if untreated.
Barker, & Maughan, 2009	Longitudinal	ALSPAC cohort, 4-17 years	Distinction between childhood limited and lifelong persistent antisocial behaviours. Parental/postnatal stress strong predictor of child development.
Barker, Oliver, & Maughan, 2010	Longitudinal	ALSPAC cohort, 4-13 years	Hyperactivity, prosocial behaviour, peer development problems and emotional difficulties mirrored the development of conduct problems.
Bigelow, MacLean & Proctor et al., 2010	Longitudinal	15 months – 2.5 years	Maternal sensitivity scores consistent across different time-point. Mother's smiling contingency and mother's vocal contingency important.
Bowen, & Heron, 2008	Cohort	ALSPAC, 8.5-10.5 years	Persistent engagement in antisocial behaviour increased conduct disorder in adolescence, poor peer relationships, lower IQ, decreased prosocial behaviour.
Bowen, Komy, & Steer, 2008	Longitudinal	ALSPAC cohort	Those resilient to antisocial behaviour had higher levels of self-esteem, greater IQ, more school enjoyment, lower levels of family adversity.
Bowlby, 1944	Empirical	N = 44, 9-11 years & controls	Children showing delinquent behaviours had not lived securely in a home, with a secure relationship.
Colman, Murray & Abbott et al., 2009	Longitudinal	N = 3,652, Cohort Data	Those with conduct disorder were more likely to suffer adverse long-term outcomes, lower educational attainment, interpersonal & employment difficulties.
Cooper, Shaver, & Collins, 1998	Empirical	N = 1,989, 13-19 years,	Secure adolescents showed better adjustment, but no less likely to engage in risky behaviours, anxious adolescents reported more adjustment difficulties

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<u>Reference</u>	<u>Design</u>	<u>Sample</u>	<u>Key Findings</u>
Dallaire, & Weinraub, 2005	Longitudinal	N=99, 15-72 months-6 years	Mothers who declined participation were significantly less well educated. Insecure-ambivalent attachment reporting the highest levels of anxiety.
Dodge, & Pettit, 2003	Theoretical		Conduct disorder is a product of biological disposition, early risk factors, life experiences, social interactions and cognitive and emotional development.
Douglas, 1975	Empirical		Repeated or prolonged hospital admissions prior to the age of 5 were related to increased risk of behavioural disturbances and reading difficulties.
Eisenberg, Miller, Shell, McNalley, & Shea, 1991	Empirical	Adolescent sample	Ability for higher level reasoning emerged in late adolescence, developed sooner in girls than boys, associated with empathy and prosocial behaviour.
Farrington, 2005	Literature review		Interventions for antisocial behaviour should be multi-component and community-based. Need to identify and target key risk factors.
Fonagy, & Target, 1997	Literature review		Reflective functioning is related to the ability to employ theory of mind and to mentalise, learnt through early attachment relationships.
Fontaine, Carbonneau, Vitaro, Barker, & Tremblay, 2009	Literature review		Antisocial behaviour in females showed a range of trajectories supported in the literature (e.g. childhood limited, adolescent only and life-course persistent).
Gaik, Abdullah, Elias, & Uli, 2010	Literature review		Parent and peer attachments important in predicting antisocial behaviour, attachment is just as important as parenting.
Jaffari-Bimmel, Juffer & van IJzendoorn et al., 2006	Longitudinal	N = 160	Found that temperament and social development were stable over time. Parental sensitivity in childhood was protective against adverse affects.
Keenan, & Shaw, 1997	Systematic review		Girls develop more rapidly in school years, channel difficult behaviours into internalising behaviours from an early age through socialisation.
Kobak, Cole, Ferenz-Gillies, Fleming, & Gamble, 1993	Cross sectional	Study 1: N=53, Study 2: N=48	Teens with secure attachment had a greater ability to engage in problem solving discussions, less avoidant, less aggression, & greater "balanced assertiveness".

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<u>Reference</u>	<u>Design</u>	<u>Sample</u>	<u>Key Findings</u>
Koomen, & Hoeksma, 1993	Natural experiment	N=27 +14 controls, 9.5-12.5 months	Children in the hospitalised group were more likely to ignore or turn their attention away from their mothers following later separations.
LaFreniere, & Sroufe, 1985	Cross-sectional	N=20 primiporous, 47-57 months.	Hypotheses of mother –infant attachment and social competence was strongly supported for girls, but less so for boys.
Laible, 2007	Cross-sectional	N=117, mean age of 19.6 years	Secure relationships with peers increased social and emotional competence, secure attachment to parents associated with greater prosocial tendencies.
Laible, Carlo, & Roesch, 2004	Cross-sectional	N= 246, mean age 18.6yrs	Significant relationship between empathy and prosocial behaviour. Adolescents higher on empathy engaged in more prosocial and less aggressive behaviours.
Laranjo, Bernier, & Meins, 2008	Cross-sectional	N=50 mother & infants 12-16 months	Maternal sensitivity, mind mindedness and attachment were all positively inter-related. Maternal sensitivity and mind mindedness were independent predictors.
Light, & Dishion, 2007	Cross-sectional	N=1.289 adolescents	Support for peer rejection and affiliation with antisocial peers increasing antisocial behaviour's. Further research needed on the role of social networks.
Lovett, & Sheffield, 2007	Systematic review	14 studies identified	No consistent relationship found, despite consistent measures for empathy. Self-reported empathy in adolescence was correlated with antisocial behaviour.
Lundy, 2003	Cross-sectional	N=24 families, infants at 6 months.	Mind related comments were positively correlated with attachment security ($r=.30$, $p<0.05$) as did consistency of mind-mindedness comments across.
MacDonald, 1985	Literature review		Long-term effects from early experiences found across human and animal literature, varying degrees of susceptibility.
Meins. & Fernyhough. 1999			Consistency across mind mindedness measures related to better performance on false belief and emotion task. Early interactions inform theory of mind.
Meins, Fernyhough, Fradley, & Tuckey, 2001	Cross-sectional	N=71 mothers and infants (6 months)	Appropriate mind related comments were associated with attachment security. Mind-mindedness as a component of developing a positive working model.

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<u>Reference</u>	<u>Design</u>	<u>Sample</u>	<u>Key Findings</u>
Millie, Jacobson, McDonald, & Hough, 2005	Policy review		Targeting antisocial behaviour's requires the integration of local services and policies.
Moffitt, 1993	Review article		Two groups of antisocial behaviour: engagement in behaviours across the lifespan and engagement in antisocial behaviours only in adolescence
Murray, Irving, Farrington, Colman, & Bloxson, 2010	Longitudinal	1970 Cohort Data N=16,401	Early psychosocial risk factors were strong predictors of conduct disorder and criminal convictions, greater number of risk factors, the stronger the association.
Nelis, & Rae, 2009	Cross-sectional	N=476, aged 13-19 years	Females more likely to be classified as secure, males more likely to be avoidant. Those with secure attachments were significantly less depressed and anxious.
Patterson, Forgatch, Yoerger, & Stoolmiller, 1998	Longitudinal	N=206 adolescents	Found sequence of early antisocial behaviour, early arrest and chronic offending. Greater incidence of family disruption with antisocial and offending population.
Quinton, & Rutter, 1976			Supports earlier findings; week long hospital admission is not related to later behavioural disturbances, but that repeated admissions are.
Scott, Brown, & Wright, 2003		30 adolescents, 14-20 years.	Adolescents with anxious attachments reporting greater interpersonal difficulties than those with secure and avoidant.
Scott, Knapp, Henderson, & Maughan, 2001	Longitudinal	N=142, followed up at age 28.	Adults with conduct disorder in childhood were estimated to cost society £70,019 compared to £7,423 for adults with no history of conduct disorder problems.
Smith, McVie, & Woodward et al., 2001	Review article	EYTCS cohort data, 12-13 years	50% admitted to antisocial behaviour in the past 12 months, mostly group activities. Delinquency associated with conflict with parents and poor supervision.
Thompson, & Gullone, 2008		N=281 adolescents 12-18 years	Both attachment security and empathy were found to be significantly associated with prosocial and antisocial behaviours.
van IJzendoorn, Rutgers & Bakermans-Kranenburg et al., 2007		55 mother infant dyads	Typically developing children were more securely attached to more sensitive parents.

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<u>Reference</u>	<u>Design</u>	<u>Sample</u>	<u>Key Findings</u>
Walker, & Bright, 2009	Systematic review	19 articles reviewed	Factors associated with violence are also associated with self-esteem, and the protection of low self-esteem.
Wolke, Wang, & Christ et al., 2013	Longitudinal	ALSPAC	Those who were lost from ALSPAC were more likely to have a disruptive behavioural disorder.
Zeanah, Berlin, & Boris, 2011	Theoretical		Attachment is commonly integrated into clinical thinking, disorganised attachment is attributed to greater behavioural problems.

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As a result of the literature search, this review covers the following key themes; an overview of attachment theory in relation to adolescent antisocial behaviour, and mechanisms found to mediate this relationship (e.g. empathy and self-regulation). The review reflects on the role of maternal sensitivity as a component measure of attachment, for use in empirical research to explore the effect of attachment on adolescent antisocial behaviour.

3. Evaluation of the Literature

3.1 Antisocial Behaviour

Antisocial behaviour is described primarily as the inability to respect the rights of others (Frick, 1998), leading to the violation of societal norms (Gaik Abdullah, Elias, & Uli, 2010). It is characterised by a variety of acts that can be viewed from quite minor to more severe, including; assault, theft, fraud, physical and psychological aggression, truancy and bullying (Farrington, 2005). Antisocial behaviour can be considered a socially constructed concept, varying across cultures (Baker, 2006). Although some antisocial acts may appear inconsequential or normal, expected adolescent behaviour, there remains a growing concern about the amount of antisocial behaviour recorded by adolescents in today's society because it is a strong predictor of adjustment difficulties in adulthood. Adolescents who exhibit relentless antisocial behaviours are likely to experience a greater number of difficulties in adulthood compared to their non-antisocial peers. Such difficulties include problems with employment (Millie, Jacobson, McDonald & Hough, 2005), interpersonal relationships (marriage, friendships, parenting), and substance misuse (Farrington, 1991). Antisocial behaviour in adolescence is also a strong precursor to adulthood criminality (Harrington, Fudge, Rutter, Pickles, & Hill, 1991), which is also strongly associated with adult mental health difficulties (Colman, Murray, Abbott, Maughan, Kuh, Croudace, & Jones, 2009). Antisocial adolescents are commonly excluded from society, leading to

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disengagement, which perpetuates problem behaviours (Millie et al., 2006) and increases the financial burden on society (Scott, Knapp, Henderson & Maughan, 2001).

Although there has been substantial research on the development of antisocial behaviour, there is little consensus on the taxonomy. The most commonly supported is a dual model proposed by Moffitt (1993), who defined antisocial behaviour as either childhood-onset/life-course persistent (estimated to account for 5-10% of the population), or adolescent-limited/adolescent-onset. In terms of factors contributing to the development of adolescent antisocial behaviour, multiple risk factors have been identified in the research including environmental, biological and sociocultural (Dodge & Pettit, 2003). Some researchers support a linear developmental trajectory of adolescent antisocial behaviour (e.g. additive models, Rutter, Cox, Tupling, Berger & Yule, 1975), with others favouring interactional and transactional models (Dodge & Pettit, 2003).

3.2 Attachment and Antisocial Behaviour

The early work of John Bowlby (Bowlby, 1969) and Mary Ainsworth (Ainsworth, 1989) on the theory of attachment provides a theoretical rationale for the importance of the early attachment relationship between a newly born infant and their mother. Attachment between the mother and infant provides an emotional reciprocal bond (Bowlby, 1973), with the mother providing a consistent and safe base for the infant to confidently explore their surroundings ('a secure base'; Bowlby, 1969). A securely attached infant learns that their mother will provide safety and comfort for them when danger arises. The infant incorporates this knowledge into an internal working model (Bowlby, 1969) which synthesises the child's experiences of the world and formulates a child's expectations of others in future interpersonal and intimate relationships. A secure attachment is associated with a positive internal working model, where the child views themselves in high self-esteem. The child has learnt from their mother how to regulate their raw emotions through her intuitively regulating these for the child through consistent, and sensitive, verbal and non-verbal responses. .

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A secure attachment supports the development of two key mechanisms: self-regulation and empathy (Fonagy & Target, 1997). The infant is reliant on the mother to teach them these skills and the mother does so by regulating the child's emotions, empathising with the child's feelings and labelling and validating them. A child with an insecure attachment learns that empathy from their mother is either unavailable or inconsistent, and as a result the importance of empathy is not internalised fully within their internal working model.

These underlying mechanisms (self-regulation and empathy) of attachment are predictive of future outcomes. Securely attached children have been found to be more empathetic towards others (LaFreniere & Sroufe, 1985), and more adept at regulating strong emotions successfully than their insecure counterparts (Kobak, Cole, Ferenz-Gillies, Fleming & Gable, 1993). Empathy has been found to be correlated with increased prosocial behaviours (Eisenberg, 2000), with decreased levels of empathy associated with antisocial tendencies, particularly towards others (Lovett & Sheffield, 2007) and violent offending in adulthood (DeZulueta, 2006). The ability to empathise is thought to increase a child's social competence and has been found to be correlated with the child behaving more altruistically (Eisenberg, Miller, Shell, McNalley, & Shea, 1991). Children who find it difficult to read others feelings are hypothesised in the literature to respond to perceived threats in a more aggressive manner as a means of controlling the situation (Scott, 1998).

An insecure attachment can be classified as: avoidant, ambivalent (Ainsworth, 1989) and disorganised (classified by Main & Solomon, 1986). An avoidant attachment emerges from the child who experiences that help with regulating their feelings is unavailable and in response to this they try to regulate their mother's behaviour towards them by suppressing their own emotions. In this situation, the child appears calm, but physiologically they are highly aroused and disregulated (DeZulueta, 2006). In contrast to this, an ambivalent attachment (relatively uncommon, Cassidy & Berlin, 1994) is characterised by an inconsistent parent, who portrays that help with regulating emotions is not consistently

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available. As a result, the ambivalent child is likely to exaggerate their emotions, in an attempt to secure attention from their mother. Last to be classified was the disorganised attachment style (Main & Solomon, 1986), where the mother represents fear and reassurance (Main & Hesse, 1990), commonly due to earlier trauma in their life that has not been processed (DeZulueta, 2006). As a result the child does not learn how to manage and regulate their feelings. Table 1 summarises the different attachment styles and theoretical relations with antisocial behaviour.

In sum, attachment describes a complex relationship between the mothers and child's emotions and behaviours, influenced by innate factors and sensitivities which play out during the development of the relationship.

Table 1 <i>Theoretical framework for attachment</i>		
Secure attachment	<i>Secure attachment style:</i> This attachment style represents a relationship where the mother is consistently available for the child. The mother is able to empathise with the child and validates their feelings, assisting the child to regulate their own emotions. Through this process the mother is coaching the child on how to do this independently when the time comes.	Children with a secure attachment have been found to be more empathetic and more adept at regulating their own emotions. Studies have found that the ability to empathise correlates strongly with the development of prosocial behaviours (Eisenberg et al., 1991)
Insecure attachment	<i>Ambivalent attachment style:</i> This refers to a mother who is inconsistently available to the child to help the child to successfully regulate their emotions. As a result, the child copes with the inconsistency from the mother by exaggerating their emotions, as a way of securing attention from their mother.	An insecure attachment is indicative of the child struggling to read other people's feelings, thought to lead to a diminished ability to employ theory of mind, and reflective functioning (Farrington, 2000), affecting the child's ability to empathise with others and to successfully regulate their behaviours.

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<u>Attachment style</u>	<u>Description</u>	<u>Predictions for ASB</u>
	<p><i>Avoidant attachment style:</i> This occurs when the child attempts to regulate their mother's behaviour towards them by suppressing their own emotions, as a way of coping with their mother's unpredictability.</p> <p><i>Disorganised attachment style:</i> This was first categorised by Main & Solomon (1986), in addition to the ambivalent and avoidant categories. A disorganised attachment style is used to describe a child whose attachment figure represents an unpredictable pattern of both fear and avoidance; hence the child struggles to appropriately regulate their emotions.</p>	<p>Children who have difficulty interpreting a situation may respond to perceived threats with aggressive behaviour as a means of controlling the situation (Scott, 1998).</p> <p>Infants experiencing a traumatic or abusive attachment will develop an internal working model representing a 'moral defence' (Fairbairn, 1952), whereby the child holds the belief that their mistreatment from their parent is their fault, and they maintain the persona of being "bad", to keep their caregiver as an idealised figure, allowing the child to maintain control.</p>

As a child develops into toddlerhood the mother starts introducing boundaries into the relationship to coach the child into using prosocial behaviours, by drawing on the mutual understanding already established between them. For insecurely attached children this process can be problematic as the child has learnt that the world in which they interact is inconsistent, and that they have nothing to lose by defying their parents' attempts at creating boundaries and discipline (Gardner, 1992). This triggers a bidirectional process in which the parents respond by adjusting their parenting style, often resulting in punitive parenting styles characterised by antisocial and negative behaviours being punished (Patterson Patterson, Forgatch, Yoerger, & Stoolmiller, 1998). Through this process the child learns that punishment and antisocial behaviour is an acceptable way to manipulate their environment. In this instance the child forgoes the opportunity to learn family rules and expectations which will later transpose into respect for societal norms (Belsky & Cassidy, 1994).

4. Empirical Research

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Research findings support the idea that early infant attachment affects the biological (Coe, Wiener, Rosenberg, & Levine, 1985), psychological and social development (Light & Dishion, 2007) of the child. A series of cross-sectional studies show that securely attached children have been found to have fewer adjustment problems during childhood, to be more socially and academically competent (Gaik et al., 2010), report higher levels of self-esteem (Arbona & Power, 2003) and display more adaptive coping skills (Gaik et al., 2010). In contrast, insecurely attached children have been found to appear more aggressive and hostile (Kobac et al., 1993), more likely to associate with deviant peers (Light & Dishion, 2007) and as a result display more antisocial behaviours (Cooper, Shaver & Collins, 1998). However, longer-term research exploring the effects of attachment on adjustment in adolescence is scarce (Scott Brown & Wright, 2003), with studies relying on cross-sectional methodological designs and utilising retrospective attachment measures which have been criticised for reconstructing autobiographical memories (Van IJendoorn et al., 2007). A cross-sectional design makes it difficult for a cause and effect relationship to be inferred. Despite this limitation, the studies make good use of the data available and highlight the need for future prospective longitudinal studies.

Laible, Carlo & Roesch (2004) conducted a cross-sectional study and found that adolescents reporting either a secure parent attachment or secure peer attachment have higher levels of self-esteem. The relationship between secure peer attachment and positive self-esteem has been found to be strongly mediated by prosocial behaviour and empathy, with adolescents who reported higher levels of empathy scoring lower on measures of aggressive behaviour, and higher on prosocial behaviour. This research highlights the importance of peer attachment in adolescence, with secure peer attachments activating a positive internal working model reliant upon the adolescent being able to empathise appropriately with peers, and regulate their emotions. A systematic review carried out by Walker & Bright (2009) reviewed 19 articles from 1986-2006 (18 of which were published after 2001) to explore the relationship between self-esteem and violence, and found low self-

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esteem has a stronger association with aggressive and violent behaviours than high self-esteem.

The transition to adolescence initiates both physical and psychological changes that can be stressful for the parent and adolescent (Carter & McGoldrick, 2005) that may reactivate early attachment frameworks. Therefore, it seems plausible that a secure attachment in infancy will be a protective factor against adolescent antisocial behaviour through the building and maintaining of peer relationships.

The role of social competence in mediating attachment security and social behaviour in adolescence was explored further by Laible (2007), who measured affective and cognitive aspects of parent and peer attachment, in a sample of 117 adolescents. They found that secure peer and parental attachments were correlated with all areas of social and emotional competence including prosocial behaviour; suggesting that attachment relationships are key to the development of interpersonal skills, protecting against antisocial behaviour. Again, inferring cause and effect from this research was not possible due to the correlation design; also the ecological validity of the results was limited due to the homogeneous sample (white Caucasian) studied.

Further research by Nelis & Rae (2009) found adolescents with insecure attachments tended to report more interpersonal difficulties, which may contribute to greater levels of anxiety and depression. Nelis & Rae (2009) went on to argue that peer attachment was just as important as parental attachment during adolescence, with the skills to form close peer relationships reliant on a secure attachment in infancy to assist with the development of empathy. In summary, higher levels of empathy in adolescence was associated with higher levels of prosocial behaviour and a decreased level of aggression (Carlo, Raffaelli, Laible & Meyer, 1999).

4.1 Research Exploring Maternal Sensitivity and Antisocial Behaviour

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There is growing evidence to suggest that a secure infant attachment is dependent on the mother's ability not only to respond consistently to their infant but also to respond sensitively to their needs (Meins & Fernyhough, 1999), within the child's zone of proximal development (Bigelow, McLean, Proctor, Myatt, Gillis & Power, 2010). Such findings suggest that this requires a multimodal approach to researching attachment (Laranjo, Bernier & Meins, 2008) that considers the role of maternal sensitivity, which has been found to be central to forming a secure attachment (Ainsworth, 1978; Lundy, 2003; Meins, Fernyhough, Fradley, & Tuckey, 2001). Maternal sensitivity can be observed in interactions with the child from age 3-5 months centring on face-to-face interaction, and between 6-9 months fostering mutual interest between the mother and child. For maternal sensitivity to be achieved, the mother needs to be able to interpret and respond to their infant's mind, a concept termed by Meins & Fernyhough (1999) as mind-mindedness. Mind-mindedness has been found through empirical research to be a pre-requisite for maternal sensitivity, with maternal sensitivity found to partially mediate the relationship between mind-mindedness and a secure attachment (Laranjo, Bernier & Meins, 2008). Although the research suggests a linear relationship between the variables, the authors point out that the analysis looks at correlations and a longitudinal study is needed to sufficiently infer causality. However, it does suggest that maternal sensitivity measures could be used as an indicator of attachment style, further supported by Bigelow et al., (2010).

At the time of writing this review there were no studies looking at the effect of maternal sensitivity on adolescent antisocial behaviour, despite studies suggesting that maternal sensitivity is predictive of better childhood outcomes (Jaffari-Bimmel et al., 2006). Recent research by Wang Christ, Mills-Koonce, Garrett-Peters & Cox (2013), found maternal sensitivity in infancy decreased externalising and antisocial behaviours in childhood, but this has yet to be confirmed in adolescence.

4.2 Research on Separation and Antisocial Behaviour

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In infancy, a secure attachment is testable using the 'Strange Situation' (Ainsworth, 1978), a laboratory based procedure to test an attachment style, typically used at the age of 12 to 18 months. This process simulates separation between the child and the caregiver for a short period of time, with the mother/caregiver asked to leave the room leaving the baby on their own with a stranger. The child's reaction to the separation is observed, as well as the child's behaviour when they are reunited with the caregiver following the brief separation. Typically a child with a secure attachment is observed to exhibit signs of distress when the mother leaves the room, but is consoled and soothed once the mother returns. Children with ambivalent, anxious or disorganised attachment styles will either be unaffected by their mother's absence, or inconsolable on their return. Separation anxiety shown by children in this situation is developmentally appropriate between 6 and 20 months of age, with infants traditionally growing out of this from two years. However for some children, separation anxiety can persist into childhood, interfering with everyday activities, and has been found to be more common in children with insecure attachments, particularly those classified with an ambivalent attachment at age 15 months (Dallaire & Weinraub, 2005). Infants with an insecure attachment learn that their caregiver is not consistently available, hence may be more anxious when separated from them, due to being uncertain of whether they will return.

Separation for the child from their caregiver can be extremely stressful when young, and as repeated separations occur the child builds an IWM of the separation experience. For children with a secure attachment they learn that although the separation is stressful, their caregiver predictably returns. For children with an insecure attachment they have learnt that their caregiver is not always predictably available and hence separations can be a particularly stressful experience. Empirical research has looked at a range of different types of separations from separations during nursery (Ditting et al., 1999), to longer-term separations including parental divorce. With regard to defining separations in relation to attachment, these include any experiences that mark an absence in availability of the caregiver from the infant, causing the infant distress.

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In 1975 and 1976, two studies indicated an association between brief hospital admission and increased risk of later delinquency (Douglas 1975; Quinton & Rutter, 1976). However, causality could not be inferred by the studies due to methodological constraints; utilising a cross-sectional design, which is not conclusive of a causal relationship. More recently, this relationship has been observed following brief hospitalisation for the infant, following which they were found to exhibit increased avoidant behaviours following stressful events, suggesting an adaptive coping style of turning their attention away from their caregiver (Kooman & Hoeksma, 1993). This observation was observed following further separations included an induced separation at home, and the strange separation, with children admitted to hospital at 12.5 months displaying more behaviour problems at follow-up (18 months) than those admitted to hospital at 9.5 months). The length of stay for the group admitted to hospital at 12.5 months was also found to be significantly longer than the group at 9.5 months.

4.3 Research on Gender and Antisocial Behaviour

The prevalence of antisocial behaviour prior to adolescence has been found to be greater in males than females, with an estimated ratio of 4:1 which is reported to be 2:1 in adolescence, with males still exhibiting a greater incidence of antisocial behaviour (Frick, 2006). It is hypothesised that this is due to girls maturing at a faster rate cognitively, socially and biologically in comparison to their male counterparts, and having a higher resistance to trauma (Keenan & Shaw, 1997). A meta-analysis by Fontaine, Carbonneau, Vitaro, Barker, & Tremblay (2009) reviewing 46 studies found that the current research supports gender differences in adolescent antisocial behaviour. They found that antisocial behaviour in females follows a different developmental trajectory to males. However, the studies reviewed used threshold and global measures of antisocial behaviour, which focused on aggressive acts and official crime data within a small, male dominated sample. The limitations of the empirical research reviewed by Fontaine and colleagues supports the need

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for future longitudinal analyses accounting for gender differences, using self-report measures, as advocated by other researchers (Bailey, Pedersen, Lösel, & Vermeiren, 2006).

4.4 Review of Methodological Approaches

The review of the empirical evidence highlights the limitations of using cross-sectional studies to investigate a relationship that is theoretically implicated to be longitudinal in nature. The research supports the hypothesis that a secure early infant attachment and positive maternal sensitivity are important for adolescent adjustment (Laible, 2007; Laible, Carlo & Roesch, 2004), with a secure attachment acting as a protective factor against the development of antisocial behaviour, and an insecure attachment as a risk factor (see Table 1 for clarification on types of attachment). However, the evidence to date is retrospective and cause and effect cannot be reliably concluded.

The Edinburgh Study of Youth Transitions and Crime (ESYTC; 1998), used a cohort of approximately 4,300 young people aged 11½ and 12½ years of age, set up with the objective of furthering knowledge and understanding of offending behaviour in young people. Self-report questionnaires were used to measure antisocial behaviour and delinquent behaviour. The questionnaires gave an aggregate score of antisocial behaviours. At ages 12-13 years, the ESYTC had revealed that a high proportion of teenagers participating in the study had engaged in some form antisocial behaviour, with 11.7% of respondents reporting 21 or more acts (mean number of 4.2; Smith et al., 2001), with distinct phases of offending emerging as the study progressed, defined as: onset, escalation and desistance (Blumstein, Cohen & Farrington., 1988), an observation that would have gone unnoticed in a cross-sectional study.

A longitudinal study based in the south west of England (The Avon Longitudinal Study of Parents and Children, ALSPAC), established in 1991 is collating data on a non-clinical sample of 13,971 children from birth, with some measures taken in the antenatal stage. Studies on this data set are unique as they have access to measures taken across

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the lifespan from a large population based sample. In recent years, there have been a number of influential studies using these data to support three developmental trajectories of conduct disorder: childhood limited, adolescent only and early onset persistent (Barker & Maughan, 2009; Barker, Oliver, Maughan, 2010; Moffitt et al., 2008).

Bowen & Heron (2008) looked at the discrepancies in antisocial behaviour at 8.5 years and 10.5 years using a sample taken from the ALSPAC study. They found that children who had engaged in antisocial behaviour at the age of 8.5 years were more likely to have engaged in further antisocial behaviour at age 10.5 years. Those who were found to engage persistently in antisocial behaviour had significantly greater conduct problems in adolescence, poor peer relationships, higher levels of family adversity, lower level of IQ and decreased levels of prosocial behaviour. These risk factors were further explored by Bowen, Komy & Steer (2008), who used data, from ALSPAC, collected up to the age of 8.5 years to investigate risk factors of antisocial behaviour. They created a high risk category (defined as being exposed to a number of adverse or stressful factors) and found that 88% of this group had either no incidents of reported antisocial behaviour or only one incident. Those resilient to antisocial behaviour were then compared with the rest of the high risk group, and found to have higher self-esteem, greater school enjoyment, higher IQ and lower levels of family adversity.

The use of cohort and longitudinal data overcomes some of the methodological limitations imposed by cross-sectional designs, but they also incur their own pitfalls due to inevitable attrition and missing data, with high risk populations (for example, individuals exhibiting antisocial behaviours) more prone to being lost to follow-up (Wolke, Waylen, Samara, Steer, Goodman, Ford, & Lamberts, 2009).

5. Review Conclusion

There is extensive literature on the importance of attachment in infancy, with recognition of the long-term effects that an insecure attachment can have on development

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throughout infancy, childhood, adolescence and into adulthood. From this review of relevant theoretical and research literature, it is suggested that a secure infant attachment is a protective factor against the development of adolescent antisocial behaviour, as explored in recent studies (Laible, 2007; Laible, Carlo & Roesch, 2004; Nelis & Rae, 2009). There is also theoretical and empirical evidence to support the hypothesis that separation for short and longer periods of time, between the infant and their primary caregiver, can have an adverse affect on developmental outcomes including antisocial behaviour (Douglas 1975; MacDonald, 1985; Quinton & Rutter, 1976). Separation between the infant and caregiver is associated with the outcome of adolescent antisocial behaviour, but as far as the author is aware, there are no longitudinal studies to prove this link, and the lack of prospective longitudinal data to assess later adolescent outcomes has been recently noted (Liu, 2011).

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Appendix A: Results from literature search

Table 1
Results from Literature Search

Search Terms ¹	Applied Social Sciences Index and Abstracts (ASSIA)	Sciencedirect ²	Psycharticles EBSCO host ³	Web of knowledge ⁴	British Medical Journals ⁵
Adolescent Antisocial Behaviour	400	257	27	267	9
Adolescent Antisocial Behaviour (& Maternal	22	11	2	2	1
Adolescent Antisocial Behaviour (& Maternal sensitivity	1	2 (1 English)	0	0	0
Adolescent Antisocial Behaviour (& Maternal (& Sensitivity	1	search not valid	0	0	0
Adolescent Antisocial Behaviour (& Attachment	5	6 (4 English)	0	4	1

¹ Last searched/checked on the 27th April 2013

^A Abstract search

³ Abstract search

⁴ Title search, restricted search criteria

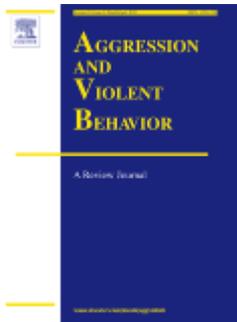
⁵ Abstract and title

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Adolescent Antisocial Behaviour (& Separation	3	5	0	1	0
Adolescent Antisocial Behaviour (& Separation anxiety	1	1	0	0	0
Adolescent Antisocial Behaviour (& Separation (& Anxiety	1	search not valid	0	0	0
Separation (& Behaviour	223	10,583	142	1,294	18
Separation (& Antisocial Behaviour	8	10	0	1	1

Appendix B: Author Guidelines

Author Guidelines retrieved from: <http://www.elsevier.com/journals/aggression-and-violent-behavior/1359-1789/guide-for-authors>, on 1st May 2013.



Aggression and Violent Behaviour



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-
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Divide your article into clearly defined and numbered sections. Subsections should be numbered 1.1 (then 1.1.1, 1.1.2, ...), 1.2, etc. (the abstract is not included in section numbering). Use this numbering also for internal cross-referencing: do not just refer to 'the text'. Any subsection may be given a brief heading. Each heading should appear on its own separate line.

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State the objectives of the work and provide an adequate background, avoiding a detailed literature survey or a summary of the results.

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- **Theory/calculation**
A Theory section should extend, not repeat, the background to the article already dealt with in the Introduction and lay the foundation for further work. In contrast, a Calculation section represents a practical development from a theoretical basis.
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Results should be clear and concise.
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This should explore the significance of the results of the work, not repeat them. A combined Results and Discussion section is often appropriate. Avoid extensive citations and discussion of published literature.
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