Effective strategies for promoting attachment between young children and their parents

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It was authored by Dr Carolyn Doughty (Research Fellow), who conducted the critical appraisals, prepared the report and coordinated the project.

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The literature search strategy was developed and undertaken by Ms Susan Bidwell (Information Specialist Manager). Ms Cath Turnbull (Administrator) provided document formatting. Internal peer review was provided by Dr Robert Weir (Director).

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LEVEL OF EVIDENCE CONSIDERED IN TECHNICAL BRIEFS

Technical Briefs are rapidly produced assessments of the best available evidence for a topic of highly limited scope. They are less rigorous than systematic reviews. Best evidence is indicated by research designs which are least susceptible to bias according to the National Health and Medical Research Council’s (NHMRC) criteria (see Appendix 1). Where methodologically acceptable and applicable, appraised evidence is limited to systematic reviews, meta-analyses, evidence based clinical practice guidelines, health technology assessments and randomised controlled trials (RCTs). Where not available, poorer quality evidence may be considered.

CONFLICT OF INTEREST

None.
EXECUTIVE SUMMARY

Objective

To systematically identify and appraise international evidence on the effectiveness of specific interventions for promoting attachment between young children and their parents.

Data sources

The literature was searched using the following databases: Medline, Embase, Cinahl, Current Contents, Science/Social Science Citation Index, Cochrane Central Register of Controlled Trials, Index New Zealand and Te Puna-New Zealand Bibliographic Database. Other electronic and library catalogue sources searched included the Cochrane Database of Systematic Reviews, Database of Abstracts of Reviews of Effectiveness, the NHS Economic Evaluation Database, Health Technology Assessment Database and the ACP Journal Club. Wider searches of the Internet, hand searching of journals and contacting of authors for unpublished research were not undertaken.

Searches were limited to English language material and published between January 1999 and December 2006 inclusive.

Study selection

Studies were included if they investigated the effectiveness of an early intervention or intervention strategy which aimed to promote the development of positive, trusting parent-child relationships. Clinical and home-based interventions including group-based parent training programmes, other types of parent training or education, home visiting programmes with a clearly identified parent training component and relationship-based interventions were considered. Key socio-emotional outcomes, usually relating to the relationship with the maternal parent must have been reported for either parental sensitivity or responsiveness to infant needs and/or infant-parent attachment security. Only relevant systematic reviews, meta-analyses and randomised controlled trials within the timeframe were eligible for appraisal.

Excluded studies included those that reported on outcomes for specific populations including adoptees, pre-term infants, and children with severe existing behavioural problems. Children with other serious mental health issues or developmental problems and mothers with drug dependency were also excluded. Interventions for preventing family violence, child abuse and neglect including interventions that target parental attitudes and behaviours around violence were not examined. Studies that focused on a primary outcome related to child physical health (breastfeeding and nutrition, intention to vaccinate, sudden infant death, accidental injury, use of medical services), brief postnatal interventions with the Brazelton Neonatal Behavioural Assessment Scale and early skin-to-skin contact or infant massage for mothers and infants were not eligible.

Data extraction and synthesis

A systematic method of literature searching, selection and appraisal was employed in the preparation of this report.

Of more than 517 potentially relevant articles/abstracts identified, 105 articles were retrieved as full text from which a final group of 20 studies were selected. Of these, two systematic reviews, 18 randomised controlled trials (represented by 24 articles) were identified as eligible for inclusion in this Technical Brief.
**Key results and conclusions**

Changes reported in attachment security were generally in a direction consistent with attachment theory; however effect sizes were relatively modest. Less broad interventions that target sensitive maternal behaviour are among those that are the most successful both at improving insensitive parenting and promoting better infant attachment security.

Results suggest that the most effective interventions do not always use a large number of sessions with families, in fact fewer contacts may be more effective. There is good evidence supporting the use of behaviourally focused interventions and these types of interventions, with or without video feedback are effective regardless of the presence or absence of multiple problems in the family. Highly intensive interventions with numerous sessions focusing on sensitivity, representation and support may not be as effective as less intensive approaches.

Overall, evidence from primary and secondary research shows that a variety of types of intervention for enhancing maternal sensitivity and to a lesser extent attachment security are effective, with nearly all of the studies appraised in this review involving the use of some form of home visiting to deliver the intervention.

**Limitations of this report**

The size of included studies ranged from very small pilot trials to larger multi-site studies. Some of the smaller studies may not be of adequate size to detect an intervention effect, if there is one, whereas the larger studies that used broader approaches although sufficiently powered may have not resulted in significant effects for a number of reasons. These types of more general home visiting programmes may be more likely to show patterns of small pervasive benefits than large effect sizes for specific outcomes.

Differential attrition may present an issue for these longer term interventions as it may be difficult for the control group to remain motivated to participate in the face of problems but no active support from the programme. For studies in which specific populations were targeted, treatment effects found may hold only for the participants of that specific sample and results may not be generalisable to other groups. All of the studies considered focused on exclusively mother-infant interaction rather than father or parent-child interaction which are consistent with previous reviews that have only noted several such studies.

Within individual studies the aim or objective was often described but without reference to the specific individual components of the intervention or the process by which intervention goals were achieved. Although research only trials were in theory excluded from this review, in the absence of predetermined criteria to ascertain what this meant in practice (eg. laboratory versus community setting) a small minority of the included studies may be nearer to being efficacy than effectiveness trials. Efficacy studies may not truly reflect how a therapeutic intervention might be more flexibly applied in a real world setting as opposed to the research setting but remain informative for considering what interventions demonstrate potential and therefore what future research might be indicated.

**MeSH headings**

parent-child relations, object attachment, child-preschool, infant, early intervention (education), family therapy, intervention studies, prevention

**Additional key words**

Attachment, resilience, wellbeing, well being, wellness, early intervention, parent$ program$, parent$ train$, parent$, educat$, home visit$, domiciliary visit$, family visit$, multisystemic therapy, healthy steps, healthy start, early start, healthy famil$, (promot$ and wellbeing or wellness or attachment or well being).
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BACKGROUND

This Technical Brief was requested by Dr Pat Tuohy, Chief Advisor of Child and Youth Health, New Zealand Ministry of Health and aimed to critically appraise the evidence for effectiveness of a range of early intervention strategies seeking to promote attachment between young children and their parents.

The scope of this report reflects the Ministry of Health’s priority to understand what actions can be taken or future services developed to ensure healthy socio-emotional development, including secure attachment in young children before they start school. Healthy child development has been identified as one of the key determinants of health and resiliency in adulthood. Therefore parent support interventions aimed at improving the parent-child relationship are indirectly targeting the future resilience capacity of children for whom healthy development may be at risk.

Research indicates that the quality of the parent-infant relationship creates conditions for establishing healthy patterns of functioning throughout childhood and adulthood. Early secure attachments with parents provide a firm basis for secure attachments later in life. Furthermore, insecure attachment prior to the age of 2 years is associated with a range of poor outcomes that includes conduct problems, low sociability, poor peer relations, anger, and poor behavioural self-control during the preschool years (Barlow and Parsons 2006) and beyond. In a classic treatise on attachment Ainsworth and colleagues (1978) described a method of categorising infants’ responses using the “strange situation”. The categories that result from this procedure are based on the child’s behaviours when the child and mother are alone in the playroom together, when the mother leaves the room, when a strange woman offers comfort, and when the mother returns.

Table 1. Typology of child attachment patterns or responses to the “strange situation”

<table>
<thead>
<tr>
<th>Anxious/Avoidant</th>
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<tbody>
<tr>
<td>mother and child are left alone together in playroom</td>
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<tr>
<td>the child is more or less indifferent to where their mother is sitting</td>
</tr>
<tr>
<td>may or may not cry when their mothers leave the room</td>
</tr>
<tr>
<td>if the child becomes distressed, strangers are likely to be as effective as comforting them as their mothers</td>
</tr>
<tr>
<td>when the mother returns these children may turn or look away from her instead of seeking closeness or comfort.</td>
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</table>

<table>
<thead>
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<th>Securely Attached</th>
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<tr>
<td>if the mother is present, the child plays comfortably with the toys in the playroom and reacts positively to the stranger</td>
</tr>
<tr>
<td>the child become visibly and vocally upset when their mothers leave</td>
</tr>
<tr>
<td>the child is unlikely to be consoled by a stranger</td>
</tr>
<tr>
<td>when the mother reappears, the child climbs into her arms, quickly calms down and resumes playing</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Anxious/Resistant</th>
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<tr>
<td>these children have trouble from the start in the strange situation</td>
</tr>
<tr>
<td>the child stays close to their mother and appears anxious even when their mother is near</td>
</tr>
<tr>
<td>the child becomes very upset when their mother leaves, but is not comforted by her return</td>
</tr>
<tr>
<td>the child may seek renewed contact with their mother and resist her efforts to comfort them</td>
</tr>
<tr>
<td>the child may cry angrily to be picked up with their arms outstretched, but will struggle to climb down once they are in their mother’s arms</td>
</tr>
<tr>
<td>these children do not readily assume playing after their mother returns, instead they keep a wary eye on her.</td>
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</tbody>
</table>

After (Ainsworth et al. 1978; Cole and Cole 1997)

Further to this typology, some child-parent attachment relationships appear to be characterised by the absence or breakdown of an organised strategy, for dealing with the stresses of separations, illness, and other life threatening events. This has been described as disorganised attachment (Juffer et al. 2005). The rates of disorganised attachment in low-risk families are about 15% compared to high-risk samples where elevated rates (up to 80%) have been found. Disorganised attachment in infancy has been shown to predict problems with stress management, increased externalising behaviour and dissociative behaviour in adolescence (Juffer et al. 2005b). It is considered to be of clinical importance as it is also predictive of later psychopathology. It highlights the need to search for determinants of attachment disorganisation with the goal of developing effective child-parent interventions to mitigate its effect on normal child development.
This Technical Brief focuses on identifying studies that have experimentally evaluated attachment-based interventions. Experimental intervention studies that aim at changing parental behaviour or children’s development are important partly because of the dominance of non-experimental research in the field of parenting and child development. Descriptive, cross-sectional or longitudinal designs are far more common than experimental studies but a moderate number of experimental studies have been conducted. Of these, only a minority of studies target low risk parents with healthy children with more studies being concerned with interventions designed for infants at risk for problematic socio-emotional development, for parents in adverse circumstances, or for families with both parents and children at-risk. Studies frequently examine special groups of children including families with premature infants (Brisch et al. 2003), clinically referred children (Cohen et al. 1999) or mothers (Field et al. 1998; Suchman et al. 2004), children with developmental disabilities, anxious-withdrawn preschoolers (LaFreniere and Capuano 1997), or internationally adopted infants (Juffer et al. 1997) but these particular studies were outside the scope of this report.

Dunst et al. (2004) noted that parental sensitivity has been implicated as a factor influencing and contributing to variations in child developmental outcomes. Ainsworth (1978) defined sensitivity as the ability to perceive the child’s signals correctly and react to these signals promptly and adequately. Sensitivity has been proposed to have a causal role in shaping attachment. For this reason, many interventions that have the goal of promoting children’s emotional and social development, especially their attachment security attempt to do so by enhancing maternal sensitivity or responsiveness. In these types of intervention the parent’s behaviour toward the child is the focus of the intervention. Attachment-based interventions start at the most basic level of sensitivity and aim to make parents better perceivers of their child’s needs by teaching them observational skills. Intervenors may also encourage and train parents to perceive their child’s behaviour in a more objective way, by explaining salient issues around child development.

The primary focus of this Technical Brief was to review recent evidence from systematic reviews and randomised controlled trials about a range of early intervention strategies that seek to promote attachment between young children and their parents.
EFFECTIVE STRATEGIES FOR PROMOTING ATTACHMENT BETWEEN YOUNG CHILDREN AND THEIR PARENTS

SELECTION CRITERIA

Study inclusion criteria

Publication type

Studies published between January 1999 and December 2006 inclusive in the English language, including primary (original) research (published as full original reports) and secondary research (systematic reviews and meta-analyses) appearing in the published literature.

Context

Studies reporting on effective strategies for promoting attachment between young children and their parents

Population of interest

Infants and young children aged 0 to 4 years, inclusive. Parent/s or primary caregivers of sample children.

Setting

Community (home or clinic)

Intervention

Studies that investigate the effectiveness of an early intervention or strategy which aims to promote the development of positive, trusting parent-child relationships.

Clinical and home-based interventions may be universal or selective and include

- group-based parent training programmes
- other parent training or education programmes
- home visiting programmes with a clearly identified parent training component
- relationship-based interventions

Outcomes

Key socio-emotional outcomes, usually relating to the relationship with the maternal parent must have been reported in either of the following categories:

- parental sensitivity or responsiveness to infant needs
- infant-parent attachment security

Outcomes measures directly addressing sensitivity and attachment including but not limited to the:

- Ainsworth sensitivity rating scales (e.g. strange situation)
- Home Observation for Measurement of the Environment (HOME)
- Erickson rating scales for maternal sensitivity and supportiveness
- Nursing Child Assessment Feeding (NCAFS) and Teaching Scales (NCATS)

Study design

Systematic review or meta-analysis
Randomised controlled trials

Sample size

Studies with samples of at least 10 participants.
**Study exclusion criteria**

Studies were excluded if they:

- were non-systematic reviews, letters, editorials, expert opinion articles, comments, book chapters, articles published in abstract form, and studies on animal subjects,
- were not published work or were non-English language articles,
- were evidence obtained from comparative studies, case series, either post-test or pre-test/post-test, (Level III and IV intervention evidence).
- reported on programmes that focused on settings where 50% or more of the sample had a mean age > 5 years
- reported only outcomes for specific populations where 50% or more of the sample were adoptees, pre-term infants, children with severe existing behavioural problems, children with other serious mental health issues or developmental problems or mothers with drug dependency
- other multi-component or comprehensive programmes except where specific outcomes of interest were clearly reported
- focused on specific interventions for preventing family violence, child abuse and neglect including interventions that target parental attitudes and behaviours around violence
- did not clearly describe the methods and results, or where there were significant discrepancies
- were implemented only in a research setting
- focused on a primary outcome related to child physical health (breastfeeding and nutrition, intention to vaccinate, sudden infant death, accidental injury, use of medical services)
- were on brief postnatal interventions with the Brazelton Neonatal Behavioural Assessment Scale
- were on early skin-to-skin contact or infant massage for mothers and infants
- were on parental satisfaction with services or programmes
- evaluated the process of the early intervention (e.g. uptake of programme) rather than eligible outcomes

**MAIN SEARCH TERMS**

**MeSH headings (Medline subject headings):** parent-child relations, object attachment, child-preschool, exp infant, “early intervention (education)”, family therapy, intervention studies, pc.fs (prevention & control as floated subheading)

**Embase subject headings** (where different from Medline): emotional attachment

**PsychInfo subject headings** (where different from Medline): attachment behavior, early intervention, parent training, family intervention, exp multimodal treatment approach, treatment effectiveness evaluation

**Additional free text** (used in all databases): attachment, resilience, wellbeing, well being, wellness, early intervention, (parent$ adj3 program$), (parent$ adj3 (train$ or educat$)), (home adj2 visit$), domiciliary visit$,(family adj2 visit$), multisystemic therapy, healthy steps, healthy start, early start, healthy fami$, (promot$ and (wellbeing or wellness or attachment or well being))

Correspondence was excluded from the search and references with vaccination, immunisation or breastfeeding (or variant forms) in the title of the article were excluded in all databases.

Full details of the search strategies are presented in Appendix 2.

**Principal sources of information**

Bibliographic databases
- Medline
- PubMed (last 90 days)
- Embase
References of all retrieved papers were scanned for further relevant studies.

Extended searching of internet websites, meeting abstracts, hand searching of journals, and contacting of authors for unpublished data was not undertaken for this Technical Brief.

SEARCH SOURCES

Search methodology

Searches were for material in English published from 1999 onwards. Searches of Medline and PsychInfo were carried out on 12 October 2006. Other databases were searched on 8 January 2007. A follow-up search for additional material on home visiting was carried on 26 January 2007 and an update of the Medline and PsychInfo databases on 8 February 2007.

APPRAISAL METHODOLOGY

Summaries of appraisal results are shown in tabular form (known as Evidence Tables) which detail study design, study setting, sample, methods, results, reported conclusions and NZHTA reviewer conclusions/comments based on the limitations and validity of the study. The spelling of the original article is retained in the Evidence Tables.

The evidence presented in the selected studies were assessed and classified according to the NHMRC’s revised hierarchy of evidence (Appendix 1).

RESULTS

From the above search strategy we identified 517 potentially relevant articles/abstracts of which 108 were retrieved. Of these retrieved articles, 81 were excluded. These papers, annotated with the reason for exclusion, are presented in Appendix 3a.

- primary outcomes of interest were not evaluated at all (n=18)
- narrative review or background article (n=17)
- attachment interventions and related outcome were not the focus of primary or secondary study (n=15)
- population outside scope (n=10)
- descriptive or cross sectional study (n=8)
- they focused on home environment (HOME) only and did not examine any other relevant outcomes (n=6)
- case study or pretest/post-test study (n=3)
- editorial, commentary or book chapter (n=2)
- letter to the editor or conference abstract (n=1)
- research focus only (n=1)
Two secondary studies and 18 primary studies (from a total of 24 articles) were critically appraised (listed in Appendix 4). The included papers are presented in the evidence tables on the following pages. Two systematic reviews that were directly relevant to the present review were identified, although it is noted that neither of these were exclusively reviews of controlled trials. However the review by Bakermans-Kranenburg et al. (2003) did establish a core set of randomised controlled trials on which their principal analyses were based. All of the primary studies selected for inclusion were level II according to NHMRC’s hierarchy of intervention evidence (NHMRC 2005).
### Table 2. Evidence table of a secondary research appraised relating to effective strategies for promoting attachment between young children and their parents.

<table>
<thead>
<tr>
<th>Authors Country</th>
<th>Study Design</th>
<th>Scope</th>
<th>Methods</th>
<th>Results</th>
<th>Authors’ conclusions</th>
<th>Limitations</th>
<th>Comments</th>
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<tr>
<td>Bakersman-Kranenburg et al. (2005) The Netherlands.</td>
<td>Systematic Review/ Meta-Analysis</td>
<td>Interventions to prevent disorganized attachment. Review conducted in Leiden University. Setting and participants Healthy participants, clinically referred groups, children at risk and mothers at risk. Any setting but 87% (n=13/15) were home-based.</td>
<td>Search Strategy Electronic databases PsycINFO, Dissertation Abstracts and Medline were searched with key terms attachment, sensitivity (or responsiveness) and intervention (preventive or therapeutic). Citation searching was undertaken of retrieved papers, books, book chapters. Experts in the field were approached. Inclusion criteria any intervention studies that assessed disorganized attachment with specific coding or criteria for disorganization/disorientation, or atypical attachment middle class families with healthy infants clinical and at-risk populations</td>
<td>Ten studies1 with 15 preventive interventions (N=842) were found that included infant disorganized attachment as an outcome measure. The effectiveness ranged from negative to positive, with an overall effect size of $d = 0.05$ (ns). Effective interventions started after 6 months of the infant’s age ($d=0.23$). Interventions that focused on sensitivity only were significantly more effective in reducing attachment disorganization ($d=0.24$) than interventions that focused on support and parent’s mental representations ($d=-0.04$). Most sample characteristics that were not associated with differences in effect sizes, but studies with children at risk ($d=0.29$) were more successful than studies with at-risk parents ($d=0.10$), and studies on samples with higher percentages of disorganized children in the control group were more effective ($d=0.31$) than studies with lower percentages of disorganized children in the control group ($d=0.18$). Authors’ conclusions The meta-analysis shows that disorganized attachments may change in response to sensitivity-focused interventions but also suggests that interventions that specifically focus on the prevention of disorganization may be warranted.</td>
<td>Limitations none of the studies examined an intervention aimed exclusively at preventing disorganized infant attachment or focused on the reduction of frightening/frightened parental behaviours broader interventions dubbed “psychotherapy” in the kitchen may require more skilled intervenors, that may be scarce however more focused programmes may potentially be delivered by people trained to adhere to an intervention protocol professional intervenors appear to be more effective but more data on this is required to be definitive only a few studies actually yielded positive effects, those aimed at promoting sensitivity and infant-parent attachment security but not more specific attachment security</td>
<td>Four important moderators (age when intervention started, type of intervention, type of risk of involved families, base rate of disorganization in control group) were found while broader approaches may not result in a significant effect they may be required first to enable multi-problem families to engage in more focused effective interventions targeting sensitivity and representations Interactive correlates of disorganization such as frightening/frightened, non-involved or intrusive parental behaviours may be important to include in future studies the current review and meta-analysis suggests that attachment disorganization can be prevented or changed and that sensitivity-focused feedback should be an essential part of future interventions.</td>
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Table 2. Evidence table of secondary research appraised relating to the effectiveness of interventions to promote attachment

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<thead>
<tr>
<th>Authors Country</th>
<th>Study Design</th>
<th>Scope</th>
<th>Methods</th>
<th>Results Authors’ conclusions</th>
<th>Limitations Comments</th>
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<tr>
<td>Bakersman-Kranenburg et al. (2005) The Netherlands. Continued</td>
<td></td>
<td></td>
<td>A detailed coding system was used to rate every intervention study on design, sample and intervention characteristics. Studies were coded independently by two raters and intercoder reliability established.</td>
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<td>Interventions to enhance parental sensitivity and infant attachment security. Review conducted in Leiden University. Setting and participants Healthy participants, clinically referred groups, children at risk and mothers at risk. Any setting but 78% (n=40/51) were home-based.</td>
<td>Search Strategy: Electronic databases PsychINFO, Dissertation Abstracts and Medline were searched with key terms attachment, sensitivity (or responsiveness) and intervention (preventive or therapeutic). Citation searching was undertaken of retrieved papers, books, book chapters. Experts in the field were approached. Inclusion criteria: 1. interventions starting before children’s mean age of 54 months 2. studies using classic Ainsworth sensitivity rating scales 3. studies with posttests based on the Home Observation for Measurement of the Environment (HOME) 4. studies using the Nursing Child Assessment Teaching Scale (NCATS) 5. Erickson rating scales for sensitivity and supportiveness Exclusion criteria: 1. case series 2. unpublished studies 3. interventions only reported at meetings or conferences</td>
<td>Sevenly studies were traced including 88 interventions. Data on 9957 children and their parents were reported. A total of 88 intervention effects on sensitivity (n=7634) and/or attachment (n=1503) were produced. To estimate the combined effect size in the set of studies with the strongest designs only the intervention studies with randomized control group design were selected. A core set of 51 RCTs was established (6282 mothers with their children). Interventions were moderately effective in enhancing maternal sensitivity (d=0.33, p&lt;0.001). Random studies were less effective than other studies (d=0.61, p&lt;0.001). Interventions focusing on sensitivity only (d=0.45, p&lt;0.001), combined sensitivity and support (d=0.27, p&lt;0.001), combined representation, sensitivity and support (d=0.46, P&lt;0.001) showed substantial effect sizes. Interventions focusing on sensitivity only were more effective (d=.45) than all other types of interventions combined (d=0.27, p=0.03). Interventions with video feedback were more effective (d=0.44) than interventions without this method (d=0.31, p=0.04). Interventions with fewer than five sessions were as effective (d=0.42) as interventions with 5 to 16 sessions (d=0.38) but interventions with more than 16 sessions were less effective (d=0.21) than interventions with a smaller number of sessions (p&lt;0.001). Interventions starting later (d=0.44) were more effective than interventions starting prematurely (d=0.32) or in the first 6 months of life (d=0.28, p=0.04).</td>
<td>Limitations: 1. In general attachment security may be more difficult to change than maternal insensitivity 2. Small samples may lack power to detect a moderate intervention effect 3. Randomization with a small number of participants may result in systematic differences between control and experimental groups 4. There may be a ceiling effect when relatively high scores in the control group prevent any intervention effects from being detected 5. Slepper effects (time lag between changes in sensitivity and attachment) may make it difficult to evaluate program effectiveness as only long-term effects on deeply rooted relational or representational characteristics are to be expected 6. Analyses were limited to maternal sensitivity</td>
<td>Some studies with outlying effect sizes were identified and excluded from further analysis (Van den Boom 1994 and a subsample of Zahr 2000). To avoid excessive influence of the large multisite intervention study (St Pierre and Layzer) analyses for this study were based in the windstorted number. Only a small number of the interventions were aimed at both mothers and fathers (three studies in total). Fail-safe n=913, that is it would take more than 900 unpublished studies without intervention effects to cancel out combined effect size of randomized studies</td>
</tr>
</tbody>
</table>
# Table 2. Evidence table of secondary research appraised relating to the effectiveness of interventions to promote attachment

<table>
<thead>
<tr>
<th>Authors Country</th>
<th>Study Design</th>
<th>Scope</th>
<th>Methods</th>
<th>Results Authors’ conclusions</th>
<th>Limitations Comments</th>
</tr>
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<tr>
<td>Bakersman-Kranenburg et al. (2003) The Netherlands Continued.</td>
<td>brief postnatal interventions with the Brazelton Neonatal Behavioral Assessment Scale</td>
<td>A detailed coding system was used to rate every intervention study on design, sample and intervention characteristics. Studies were coded independently by two raters and intercoder reliability established. Disagreements were discussed to consensus.</td>
<td>Authors’ conclusions: The current meta-analytic data suggest that interventions with a clear focus and a modest number of sessions are preferable. Interventions with an exclusively behavioural focus on maternal sensitivity appear to be the most effective not only in enhancing maternal sensitivity but also in promoting children’s attachment security.</td>
<td>* Four studies that did not use personal contact as a means of intervening (d=0.62, p&lt;.05) had largest effect sizes. These studies relied on holding infant close (soft baby carriers, snuggles, kangaroo method etc). It is paradoxical that interventions with the smallest investment in terms of time and money tended to be more effective than more elaborate interventions but this difference was not significant and its important to note the precision of the estimate was low and the subset of studies small.</td>
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Table 3. Evidence table of primary research appraised relating to effective strategies for promoting attachment between young children and their parents.

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<tr>
<td>Ammaniti et al. (2006) Italy</td>
<td>Interventions: Home Visiting Program (HV) Control: Scheduled visits for data collection only</td>
<td>Participant families were recruited from maternity and child health services in the second trimester of pregnancy. Home Visiting (HV), n=47 Control (nHV), n=44</td>
<td>Randomised controlled trial. Experimental group versus control, pretest/posttest. Data were collected at baseline and at 3, 6 and 12-month follow-up.</td>
<td>Selected observations of maternal and infant behavior: 6 months nHV HV p Sensitivity 6.89 (1.20) 7.70 (0.77) 0.002 Cooperation 7.77 (1.17) 8.25 (0.67) 0.04 Interference 2.12 (1.32) 1.55 (0.72) 0.03</td>
<td>- The process of allocation was not clearly stated though it was described as being “randomly split into two subgroups” - The authors suggest that compared to the US or UK, home visiting in Italy is in a very early stage of development and women are less prone to welcome strangers into their houses, even if they are health visitors. Program was very intensive both for the number of visits in the first year and for the kinds of assessments carried out through interviews and videotaped observations. - Dropouts could also be due to difficulty keeping engagement they experienced as demanding and potentially judging - The efficacy of the intervention could be less evident due to the inverted-U shaped association between the number of risk factors and efficacy of prevention, where intervention effects in samples with too few risk factors, as per this sample, could be less clear - Possibility exists that both groups are biased as the rate of women who refused to join the program was relatively high - The distribution of mothers in the sample with secure attachment (65-85%) was higher than previously reported in clinical samples (55%)</td>
</tr>
</tbody>
</table>

**EFFECTIVE STRATEGIES FOR PROMOTING ATTACHMENT BETWEEN YOUNG CHILDREN AND THEIR PARENTS**
### Table 3. Evidence table of primary research appraised relating to effective strategies for promoting attachment between young children and their parents.

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<tr>
<td>Ammaniti et al. (2006)</td>
<td>Italy</td>
<td>Continued</td>
<td>Authors’ conclusions</td>
<td>The study found that the home visiting intervention was effective in improving sensitive maternal behaviors toward the child after 6 months of intervention.</td>
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**Authors’ conclusions:**

The study found that the home visiting intervention was effective in improving sensitive maternal behaviors toward the child after 6 months of intervention.
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| Armstrong et al.   | Australia| Child Health Nurse Visits (Home-based)                                                                                   | Participant families were recruited from an inner city obstetric hospital. All families with a live-born infant were invited to participate (n=1008). Child Health Nurse Visits, n=90. Control, n=91. Participants were selected for inclusion on the basis of risk status (1) and (2) giving informed consent: Inclusion criteria: >1 of the following factors:  
  - physical domestic violence  
  - identified childhood abuse of either parent  
  - sole parenthood  
  - ambivalence to the pregnancy (sought termination, no antenatal care)  
  and ≥3 of the following factors:  
  - maternal age <18 years  
  - unstable housing (three or more moves in the preceding 2 years)  
  - financial stress (always concerned about having enough food, making ends meet)  
  - <10 years maternal education  
  - low family income (<A$16000 per annum)  
  - social isolation  
  - history of mental health disorder  
  - drug or alcohol abuse (either parent)  
  - domestic violence other than physical abuse. | Randomised controlled trial. Experimental group versus control, pretest/posttest. Data was collected at baseline, at posttest (6 weeks) and at a 4-month follow-up.  
  - Attrition: n=14 families lost to follow-up  
  - Assessment and outcome measures: Edinburgh Post Natal Depression Scale (EPDS), Parenting Stress Index (PSI), Home Observation for Measurement of the Environment (HOME), Parent Satisfaction Questionnaire (PSQ-18) | At the 4-month follow-up, 160 families (80 intervention, 80 control) were available for assessment. All aspects of the home environment, including the quality of maternal-infant attachment and mothers’ relationship with the child, were significantly enhanced.  
  - PSI Measure of attachment Mean (SD)  
  - HOME environment quality  
  - HOME environment quality  
  | Limitations:  
  - the control group had also accessed their local community child health clinic on at least one occasion and 20% had attended the clinic on seven or more occasions.  
  - At 4-months 35% of the families in the control group were still regularly attending their child health clinic. As both groups received some form of intervention this decreases the likelihood of detecting an effect.  
  - the HOME inventory scale was not measured at baseline and it is not completely clear whether the figures reported pertain to data collected at 6 weeks or 4 months (most likely at 4-months)  
  - short-term follow-up data only so it is not clear whether any benefits are sustained over time. | Comments:  
  - clients of the Child Health service reported greater satisfaction with service than the comparison group  
  | Authors’ conclusions:  
  - This form of early home-based intervention targeted to vulnerable families promotes an environment conducive for infant mental and general health and hence long-term psychological and physical well-being, and is valued by the families who receive it.  

Table 3. Evidence table of primary research appraised relating to effective strategies for promoting attachment between young children and their parents.

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<tr>
<td>Armstrong et al. (2000)</td>
<td>Australia</td>
<td>Exclusion criteria: None stated.</td>
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<td>No significant baseline differences between intervention and control groups were reported.</td>
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<td>Caughy et al. (2004) USA</td>
<td>Healthy Steps [Pediatric office visits plus home visits]. Control Usual care</td>
<td>Eligible families were identified and enrolled either at the hospital following the birth of their child at the pediatric practice following the birth of their child. A total of 758 families enrolled in the National Evaluation at the two selected sites. Of these 658 Healthy Steps, n=337 Control, n=321</td>
<td>Randomised controlled trial with cross sectional and longitudinal analysis. Experimental group versus control. Observational data were collected at two time points Time 1 [T1, 16-18 months] and Time 2 [T2, 34-37 months]. Attrition: A total of 378 of the eligible families (57%) completed at least first part of home observation. At time 2, 604 families were eligible and of these 233 (39%) completed at least part of the second home observation. Assessment and outcome measures: The Teaching Scale Score of the Nursing Child Assessment by Satellite Training (NCAST), The Parent/Caregiver Involvement Scale (P/CIS) Home Observation for Measurement of the Environment, Infant/Toddlers [HOME] The Attachment Q-Sort Child Behavior Checklist/2-3 (CBCL);Toddler Behavior Assessment Questionnaire (TBAQ)</td>
<td>Results indicated that mothers participating in Healthy Steps were more likely to interact sensitively and appropriately than mothers in the comparison group at the second assessment point (age 16-18 months) but not at the first assessment point (age 16-18 months). There were no differences in child outcomes at either time point when the cross sectional data were analysed. The results of the longitudinal analysis that included families who participated in the home observations at both time 1 and time 2 indicated that Healthy Steps participation was associated with greater security of attachment and fewer child behavior problems. Mean treatment differences (n=179) were adjusted by maternal age, race, maternal education, insurance status during pregnancy, and marital status. Post-hoc comparisons indicated mothers in Healthy Steps group had significantly higher NCAST total scores, F[1132]=4.70, p&lt;.05, ES=0.18 and children who participated in Healthy Steps were more securely attached to their mothers, F(1126)=6.91, p&lt;.01, ES=0.23. The maternal behaviors in which differences between treatment and comparison group were found indicated that mothers participating in Healthy Steps were more likely to interact sensitively and appropriately than mothers in the comparison group in that they were more likely to match their interaction to the needs of the child. Differences in maternal sensitivity were observed both in a structured teaching task as well as during free play activity.</td>
<td>Limitations:</td>
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<tr>
<td>Coughy et al. (2004) USA</td>
<td><strong>Continued</strong></td>
<td>There were no significant differences between intervention and control groups who completed both observations assessed at time 1. At time 2, treatment families were more likely to have used health insurance to pay for pregnancy and delivery.</td>
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<tr>
<td>Cicchetti et al. (2006) USA</td>
<td>Infant parent psychotherapy (IPP)</td>
<td>Infants in maltreating families and their mothers were recruited for a study of the effects of child maltreatment on infant development and for an evaluation study of the efficacy of two preventive interventions designed to optimize mother-infant relationships and improve parenting. Malnurtreated, n=137 infants (60 boys, 77 girls) and their mothers. Normnurtreated, n=52</td>
<td>Randomised controlled trial Experimental group versus control, pretest/posttest. Data were collected at baseline, during the course of the intervention and at a one-year follow-up (when the infants were approximately 26 months old).</td>
<td>Follow-up contrasts indicated that no significant differences existed among the IPP, PPI and CS groups in their respective distributions of attachment classifications but each maltreatment group differed significantly from the NC group. Post intervention, all mother-child dyads were reassessed in the Strange Situation and significant differences were found that showed the pattern of differences had changed, indicating substantial intervention effects. Strange Situation attachment post intervention (%)</td>
<td>Limitations: • cases randomly assigned to IPP and PPI did not always comply with the assignment, declining to be involved in the interventions. As a result those who completed the interventions are partially self-selected. • changes were not found for the constructs hypothesized to serve as potential mediators of intervention efficacy • the extent to which some mothers did not engage in interventions, despite active outreach efforts indicating that additional strategies are necessary to facilitate active participation • the rates of refusal are problematic for intent-to-treat analyses because lack of participation could overwhelm treatment effects Comments: • intent-to-treat analyses examined the group composition irrespective of whether mothers actually participated. These indicated that even with cases declining intervention included in the IPP and PPI groups treatment effects were nonetheless found. • during baseline both home and center-based sessions were conducted with mothers and infants • IPP assumes that difficulties in the parent-infant relationship do not result from deficits in parenting knowledge alone but that the problems that maltreating mothers have in relating sensitively and responsively to their infants stem from insecure representational models evolved in response to the mother’s own experiences in childhood. In IPP the intervention target is not the mother or the infant but the relationship between the two • PPI model is based on the work of Olds et al. involving nurse home visitation. Supplemental cognitive and behavioural techniques were introduced to address parenting skill deficits and social-ecological factors • both interventions were manualized with central components. Therapists participated in weekly group and individual supervision. Fidelity checks were performed throughout the course of the intervention.</td>
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<tr>
<td>Cicchetti et al. (2006) USA</td>
<td>Continued</td>
<td>Baseline differences between intervention and control groups in the maltreatment sample were not found. Mothers in the NC group had higher level of education than the mothers in the IPP and CS groups. Mothers in the NC group had fewer children than mothers in each of the maltreatment groups.</td>
<td>Adult-Adolescent Parenting Inventory (AAPI) Social Support Behaviors Scale (SBS) Parenting Stress Inventory (PSI) Strange Situation Procedure (SSP)</td>
<td>S to IS 18.2 IPPI 0.0 IPP 0.0 PPI 43.2 CS 1.9 NC 18.2</td>
<td>Authors’ conclusions: Findings suggest that an attachment-theory informed intervention (IPP) and an intervention that focuses on improving parenting skills, increasing maternal knowledge of child development, and enhancing the coping and social support of maltreating mothers (PPI) were both successful in altering the predominantly insecure attachment organizations of infants in maltreating families. The majority of cases in the IPP and PPI groups changed from insecure to secure attachments.</td>
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| Cohen et al. (1999) USA | Intervention Mother-infant psychotherapy/Watch, wait and wonder program (WWW) Control Psychodynamic psychotherapy/usual care (PPT) | Infants and mothers attending a centre for Children’s Mental Health. Self-referral to the centre by parents or mental health, medical or child welfare professionals. Total sample, n=67 WWW n=34 61.8% male Child mean age 21.5 months Mother mean age 32.2 years PPT n=33 57.6% male Child mean age 19.2 months Mother mean age 32.4 years Inclusion criteria - 10- to 30-month-old infants - parents had to make first contact to project - mothers and infants both physically capable of participating in play - presenting problems including functional problems with feeding, sleeping, and behavioral regulation or - referrals due to maternal depression, feelings of failure in bonding or attachment | Randomised controlled trial/Pseudo-controlled trial. Experimental group versus control, pretest/posttest. Two thirds of the allocation was done randomly with the final one third allocated by remaining therapist caseload and time for treatment. Data was collected at baseline, during the course of the intervention and after the intervention program was completed. | The majority of infants were classified as either insecure (A or C, 38%) or disorganized (D, 39%). The remaining infants were classified as secure (B, 22%). At the end of treatment, 20.6% (n=7) in the WWW group shifted to a secure attachment compared to 3% (n=1) in the PPT group. The shift from disorganized attachment to organized albeit insecure (A or C) was examined with WWW 14.7% (n=5), PPT 9.3% (n=3). Attachment Security Infants in the WWW group were significantly more likely than infants in the PPT group to move towards either a secure or organized attachment relationship (WWW 35.2%, PPT 12.5%) (Fisher’s Exact text, p<.03). Approximately half of the infants did not change attachment category from pre- to post-treatment assessment (WWW=50% and PPT=59.4%) and a small proportion of infants became less secure (WWW=14.7%, PPT=28.1%). Attachment Security Infants in the WWW group were significantly more likely than infants in the PPT group to move towards either a secure or organized attachment relationship (WWW 35.2%, PPT 12.5%) (Fisher’s Exact text, p<.03). Approximately half of the infants did not change attachment category from pre- to post-treatment assessment (WWW=50% and PPT=59.4%) and a small proportion of infants became less secure (WWW=14.7%, PPT=28.1%). | Limitations - the sample for this study differs from others in that participants included self-referals and children with specific problems were not excluded, the sample may be more heterogeneous and results may be less generalisable - randomization was not complete - small sample size means study may be underpowered when looking at attachment subgroups - may be selection bias due to the non-systematic method of recruiting participants however this may also more truly reflect what happens naturally in clinical settings - clinic-based sample and service delivery so results may not be comparable with studies using primarily home visitation - application of this treatment may not mirror what would constitute a flexible, clinical application of the therapy which might include use of more collateral therapies | Comments - WWW sessions were in two parts. Infant-led activity with observed floor time between infant and mother. Therapist did not intervene or comment. Following this a 20min discussion exploring what the mother observed and her experience of the session - assessment and outcome measures Strange Situation Procedure (SSP) Chatoor Play Scale Mental Scales of Infant Development I or II Parenting Stress Index (PSI) Parenting Sense of Competence Scale (PSCS) Beck Depression Inventory (BDI) Working Alliance Inventory | **EFFECTIVE STRATEGIES FOR PROMOTING ATTACHMENT BETWEEN YOUNG CHILDREN AND THEIR PARENTS**

The “watch, wait and wonder group” showed a more organized or secure attachment relationship and a greater improvement in cognitive development and emotional regulation than infants in PPT group.
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<tr>
<td>Cohen et al. (1999) USA Continued</td>
<td>Exclusion criteria None stated. There were no significant baseline differences between intervention and control groups on pre-assessment measures, demographics, presenting symptoms or the distribution of attachment categories.</td>
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<td>Constantino et al. (2001) USA</td>
<td>Intervention: Socioemotional development education programme</td>
<td>Cohort 1: Families already involved in home visitation (Parents as Teachers); Cohort 2: Families not previously enrolled in home visitation; Control: No education programme.</td>
<td>Randomised controlled trial (intervention group versus control, pretest/posttest); Data was collected at baseline and at a 6-month follow-up.</td>
<td>Cohort 1 (Home visitation): Parents in intervention group made greater gains in the number of categories of emotion for which the number of IFEEL picture cards attributed fell with 1 SD from population mean (p&lt;0.08). This suggests an increase in the appropriateness of their emotional cues communicated by infants’ facial expression. None of the specific changes reached statistical significance. Cohort 2 (No previous home visitation): Six months following the intervention period, 14 mothers in the intervention group were enrolled and actively participating in a home visitation program.</td>
<td>Limitations: in both cohorts, those with higher levels of education and income were more likely to complete the study; high attrition rates were a significant problem in all aspects of the intervention including recruitment, enrolment, treatment and follow-up. These rates were inversely associated with parental income and level of income; the magnitude of attrition may have compromised the ability of the study to detect an effect. Comments: the geographical areas represented by specific zip codes represent an ethnically heterogenous stressed, disadvantaged urban population with elevated rates of child abuse and neglect and crime; completed study was deemed to be the number of subjects who completed at least 7 intervention sessions and the 6 month follow-up research assessment (for intervention group) and the number of subjects who completed the 6 month follow-up research assessment (for the control group); analyses for Cohort 1 were controlled for maternal education level and infant age at follow-up; the intervention was a 10-session curriculum (completed over 10 weeks for Cohort 1 and 20 weeks for Cohort 2); it sought to provide parents with practical experience of interactive play and provide support for young adults in their role as parents. Structured 40min sessions were run with infants present. Sessions included free play, brief review of topic, mentored practice of play techniques and group discussion; availability of a registry for enrolment in the statutory home visitation program allowed participation or nonparticipation in home visitation to be ascertained for every participant. Authors’ conclusions: Group meetings designed to promote parents’ practical understanding of children’s earliest social relationships may be an effective means of engaging hard-to-reach families in home visitation.</td>
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<tr>
<td>Constantino et al. (2001) USA</td>
<td>Intervention: Socioemotional development education programme</td>
<td>Cohort 1: Families already involved in home visitation (Parents as Teachers); Cohort 2: Families not previously enrolled in home visitation; Control: No education programme.</td>
<td>Randomised controlled trial (intervention group versus control, pretest/posttest); Data was collected at baseline and at a 6-month follow-up.</td>
<td>Cohort 1 (Home visitation): Parents in intervention group made greater gains in the number of categories of emotion for which the number of IFEEL picture cards attributed fell with 1 SD from population mean (p&lt;0.08). This suggests an increase in the appropriateness of their emotional cues communicated by infants’ facial expression. None of the specific changes reached statistical significance. Cohort 2 (No previous home visitation): Six months following the intervention period, 14 mothers in the intervention group were enrolled and actively participating in a home visitation program.</td>
<td>Limitations: in both cohorts, those with higher levels of education and income were more likely to complete the study; high attrition rates were a significant problem in all aspects of the intervention including recruitment, enrolment, treatment and follow-up. These rates were inversely associated with parental income and level of income; the magnitude of attrition may have compromised the ability of the study to detect an effect. Comments: the geographical areas represented by specific zip codes represent an ethnically heterogenous stressed, disadvantaged urban population with elevated rates of child abuse and neglect and crime; completed study was deemed to be the number of subjects who completed at least 7 intervention sessions and the 6 month follow-up research assessment (for intervention group) and the number of subjects who completed the 6 month follow-up research assessment (for the control group); analyses for Cohort 1 were controlled for maternal education level and infant age at follow-up; the intervention was a 10-session curriculum (completed over 10 weeks for Cohort 1 and 20 weeks for Cohort 2); it sought to provide parents with practical experience of interactive play and provide support for young adults in their role as parents. Structured 40min sessions were run with infants present. Sessions included free play, brief review of topic, mentored practice of play techniques and group discussion; availability of a registry for enrolment in the statutory home visitation program allowed participation or nonparticipation in home visitation to be ascertained for every participant. Authors’ conclusions: Group meetings designed to promote parents’ practical understanding of children’s earliest social relationships may be an effective means of engaging hard-to-reach families in home visitation.</td>
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<tr>
<td>Fraser et al. (2000)</td>
<td>Australia</td>
<td>Intervention, Home visitor program</td>
<td>Experimental group versus control, pretest/posttest. Data were collected at baseline and post intervention at a 12-months and an 18-month follow-up.</td>
<td>Maternal interactions, simulation and home safety standards were observed and measured in participating family homes where natural behavior between parent and infant could be observed. In this study, inter-rater reliability of the HOME Inventory was checked by having two research assistants visit 23% of the homes at the same time at 12 months. Each made an independent assessment. A correlation between observers of 0.79 for assessing emotional and verbal responsivity to infant was obtained. Maternal-infant interactions were more likely to be positive, with significantly higher (better) scores in aspects of the home environment related to optimal development in children, particularly maternal-infant attachment in the intervention group. Parent attachment in intervention group, mean (SD)</td>
<td>Limitations</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Women in the immediate postnatal period were selected on the basis of two criteria sets listed above.</td>
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<tr>
<td>Fraser et al. (2000)</td>
<td></td>
<td>• alcohol or drug abuse • domestic violence other than physical abuse</td>
<td>The schedule of visiting included weekly visits until the infant was 6 weeks old, fortnightly visits until 3 months, then monthly visits until the age of 12 months. The minimum number of nurse-visits per family was 18.</td>
<td>No overall intervention effect was demonstrated at 12 or 18-month follow-up with no significant differences between intervention and comparison groups.</td>
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<tr>
<td>Goodson et al. [2000] USA</td>
<td>Home visitor program, Comprehensive Child Development Program (CCDP)</td>
<td>Participants were 4410 families within 21 CCDP projects who were followed for five years. CCDP Program; n=1369 Control; n=1430</td>
<td>Randomised controlled trial. Experimental group versus control, pretest/posttest. Data were collected at baseline and at 12 and 18 month posttests and then annually at 2, 3, 4 and 5 year follow-ups.</td>
<td>In the structured observation of parent/child interaction using the NCATS program and control mothers were nearly identical in their scores. For child at age 3 years: Parent Behavior-Total Score Program Control Mean 40.20 40.30 SD (5.59) (6.05) Child Behavior-Total Score Program Control Mean 14.66 14.65 SD (3.33) (3.53)</td>
<td>Limitations: based on studies of only 21 of 24 of the CCDP project as one project was not able to randomly assign families, a second project was not able to maintain appropriate records about families which were recruited and assigned and a third project joined a year late. CCDP may not have provided a sufficient amount of parenting education to affect changes in parent behaviour. Large site-to-site differences in the amount of center-based care received by children though on average program children received more than control children (3 projects average time was equal to halftime care whereas in 10 projects average time &lt; 2 hours per day). Comments: sample n reported in this table is only for sub-analyses based on the NCATS, for other measures not of direct relevance to this report the reader should refer to the original article.</td>
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<tr>
<td>Heinicke et al. (1999, 2000 and 2001) USA</td>
<td>Intervention: Home visiting, relationship based program (UCLA Family Development Project)</td>
<td>All families receiving prenatal care at the UCLA Ob/Gyn and pediatric clinics, in total 70 families were recruited to the study. Home-visited (HV), n=31 (52% girls); Pediatric follow-up (PF), n=33 (48% girls)</td>
<td>Randomised controlled trial, Experimental group versus control, pretest/posttest. Data were collected at baseline and at 12- and 24-month follow-ups. Affiliation at 12-month follow-up: 4/70 intervention families and 2/70 non-intervention families</td>
<td>Results:</td>
<td>Limitations:</td>
</tr>
<tr>
<td></td>
<td>Control: Pediatric follow-up</td>
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<td>on the basis of trends seen at 12 months it was anticipated that intervention families would show further differential gains in adaptation however this was not realized.</td>
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<tr>
<td></td>
<td>Mean age mother (both groups) = 24 years</td>
<td>Inclusion criteria:</td>
<td></td>
<td>HV 4.29 5.22 5.29</td>
<td>may lack generalisability due to the detailed inclusion and exclusion criteria.</td>
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<tr>
<td></td>
<td>Having first child</td>
<td>All families receiving prenatal care at the UCLA Ob/Gyn and pediatric clinics, in total 70 families were recruited to the study. Home-visited (HV), n=31 (52% girls); Pediatric follow-up (PF), n=33 (48% girls)</td>
<td></td>
<td>PF 4.90 4.30 4.00</td>
<td>inadequate resources prevented completion of the three and 4-year follow-up.</td>
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<tr>
<td></td>
<td>Live within a 20-min drive of the hospital</td>
<td>Assessment and outcome measures: Wechsler Adult Intelligence Scale, Maternal Support Interview, Beck Depression Inventory, Cutrona Support Inventory, Spielberger Anxiety Inventory, Locke-Wallace Marital Inventory, Parent-Child and Child Global Ratings, Caldwell HOMES Scales, Bayley Scales of Infant Development/Bayley Scale Test Situation Attachment Q-set, Strange Situation Procedure (SSP).</td>
<td></td>
<td>Effect size -.11 .47 1.00</td>
<td>Findings suggest that the intervention made a significant impact on three critical socio-emotional mother-infant transactions in the first year of life. Children receiving the intervention were more secure and their mothers more responsive to their needs in the first second year of life.</td>
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<tr>
<td></td>
<td>Families who had four or more risk factors from social interview</td>
<td></td>
<td></td>
<td>p-value .03 .0003 .0001</td>
<td>Authors’ conclusions:</td>
</tr>
<tr>
<td></td>
<td>Mother is poor and receiving aid</td>
<td></td>
<td></td>
<td></td>
<td>Findings suggest that the intervention made a significant impact on three critical socio-emotional mother-infant transactions in the first year of life. Children receiving the intervention were more secure and their mothers more responsive to their needs in the first and second year of life.</td>
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<tr>
<td></td>
<td>Mother lacks support (partner, family, friends)</td>
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<td></td>
<td>Pregnancy not wanted</td>
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<td></td>
<td>Mother victim of childhood sexual or emotional abuse</td>
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<td></td>
<td>Mother experienced suicidal thoughts in the past</td>
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<td></td>
<td>Mother referred for mental/health counseling in the past</td>
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<td></td>
<td>Mother treated for drug and/or alcohol addiction in the past</td>
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<td></td>
<td>Mother homeless</td>
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**EFFECTIVE STRATEGIES FOR PROMOTING ATTACHMENT BETWEEN YOUNG CHILDREN AND THEIR PARENTS**
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| Heinicke et al. (1999, 2000 and 2001) | USA | Exclusion criteria:  
- any DSM-IV Axis I diagnosis  
- currently using drugs  
- do not speak English  
- any member of the family suffering from serious health complications  

No statistically significant differences in demographic characteristics including IQ between intervention and control groups were reported at baseline. | | | |
| | | Child positive affect | 6Mos | 12Mos | 24Mos |
| | | HV | 3.77 | 4.58 | 4.87 |
| | | PF | 3.91 | 4.33 | 3.91 |
| | | Effect size | -.11 | .21 | .74 |
| | | p-value | .66 | .41 | .004 |
| | | For standard deviations (SD) refer to original article. | | | |
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<tr>
<td>Letourneau et al. [2001a and 2001b] USA</td>
<td>Study 1 Interventions Keys to Caregiving program Control Home visits with nurse social support</td>
<td>Two studies were conducted on two different interventions both with a focus on parent and infant interactive behavior. Study 1 is reported here. Study 1, n=15 (time 1), n=16 (time 2), Mothers mean age=18 years (SD=1) 50% partners Inclusion criteria • adolescent parents • at risk due to low income, educational attainment and single parent status Exclusion criteria None stated.</td>
<td>Randomised controlled trial Experimental group versus control, two posttests only, Interactive behavior was assessed at the baseline pretest and 6 months posttest. Data were collected and mother-child interactions videotaped posttest only, at 7 to 9 (time 1) weeks and at follow-up, 11 to 13 (time 2) weeks old. Attition Study 1 Of 24 mothers recruited 18 completed two follow-ups (75%), only 13 of 24 completed all of the intervention and outcome measurement. Assessment and outcome measures Nursing Child Assessment Feeding (NCAFS) and Teaching Scales (NCATS) Preschool-Parent Interactive Behavior (PPIB) Coding System</td>
<td>Feeding Scale Effects Parent time 1 time 2 Sensitivity to cues 1.07 0.67 Response to distress 0.86 0.61 Socioemotional growth 1.09 1.08 Cognitive Growth 0.86 1.19 Infant Clarity of cues 0.38 - Responsiveness 0.69 - Teaching Scale Effects Parent time 1 time 2 Sensitivity to cues 1.02 0.47 Response to distress 0.66 0.45 Socioemotional growth 0.88 0.32 Cognitive Growth 0.35 1.03 Infant Clarity of cues - - Responsiveness 0.21 0.63 Larger effect sizes greater than 0.8 are noted for 11 of 16 comparisons in the subscales relating to parental behavior change suggesting mean change scores approaching 1 standard deviation were achieved for most subscale measures. Anovas were computed by using those participants who completed all measures of NCAFS and NCATS.</td>
<td>Limitations • pilot study (study 1), very small sample size problematic for statistical analysis however effect size calculation were presented, a separate article presents some analyses • support processes were not documented as per intervention Comments • the Keys to Caregiving program delivered via six home visits introduces five key concepts 1) infant states, 2) infant behaviour, 3) infant cues, 4) how to modulate states, and 5) interacting during feeding • social support for the control group included informational resources, affirmation or reinforcement of parents perspectives or behaviours, and listening and responding to parents (emotional support) • a second trial was reported in the same article however this is not reported here as to qualify for inclusion children had to have exhibited a 6-month developmental delay in two or more areas • mean intrarater reliability of 95% for the feeding scale and 94% for the teaching scale were achieved • intervention integrity was monitored through regular debriefing sessions, field not taking, and selected audio recordings of intervention sessions Authors’ conclusions Results suggested that parent-child relationships were enhanced.</td>
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<tr>
<td>Klein and Rye, (2004) Israel</td>
<td>Intervention Meditational Intervention for Sensitising Caregivers/Mor e Intelligent and Sensitive Children [MISC] Control</td>
<td>Families with infants and very young children living in two of the poorest communities in Addis Ababa, Ethiopia participated in the study. 49 out of 893 families from Kebele 18 and 47 of 1997 families from Kebele 15 were randomly selected for the intervention and comparison groups respectively. MISC, n= 49 Control, n=47</td>
<td>Randomised controlled trial, Experimental group versus control, pretest/postest. Data were collected at baseline (6 months) and within 3 months of termination of the programme at 12-month and 6-year follow-ups.</td>
<td>The effects of the intervention on the participating mothers and their children were assessed and findings were consistent with stable effects of the intervention over time. A clear improvement in the quality of mother-child interactions was noted following the MISC intervention. These findings persisted over time and were noted in the 6-year follow-up study. The change in the interactive behavior of the intervention group mothers and their children was clearly apparent in comparison to their own behavior prior to the intervention as well as in comparison to the behavior of mothers in the comparison group. A clear increase in frequency of parental mediation was found and included interaction initiated by mothers and by children. The latter was rare at outset and remained rare in comparison group. Mothers and children initiated more eye contact as well as physical contact, responded more fully to each other’s communicative signals and had more and longer shared attention episodes. The emotional climate of the parent-child interactions became more positive in the intervention group, with high frequencies of positive affect and turn taking in the intervention group and nearly none in the comparison group.</td>
<td>Limitations • study conducted in a very specific population so may not be generalisable to other populations • statistical analyses although performed were not explicitly reported but are reported elsewhere in a unpublished doctoral dissertation and a book chapter² Comments • the intervention with the families was carried out by 21 paraprofessionals, selected from the site of the project as well as from neighbouring communities, all of them were already employed by the community as health and social workers and other positions • this community was among the poorest and most congested urban slum areas in the city with little or no sanitation and extreme poverty • training materials were adapted for use in Ethiopia in a pilot study constructed a year prior to the current intervention study • home-based and institution-based intervention however this article focuses on the home-based intervention (5 individual meetings of 1-1.5hours and 5 group meetings of 2-3 hours) • parent-child interactions were videotaped and analyzed • this program has been evaluated cross culturally in other settings. Authors’ conclusions One year following the intervention, mothers in the intervention group were more sensitive, more responsive, and optimistic about their potential to affect their child’s development than were mothers in the comparison group. Six years later significant changes were still noted in the quality of the adult-child interactions and developmental measures of the children.</td>
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<td>Klein and Rye (2004), Israel</td>
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<td>Although no statistically significant intervention effects were found for children's socioemotional development, there was a consistent trend showing that more children in the intervention group reached developmentally higher landmarks of socioemotional development compared to others.</td>
<td>Findings confirmed that the intervention resulted in an increase in age-appropriate, sensitive and affective interactions had a positive effect on childrens' cognitive and socioemotional development.</td>
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<td>Koniak-Griffin et al. (2003) USA</td>
<td>Intervention: Home visiting program (Early Intervention program, EIP)</td>
<td>Adolescent mothers and their infants were recruited into this study. EIP, n=56 TPHNC, n=45 Mothers mean (SD) age =16.8 (1.13) years</td>
<td>Randomised controlled trial Experimental group versus control, pretest/posttest Data were collected at baseline (6 weeks after birth) and at 6, 12, 18 and 24-month postpartum follow-ups.</td>
<td>Repeated measures ANOVA revealed no significant group differences in the change in NCATS mother, child or total scores over time. Significant time effects were found for all three measures from 6 weeks to 24 months postpartum. For both groups the scores markedly increased from birth to 12 months and then showed little change in the 2nd year of life. Similarly, a main effect for time was found for the total HOMES scores, without significant differences between groups in the pattern of change. Scores increased for both groups from 1 to 2 years postpartum. Adolescents receiving the EIP showed a slightly greater gain over time in internal social competence (p=0.057). No differences were noted for the external social competence measure.</td>
<td>Limitations: • hard to determine whether improvements in scores over time reflect benefits of intervention or normal maturational changes of adolescents • difficulties encountered collecting medical records from multiple sources, some infant health data collected by maternal report only • control group may have received active intervention in the form of telephone contact • article not focused on mother-child interaction Comments: • experimental group received preparation-for-motherhood classes plus intense home visitation by public health nurses; control group received traditional public health nursing care • videotape instruction and feedback was used Authors’ conclusions: The EIP improved selected areas of infant and maternal health but no specific improvement was reported for mother-child interaction.</td>
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<td>Moran et al. (2005) Canada Intervention, Home visiting program</td>
<td>A total of 100 adolescent mothers and their infants were recruited into a longitudinal study. n= 99 dyads (50 girls, 49 boys). Mothers mean (SD) age = 18.4 (1.0) years.</td>
<td>Randomised controlled trial Experimental group versus control, pretest/posttest. Data were collected at baseline (6 months) and at 12- and 24-month follow-ups.</td>
<td>Fifty-seven (58%) of the 99 dyads were classified as Disorganized in the SSP reflecting the high-risk nature of the sample. Mothers participating in the intervention program were more likely than comparison mothers to be in secure attachment relationships with their infants at 12 months. Twenty-eight of the 49 dyads were secure (57%) compared to 19 of the 50 (38%) dyads in the comparison group. The difference in attachment security was significant, p&lt;.05 with an effect size of 0.25 but the overall effect was modest. Maternal sensitivity scores assessed with the Maternal Behavior Q-set in observations in the home fell for mothers in the comparison group from 0.38 to 0.12 between 6 and 12 months; at 24 months sensitivity had recovered to an average value of 0.24. Mothers in the intervention group displayed similar levels of maternal sensitivity to the comparison group at 6 months (0.34), dropped less in sensitivity at 12 months (0.2) and recovered to a substantially higher level at 24 months (0.49). Overall the brief intervention had a positive effect on the quality of mother-infant interactions but a quarter of mothers participating in the intervention did not appear to benefit.</td>
<td>Limitations: - small sample size in subgroups may mean the study lacked power to detect an effect - participants were all young mothers so results may not be generalisable to other age groups - there was an age by group interaction but there were no significant differences between group means at each age - problems were encountered with scheduling visits with 20% requiring rescheduling due to mothers not being at home when home visitor called - funding constraints limited the number of visits to eight compared with 12 to 16 visits in a previous study. Comments: - home visits lasted one hour and were carried out by two mature women who had raised their own families and who were knowledgeable about infant development and attachment theory/research - dyads in intervention group received eight home visits between 7 and 12 months; comparison group received one visit at 9 months; SSP was conducted at approximately 12 months - the intervention procedure was designed to promote sensitivity, a behaviour theoretically unrelated to disorganization - the differential effectiveness of the intervention was attributed to the impact of the intervention on the sensitivity of the mothers. The intervention was only effective in promoting a secure mother-infant attachment relationship only when the mother was not classified as unresolved/disoriented on the AAI. Authors’ conclusions: Results showed that interaction-focused intervention in the first year of life can improve the quality of the relationship between adolescent mothers and their infants and that the improvement in interactions persists at least into the second year of the child’s life.</td>
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<td>Murray et al. (2003) UK</td>
<td>Interventions Non-directive counselling Cognitive Behavioural Therapy Psychodynamic Therapy Control Routine primary care</td>
<td>A community sample of 206 women with major depressive disorder was identified. Of these 193 were randomly assigned to one of three intervention groups or routine care. Inclusion criteria: primiparous, living within a 15-mile radius of the maternity hospital, women with post-partum depression (Edinburgh Postnatal Depression Scale), English as first language. Exclusion criteria: women who had delivered prematurely (before 36 weeks gestation), if their infant had any gross congenital abnormality, if they had not had a singleton birth, if they were intending to move out of the area within the period of the intervention. Baseline differences between intervention and control groups were not found for background demographic factors and negative orientation to motherhood. More women in the control group had experienced high levels of adversity (35%) and fewer women in the psychodynamic therapy group (10%).</td>
<td>Randomised controlled trial. Experimental groups versus control, pretreatment/posttreatment. Data were collected at baseline, immediately after treatment (4.5 months postpartum) and at 18-months and 5-year postpartum. Therapy was conducted in the women's own homes on a weekly basis from 8 to 18 weeks post-partum. Mother-infant interaction was videotaped before and after treatment and independently rated. Attrition: Of the eligible participants 83% (n=171) completed therapy. Nineteen dropped out of treatment early or moved away from the study area. Of those successfully assigned 10% did not complete the trial. Assessment and outcome measures: Strange Situation Procedure (SSP); Behavioral Screening Questionnaire; Mental Development Index of the Bayley Scales of Infant Development; Rutter A2 Scale; Preschool Behaviour Checklist.</td>
<td>Maternal sensitivity at 2 and 4.5 months postpartum. The three treatments were found to be comparable with the control condition. After level of maternal sensitivity at 2 months was controlled for. For women with low levels of social adversity those in the control condition had higher levels of sensitivity than women in the CBT or PT groups. No significant difference was found between the control condition and non-directive counselling. For women with high social adversity, women who received non-directive counselling were found to have higher levels of maternal sensitivity than women in the control condition. There were no treatment effects for CBT or PT. Maternal sensitivity at 18 months postpartum. Compared with the control group, after controlling for social adversity and the significant effect of maternal age, the effect of treatment was significant for non-directive counselling (p=0.01), with PT (p=0.03) and CBT (p=0.06) showing some improvement compared to control. Infant attachment: The rates of secure (B) and insecure (A, C and D) attachment were similar for all four groups and no significant differences were found between the treated groups and the control condition.</td>
<td>Limitations: the sample was one that was generally low risk, and comprised of first time mothers so the generalisability to high-risk and multiparous populations is unknown. the sample was underpowered to detect differences between the treatment groups. although the efficacy of the interventions has been demonstrated for some outcomes, effectiveness studies are required to establish whether such benefits would be obtained in routine practice. indications of a positive benefit were limited. despite symptomatic improvement underlying maternal vulnerabilities persisted and to prevent longer-term difficulties in child functioning more prolonged interventions may be required. Comments: routine care involved normal care provided by the primary health team (GP plus health visitors) with no input from research team. cognitive-behavioural therapy (CBT) with a focus on problems identified by mother in management of her infant. psychodynamic therapy promoting an understanding of the mothers representation of her infant and her relationship with her infant by exploring aspects of the mothers own early attachment history. non-directive counselling where women were given the opportunity to air their feelings about current concerns. Authors’ conclusions: Findings indicated that the treatments had no significant impact on security of infant-mother attachment but in mothers who experience social adversity, whose interactions with their infants were particularly poor, non-directive counselling produced a more sensitive pattern of mother-infant interaction.</td>
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<tr>
<td>Olds et al. (2002) USA</td>
<td>Nurse home visitation. Paraprofessional home visits. Control.</td>
<td>A total of 1178 consecutive women from 21 antepartum clinics were invited to participate (Denver). Of these, 735 were randomized. Nurse home visits, n= 235 Paraprofessional home visits, n=245 Control, n=255 Nurses (paraprofessionals) home visit average was 6.5 (6.3) during pregnancy/21 (16) visits from birth to 2nd birthday. Ethnicity Caucasian 35-37% Hispanic (Mexican American) 44-46% African American 16-17%. Inclusion criteria • no previous live births • qualified for Medicaid or had no private health insurance • enrol any time prior to delivery • informed consent. Exclusion criteria none stated. The treatment groups were similar at baseline.</td>
<td>Randomised controlled trial Experimental groups versus control, assessment at baseline with follow-ups at 6, 12, 15, 21 and 24 months. Attrition for interviews 6 mths 17.7% 12 mths 16.7% 15 mths 23.6% 21 mths 12.7% 24 mths 14.3% Rates of attrition were slightly higher for the child assessments. Assessment and outcome measures: Mental Development Inventory. Mother-reported behavior problems (NCAST) Mother-infant interaction (HOME) Home Observation for Measurement of the Environment (HOME)</td>
<td>Data were modeled statistically using treatments (3 levels), maternal psychological resources (high vs low) and the interaction between these classifications. In addition a number of covariates were included in model. Addition of the covariates did not alter the model greatly. Nurse-visited mother-child pairs interacted with each other more responsively than those in the control group (p&lt;0.05). At 6 months, nurse-visited infants were less likely to exhibit emotional vulnerability to fear stimuli and nurse-visited infants born to women with low psychological resources were less likely to exhibit low emotional vitality in response to joy and anger stimuli. At 21 months nurse-visited children were less likely to exhibit language delays and at 24 months exhibited superior mental development. There were no program effects on women’s use of prenatal services, educational achievement or children’s temperament or behavior problems.</td>
<td>Limitations • absence of statistical significance probably due to limited statistical power to detect small effects • higher rates of refusal among women who smoked may limit generalisability to smokers and probably users of other substances • higher study attrition among the nurse-visited women • women visited by nurses and paraprofessionals may have altered their interview responses and behaviour during the observations to coincide with what they thought was expected of them • given the large number of dependent variables, some findings may be spurious • several of the outcome measures are not independent of one another. Comments • no specific measures of attachment status were reported • mother-infant interaction was videotaped either in the laboratory or home at all postpartum assessments using 2 validated procedures • infants home environments were rated at 12 and 21 months • more of a difference was noted between groups with the subsample of women classed as having low psychological resources Authors’ conclusions When trained in a model program of prenatal and infancy home visiting, paraprofessionals produced small effects that rarely achieved statistical or clinical significance. Nurses produced significant effects on a wide range of maternal and child outcomes including more responsive mother-infant than those visited by non-nurses.</td>
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<td>Toth et al. (2006) USA</td>
<td>Interventions Toddler-Parent Psychotherapy [DI] Control groups Depressed mothers (DC) Nondepressed mothers (NC)</td>
<td>A total of 202 mothers with a history of major depression were recruited. Of these 130 were eligible and were randomly assigned to one of two intervention groups. A group of 89 mothers were recruited for the NC, of which 21 were not eligible. DI, n=66 DC, n=64 NC, n=68</td>
<td>Randomised controlled trial Experimental groups versus control, pretest/posttest. Data were collected at baseline (on average child aged 20 months), and at the 16-month (on average child aged 36 months) follow-up. Attribution Of the original sample of 198, DI, n=20 (30%); DC, n=10 (15.6%); and C, n=5 (7%) did not complete the post-intervention assessments. However no significant differences due to completion status were found for baseline maternal scores, demographic characteristics and a range of other variables. Therefore no specific evidence of selection bias in the retained sample was found.</td>
<td>The pattern of secure versus insecure classification at post-intervention shifted in agreement with the predicted effect of the intervention. The overall distributions of post-intervention attachment differed significantly (p&lt;0.001). The pattern of the groups had also changed markedly. Maternal depression was found to be related to insecure attachment. Prior to the initiation of the intervention, offspring in the DI and DC groups both had higher rates of attachment in security than the NC group. The same was true of disorganized attachment. Following completion of the TPP intervention, offspring in the DI group showed increased attachment security compared with offspring in both the DC and NC groups. Thus offspring with depressed mothers who had participated in TPP actually had more secure attachment relationships than did offspring of well mothers. In intervention effect size for difference in proportions between DI and DC group was 1.084, indicating a large treatment effect associated with the intervention. Furthermore there was a greater degree of change from insecure to secure attachment in the DI group relative to the DC group with a large effect size of 1.11. For further detail see the original article which lists a variety of comparisons.</td>
<td>Limitations: a significant amount of attrition occurred during the study, though this was a largely self-referred sample and that motivation to participate was not enhanced or encouraged by any external service providers. Because only one intervention was provided it is not possible to demonstrate whether the improvement in outcomes was specific to an attachment-theory informed mode of intervention. Sample was predominantly low risk (married, well educated, financially comfortable) so results may not be generalisable to high risk populations, therapists could focus on mother-child relationship rather than issues associated with poverty, substance abuse and domestic violence. Efficacy trial where co-occurring risk factors were minimized rather than effectiveness (real world) study. Possible that participants received a “purer” dose of attachment-focused intervention and this could account for the positive results. Comments: mothers in the DI and DC groups were not restricted from being involved in other mental health treatment during the course of the study and 75% (DI) and 67% (DC) respectively were engage in some form of intervention. Although this is a research trial some of the assessment sessions were conducted in the home. All therapists received extensive training and supervision, the intervention was manualized, and the fidelity of the intervention was monitored closely by videotaping and reviewing taped sessions. The efficacy of TPP in modifying disorganized attachment is consistent with findings that suggest treating parental depression is insufficient to improve parenting behaviours. The presence of fewer risk factors enabled therapists to focus an implementation of TPP in the absence of crisis situations that would require departure from the therapeutic protocol. The authors note that where populations have more extreme needs, a more multifaceted and less focused intervention may be necessary.</td>
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Table 3. Evidence table of primary research appraised relating to effective strategies for promoting attachment between young children and their parents.

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<tr>
<td>Toth et al. (2006)</td>
<td>USA</td>
<td>The groups were comparable on a range of demographic characteristics.</td>
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<td></td>
<td>Authors' conclusions Results demonstrated the efficacy of toddler-parent psychotherapy in fostering secure attachment relationships in young children of depressed mothers.</td>
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<td>Van Zeijl et al. [2006] The Netherlands</td>
<td>Intervention: Video-feedback based on positive parenting and sensitive discipline (VIPP-SD) Control: No explicit intervention but mothers received six telephone calls where they were invited to talk about the general development of their child</td>
<td>Participants were recruited from community records of several cities and towns. Parents of 4615 eligible children born between May 2001 and December 2002 were sent screening questionnaires of which 2408 were returned (52%). Of 438 selected families parents of 246 children (56%) agreed to participate. VIPP-SD, n=120 Control, n=117 Mothers mean (SD) age = 33 years 56% boys children with siblings (59%) Inclusion criteria: children living with two parents [biological mother as primary caregiver and father figure, biological or stepfather as second caregiver] children with scores above the 75th percentile on the Child Behavior Checklist (CBCL)/1.5-5 Externalizing Problems scale (age 1 year: scores &gt;13, age 2 years: scores &gt;19; age 3 years: scores &gt;20) Exclusion criteria: twins serious medical condition in mother or child children with both a non-Dutch first name and non-Dutch surname No significant differences between groups regarding initial level of child externalizing problems, parental educational level, child and maternal age or presence of siblings.</td>
<td>Randomised controlled trial Experimental group versus control, pretest/posttest Video observation data were collected at baseline and at one year follow-up. Attitude: During the intervention phase, 9 families withdrew from the study, either directly after the pretest and before randomization took place (4 families) or before the posttest (1 intervention family and 4 control group families). Selection, assessment and outcome measures Child Behavior Checklist (CBCL)/1.5-5 Maternal sensitivity (7 pt scale) Maternal Discipline Strategies Infant Characteristics Questionnaire (ICQ) Cantill Ladder (Mothers sense of wellbeing), Dutch Family Problems Questionnaire</td>
<td>Repeated measures multivariate analysis of variance (MANOVA) were used to measure intervention effects. A MANOVA on attitudes towards sensitivity and attitudes towards sensitive discipline showed that the dependent variables were significantly affected by the intervention, F(2,234)=11.0, p&lt;0.01. Univariate tests revealed that after receiving the intervention, mothers in the intervention group had more favorable attitudes towards sensitivity, F(1,235)=18.9, p&lt;0.01 and towards sensitive discipline F(1,235)=4.5, p&lt;0.05. Treatment effectiveness was not related to child characteristics (sex, age, temperament), family characteristics (level of daily hassles, marital discord and maternal wellbeing), or professional training level of intervenor. Univariate tests showed that especially in families with more marital discord, the intervention was effective in decreasing overactive child behavior F(1,229)=8.1, p&lt;0.01. In families with more daily hassles, the intervention was effective in decreasing overactive child behavior F(1,229)=6.79, p&lt;0.05. Treatment effectiveness was not related to child characteristics, maternal wellbeing, or the training level of intervenor. The change in maternal attitudes towards sensitivity and towards sensitive discipline and the change in sensitive discipline behaviors did not mediate the change in children’s overactive problem behavior, given the posttest assessments of these parenting variables were not associated with this child outcome variable. Similarly, attitudes towards sensitive discipline did not mediate the change in sensitive behavior.</td>
<td>Limitations: no information was known about the nonparticipating families from the screening phase higher percentage of girls (51.8%) in the intervention group compared with the control group (38%) response rates were moderate families from higher socioeconomic backgrounds were over represented families with a non-Caucasian background were excluded although families participating did show higher levels of child externalizing problems, marital discord, and daily hassles as well as lower levels of maternal well-being compared with those initially screened it is not clear whether VIPP-SD program is similarly effective in more troubled families from lower socioeconomic backgrounds the program results may not be generalisable to families from other cultural backgrounds to avoid overload to parents and children not all constructs could be measured at all times plus measures were not broad enough to capture those changes that caused the decrease in overactive child behaviours findings constrained by lack of home observations Comments: WIPP-SD is a standard, manualised program that describes structure, themes, tips, and exercises for mother and child and is delivered in six home visits a dummy intervention for control group was used to ensure comparable motivation and attention in both groups and prevent attrition authors suggest also finding effects of this home-based intervention in laboratory assessment strengthens rather than diminishes results Authors’ conclusions The intervention proved to be effective in enhancing maternal attitudes toward sensitivity and in promoting actual sensitive discipline interactions in the intervention group compared with the control group.</td>
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<td>Velderman et al. (2006a and 2006b), The Netherlands</td>
<td>Intervention Video-feedback and brochures (VIPP) Video-feedback, brochures and discussion (VIPP-R) Control No explicit intervention</td>
<td>Mothers with first-born children were identified by town hall records and child health center records. Selected mothers (n=311) were invited to participate in an interview about their childhood as part of a study on the influence of their own childhood on child development. Of these 262 AAls were administered (16% attrition). From this 84 mothers tentatively classified as insecure were included in the study. Inclusion criteria: mothers with more than 8 but less than 14 years of formal education. Exclusion criteria: None stated.</td>
<td>Randomised controlled trial Experimental group versus control, pretest/posttest Video observation data were collected at baseline and at a 6-month follow-up. Attrition: Of 84 mothers, 91 participated in all activities (3.6% attrition). Selection, assessment and outcome measures Adult Attachment Interview (AAI) Strange Situation Procedure (SSP) Infant Behavior Questionnaire (IBQ) The AAI was used as a selection instrument and mothers were selected on the basis of their insecure attachment representation. Home visitors made video observations of mother-infant dyads to assess sensitive responsiveness during free play. A further four home visits were scheduled with a posttest video observation assessment of sensitivity made by research assistant unknown to the mother.</td>
<td>Post-intervention, intervention mothers were significantly more sensitive than control mothers (p&lt;0.05, d=0.49). Univariate ANOVA with pretest as the covariate showed that sensitivity of intervention mothers increased significantly more than control mothers’ sensitivity (p&lt;0.05, d=0.46). Mothers’ posttest sensitivity in both intervention groups was significantly higher than in the control group (for the VIPP group p&lt;0.05, d=0.46 and for the VIPP-R group p&lt;0.05, d=0.52) and the effectiveness of the two types of interventions did not differ. The intervention was less effective in changing children’s attachment security. Although 67% of the intervention groups developed a secure attachment to their mothers, the same was true of 56% of the infants in our control group (p=0.17, d=0.22). The number of secure infants in both intervention groups was not significantly higher than in the control group. The effectiveness of the two different interventions did not differ. The infants of mothers who showed more increase in sensitivity were more securely attached (using continuous security scores). Mothers of highly reactive infants profited more from the intervention than others. At posttest, sensitivity in the highly reactive control group (p&lt;0.01, d=2.27). There was no difference between the less reactive groups.</td>
<td>Limitations: small sample size may be underpowered even a brief home-based intervention such as this requires significant resources and effort to implement a larger sample might have resulted in a significant interaction effect instead of a trend for intervention effects on attachment security for highly versus less reactive infants the use of the IBQ may be less robust than observational assessment of negative reactivity there may be a ceiling effect due to the selection of mothers on the basis of the AAI from audiotape as this may not have led to a sample of 100% insecure mothers, in a completely insecure sample the possibility of improvement in maternal sensitivity and infant attachment security would be higher the approach of assigning classifications to AAI from tape instead of transcript needs to be validated. Comments: WIPP focused on enhancing mothers’ sensitive responsiveness by providing them with video feedback about their own (in-sensitive) behaviours VIPP-R aimed to enhance sensitivity and restructure mothers’ attachment representation (representational level) discussions in VIPP-R were of mothers’ childhood attachment experiences in relation to their current caregiving educational level scale ranged from 1 to 4, with 1 = primary school or junior secondary vocational education and 4 = senior secondary general education followed by senior secondary vocational education the authors suggest the findings are important for mental health providers planning and implementing intervention or prevention programs in that is seems promising and possibly cost effective to implement brief interventions with a clear focus that may have an effect. Authors’ conclusions: Post-intervention, both groups of intervention mothers were found to be more sensitive than control mothers. The two interventions were equally effective at enhancing maternal sensitivity but failed to produce a significant effect on infant attachment security.</td>
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<tr>
<td>Velderman et al. [2006a and 2006b]</td>
<td>The Netherlands Continued</td>
<td>Finally, mothers were invited to the Child and Family Studies Center to participate in the SSP.</td>
<td></td>
<td>This differential intervention effect cannot be ascribed to differences in pretest sensitivity between mothers of highly reactive infants and mothers of less reactive infants ((p=0.99)).</td>
<td>The interventions were most effective for highly reactive children and their mothers, providing support for theories suggesting that there may be differential susceptibility to rearing influences.</td>
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OVERVIEW

Emotional and behavioural problems in infancy are mostly viewed as relational so there is general agreement that the intervention focus for infants should be on improving the quality of parent-infant relationships. Within this context most studies are guided by the theoretical framework of attachment to delineate goals and components of specific interventions (Cohen et al. 1999). Hence this report summarises the evidence from studies seeking to promote attachment between young children and their parents. For pragmatic reasons (primarily timeframe) this report was limited to studies conducted in the last eight years only.

Overall quality of evidence

Of the 27 eligible articles identified, two systematic reviews were appraised (see Table 2, pages 7-10) and 18 separate primary studies were appraised from a total of 24 articles (see Table 3, pages 11-38). An additional trial focusing on an eligible form of attachment intervention was originally appraised but subsequently excluded due to its focus on adoptive children (see Appendix 3b).

Summary of evidence for the effectiveness of interventions promoting attachment between young children and their parents

Secondary studies

Two secondary studies (see Table 2, pages 7-10) met selection criteria and are summarised below.

Bakermans-Kranenburg et al. (2005) published a systematic review that examined intervention studies designed to prevent disorganised attachment. Ten studies with 15 preventive interventions (n=842) were found that included infant disorganised attachment as an outcome measure. The effectiveness of these interventions ranged from negative to positive, with a non-significant overall effect size (d = 0.05). A meta-analysis showed that disorganised attachment may respond to sensitivity-focused interventions but the authors’ suggest that interventions that specifically focus on the prevention of disorganisation may also be warranted.

An earlier systematic review by the same principal author provides what is the most comprehensive summary of the relevant literature in this field to date. Bakermans-Kranenburg et al. (2003) identified seventy relevant studies including 88 interventions effects on sensitivity (n=7636) and/or attachment (n=1503). Not all of the studies considered used true experimental designs to test intervention effectiveness so to estimate the combined effect size, a smaller group of studies consisting of only the intervention studies with randomised control group design were selected.

A core set of 51 randomised controlled trials was established (6282 mothers with their children) and a meta-analysis of these studies was done. Randomised interventions appeared rather effective in changing insensitive parenting (d=0.33) and infant attachment insecurity (d=0.20). The results suggested that interventions with a clear focus and a modest number of sessions may be preferable. Furthermore interventions with an exclusively behavioural focus on improving maternal sensitivity appear to be the most effective not only in enhancing maternal sensitivity but also in promoting children’s attachment security.

Primary studies

Eighteen independent randomised controlled trials were reported from a total of 24 articles. All of these studies had either a focus on promoting attachment or maternal sensitivity or responsiveness, as either a primary or a secondary outcome and included studies that satisfied pre-determined selection criteria. These studies are summarised briefly on the following pages and further detail is provided in Evidence Tables (see Table 3, pages 11-38) and in an overall summary table (see Table 4, page 41).

In the following sections studies have been grouped either by their risk status or by some other common identifying feature of the population of interest.
Mothers with or at risk of depression

Maternal depression is believed to have an adverse impact on the mother-child attachment relationship but empirical findings are equivocal. A significant but modest association has been confirmed (Martins and Gaffan 2000) especially when depression is severe or protracted. In some studies maternal depression has not been associated with insecure attachment, and in all studies it is clear that a substantial number of mothers with depression are able to provide a sensitive caretaking environment for their children (McMahon et al. 2006). Three intervention studies were found that specifically targeted mothers with or at risk of depression in one of the experimental groups.

A study by Ammaniti (2006) focused on three groups of participants, those at risk of depression (high or low risk) and an additional group of low risk women who had fewer psychosocial risk factors. The comparison group received only scheduled visits for data collection. The intervention group women all participated in a home visiting programme theoretically based on attachment theory that was designed specifically to promote child development, improve parenting practices, and facilitate positive parent-child relationships. The intervention was effective at 6 and 12 months post-intervention, as sensitive maternal behaviours toward their child in the combined group of mothers receiving the intervention increased significantly.

Murray et al. (2003) recruited mothers with post-partum depression into a treatment study that compared the effectiveness of non-directive counselling with cognitive behavioural therapy, psychodynamic therapy and routine primary care. Sensitivity and attachment were both primary outcomes in this study. Findings indicated that the treatments had no significant impact on security of infant-mother attachment but in mothers who experience social adversity, whose interactions with their infants were particularly poor, non-directive counselling produced a more sensitive pattern of mother-infant interaction.

Mothers with and without a history of major depressive disorder since their child’s birth were offered Toddler-Parent Psychotherapy, a manualised intervention based on attachment theory (Toth et al. 2006). Two control groups, one of depressed mothers, the other of non-depressed mothers received usual care. In many regards this was an efficacy trial, in that co-occurring risk factors were deliberately minimised in the sample and the intervention was not delivered in the home. The authors suggest that their results demonstrate the efficacy of toddler-parent psychotherapy in fostering secure attachment relationships in young children of depressed mothers but qualify this by stating that it is yet to be ascertained whether the same magnitude of effect (i.e. large) would be found in more heterogenous samples or where a lesser amount of therapy was received.

Adolescent mothers

Several researchers have targeted adolescent mothers for intervention. This is because children of adolescent mothers are at risk for a variety of developmental difficulties. Jaffee et al. (2001) found compelling evidence that negative outcomes for children of adolescent mothers are associated with both family circumstances (social influence) and maternal characteristics (social selection). They concluded that the personal characteristics of adolescent mothers contribute to adverse outcomes for their children, even when the negative social consequences of early childbirth are taken into account. Furthermore adolescent mothers have been shown to be less responsive to their infants’ signals, to use more intrusive and physical interventions, and to provide less verbal stimulation than adult mothers (Culp et al. 1991).

Three programmes were identified that sought to intervene with adolescent mothers.

The Keys to Caregiving programme was designed to promote high-quality parent-infant interaction through improving parents’ understanding on infant behaviours, cues and needs. Several articles by Letourneau and colleagues (2001a; 2001b) and Letourneau (2001) provide the results from a small pilot study of this intervention. Across multiple sample sizes, observers, data coders, testing sessions, types of analysis, and instruments, significant differences between groups were found. Interpretation of these results is limited by the small size of the sample however this study does provide tentative support for a nursing intervention programme to improve parent-infant interactions. A full trial with an adequate number of participants is required to make stronger conclusions about this particular intervention’s effectiveness.
Table 4. Summary of aim, mode of delivery, settings and theoretical basis of interventions appraised in primary studies

<table>
<thead>
<tr>
<th>Primary study</th>
<th>Country</th>
<th>Aim and mode of service delivery</th>
<th>Sample</th>
<th>Theoretical basis</th>
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<tbody>
<tr>
<td>Ammaniti et al. (2006), Italy</td>
<td>Home visiting programme to enhance the quality of mother-infant interaction.</td>
<td>Sample at risk of psychosocial problems or depression.</td>
<td>Intervention based on attachment theory.</td>
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<tr>
<td>Armstrong et al. (2000), Australia</td>
<td>Home visiting programme to enhance quality of maternal-infant attachment and mothers’ relationship with the child.</td>
<td>Multi-risk sample.</td>
<td>Intervention promoting optimal child development.</td>
<td></td>
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<tr>
<td>Caughy et al. (2004), USA</td>
<td>Pediatric office visits plus home visits to enhance sensitive interaction and attachment security.</td>
<td>Low risk sample.</td>
<td>Intervention promoting optimal child development.</td>
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<tr>
<td>Cicchetti et al. (2006), USA</td>
<td>Home and center-based sessions to optimize mother-infant relationship and parenting.</td>
<td>Multi-risk sample.</td>
<td>Based on nurse home visitation model and mothers attachment history.</td>
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<tr>
<td>Cohen et al. (1999), USA</td>
<td>Center-based intervention to improve attachment security and mother-infant interaction.</td>
<td>Heterogeneous sample, self-referrals.</td>
<td>Based on attachment theory.</td>
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<tr>
<td>Constantino et al. (2001), USA</td>
<td>Home visitation to promote infants’ social and emotional development.</td>
<td>Multi-risk sample.</td>
<td>Based on attachment theory.</td>
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<tr>
<td>Letourneau et al. (2001a and 2001b), USA</td>
<td>Home visitation to promote high-quality parent-infant interaction.</td>
<td>Adolescent mothers.</td>
<td>Based on Barnard’s model which promotes sensitivity to infant cues.</td>
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<tr>
<td>Koniak-Griffin et al. (2003), USA</td>
<td>Home visitation to improve social and emotional competence.</td>
<td>Adolescent mothers.</td>
<td>Based on social-learning theory.</td>
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<tr>
<td>Moran et al. (2005), Canada</td>
<td>Home visitation to increase the probability of a secure infant-mother attachment relationship.</td>
<td>Adolescent mothers.</td>
<td>Based on attachment theory.</td>
<td></td>
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<tr>
<td>Toth et al. (2006), USA</td>
<td>Home- and lab-based to foster improved attachment security.</td>
<td>Women with post-partum depression.</td>
<td>Based on attachment theory.</td>
<td></td>
</tr>
<tr>
<td>Van Zeijl et al. (2006), The Netherlands</td>
<td>Home-based visitation to enhance sensitive parenting.</td>
<td>Low-risk sample.</td>
<td>Based on attachment and coercion theory.</td>
<td></td>
</tr>
<tr>
<td>Velderman et al. (2006a and 2006b), The Netherlands</td>
<td>Home visits and clinic-based assessment to improve infant attachment security.</td>
<td>Mothers classified with insecure attachment.</td>
<td>Based on attachment theory.</td>
<td></td>
</tr>
</tbody>
</table>
Two further studies were identified that focused primarily on intervening with adolescent mothers. Koniak-Griffin et al. (2003) implemented an early intervention programme that started with preparation for parenting classes pre-birth and incorporated intensive post-birth home visitation from nurses. Mother-child interaction was only a secondary outcome and no improvements were noted specifically for this measure.

A trial by Moran et al. (2005) compared another home visiting programme with a minimal intervention consisting of one home visit only. The latter study had a much stronger focus on attachment and mother-child interaction was a primary outcome measure. Results showed that an interaction-focused intervention in the first year of life can improve the quality of the relationship between adolescent mothers and their infants and that the improvement in interactions persists at least into the second year of the child’s life. The authors also noted that there was a sizeable subgroup (25%) for whom the intervention appeared to be of no benefit.

**Mixed or multi-risk populations**

Interventions that focus on mixed or multi-risk populations tend to have a broader focus, although this is not always the case. A range of studies were found that looked at either home visiting as an intervention alone or home visiting plus adjunctive education programmes with a relationship focus. Eight groups of studies (some with more than one publication3) were reported in this category.

Armstrong et al. (2000) examined two groups, families who received child health nurse home visits and families who received usual care which may have included accessing their local community child health clinic. Both the quality of maternal-infant attachment and the mothers’ relationship with the child, were significantly enhanced in the experimental group and intervention mothers showed greater emotional responsivity to their infants and more readily accepted their infants’ behaviour.

A recent trial by Cicchetti et al. (2006) compared infant parent psychotherapy (IPP), a psychoeducational parenting intervention (PPI) to a community control group and a second normative comparison group (from non-maltreating families). This study was one of only a few to directly examine the change in attachment pattern from pre intervention to post intervention and to also include a normative comparison group. Post intervention, all mother-child dyads were reassessed using the Strange Situation Procedure and significant differences were found that showed the pattern of differences had changed, indicating substantial intervention effects. The authors suggest that an attachment-theory informed intervention (IPP) and an intervention that focuses on improving parenting skills, increasing maternal knowledge of child development, and enhancing the coping and social support of maltreating mothers (PPI) were both successful in altering the predominantly insecure attachment organisations of infants in maltreating families.

Another study that also looked at mother-infant psychotherapy was conducted by Cohen and colleagues (1999). They compared two interventions, the “watch, wait and wonder programme” and psychodynamic psychotherapy. A mixed sample of mothers both self-referred and referred by health professionals were randomly assigned to receive either intervention. Both attachment security and change in attachment security status were examined along with other measures of mother-child interaction. Overall the “watch, wait and wonder group” showed more organised or secure attachment relationships and a greater improvement in cognitive development and emotional regulation than infants in the comparison group.

Constantino et al. (2001) investigated the effectiveness of an educational programme which had a socioemotional-development focus. The intervention was offered as an adjunct to home visitation to a cohort of families already receiving home visits and to another cohort of families not previously enrolled in home visits. A further group that acted as a control received no educational programme. There was no clear evidence from this study that the group education intervention delivered positively influenced children’s development independent of the increase in participation in home visitation. A trend for improvement in parental ability to interpret infant’s emotional cues was noted. The authors suggest that group meetings designed to promote parents’ practical understanding of children’s earliest

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3 Where multiple publications exist, results from more than one article may have been combined in a single Evidence Table or a summary article selected for appraisal. For example, for some studies such as the Nurse Family Partnership programme (Olds and colleagues) only the most relevant publications are listed in the references.
social relationships may however be an effective means of engaging hard-to-reach families in home visitation.

A home visiting programme delivered to at risk women in Australia by Fraser et al. (2000) reported on a number of secondary outcome measures related to attachment. No significant differences were reported between intervention and comparison groups for parental attachment. However maternal-infant interactions were more likely to be positive, with significantly higher (better) scores in aspects of the home environment related to optimal development in children, particularly maternal-infant attachment. Despite some changes that were noted over time in this study, no sustained, overall intervention effect was demonstrated at the 12- or 18-month follow-up.

In a similar but much larger scale, multisite study Goodson et al. (2000) compared families who received services from the Comprehensive Child Development Program (CCDP) against families who received no CCDP services but were able to access other local services. There were no significant differences between the groups on maternal behaviours including sensitivity to cues, response to child distress, fostering of socio-emotional growth, or on total maternal score, nor was there a significant difference in the observed behaviour of the programme and control children. Findings suggest that a combination of case management and parenting education, delivered through home visits, is not an effective means of improving developmental outcomes for low-income children.

A series of articles by Heinicke and colleagues (1999; 2000; 2001) reported on a relationship oriented and home visit-based programme (the UCLA Family Development Project). Children receiving the intervention were more secure and their mothers more responsive to their needs in the first and second year of life relative to a group receiving paediatric follow-up. The authors concluded that the intervention made a significant impact on several socio-emotional mother-infant transactions including parental responsiveness.

Nurse home visitation was compared to paraprofessional home visits by Olds et al. (2002 and 2004). Nurse-visited mother-child pairs interacted with each other more responsively than those in the control group (p=0.05). A very large number of outcomes were studied in this trial. At six months, nurse-visited infants were less likely to exhibit emotional vulnerability to fear stimuli and nurse-visited infants born to women classed as having low psychological resources were less likely to exhibit low emotional vitality in response to joy and anger stimuli. The authors concluded that nurses produced significant effects on a wide range of maternal and child outcomes including more responsive mother-infant interaction compared to those visited by non-nurses.

**Low-risk populations**

Several studies focused on low risk participants. One of the main reasons for focusing on a sample with a lower level of risk is that it is theoretically easier to deliver a more focused, intensive intervention.

An intervention that combined paediatric office with home visits (Healthy Steps) was compared to usual care by Caughy et al. (2004). Only two of the original fifteen sites (six of which used a randomised design) were examined in this report. Results suggested that mothers participating in Healthy Steps were more likely to interact sensitively and appropriately with their children than mothers in the comparison group by the second assessment point (age 34-37 months) but not at the first assessment point (age 16-18 months). From a developmental perspective this is consistent as it may reflect the fact that programme effects start to emerge and become evident at later time points. Findings indicate that child development services can be offered through paediatric (primary care) practices. What remains unclear from this study is whether the observed effect is due primarily to the home visiting or paediatric visit components of the intervention or whether it is a combined effect.

Van Zeijl et al. (2006) delivered an early intervention programme to low-risk mothers that used video-feedback and was based on a standard manualised programme. The focus of the programme was on improving sensitivity and sensitive discipline. While the control group did not receive any explicit intervention mothers in this group did receive a number of phone calls over the course of the study where they had the opportunity to talk about the general development of their child. The intervention proved to be effective in enhancing maternal attitudes toward sensitivity and sensitive discipline and in promoting sensitive discipline interactions. The change in maternal attitudes toward sensitivity and towards sensitive discipline and the change in sensitive discipline behaviours did not mediate any
changes in children’s overactive problem behaviour. Similarly, attitudes towards sensitive discipline did not mediate any change in sensitive behaviour.

Other studies

One novel trial reported by Klein and Rye (2004) was conducted in Ethiopia among families in two very poor communities. This intervention focused on improving the quality of parent-child interactions including maternal sensitivity and responsiveness. One year following the intervention, mothers in the intervention group were found to be more sensitive, more responsive, and optimistic about their potential to affect their child’s development than were mothers in the comparison group. Six years later significant changes were still noted in the quality of the adult-child interactions and developmental measures of the children. Further interpretation of the results from this article was limited by the lack of information provided on the statistical analyses but this study stood out as being unique in its community development approach.

Finally, an intervention study by Velderman et al. (2006a and 2006b) was aimed at breaking the intergenerational cycle of insecure attachment. Eighty-one first time mothers were randomly assigned to receive video-feedback and brochures to enhance sensitive parenting. The second intervention involved additional discussions of mothers’ childhood attachment experiences in relation to their current caregiving. By the time of the six-month follow-up, intervention mothers were found to be more sensitive than control mothers. Furthermore the interventions were most effective for the highly reactive children and their mothers.

One additional study was appraised (see Appendix 3b) that falls outside of the scope of the current review (due to the population rather than intervention considered). This trial looked at the effectiveness of a “personal book” intervention with and without sessions of home-based video feedback in adopted children (Juffer et al. 2005b). This short-term preventive intervention program lowered the rate of disorganized attachment in this specific population. The effectiveness of this intervention documents the importance of parenting in the development of infant attachment disorganization, particularly in children with a heightened risk of attachment problems. Although the results of this study may not be generalisable to children who are not adopted, the intervention approach itself could have application with non-adopted children and their parents.

Discussion

Thirteen out of the 18 eligible studies (72%) reported a statistically significant improvement on one or more outcomes of interest by the time any follow-up was completed. Of the remaining studies, three reported no effect, one study reported a trend to improvement on the primary outcome measure of interest and one additional study reported a positive effect but did not include data to verify this in the published report (see Table 5, page 45).

Overall, when all the trials are considered disregarding their methodological differences the evidence is relatively consistent, suggesting that interventions based on attachment theory and delivered to different populations, are moderately effective despite the wide range of different intervention approaches and different comparison groups used.

This body of evidence should however not be considered without due consideration to a number of methodological issues and limitations.

Methodological Issues

Attachment security is only one factor in a multi-risk model of developmental psychopathology and only one of a number of variables that contribute to parent-child relationships, it may be that attachment may serve better as an endpoint or marker of improvement over time rather than an immediate outcome (Cohen et al. 1999). Moreover, in general attachment security may also be more difficult to change than maternal insensitivity.

4 Analyses appear to have been done but have been reported elsewhere primarily in an unpublished PhD which was not able to be retrieved.
### Table 5. Summary of direction of observed effect in intervention group by outcome and the statistical significance or size of the effect

<table>
<thead>
<tr>
<th>Primary Study</th>
<th>Improvement shown on outcome measure for intervention group/s</th>
<th>Significance/Effect Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ammaniti et al. (2006)</td>
<td>Sensitive maternal behaviours</td>
<td>At 12 months p&lt;.03</td>
</tr>
<tr>
<td>Armstrong et al. (2000)</td>
<td>Emotional responsivity</td>
<td>At 4 months p&lt;.05</td>
</tr>
<tr>
<td>Caughy et al. (2004)</td>
<td>Secure attachment Sensitive interaction</td>
<td>At 37 months p&lt;.01/ES 0.23</td>
</tr>
<tr>
<td>Cicchetti et al. (2006)</td>
<td>Secure attachment [for IPP and PPI respectively]</td>
<td>At 26 months p&lt;.001/ES 1.46 and ES 1.51</td>
</tr>
<tr>
<td>Cohen et al. (1999)</td>
<td>Secure attachment</td>
<td>At approx 30 months p&lt;.03</td>
</tr>
<tr>
<td>Constantino et al. (2001)</td>
<td>Interpreting emotional cues</td>
<td>Trend only, p=.08</td>
</tr>
<tr>
<td>Fraser et al. (2000)</td>
<td>Short-term improvement on maternal-infant interaction</td>
<td>No effect reported.</td>
</tr>
<tr>
<td>Goodson et al. (2000)</td>
<td>No improvement</td>
<td>No effect reported.</td>
</tr>
<tr>
<td>Heinicke et al. (1999, 2000 and 2001)</td>
<td>Secure attachment Responsivity</td>
<td>At 24 months p&lt;.0001/ES 1.31</td>
</tr>
<tr>
<td>Letourneau et al. (2001a, 2001b)</td>
<td>Responsiveness</td>
<td>For parent subscale p=.036</td>
</tr>
<tr>
<td>Koniak-Griffin et al. (2003)</td>
<td>No improvement</td>
<td>No effect reported.</td>
</tr>
<tr>
<td>Moran et al. (2005)</td>
<td>Secure attachment Maternal-infant interaction</td>
<td>At 24 months p&lt;.05/ES 0.25</td>
</tr>
<tr>
<td>Olds et al. (2002, 2004)</td>
<td>Responsive interaction</td>
<td>At 24 months p&lt;.05</td>
</tr>
<tr>
<td>Toth et al. (2006)</td>
<td>Secure attachment</td>
<td>At 36 months p&lt;.001/ES 1.08</td>
</tr>
<tr>
<td>Van Zeijl et al. (2006)</td>
<td>Attitude towards sensitivity</td>
<td>At 12 months p&lt;.01</td>
</tr>
<tr>
<td>Velderman et al. (2006a and 2006b)</td>
<td>Sensitivity [for VIPP and VIPP-R respectively]</td>
<td>At 6 months p&lt;.05/ES 0.46 and ES 0.52</td>
</tr>
</tbody>
</table>

† where two effect sizes (ES) are noted, more than one intervention was compared with control

Of the primary studies appraised in this review half of them (n=9) included some measure of attachment security, predominantly the Strange Situation Procedure (which is usually conducted in a laboratory playroom). One study used an alternative measure, Caughy et al. (2004) used the Attachment Q-Sort, results from which have been reported to converge with the Strange Situation Procedure (van Ijzendoorn et al. 2004). Of the studies directly considering attachment as an outcome, six studies reported significant change, usually from an insecure or disorganised pattern of attachment to one that was secure (Caughy et al. 2004; Cicchetti et al. 2006; Cohen et al. 1999; Heinicke et al. 1999; Heinicke et al. 2000; Heinicke et al. 2001; Moran et al. 2005; Toth et al. 2006).

However even if infants shift toward a more secure or organised attachment pattern these types of results still need to be viewed with caution. Some of the earlier literature that predates this report involved even younger infants in the birth through pre-attachment stage. It is important to be aware that the effects of interventions will be dependent on the stage of attachment formation. For this reason studies that include outcomes that were measured beyond very early infancy are useful as there may
There may be a time lag between delivery of an intervention and subsequent changes in outcome measures (or other endpoints).

One of the difficulties is in knowing whether any improvements are due specifically to the intervention or whether the improvements might have occurred naturally over time. To some extent the use of studies with an experimental design addresses this but to directly look at this, a normative control is required in addition to their primary comparison group. A few studies did include a normative group for comparison (Cicchetti et al. 2006; Toth et al. 2006). Cohen et al. (1999) points out it is always a possibility that infants with mental health problems may become less symptomatic over time without treatment, as is observed in some studies with older children. It is also possible, that as mothers mature and become more confident in their role, that they might also become more sensitive and responsive in their interactions with their children. Some researchers have suggested that the introduction of an early intervention actually serves to mitigate a reduction in the number and quality of sensitive and responsive interactions that may otherwise naturally occur over time due to the increased behavioural demands of toddlers and other factors such as the arrival of additional children.

Ideally, intervention studies in this field would also include a waiting list or no treatment control group so that infant behaviour and parent perceptions can be more clearly attributed to the effect of treatment. This was not always possible in all of the studies considered either for ethical reasons or because it was impossible to restrict mothers’ access to services available within their community that might constitute an intervention. Notably, several of the studies which report no effect (Fraser et al. 2000; Goodson et al. 2000) were broader studies where comparison mothers received usual care, with no restriction on other programmes and services they might access during the course of the study.

Nearly without exception all of the studies identified used home visiting as the mode of service delivery, however the extent to which home visits were used varied by study. In some studies the home visiting programme constituted the intervention itself, whereas in other studies it was the vehicle for delivering another specified psychosocial intervention.

Only one study by Cohen et al. (1999) appeared to have not used any home-based sessions. The authors alluded to this by suggesting the need to further test their variant of mother-infant psychotherapy in other settings.

Study Limitations

The specific strengths and limitations associated with each study are set out in the limitations and comments section in the evidence tables. Key points are only very briefly discussed here.

The majority of studies were carried out in the United States (56%), with two studies conducted in the Netherlands and Australia respectively (11%). The remaining four reports were from studies based in Canada, Ethiopia, Italy and the United Kingdom.

The studies ranged in size from small pilot trials to large multi-site studies. Studies with smaller sample size may have lacked sufficient power to detect an intervention effect.

The larger studies that used broader approaches although sufficiently powered may have not resulted in significant effects for a number of reasons. Those delivering the intervention may be required first to enable multi-risk families to engage by problem solving and attending to daily hassles before more focused effective interventions targeting sensitivity and representations could be attempted. These types of programmes are also more likely to demonstrate a pattern of small pervasive benefits than large effect sizes for one specific outcome (Fergusson et al. 2005a; Fergusson et al. 2005b; Fergusson et al. 2006).

For studies where difficulties were experienced with recruitment or retention (particularly those with multiple risk factors), samples may not be representative and therefore less generalisable to others. In particular, differential attrition may present an issue for longer term interventions as it may be difficult for control groups to remain motivated to participate in the face of problems but no active support from the programme (Goodson et al. 2000). Samples that have high rates of initial refusal may also be biased as the overall pattern of attachment may be different, with the rate of secure attachment lower and rate of disorganised attachment higher, in refusers compared to mothers who opted to participate in a
programme. Clearly, for studies in which specific populations were targeted treatment effects found may hold only for that specific group, for example, Klein and Rye (2004).

Few studies addressed how clinicians might identify those mothers for whom the intervention is more likely to be of benefit. In many articles the aim or objective of the intervention was often described but without reference to the specific individual components of the intervention or detail of the process by which intervention goals were achieved. Three groups of investigators specifically referred to their programme as being manualised (Cicchetti et al. 2006; Toth et al. 2006; Van Zeijl et al. 2006) which implies more detailed information on the intervention would be readily available.

Several of the included studies may be nearer to being efficacy than effectiveness trials (for example, “watch, wait and wonder- mother-infant psychotherapy”) and may therefore may not reflect how a therapy might be more flexibly applied in a real world setting as opposed to the clinic setting where few or no collateral therapies were utilised (Cohen et al. 1999; Toth et al. 2006).

**Conclusions**

The evidence presented in this Technical Brief supports the earlier findings of Bakermans-Kranenburg et al. (2003) who suggested that the most effective interventions do not always use a large number of sessions with families, in fact fewer contacts may be more effective. It also reinforces the idea that behaviourally focused interventions delivered one-to-one with mothers are useful and that these types of interventions are effective regardless of the presence or absence of multiple problems in the family.

Sample characteristics appear to be unrelated to the effectiveness of interventions, though Bakermans-Kranenburg et al. (2003) noted two exceptions to this. Firstly, samples with a higher percentage of insecurity in the control group where interventions may exert a larger effect on infant attachment compared to normative samples and secondly, clinical groups where interventions also appear to have a greater effect on parental sensitivity.

Interventions that were more effective when Bakermans-Kranenburg et al. (2003) restricted their meta-analysis to studies with both random allocation and a control group were also more effective in the subset of clinical and high-risk samples. More general and long-term support of multi-problem families in coping with daily hassles may be needed before more focused interventions can be implemented successfully in this group.

While changes in attachment security reported were generally in a direction consistent with attachment theory, they are modest. Less broad interventions that target sensitive maternal behaviour are among those that are the most successful both at improving insensitive parenting and promoting better infant attachment security. Infant-parent psychotherapy shows some promise while group educational interventions generally do not.

Overall, evidence from primary and secondary research suggests that a variety of types of intervention for enhancing maternal sensitivity and to a lesser extent attachment security are effective, with nearly all of the different approaches involving the use of some form of home visiting to deliver the intervention.
REFERENCES


Cooper, P. J., & Murray, L. (1997). The impact of psychological treatments of postpartum depression on maternal mood and infant development. In L. Murray & P. J. Cooper (Eds.), Postpartum depression and child development (pp. 201-261). New York: Guilford Press.


**APPENDIX 1: LEVELS OF EVIDENCE**

<table>
<thead>
<tr>
<th>Level</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level I</td>
<td>Evidence obtained from a systematic review (or meta-analysis) of relevant randomised controlled trials.</td>
</tr>
<tr>
<td>Level II</td>
<td>Evidence obtained from at least one randomised controlled trial.</td>
</tr>
<tr>
<td>Level III</td>
<td>1 Evidence obtained from pseudorandomised controlled trials (alternate allocation or some other method).</td>
</tr>
<tr>
<td></td>
<td>2 Evidence obtained from comparative studies (including systematic reviews of such studies) with concurrent controls and allocation not randomised, cohort studies, case control studies or interrupted time series with a control group.</td>
</tr>
<tr>
<td></td>
<td>3 Evidence obtained from comparative studies with historical control, two or more single-arm studies or interrupted time series without a parallel control group.</td>
</tr>
<tr>
<td>Level IV</td>
<td>Evidence obtained from case series, either post-test or pretest/post-test.</td>
</tr>
</tbody>
</table>

*From NMHRC 2000*
APPENDIX 2: SEARCH STRATEGY

**Medline**

1. exp parent-child relations/ (31995)
2. object attachment/ (7085)
3. 1 and 2 (2473)
4. attachment.tw. (45934)
5. resilience.mp. (1673)
6. (wellbeing or well being or wellness).mp. (22494)
7. or/3-6 (71358)
8. child, preschool/ or exp infant/ (982779)
9. 7 and 8 (4695)
10. "early intervention (education)"/ (670)
11. early intervention.mp. (4831)
12. (parent$ adj3 program$).mp. (1122)
13. (parent$ adj3 (train$ or educat$)).mp. (3313)
14. (home adj2 visit$).mp. (3318)
15. family therapy/ (6150)
16. (family adj2 visit$).mp. (556)
17. multisystemic therapy.mp. (63)
18. or/10-17 (18780)
19. intervention studies/ (3547)
20. pc.fs. (669817)
21. 8 and 18 (5485)
22. 19 and 20 and 21 (25)
23. (promot$ and (wellbeing or wellness or attachment or well being)).tw. (5374)
24. 23 and 8 (225)
25. (healthy steps or healthy start or early start or healthy fami$).tw. (760)
26. 9 and 18 (171)
27. 22 or 24 or 25 or 26 (1162)
28. limit 27 to english (983)
29. limit 28 to yr=1995-2006 (701)
30. (vaccin$ or immuni$ or breastfeeding or breast feeding).ti. (123620)
31. 29 not 30 (687)
32. letter.pt. (581686)
33. 31 not 32 (684)

**Embase**

1. exp child parent relation/ (16863)
2. emotional attachment/ (2235)
3. 1 and 2 (770)
4. attachment.tw. (28465)
5. (resilience or wellbeing or well being or wellness).mp. (22842)
6. or/3-5 (51410)
7. Preschool Child/ (65212)
8. Infant/ (128456)
9. 7 or 8 (175620)
10. 6 and 9 (845)
11. Early Intervention/ (358)
12. (parent$ adj3 program$).tw. (687)
13. (parent$ adj3 (train$ or educat$)).tw. (2690)
14. (home adj2 visit$).tw. (1922)
15. family therapy/ (3427)
16. (family adj2 visit$).tw. (340)
17. multisystemic therap$ .tw. (45)
18. or/11-17 (9078)
19. 10 and 18 (26)
EFFECTIVE STRATEGIES FOR PROMOTING ATTACHMENT BETWEEN YOUNG CHILDREN AND THEIR PARENTS

Cinahl

1. exp Parent-Child Relations/ (6245)
2. Attachment Behavior/ (663)
3. 1 and 2 (265)
4. (infan$ or preschool$ or pre-school$).tw. (21944)
5. 3 and 4 (87)
6. limit 3 to (newborn infant <birth to 1 month> or infant <1 to 23 months> or preschool child <2 to 5 years>) (140)
7. 5 or 6 (156)
8. (attachment or resilience or wellbeing or well-being).tw. (9617)
9. 4 and 8 (553)
10. limit 8 to (newborn infant <birth to 1 month> or infant <1 to 23 months> or preschool child <2 to 5 years>) (808)
11. 7 or 9 or 10 (1057)
12. early intervention/ or early childhood intervention/ (2283)
13. early intervention.tw. (1638)
14. (parent$ adj3 program$).tw. (574)
15. parenting/ (2420)
16. (parent$ adj3 (training or educat$)).mp. (4437)
17. (home adj2 visit$).tw. (1477)
18. (multi-systemic therapy or multisystemic therapy).mp. (19)
19. intervention$.mp. (61888)
20. Program Evaluation/ (8269)
21. or/12-20 (75019)
22. 11 and 21 (327)
23. (healthy steps or healthy start or sure start or healthy famil$).tw. (269)
24. 4 and 23 (47)
25. limit 23 to (newborn infant <birth to 1 month> or infant <1 to 23 months> or preschool child <2 to 5 years>) (100)
26. 24 or 25 (114)
27. 22 or 26 (438)
28. limit 27 to english (431)
29. limit 28 to yr=1995-2007 (388)
30. (autism or autistic).ti. (1322)
31. (vaccin$ or immuni$ or breastfeed$ or breast feeding$).ti. (10772)
32. 29 not (30 or 31) (373)
Current Contents

1. Attachment
2. Preschool* OR pre-school*
3. Infant OR infants OR infancy
4. #1 AND (#2 OR #3)
5. Parent SAME (train* OR educat* OR program*)
6. #3 AND #5
7. #4 AND #5
8. #6 OR #7
9. #6 AND (trial OR study OR intervention OR program*)
10. #7 OR #9
11. #10 NOT (vaccin* OR immuni* OR breastfeed* OR breast feed*)

Additional cross database search for home visiting – Medline, Embase, Cinahl, PsychInfo

1       home visit$.mp. (7392)
2       domiciliary visit$.mp. (107)
3       1 or 2 (7487)
4       (infant or infants or infancy).mp. (474538)
5       (preschool child$ or young child$).mp. (128133)
6       child$.mp. (1321036)
7       4 or 5 or 6 (1520448)
8       3 and 7 (3403)
9       limit 8 to english (3257)
10      limit 9 to yr=1996-2007 (2579)
11      random$.mp. (661954)
12      10 and 11 (634)
13      remove duplicates from 12 (374)
14      (breastfeed$ or breast feed$).mp. (27148)
15      asthma$.mp. (108630)
16      (vaccin$ or immuni$).mp. (288546)
17      13 not (14 or 15 or 16) (288)

*Systematic review. Intervention outside scope.*


*Systematic review. General focus on quality of home environment (responsivity measured by the HOMES scale) rather than attachment interventions delivered by home visitors.*


*Systematic review. Did not focus on outcomes of interest.*


*Systematic review. Focus on child behavioural adjustment rather than attachment. Outcomes of interest not reported.*


*Systematic review. Focus on child abuse and neglect rather than attachment. Outcomes of interest not reported.*


*Systematic review. Focus on emotional and behavioural adjustment outcomes rather than attachment, responsivity and sensitivity.*


*Systematic review. Focus on emotional and behavioural adjustment outcomes rather than attachment, responsivity and sensitivity.*


*Randomised controlled trial. Outcomes of interest not reported.*

**Cross sectional study.**


**Randomised controlled trial** Focus on feeding disordered infants.


**Cohort study. No intervention delivered.**


**Background.**


**Randomised controlled trial. Specific intervention effects of STEEP (Steps Towards Effective Enjoyable Parenting) were not clearly reported in this article. The focus of this paper was on reporting associations between maternal characteristics with regard to attachment status and their relation to maternal and child behaviour. Research focus.**


**Randomised controlled trial. Relevant attachment-based intervention however focused on a population of interest (preterm infants) that was outside the scope of this report.**


**Randomised controlled trial. Outcomes of interest not reported.**


**Randomised controlled trial. Outcomes of interest not reported.**

*Background.*


*Background*


*Case study.*


*Randomised controlled trial. Outcomes of interest not reported though intervention based on attachment theory.*


*Book chapter.*


*Comparative study. Used Brazelton Neonatal Behavioural Assessment Scale.*


*Systematic review. Broader focus than attachment and sensitivity. This review did identify several parenting programs (articles published predate the time restriction for this report) that examined parenting programmes delivered on a one-to-one basis in the home. Results using the NCATS measure indicated a large but non-significant effect favouring infants in the intervention group on responsiveness to the parent. No significant difference was apparent for improving the clarity of interpreting infant cues.*


*Systematic review. Broader focus than attachment and sensitivity.*

*Descriptive study.*


*Narrative review.*


*Controlled trial. Random allocation not reported. No intervention effects reported.*


*Randomised controlled trial. Outcomes of interest not reported.*


*Meta-analysis. This is a practice-based summary of the systematic review by Bakermans-Kranenburg et al. (2003).*


*Randomised controlled trial. Attachment outcomes not the focus of article.*


*Systematic Review. Focus on home visiting not attachment intervention. All age focus.*


*Randomised controlled trial. Attachment outcomes not the focus of the article.*


*Controlled trial, method of assignment unclear. Mothers using drugs.*

Descriptive study of a programme.


Background. Presents models of three types of parental service use.


Randomised controlled trial. Describes evaluation design and study.


Background to the therapy. Not a study.


Pre-test/post-test study with no control group.


Randomised controlled trial. Only one relevant outcome reported. The treatment group did show significantly higher maternal infant responsiveness after an interactive coaching intervention to promote responsiveness (as measured by the Dyadic Mutuality Code).


Randomised controlled trial. Outcomes of interest not reported.


Book chapter.

*Randomised controlled trial. Sample of adoptive children outside predetermined scope but included as a separate appendix.*


*Randomised controlled trial. Conference Abstract.*


*Systematic review. General focus on home visiting programmes and quality of home environment (measured by the HOMES scale) rather than attachment interventions delivered by home visitors.*


*Descriptive study.*


*Cross-sectional study. No control group.*


*Narrative review. Methods not outlined. Includes sensitivity and attachment interventions.*


*Randomised controlled trial. Only reported one outcome of interest (responsivity) and did not report any outcome measures for attachment. The study compared term infants with those born at very low birth weight with a developmental comparison group. The target group that received the intervention showed greater increases in responsiveness than the comparison group, with changes in emotionally supportive behaviours strongest for the low birth weight babies and mothers.*


*Quasi-experimental study. Random assignment to intervention group at time of registration. Reports on a brief prenatal intervention but relevant outcomes only measured 24 hours post-birth.*

**Randomised controlled trial (pilot study). Only one outcome of interest reported (NCATS).**


**Randomised controlled trial. This was a high quality trial however this article did not specifically report outcomes of interest (sensitivity, responsiveness, attachment) although child outcome measures did include relevant instruments such as the Child Behavior Checklist (CBCL) and the Home Observation for Measurement of the Environment (HOME). Early Head Start children had lower levels of aggression and rated higher on engagement with their parents compared with children in the control group.**


**Randomised controlled trial. Attachment outcomes not the focus of article.**


**Narrative review.**


**Meta-analysis. Only one outcome measure (HOME) of interest reported and no detail on sensitivity subscales.**


**Meta analysis but not of intervention studies.**


**Case study.**


**Longitudinal study. Focus on implications for intervention.**

*Systematic review. Focus on brief postnatal interventions (up to 4 months post-partum).*


*Randomised controlled trial (by site). Attachment outcomes not the focus of article.*


*Meta-analysis. Not outcomes of interest. Socioemotional outcomes only reported at a broad level.*


*Randomised controlled trial. Only one outcome of interest reported (HOMES).*


*Narrative review.*


*Background.*


*Narrative review.*


*Randomised controlled trial. Not intervention of interest.*


*Comparative study. Outcomes of interest not reported.*

Descriptive summary of cohort study.


Pseudorandomised controlled trial. Not population of interest.


Randomised controlled trial. Mothers using drugs


Cross sectional study. Background on maternal responsive behaviour.


Randomised controlled trial (by site). Attachment outcomes not the focus of article.


Narrative review. Also describes the development of a pilot randomised controlled trial.


Background. Mothers using drugs.


Meta analysis. General focus on home visiting programmes rather than attachment interventions delivered by home visitors.


Comparative study. Population group outside the scope of this report.

Randomised controlled trial. Intervention outside the scope of this report.


Randomised controlled trial. Outcomes of interest not reported in this article.


Randomised controlled trial. Brief postnatal hospital-based intervention.


Randomised controlled trial. Not outcomes of interest.


Background.


Pseudo-randomised controlled trial. Focus on low-birth-weight infants.
### APPENDIX 3b: APPRAISED RETRIEVED PAPERS (EXCLUDED)

<table>
<thead>
<tr>
<th>Authors, country</th>
<th>Intervention, setting</th>
<th>Sample characteristics, inclusion and exclusion criteria</th>
<th>Study design, methods</th>
<th>Results</th>
<th>Comments/limitations, authors’ conclusions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Juffer et al. (2005b)</td>
<td>Personal book group (PB)</td>
<td>Participants were 90 families with a first adopted child and 40 families with birth children and a first adopted child. All families were randomly recruited through adoption agencies and not selected in future problems. Adopted children were not selected by, nor matched to, the characteristics of their future adoptive parents.</td>
<td>Randomised controlled trial. Experimental group versus control, pretest/posttest. Data was collected and mother-child interactions videotaped in the home at baseline (6 months) and at follow-up (12-months). In addition at 6 and 9 months mother-child interaction was videotaped in all families. In the video-feedback group, videotapes were used in the intervention whereas in the other groups they were not. At 12 and 18-months infant-mother attachment was observed in the laboratory.</td>
<td>Intervention effects were computed using analysis of covariance (ANCOVA). Sensitive Responsiveness The standardized composite score for sensitive responsiveness at 12 months was conducted with experimental condition (video feedback, book-only and control) as the independent variable and pretest responsiveness (standardized composite score) as the covariate. A significant main effect of the experimental condition was found (p&lt;.01). Two further planned comparisons were examined. The book intervention did not yield a significant effect compared with the control (p=.07). However there was a significant main effect for the video-feedback intervention (p&lt;.01). Post hoc analyses confirmed that the effects on sensitiveness responsiveness were in the same direction and of comparable magnitude in families with and without birth children. Disorganized Attachment The intervention with video feedback was effective and lowered the number of disorganized infants as well as the continuous disorganization score. A moderate effect size of $d=0.46$ for the effect on the disorganized attachment classification, and a medium to strong effect size of $d=.62$ for the effect on the continuous disorganization ratings. The book-only intervention did not result in a significant decrease of infant disorganization, although infants in this group had lower ratings than in the control group.</td>
<td>Limitations • sample of adopted children who may be a special case of attachment insecurity, may limit generalisability • the study intervention was not specifically aimed at changing attachment disorganization but may have affected aspects of parenting that are important for this Comments • the intervention was primarily aimed at promoting sensitive parenting and secure attachment • the authors note that the discovery of a distinct effect of the video-feedback intervention is important, as a follow-up study has found that infant disorganized attachment in combination with difficult temperament is predictive of less optimal cognitive development and less optimal ego-control in middle childhood • adoptive families were particularly open to intervention and eager to receive support (as noted by the zero attrition rate) • the success of the intervention cannot be explained by post-adoption support as no such service were available at the time of the study • sample consists of parents with genetically unrelated, adopted children who were not selected but placed by chance so results are not confounded by genetically transmitted risks or protective factors for attachment disorganization. Authors’ conclusions A short-term preventive intervention program with video feedback and a book lowered the rate of disorganized attachment. The effectiveness of the intervention documents the importance of parenting in the development of infant attachment disorganization.</td>
</tr>
<tr>
<td>The Netherlands</td>
<td>Personal book plus three sessions home-based video feedback (VF)</td>
<td>n=130 (66 boys, 64 girls)</td>
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<tr>
<td>Control</td>
<td>No intervention</td>
<td>Inclusion criteria • family with first adopted child • child came into adoptive care before 6 months of age</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exclusion criteria</td>
<td>None specifically stated.</td>
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<td>Baseline differences between intervention and control groups were not found for family background characteristics, e.g. socioeconomic status or parent’s age, the number of boys or girls, or the adopted child’s health problems on arrival. There were significant differences with respect to the association between country of origin and age on arrival. Post hoc tests indicated that infants in the video-feedback group arrived at an older age than the children in the book-only or control group.</td>
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</table>

**Effective strategies for promoting attachment between young children and their parents**
APPENDIX 4: APPRAISED RETRIEVED PAPERS

Secondary Articles


Primary Articles


