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Measuring parental language in flying start areas in Wales

Gridley, Nicole

Award date:
2014

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Measuring Parental Language in Flying Start Areas in Wales

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Completed as part of PhD Psychology September 2014

Word Count: 37,949

Acknowledgements

I am privileged to have had the opportunity to work under the supervision of both Judy Hutchings and Helen Baker-Henningham, who are both undoubtedly knowledgeable and highly respected within their fields. Their patience, time and support over the last few years have been appreciated immensely. I would also like to acknowledge Tracey Bywater for her words of wisdom and support in times of need.

I would like to thank both the Children's Early Intervention Trust and the School of Psychology, Bangor University for funding the PhD and providing me with the opportunity to achieve a dream I never thought was possible.

To all the staff at the Centre for Evidence Based Early Intervention, thank you for being wonderful people. Most importantly, I should acknowledge and thank Dilys and Kath for allowing me full access to the coffee machine and for listening to my grumbles. Margiad my office buddy, for putting up with my incessant chatting and providing me with endless gossip, and to all of those faces past and present who worked on the toddler project. Without your hard work and dedication my life would undoubtedly have been made more difficult.

I would like to thank my beloved parents because even though I know you never really understand what I am doing, or even why I am doing it, I have always been safe in the knowledge that I have your love and support. I have been blessed to have two parents who share my sense of humour, who lift me up when I am down, and bring me back down to earth with a thud when I get above my station. It is this humility that keeps me grounded, and makes me appreciate everything I have achieved is because of you. Thank you.

Finally, I would like to thank my sisters for bringing five little people into my life that, on a daily basis, provided me with the inspiration and motivation to finish the PhD. I cannot express how blessed I have been to take words off a page and see it play out in real time. Watching the littlest ones, Mikey, Emily-Grace and Benjamin, go through the stages of language development right from the beginning all the way to the end of my PhD has been a privilege and a beautiful journey to be part of. I should also acknowledge the eldest two, Aisha and James for their straight-to-the-point attitude, and the countless games of Cluedo. Yes, I can play as many games as you like now! For all the riches in the world I would not change the last three years.

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Summary

There is substantial evidence to suggest that parenting plays a significant role in children's development. The Welsh Government (WG) has recognised that early intervention programmes, designed to enhance parenting skills, can address social inequalities and reduce poor child outcomes. The Incredible Years (IY) series has strong evidence for improving parent and child outcomes with children from three to eight years. Consequently, the Incredible Years Parent-Toddler Programme (IYPTP) was one of five parent programmes selected for use in Flying Start areas in Wales in 2007 as part of the WG Flying Start Initiative. The take up of the IYPTP by a significant number of Authorities provided the first opportunity to assess the effectiveness of the 12-week programme in a rigorous randomised controlled trial (RCT). Videotaped observations of parents and children interacting during free-play were collected during the main trial and consequently the thesis is comprised of a number of sub-studies resulting from this data.

The aims and specific objectives of the thesis were to:

1. Identify the strength of the relationship between socioeconomic disadvantage and poor parenting behaviours for a sample of parents living in targeted Flying Start areas.
2. Develop a reliable observational tool to measure parental language in Wales.
3. Evaluate the efficacy of using a behaviour based parenting programmes to enhance parental language.

The observational data provided seven categories of parental language for assessment, five complex and two simple. Socioeconomic disadvantage was strongly associated with reductions in simple quantifications of parental speech and home

stimulation measures. Two or more risks indicated a threshold for poor outcome. Simple measures of parental speech were also fairly stable over time and moderately associated with child language outcomes six months later. In contrast, complex measures were less stable over the short-term, and relations with socioeconomic disadvantage and child language outcomes were weak. Results generated from the efficacy study indicated that the IYPTP, a behaviour based parent programme, provides some benefit to two complex measures of parental language six-months post intervention for a sample of parents living in disadvantaged areas in Wales. Whilst these findings should be considered in line with the methodological limitations of the study the thesis does conclude that parenting programmes designed to enhance parenting behaviours may not be as beneficial to parental language than those that contain a stronger component of language coaching.

Chapter One

General Introduction

Language development is a natural process in which an individual learns to understand, interpret and convey strings of written or spoken symbols into meaningful units of communication (Harley, 2001; Tomasello, 1992). The successful acquisition of language underlies all aspects of human behaviour and although the rate of reaching specific milestones varies, the acquisition of language progresses in a similar fashion for all children (Wetherby, Allen, Cleary, Kublin & Goldstein, 2002).

It is widely acknowledged that a certain amount of vocabulary needs to be acquired before a child is able to begin combining strings of words into multiword utterances (Huttenlocher, Haight, Bryk, Seltzer & Lyons, 1991). Consequently, language comprehension and non-verbal communication precede language production serving as the facilitators for and prototypes of later adult conversation. Around the child's first birthday children typically begin to produce their first words, namely familiar objects in their environment that are frequently used with children, such as the names of people or animals (Hart, 1991). Through their second year children learn language at a rapid pace and by 24 months are able to produce up to 50 different words and are naturally acquiring 10 new words a day (Carey, 1978). This 'word explosion' stage is a significant period during language development providing children with the first opportunity to actively apply their comprehension skills with the newly found skill of talking. Subsequently, this period is an important precursor for the progression to more complex adult-like verbalisations and provides an ideal time in which to make inferences about a child's language trajectory.

Why is Language Important?

At school entry six to seven percent of children are affected by speech and language delays (Boyle, 2011). Language deficits affect all aspects of children's word comprehension (understanding), expression (language production), semantics (word meaning), grammar and written modalities. Children who fail to acquire a comprehensive understanding and expression of a language often fail to catch up with age-matched children and often face difficulties expressing their feelings effectively. The acquisition of language is considered a key factor in the development of effective academic and social and emotional skills (Law, Boyle, Harris, Harkness & Nye, 1998) with language difficulties associated with academic underachievement, peer rejection and behavioural problems (Menting, van Lier & Koot, 2010). The long-term impact of language problems on financial and societal costs in terms of criminal activity, prison and the penal system has prompted researchers to determine the cause of language problems in order to facilitate early diagnosis and intervention.

The Role of Parents in Language Development

Aside from genetic causes or trauma developmental research has established that language acquisition is greatly influenced by social environmental factors such as parenting (Hart & Risley, 1995). Social learning theory (SLT) proposes that children learn and acquire specific behaviours, such as language, through the observation and imitation of appropriate social role models (Bandura, 1969). According to SLT language is acquired through a series of complex cognitive processes in which children play an active role by observing the actions and consequences of others before making decisions about their performance (Vygotsky, 1968). When parents provide supportive,

stimulating and encouraging learning environments that are tailored to the child's developmental needs SLT postulates that this creates a 'zone of proximal development' where children are able to learn most effectively (Vygotsky, 1968).

High quality parenting is consistently associated with positive child outcomes; warm and supportive learning environments help children to develop effective social skills (Hutchings, Bywater & Daley, 2007; Hutchings et al., 2007; Webster-Stratton, 1998), and high levels of diverse child-directed speech are associated with the development of positive child language skills (Hart & Risley, 1995; Hoff, 2003; Hoff & Naigles, 2002). Consequently, children whose parents provide poor levels of developmentally appropriate cognitive and sensory stimulation in the first three years exhibit slower and reduced rates of neurological maturity and cognitive processing which affects language growth (Allen, 2011; Rodriquez et al., 2009).

A longitudinal investigation conducted by Hart and Risley (1992; 1995) provided ground breaking and comprehensive evidence that parental language strongly affects child language outcomes. Videotapes of parents and children interacting across a variety of daily routines were collected every two weeks, over a period of 30 months from a population of 42 socioeconomically diverse families. The coding scheme included 30 categories of parental language (representing vocabulary, social function and conversational turn described in detail in Chapter Two) and was devised on the basis of previous research and using advice from leading language researchers. The results indicated that the quantity and diversity of parental speech was significantly associated with child vocabulary growth, vocabulary use and general intelligence at three years, and academic outcomes at eight years contributing up to 25% variance in outcome. In addition, the findings also indicated that the overall amount of parental speech could be

predicted by the family's socioeconomic status. The study provided further evidence to support the parents' role in children's language development but also highlighted the significant negative contribution made by socioeconomic disadvantage on parenting outcomes.

Socioeconomic Disadvantage, Parenting & Child Outcomes

Socioeconomic disadvantage (SED) is a term most associated with poverty that also includes other factors that may or may not be financially related (Bradley & Corwyn, 2002). SED has shown a direct negative effect on parenting predicting low levels of good quality sensory stimulation (Bradley & Corwyn, 2002), fewer positive parent-child interactions (Brody, Flor & Gibson, 1999; McLloyd, 1998) and less child-directed speech (Burchinal et al., 2008; Hart & Risley, 1995; Hoff, 2003; Hoff-Ginsberg, 1991; Hoff-Ginsberg & Tardiff, 1995; Schmitt, Simpson, & Friend, 2011; Trentacosta et al. 2008). Exposure to impoverished environments even in the short-term has dramatic long-term consequences, significantly increasing the likelihood of social and behavioural problems later in life (Farrington, 1990; Menting et al., 2011), poor cognitive development and limited language skills (Rodriquez et al., 2009). Despite this, there is evidence that the negative consequences of poverty can be overcome if children at risk are identified early enough (Hair, Halle, Terry-Humen, Lavelle & Calkins, 2006; Karoly, Kilburn & Cannon, 2005; McCain, Mustard & Shanker, 2007; Offord & Lipman, 1999).

Study Context

Wales reports the highest percentage of children (32%) living in poverty compared to the UK (31%) overall (Welsh Government, 2011a). In 2006 the Welsh Government (WG) produced the Child Poverty Strategy to target and eradicate child poverty by 2020. Central to achieving this was the Flying Start (FS) initiative, a nationwide intervention to provide additional resources to families most at risk of poor outcomes attributable to SED. In 2006/2007 all 22 authorities across Wales were invited to participate in the first roll out of the scheme (Welsh Government, 2011b) targeting approximately 25,000 children aged from birth to 3 years old (Prabhaker, Thompson & McCrindle, 2008). Localities within each Authority were selected for inclusion based on school catchments areas with the highest proportion of free-school meals, and those scoring as the most deprived using the Welsh Index of Multiple Deprivation (Welsh Government, 2011b).

The rationale for FS was based on the evidence that early intervention to support parents and provide stimulation for children in the early stages of their development improves child outcomes (Ipsos Mori, 2009). In the short term, the goal of FS was to deliver services in at-risk communities to reduce childhood behaviour problems and the number of children being taken into care. In the long term, the aim of FS was to reduce the number of people living in Wales with poor skills, and cut the number of families with criminal, substance abuse and truancy records. To achieve these goals FS initially invested £2000 per annum per child under the age of three, for every child living within each defined FS catchment area. This financial resource was used to support the delivery of four services within each area:

1. Free good quality childcare for parents with children aged two to three years for two and a half hours a day, five days a week, 42 weeks a year.
2. Enhanced Health Visitor services for FS families, providing extra support and advice in the home throughout pregnancy and the first years postpartum.
3. Behaviour-based parenting courses for parents of children from birth to 36 months, such as the Incredible Years Parent-Baby (IYPBP; Webster-Stratton, 2008), the Incredible Years Parent-Toddler Programme (IYPTP; Webster-Stratton, 2008), or the Family Links Parent Nurturing Programme (Barlow & Stewart-Brown, 2001).
4. Language and Play and Number and Play programmes to aid parents in supporting their child's language and literacy development.

Since the initial roll out of the scheme two evaluations of the FS initiative have been conducted. An interim evaluation, initiated by the WG in 2009 (White & McCrindle, 2010) concluded that there was evidence of short-term improvements in children's emotional and social development, language and cognitive development, and increases in parental confidence and engagement with FS services. A final evaluation of the first phase of FS (Ipsos-Mori, 2009) suggested that families that engaged with services showed increases in self-reported parental confidence in dealing with their child's behaviour.

The Centre for Evidence Based Early Intervention (CEBEI) was also commissioned to undertake an evaluation to inform the WG FS policy in 2008 (see Appendix A for project protocol). Unlike the previous two evaluations, whose primary goal was to assess the overall uptake of FS services, the focus for the CEBEI project was to assess the benefits to parents and children following attendance on the IYPTP (Griffith, 2012;

Griffith, Hutchings, Baker-Henningham & Williams, in prep; Griffith, Hutchings, Jones & Williams, 2011).

The Incredible Years Series & The Parent- Toddler Programme (IYPTP)

The IY series (Webster-Stratton, 1981, revised 1987; 2008) is a set of evidenced based interventions that offer comprehensive training for either parents or children in developing children's social and pro-social skills, and for teachers in effective behavioural management strategies. The IYPTP is one of the five parent programmes in the series. After thirty years of research some programmes in the series have rigorous evidence gained via randomised controlled trials (RCTs). These trials have evidenced positive results for the parent programmes when implemented as both a clinical intervention and as a universal preventative intervention (Furlong et al., 2012, Gross et al., 2003; Hutchings et al., 2007b; Jones, Daley, Hutchings, Bywater & Eames, 2007; McGilloway et al., 2012; O'Neill, Bard, Linell & Fluck, 2013; Reid, Webster-Stratton & Hammond, 2003; Walcott, Carlson & Beamon, 2009; Webster-Stratton, 1989; 1990; 1998; 2001).

Following programme attendance results have indicated positive improvements for parental mental health, reductions in child conduct problems and increases in child social competence (Hutchings et al., 2007b; Webster-Stratton, 1990). Furthermore, the series of parenting programmes have also established economic viability (Charles, Bywater & Edwards, 2013; Olchowski, Foster & Webster-Stratton, 2007; O'Neill, McGilloway, Donnelly, Bywater & Kelly, 2013) and have been identified in many systematic reviews as effective evidence-based interventions for reducing and preventing violence (Barlow, Coren & Stewart-Brown, 2002; Kane, Wood & Barlow,

2007). Previously, the IY programmes were identified as a Blueprint model programme (Mihalic, Fagan, Irwin, Ballard & Elliot, 2004; US Department of Justice, 2004) but only recently have been listed as a promising programme as they await the longer-term intervention versus control comparisons that are a requirement of model programmes (Centre for the Study and Prevention of Violence, 2014).

Whilst there is a wealth of research to support the effectiveness of the two parent programmes for older children; the pre-school BASIC early childhood programme (Webster-Stratton, 1981, revised 1987), the school age BASIC programme (Webster-Stratton & Hancock, 1998) to date, only one small-scale feasibility study has been published citing use of the IYPTP with nursery staff (Bywater, Hutchings, Gridley & Jones, 2012). The evaluation conduced by CEBEI (Griffith et al., 2011) in 2008 is therefore the first known RCT of the IYPTP. Given the substantial investment in providing extra services for all eligible FS families the results from this RCT have contributed to the overall FS evaluation by informing policy in terms of future allocation of resources.

The IYPTP is a manualised programme based on SLT, delivered in a collaborative format to parents across 12, two-hour weekly sessions led by two trained group facilitators. To ensure that sessions are implemented with fidelity group leaders videotape sessions and receive weekly supervision. For the main RCT the IYPTP was delivered to a median of 11 parents (range 8 to 14). During sessions parents participated in group discussions, watched video vignettes to prompt the identification of key parenting principles and rehearsed effective parenting skills and techniques via role-play.

The IYPTP covers eight core topics over the twelve sessions; 1) child directed play, 2) promoting toddler language, 3) coaching child social and emotional development, 4) effective praise and encouragement, 5) spontaneous incentives, 6) handling separations, 7) positive discipline and 8) effective limit setting (see Appendix B for IYPTP pyramid). Underlying the IYPTP's objective to foster good quality parent-child relationships and deal with unwanted child behaviour is the need to teach parents principles in effective verbal communication. Group leaders model methods in which parents can encourage their children's language development, for example through positive praise, encouragement and repetition. In addition, parents are taught the basic principles in child-led play, descriptive commenting (describing what the child is doing) and persistence coaching (teaching children to remain focused and calm during stressful activities). In the short-term these developmentally appropriate verbal strategies support both intellectual and language development and reduce unwanted child behaviours. In the long-term, application of these principles prepare children for school, increase their social and emotional competencies, reduce behavioural problems and encourage a positive parent-child relationship.

Ethical approval for the main RCT was sought from both the NHS and via Bangor Universities School of Psychology Ethics Committee. The trial recruited 125 parent-child dyads in two phases six months apart (Appendix A for project protocol). Parents were reassured that they may withdraw from the study at any time without facing penalty and that all data provided to the research team would remain anonymous in accordance with the Data Protection Act (1998). Consenting parents (N =89) completed a battery of measures including self-reported mental health and parenting skills questionnaires, as well as child developmental assessments and independent

observations of the parents interacting with their children during free-play. Parents were provided with a monetary incentive at each time point to thank them for their time and help with the study. At six months results from the RCT revealed that parents who attended the 12-week IYPTP programme reported increases in parental mental well-being and were observed to use significantly fewer negative parenting behaviours in comparison to a wait-list control group (Griffith, 2012; Griffith et al., in preparation).

The abundance of videotaped observational data collected as part of the RCT provided an opportunity for further exploration of the FS sample with a specific focus on language outcomes. The main objective underlying the thesis was to explore the efficacy of using the IYPTP to enhance parental language in disadvantaged areas in Wales. The extensive literature demonstrating strong relationships between parent and child language and associations with socioeconomic disadvantage, in addition to the strong component of language coaching in the IYPTP programme provided the rationale for the thesis. The aims and specific objectives of the thesis were to:

1. Identify the strength of the association between SED and parenting behaviours in targeted FS areas in Wales.
2. Develop a reliable observational tool to measure parental language for research purposes.
3. Evaluate the efficacy of using the IYPTP to enhance parental language in Flying Start areas in Wales.

As the data for the current thesis is derived from the same RCT only data provided by parents who consented to being videotaped was utilised. The thesis is therefore comprised of a number of linked sub-studies, each of which is described as a stand-alone study but is also cross-referenced to other chapters. The seven chapters are:

Chapter 2. An overview of how parental language has been measured in research over the last ten years using observation and transcript methodology. This literature will be compared to the coding scheme used previously by Hart and Risley (1995) to establish the most common measurements of parental language used in research. This chapter informs the selection of an appropriate coding scheme for measuring the language of parents taking part in the FS IYPTP trial.

Chapter 3. This chapter provides an overview of the current evidence for the associations between measures of observed parental language and language outcomes for the child. This chapter informs the thesis by providing evidence to support the study of parental language in disadvantaged FS areas.

Chapter 4. The chapter provides a review of universal parent programmes and their benefit to parent and child language outcomes. This chapter provides further support to assess the benefits of the IYPTP on parental language outcomes.

Chapter 5. This chapter seeks to establish the relationship between SED and parenting behaviours in a targeted sample of high-risk families receiving Flying Start services in Wales. The chapter provides evidence to support the delivery of early intervention services for families considered most at risk.

Chapter 6. This chapter develops and evaluates tool to measure parental language for research and evaluation purposes. Seven measures of parental language, two simple and five complex, are assessed for their levels of reliability and

validity. This chapter informs the selection of language measures to evaluate the IYPTP.

Chapter 7. This chapter uses observational data collected as part of the IYPTP RCT to assess the efficacy of the programme on parental language outcomes.

Chapter 8. A final summary and reflection of what has been learned follow this chapter.

Chapter Two

An Introduction to Measuring Parental Language: Comparisons with Hart and Risley

The purpose of this chapter is two-fold. The main objective is to provide an insight into how parental language has typically been measured over the last ten years using observational and transcript methodology. The second objective is to compare these measurements with those described by Hart & Risley (1992; 1995). This chapter will inform the method of coding to be employed in the thesis (Chapters Five, Six and Seven) by identifying the most common and appropriate categories to assess parental language.

Introduction

From a developmental perspective parents play a significant role in children's acquisition of language (Vygotsky, 1968) and independent observations conducted in naturalistic environments are considered the 'gold standard' method in which to study parent-child interactions (Gardner, 2000). Research has established that unlike self-or parent-reported measures independent observation offers an objective insight into the child's environment and allows researchers to understand a specific sequence of events as they occur (Pepler & Craig, 1998). For researchers the progress and widespread availability of videotape technology has also enabled them to preserve this data and re-examine parent-child interaction at many different levels (Foster, Bell-Dolan & Burge, 1987).

Despite its complexity the coding scheme employed by Hart and Risley (1992; 1995), which will be used as the benchmark study for this review, has demonstrated good reliability and validity and could prove an appropriate tool to measure parental language in disadvantaged FS areas in Wales. However, 20 years has passed since the

study was published and the widespread use of transcription programmes and computational coding schemes has allowed researchers to measure parental language in a variety of different ways.

Literature Search Strategy

A literature search was conducted using Web of Knowledge to retrieve papers that measured maternal language using video taped observation and transcription methods. Such comprehensive techniques were selected for inclusion rather than live coding of behaviours in real time because they enable all of the language to be captured and aid the comparison with the scheme employed by Hart and Risley (1992; 1995). Maternal AND Language AND Speech were entered as keywords and retrieved article abstracts were screened against the eligibility criteria. A sub-sample of thirty articles met all of the inclusion criteria (Figure 2.1), and in addition to the two Hart and Risley studies the total number of papers meeting the requirements of the review were 32 (Appendix C and D).

Inclusion Criteria

1. The study had been published in a peer-reviewed journal.
2. Due to the large body of research dedicated to measuring parent language only articles published in peer-reviewed journals in the last ten years (2002-2012) were retrieved for the purpose of this chapter. The rationale was that these studies would represent the most up to date methods in which parental language is measured.
3. The study reported at least one outcome for parental language.

4. The study reported using observation and transcript methodology to obtain measures of parental language.
5. The children of the parents recruited for the study were aged between 12 and 36 months.

Exclusion Criteria

1. Any retrieved article that did not meet each of the five inclusion criteria was excluded.
2. The study reported outcomes from an intervention or experiment.
3. The study reported measures of language obtained directly during live observation as opposed to being transcribed.
4. The study reported parental language using Likert or rating scale measurements.
5. The study reported parental language as measures of the acoustic, pitch, and fluency properties of speech (for example, temporal frequency, amplitude, duration and quality of sound).

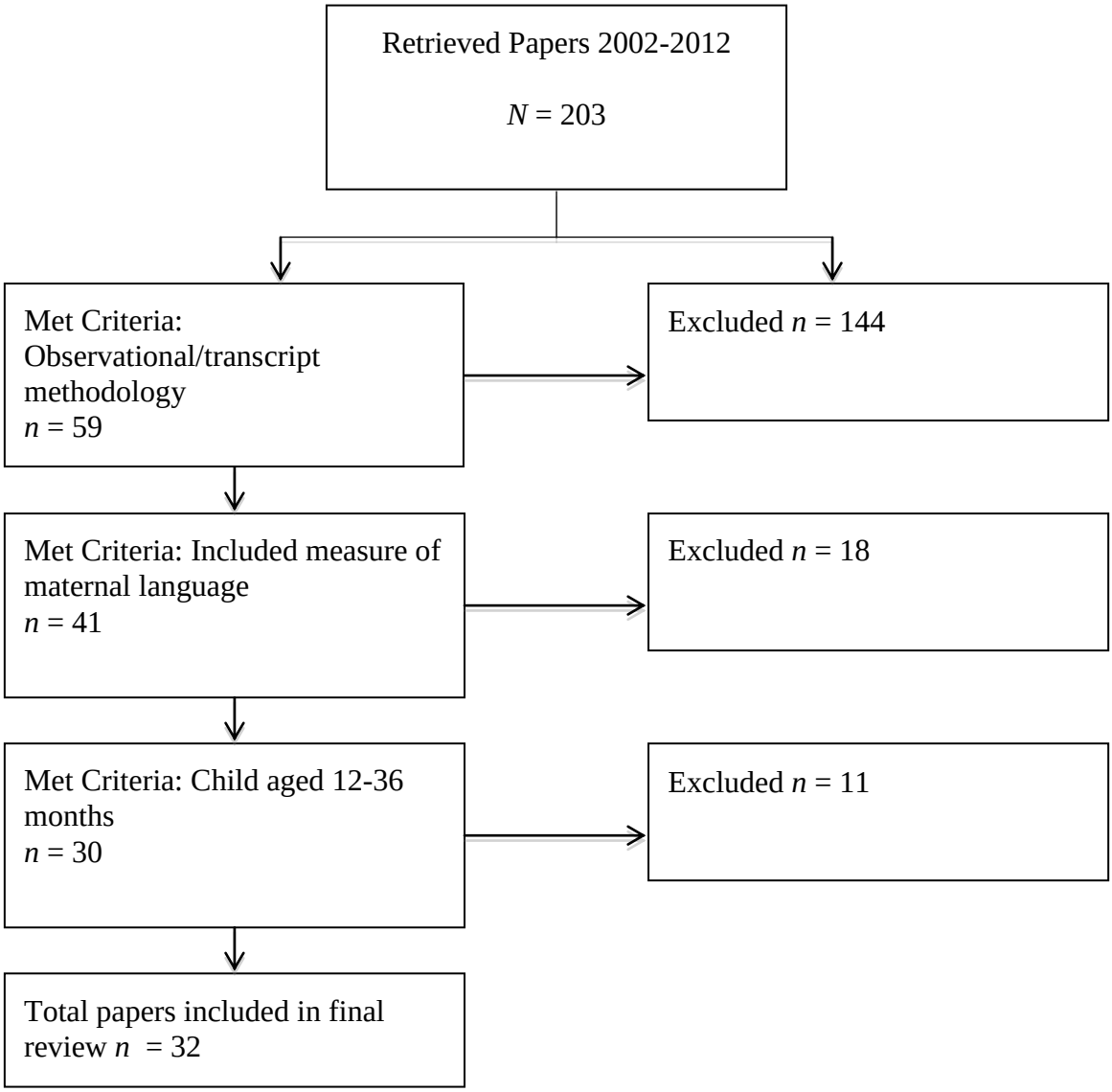

Figure 2.1. Flowchart of retrieved articles from the literature search of parental language measures

Results & Discussion

Assessment

Retrieved studies will be collectively assessed and compared to those published by Hart and Risley (1992; 1995) along a number of dimensions. Table 2.1 provides a summary of findings (see Appendix C and D for detailed summaries of each retrieved article).

Table 2.1.

Summary table of the methodology for retrieved articles measuring parental language

Methodology	Observation Duration	Transcription	Language Classification	Composite Variables	Reliability
Cross-sectional *n* = 13 Multiple assessments *n* = 17	Range between five and 120 minutes (*M* = 30.32 minutes)	Hand transcribed *n* = 9 Database transcription *n* = 18 Re-analysis *n* = 3	Quantity and quality *n* = 18 Social Communication Function *n* = 20 Conversational Turn *n* = 5	*n* = 8	Reliability *n* = 23 Kappa .78 to .99 ICC's .86 to .98 % agreements 74 to 100%

Study Methodology

The Hart and Risley studies (1992; 1995) collected fortnightly language data from 42 parent-child dyads (40 reported in the 1992 study) via 60-minute naturalistic observations of parent-child interactions across various daily routines for two and a half years. Of the 30 studies reviewed for comparison 17 conducted multiple observations over time and 13 were cross-sectional, obtaining measures at only one time point. In

those studies that reported more than one time point the number of speech samples and the duration between visits ranged from two visits over a 10-week period, to one monthly visit for 24 months. Speech samples ranged between 5 and 120 minutes (*M* = 30.32 minutes) and were taken from a variety of contexts including daily routines and book reading. Speech samples taken during free play observations were the most frequently reported (*n* = 15). Sample sizes ranged between 1 and 226 families (*M* = 69).

transcription.

In the Hart and Risley (1992; 1995) studies each parent-child observation was hand transcribed and coded by a researcher. Of the 30 studies reviewed for comparison only nine were hand-transcribed (typed out in full with each word/utterance individually coded and counted by a researcher), 18 employed database software to aid in transcription (hand transcribed and coded by a researcher with software calculating the specified units of analysis), whilst the remaining three re-analysed previously created transcripts extracted from a database corpus which had already been coded and scored.

databases.

The most commonly used database for transcription purposes (*n* = 11) was the Child Language Data Exchange System (CHILDES: MacWhinney & Snow, 1984) that assesses linguistic properties of speech such as grammar or syntax. Individual transcripts are inputted by hand using the Computerised Transcription (CHAT) manual and are then coded by a trained researcher using the Computerised Language Analysis (CLAN) scheme for linguistic coding. The CHILDES will automatically generate scores for each speakers mean length of utterance (MLU), mean length of turn (MLT), and

type/token ratios (TTR), discussed later in the chapter, without the aid of coding by a researcher. The CHILDES also provides a drop box for researchers to upload, share, and re-analyse a range of parent-child speech samples. The CHILDES is the most widely used tool in language research with to date over 3,000 published papers having used one or more components of the database.

The second most cited database (n = 6) for transcription purposes was the Systematic Analysis of Language Transcripts (SALT: Miller & Chapman, 1983) that can be used to measure both linguistic and pragmatic properties of speech. Much like the CHILDES the SALT requires a trained researcher to input the transcript by hand. The SALT also includes a manual in which to code the data for various pragmatic indices of language, for example questions or directives, in addition to automatically generating linguistic measures of MLU, MLT and TTR without the aid of a researcher.

A third database, the Interact software (Mangold, 2008), can also be used for transcription purposes but was only reported in one study. Unlike the previous two databases this software offers the opportunity to code data using either event or interval sampling methods in addition to providing the option to focus on verbal and/or non-verbal behaviour. Unfortunately, this database is rarely used in published research and consequently information regarding this system is limited.

Classification of Language

The 30 categories of parental language described by Hart and Risley (1992; 1995) can be classified according to three aspects of speech; the quantity and quality, the social communicative function and the amount and diversity of conversational turn (see Appendix E for category descriptions). The 30 categories of parental language

employed by Hart and Risley (1992; 1995) were selected based on discussions held with leading language researchers and the appropriateness of these categories to capture quality features of parent-child interaction. From the comparison literature only one study (Clark & Bernicot, 2008) devised a coding scheme specifically for their research. The remaining 29 studies employed categories derived from previous research. Similarities between the categories employed by Hart and Risley (1992; 1995) and those cited within the literature were evident. For ease of interpretation measures of parental language are examined in relation to the three aspects of speech utilised by Hart and Risley (1992; 1995).

quantity & quality.

In the Hart and Risley (1995) study the quantity and quality of parental speech was assessed using various measures of vocabulary, counts of the total number of words and different words and assessments of sentence clause and tense. The 1992 study also provided a single measure of grammatical diversity using the MLU. These categories were also applied across the comparison literature.

mean length of utterance (MLU).

The MLU is a measure of morphological and syntactic complexity first described by Brown (1973). The MLU encodes six stages of language development spanning the pre-linguistic stage where a child coos and babbles, to when the child is of school age and begins to use complex grammatical structures. MLU is typically defined as a measure of linguistic productivity that is traditionally calculated by collecting 100 utterances spoken by a speaker. An utterance is defined as a continuing piece of speech that is

denoted by beginning and ending with a clear pause (Hoff & Naigles, 2002). The number of utterances spoken then divides the number of morphemes used within each utterance. A higher MLU is taken to indicate a higher level of language proficiency (Brown, 1973).

In addition to Hart and Risley (1992), 14 other studies reported using the MLU as a measure of parental language complexity. The MLU was typically reported using morphemes (MLUm) the smallest meaningful grammatical unit of language (Campisi, Serbin, Stack, Schwarzman & Ledingham, 2009; DeFalco, Venuti, Esposito & Bornstein, 2011; Goldin-Meadow, Goodrich, Sauer & Iverson, 2007; Hoff, 2003; Hoff & Naigles, 2002; Hoff & Tien, 2005; Hurtado, Marchman & Fernald, 2008; Hwa-Froelich, Cook & Flick, 2008; Pancsofar & Vernon-Feagans, 2006; Taylor, Donavan, Miles & Leavitt, 2009). As morphemes are not necessarily free standing and can appear as a whole word, "sing", or as a unit of a word, "sing-ing", estimations regarding parental morpheme production are said to provide a unique insight into the complexity of the language environment that children are exposed to (Pancsofar & Vernon-Feagans, 2006; Taylor et al., 2009). Research has suggested that MLU in morphemes (MLUm) and MLU in words (MLUw) are interchangeable (DeFalco et al., 2011). Three studies also reported using MLUw to assess parental language (D'Ororico & Jacob, 2006; Giromaletto et al., 2002; Vigil, Hodges & Klee, 2005).

total words & total different words or word types & word tokens.

Inclusion of a category that sought to measure either the overall quantity or diversity of parental speech was common practice across all of the included research studies. Hart and Risley (1992; 1995) originally described a simple method for calculating the total

number of words and the total number of different words that parents used with their children. Three other studies also reported a measure of total words (Goldin-Meadow et al., 2007; Pancsofar & Vernon-Feagans, 2006; Vigil et al., 2005). For the remaining 11 studies that assessed the quantity and diversity of parental language outcomes were reported using linguistic terms of 'word tokens and 'word types'. (Campisi et al., 2009; D'Ororico & Jacob, 2006; Giromaletto et al., 2002; Hoff, 2003; Hoff & Naigles, 2002; Hoff & Tien, 2005; Hurtado et al., 2008; Huttenlocher, Waterfall, Vasilyeva, Vevea & Hedges, 2010; Hwa-Froelich et al., 2008; Pan, Rowe, Singer & Snow, 2003; Taylor et al., 2009). Word tokens and types differ from measures of total words and total different words in that they are defined as the total number of all and all-different word roots. A word root is defined as the smallest unit of a word that carries the semantic (word meaning) component either at the beginning or at the end of the word, for example, 'aqua' in aquamarine or 'cycle' in bicycle. In this example there are two word tokens and two word types. Word types are considered to be the stronger predictor of child language outcomes than compared to word tokens and not surprisingly this measure was often reported independent of word tokens (Hoff & Tien, 2005; Huttenlocher et al., 2010; Taylor et al., 2009).

Three studies (D'Ororico & Jacob, 2006; Giromaletto et al., 2002; Hwa-Froelich, et al., 2008) that reported measures of word types and tokens also reported use of the type/token ratio (TTR). The TTR is a single measure of functional vocabulary skills used to calculate the diversity of vocabulary in any one utterance by means of the formula below. Larger TTR scores are indicative of the presence of greater lexical diversity.

(1) Type/token ratio = (number of word types/number of word tokens) * 100

number of utterances.

Although not reported by Hart and Risley (1992; 1995) the total number of parental utterances was reported in seven of the 30 reviewed articles (D'Ororico & Jacob, 2008; Giromaletto et al., 2002; Hoff & Naigles, 2002; Hurtado et al., 2010; Huttenlocher et al., 2010; Pancsofar & Vernon-Feagans, 2006; Vigil et al., 2005). Although this category is not considered as informative as other quantity and diversity measures, i.e. MLU, it does provide a general indication of the quantity of verbal interaction used by parents' with their children.

vocabulary.

Single units of parental vocabulary such as nouns, verbs, adjectives and adverbs were calculated and coded by Hart and Risley (1992; 1995) using standard Oxford dictionary definitions. Four other studies also included measures of parental vocabulary in their reports (Blackwell, 2005; Cameron-Faulkner, Lieven & Tomasello, 2003; Chan, Brandane & Tardiff, 2009; D'Ororico & Jacob, 2006; Huang, 2012; Huttenlocher et al., 2010). Parental vocabulary provides children with experience and knowledge of specific object labels and actions. In addition, such information shows how objects share similar attributes thereby allowing the child to develop an understanding of the relations between objects and their verbal labels (Tomasello, 2000).

social communicative function.

In addition to the standard measures of complexity and quantity of parental speech there has been an effort to classify parental language either by its intended pragmatic

function within interaction (the utterance is classified according to the intention of the speaker to elicit a particular response from a child), or by its syntactic discursive form (the utterance is classified based on grammatical rules of sentence construction). Whilst there are some noticeable similarities between schemes of discourse and those of pragmatics there are also some major differences (described below) suggesting that these schemes should not be used in tandem. Despite this, Hart and Risley (1992; 1995) coded eight categories of parental language (imperatives, questions, declaratives, affirmatives, reflections, expansions, prohibitions, and prohibitory imperatives) based on both their grammatical structure (discourse) and the type of response prompted from the child (pragmatics). Categories cited in the reviewed literature that relate to both pragmatic and discourse function are discussed together with the differences cited.

declarative or statement.

According to discourse function the sentence "the puzzle is missing a piece" would be classified as a *declarative* based on its syntactic composition that only conveys factual information. Similarly, in pragmatics such utterances are categorised as *statements* because they only convey information and do not require a response from the child (DeFalco et al., 2011; D'Ororico & Jacob, 2006; Hwa-Froelich et al., 2008; Matychuk, 2005; Venuti, DeFalco, Esposito, Zaninelli & Bornstein, 2012). There is considerable overlap with discourse and pragmatic methods of categorisation and consequently both approaches could be used in tandem for assessing declaratives/statements.

imperative or directive/command.

The sentence "you need to find the missing puzzle piece" would be coded as an *imperative* in discourse function and either a *command* or *directive* in pragmatics. According to both schemes such utterances serve to issue an order, direct the child's attention, or prompt behavioural action (Cameron-Faulkner et al., 2003; D'Ororico & Jacob, 2006; Flynn & Masur, 2007; Hoff & Naigles, 2002; Hwa-Froelich et al., 2008; Masur, Flynn & Eichorist, 2005; Matychuk, 2005; Sung & Hsu, 2009; Tamis-LeMonda, Song, Leavell, Kahana-Kalman, & Yoshikawa, 2012a; Taylor et al., 2009; Vigil et al., 2005; Yont, Snow & Vernon-Feagans, 2003).

The difference between discourse and pragmatic categorisation of an imperative/command stems from the grammatical construction of the utterance. For a sentence to be categorised as an imperative in discourse the sentence must issue an order and the verb must appear in its base form, i.e. the root word as it appears in the dictionary without any added endings such as 's/ing/ed'. In the example above the sentence is constructed such that the child is being given an instruction where the verb appears in its base form i.e. 'find'. In contrast, using pragmatic definitions a command/directive can also include utterances where the verb does not appear in its base form, for example 'I need your help in finding this puzzle piece now'. Consequently, the two approaches to coding imperatives/commands should not be used in tandem with one another.

interrogative or question.

Any parental utterance that intends to elicit information from the child is coded as either an *interrogative* in discourse function or as a *question* in pragmatics (Cameron-

Faulkner et al., 2003; DeFalco et al., 2011; D'Ororico & Jacob, 2006; Hoff & Naigles, 2002; Hwa-Froelich et al., 2008; Matychuk, 2005; Pancsofar & Vernon-Feagans, 2006; Rowland, Pine, Lieven & Theakston, 2003; Sung & Hsu, 2009; Tamis-LeMonda et al., 2012a; Taylor et al., 2009; Vigil et al., 2005; Venuti et al., 2012). Whilst pragmatic definitions place all different types of questions into one category discourse function makes careful distinctions between four sub-types based on their grammatical composition and the verbal response required (described below). Whilst there is come overlap between the two approaches to categorising questions, based on the complexity of discourse coding they should not be used in tandem with each other.

a. Wh-questions typically begin with a wh-word, such as *what*, *where*, *when* and *why* with *how* being the only exception to this rule. Wh-questions elicit an open-ended response for example, 'What would you like for dinner?'
b. Simple Yes/No questions are coded based on a forced-choice response that requires only a yes or no answer. An example would be 'Is it raining today?'
c. Auxiliary Yes/No questions also require a forced-choice response between a yes or no answer, but can be distinguished from simple yes-no questions by beginning with an auxiliary verb, such as *can*, *could*, *would*, or *should*. For example, 'Should we put the red blocks on the blue blocks?'
d. Alternate questions require a forced-choice between two alternate options presented within the question irrespective of grammatical composition. An example of an alternate question is 'Should I be Postman Pat or Fireman Sam?'

affirmative or praise/reflection/expansion/interpretation.

Affirmatives in discourse and *praise, reflections, expansions* or *interpretations* in pragmatics all seek to reflect the positive verbal responses made by parents in relation to their child's previous verbalisation, behaviour or product and could be considered synonymous with each other (Bernier, Carlson, Deschenes & Matte-Gagne, 2012; Clark & Bernicot, 2008; DeFalco et al., 2011; D'Ororico & Jacob, 2006; Giromaletto et al., 2002; Sung & Hsu, 2009; Venuti et al., 2012; Vigil et al., 2005).

In addition to the categories that mirrored Hart and Risley (1992; 1995) other categories relating to parental social communicative function were also reported in the reviewed literature:

1. *Descriptions* are pragmatic verbal observations made by the parent about the child and their current activity (De Falco et al., 2011; Flynn & Masur; 2007; Masur et al., 2005; Venuti et al., 2012; Vigil et al., 2005). For example, if a child is drawing a picture of a dog a parent may say 'You are drawing a picture of a brown dog'.
2. *Joint attention* is a pragmatic pre-requisite for language development and has been described as a period of interaction lasting three or more seconds where both the parent and the child are focused on the same object (Hoff, 2003; Hoff & Naigles, 2002; Sung & Hsu, 2009; Yont et al., 2003).
3. *Gestures* are non-verbal communications to the child involving an extension of the index finger, or universal conventions that involve manipulations of the body to convey intentional communication, such as shaking the head to indicate 'no' (O'Neil et al., 2005; Pan et al., 2005; Vigil et al., 2005).

conversational turn.

The final group of language measures used in the Hart and Risley (1995) study focused on how conversations play out in terms of a sequence of turn taking. Hart and Risley (1995) distinguished three categories relating to conversational turn taking; an initiation, response or floor hold.

1. An initiation begins an interaction between speakers.
2. A response is any utterance made by a speaker that follows on from another speaker's previous utterance within five seconds.
3. Floor holding is when a speaker produces an utterance within five seconds of his or her own previous verbalisation, without interruption from the other speaker.

Parental responses were the most commonly reported category of conversational turn taking. Distinctions were made between those that:

1. Followed immediately from a child's verbalisation and referred to the entity or event that the child had referred to in their previous utterance. This category was commonly referred to as topic continuing replies (Hoff, 2003; Hoff & Naigles, 2002).
2. Those that served to translate the child's previous utterance (Goldin-Meadow et al., 2007).
3. Any description made by the parent that followed the child's attention or verbalisation (Flynn & Masur, 2007; Vigil et al., 2005).

Aggregating Variables for Analysis

Both Hart and Risley (1992; 1995) studies used principal component analysis (PCA) to convert the 30 categories of parental language into more manageable units for analysis. Of the studies reviewed only eight created composite variables, seven of which utilised previous research to guide their varied compositions whilst one also utilised PCA (Bernier et al., 2012).

In 1992 Hart and Risley described three composite variables that reflected a) the amount of parental activity within interactions, b) the parents performance as a social partner, and c) the quality of parental utterances. These three composite variables incorporated information derived from additional parent interaction measures such as the infant-toddler home observation measurement of the environment (IT-HOME) inventory (Caldwell & Bradley, 1984; 2003). In the 1995 study five composites variables were devised based on their relation to child language outcomes. Using measures of vocabulary, social communicative function and conversational turn five composite variables were devised:

1. *Language Diversity* – How much the parent spoke to the child. Calculated by totalling the sum of all different nouns plus different modifiers.
2. *Guidance style* – How much choice the parent gave the child. Calculated by dividing all auxiliary fronted yes-no questions by all auxiliary fronted yes-no questions plus imperatives.
3. *Symbolic Emphasis* – How much the parent spoke to the child about things in their life. Calculated by dividing the sum total of all nouns, modifiers and past-tense verbs by the number of all utterances.

4. *Feedback Tone* – How much the parent was nice to the child. Calculated by dividing all affirmatives by all affirmatives plus prohibitions.
5. *Overall responsiveness* – How much the parent listened to the child. Calculated by dividing all parental responses minus all parent initiations by the number of all parental responses.

Within the reviewed literature two similar patterns emerged. Composite variables that reflected the style, or quality of the parent-child interaction were described in six of the eight studies (Bernier et al., 2012; DeFalco et al., 2011; Flynn & Masur, 2007; Tamis-LeMonda et al., 2012a; Taylor et al., 2009; Venuti et al., 2012), whilst the overall amount of parental verbal interaction was reported in one study (Pancsofar & Vernon-Feagans, 2006).

Reliability & Validity of Category Coding

In the Hart and Risley (1992; 1995) studies reliability checks were conducted in two ways. Approximately 56% of transcripts were randomly selected and double-checked by a second researcher. In addition, four transcripts from each of the participating families were also double-checked. Across the reviewed literature inter-rater reliability was assessed by as little as 10% to a maximum of 100% of all speech samples.

Inter-rater reliability was reported in both Hart and Risley (1992; 1995) studies as percentage agreements for all categories, ranging between 77 and 100%. Across the reviewed literature inter-rater reliability was reported in 23 of the 30 studies using kappa coefficients, intra-class correlations or percentage agreements. Four studies used a combination of these methods, such as kappa and percentage agreements. Reliability for individual categories was reported in five studies whilst the remainder reported

reliabilities for categories as a collective. The following statistics are based on reliabilities given for the studies as a whole. Kappa coefficients ranged from strong to near perfect agreement (.78 to .99). ICC's fell between .86 and .98, indicating strong to perfect agreement and percentage agreements ranged between 74-100%, which for the lowest value enters just below acceptable levels of agreement (Graham, Milanowski & Miller, 2012).

No measures of validity were reported for either of the two Hart and Risley studies nor for any of the studies reviewed.

Summary & Conclusion

The current chapter provided a review of parental language measurements used in research over the last ten years and compared these to measures employed by Hart and Risley 20 years ago. The review indicates similarities between the comprehensive scheme used by Hart and Risley (1992; 1995) and those identified in the literature. However, several differences were highlighted and were discussed in more detail.

The review highlighted how the use of databases, such as the CHILDES or SALT, is becoming more commonplace than traditional methods of hand-transcription. Whilst such technological advances are useful they require a degree of training in order to become proficient and consequently can be time-consuming and not very cost effective. Despite this, databases such as the CHILDES, provide a vital resource for researchers requiring larger samples of data. Furthermore, secondary analysis of previously reported data is now achievable via database transcript corpus. Such innovation allows for reanalysis at varying levels and encourages collaboration between researchers within the field, two factors that can contribute to the advancement of language study.

Whilst the majority of categories of parental language reported in the reviewed literature did not deviate significantly from those reported by Hart and Risley (1992; 1995) several differences emerged. Firstly, complex measures of grammar and the quantity of language, such as MLU, word types and tokens, are more frequently reported than simplistic measures of total words and total different words. One possible explanation for this is the widespread use of databases for transcription and coding, and the high number of studies included in the review that used a linguistic approach to language research, for example the study of the grammatical units of language i.e. MLU.

Reporting of inter-rater reliability for individual categories of language was poor. However, the majority of studies did report reliability for categories as a collective and appeared to achieve statistically acceptable levels. It would be helpful if studies provided detailed information regarding individual category reliability in order to allow future researchers to select the best measures. No measure of validity was reported for any of the reviewed studies or for the two comparative studies.

Aggregating variables to form composites for analysis was under-utilised, with many studies analysing language categories separately. From the studies that did produce composite variables similarities were identified with those created by Hart and Risley (1992; 1995). General themes emerged suggesting that parental language is typically grouped according to a) the style and quality of the interaction, or b) by the overall amount of speech.

In conclusion, the current chapter has indicated that whilst there have been advances in technology and different aspects of parental language are now being studied, little has changed in the way in which parental language has been categorised since the ground

breaking study conducted by Hart and Risley 20 years ago. Parental language is most often assessed in relation to its quantity and variety and its social communicative function. The categories used by Hart and Risley (1995) appear to have informed current research, and given their demonstrated sensitivity in identifying factors that predict child outcomes (described in Chapter One and Three) may represent the best methods to study parent-child language in Flying Start areas in Wales.

CHAPTER 3

An Overview of the Association between Parent and Child Language

Chapter Two highlighted two key aspects of parental language that are typically observed and measured across the literature, the quantity and variety of parental language and its social communicative function. It was argued based on these findings that the coding scheme employed by Hart and Risley (1995) may provide a suitable method in which to assess parental language in FS areas in Wales. Prior to this assessment it is important to establish the specific relationships between these aspects of parental speech and outcomes for children's language development. Using the papers retrieved for Chapter Two the current chapter provides an overview of these relationships. The specific aims of the chapter were to:

1. Identify the key child language measures used in developmental research.
2. Identify specific categories of observed parental language that demonstrate significant benefits to child language outcomes.

Introduction

Alongside genetic and trauma induced language delays poor home environmental conditions that provide limited opportunities for learning and high levels of critical coercive parenting have a substantial impact on child outcomes (Boyle, 2011). Poor quality stimulation affects early brain development predicting underdeveloped cognitive, social and language skills within the first three years (Neuman, Koh, & Dwyer, 2008). In contrast, parents who interact with their children in a warm, positive and supportive manner have been shown to facilitate their child's language and behavioural development by offering a positive environment in which to learn (Hart & Risley, 1995; Hutchings et al., 2007b).

Method

The original 32 studies retrieved and reviewed for Chapter Two were screened and assessed using the criteria below. In total 18 papers met the inclusion criteria for the current chapter (see Figure 3.1, Table 3.1 and Appendix F).

Inclusion Criteria

1. The study included at least one outcome measure of child language.

2. The study reported at least one analysis of the relationship between parent and child language.

Exclusion Criteria

1. The opposite of the inclusion criteria.

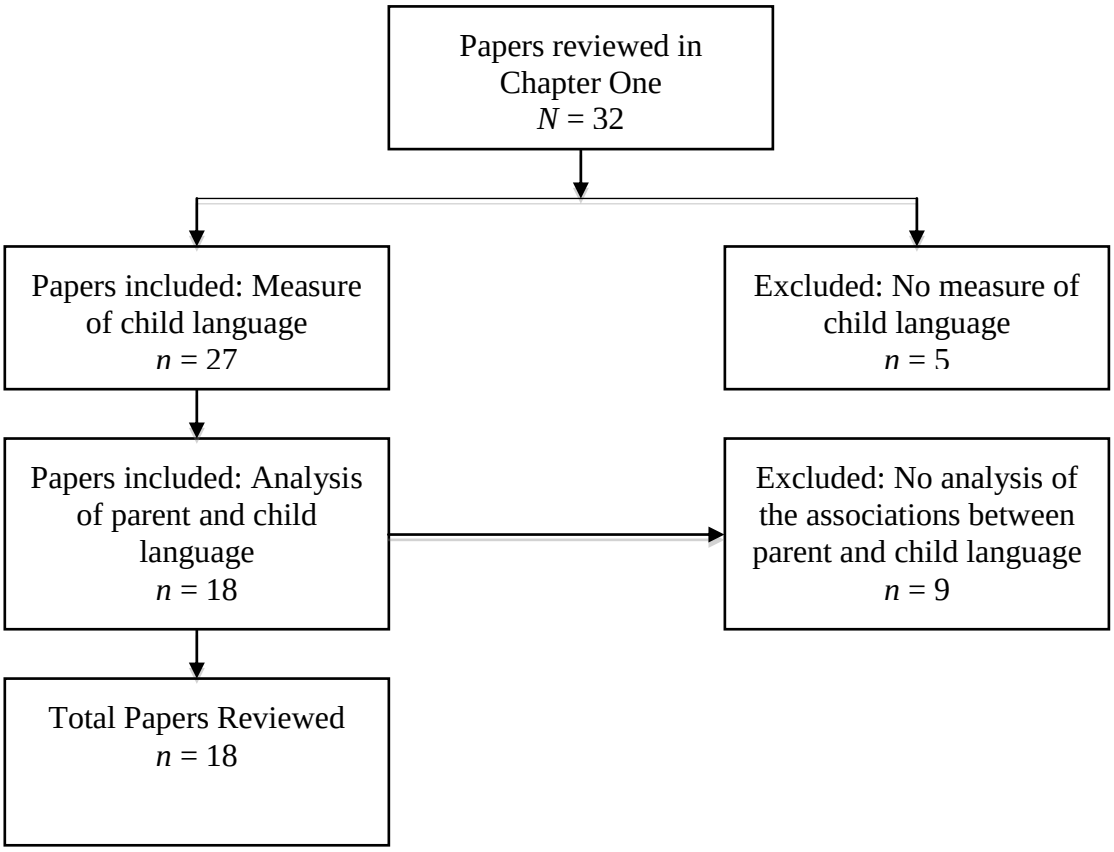

Figure 3.1. Flowchart of papers included for the review of the associations between parent and child language.

Results

Sample and Assessment

Sample sizes for identified studies ranged between two and 226 families averaging 63 participating dyads per study with children aged between nine and 27 months at the initial assessment. Attrition varied between zero to 30%. In total five studies were cross-sectional whilst 13 carried out multiple assessments over the short and long-term. The number of data collection time points ranged between one and 24 i.e. once a month for two years with five studies collecting data in the short-term (within 12 months of the initial assessment) and nine collecting data beyond a 12 month period. Observations ranged between seven and 190 minutes with an average duration of 34 minutes. Naturalistic free-play was the most common context for observation (n = 11) over daily routines (n = 6), clean up tasks (n = 1) and book reading scenarios (n = 1).

Measures of Child Language

Measures of parental language have already been identified and discussed in full in Chapter Two however, prior to discussing the associations between parent and child language in full an overview of child language measures is provided. Studies reported a number of different child language assessments that could be categorised into the following three groups: diagnostic assessments, parent-report and speech samples (Table 3.1). A total of nine studies reported data only collected via speech samples (Blackwell, 2005; Goldin-Meadow et al., 2007; Hart & Risley, 1992, Hoff, 2003; Hoff & Naigles, 2002; Huttenlocker et al., 2010; Rowland et al., 2003; Pan et al., 2005; Venuti et al., 2012), two reported only using diagnostic assessments (Campisi et al., 2009; Pancsofar & Vernon-Feagans, 2006) and a further two used only parent report

measures (Hurtado et al., 2008; Sung & Hsu, 2009). The remaining five studies reported using a combination of measures to obtain data for child language outcomes including speech samples and diagnostic assessments (Hart & Risley, 1995), speech samples and parent report (Masur et al., 2005; Taylor et al., 2009), diagnostic assessments and parent report (Tamis-LeMonda et al., 2012), or a combination of all three (Giromaletto et al., 2002).

diagnostic assessments.

In total five studies used a diagnostic (Campisi et al., 2009; Tamis-LeMonda et al., 2012) or screening (Giromaletto et al., 2002; Hart & Risley, 1995; Pancsofar & Vernon-Feagans, 2006) assessment as a measure of child language. Standardised diagnostic measures such as the Mullen Scales of Infant Development (Mullen, 1989) or the Bayley Scale of Infant and Toddler Development (Bayley, 2005) are broad assessments of children's developmental abilities (fine and gross motor, vision, cognitive and language) used with children aged from birth to five years. Assessments are rigorous, conducted during developmental play tasks administered by trained professionals and can take 30 to 60 minutes depending on the age of the child.

Alternatively, specific language screening tests such as the Peabody Picture Vocabulary Test (PPVT; Dunn & Dunn, 1981), the Test of Language Development (TOLD; Newcomer & Hammill, 1988) or the Sequenced Inventory of Communication (SICD; Hedrick, Prather & Tobin, 1984) provide a comprehensive assessment of receptive (language comprehension/understanding words) and/or expressive (language production/using words) language. Such tools are developed for children over 30 months old and are administered by professionals, taking approximately 45 minutes to

complete. Scoring of both developmental and specific language assessments results in a percentile rank for each child, which is then compared to age equivalent scores of a normative sample. When used within a clinical context if the child performs below a specified standard they are generally referred for further assessment and intervention.

parental report.

The MacArthur Child Development Inventory (MCDI, Fenson et al., 1991) was the only parent report measure of child language cited in the literature and was included in seven studies. The MCDI is an established, standardised and validated tool of receptive and expressive language for use within research contexts taking between 20 to 40 minutes to complete. The MCDI series includes three inventories targeting specific developmental age ranges between 8 and 37 months. Each inventory contains an extensive list of gestures and/or words and the parent is asked to say whether the child can comprehend or produce them. Scoring of the MCDI includes totalling the number of yes responses under each sub-heading to create percentile ranks that are then compared to age equivalent norms.

observation.

Thirteen studies included a measure of children's language that was derived from observations of parent-child interaction. Categories of child language were reported as either measures of grammatical complexity and diversity or social communicative functions, mirroring those previously reported as key measures of parental language. Whilst measures of the mean length of utterance (MLU), word types and tokens and individual indices of vocabulary were commonly reported use of child social

communicative function were rare. Categories of social function included gesture use (Goldin-Meadow et al., 2007), the frequency of conversational turn (Hart & Risley, 1992; 1995), wh-questions (Rowland et al., 2003), and measures of the child's communicative diversity (Taylor et al., 2009).

Table 3.1.

Summary of measures reported in eligible studies for a review of the associations between parent and child language.

Author(s)	Parent Measures	Child Measures	Reliability
Hart & Risley Kansas, USA 1992	*Social Communicative Function:* Amount of parent activity Performance as a social partner Contentive quality of parental utterances	*Speech Sample:* MLU Initiations Response Floor holding	*Parent:* 86-91% reliability
Hart & Risley Kansas, USA 1995	*Social Communicative Function:* Language diversity Guidance style Responsiveness Feedback tone Symbolic emphasis *Quantity:* Total words Total different words	*Speech Sample:* MLU Total vocabulary Initiations Response Floor holding *Diagnostic Assessments:* Peabody Picture Vocabulary Test (PPVT) Test of Language Development (TOLD)	*Parent:* 77-100% reliability
Giromaletto et al., Toronto, Canada 2002	*Social Communicative Function:* Imitation Interpretation Expansion *Quantity:* TTR for 100 utterances Rate of words per minute MLUw Number of Utterances	*Speech Sample:* Total productivity Number of word combinations Different Words *Diagnostic Assessments:* Sequenced Inventory of Communication Developmental Profile II (SICD) *Parent Report:* MCDI	*Parent:* 84-100% reliability

Author(s)	Parent Measures	Child Measures	Reliability
Hoff & Naigles Florida, USA 2002	*Quantity:* MLU Word tokens Word types	*Speech Sample:* Word types MLU	*Parent:* 87% reliability
Hoff Florida, USA 2003	*Quantity:* MLU Word roots Number of topic continuing replies	*Speech Sample:* Word types	*Parent & Child:* 87% reliability
Rowland, Pine, Lieven & Theakston Liverpool, UK 2003	*Quantity:* Wh-questions	*Speech Sample:* Wh-questions MLU	DNS
Blackwell Tennessee, USA 2005	*Quantity:* Cumulative adjectives Tokens Syntactic diversity	*Speech Sample:* Adjective utterances	*Parent & Child:* 95% reliability
Masur, Flynn & Eichorist Illinois, USA 2005	*Social Communicative Function:* Behavioural directives	*Speech Sample:* Observed lexicon Total vocabulary *Parent-Report:* Reported lexicon Words, Sounds and Actions Checklist	*Parent & Child:* 0.83 to 0.85
Pan, Rowe, Singer & Snow Harvard, USA 2005	*Quantity:* Total words Total different words Total gestures	*Speech Sample:* Word types Word tokens	DNS
Pancsofar, Vernon-Feagans North Carolina, USA 2006	*Quantity:* Total utterances Total words Different word roots MLU *Social Communicative Function:* Proportion of wh-questions Total conversational turns	*Diagnostic Assessment:* Sequenced Inventory of Communication (SIC)	DNS

Author(s)	Parent Measures	Child Measures	Reliability
Goldin-Meadow, Goodrich, Sauer & Iverson Chicago, USA 2007	*Quantity:* Number of responses translating child's utterance Number of words per sentence MLU	*Speech Sample:* Gestures Vocalisations	*Parent:* 93-98% reliability
Hurtado, Marchman & Fernald Stanford, USA 2008	*Quantity:* Number of utterances Word tokens Word types MLU	*Parent-Report:* MCDI	N/A
Campisi, Serbin, Stack, Schwartzman & Ledingham Montreal, Canada 2009	*Quantity:* MLU Word types Word tokens	*Diagnostic Assessments:* Bayley Scale of Infant Development Language Abilities Reading Achievement	*Parent:* 75-98% reliability
Sung & Hsu Rhode Island, USA 2009	Introducing Redirecting Following Simple Elaborative Prompting	*Parent Report:* MCDI	*Parent:* 0.78 reliability
Taylor, Donovan, Miles & Leavitt Wisconsin, USA 2009	Asks if needs help Persuades/explains Suggests/asks Verbally assists Compromises Tells or tells not o Bribes Criticals Forces and restricts Behaves non empathetically Punishes Spanks/slaps Threatens MLU Word types Bound morphemes Word roots	*Speech Sample:* MLU Word types Bound morpheme types Word roots Pragmatic functions of language *Parent Report:* MCDI	*Parent & Child:* 88-97%

Author(s)	Parent Measures	Child Measures	Reliability
Huttenlocker, Waterfall, Vasilyeva, Vevea & Hedges Chicago, USA 2010	*Quantity:* Word types Syntactic diversity Constituent diversity Causal diversity Quantity of speech	*Speech Sample:* Word types Syntactic diversity Constituent diversity Causal diversity Quantity of speech	*Parent & Child:* 95% reliability
Tamis-LeMonda, Song, Leavell, Kahana-Kalman & Yoshikawa New York, USA 2012	*Social Communicative Function:* Referential Regulatory	*Diagnostic Assessments:* Mullen Scales of Infant Development *Parent Report:* MCDI	DNS
Venuti, de Falco, Esposito, Zaninelli & Bornstein Trento, Italy 2012	Encouragement Discouragement Nonsense Greetings Mimics Repeats Singing and reciting Onomatopoeia Conventions Direct statements Questions Descriptions Childs action Child internal state Parent Environment Unintelligible speech Non-affect Non-information speech Mother speaking on behalf of toy	*Speech Sample:* Number of words Number of utterances MLU	*Parent & Child:* 0.79 to 0.96

The findings from each study regarding the associations between parental and child language outcomes are discussed below. For ease of understanding the relationship between parental language input and child language outcomes are summarised in relation to the main measures of parental language previously discussed in Chapter Two; quantity and quality and social communicative function.

Associations Between Parental Language & Child Language Outcomes

quantity and quality of parental language.

The overall quantity of parental speech in early infancy has consistently been shown be an important part of the child's social environment that shapes or contributes to the child's development (Hart & Risley, 1992; 1995; Masur et al., 2005; Pancsofar & Vernon-Feagans, 2006). Parents who talk more and produce more utterances also tend to use more different words and longer utterances and consequently expose their child to more diverse language (Hart & Risley, 1992; 1995; Hurtado et al., 2008; Huttenlocher et al., 2010; Pancsofar & Vernon-Feagans, 2006). Comparisons of paternal and maternal speech indicate that the quantity of father speech at 24 months predicts child expressive language on the SICD-R at 36 months, over and above measures of maternal language (Pancsofar & Vernon-Feagans, 2006). However, when combined with maternal speech the overall quantity of parental output at 24 months contributes 11% of the variance in child language expressive scores at 36 months. Furthermore, the overall quantity and diversity of parental speech predicts children's observed and reported vocabulary, rate of vocabulary growth and IQ by the age of three (Hart & Risley, 1995; Hurtado et al., 2008; Masur et al., 2005). Longer-term analysis has also indicated that a difference in children's early experience of language continues to impact upon their language skills, as measured by the PPVT and TOLD at nine and ten years of age (Hart & Risley, 1995).

The MLU is a highly valued measure of linguistic productivity and a reciprocal relationship exists between child MLU and maternal MLU (Hoff, 2003; Hoff & Naigles, 2002; Taylor et al, 2009; Venuti et al., 2012) with maternal MLU differing as a

consequence of how much information parents derive from their child's verbal and non-verbal communication (Goldin-Meadow et al., 2007). Parents that include translations of both the child's verbalisation and gesture in their responses use significantly longer MLU which is associated with the early onset of children's two-word combinations (Goldin-Meadow et al., 2007). MLU has also been shown to correlate significantly with measures of socio-economic status (SES: Hoff, 2003) and child age (Miller & Chapman, 1981).

Research regarding the association between parental word types and tokens on child language outcomes is mixed. Word types and tokens are two highly inter-correlated measures of parental language and, in addition to parent MLU are highly associated with short-term observed vocabulary growth for children aged between 16 and 31 months (Hoff & Naigles, 2002). In the long term, parental word types, tokens and MLU at 24 months contribute 7% of the variance in child language complexity scores when measured using the Bayley Infant Scale of Development (Bayley, 2005) at 54 months (Campisi et al., 2009). Furthermore, measures of parental word type-token ratios (TTR) indicate positive relationships with the number of different words children use (Giromaletto et al., 2002). When parental word types and tokens are assessed as independent predictors of child language word tokens have demonstrated little effect on observed child vocabulary growth (Pan et al., 2005). However, for parent-reported measures of child language at 24 months (the MCDI) maternal word token use at 18 months is a significant predictor (Hurtado et al., 2008). Despite these results, when comparing the strength of word types and parent MLU on child language outcomes results indicate that parental MLU is the stronger predictor (Hoff & Naigles, 2002) and provides 22% of the variance in child vocabulary outcomes (Hoff, 2003).

The diversity of vocabulary that parents use in their interactions has also demonstrated significant benefits to child IQ (Hart & Risley, 1995) and other associated child language outcomes (Huttenlocher et al., 2010). However, there is evidence that the overall quantity of diverse parental speech may contribute to this association (Huttenlocher et al., 2010). Parental lexical (number of different word types), constituent (the number of different words or phrases used within a clause i.e. adjectives, adverbs, nouns) and clausal (the range of different clause combinations i.e. conjoined, adjunct, relative or multi-clause) diversity used when a child is 14 months is significantly associated with corresponding measures of child language at 18 months. Furthermore the overall quantity of this input at 14 months is a strong predictor of child lexical and clausal diversity outcomes at 18 months.

the social communicative function of parental language.

Measures of parental social communicative function are associated with a range of child language outcomes from the beginning of the child's second year, including relations with child MLU (Venuti et al., 2012). Four classes of parental social communicative function; *directives, questions, responsiveness and affirmatives* were consistently shown to impact upon children's language development and for the purpose of this review are the only categories to be discussed. Please refer back to Chapter Two for complete descriptions of these categories.

directives.

Directives are the most commonly used category of parental language reported in the literature and have demonstrated a variety of effects on child language development. Directives are suggested to be detrimental to a child's cognitive and language development as they are incompatible with a responsive parenting style (McDonald & Pien, 1982). Furthermore, directives may direct the child's attention away from their current task therefore requiring greater processing skills on behalf of the child and complicating the task of mapping words to situational referents (Tomasello & Farrar, 1986).

Research has indicated that the total frequency of maternal directives measured at 10 and 13 months are positively associated with child observed vocabularies at 10 and at 17 months (Masur et al., 2005). A distinction has been made between directives that seek to command the child's behaviour (*behavioural directives*) from those that command the child's attention (*attentional directives*: Dore, 1975). Evidence has indicated that directives that include commands, limited prohibitions such as critical remarks, and a minimum expression of negative affect such as sadness, are far more facilitative that a directive style that includes both commands and prohibitions with expression of negative affect (Taylor et al, 2009). Furthermore, directives that relate specifically to the child's current activity have also been shown to be positively associated with greater MCDI scores (Sung & Hsu, 2008) in addition to total and observed vocabularies (Masur et al., 2005).

Research that has sought to categorise directives by their attentional/behavioural role has established that these two groups can be further sub-divided into those that follow or lead the child's activity. *Behavioural follow directives* are commands that follow a

child's lead and actively encourage the child to continue within their chosen task (e.g. 'That Lego block should go on there'). At 10 months behavioural follow directives positively predict total and reported child vocabularies at 13 months (Masur et al., 2005). Behavioural follow directives at 13 months have also been identified as an independent positive predictor of child observed vocabularies at 17 months (Masur et al., 2005). In contrast, *attention lead directives* are commands that steer the childs' attention away from their current activity (e.g. 'Look at this') and at 13 months are negatively associated with three indices of reported, observed and total vocabulary at 17 months (Masur et al., 2005). Furthermore, for the period between 17 to 21 months children's vocabularies are shown to be positively associated with behavioural follow directives and negatively associated with attentional lead directives (Masur et al., 2005). Based on this evidence directives can be considered as both positive and negative predictors of child language outcomes.

questions.

Questions are considered to be a quality factor of interaction as they provide the child with cognitive and linguistic scaffolding. Questions help to sustain a specific topic increasing the opportunity for the child to participate and set the tone for the interaction (Taylor et al., 2009). At least one third of all utterances children hear in the first three years are questions and this has been shown to remain stable with increasing child language proficiency (Hart & Risley, 1992). At 24 months maternal questions have been shown to predict infant vocalizations and gestures at the same time (Tamis-LeMonda et al., 2012a). Furthermore, children of high guidance parents (who used proportionally more questions) had significantly longer MLU compared to children of a

high negative control group whose parents used a higher proportion of negative commands (Taylor et al., 2009).

The grammatical structure of a question has been shown to play a significant role in child language outcomes. Auxiliary fronted yes/no questions (would, could, shall) are strongly related to vocabulary use, growth and IQ at three years old and wh-questions (what, where, how, when, why) are also associated with IQ outcomes (Hart & Risley, 1995). Wh-questions are frequently used by parents as a means of eliciting infant conversation and are the primary source of early scaffolding of linguistic competence (Van Veen, 2011). The overall frequency of input for wh-questions when a child is aged between 20 and 25 months predicts wh-acquisition (what, where, when, why) order between 32 and 37 months. This association for quantity of input has also been shown to be stronger than when compared to the overall structural complexity of the wh-question used (Rowland et al., 2003). These findings seem to suggest that irrespective of structural complexity the frequency with which a child hears a wh-question will focus their attention to its particular word combinations thereby increasing the likelihood that the child will be able to generalise these rules to simpler word forms (Rowland et al., 2003).

responsiveness.

Parental responsiveness (responses to the child's verbalisations) and affirmatives (positive acknowledgement, encouragement, imitation and expansions of the child's verbalisations) are two features of parental language associated with positive parenting practices and subsequent positive child language outcomes. Parental responsiveness at 10 months has been shown to predict child total and parent reported vocabularies at 13

months, whilst responsiveness at 13 months is associated with outcomes for all three measures of child language growth (total, reported and observed vocabularies) at 17 months (Masur et al., 2005). Between 17 and 21 months a positive association has been observed between parental responsiveness and child vocabularies (Masur et al., 2005).

***imitation*.**

Verbal imitation of the child by the parent is a strong predictor of children's vocabulary development accounting for 43-47% of the variance in child total and reported vocabularies at 17 months (Masur et al., 2005). Imitation emphasises language skills by providing a response attuned to the child's attentional focus, highlighting and reinforcing the child's attempts at verbal communication (Tamis-LeMonda, Bornstein & Baumwell, 2001). Expansions (an expanded version of the child's verbalisation) provide the child with a continual model for the practice of language concepts by extending beyond the repeated word and by placing the child's verbalisation within a grammatically correct sentence (Tamis-LeMonda et al., 2001). Frequent elaborative speech is associated with increases in expressive and receptive child vocabulary as measured using the MCDI (Sung & Hsu, 2008).

Cross-cultural research (Giromaletto et al., 2002) has indicated that for a sample of Italian parents imitations were associated with the child's number of different words and their total number of utterances, whilst parental expansions predicted the total number of child utterances and two-word combinations. In a sample of Canadian dyads, parental imitations were only predictive of children's total number of utterances, whilst parental expansions predicted the number of different words a child used. For children's two-word combinations only parental interpretation of the child's verbalisation was

significant. These findings are important as they indicate that verbal strategies employed by parents universally contribute differently to child language outcomes. Such findings may implicate grammatical and syntactic variations associated with different cultural languages.

Summary & Conclusion

This chapter provided a brief review of the associations between parental and child language outcomes in the first three years of life. A variety of developmental/screening assessments, parent-report and observational methods were reported as the main outcomes of children's language. Findings indicated that the quantity and variety of parental language and four indices of social communicative function (directives, questions, responses and imitations) were commonly reported to benefit child language.

Parent-reported measurements of children's language are considered as a fairly unbiased manner of collecting up to date information as parents have unlimited opportunities to engage in conversations and observe what their child can and cannot do (Houston-Price, Mather & Sakkalou, 2007). The use of the MCDI as the only parent-reported measure of children's language is an important finding as it highlights how despite its limitations the MCDI has become one of the most widely used and respected measures of children's language in the early years.

The MLU and word types were the most frequently reported grammatical measures of children's language. These findings indicate that, much like parental language measures, the availability of database methods for transcription allow for quick, reliable assessment of the grammatical maturity of children's language. Conversely, measures of children's social communicative function were rare. It is possible that given the

difficulties faced when discerning the communicative intent of young children that such measures may be deemed inappropriate. In addition, the time and cost required to train observers to be competent and reliable in carrying out such assessments may outweigh the benefits of conducting such assessments.

Associations between parent and child language are evident. Parent MLU was shown to have greatest impact on child language development compared to other grammatical measures of word types and tokens, contributing a substantial amount of variance in child language outcomes. Furthermore, the overall quantity of words parents use with their children was shown to contribute significantly more variance in child language outcomes over and above that provided by the diversity of the language. These findings indicate that it is the quantity of the diverse language, and not the diversity of the language itself, that is an important predictor of positive child outcomes. Further assessment of these quantity and variety measures is required in order to better understand the relations to various measures of child language i.e. parent report, observation.

Parental social communicative function was shown to have a range of effects on child language outcomes including age of acquisition, vocabulary growth (total, reported and observed) and IQ at three years old. Despite the range of categories available for this type of assessment only four were consistently reported as predicting change in children's language outcomes; directives, questions, imitations and responsiveness. This is an important finding for research where there are both financial and time constraints and researchers are striving to utilise reliable and valid measures. Despite this, cross-cultural evidence indicates that these measures may not predict similar outcomes for all children universally. Consequently, further work is required to

assess structural differences between languages, and how these may manifest in differences in children's language experience.

Despite providing only a snapshot of the relationships between parental language and child language outcomes this review has identified that the MLU, word types, directives, questions, imitations and parental responsiveness are all strong predictors of child language outcomes. Further work is required to substantiate cross-cultural differences in language use, and to assess the relationships between other measures of parental language not reported here and child language outcomes.

CHAPTER 4

A Review of Parenting Interventions for Parents of Toddlers: Changes in Parent and Child Language Outcomes

Based on the evidence presented in Chapter Three indicating the strong relationship between measures of parent and child language the aim of the current chapter is to provide a review of the literature to determine the benefits provided by parent education programmes on parent and child language outcomes. The review has three objectives:

1. To establish if parent education programmes, that include a component of language aimed at parents of typically developing infants and toddlers (birth to 36 months), are associated with positive short-term changes in parental language outcomes?
2. To establish if parent education programmes, that include a component of language, aimed at parents of typically developing infants and toddlers (birth to 36 months), are associated with positive short-term changes in child language outcomes?
3. To establish if there is any long-term evidence to support the effectiveness of parent education programmes which include a component of language on either child or parental language outcomes?

Introduction

The benefit to parents and children from providing support to families in the first three years has been reported in a comprehensive review of the implementation of early intervention programmes within socioeconomically deprived communities (Nores & Barnett, 2010). Such projects generally include the provision of free childcare, increased health visitor contact and parent education programmes to enhance parenting knowledge and skills. Short-term improvements in parental mental health and in children's health and development have been demonstrated (Hutchings

et al., 2007b; Ipsos-Mori, 2009; Nores & Barnett, 2010). In the long-term these benefits could contribute to the prevention and reduction of social problems suggesting that early intervention may possibly break the cycle of poverty (Allen, 2011; Downs & Strand, 2006). Evidence of the effectiveness of early intervention has prompted increased interest in parent education programmes as targeted social policy initiatives and as a consequence there is now a demand for such programmes to evidence effectiveness.

The underlying principle for all parent education programmes is the idea that the parent is an active agent of change in their child's development (Brooks-Gunn, Berlin & Fuligni, 2000) Parent education programmes are designed to help parents of different age groups better understand their child's needs, fostering positive parent-child relationships that facilitate social, emotional and cognitive outcomes. Programmes can be classified as preventative if they are designed for at-risk populations, or targeted if designed for the management of specific disorders i.e. autism. Programme content varies but delivery takes place during either a one-to-one session or as part of a group-based format. Programmes that have demonstrated evidence via independent evaluations or randomised controlled trials have indicated benefits to parental mental-health outcomes, supportive parent-child interactions and child social and emotional competencies (Barlow & Stewart-Brown, 2002; Barlow, Smailagic, Ferriter, Bennett & Jones, 2010; Furlong et al., 2012; McGilloway et al., 2012). Significant reductions in child behaviour problems have also been evidenced in the short and longer-term (Furlong et al., 2012; McGilloway et al., 2012).

Programmes for parent of infants and toddlers are also delivered in either a group-based format or on an individual basis in the home and can be classified as either informational or instructional. Typically, informational programmes cover all aspects

of child development in addition to providing the parent with an opportunity to discuss any concerns. On the other hand, instructional programmes are designed to target specific child outcomes such as language or literacy by teaching parents key behaviours known to be effective in supporting early child development, such as imitation or expansion of children's language and praise (Reese, Sparks & Levy, 2010).

A meta-analysis of 77 published evaluations of parent programmes designed for parents of children aged from birth to seven years demonstrated that, independent of study design, programmes that taught specific parenting skills and those that promoted the practice of these skills with their child demonstrated larger parenting behaviour effects than those that did not (Kaminski, Valle, Filene & Boyle, 2008). Furthermore, programmes that taught parents strategies of positive communication (reflecting children's verbalisations and expanding upon verbalisations) and methods to reduce negative communication (criticism and prohibitions) were more likely to show greater immediate post-intervention parenting effects.

Evidence to demonstrate the specific benefits to child language development in the first three years of life is inconsistent. The main reason appears to be that apart from language and literacy targeted programmes the majority of parent programmes include only a small component on language enhancement. Consequently, whilst benefits to motor, cognitive and behavioural outcomes are widely documented, many evaluations do not assess child language outcomes specifically and it is often assessed within a general developmental measure. As a result, the strongest evidence of benefit of parent education programmes on child language comes from programmes in which language is the targeted outcome (Reese et al., 2010). A review of 11 language and literacy programmes for typically developing toddlers and preschoolers, that included

book reading, parent-child conversation and parent-child writing, indicated that direct training of key parenting behaviours accounted for 8% of the variance in child language skills. Programmes designed to modify specific parenting skills produced gains in those domains. For example, teaching parents effective book-reading strategies benefited parent and child book-reading outcomes, training parents in effective methods for good quality parent-child conversation enhanced child productive language and their narrative skills, and parent-child writing programmes improved child-writing outcomes. The most successful components, such as the use of open-ended questions, praise and encouragement, share features known to be effective for children with speech and language delay (Reese et al., 2010).

Method

Search Strategy

A search strategy was conducted using Sciencedirect, PsycInfo, PsycArticles, JSTOR, Web of Knowledge and PubMed using the following key terms: preschool child; toddler; infant; language; communication; parent training; parent education; parent program; parent intervention; early intervention; randomised controlled trial. These key terms were used to identify the most relevant papers for review. Table 4.1 documents how the search formulae were constructed for each selected database.

Table 4.1.

Database search formulas for a review of parenting programmes

	Formula Applied
Pubmed	"Infant"[Mesh]) OR "Child, Preschool"[Mesh]) AND "Language"[Mesh]) AND (("Parenting"[Mesh] AND "Education"[Mesh]) OR ("Early Intervention (Education)"[Mesh] AND "Randomised Controlled Trial" AND randomised controlled trial
JSTOR	preschool child* OR infant* OR toddler* AND language OR communication AND “parent* program*” OR “parent* intervention” OR “parent* training” OR “parent* education” OR “early intervention” AND randomi?ed controlled trial
Sciencedirect	(preschool child* OR infant* OR toddler*) AND (language OR communication) AND (“parent*training” OR “parent*education” OR “parent program*” OR “parent* intervention” OR “early intervention”) AND “randomi?ed controlled trial”)
Psycarticles	(preschool child* OR toddler* OR infant*) AND (language OR communication) AND ("parent* program*" OR "parent* training" OR "parent* education" OR "parent* intervention" OR “early intervention”) AND (randomi?ed controlled trial)
Psycinfo	(preschool child* OR toddler* OR infant*) AND (language OR communication) AND ("parent* program*" OR "parent* training" OR "parent* education" OR "parent* intervention" OR “early intervention”) AND (randomi?ed controlled trial)
Web of knowledge	preschool child* OR infant* OR toddler* language OR communication AND (“parent* program*”) OR “parent* intervention”) OR “parent* training”) OR “parent* education” OR “early intervention”) (randomi?ed controlled trial)

Search Criteria

In order to identify programmes that were suitable for inclusion, abstracts and full articles were screened against the following criteria.

inclusion criteria.

Full articles were included if they met all of the following:

- Peer-reviewed article published between 1990 and 2013.
- Article published in English.
- The mean age of the children was less than 36 months at the pre-intervention assessment.
- The article reported randomisation of participants to a treatment or control condition.
- The sample of children were typically developing and without developmental disability.
- The aim of the parent education programme was to enhance positive parenting behaviours and increase parental knowledge of child development.
- The parent education programme contained a component designed to promote children's language development.
- The study reported at least one outcome of child language. Measures may include standardised developmental assessments, parent-reported or observational methods (continuous frequency counts or interval).

exclusion criteria.

Abstracts or articles were excluded if they meet one, or more of the following:

- The sample of children were recognised as developmentally disabled, or scoring outside the normal range on screening tests for ADHD, conduct problems, Autism, Downs Syndrome, Specific Language Impairment, or Language delay.
- The mean age of children recruited for study was greater than 36 months at the pre-intervention assessment.
- Child language outcomes were reported using only global measures, such as rating or Likert scales.
- The study reported outcomes for the treatment condition only.
- The parent education programme contained no component of language.
- The study reported an evaluation of community-based services, such as Sure Start, where no specific parent education programme was identified.
- The article was a literature review.

Study Selection & Data Collection Process

Initial database searches were conducted during August 2013 and updated to include new publications in December 2013. In total 1083 papers were retrieved using the selected keywords. After removing duplicate articles 988 abstracts were screened and considered against the eligibility criteria. At this stage a total of 866 papers were excluded. Over half were excluded on the basis that the sample consisted of children diagnosed with, or scoring outside the normal range on developmental tests. The second most common reason for exclusion was that child age exceeded 36 months at the pre-intervention assessment. A total of 122 papers were short-listed and reviewed. Following consideration against the eligibility criteria only nine papers met all of the specified inclusion criteria. One paper included two independent evaluations of the

same programme thus the final review includes ten studies (Figure 4.1). A data extraction sheet and summary matrix were constructed in order to compare studies and their effectiveness (see Appendix G for a summary of included papers and Appendix H for data extraction sheet).

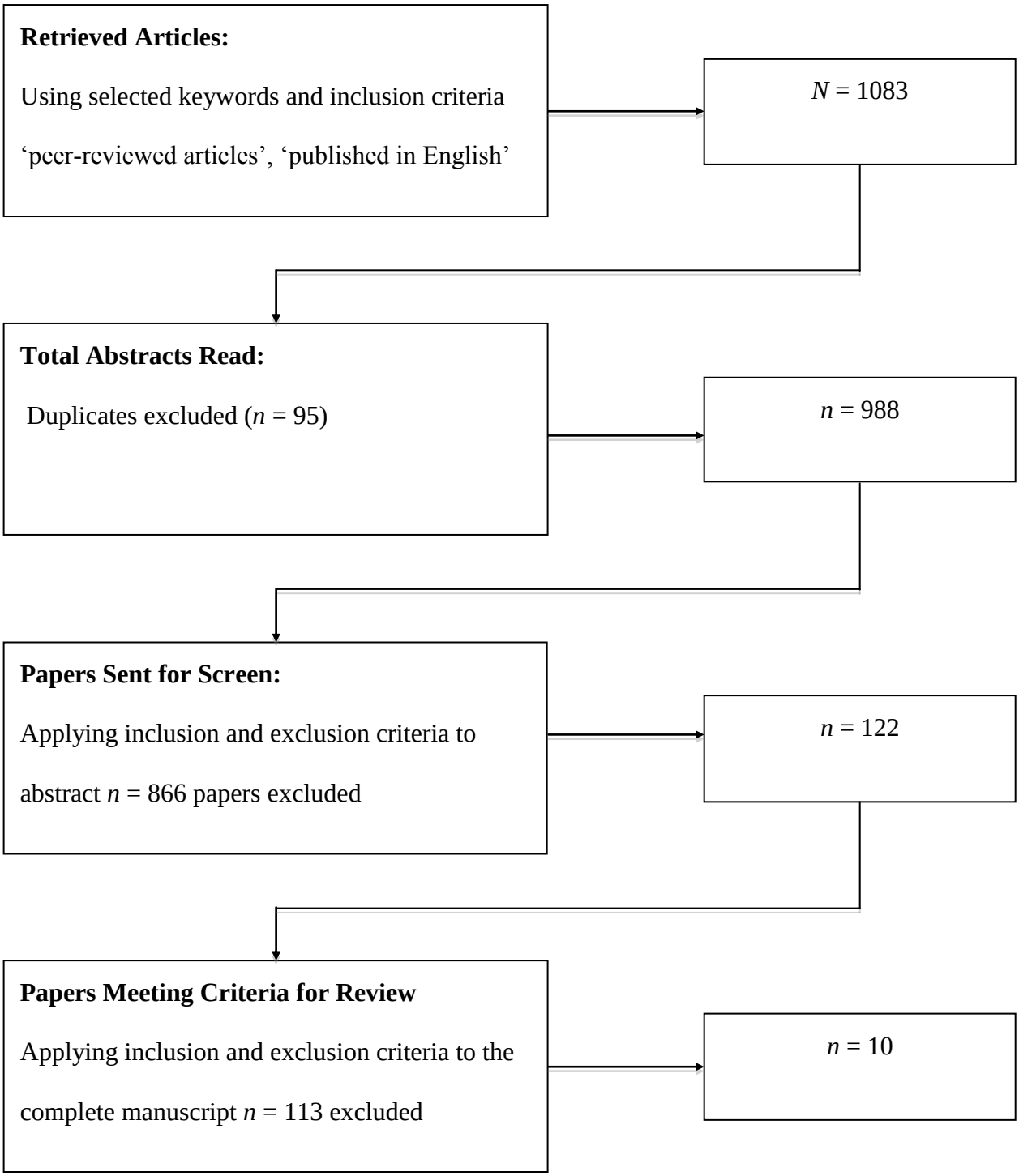

Figure 4.1. Flowchart of retrieved papers from literature search of parenting programmes.

Results

A total of eight programmes were evaluated in the 10 retrieved articles. Each of the 10 studies was tabulated to summarise intervention components, study methods and findings. Table 4.2 provides a brief summary for each of the included studies. Appendix G provides the full summary.

Programmes

A specification of the review was that the parent education programme under evaluation included a component that addressed language development. Programmes included both informational and instructional methods of delivery and could be classified into one of the following categories; a) an instructional programme designed to enhance children's reading, literacy or language, b) an instructional programme designed to enhance parental responsivity, or c) an informational home-visitation programme designed to enhance parental knowledge of child development.

instructional reading, literacy or language programmes.

Four studies reported evaluations of instructional reading, literacy or language programmes. Project PRIMER (Cronan, Cruz, Arriaga, & Sarkin, 1996) is a home-based one-to-one reading intervention designed to enhance child literacy skills by teaching parents methods to support their child's concept development during reading. The programme was delivered to low-income, ethnically diverse Head Start families, with one, two or three-year-old children by trained reading facilitators. The evaluation included a high instruction version of the programme (18 sessions) a low instruction group (three sessions), and a no intervention control.

The Dialogic Reading Programme (Huebner, 2000) is a two-session reading intervention typically delivered on a one-to-one basis with the parent. Its aim is to enhance child literacy skills by teaching parents specific dialogic reading behaviours that encourage children to actively engage in story time. In the reviewed study the programme was delivered to small groups of six to ten middle-class, ethnically diverse parents in libraries across four communities over three weeks. The study assessed the effect of the programme on two-year old children's language skills and parenting behaviours. The comparison group included a standard group-based informational programme that did not teach parents dialogic reading behaviours.

The Peers Early Education Partnership (PEEP: Evangelou, Brooks & Smith, 2007) was developed as a community-based project to encourage parents living in economically deprived communities to share experiences in a group format and engage with service resources. The PEEP programme is available to parents of newborn babies and delivered by a trained facilitator. The programme uses music, rhyme and rhythm to enhance parent-child relationships and promote language and literacy skills. The effectiveness of PEEP on the community as a whole and for those parents who attended more than one session was compared to a no treatment control sample that had been matched for demographic factors. For the current review only results for the sub-sample who received more than one session of PEEP was used.

The Parent-Child Mother Goose (PCMG; Terrett, White & Spreckley, 2013) programme was designed specifically as a language intervention for typically developing children to be delivered in a group format over 20 weeks. The programme encourages both parent and child attendance at sessions to promote positive parent-child relationships. Child language development is encouraged through 'kangaroo time' where the parents bounce the child on their lap whilst they sing songs, recite

nursery rhymes and read stories. In the reviewed evaluation the treatment group was compared to an age and sex matched control sample recruited from the same Child Development centre in the local community.

instructional programmes for responsive parenting.

Four evaluations representing three instructional programmes that taught parents responsive behaviour strategies were included in the review. The Meditational Strategies intervention is an instructional home-based programme (Klein & Alony, 1992) that teaches parents effective meditational verbal and behavioural methods for changing their child's behaviour during interaction. Video playback is utilised to teach parents to recognise opportunities where meditational strategies can be applied, and to promote an understanding of the meditational principles. To assess the long-term benefit of meditational strategy training on child cognitive and behavioural outcomes a treatment group was compared to a control sample that had only received video playback of interactions with their children.

The Play and Learning Strategies (PALS: Landry, Smith, Swank & Guttentag, 2008; Landry et al., 2012) is a home-based instructional programme conducted by trained facilitators over the course of 11 weeks. The programme teaches responsive parenting strategies with a specific emphasis on verbal scaffolding. Both the 2008 and 2010 evaluations sought to identify the optimal timing for intervention during the first three years of a child's life using four treatment groups consisting of term and pre-term children. The PALS treatment group parents received PALS during infancy (PALS I) and during the toddler period (PALS II). The strict no treatment control group received only a developmental assessment screening during infancy (DAS I) and the toddler period (DAS II). The remaining two groups consisted of parents who

received PALS I during infancy or PALS II during the toddler period. For the purpose of the current review only findings for term children are reported.

The Responsive Stimulation programme (Aboud & Akhter, 2011) aims to enhance positive parent-child relationships by informing parents about typical child development and teaching strategies for responsive parenting. In the reviewed study two treatment groups received responsive stimulation training over a five-week period in addition to 12 informational sessions about child development. One treatment group also received sprinkles, a nutritional supplement to enhance health. The comparison control sample only received the 12 information sessions. Parents were recruited from 16 poor wealth villages in Bangladesh.

informational programmes.

The final programme included in the review was the Parents as Teachers Programme (PATS: Wagner & Clayton, 1999), a one-to-one informational home visiting service conducted once a month from the child's birth until their third birthday. During delivery of PATS parents have the opportunity to discuss child developmental milestones and acquire knowledge regarding how best to prepare their children for school. The PATS was evaluated in two trials. For the main PATS evaluation a treatment group, consisting of ethnically diverse low-income families was compared to an untreated control sample. In PATS teens, a modified programme for teenage mothers, the treatment sample was compared to three additional groups: case management only, case management plus PATS teens, and an untreated control sample. A priori analysis of the main PATS trial included a comparison of the effects of PATS on the sub-sample of Latino mothers.

Table 4.2.

Summary table for included study methods in a literature review of parenting programmes.

Author, Date, Location	Setting	Design	Intensity	Child Age Pre-intervention	Pre-Treat:Control	Post-Treat:Control	Follow Up	Attrition
Instructional Reading, Literacy or Language Programmes								
Project PRIMER Cronan et al., (1996) USA	Home	RCT[1]	18 x 30-minute sessions, or, 3 x 30-minute sessions	1,2 or 3 years (*M* = 28 months)	88:101:100	83:73:69	4-months	289 initially recruited. Data reported for only 225. 22% attrition.
Dialogic Reading Huebner (2000) USA	Group	RCT 2:1	2 x 1-hour sessions conducted three-weeks apart	Between 24-35 months	88:41	73:30	6 weeks and 3-months	From baseline to post test 11% attrition.
PEEP[2] Evangelou, Brooks & Smith	Group	Quasi-experimental	Not Stated	Before 12 months old	301:303	Not Stated	12, 24, 36, 48 and 54 months	29% attrition in PEEP and 34% attrition in control.

[1] RCT = randomised controlled trial

[2] PEEP = Peers Early Education Partnership

Author, Date, Location	Setting	Design	Intensity	Child Age Pre-intervention	Pre-Treat:Control	Post-Treat:Control	Follow Up	Attrition
(2007) England								
PCMGP[3] Terrett, White & Spreckley (2013) Australia	Group	Matched for child age and sex	20 x 2-hour sessions	*M* = 14.2 months	29:22	29:22	15-weeks	None
Instructional Programmes for Responsive Parenting								
Mediation Strategies Klein & Alony (1993) Israel	Home	RCT	1-hour weekly sessions for 7-months or as long as was required	Between 6 and 18 months (*M* = 12.07 months, SD 6.43)	48:20	42:17	1 and 3-years	11% attrition at Time 2
PALS[4] Landry et al., (2008) USA	Home	RCT	11 x 1.5-hour sessions weekly	Between 24 and 33 months	Not stated	34:49:33:50	1-month and 3-months	From the original sample of 242 families that had previously participated in the

[3] PCMGP = Parent Child Mother Goose Programme

[4] PALS = Play and Learning Strategies programme

Author, Date, Location	Setting	Design	Intensity	Child Age Pre-intervention	Pre-Treat:Control	Post-Treat:Control	Follow Up	Attrition
								first phase 222 were eligible, but only 166 agreed to participate – 75% retention.
Resp. Aboud & Akhtar (2011) Bangladesh	Group	Cluster-RCT	12 x informational sessions over seven months, plus additional 5 x weekly sessions	Between 8 and 20 months	92:100:110	85:99:101	2 weeks and a follow up	At post-test 3% attrition. At follow up 6% attrition.
PALS Landry et al., (2012) USA	Home	RCT	11 x 1.5-hour sessions weekly	Between 24 and 28 months	Not stated	34:49:33:50	1-month and 3-months	264 families originally participated in PALS I. 222 were eligible for inclusion in the current study, of which 166 participated – 75% retention.

Author, Date, Location	Setting	Design	Intensity	Child Age Pre-intervention	Pre-Treat:Control	Post-Treat:Control	Follow Up	Attrition
Instructional Programmes								
PATS[5] Wagner & Clayton (1999) USA	Home	RCT	60 minutes once a month until the child was 3-years old	Recruited before 6 months old	298:199	202:148	3-years	43% attrition over three years. Data for 73% of the original sample. 70% retention for intervention and 77% control
PATS teens Wagner & Clayton (1999) USA	Home	RCT	60 minutes once a month until the child was 2-years old	Recruited before 6 months old	177:178:174:175	90:96:88:89	3-years	57% attrition over three years. Data for 52% of original sample. 52% intervention and 51% control

[5] PATS = Parents as Teachers programme

Programme Features

intervention duration.

The duration over which intervention delivery lasted ranged from three weeks to three years (*M* = 41 weeks). The total time that parents spent with facilitators ranged from two to 40 hours (*M* = 15.2 hours). The PEEP evaluation failed to report information regarding the number of sessions delivered or session length. Although the PATS intervention was available to families for the first three years and the PATS teens for the child's first two years, take up was minimal with parents agreeing to receive between 10 to 20 home visits (out of a possible 36) over the course of the programme. For the Mediational Strategies programme the intervention was terminated when parents could explain in their own words what was meant by meditational behaviours. The average number of sessions parents received prior to termination was 21.

sample size.

The pre-intervention sample size ranged from 51 to 704 parent-child dyads (*M* = 272). The PEEP and PATS interventions recruited the largest samples, 704 and 604 respectively, whilst the PCMGP, Mediational Strategies and the Dialogic Reading intervention recruited the least (51, 68 and 78 respectfully). For the majority of studies (*n* =7) measures were collected from over 100 participants.

post-intervention assessment.

All of the included evaluations ensured adequate follow-up of participants following completion of the programmes. The period of time between programme

completion and the initial post-intervention assessment ranged from two weeks to four years (*M* = 20 months). Information regarding the final assessment point for the Responsive Stimulation programme was not reported.

attrition.

Between three and 57% of participants withdrew from the intervention prior to post-intervention assessments. At least half of studies reported attrition levels below 25% with the PCMGP reporting no withdrawal at all and the Responsive Stimulation programme reporting a minimal loss of 6% at the final follow up. Attrition rates were greater for long-term follow-up studies. The PATS and the PATS teens reported the greatest loss of participants (43% and 57% respectively) over three years followed by the PEEP (29% intervention and 34% control).

evaluation measures.

Child language was measured using a variety of diagnostic and screening tools (e.g. the Bayleys/ PPVT), parent report (e.g. MCDI/Developmental Profile) and independently collected speech samples to assess language production, comprehension, general development, and academic ability. A brief overview of these measures is presented in Chapter Three. The most popular tools reported in the retrieved articles were the PPVT with five citations and the Bayleys with three. In addition, five studies also reported outcomes for parental language all using independent observation. Table 4.3 provides a summary of child and parent language measures.

Effect sizes were reported for seven studies, the PATS, PATS teens, PEEP, PCMGP, PALS (2008; 2012) and the Responsive Stimulation evaluation. For the

remaining three studies Cohen's *d's* were calculated where means and standard deviations had been provided. For the Meditational Strategies intervention little data for child language measures was available. In addition there was insufficient outcome data for Project PRIMER for the calculation of Cohen's *d* (Cohen, 1988). Table 4.4 presents an overview of results obtained using child language measures. Table 4.5 presents an overview of results obtained using parental language measures.

Table 4.3.

Summary table of included measures by each study evaluated for a literature review of parenting programmes.

Programme	Child Measures	Parent Measures	Observational Reliability
Mediation Strategies Klein & Alony (1993) Israel	Bayleys (T1) Observed Mediational Interaction (T2 & 3) • Naming • Feeling • Associating • Requests • Affecting Behaviours • Total Affecting Behaviours • Total Expansion PPVT [6](T2 & 3)	Observed Meditational interaction (T1, 2 & 3) • Focusing • Affecting • Regulating • Expanding • Encouraging	Children - *reliability 0.87* Parents - *reliability 0.85*
Project PRIMER Cronan et al., (1996) USA	Bracken Basic Concept Scale (3-year olds only) (T1 & 2) MCDI[7] (1 & 2 year olds only) (T1 & 2) PRIMER language comprehension (1 & 2 year olds only) (T1 & 2)	None	None

[6] PPVT = Peabody Picture Vocabulary Test

[7] MCDI = Macarthur Communication Development Inventory

Programme	Child Measures	Parent Measures	Observational Reliability
PATS Wagner & Clayton (1999) USA	PPVT[8] (for children aged 3 T2 only) Developmental profile II communication scale (T1 & T2)	None	None
PATS teens Wagner & Clayton (1999) USA	PPVT (for children aged 3 T2 only) Developmental profile II communication scale (T1 & T2)	None	None
Dialogic Reading Programme Huebner (2000) USA	PPVT (T1, 2 & 3) Expressive one-word picture vocabulary test (T1, 2 & 3) Illinois test of psycholinguistic abilities – verbal subscale (T1, 2 & 3) Child verbal behaviours including MLU[9], one-word utterances and multiword phrases (T1, 2 &3)	Parent Reading Behaviours (T1, 2 &3) Dialogic Reading Behaviours (wh-questions, questions about function or attributes, repetition, labelling, imitative, directives, praise, open ended questions, expansions, reading without child) Non-dialogic reading behaviours (yes/no questions, pointing questions and criticisms)	Children - *reliability .61 to .98* Parents - *reliability 0.72 to 0.98*

[9] MLU = Mean Length of Utterance

Programme	Child Measures	Parent Measures	Observational Reliability
PEEP Evangelou, Brooks & Smith (2007) England	No T1 measures Bayleys (T2) MCDI (T2) British Abilities Scale II (T3 & 4) Phonological awareness Rhyme (T4 & 5) Phonological awareness Alliteration (T4) Concepts about print (T4 & 5) Writing (T4 & 5) British Picture Vocabulary Scale (T4) Picture similarities (T3 & 5) Letter identification (T5)	None	None
PALS Landry et al., (2008) USA	PPVT (T1 & 2) Preschool Language Scale 3rd end (T1 & 2) Observed verbal behaviours (T1 & 2): Cooperation Social Engagement Positive Affect Communication Behaviours Use of Words Coordinating Attention Use of Words	Observed verbal behaviours (T1 & 2): Affective emotional (contingent response, warm sensitivity and positive affect) Cognitively Responsive Focus of Attention (maintaining/directing) Cognitively Responsive Rich Verbal Input (verbal scaffolding/encouragement)	Children – *reliability .62 - .85* Parents - *reliability .64-.81*
Responsive stimulation Aboud & Akhtar (2011) Bangladesh	Bayleys Scale of Infant Development (T1 & 3)	Responsive talk (T1, 2 & 3) Verbal Responsiveness (T1, 2 & 3) Directive Talk (T1, 2 & 3)	Children – none Parents - *reliability > .90*

Programme	Child Measures	Parent Measures	Observational Reliability
PALS Landry et al., (2012) USA	Observed child behaviours (T1 & 2): Response to request Initiations Comments Social Engagement Cooperation Book Interest	Observed maternal behaviours (T1 & 2): Affective – Praise or Encouragement Cognitive linguistic – Scaffolding or Verbal prompting	Children – *reliability > .80* Parents - *reliability > .80*
PCMGP Terrett, White & Spreckley (2013) Australia	Preschool Language Scale Auditory comprehension (T1 &2) Preschool Language Scale Expressive communication (T1 &2)	None	None

Table 4.4.

Summary of results by child language outcomes for a literature review of parenting programmes

Programme	Outcome	*p*	*d*
Language Production			
PEEP	No effect on MCDI[10] T2	No difference	-
Project PRIMER	High Intervention improved MCDI T2	0.009	NR
Dialogic Reading (2000)	Intervention improved Expressive One Word Vocabulary Test T2 & 3	No difference	-
	Intervention improved Illinois test of Psycholinguistic Abilities T2 but not at T3	0.003	0.82
PALS (2008)	PALS II effect on Preschool Language Scale T3	0.001	0.38
PCMGP	Effect of Intervention on Preschool Language Scale T2	0.02	0.65
Language Comprehension			
Project PRIMER	High Intervention improved Bracken Basic Concept Scale T2	0.054	NR
	High Intervention improved PRIMER Comprehension Book T2	0.024	NR
PATS	No effect of Intervention for full sample on PPVT T2	No difference	-
	Significant effect of Intervention for sub-sample of Latino mothers on PPVT T2	< 0.05	0.36
PATS teens	No effect of Intervention on PPVT[11] T2	No	-

[10] MCDI – Macarthur Communication Development Inventory

Programme	Outcome	*p*	*d*
		difference	
Mediational Strategies	Significant effect of Intervention on PPVT at T3	0.005	NR
Dialogic Reading (2000)	Intervention improved PPVT T2 & 3 but were not significant	No difference	-
PALS (2008)	Significant effect of PALS II on PPVT T3	0.022	0.36
	Significant effect of PALS II on Preschool Language Scale T3	0.022	0.38
PCMGP	Significant effect of Intervention on Preschool Language Scale T2	0.07	0.51
PEEP	Significant effect for intervention British Picture Vocabulary Scale between T2 & 4	< 0.05	0.41
	T4 & 5	< 0.05	0.25
PATS	No effect of Intervention on Developmental Profile II communication scale T2	No difference	-
PATS teens	No effect of Intervention on Developmental Profile II communication scale T2	No difference	-
PEEP	No effect of Intervention on Bayley's Infant language scale T2	No difference	-
Responsive Stimulation	Significant effect of Intervention on Bayley's Infant language scales T3	0.02	0.35
PEEP	No effect of Intervention on British Abilities Scale T3 or 4	No	-

[11] PPVT = Peabody Picture Vocabulary Test

Programme	Outcome	*p*	*d*
		difference	
	Significant effect of Intervention on Phonological Awareness Alliteration T2 to 4	< 0.05	0.37
	Significant effect of Intervention on Phonological Awareness Rhyme T2 to 4	< 0.05	035
	T2 to 5	< 0.05	0.44
	Significant effect of Intervention on Concepts about Print T2 to 4	< 0.05	0.46
	T2 to 5	< 0.05	0.34
	No effect of Intervention on Writing	No difference	-
	No effect of Intervention on Picture Similarities	No difference	-
	Significant effect of Intervention on Letter Identification T2 to 5	< 0.05	0.65
	T2 to 4	< 0.05	0.19
Observed Verbal Behaviours			
Mediational Strategies	Significant effect of Intervention on Naming T3	0.05	1.41
	Significant effect of Intervention on Associations T3	0.03	0.90
	No effect of Intervention for Requesting Affecting Behaviour T3	No difference	-
	No effect of Intervention for Total Affecting Behaviour T3	No	-

Programme	Outcome	*p*	*d*
		difference	
	No effect of Intervention for Total Expansions T3	No difference	-
Dialogic Reading (2000)	Significant effect of Intervention on MLU	< 0.001	0.87
	Significant effect of Intervention on Multiword sentences	< 0.001	1.15
	Significant effect of Intervention on One-word sentences	< 0.001	0.83
PALS (2008)	No effect of PALS II on Responses & Initiations at T3	No difference	-
	Significant effect of PALS II on Communicating Behaviour - Use of words at T3	0.006	0.37
	Significant effect of PALS II on Child cooperation at T3	0.044	0.30
	Significant effect of PALS I on Coordinating Attention – Use of words T3	0.018	0.68
	Significant effect of PALS II on Coordinating Attention – Use of words T3	0.045	0.57
	Significant effect for PALS II on Social Engagement T3	0.006	0.32
PALS (2012)	Significant effect of PALS II on Responses to Requests T2	0.057	0.30
	No effect of intervention on Initiations T2 or T3	No difference	-
	Significant effect of PALS II on Verbal Cooperation T2	0.057	0.30
	Significant effect of PALS II Asking Questions T3	0.010	0.16
	Significant effect of PALS I & II on Comments T2	0.048	NR
	T3	0.029	0.23

Table 4.5.

Summary of parental language results by programmes evaluated for a literature review of parenting programmes.

Programme	Outcome	*p*	*d*
Observed Verbal Behaviours			
Responsive Stimulation	Significant effect of Intervention on Responsive Talk at T2	0.001	0.40
	T3	0.003	NR
	No effect for Intervention on Verbal Responsiveness at T2 or T3	No difference	-
	No effect for Intervention on Directive Talk at T2 or T3	No difference	-
Mediational Strategies	Significant effect of Intervention on Focusing at T3	< 0.001	1.08
	Significant effect of Intervention on Affecting at T2	< 0.001	0.92
	T3	< 0.001	0.92
	Significant effect of Intervention on Expanding at T2	< 0.001	1.15
	T3	<0.001	1.22
	Significant effect of Intervention on Encouraging at T2	< 0.005	0.48
	T3	< 0.005	0.83
	Significant effect of Intervention on Regulating at T2	< 0.01	0.22
	T3	< 0.01	0.60

Programme	Outcome	*p*	*d*
Dialogic Reading (2000)	Significant effect of Intervention on Dialogic Reading behaviours at T2	0.001	1.70
	No effect of intervention at T3	No difference	-
	Significant effect of Intervention on Non-Dialogic Reading Behaviours at T2	0.001	-
	No effect of Intervention at T3	No difference	1.81 -
PALS (2008)	Significant effect of PALS I & II on Affective Emotional – Contingent Response	0.024	0.51
	Significant effect of PALS I on Affective Emotional – Warmth	0.021	0.29
	Significant effect of PALS I on Cognitively Responsive – Maintaining	0.038	0.32
	Significant effect of PALS I & II on Cognitively Responsive – Redirecting	0.008	0.39
	Significant effect of PALS I & II for Cognitively Responsive – Verbal Scaffold/Encourage	0.032	0.52
PALS (2012)	Significant effect of PALS I & II on Affective – Praise & Encouragement T2	0.05	0.34
	Significant effect of PALS I & II on Language Facilitation T2	0.025	0.30
	Significant effect of PALS I & II on Verbal Support T2-T3	0.013	0.76
	Significant effect of PALS I & II on Prompts T2	0.025	0.38

Observed Parent & Child Language Outcomes During Parent-Child Interaction

Five studies reported observational measures, with four reporting measures for both parents and children. The Responsive Stimulation programme was the only study to include observed parental language without reporting observed child language. Findings for both parent and child observed language are discussed below.

In the Mediational Strategies trial five measures of meditational verbal behaviours were assessed independently for both parents and children. Categories for parents were selected to best reflect the meditational techniques taught on the programme. Inter-rater reliability for both parent and child measures exceeded $r > 0.85$, with coding conducted by assessors blind to the research design. Results indicated two significant findings for intervention children at the three-year assessment on naming and association, whilst all parental language measures of mediational strategies (focusing, affecting, encouraging, regulating and expanding) indicated an intervention benefit with a moderate to large effect. Even though the control sample received some parenting skills training, and a large proportion of the data was subject to contamination due to parents in both the intervention and control groups accessing other parent programmes, by the three year assessment only the intervention sample were taught specific meditational strategies. Therefore these results provide some support for the effectiveness of this programme on observed parent and child language categories.

For the Dialogic Reading Programme three observational assessments of children's language were made, MLU, multi-word and one-word sentences. Seventeen categories of parental language were measured to form two composite variables reflecting either desirable dialogic reading behaviours or undesirable non-dialogic reading behaviours. Inter-rater reliability ranged between $r = 0.61$ and 0.98. All three measures of children's

language benefitted from the two-session intervention at six-week post-intervention assessment but these results were not maintained at three-months. Results of parental language measures also indicated significant intervention benefits at six-weeks. The short-term effect sizes were large but again not maintained at the three-month assessment. These results suggest a strong intervention effect immediately after programme completion but that it would benefit from a maintenance component.

In the 2008 evaluation of PALS a clear benefit of PALS II on child language was evident. The results suggested that regardless of assignment to PALS I or DAS I during infancy, PALS II enhanced children's use of words for coordinating parental attention and communicating behaviour in addition to increasing their level of social engagement and cooperation with parental requests three-month post-intervention. The effect of only receiving PALS I during infancy was shown for children's use of words for coordinating parental attention at the three-month post-intervention assessment. The effect sizes were small. Findings for parental language measures indicated that a double-dose of PALS was required to achieve significant change. Parents who received both PALS I and II were more contingently responsive, used greater levels of rich language and were less directive/commanding during parent-child interaction three-month post intervention than all other groups. The only benefit to parental language from receiving PALS II in isolation was for verbal engagement with children at three-months. The effect sizes ranged from small to moderate with inter-rater reliability ranging from $r = 0.61$ to 0.85.

In the 2010 evaluation of PALS parent and child language were assessed during a book-reading task. Results again indicated a benefit of PALS II on children's language

outcomes. Children whose parents received PALS II were more verbally responsive, asked more questions, and made more requests than the children of the other groups at a three-month post-intervention assessment. A double dose effect of PALS was shown to benefit only the number of statements that children made. Effect sizes for these results were small. Findings for parental language again indicated a benefit from receiving a double-dose of PALS. Parents who received PALS I and II were more encouraging, and used more praise, in addition to using a greater number of techniques to promote child speech such as asking the child questions during book-reading. Receiving PALS II in isolation benefited parental responsiveness and verbal support. Effect sizes ranged between small and large and inter-rater reliability for all categories of language were above $r = 0.80$. Findings from both trials are promising, and suggest that greater exposure to programme components is required to encourage parental language use with their child.

The evaluation of the Responsive Stimulation programme only reported observed outcomes for parental language. Results from a 2-week post-intervention assessment indicated a significant benefit of intervention to parental responsive talk. At follow-up these results were no longer significant. For measures of parental verbal responsiveness and directive talk no significant differences were found at either the 2-week post-intervention assessment or at follow-up. Inter-rater reliability for all three measures was above $r = 0.90$. As pre-intervention analysis indicated significant differences between groups for verbal responsiveness, the non-significant difference post-intervention may indicate a temporary effect of the intervention.

Child Language Outcomes

standardised measures of language production.

Child language production was measured in five studies.

In the PEEP study no effect of intervention was found on the MacArthur Communication Development Inventory (MCDI; Fenson et al., 1991) at the child's second birthday. Due to the lack of information regarding the duration of the programme or the number of sessions parents received it is not possible to identify the reason for this result. In contrast, results from the Project PRIMER trial indicated that one and two year old children whose parents received the high intensity, 18 session intervention achieved greater scores on the MCDI in comparison to both the low intensity and the no treatment control group at the four-month post-intervention assessment. Whilst these results appear positive it should be noted that differences between conditions might have been highly influenced by child age. It was reported that more two-year olds were recruited for the research than both one and three-year old children.

The Dialogic Reading Intervention measured language production using both the Expressive One-Word Picture Vocabulary Test (EOWPVT; Gardener, 1990) and the verbal scale of the Illinois Test of Psycholinguistic Abilities (ITPA; Kirk, McCarthy & Kirk, 1968). At both six-week and three-month post-intervention assessments there was a trend for the intervention sample to show increased scores on the EOWPVT, but these results did not achieve statistical significance. Scores for the ITPA verbal scale indicated significant benefits for the intervention group at the six-week post-intervention assessment with a large effect but this was not maintained at the three-month follow up.

Both the PALS and the PCMGP studies collected information for child language production using the Preschool Language Scale (Zimmerman, Steine & Pond, 1992). In the PCMGP trial analysis was conducted using independent t-tests. Despite the programme targeting typically developing children a greater number of children with poor language skills were recruited in the intervention group. Pre-intervention analysis indicated significant differences between the groups in terms of language ability with the intervention sample demonstrating more language problems. Without controlling for pre-intervention scores, and without using rigorous statistical tests it is not possible to determine the true effect of the programme on children's language production. Results for PALS indicated a significant effect for the PALS II group over all other groups at a three-month post-intervention assessment with a small effect. Results from the PCMGP indicated a significant benefit to the intervention sample 15-weeks post-intervention with a medium effect. Despite this, results should be taken with caution.

standardised measures of language comprehension.

Eight studies measured child language comprehension.

The PPVT (Dunn & Dunn, 1981) was measured in five studies. No significant differences between treatment groups were evident in either trial of the PATS programme when the children were aged 36 months. However, a small effect (d = 0.36) was found for a sub-sample of Latino mothers who received the intervention compared to those who did not. A three-year post-assessment of the Mediational Strategies intervention indicated significant benefits to children's PPVT scores in comparison to a control condition. No effect size was reported. Results from PALS indicated that assignment to PALS II enhanced children's PPVT scores at three-month post-

intervention assessment with a small effect. Results from the Dialogic Reading programme indicated a positive change for the intervention sample at the 6-week assessment but failed to reach significance. No effect was found at the three-month post-intervention assessment. These findings are promising however the methodological flaws previously noted need to be taken into account.

Results from Project PRIMER indicated significant differences on the PRIMER language comprehension test four-months post-intervention for one and two-year old children whose parents received the high intensity intervention. Three-year old children from the high intensity group also had greater scores on the Bracken Basic Concept Scale (Bracken, 1984) but this failed to achieve significance. Three-year old children were under represented in the study being the smallest age group recruited and there is no information regarding *n* assignment to treatment condition.

The comprehension sub-scale of the Preschool Language Scale (Zimmerman et al., 1992) was measured in both the PALS and PCMGP trials. Results from both evaluations indicated significant benefits to those children whose parents were assigned to the intervention.

The British Picture Vocabulary Test (BPVT; Dunn, Dunn & Whetton, 1997) was used in the PEEP evaluation. Results indicated a significant change for the intervention sample between the ages of two and four, two and five, and four and five. Effect sizes ranged from small to medium.

standardised measures of language development.

Four studies obtained measures of children's language development using sub-scales derived from standardised developmental tests. Results from the Responsive

Stimulation programme indicated significant benefits for intervention children using the Bayley Infant Development Language Scale (Bayley, 2005) at follow up. However, these results should be interpreted with caution as only 11 items from the language scale were used for this assessment, and no pre-intervention assessment of child language was under-taken. In contrast, the PEEP found no effect for the intervention using the complete language scale from the Bayley scale. Both trials of the PATS programme found no effect on child language measured at 36 months using the Developmental Profile communication scale (Alpern, Boll & Shearer, 1986).

standardised measures of academic abilities.

Only one study, the PEEP, obtained measures of children's academic ability over time prior to school entry. Significant intervention benefits were found between child ages two and four for measures of phonological awareness, concepts about print, and the British Abilities Scale (BAS; Elliot, Smith & McCulloch, 1996). There were also greater changes between the ages of two and five for the intervention group on measures of phonological awareness, concepts about print, writing, the BAS and letter identification. Effect sizes ranged between small to medium. These results are promising evidence for the long-term effectiveness of the PEEP programme.

Discussion

There is some evidence to suggest that instructional parent education programmes designed for typically developing children under the age of three benefit both parent and child language outcomes in the short-term. Short-term effects were obtained from standardised measures of child language production and comprehension immediately

following programme completion or shortly after completion from a number of interventions. Three studies indicated that greater exposure to programme components yielded better results for both parents and children (Cronan et al., 1996; Landry et al., 2008; 2012). Evidence from the two studies that assessed long-term effects suggested that instructional programmes benefit observed parent and child language outcomes, child language comprehension and achievement over time on academic measures. Only one study reported use of an informational programme that failed to provide sufficient evidence for its effectiveness. It can be concluded that whilst parenting programmes have previously proven beneficial to both parent and child behaviours the current evidence seems weakest in relation to language development.

This review highlights the lack of rigorous research trials on interventions that have sought to influence and evaluate the effectiveness of parent education programmes on child and parent language. Despite some positive findings results need to be interpreted with caution due to the small number of studies meeting the specified criteria and varying methodological approaches undertaken. Many studies had limitations including randomisation issues, contamination of samples between pre- and post-intervention assessments, high attrition rates and/or lack of language data at the pre-intervention assessment.

Limitations

The main limitation of this review is that it is not an exhaustive or comprehensive review of all the available literature. The results provide some interesting insights into how behaviour based parent-programmes benefit parent and child language and this should be followed up by a more rigorous, systematic review.

Conclusion

There is evidence to support the hypothesis that some parent education programmes that contain a component of language improve child and parent language immediately after programme completion and/or in the immediate short-term. The programmes that appeared to benefit parent and child language outcomes most were those that taught parents specific verbal strategies during interaction. Further study is required to assess the longer-term outcomes and what is needed to maintain positive short-term benefits.

CHAPTER 5

Associations between Socioeconomic Disadvantage and Parental Behaviours

The aim of the first study was to assess the relationship between SED and parenting behaviours for a population of parent-child dyads living within designated FS areas. The purpose was to contextualise the rationale for assessing the benefits of the IYPYP on parental language in FS areas in Wales. Five SED risk factors; education, family size, marital status, employment and housing quality were measured and assessed with regards to their relations with parental language (total words and total different words) and home stimulation outcomes. Based on previous evidence presented in Chapter One it was hypothesised that each risk factor would individually predict poor parental outcomes and that evidence of multiple risk would result in a more pronounced effect.

Introduction

Variations in children's social and economic environments consistently predict differences in their development and subsequent life trajectories (Hartas, 2011; Hoff, 2003). Low socio-economic status (SES) is associated with poorer child developmental outcomes both concurrently and in the longer-term (Appleyard. Egeland, van Dulmen & Stroufe, 2004; Bradley & Corwyn, 2002; Dodge, Pettit & Bates, 1994; Hart & Risley, 1995; McLoyd, 1998).

Exposure to Risk

Education, occupational status and income level are consistently reported as important predictors of parenting behaviours such as language (Vernon-Feagans et al., 2008). Highly educated parents provide environments that are more sensitive to the child's developmental age (Hupp, Manula, Kaffenberger & Hensley-Wessell, 2011). In addition, employed and affluent parents are more responsive to, less restrictive and

generally more talkative with their children (Hart & Risley, 1995). High levels of parental sensitivity and good quality stimulation predict positive cognitive and social and emotional development in children. The absence of such positive parenting practices is associated with children's behavioural problems (Bradley & Corwyn, 2002; Hart & Risley, 1995; Furlong et al., 2012) contributing approximately 11% variance in outcome (Hoeve et al., 2009).

Exposure to multiple risk strongly predicts negative parenting practices and poor child outcomes (Burchinal et al., 2008). Where coping skills are overstretched the frequency with which a parent can provide supportive behaviours and be involved in the child's daily activities are significantly reduced (Trentacosta et al., 2008). Subsequently, multiple risk is more strongly associated with behavioural problems, reduced social competence and poorer language skills in children (Belsky & Pasco-Fearon, 2002).

Previously, Hart and Risley (1995) demonstrated that simple measures of parental language, such as total words and total different words, were strongly associated with socioeconomic disadvantage. In addition, both measures taken at 12 months were strong predictors of child language outcomes at 36 months (see Chapter Three). Such simple measures of parental language require very little training and no specialist knowledge, and provide researchers with a quick and reliable index for assessing a child's social environment.

Study Context

Wales has the highest percentage of children (32%, the equivalent of 192,000) living in poverty compared to the UK (31%) overall (Welsh Government, 2011a). In 2007, the Welsh Government (WG) implemented the FS initiative, providing additional services

to support 18,000 (9%) of the 192,000 families of pre-school children in deprived areas. School catchments areas with higher proportions of free-school meals, and scoring as most deprived using the Welsh Index of Multiple Deprivation, were targeted for FS provisions (Welsh Government, 2011b) including parenting programmes such as the IYPTP. In 2008 CEBEI were commissioned by the WG to undertake an independent RCT of the IYPTP to assess its benefit to those families who attended. Using the data drawn from this trial and evidence presented in Chapters One, Two and Three regarding the measurement of parental language and its associations with SED and child language outcomes this chapter sought to assess the impact of SED on parenting behaviours for a sample of FS parents living in Wales.

Method

Participants, Randomisation, & Power

Data for the study were drawn from a sample of parent-child dyads previously recruited as part of an RCT of the IYPTP (Griffith, 2012; Griffith et al., 2011; Griffith et al., in preparation) conducted across FS areas in Wales in 2008. FS staff obtained expressions of interest from 125 families resident in eight FS areas across North, Mid and South Wales. Families were eligible for inclusion in the RCT if they lived in a FS area, had a child aged between 12 and 36 months at the pre-intervention assessment and were willing and able to participate in the trial (Figure 5.1). Participants were excluded if the parent had previously attended an IY parenting programme within the previous two years.

From the original 125 expressions of interest 89 participants consented to participation in the trial and were randomly allocated on a 2:1 basis, stratified by child

age and sex, to the IYPTP (n = 60) or to a wait-list control group (n = 29) after they had completed pre-intervention assessments. An independent statistician from the North Wales Organisation for Randomised Trials (NWORTH) who was not involved in data collection undertook the randomisation. Researchers were blind to participant assignment throughout the trial and parents were asked not to inform researchers at the post-intervention assessment whether they had attended the programme.

Participants in the main RCT trial were eligible for inclusion in the current study if the parent had provided written informed consent to being videotaped and had been videotaped with their child during the half-hour free-play observation (Figure 5.1). At the pre-intervention assessment eight families (six intervention and two control) were unwilling to provide written informed consent for the videotaped observations and were excluded from the study. Pre-intervention data for a total of 81 parent-child dyads (54 intervention and 27 control) was available for analysis. Parents were English or Welsh first language speakers and videos were recorded in the language parents preferred to use with their child: 13 Welsh, and 68 English. Parents were aged 28.94 years (SD = 6.72, range = 16 to 48 years) at the time of the first assessment and all but two primary carers (who were fathers) were the child's biological mother (n = 79). The children's mean age was 21.57 months (SD = 6.71, range = 11 to 34 months) and 49 (61%) were male. The current sample size was sufficient to detect an effect size of 0.75 SD at 80% power and a 0.05 level of significance.

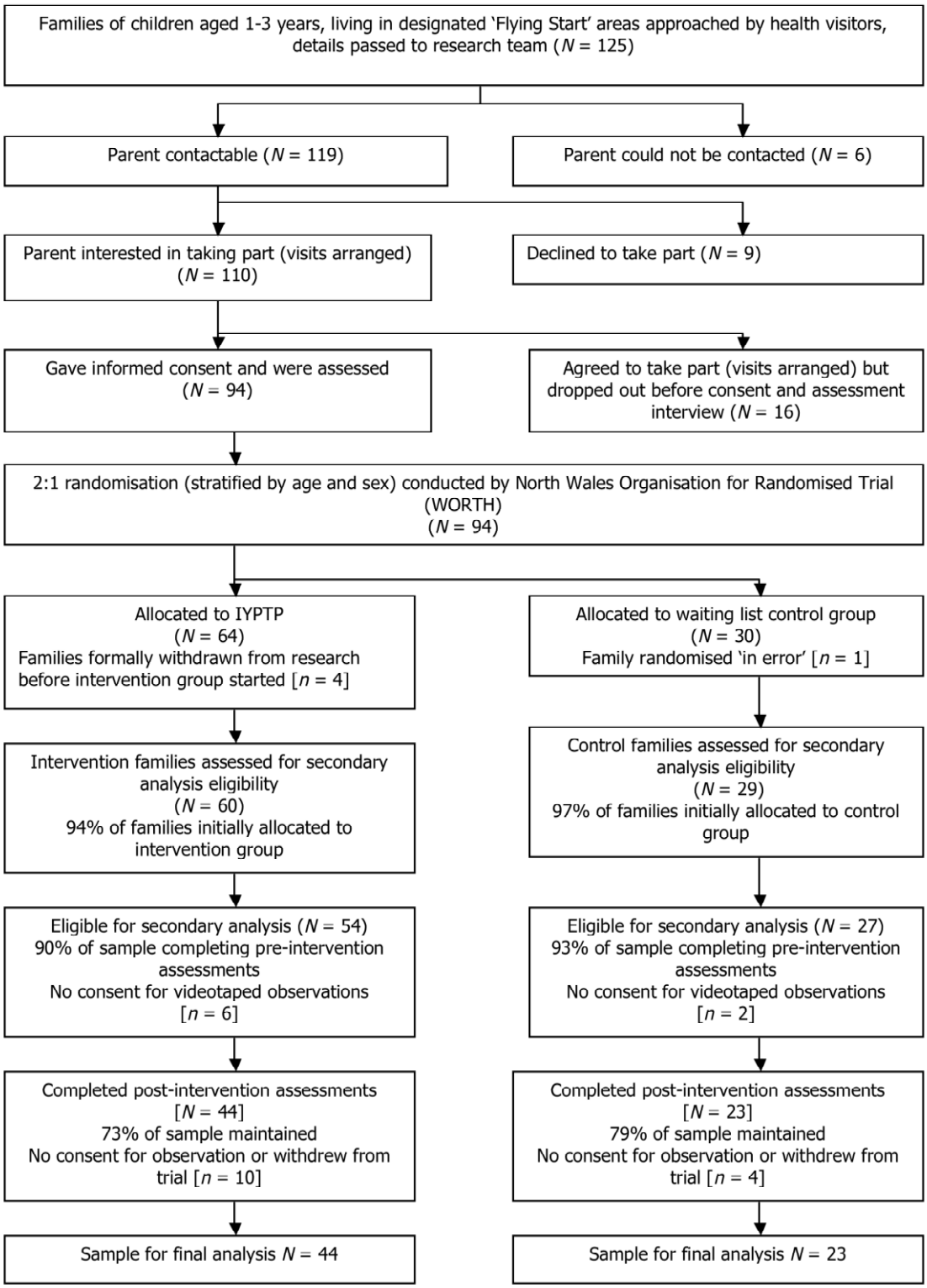

Figure 5.1.
Flowchart of participants throughout trial

Measures

demographics.

Demographic and health information for the caregiver, child and immediate family members was collected using the Personal Data Health Questionnaire (PDHQ; Hutchings, 1996) a semi-structured interview conducted between the parent and the researcher that takes approximately 20-minutes to complete (Appendix I). Based on the work of Rutter and Quinton (1977) and Dumas and Wahler (1983) selected questions from the PDHQ are used to provide information for the socioeconomic disadvantage scale (SED-5; Hutchings, 1996). The SED-5 has been used consistently across RCT's in Wales (Griffiths et al., 2011; Hutchings et al., 2007b; Jones et al., 2007; Jones, 2013). Questions regarding the parents' level of education and qualifications, employment, marital status, family size and housing quality were used for the current study to assess participants' level of SED risk using the criteria set out below. For each risk factor participants scored 1 for at risk, with total scores ranging between 0 and 5. Scores of two and above are suggested to be indicative of families living in disadvantage (Hutchings, 1996).

1. *Primary caregiver education*: No post 16 basic leaving school qualifications or did not achieve qualifications ≥ 17 years old.
2. *Marital status of primary caregiver*: Single parent/ unmarried or having co-habited for less than two years.
3. *Family size*: three or more children.
4. *Quality of housing*: Assessed using two independent indices of overcrowding and housing standards. Combined scores of overcrowding and housing standards

resulted in scores ranging between 0 and 2 with scores ≥1 considered as indicative of poor quality housing.

a. Overcrowding was measured using the recognised quota for bedroom standards (United Kingdom Housing Act, 1985). Houses that were overcrowded were given a score of 1, and those not overcrowded a score of 0.

b. Housing quality was measured using four questions from the Coders Impression Inventory (CII; Dishion, Hogansen, Winter & Jabson, 2004). The CII is a 59-item inventory completed by an independent observer regarding their overall impression of the nature of interactions between the parent and the child (Appendix J). No training is required to complete this inventory. Four items from the CII relating to the observed light, air, safety and cleanliness of the family home were extracted for analysis. These items were scored unacceptable (1) or acceptable (0) with scores ranging from 0 to 4. Families scoring ≥2 using the CII were considered to live in poor housing.

5. *Employment status of primary caregiver*: Not employed part-or full-time and/or living on benefits.

According to the WG (2011b) 74% of all FS families living in Wales meet the criteria for at least one risk factor of SED. Of the current sample 79% also met the criteria for one risk factor and can be considered representative of families in receipt of FS services across Wales. Table 5.1 highlights the similarities across the two samples.

Table 5.1.

Comparisons between the current Flying Start sample and the Welsh Flying Start sample as a whole[12]

	% Current sample (N = 81)	% Flying Start as a whole
Parent age:		
16-19	5	7
20-24	28	31
25-29	21	30
30-34	25	19
35+	21	14
1st time parent	40	38
3 or more children	15	29
Single parent	35	39
Unemployed	48	46
Educated < 17 years	59	64
Poor housing	54	N/A

infant-toddler home observation for measurement of the environment inventory (IT-HOME: Caldwell & Bradley, 1984; 2003).

The IT-HOME (Appendix K) is a standardised measure that assesses the quality of parenting and level of interaction and stimulation in the home environment of children aged birth to three years. It has good short-term reliability (Bradley, 1993), reasonable stability over 12-months (Saudino & Plomin, 1997) and is predictive of a child's IQ at three-years of age (Bradley & Caldwell, 1979). Administration is conducted by means

[12] Statistics drawn from the Evaluation of Flying Start: Baseline survey of families (Welsh Government, 2011b)

of an informal semi-structured observation and interview during a 45-90 minute home-visit with both the caregiver and target child. No formal training is required to administer the IT-HOME. Six areas are assessed via 45 yes-no questions resulting in an overall total score.

1. Parental Responsivity: How responsive the caregiver is to the child

   E.g. Parent spontaneously vocalises to child at least twice.

2. Acceptance: How accepting the caregiver is to misbehaviour, and avoidance of punishment techniques

   E.g. Parent neither slaps nor spanks child during the visit.

3. Organisation of the Environment: The regularity and predictability of the environment

   E.g. Childcare, if used, is provided by one of three regular substitutes.

4. Learning Materials: The provision of age-appropriate learning materials

   E.g. Toys for literature and music.

5. Parental Involvement: How involved the caregiver is with the child's activities

   E.g. parent talks to child while doing household chores.

6. Variety in Experience: The variety of daily stimulation

   E.g. Child has three or more books of his/her own.

quantity of parental speech.

Due to time and financial constraints only the final 15-minutes of each dyadic video were transcribed and coded using an adapted version of the scheme described by Hart and Risley (1995; see Appendix E for full descriptions, Appendix L for example transcript and Appendix M for coding sheet). The final fifteen minutes was selected for

transcription over the first fifteen minutes based on past evidence that has indicated that parents require a period of time to become accustomed to being observed therefore rendering the final fifteen minutes as more representative of typical behaviour (Gardner, 2000).

In the Hart and Risley (1995) study 60-minute naturalistic dyadic observations conducted during daily routines in the home, twice a month, for two and a half years provided data for analysis. Transcripts of 60-minute averaged speech samples were coded according to 30 categories relating to vocabulary, social communicative function and conversational turn. For the current study each transcript was coded according to the descriptions for 25 of these 30 categories (Appendix E). The five categories that related to sentence clause and verb tense were excluded based on the rationale that these measures were more strongly associated with grammatical complexity than to categories of social communicative function, conversational turn or simple quantifications of total words and total different words described below (see Chapter Two for more detailed category descriptions).

vocabulary.

Words used by the parent were coded into four categories, using standard English dictionary definitions of nouns, verbs, modifiers (adjectives and adverbs) or functors (e.g. prepositions [up, down] or conjunction words [the, and]). Collectively these four categories form a measure of the total number of all words spoken by the parent. The number of different nouns, verbs, modifiers and functors were also recorded and the totals for each of these additional categories were calculated separately. Together these

additional four categories provide a measure of the total number of different words a parent uses with their child.

social communicative function.

Parental sentences were coded into one of 11 categories and tallied as frequency counts:

1. *Declarative*. A statement of fact regarding the parent, child or environment ("Mummy is building a tower").
2. *Wh-Question*. A question that begins with either what, how, when, why, or where.
3. *Simple Yes/No Question.* A question that only requires a simple yes or no response i.e. "is that a dog?"
4. *Auxiliary Fronted Yes/No Question.* A question that requires only a yes or no response but that begins with an auxiliary verb i.e. "*would (could, should)* you pass me your teddy?"
5. *Alternative Question.* A question that provides the child with an option between two alternatives i.e. "is that Postman Pat or Fireman Sam?"
6. *Imperative*. A request or command ("put the puzzle back now").
7. *Affirmative*. A praise of the child, or a product of the child ("your dancing is beautiful").
8. *Reflective*. A repeat of the child's previous verbalisation (C: "car", P: "car").
9. *Expansion.* An expansion of the child's previous verbalisation (C: "ball", P: "it's a blue ball").
10. *Prohibition*. A critical remark towards the child ("you're naughty").

11. *Prohibitory imperative.* Any command that tells the child not to do something ("stop that now").

conversational turn.

Three categories of conversational turn were recorded for both the parent and the child resulting in six categories overall. An initiation was coded if a new line of conversation began following a pause of five seconds. A response was coded if either the parent or the child responded to the other's previous verbalisation within five seconds. A floor hold was recorded if the parent or the child continued to speak within five seconds of his or her own previous verbalisation without interruption from any other speaker. Frequencies for each category were tallied and totals were calculated.

Intra-rater reliability was conducted on 20% (n = 14) of transcripts prior to further coding at pre-intervention assessment (see Appendix N for reliability procedures manual). Intra-class correlations (ICC) across all 25 categories of vocabulary, social communicative function and conversational turn were high, ranging from r = .585 to 1.000.

Procedure

Ethical approval for the main RCT was obtained through the NHS and Bangor Universities Ethics Committee in 2008. Information sheets were provided to all families via their local FS Health Visitor and parents provided written informed consent to participation in the trial at the first home visit (see Appendix A for project protocol). Recruitment was undertaken in two phases. Participants living in North and Mid Wales were recruited during August 2008 with the IYPTP delivered between September and

December 2008. Participants living in South Wales were recruited between November and December 2008 with intervention families receiving the programme between January and March 2009. Parents were informed of their allocation to either the intervention or wait-list control groups after the two pre-intervention assessments were completed. Post-intervention data were collected six-months after the initial assessments, approximately three months after programme completion. The IYPTP was then offered to the control group. All participants were given a small payment, £10, as a token of gratitude for their participation in the trial at both pre- and post-intervention assessments.

Pre- and post- intervention data was collected from the child's primary carer, most of whom were mothers (n = 87), via two home visits conducted at each time point one-week apart. Demographic information was obtained via the PDHQ (Hutchings, 1996, see Appendix I), a semi-structured interview between the caregiver and the researcher. Measures of parental depression, stress, wellbeing and competence, in addition to measures of children's development (described in Chapter Six), were also collected at the initial visit and are in the process of being written up (Griffith, Hutchings, Baker-Henningham & Williams, in preparation), The initial visit lasted 90 minutes. Data for the IT-HOME (Appendix K; Caldwell & Bradley, 1984; 2003), the CII (Appendix I; Dishion et al., 2004) and half-hour videotapes of parents and children interacting during naturalistic free-play were collected during the second visit at each time point and lasted approximately 60 minutes.

For the current thesis ethical approval was obtained from Bangor Universities School of Psychology Ethics Committee. The final 15 minutes of each half-hour videotaped observation from both pre- and post-intervention assessments were viewed by a

researcher in a closed room and were hand-transcribed verbatim (see Appendix L for example of transcript). Transcripts provided a detailed and accurate record of the interaction including speaker identification (parent or child), the utterance and the timing of each utterance. Real nouns, play noises and interjections were recorded but excluded from further coding. Welsh videotapes were transcribed and translated into English by a native Welsh-speaker and underwent the same procedures as all other transcripts.

Each transcript was coded for 25 language categories described in detail above and in Appendix E. For the purpose of the current study only the two simple indices of parental language were used for analysis, total words and total different words. Intra-class correlations (ICC) for intra-rater reliabilities ranged between r = .994 to .999 for total words and r = .975 to .997 for total different words. A secondary coder received eight hours training prior to coding. Reliability checks on 20% (n = 16) of transcripts obtained ICC's ranging between r = .914 to .993 for total words and r = .811 to .983 for total different words.

Analysis

All outcome variables, IT-HOME, total words and different words, were checked for normality. Four of the five-predictor variables; marital status, employment, education and housing quality were shown to correlate with all three outcome variables, IT-HOME, total words and different words. Family size was not correlated and was excluded from analysis. Total words and total different words were highly correlated with one another (r = .859) however both were retained for analysis as they measure two distinct qualities of parental speech, i.e. quantity and diversity.

Independent *t*-tests, were conducted for the three outcome variables prior to stepwise linear regression to determine which SED factors were independently associated with parenting outcomes. In the stepwise regression analysis the dependent variables were the IT-HOME total score, total words and total different words. The independent variables were child age and gender which were entered in the first step. The SED factor risk groups, marital status, employment, education and housing quality were offered in a second step.

Multiple risk was assessed using multiple regression. A total risk score using all SED risk factors was calculated with scores ranging between 0 and 4. Three dummy variables were created to represent caregivers with one risk factor, two to three risk factors and four risk factors. The number of participants experiencing two risk factors sample was relatively small (n = 8) and they were combined with the participants experiencing three risk factors to ensure sufficient numbers for analysis. The dependent variables were the IT-HOME, total words and different words and the independent variable were child age and gender entered in the first step and the three dummy variables entered in the second step.

Results

Individual Contributions of Risk Factors

Independent t-tests revealed that caregivers who were employed or who lived in good quality housing spoke significantly more to their children, used more diverse language and scored higher on the IT-HOME than those who were not (Table 5.2). In addition, caregivers who achieved qualifications beyond 17 years or who were married scored significantly higher using the IT-HOME.

Table 5.2.

Independent t tests for parental language and IT-HOME by each SED risk factor.

	Total Words *M* (*SD*)	*t* *p*	Different Words *M* (*SD*)	*t* *p*	IT-HOME *M* (*SD*)	*t* *p*
Employed (*N* = 42)	773.55 (328.05)	2.387 .019	177.86 (55.16)	2.411 .018	38.36 (4.82)	5.916 .000
Benefits (*N* = 39)	612.03 (276.33)		150.77 (45.01)		31.18 (6.07)	
Married (*N* = 53)	737.30 (338.50)	1.660 .101	170.62 (56.32)	1.390 .168	37.42 (5.41)	5.619 .000
Single (*N* = 28)	617.18 (244.85)		153.82 (41.48)		30.14 (5.79)	
Educated (*N* = 33)	757.61 (315.35)	1.485 .142	165.73 (52.51)	.130 .897	38.24 (5.65)	4.210 .000
Uneducated (*N* = 48)	653.27 (307.57)		164.19 (52.24)		32.60 (6.11)	
Good Housing (*N* = 37)	806.86 (317.33)	3.080 .003	181.65 (54.91)	2.780 .007	38.89 (4.29)	6.093 .000
Poor Housing (*N* = 44)	602.36 (280.19)		150.66 (45.43)		31.55 (6.19)	

Stepwise linear regression was performed to investigate the ability of four SED risk factors to predict three parenting behaviours after controlling for child age and gender. Preliminary analysis was conducted to ensure no violation of assumptions of normality, linearity and homoscedasticity. Inspection of histograms, P-P plots and scatter plots confirmed normally distributed errors and homogeneity of variance. Additionally the correlations amongst the predictors (child age, gender and the four SED risk factors) included in the study were examined and presented in Table 5.3. All correlations were weak to moderate indicating that multicollinarity was unlikely to be a problem. The majority of predictor variables were statistically correlated with the dependent variables suggesting that the data was suitably correlated with the dependent variable for

examination through stepwise linear regression. All correlations were weak to moderate ranging between $r = .133$ to $r = .583$. Both parental total words and total different words were positively correlated with child age, and negatively correlated with parental employment and quality of housing. IT-HOME total scores were negatively correlated with child age, marital status, employment, quality of housing, education, two to three risks and four risk factors. In addition, IT-HOME scores were positively correlated with one risk factor. The strength of these correlations ranged from poor to moderate.

Table 5.3

Correlations matrix between SED risk factors and the three dependent variables of parenting behaviours

	Child Age	Gender	Family Size	Education	Marital Status	Employ -ment	Housing	1 Risk	2-3 Risk	4 Risks	Total Words	Different Words	IT-HOME
Child Age	1.000	-	-	-	-	-	-	-	-	-	-	-	-
Gender	.075	1.000	-	-	-	-	-	-	-	-	-	-	-
Family Size	.074	.232*	1.000	-	-	-	-	-	-	-	-	-	-
Education	.244*	.156	.134	1.000	-	-	-	-	-	-	-	-	-
Marital Status	.261*	.209	.062	.391***	1.000	-	-	-	-	-	-	-	-
Employment	.244*	.131	.224*	.296**	.598***	1.000	-	-	-	-	-	-	-
Housing	.153	.082	.243*	.248*	.354*	.437***	1.000	-	-	-	-	-	-
1 Risk	.016	-.111	-.158	-.050	-.416***	-.380***	-.280*	1.000	-	-	-	-	-
2-3 Risks	.068	.134	.268*	.252*	.161	.363**	.375**	-.428**	1.000	-	-	-	-
4 Risks	.184	.070	.070	.395**	.656***	.495***	.437***	-.273*	-.356**	1.000	-	-	-
Total Words	.231*	-.126	-.118	-.199	-.154	-.255*	-.334**	.117	-.210	-.169	1.000	-	-
Different Words	.358**	-.033	.013	-0.25	-.144	-.226*	-.281*	.150	-.166	-.122	.859***	1.000	-
IT-HOME	-.292**	-0.11	-.143	-.466***	-.563***	-.569***	-.583***	.318**	-.320**	-.490**	.224*	.202	1.000

*** $p < .001$, ** $p < .01$, * $p < .05$

total words.

Simple linear regression (Table 5.4) using stepwise entry was performed. In step one two predictors were entered, child age and gender. This model was statistically significant (F (2, 78) = 3.12, p = 0.050) and explained 7.4% (R^2 = 0.07, p = 0.050) variance in parental total words. After stepwise entry of the four SED risk factors in step two the total variance explained by the model was 20.2% (F (3, 77) = 6.49, p = 0.001). After controlling for child age and gender quality of housing was the only SED risk factor to contribute significantly to the model explaining an additional 13% (ΔR^2 = 0.13, p = 0.001) variance in outcome. These results indicate that after controlling for child age and gender, caregivers living in over-crowded, poor quality housing use significantly less words with their children in 15-minutes than those living in good, un-cramped conditions.

Table 5.4.

Regression model for predicting Parental Total Words by four SED risk factors

	B	*SE B*	ß	*t*	*p*
Step 1					
Age	11.28	5.10	0.24	2.21	0.030
Gender	-91.73	69.55	-0.14	-1.32	0.191
Step 2					
Age	13.78	4.82	0.30	2.86	0.005
Gender	-75.35	65.15	-0.12	-1.16	0.251
Housing Quality	-226.55	64.51	-0.36	-3.51	0.001
Excluded Variables					
Marital Status				-1.18	0.240
Employment				-1.79	0.08
Education				-1.35	0.18

Age and gender entered in the first step. Quality of housing, marital status, education and employment offered in the second step.

total different words.

The model for parental total different words is presented in Table 5.5. In step one child age and gender contributed to a significant model (F (2, 78) = 5.93, p = 0.004) explaining 13.2% variance (R^2 = 0.13, p = 0.004) in parental total different words. The inclusion of employment status in step two further explained an additional 12.6% variance (ΔR^2 = 0.13, p = 0.001) in outcome (F (3, 77) = 13.13, p = 0.000). Housing quality included in step three explained an additional 5% variance (ΔR^2 = 0.05, p = 0.019) contributing to a significant model (F (4, 76) = 8.54, p = 0.000). Overall, the model that included child age, gender, employment and housing explained 31% variance in parental total different words. The results suggest that after controlling for child age and gender, caregivers living in poor housing conditions and parents living in households that were unemployed use less different words with their children than those that were not.

Table 5.5.

Regression model for predicting parental Total Different Words by four SED risk factors

	B	*SE B*	ß	*t*	*p*
Step 1					
Age	2.82	0.82	0.36	3.43	0.001
Gender	-6.35	11.19	-0.06	-0.06	-0.567
Step 2					
Age	3.49	0.79	0.45	4.44	0.000
Gender	-1.92	10.48	-0.02	-0.18	0.855
Employment	-38.21	10.55	-0.37	-3.62	0.001
Step 3					
Age	3.58	0.76	0.46	4.69	0.000
Gender	-1.31	10.18	-0.01	-0.13	0.898
Employment	-27.13	11.24	-0.26	-2.41	0.018
Housing Quality	-26.30	11.02	-0.25	-2.39	0.019
Excluded Variables					
Marital Status				-0.35	0.726
Education				0.17	0.865

Age and gender entered in the first step. Quality of housing, marital status, education and employment offered in the second step.

it-home total scores.

The model for the IT-HOME is presented in Table 5.6. In step one child age and gender contributed to a significant model (F (2, 78) = 3.65, p = 0.031) explaining 8.6% variance in IT-HOME total scores (R^2 = 0.09, p = 0.031). The inclusion of housing in step two explained a further 28% variance (ΔR^2 = 0.28, p = 0.000) in outcome (F (3, 77) = 14.79, p = 0.000). The inclusion of marital status in step three explained a further 11.1% variance (ΔR^2 = 0.11, p = 0.000) in outcome (F (4, 76) = 17.31, p = 0.000). The addition of education in step four contributed only an additional 3.2% variance (ΔR^2 =

0.03, $p = 0.030$) in outcome (F (5, 75) = 15.54, $p = 0.000$). The addition of employment status in the final step explained only a small amount of variance ($\Delta R^2 = 0.03$, $p = 0.045$) in outcome i.e. 2.6% (F (6, 74) = 14.19, $p = 0.000$). The final model that included child age, gender and all four SED risk factors explained a total of 53.5% variance in IT-HOME scores. These results indicate that after controlling for child age and gender parents who live in poor quality housing, are single parents, unemployed and educated below GCSE level provide their children with less good quality stimulation in the home.

Table 5.6.

Regression model for predicting IT-HOME scores by five SED risk factors

	B	*SE B*	ß	*t*	*p*
Step 1					
Age	-0.29	0.11	-0.29	-2.70	0.009
Gender	0.15	1.44	0.01	0.10	0.920
Step 2					
Age	-0.21	0.09	-0.21	-2.33	0.023
Gender	0.65	1.21	0.05	0.54	0.593
Housing Quality	-6.97	1.20	-0.54	-5.83	0.000
Step 3					
Age	-0.14	0.08	-0.14	-1.62	0.110
Gender	1.48	1.12	0.11	1.32	0.192
Housing Quality	-5.48	1.16	-0.42	-4.74	0.000
Marital Status	-5.07	1.26	-0.37	-4.02	0.000
Step 4					
Age	-0.11	0.08	-0.11	-1.30	0.197
Gender	1.67	1.10	0.13	1.52	0.132
Housing Quality	-5.18	1.14	-0.40	-4.57	0.000
Marital Status	-4.26	1.28	-0.31	-3.32	0.001
Education	-2.63	1.19	-0.20	-2.21	0.030
Step 5					
Age	-0.09	0.08	-0.10	-1.14	0.260
Gender	1.69	1.08	0.13	1.56	0.124
Housing Quality	-4.49	1.16	-0.35	-3.87	0.000
Marital Status	-2.87	1.43	-0.21	-2.01	0.049
Education	-2.55	1.16	-0.19	-2.19	0.032
Employment	-2.76	1.35	-0.21	-2.04	0.045

Age and gender entered in the first step. Quality of housing, marital status, education and employment offered in the second step.

Associations with Multiple Risk

total words.

Multiple risk was associated with poorer outcomes for caregivers across all outcome measures. Table 5.7 presents the regression model for total words. Child age and gender were entered in the first step and produced a significant model (F (2, 78) = 3.12, p = 0.050) explaining 7.4% (R^2 = 0.07, p = 0.050) variance in parental total words. The addition of the three multiple risk dummy variables in the second step explained an additional 17% (ΔR^2 = 0.17, p = 0.001) variance in parental total word outcomes (F (5, 75) = 4.92, p = 0.001). After controlling for child age and gender, two of the three dummy variables were significant with two to three risk factors recording higher betas than four risk factors. These results suggest that parents with two or more risk factors speak less to their children. The total variance in parental total words explained by the final model was 24.7%.

Table 5.7.

Association between exposure to multiple risk and parental Total Words

	B	*SE B*	ß	*t*	*p*
Step 1					
Age	11.28	5.10	0.24	2.12	0.030
Gender	-91.73	69.54	-0.14	-1.32	0.191
Step 2					
Age	16.78	4.90	0.36	3.42	0.001
Gender	-51.43	64.93	-0.08	-0.79	0.431
1 Risk	-170.79	94.31	-0.24	-1.81	0.074
2-3 Risks	-319.97	88.78	-0.49	-3.60	0.001
4 Risks	-372.26	104.24	-0.47	-3.57	0.001

Child age and gender entered in the first step. Three dummy variables representing 1 risk, 2-3 risks and 4 risks (with no risk as the control condition) entered in the second step.

total different words.

Table 5.8 presents the regression model for total different words. Both child age and gender entered in the first step contributed 13.2% (R^2 = 0.13, p = 0.004) variance in outcome (F (2, 78) = 5.93, p = 0.004). The addition of the three dummy variables in the second step explained an additional 14% (ΔR^2 = 0.13, p = 0.005) variance in outcome (F (5, 75) = 5.53, p = 0.000). In the final model, after controlling for child age and gender both two to three risk factors and four risk factors were significant and achieved similarly high betas. The results indicate that the presence of two or more SED risk factors predict less parental different words. The final model explained a total of 27% variance in parental total different words.

Table 5.8

Association between exposure to multiple risk and parental Total Different Words

	B	*SE B*	ß	*t*	*p*
Step 1					
Age	2.82	0.82	0.36	3.43	0.001
Gender	-6.35	11.19	-0.06	-0.57	0.572
Step 2					
Age	3.58	0.80	0.46	4.56	0.000
Gender	0.01	10.63	0.00	0.00	0.999
1 Risk	-15.09	15.44	-0.13	-0.98	0.331
2-3 Risks	-43.04	14.53	-0.40	-2.96	0.004
4 Risks	-53.42	17.06	-0.40	-3.13	0.002

Child age and gender entered in the first step. Three dummy variables representing 1 risk, 2-3 risks and 4 risks (with no risk as the control condition) entered in the second step.

it-home total scores.

Table 5.9 presents the regression model for the IT-HOME. Child age and gender explained 8.6% variance (R^2 = 0.09, p = 0.031) contributing to a significant model (F (2, 78) = 3.65, p = 0.031). The addition of three dummy variables in the second step provided an additional 44% variance (ΔR^2 = 0.44, p = 0.000) in IT-HOME scores (F (5, 75) = 16.89, p = 0.000). Tow to three and four risk factors were significant independent predictors. Four risk factors recorded the higher beta. Results suggest that the presence of two or more SED risk factors predicts less stimulating home environments with four risk factors being most significant. The final model explained a total of 53% variance in IT-HOME scores. Figure 5.1 provides a pictorial representation of the relationship between multiple risk and the three parenting outcomes.

Table 5.9

Association between exposure to multiple risk and the IT-HOME when controlling for child age and sex

	B	*SE B*	ß	*t*	*p*
Step 1					
Age	-0.29	0.11	-0.29	-2.70	0.009
Gender	0.15	1.44	0.01	0.10	0.920
Step 2					
Age	-0.12	0.08	-0.12	-1.47	0.145
Gender	1.52	1.07	0.12	1.43	0.158
1 Risk	-1.99	1.55	-0.13	-1.29	0.203
2-3 Risks	-8.04	1.46	-0.60	-5.50	0.000
4 Risks	-12.36	1.71	-0.74	-7.21	0.000

Child age and gender entered in the first step. Three dummy variables representing 1 risk, 2-3 risks and 4 risks (with no risk as the control condition) entered in the second step.

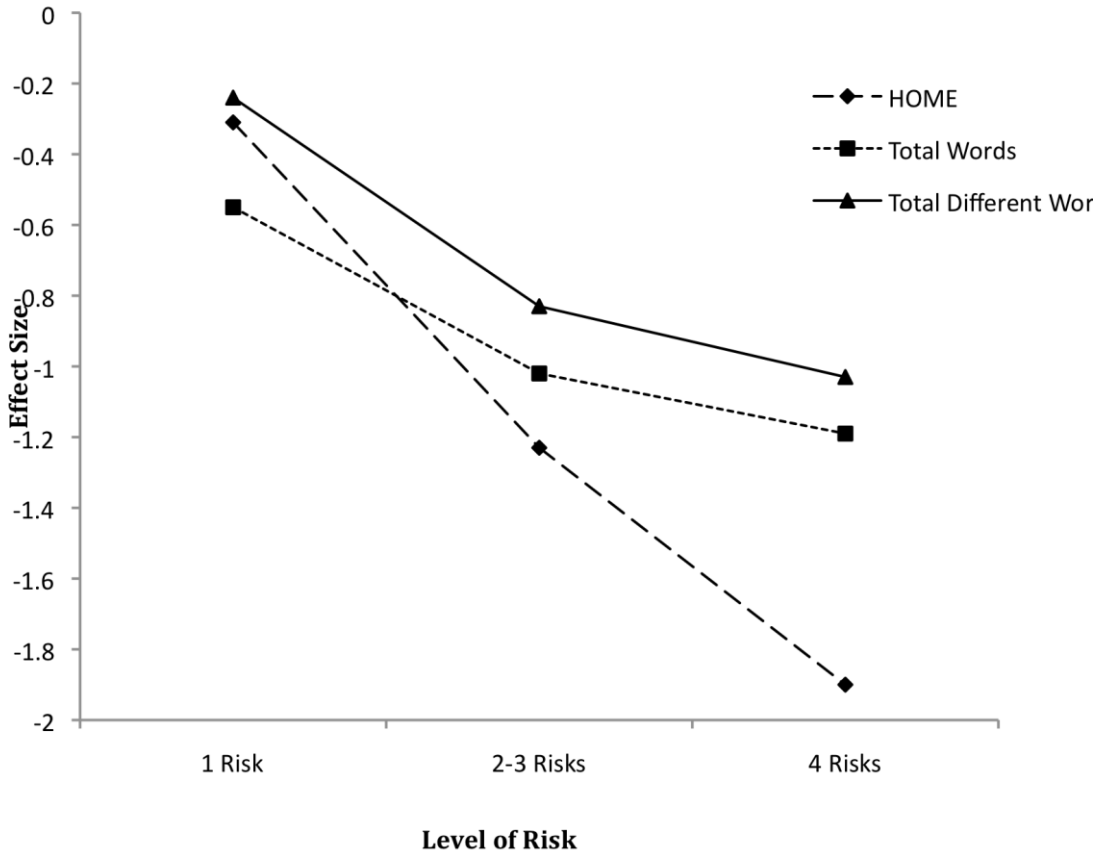

Figure 5.1. Associations between number of risk factors and parenting measures.

Discussion

All four SED risk factors: employment, education, quality of housing and marital status predicted poorer outcomes on the IT-HOME. Poor quality housing predicted less total words, whilst poor quality housing and unemployment both predicted less different words. Across all three-outcome measures poor quality housing was shown to be the most predictive of poorer parenting behaviours. Furthermore, multiple risk was associated with poorer outcomes irrespective of which SED risk factors were present. Across all outcome measures, and after controlling for child age and gender, quality of

housing was shown to be the most predictive risk factor associated with poorer parenting outcomes. This result suggests that for the FS sample at least this may be a good measure of identifying children at risk.

The results of the present study support previous research that has indicated relationships between socioeconomic disadvantage and poor parenting (Belsky & Pasco-Fearon, 2002; Bradley & Corwyn, 2002; Burchinal et al., 2008; Hart & Risley, 1995; Vernon-Feagans et al., 2008). In the current study quality of housing was shown to be the most predictive of poor parenting behaviours. This result contributes to the literature that suggests that housing quality and overcrowding are important indices for poor child outcomes (Bradley & Caldwell, 1979; Bradley & Corwyn, 2002; Vernon-Feagans et al., 2008). Contrary to previous evidence (Hart & Risley, 1995) family size was not associated with poor parenting outcomes. However in the current sample only 15% (n = 12) had three or more children that may have contributed to the conflicting results. A larger sample of families may obtain results similar to those previously reported in the literature.

Strengths

The principal strength of this research is that the results are based upon independent measures collected by different researchers. Language data was obtained using an objective measure of language collected from videotaped observations of parent-child free-play by the first author. Information for predictors was gathered via parent report from the researchers working on the main RCT of the IYPTP.

When looking at the four SED risk factors individually not all were significantly predictive of poorer outcomes. However, multiple risk predicted poorer outcomes,

complementing and supporting previous research in this area (Belsky & Pasco-Fearon, 2002; Trentacosta et al., 2008). These findings contribute to the growing body of evidence that suggests that alternative methods that consider each family individually should be investigated for their effectiveness to identify those at a greater risk (Hutchings, Griffith, Bywater, Williams & Baker-Henningham, 2013).

Weaknesses

The speech sample used in this study was 15-minutes in duration. Unlike past studies that have used similar, yet more sophisticated methods for measuring speech (Hoff, 2003; Hoff-Ginsberg, 1991; 1998), parental education was not predictive of poorer language outcomes. Whilst this contradicts previous research the current sample was small and was not targeted for specific levels of educational attainment. It could also be that 15-minutes is not a sufficient amount of time to account for individual variability given the small sample size (N = 81), or indeed the classification of parental education used may not have been sufficiently fine grained compared to those in previous studies.

Implications & Future Research

The results have implications for current targeting methods in Wales suggesting that demographic data could provide a quick, cost-effective method for identifying those families at risk of poor outcomes. A previous evaluation of the FS programme (Ipsos-MORI, 2009) highlighted limitations with the geographical targeting method indicating that many disadvantaged families lived outside the specified areas and were not able to access additional resources. Consequently, compared to a sample targeted using known child risk factors FS families have been identified as being less disadvantaged

(Hutchings et al., 2013). In response, the WG have increased funding for the next three years to target an additional 18,000 (9%) families living outside the current geographical areas (Welsh Government, 2012). Referrals and identification of children living in income benefit households (IBHH's) will provide targeting methods for delivering services to these additional families.

In practice, simple demographic information could be obtained during routine health visitor assessments. Currently in Wales, health visitors conduct assessments when the child is two, four, and six weeks old, then at nine and 24 months. Data for the four risk factors can be obtained in five to ten minutes and could be incorporated in the initial health visitor assessment in order to identify and target high-risk families more effectively. Despite this there are several practical limitations to this approach. Despite managing smaller caseloads to health visitors in England, an additional 10-minutes spent with each family that the health visitor sees may result in an additional 1 to 2-hours work every day and may not be feasible given time-constraints and financial implications.

In conclusion, the results provide evidence of an association between SED and poor parenting behaviours for our sample of FS parent. These results provide the rationale to explore the benefit of intervention on parental language for the same sample. In addition, the findings do seem to suggest that assessment of SED risk factors could provide an alternative method for targeting families living outside of the current geographical FS areas that are not eligible but may need additional support. Despite this, these results should be taken with caution as they are derived from a cross-sectional study examining the association between SED risk and parental outcomes and therefore do not explain causality.

CHAPTER 6

Constructing a Tool to Measure Parental Language

The purpose of the second study was to develop and test a tool for measuring parental language that may be appropriate for evaluating change following attendance on the IYPTP. The 25 categories of parental language used by Hart and Risley (1995) that have been described previously in Chapter Two and Five were distilled into more manageable units for analysis. These reduced categories of parental language were then compared to two simple measures of parental total words and total different words for their comparable levels of reliability and validity. Reliability for both the simple and complex measures of language was assessed via their level of inter-rater agreement and stability over time. Construct validity for both the simple and complex measures was assessed via their associations with socioeconomic disadvantage. Finally, the predictive validity for both sets of measurements was assessed via their associations with children's language skills six months later.

Introduction

One aim of many evidence-based parenting interventions is to strengthen the parent-child relationship by enhancing parents positive communication skills and increasing their use of positive praise and encouragement (Hunt, 2003; Saunders, 1999; Saunders & Glynn, 1981; Webster-Stratton, 2001). Categories associated with social communicative function, such as directions, questions and encouragements (described previously in Chapter Two) are closely aligned with the verbal strategies taught on parenting programmes (Chapter Four), are independent of grammatical complexity (Tamis-LeMonda, Baumwell & Cristifara, 2012b) and are predictive of a variety of child language outcomes. Evidence indicates that maternal social function language use

at 18, 30 and 36 months contributes to 33% of children's language comprehension scores and 18% of their total vocabulary skills at 36 months (Lacroix, Pomerleau & Malcuit, 2002). Social functions that prohibit children's actions and verbalisations, such as "stop that" or "don't do that", hinder later language development (Hart & Risley, 1992; 1995; Masur et al., 2005) whilst functions that promote child participation in interactions, such as questions increase positive outcomes (Flynn & Masur, 2007; Masur et al., 2005; Tomasello & Farrar, 1986).

Measures of social communicative function are complex, require substantial training and can be time consuming and costly. Despite this, the similarity between measures of social communicative function and the strategies taught on parenting programmes suggest that such measures may be appropriate for evaluating the effects of the IYPTP in FS areas in Wales.

Method

Participants

Pre-intervention videotaped data for the same 81 primary-caregiver child dyads previously described in Chapter Five met the criteria for the current study. Complete datasets for a sub-sample of 67 dyads was also available at a six-month post-intervention assessment (44 intervention and 23 control). At the pre-intervention assessment parents were aged 28.94 years (*SD* = 6.72, range = 16 to 48 years) and were primarily mothers (*n* = 79/81). The sample of 67 children, from which the language data is taken included 43 males and 24 females with a mean age of 21.51 months (*SD* = 6.79, range = 11 to 34 months) at the pre-intervention assessment and 27.52 months (7.17, range = 16 to 28 months) six months later.

Measures

demographics.

Four questions relating to parental education and qualifications, employment status, marital status and housing quality were used to calculate levels of socio-economic disadvantage using the definitions set out in Chapter Five.

schedule of growing skills II (SGS II; Bellman, Lingam, & Aukett, 1996).

The SGS II was used as a measure of children's language. The SGS II is a screening tool used by trained professionals to assess children's development from birth to 60 months (Appendix O). The tool assesses ten sub-fields that represent five developmental domains: posture and large movements, vision and fine movement, hearing and speech, social and play, and cognitive development. The SGS II includes both parent-report items and professionally administered tasks. It can be administered in 20-minutes by certified users who have attended a two-day training workshop.

Identifying the highest-ranking item that the child performs for each sub-field provides 10 individual scores (ranging between 0 and 20) that are transformed into a sub-field specific developmental quotient (DQ) using age appropriate norms (Williams, Hutchings, Bywater, Daley & Whitaker, 2013). For the purpose of the current thesis the individual DQ's for both the hearing and language (receptive) and speech and language (expressive) sub-fields were utilised for analysis.

parental language.

Transcription and coding procedures for videotapes are detailed in Chapter Five. The descriptions for the 25 categories are also presented in Chapter Five and Appendix E. Intra-rater reliability was conducted on 20% (n = 14) of transcripts prior to further coding at baseline (see Appendix N for reliability procedures manual). Intra-class correlations (ICC) across all 25 categories of vocabulary, social communicative function and conversational turn were high ranging from r = .585 to 1.000.

Procedure

Data collection procedures for the main RCT, and the transcription and coding procedures for the current thesis are outlined in Chapter Five. Measures of vocabulary, total words and total different words were individually calculated from transcripts. Real nouns (names of people and places) play noises and interjections were recorded but excluded from further coding. Categories relating to social communicative function and conversational turn were coded using the completed transcript alongside video playback. Total scores for each category of total words, total different words, vocabulary (all and different *nouns, verbs, modifiers, functors*), social communicative function (*directives, questions, declaratives, prohibitions, propitiatory imperatives, affirmatives, reflections, expansions*) and conversational turn (*initiations, responses, floor holds*) were calculated by tallying their frequency across the 15-minutes.

Results

Development of Complex Language Measures

The 25 language categories (Chapter Five and Appendix E) coded for both pre- and post-intervention videos were subjected to principle component analysis (PCA) with five components emerging. Prior to performing PCA the suitability of the data for factor analysis was assessed. Inspection of the correlation matrix revealed the presence of many coefficients of 0.30 and above. The Kaiser-Meyer-Oklin value was 0.76 exceeding the recommended value of 0.60 (Kaiser, 1970, 1974) and the Barlett's test of Sphericity (Bartlett, 1954) reached statistical significance supporting the factorability of the correlation matrix.

Alternative questions, where the parent gave the child a choice between two options, were removed prior to further analysis due to low frequencies. At both pre- and post-intervention assessments parent initiation and child response, two measures of conversational turn, demonstrated loading across several factors and were removed from analysis. The remaining 22 categories were subjected to PCA using Varimax rotation. PCA using the pre-intervention data resulted in five components with eigenvalues exceeding 1, explaining in total 79% of the variance. PCA analysis was then repeated using the post-intervention data to assess consistency of the component structure across time. The same five components were formed with eigenvalues over 1, explaining in total 80% of the variance. The screeplots for both analyses revealed a break after the third component but it was decided to retain the five components for further analysis. Table 6.1 presents the five component structures.

As wh-questions (who, what, where, how, when and why) loaded inconsistently across pre- and post-intervention assessments for ease of further interpretation the five parent language variables were manually calculated using raw scores within SPSS. The five categories created were labelled as:

1. *Quantity and variety:* The sum of all nouns, verbs, modifiers, functors, all different nouns, verbs, modifiers and functors, declaratives, yes-no questions and auxiliary fronted yes-no questions.
2. *Parent led:* The sum of all parent initiations, parent floor holds and wh-questions. Wh-questions were incorporated into the parent led category, due to their high loading on this category at follow-up.
3. *Passive:* The sum of all child initiations, child floor holds and parent responses.
4. *Encouraging:* The sum of all affirmations, reflections and expansions.
5. *Critical:* The sum of all prohibitions and prohibitory imperatives.

Development of Simple Language Measures

In addition to the five complex categories created from the data, two simple parent language categories were also developed for comparison:

Total words: The sum of all nouns, verbs, modifiers and functors that the parent used during the interaction. This category was highly correlated with total different words (r = .896) and quantity and variety (r = .995) both in a positive direction.

Total different words: The sum of all different nouns, verbs, modifiers and functors that the parent used. This category was positively correlated with total words (r = .859) and quantity and variety (r = .896) in a positive direction.

Table 6.1.

Varimax rotation of five factor solution for parental language measures at baseline and follow up.

	1 (Quantity & Variety)	2 (Passive)	3 (Encouraging)	4 (Critical)	5 (Parent-Led)
Total nouns	.744				.408
Different nouns	.766				
Total verbs	.851				
Different verbs	.919				
Total modifiers	.801				
Different modifiers	.879				
Total functors	.863				
Different functors	.865				
Declaratives	.764				
Yes/No questions	.682				
Auxiliary fronted questions	.623				
Child initiation		.931			
Child floor hold		.947			
Parent response		.913			
Affirmatives			.824		
Reflections			.770		
Expansions			.568		
Wh-questions			.464		.557
Imperatives					.852
Parent floor hold	.520				.606
Prohibitions				.937	
Prohibitory imperatives				.943	
% of variance explained at baseline	41.78%	18.39%	8.58%	5.88%	4.93%
Total nouns	.779				.409
Different nouns	.761				
Total verbs	.908				
Different verbs	.921				
Total modifiers	.812				
Different modifiers	.904				
Total functors	.928				
Different functors	.873				
Declaratives	.678				
Yes/No questions	.441		.513		
Auxiliary fronted questions	.672				
Child initiation		.944			
Child floor hold		.938			
Parent response		.939			
Affirmatives			.754		
Reflective		.459	.742		
Expansions			.708		
Wh-questions					.813
Imperatives			-.451		.623
Parent floor hold	.552	-.490			.587
Prohibitions				.913	
Prohibitory imperatives				.908	
% of variance explained at follow up	40.44%	19.75%	8.86%	5.23%	6.06%

Note. Only loadings above .4 are displayed

All seven categories (five complex and two simple) of parental language were checked to ensure normal distribution of residuals for regression analysis. From the five complex categories encouraging language and passive parent interactions were normalised at both baseline and follow-up using square root methods, whilst critical language was normalised using log transformations.

Measure Reliability

Inter-rater reliability for the seven categories of parental language was assessed using intra-class correlations. Results demonstrated high levels of reliability across coders for the five complex categories, in addition to the two simple measures of total words and total different words (Table 6.2). Furthermore, assessment of long-term stability indicated that from the complex categories, encouraging language was satisfactorily stable over six months; whilst the quantity and variety of language, parent led and passive parent interactions showed good stability over time. Critical language was the only category from the complex analysis to demonstrate weak stability over the longer term. Both of the simple measures of total words and total different words demonstrated good stability over time.

Table 6.2.

Intra-class correlations (r) for parental language measures.

	Inter-rater	Long term stability
Quantity & Variety	.968**	.660**
Passive	.992**	.627**
Encouragement	.854**	.495**
Critical	.818**	.251*
Parent Led	.971**	.695**
Total words	.973**	.644**
Total different words	.929**	.706**

** $p \leq 0.001$, * $p \leq 0.05$

Measure Validity

construct validity: associations with level of socioeconomic risk.

As socioeconomic risk is known to predict parent language outcomes (Chapter Five) the construct validity for both the complex and simple measures was assessed via their associations with multiple risk. As in Chapter Five, family size was not shown to relate to any measure of parental language and was removed prior to analysis. From the remaining four risk factors an overall score was calculated ranging between 0 and 4 using the same methodology applied in Chapter Five. Using these scores caregivers were then grouped according to their associated level of risk; one risk factor, 2-3 and 4 risk factors. As the two risk factor sample was relatively small (n = 8) this was combined with the three risk factors group to boost numbers for analysis.

Using the full sample of 81 participants available at pre-intervention assessment analysis was conducted using multiple regression to investigate the ability of indices of multiple risk to predict levels of parental language, after controlling for child age,

gender and intervention status. Preliminary analyses were conducted to ensure no violation of the assumptions of normality, linearity, and homoscedasticity. Inspection of histograms, P-P plots and scatter plots indicated that all assumptions for running regression were met. Additionally, the correlations amongst the predictor variables (child age, gender and indices of multiple risk) included in the study were examined and these are presented in Table 6.3. All correlations were weak to moderate indicating that multicollinearity was unlikely to be a problem. Not all predictor variables were statistically correlated with parental language outcomes suggesting that the data may not have been suitably correlated with the dependent variable for multiple regressions to be reliably undertaken. Age was positively correlated with total words, total different words, quantity and variety, encouraging and passive parent interactions. Age was negatively correlated with parent led interactions. Two to three risk factors were correlated positively with critical language whilst four risk factors were correlated positively with passive parent interactions. These correlations ranged from weak to moderate.

The dependent variables for regression analysis were the five complex (quantity and variety, encouraging, critical, parent-led, and passive) and the two simple measures (total words and total different words) of parental language. Child age, gender and intervention condition (parent allocated to intervention or control condition) were controlled for and entered in the first step. The three dummy variables of multiple risks were entered in the second step.

Table 6.3.
Correlation matrix of the predictors and outcome variables for Chapter Six: Developing a tool for measuring parental language

	Child Age	Gender	Intervention	1 Risk	2-3 Risks	4 Risks	Total Words	Different Words	Quantity	Encourage	Critical	Passive	Parent-Led	Receptive	Expressive
Child Age	1.000	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gender	.075	1.000	-	-	-	-	-	-	-	-	-	-	-	-	-
Intervention	-.050	-.111	1.000	-	-	-	-	-	-	-	-	-	-	-	-
1 Risk	.016	.070	-.142	1.000	-	-	-	-	-	-	-	-	-	-	-
2-3 Risks	.068	.089	.146	-.428**	1.000	-	-	-	-	-	-	-	-	-	-
4 Risks	.184	.134	.000	-.273*	-.256**	1.000	-	-	-	-	-	-	-	-	-
Total Words	.231*	-.126	-.084	.116	-.213	-.164	1.000	-	-	-	-	-	-	-	-
Different Words	.358**	-.033	-.102	.162	-.171	-.140	.859***	1.000	-	-	-	-	-	-	-
Quantity	.241*	-.108	-.080	.121	-.216	-.169	.995***	.896***	1.000	-	-	-	-	-	-
Encourage	.383***	-.018	-.060	.198	-.173	.015	.492***	.549***	.512***	1.000	-	-	-	-	-
Critical	.044	-.152	.037	-.136	.288**	-.030	.203	.141	.179	-.033	1.000	-	-	-	-
Passive	.623**	-.011	.015	.044	.005	.227*	-.062	.085	-.040	.382***	-.196	1.000	-	-	-
Parent-Led	-.287**	-.161	-.083	.049	-.136	-.204	.653***	.389***	.627***	.130	.255*	-.494***	1.000	-	-
Receptive	.166	.040	-.082	.129	-.140	-.181	.375**	.369**	.378**	.226*	.033	.042	.094	1.000	-
Expressive	.097	.127	-.070	.057	-.235	.003	.289**	.318**	.300**	.332**	-.055	.086	.008	.549***	1.000

*** $p < .001$, ** $p < .01$, * $p < .05$

complex measures.

quantity & variety of parental language.

For quantity and variety of parental language the model that included child age, gender and intervention status in the first step only explained 7.7% (R^2 = 0.08, p = 0.100) variance in outcome (F (3, 77) = 2.16, p = 0.100). The inclusion of the three multiple risk factors in the second step explained an additional 18% (ΔR^2 = 0.18, p = 0.001) variance (F (6, 74) = 4.28, p = 0.001). Child age, two to three risks and four risk factors were significant. Two to three risks recorded the highest beta over child age and four risks. This final model explained 25.8% variance in the quantity and variety of parental language suggesting that parents of younger children who experience two or more risk factors use less quantity and variety of language with their children. Table 6.4 presents the results of the model.

Table 6.4

Regression model for the association between exposure to multiple risk and Quantity and Variety of parental language

	B	*SE B*	ß	*t*	*p*
Step 1					
Age	14.32	6.36	0.25	2.25	0.027
Gender	-96.00	86.94	-0.12	-1.10	0.273
Intervention	-46.42	90.02	-0.06	-0.52	0.608
Step 2					
Age	21.43	6.09	0.37	3.52	0.001
Gender	-47.68	80.60	-0.06	-0.59	0.556
Intervention	-13.71	83.48	-0.02	-0.16	0.870
1 Risk	-213.70	116.99	-0.24	-1.83	0.072
2-3 Risks	-404.28	110.40	-0.50	-3.66	0.000
4 Risks	-473.84	129.13	-0.48	-3.67	0.000

Child age, gender and intervention status entered in the first step. Three dummy variables representing 1 risk, 2-3 risks and 4 risks (with no risk as the control condition) entered in the second step.

encouraging language.

The model for encouraging language that included child age, gender and intervention status in the first step was significant (F (3, 77) = 4.54, p = 0.06) explaining 15% variance in outcome (R^2 = 0.15, p = 0.006). The inclusion of the three multiple risk factors in the second step explained an additional 5.9% (ΔR^2 = 0.06, p = 0.148) variance (F (6, 74) = 3.26, p = 0.000). Child age was the only predictor significantly associated with encouraging language indicating that parents of older children were more encouraging. The final model explained 20.9% variance in encouraging interactions. Table 6.5 presents the results from the model.

Table 6.5

Regression model for the association between exposure to multiple risk and Encouraging parental language

	B	*SE B*	ß	*t*	*p*
Step 1					
Age	0.12	0.03	0.38	3.64	0.000
Gender	-0.18	0.43	-0.04	-0.41	0.684
Intervention	-0.16	0.45	-0.04	-0.35	0.725
Step 2					
Age	0.13	0.03	0.42	3.86	0.000
Gender	-0.02	0.43	-0.01	-0.04	0.965
Intervention	0.01	0.45	0.00	0.02	0.987
1 Risk	0.31	0.63	0.07	0.50	0.621
2-3 Risks	-0.90	0.59	-0.22	-1.52	0.134
4 Risks	-0.62	0.69	-0.12	-0.89	0.378

Child age, gender and intervention status entered in the first step. Three dummy variables representing 1 risk, 2-3 risks and 4 risks (with no risk as the control condition) entered in the second step.

critical language.

For critical language the model that included child age, gender and intervention status in the first step was not significant (F (3, 77) = 0.77, p = 0.516) explaining only

2.9% variance in outcome (R^2 = 0.03, p = 0.516). The inclusion of the three multiple risk factors in the second step explained a further 9% (ΔR^2 = 0.10, p = 0.049) variance in outcome (F (6, 74) = 1.78, p = 0.114). Only the presence of four risk factors was significant indicating that these parents used more critical language with their children. This final model explained 12.6% variance in critical language. Table 6.6 presents the regression model.

Table 6.6

Regression model for the association between exposure to multiple risk and Critical parental language

	B	*SE B*	ß	*t*	*p*
Step 1					
Age	0.00	0.01	0.06	0.51	0.606
Gender	-0.12	0.09	-0.16	-1.42	0.159
Intervention	0.04	0.09	0.05	0.48	0.631
Step 2					
Age	0.00	0.01	-0.01	-0.08	0.940
Gender	-0.15	0.09	-0.19	-1.75	0.085
Intervention	0.03	0.09	0.04	0.33	0.742
1 Risk	-0.01	0.12	-0.02	-0.11	0.914
2-3 Risks	0.08	0.12	0.11	0.70	0.484
4 Risks	0.33	0.14	0.34	2.38	0.020

Child age, gender and intervention status entered in the first step. Three dummy variables representing 1 risk, 2-3 risks and 4 risks (with no risk as the control condition) entered in the second step.

parent-led interactions.

The model for parent-led interactions that included child age, gender and intervention status in the first step was significant (F (3, 77) = 3.15, p = 0.030) accounting for 10.9% (R^2 = 0.11, p = 0.030) variance in outcome. The inclusion of the three multiple risk factors in the second step explained a further 6.4% (ΔR^2 = 0.06, p = 0.134) variance in outcome (F (6, 74) = 2.5,9 p = 0.025). The presence of four risk

factors was the only predictor to reach statistical significance indicating that this variable predicted less parent-led interactions. The final model explained 17.4% variance in parent-led interactions. Table 6.7 presents the results of the regression model.

Table 6.7

Regression model for the association between exposure to multiple risk and Parent-Led interactions

	B	*SE B*	ß	*t*	*p*
Step 1					
Age	-3.79	1.53	-0.28	-2.61	0.011
Gender	-24.29	19.87	-0.13	-1.22	0.225
Intervention	-16.18	20.57	-0.09	-0.79	0.434
Step 2					
Age	-2.76	1.49	-0.21	-1.85	0.069
Gender	-18.28	19.78	-0.10	-0.92	0.358
Intervention	-12.85	20.49	-0.07	-0.63	0.532
1 Risk	-36.21	29.71	-0.17	-1.26	0.211
2-3 Risks	-52.98	27.09	-0.28	-1.96	0.054
4 Risks	-71.16	31.69	-0.31	-2.25	0.028

Child age, gender and intervention status entered in the first step. Three dummy variables representing 1 risk, 2-3 risks and 4 risks (with no risk as the control condition) entered in the second step.

passive parent interactions.

The model for passive interactions that included child age, gender and intervention status in the first step was significant (F (3, 77) = 16.67, p = 0.000) explaining 39.4% variance in outcome (R^2 = 0.39, p = 0.000). The inclusion of the three multiple risk factors in the second step provided an additional 2.3% (ΔR^2 = 0.02, p = 0.416) variance in outcome (F (6, 74) = 8.80, p = 0.000) however only child age significantly predicted passive parent interactions. The model suggests that parents of older children were more

likely to use passive parent interactions. The final model explained 41.6% variance in passive interactions. Table 6.8 presents the regression model.

Table 6.8

Regression model for the association between exposure to multiple risk and Passive parent interactions

	B	*SE B*	ß	*t*	*p*
Step 1					
Age	0.29	0.04	0.63	7.07	0.000
Gender	-0.39	0.55	-0.06	-0.70	0.485
Intervention	0.33	0.57	0.05	0.58	0.564
Step 2					
Age	0.27	0.04	0.59	6.31	0.000
Gender	-0.44	0.56	-0.07	-0.78	0.437
Intervention	0.354	0.580	0.06	0.61	0.543
1 Risk	0.86	0.81	0.12	1.05	0.296
2-3 Risks	0.54	0.77	0.09	0.70	0.486
4 Risks	1.46	0.90	0.19	1.63	0.108

Child age, gender and intervention status entered in the first step. Three dummy variables representing 1 risk, 2-3 risks and 4 risks (with no risk as the control condition) entered in the second step.

simple measures.

total words.

The model for the total number of words that included child age, gender and intervention status in the first step explained 7.7% (R^2 = 0.08, p = 0.100) variance in outcome (F (3, 77) = 2.16, p = 0.200). Table 6.9 presents the results. The inclusion of the three multiple risk factors in the second step explained an additional 17% variance (ΔR^2 = 0.17, p = 0.002) in outcome (F (6, 74) = 4.06, p = 0.001). Child age, two to three risks and four risk factors contributed significantly to the model with two to three risk factors recording the highest beta. The final model explained 24.8% variance in

outcome and indicates that parents of older children use more total words but two or more risk factors predict less total words.

Table 6.9

Regression model for the association between exposure to multiple risk and Total Words

	B	*SE B*	ß	*t*	*p*
Step 1					
Age	11.13	5.13	0.24	2.17	0.033
Gender	-88.17	70.17	-0.14	-1.26	0.213
Intervention	-39.40	72.65	-0.06	-0.54	0.589
Step 2					
Age	16.71	4.95	0.36	3.38	0.001
Gender	-50.51	65.50	-0.08	-0.77	0.443
Intervention	-14.08	67.84	-0.02	-0.21	0.836
1 Risk	-171.91	95.07	-0.24	-1.81	0.075
2-3 Risks	-318.29	89.72	-0.49	-3.55	0.001
4 Risks	-371.74	104.94	-0.46	-3.54	0.001

Child age, gender and intervention status entered in the first step. Three dummy variables representing 1 risk, 2-3 risks and 4 risks (with no risk as the control condition) entered in the second step.

total different words.

The model for parental total different words that included child age, gender and intervention status in the first step explained 13.8% variance (R^2 = 0.14, p = 0.009) in outcome producing a significant model (F (3, 77) = 4.12, p = 0.009). The inclusion of the three multiple risk factors in the second step explained an additional 13.3% variance (ΔR^2 = 0.13, p = 0.006) in outcome (F (6, 74) = 4.59, p = 0.001). Child age, two to three risks and four risk factors contributed significantly to the model with child age recording the highest beta. The final model explained 27.1% variance in outcome suggesting that parents of older children use more different words whilst two or more

risk factors are predictive of less total different words. Table 6.10 presents the regression model.

Table 6.10

Regression model for the association between exposure to multiple risk and Total Different Words

	B	*SE B*	ß	*t*	*p*
Step 1					
Age	2.78	0.82	0.36	3.37	0.001
Gender	-5.56	11.27	-0.05	-0.49	0.623
Intervention	-8.75	11.67	-0.08	-0.75	0.456
Step 2					
Age	3.56	0.81	0.46	4.39	0.000
Gender	0.30	10.71	0.00	0.03	0.978
Intervention	-4.45	11.10	-0.04	-0.40	0.689
1 Risk	-15.45	15.55	-0.13	-0.99	0.324
2-3 Risks	-42.51	14.68	-0.39	-2.90	0.005
4 Risks	-53.25	17.17	-0.40	-3.10	0.003

Child age, gender and intervention status entered in the first step. Three dummy variables representing 1 risk, 2-3 risks and 4 risks (with no risk as the control condition) entered in the second step.

Predictive Validity: Associations with Child Language

The final step in assessing the comparability of the two measures of parental language was to examine their predictive validity via associations with child language outcomes. For this analysis only the data for participants who completed the six-month post-intervention assessments (n = 67) were used. Both receptive (ICC = 0.481) and expressive (ICC = 0.473) language subscales had moderate positive stability over time. Of the five complex measures, the quantity and variety of parental language at baseline demonstrated significant but moderate positive relationships with both child expressive (p = 0.001) and receptive language (p = 0.009) skills six months later (see Table 6.3). Encouraging interactions were also shown to moderately positively correlate with

receptive (p = 0.030) and expressive language outcomes (p = 0.003) but no further relationships were statistically significant. Both the simple measures of total words and total different words were shown to relate moderately and positively to both child receptive (p = 0.001) and expressive language (p = 0.013; r = 0.353, p = 0.003 respectively) outcomes six months later.

Associations between parent language measured pre-intervention and child language outcomes measured at post-intervention assessments six months later were analysed using stepwise linear regression. Data was screened prior to analysis and all assumptions for regression analysis were met. The dependent variables were receptive and expressive language. Three sets of regression analyses were conducted using the five complex measures and the two simple measures of total words and total different words. Child age, gender and intervention status were controlled for in all models and entered in the first step. In model one, the total number of parental words was entered into the first step. In model two, the total number of parental different words was entered in the first step. In model three, the five factors were offered in the second step.

complex measures.

child receptive language.

The regression model containing the five complex measures of parental language as predictors of child receptive language is presented in Table 6.11. The model for child receptive language that included child age, gender and intervention status in the first step explained 4.5% variance (R^2 = 0.05, p = 0.403) in outcome and was not significant (F (3, 63) = 3.43, p = 0.403). The inclusion of the five complex measures in the second step explained an additional 13.7% variance (ΔR^2 = 0.14, p = 0.002) in outcome (F (4,

62) = 3.45, p = 0.002). Only the quantity and variety of parental language at the pre-intervention assessment indicated an independent significant contribution to the model. Results indicate that the amount of parental speech and the diversity of the language used strongly predict a child's understanding of language six months later. The final model explained 18.2% variance in child receptive language six months later.

Table 6.11

Regression model predicting child receptive language using the five complex measures of parental language

	B	SE	ß	*t*	*p*
Step 1					
Age	0.68	0.50	0.17	1.36	0.178
Gender	4.08	7.03	0.07	0.58	0.564
Intervention	-5.12	7.13	-0.09	-0.72	0.476
Step 2					
Age	0.14	0.50	0.04	0.28	0.780
Gender	5.74	6.58	0.10	0.87	0.386
Intervention	-4.71	6.66	-0.08	-0.71	0.482
Quantity & Variety	0.03	0.01	0.40	3.22	0.002
Excluded Variables					
Parent Led				-1.91	0.061
Child Led				0.08	0.937
Encouraging				0.24	0.815
Critical				-0.33	0.745

Child age, gender and intervention status entered in the first step. The five complex language categories were offered in the second step.

child expressive language.

The regression model containing the complex measures of parental language as predictors of child expressive language are presented in Table 6.12. For child expressive language the model that included child age, gender and intervention status in the first

step explained only 3.7% variance (R^2 = 0.04, p = 0.493) in expressive language outcome and was not significant (F (3, 63) = 0.81, p = 0.493). The inclusion on the five complex variables in the second step explained an additional 11.2% variance (ΔR^2 = 0.11, p = 0.006) in expressive language contributing to a significant model (F (4, 62) = 2.71, p = 0.038). Only encouraging parental language at the pre-intervention assessment was shown to be a significant independent predictor of expressive language six months later. The results suggest that encouraging parental language positively predicts the amount a child talks six months later. The final model explained in total 14.9% variance in outcome.

Table 6.12

Regression model predicting child expressive language using the five complex measures of parental language

	B	SE	ß	*t*	*p*
Step 1					
Age	0.50	0.58	0.11	0.85	0.396
Gender	9.47	8.20	0.14	1.15	0.253
Intervention	-4.08	832	-0.06	-0.49	0.626
Step 2					
Age	-0.27	0.62	-0.06	-0.44	0.662
Gender	8.31	7.78	0.13	1.07	0.290
Intervention	-3.11	7.89	-0.05	-0.39	0.695
Encouraging	5.75	2.01	0.37	2.85	0.006
Excluded Variables					
Quantity & Variety				1.44	0.154
Parent Led				-0.11	0.916
Child Led				-0.67	0.508
Critical				-0.04	0.970

Child age, gender and intervention status entered in the first step. The five complex language categories were offered in the second step.

simple measures.

child receptive language.

The model for receptive language that included child age, gender, intervention status and parental total words in the first step was significant (F (3, 63) = 3.29, p = 0.016) explaining 17.5% variance (R^2 = 0.18, p = 0.016) in receptive language outcomes. Total parental words at the pre-intervention assessment were the only predictor to make a significant contribution to the model (Table 6.13) suggesting that the amount of parental speech positively predicts a childs understanding of language six months later.

The model for receptive language that included child age, gender, intervention status and total parental different words in the first step was also significant (F = 3.43 (3, 63), p = 0.013) explaining 18.1% (R^2 = 0.18, p = 0.013) variance in receptive language skills. Parental total different words at the pre-intervention assessment were the only predictor to make a significant contribution to the model suggesting that the diversity of parental speech positively predicts a childs understanding of language six months later.

expressive language.

For child expressive language outcomes the model that included child age, gender, intervention status and pre-intervention parental total words in the first step was not significant (F (3, 63) = 2.16, p = 0.084) explaining only 12.2% variance (R^2 = 0.12, p = 0.084) in outcome. Pre-intervention parental total words were the only variable to make an independent contribution to the model suggesting that the amount of parental speech positively predicts how much a child talks six months later.

The model that included child age, gender, intervention status and parental total different words in the first step was significant (F (3, 63) = 2.76, p = 0.035) explaining

15.1% variance (R^2 = 0.15, p = 0.035) in outcome. Only pre-intervention parental total different words contributed significantly to the model suggesting that the diversity of parental speech positively predicts how much a child speaks six months later.

Table 6.13.

Regression models predicting both child receptive and expressive language using the two simple measures of parental language

	Receptive Language					Expressive Language				
	B	SE	ß	*t*	*p*	B	SE	ß	*t*	*p*
Model 1										
Age	0.18	0.50	0.05	0.37	0.716	0.03	0.59	0.01	0.05	0.961
Gender	6.06	6.62	0.11	0.92	0.363	11.33	7.93	0.17	1.43	0.158
Intervention	-4.57	6.68	-0.80	-0.68	0.496	-3.57	8.01	-0.05	-0.45	0.658
Total Words	0.03	0.01	0.38	3.13	0.003	0.03	0.01	0.31	2.45	0.017
Model 2										
Age	-0.08	0.53	-0.02	-0.16	0.873	-0.32	0.63	-0.07	-0.51	0.612
Gender	4.56	6.56	0.08	0.70	0.490	9.99	7.76	0.15	1.29	0.203
Intervention	-4.78	6.66	-0.08	-0.72	0.475	-3.72	7.87	-0.06	-0.473	0.638
Total Different Words	0.21	0.07	0.42	3.21	0.002	0.22	0.08	0.38	2.89	0.005

Child age, gender, intervention status and either total words or total different words entered in the first step.

Discussion

The aim of the study was to develop manageable categories of parental language that would be appropriate for assessing change following intervention. Principle component analysis reduced the data from 25 categories of parental language into five components. Assessment of these five categories indicated good reliability and moderate stability over time, poor construct validity when assessed for relations with SED and weak

relations to child language outcomes six months later. In comparison, two simple indices of parental language, total words and total different words demonstrated good reliability and stability over time, reasonable construct validity and good predictive validity. The five complex categories indicated reasonable correlations with these two simple measures. These results support previous evidence that indicates that simple measures of the total number of words and the total number of different words are more effective than complex measures of social communicative function in predicting child language outcomes (Hart & Risley, 1995). Despite this, the five complex measures may be more sensitive to change and could provide a useful method foe evaluating parenting interventions.

The development of manageable parental language categories was the main goal of the present study and a few interesting findings are worth discussion. Firstly, the findings are contrary to previous research that has indicated the stability of critical language across time and a negative association with child language development (Hart & Risley, 1992; 1995). Critical interactions, consisting of prohibitions and prohibitory imperatives, were the most distinct category in the data loading consistently together at pre- and post-intervention assessments. Despite this, this category demonstrated the least stability over the short-term, attained the lowest rates of inter-rater reliability and did not demonstrate any relation with child language outcomes. The methodological limitations of the study, such as the short speech sample length, and the situational context of free-play may have contributed to this finding.

Secondly, associations between SED and language categories were conducted to provide evidence for construct validity, however results for the passive parent category are contrary to initial assumptions. Given the individual categories that make up its

composition (child initiation, child floor hold and parent response) and that child age was the only significant predictor of the model, it was assumed that this category reflected a positive dyadic interaction. However the non-significant association with SED was inverted, that is as risk increased so did the frequency of passive interactions. This result indicates that the passive category maybe capturing situations where the parent is behaving apathetically, either as a consequence of feeling uncomfortable with being observed, or because the free-play requirement is not typical of their normal interactions with their child. The significant relation between SED and the parent-led category, for which parent-led interactions decreased as risk increased, supports this result.

Strengths

The parent language measures were coded from video-recorded free-play observations recorded in the home. An independent researcher, who received minimal training, conducted the inter-rater reliability checks and the high levels of reliability achieved reflect the ease with which these measures can be calculated from recordings of parents and children in typically busy home environments.

Limitations

The current study employed an adapted version of the Hart & Risley (1995) scheme in which only 15-minute speech samples collected during naturalistic free-play. The original study reported 60-minute averaged data obtained via naturalistic observations, conducted over a range of daily routines twice a month for two and a half years. Hart and Risley (1995) demonstrated that the total number of words and the total number of

different words parents used across the two and a half years were strongly associated with measures of socioeconomic disadvantage, child vocabulary use, vocabulary growth and IQ, using the Stanford-Binet Intelligence Scale (Thorndike, Hagen & Sattler, 1986), at three years. In addition, five composite variables; language diversity, feedback tone, guidance style, symbolic emphasis and responsiveness, were composed using 30 categories of interaction based upon their associations with child IQ outcomes at three years. Findings indicated that these five composite variables were no more strongly predictive of child vocabulary use and growth at three years as the simple measures of total words and total different words. For the current study composite variables were composed based upon relations within the dataset and not relations with child outcomes. These methodological differences may have influenced the resulting five complex categories. Larger speech samples taken from a variety of daily routines might have been more representative of everyday parent-child interaction, and composite variable assembly based upon relations with child language measures at the post-intervention assessment may have produced similar composite variables and results to those previously described by Hart and Risley (1995).

Future Directions

Further research is required to better understand the relationship between simple and complex measures of parental language in relation to their achievable levels of reliability and validity and their simplicity of measurement. The current study sample was small, and the age range of the children was quite large. A larger sample of children observed at specific developmental time points may more accurately assess the impact

of more complex measures of parental language on child language outcomes across time.

Conclusions

Despite evidencing less stability over time and poorer associations with child language outcomes the five complex categories of parental language developed herein could be useful tools for evaluating parenting interventions based on their achievable levels of reliability. The finding that the two simple indices of language, total words and total different words, were more reliable over time and achieved greater levels of validity does require further exploration particularly in relation use as a screening method for families requiring intervention.

CHAPTER 7

The Efficacy of the Incredible Years Parent-Toddler Parent Programme to Enhance Parental Language in Flying Starts Areas in Wales: A Randomised Controlled Trial

The primary objective of the third and final study was to explore the efficacy of using the IYPTP when delivered as part of a community based early intervention services to enhance parental language. Using the five language measures developed in Chapter Six, and based on the conclusions drawn from Chapter Four, it was hypothesised that in the short-term parents randomised to receive the IYPTP would demonstrate significant positive changes across a range of observed language measures than when compared to wait-list control parents.

Method

Participants

Chapter Five describes in detail the recruitment procedures and participant details for the main RCT. Pre-intervention data for a total of 81 parent-child dyads (54 intervention and 27 control) was available for analysis for the current study. The sample size was sufficient to detect an effect size of 0.75 SD at 80% power and a 0.05 level of significance. Figure 5.1 (page 118, Chapter Five) presents the flowchart of participants through the main RCT.

Outcome Measures

parental language.

Chapter Six describes the statistical procedures used to reduce the 25 language categories down to more manageable units for analysis. Using PCA five components emerged (Table 6.1, page 152). The five components were manually calculated using raw scores in SPSS to represent:

Quantity & Variety of Language: All, and different parental nouns, verbs, modifiers and functors, in addition to all statements, yes-no questions and auxiliary fronted yes-no questions. Stability over time was good (r = .660).

Encouraging Language: Parental utterances that praised, reflected or expanded upon the child's previous verbalisation. Stability over the six months was moderate (r = .457).

Critical Language: Parental utterances that criticised the child, or that told the child to not do something (negative commands). Six-month stability was poor (r = .140).

Passive Parent Language Interactions: All child-initiated utterances, incidents where the child held the conversational floor (utterances that followed on from their own previous utterance), in addition to the number of parental responses to a child's utterance. Stability was moderate (r = .537).

Parent-Led Language Interactions: All incidents where the parent held the conversational floor, parental commands (excluding negative commands) and wh-questions (*where, what, when, how,* and *why*). Stability across time was good (r = .695).

demographics.

The five risk factors indicative of socioeconomic disadvantage (parental employment, marital status, education level, family size, and household conditions) previously described in Chapter Five were used for group comparisons.

Procedure

Chapter Five provides a comprehensive description of the data collection procedures used for the main RCT and for the current thesis. Chapter Five also provides a detailed

description of transcription and coding procedures. Chapter Six describes the construction of the five language outcomes.

The Intervention

A full description of the IYPYP is presented in Chapter One.

Analysis Strategy

For the current study two separate analyses were undertaken. Firstly, an intention to treat (ITT) analysis was conducted whereby all participants were included in the analysis regardless of programme attendance. No change from pre-intervention assessment was assumed for participants who were lost prior to post-intervention assessment (10 intervention and 4 control). Sensitivity analysis was conducted to verify these results using the mean post-intervention scores for the whole sample. The results remained the same. Secondly, a per-protocol analysis was conducted using only those participants who completed both pre- and post-intervention assessments. For each analysis five models of simple linear regression were performed to examine post-intervention changes between treatment conditions on the five measures of parental language. Child age, gender, intervention status and the pre-intervention score for each separate measure of language were entered into the model. The dependent variables were the post-intervention scores for the five measures of parental language; quantity and variety of speech, encouraging, critical, passive and parent-led language interactions.

For both sets of analyses, square root transformations were used for encouraging and passive language factors, whilst log transformations were used for the critical language

factor as these variables were not normally distributed. Effect sizes were calculated by dividing the regression coefficient for treatment status by the pooled standard deviation at baseline. Cohen's guidelines (small d = 0.2, medium d = 0.5, large d = 0.8) were used to interpret effect sizes (Cohen, 1988).

Results

Prior to the post-intervention assessment 14 families (ten intervention and four control) withdrew from the trial leaving a total of n = 67 families who completed both pre- and post-intervention observational assessments (44 intervention and 23 control). With the exception of parent gender (p = 0.013), where both participating fathers were randomised to the intervention group but declined to participate post-intervention, there were no statistically significant differences (p > 0.05) between those lost to attrition and those retained. The pre-intervention demographics for treatment groups are displayed in Table 7.1.

Sessions Attended

Of the 44 participants assigned to the intervention group that completed both pre- and post-intervention assessments, 32 (72%) parents attended seven or more sessions (indicative of a high-dosage) and two parents did not attend any. From the sample of intervention parents who withdrew from the RCT following the pre-intervention assessment (n = 10) only three parents attended seven or more sessions of the IYPTP.

Table 7.1.

Pre-intervention characteristics by treatment group.

	Intervention	Control
N	54	27
Parent age, years: mean, (s.d.)	28.61 (7.05)	29.59 (6.08)
Parent gender, female: *n* (%)	52 (96)	27 (100)
Child age, months: mean, (s.d.)	21.33 (7.02)	22.04 (6.14)
Child gender, female: *n* (%)	23 (43)	9 (33)
Employed: *n* (%)	26 (48)	16 (59)
Small Family, <3 children: *n* (%)	48 (89)	21 (78)
Educated, ≥17yrs: *n* (%)	21 (39)	12 (44)
Good Housing: *n* (%)	23 (43)	14 (52)
Married: *n* (%)	33 (61)	20 (74)

Intention to Treat Analysis

The data was screened prior to analysis and inspection of histograms, P-P plots and scatter plots indicated that all assumptions for running regression were met. Table 7.2 presents a correlation matrix between variables. Results indicate that the predictors were suitably correlated with the dependent variables for multiple regression to be conducted reliably. Child age was positively correlated to encouraging and passive language post-intervention and negatively correlated with parent-led language. All pre-intervention scores were positively correlated with their corresponding post-intervention scores. These correlations were weak to moderate. The pre- and post-intervention scores for each of the five measures of parental language are displayed in Table 7.3. Linear regression was performed to assess the effects of intervention on the five language outcomes (Table 7.4).

Table 7.2

Correlation matrix between predictors and dependent variables for the evaluation of the IYPTP

	Child Age	Gender	Intervention	Quantity Pre-	Encouraging Pre-	Critical Pre-	Passive Pre-	Parent-Led Pre-	Quantity Post-	Encouraging Post-	Critical Post-	Passive Post-	Parent-Led Post
Child Age	1.000	-	-	-	-	-	-	-	-	-	-	-	-
Gender	.075	1.000	-	-	-	-	-	-	-	-	-	-	-
Intervention	-.050	.089	1.000	-	-	-	-	-	-	-	-	-	-
Quantity Pre-	.241*	-.108	-.080	1.000	-	-	-	-	-	-	-	-	-
Encouraging Pre-	.383***	-.018	-.060	.512***	1.000	-	-	-	-	-	-	-	-
Critical Pre-	.044	-.152	.037	.179	-.033	1.000	-	-	-	-	-	-	-
Passive Pre-	.623***	-.011	.015	-.040	.382***	-.196	1.000	-	-	-	-	-	-
Parent-Led Pre-	-.287***	-.161	-.083	.627***	.130	.255*	-.494***	1.000	-	-	-	-	-
Quantity Post-	.134	-.079	-.015	.660**	.233*	-.058	-.101	.468***	1.000	-	-	-	-
Encouraging Post-	.428**	.027	.144	.320**	.497***	-.055	.223*	.052	.463***	1.000	-	-	-
Critical Post-	.073	.048	-.074	.070	-.067	.255*	-.052	.107	.093	-.053	1.000	-	-
Passive Post-	.627***	.013	-.208	.036	.393***	-.081	.633***	-.306**	-.015	.436***	-.015	1.000	-
Parent-Led Post	-.299**	-.099	.011	.320**	-.180	.015	.416***	.699***	.634***	.038	.270*	-.395***	1.000

*** $p < .001$, ** $p < .01$, * $p < .05$

Table 7.3.

Pre- and post-intervention parental language scores for the intention to treat (ITT) sample.

	Intervention (N = 54)		Control (N = 27)	
	Pre-Median (Range)	Post-Median (Range)	Pre-Median (Range)	Post-Median (Range)
Quantity & Variety	922.50 (158-1930)	1034 (190-1817)	919 (442-1984)	951 (345-2281)
Encouraging	24 (5-141)	36 (0-123)	23 (7-92)	21 (3-84)
Passive	40 (2-207)	59.50 (2-329)	33 (4-221)	82 (14-299)
Parent-Led	153.5 (30-385)	140 (35-338)	164 (59-407)	154 (42-397)
Critical	11 (0-92)	7 (0-35)	10 (0-44)	9 (0-38)

Note: The raw scores are reported in median and ranges. The table indicates there were no significant differences between groups pre-intervention.

The model for quantity and variety of parental language (Table 7.4) that included child age, gender, intervention status and the parents' pre-intervention score in the first step explained 43.8% variance (R^2 = 0.44, p = 0.000) in outcome producing a significant model (F (4, 76) = 14.8, p = 0.000). The parents' pre-intervention quantity and variety score recorded the highest beta and was the only positive significant predictor of the quantity and variety of parental language post-intervention.

Table 7.4.

Regression model for the associations between intervention status and the Quantity and Variety of parental language post-intervention for the intention to treat sample.

	B	*SE B*	ß	*t*	*p*
Step 1					
Age	-1.46	5.22	-0.03	-0.28	0.780
Gender	-6.77	69.73	-0.01	-0.10	0.923
Baseline	0.68	0.09	0.67	7.47	0.000
Intervention	31.51	71.51	0.04	0.44	0.662

Child age, gender, parents pre-intervention (baseline) score and intervention status entered in the first step.

The model for encouraging language (Table 7.5) that included the child's age, gender, intervention status and the parents pre-intervention score explained 31.2% variance (R^2 = 0.31, p = 0.000) in outcome and was significant (F (4, 76) = 10.05, p = 0.000). The parents' pre-intervention score and the childs age were positive significant predictors of parental encouraging language post-intervention indicating that parents of older children and parents who used more encouraging language at the pre-intervention assessment were more likely to use greater level of encouraging language post-

intervention. Pre-intervention scores recorded the highest beta indicating that this had greatest effect.

Table 7.5.

Regression model for the associations between intervention status and Encouraging language post-intervention for the intention to treat sample.

	B	*SE B*	ß	*t*	*p*
Step 1					
Age	0.09	0.03	0.29	2.82	0.006
Gender	-0.02	0.42	0.00	-0.04	0.966
Baseline	0.43	0.11	0.40	3.96	0.000
Intervention	0.85	0.43	0.18	1.95	0.054

Child age, gender, parents pre-intervention (baseline) score and intervention status entered in the first step.

The model for critical language (Table 7.6) that included the child's age, gender, intervention status and the parents pre-intervention score explained only 8.4% variance in outcome (R^2 = 0.08, p = 0.152) and was not significant (F (4, 76) = 1.73, p = 0.152). The parent's pre-intervention score was the only variable to reach statistical significance indicating a positive association to critical language use six months later.

Table 7.6.

Regression model for the associations between intervention status and Critical language post-intervention for the intention to treat sample.

	B	*SE B*	ß	*t*	*p*
Step 1					
Age	0.00	0.01	0.05	0.45	0.657
Gender	0.08	0.10	0.09	0.84	0.406
Baseline	0.32	0.13	0.27	2.42	0.018
Intervention	-0.08	0.10	-0.09	-0.82	0.417

Child age, gender, parents pre-intervention (baseline) score and intervention status entered in the first step.

The model for passive (Table 7.7) interactions that included the child's age, gender, intervention status and the parents' pre-intervention score explained 52.7% variance (R^2 = 0.53, p = 0.000) in outcome and was significant (F (4, 76) = 21.21, p = 0.000). The child's age, the parents' pre-intervention score and intervention status all significantly contributed to the model with child age recording the highest beta. Child age and pre-intervention scores indicated a positive association to outcome whilst intervention status highlighted a reduction in passive parent interactions associated with attending the IYPTP.

Table 7.7.

Regression model for the associations between intervention status and Passive parent interactions post-intervention for the intention to treat sample.

	B	*SE B*	ß	*t*	*p*
Step 1					
Age	0.19	0.05	0.36	3.54	0.001
Gender	0.06	0.57	0.01	0.10	0.922
Baseline	0.47	0.12	0.41	4.07	0.000
Intervention	-1.45	0.59	-0.20	-2.47	0.016

Child age, gender, parents pre-intervention (baseline) score and intervention status entered in the first step.

The model for parent-led language (Table 7.8) that included the child's age, gender, intervention status and the parent's pre-intervention score explained 50.3% variance (R^2 = 0.50, p = 0.000) in outcome and was significant (F (4, 76) = 19.25, p = 0.000). The parents' pre-intervention score was the only significant predictor of outcome.

Table 7.8.

Regression model for the associations between intervention status and Parent-Led language post-intervention for the intention to treat sample.

	B	*SE B*	ß	*t*	*p*
Step 1					
Age	-1.24	1.03	-0.10	-1.21	0.229
Gender	2.06	13.58	0.01	0.15	0.880
Baseline	0.61	0.08	0.68	7.90	0.000
Intervention	10.43	13.98	0.06	0.75	0.460

Child age, gender, parents pre-intervention (baseline) score and intervention status entered in the first step.

Table 7.9.

Pre- and post-intervention parental language scores for the per protocol sample.

	Intervention (N = 44)		Control (N = 23)	
	Pre-Median (Range)	Post-Median (Range)	Pre-Median (Range)	Post-Median (Range)
Quantity & Variety	945 (158-1930)	1125 (190-1817)	919 (442-1984)	951 (345-2281)
Encouraging	25 (5-141)	40.50 (0-123)	24 (8-92)	23 (3-84)
Passive	40 (2-170)	62.50 (2-329)	33 (4-221)	83 (18-299)
Parent-Led	159 (30-385)	140 (35-338)	160 (59-407)	137 (42-397)
Critical	11 (0-92)	6 (0-35)	10 (0-44)	9 (0-38)

Note: The raw scores are reported in median and ranges. The table indicates there were no significant differences between groups pre-intervention.

Per Protocol Analysis

Raw scores for the per-protocol sample are presented in Table 7.9. Linear regression (Table 7.10) indicated that the model for quantity and variety of parent language explained 41.1% variance (R^2 = 0.41, p = 0.000) in outcome and the model was significant (F (4, 62) = 10.83, p = 0.000). The parents' pre-intervention score was the only significant predictor of quantity and variety six months later.

Table 7.10.

Regression model for the associations between intervention status and the Quantity and Variety of language post-intervention for the per protocol sample.

	B	*SE B*	ß	*t*	*p*
Step 1					
Age	0.58	6.37	0.01	0.09	0.927
Gender	19.67	84.39	0.02	0.23	0.816
Baseline	0.64	0.10	0.64	6.16	0.000
Intervention	47.51	85.37	0.06	0.56	0.580

Child age, gender, parents pre-intervention (baseline) score and intervention status entered in the first step.

The model for encouraging language (Table 7.11) explained 35.7% variance (R^2 = 0.36, p = 0.000) in outcome for the per-protocol sample and was also significant (F (4, 62) = 8.59, p = 0.000). The child's age, parents' pre-intervention score and intervention status all predicted positive increases in encouraging language. Child age recorded the highest beta suggesting that parents of older children who used more encouraging language at the pre-intervention assessment used more encouraging parental language six months later.

Table 7.11.

Regression model for the associations between intervention status and Encouraging language post-intervention for the per protocol sample.

	B	*SE B*	ß	*t*	*p*
Step 1					
Age	0.14	0.04	0.41	3.57	0.001
Gender	0.33	0.48	0.07	0.68	0.500
Baseline	0.28	0.12	0.26	2.24	0.029
Intervention	1.04	0.49	0.22	2.15	0.036

Child age, gender, parents pre-intervention (baseline) score and intervention status entered in the first step.

The model for critical language (Table 7.12) that included child age, gender, intervention status and the parent's pre-intervention score explained 6.8% (R^2 = 0.07, p = 0.347) variance in outcome for the per-protocol sample and the model was not significant (F (4, 62) = 1.14, p = 0.347). None of the predictors were associated with outcome.

Table 7.12.

Regression model for the associations between intervention status and Critical language post-intervention for the per protocol sample.

	B	*SE B*	ß	*t*	*p*
Step 1					
Age	0.00	0.01	0.04	0.29	0.770
Gender	0.10	0.12	0.11	0.85	0.398
Baseline	0.26	0.14	0.23	1.82	0.070
Intervention	-0.11	0.12	-0.11	-0.92	0.360

Child age, gender, parents pre-intervention (baseline) score and intervention status entered in the first step.

The model for passive language (Table 7.13) explained 53.4% (R^2 = 0.53, p = 0.000) variance in outcome and was significant (F (4, 62) = 17.75, p = 0.000). The child's age, parents' pre-intervention score and intervention status all contributed significantly to outcome. Child age and parents pre-intervention scores recorded the highest betas with positive associations with outcome. Attendance on the IYPTP indicated significant reductions in passive parent interactions six months later.

Table 7.13.

Regression models for the associations between intervention status and Passive parent interactions post-intervention for the per protocol sample.

	B	*SE B*	ß	*t*	*p*
Step 1					
Age	0.19	0.06	0.37	3.33	0.001
Gender	0.64	0.64	0.09	1.00	0.321
Baseline	0.44	0.13	0.38	3.48	0.001
Intervention	-1.71	0.65	-0.23	-2.63	0.011

Child age, gender, parents pre-intervention (baseline) score and intervention status entered in the first step.

The model for parent-led interactions (Table 7.14) explained 43.8% variance (R^2 = 0.44, p = 0.000) in outcome and was also significant (F (4, 62) = 12.07, p = 0.000). Only the parents' pre-intervention score predicted positive associations with outcomes six months later.

Table 7.14.

Regression model for the associations between intervention status and Parent-Led language post-intervention for the per protocol sample.

	B	*SE B*	ß	*t*	*p*
Step 1					
Age	-0.98	1.18	-0.08	-0.84	0.411
Gender	2.59	16.27	0.02	0.16	0.874
Baseline	0.57	0.09	0.64	6.48	0.000
Intervention	12.30	16.47	0.07	0.75	0.46

Child age, gender, parents pre-intervention (baseline) score and intervention status entered in the first step.

Discussion

We hypothesised that attendance on the IYPTP would result in positive increases in the quantity and variety of parental speech, encouraging, and parent-led language interactions. We also hypothesised that programme attendance would predict decreases in critical and passive parent language. The results from the current study indicate that when delivered within community based services, where the control sample also had access to additional support, including language and play sessions and free nursery provision, the IYPTP was significantly associated with fewer passive parent language interactions than that of the participants randomly assigned to the control group. A per protocol analysis also revealed the intervention benefited encouraging parental language. The effect sizes for these two significant findings were moderate. For all other measures the association with intervention effects were non-significant. These findings provide limited support for the efficacy of the IYPTP, a behavioural-based parenting programme, in enhancing some aspects of parental language.

Although the three categories that make up the passive language factor (child initiation, child floor hold and parent response) could be viewed as positive in nature, previous analysis of the data from this trial has indicated a negative relationship between passive language and SED (Chapter Five; Gridley, Hutchings & Baker-Henningham, 2014). This suggests that for this sample these mainly passive behaviours are maladaptive and that parents at risk of greater SED engage in more passive language. This result could be an artefact of the observation, a forced free-play scenario whereby parents were required to stay and interact with their child whilst being video taped, something that might not occur generally for the parent and child. The availability of the parent during the observation could have encouraged the children to

initiate more in attempting to engage the parent in play, however as many parental responses consisted of *'yeah'*, *'uh-huh'* and *'ok's'* higher scores for the control sample may reflect the fact that these parents did not know what to do in this context, and had not been taught more proactive strategies such as showing interest by describing what the child was doing.

The finding that randomisation to the intervention benefited encouraging language supports the tenets of the IYPTP to promote positive parenting behaviours (Webster-Stratton, 2008).

Strengths & Limitations

The main strength of the current research is that this is the first reported evaluation that has assessed the impact of the behaviourally based IYPTP programme on aspects of parental language.

The main limitation of the study is the failure, in the main trial, to record additional service access for both intervention and control families that were available as part of the FS services.

The current study is underpowered and requires a larger sample size. The effect sizes for both quantity and variety and parent-led language indicate no benefit from the intervention. However, the benefits to critical language were *ES* = 0.21 which may be meaningful at the population level.

Implications

The current study provides limited evidence that the IYPTP, when implemented as part of community based services, enhances some aspects of parental language. These

results contribute to the growing literature investigating the benefits of behaviourally based parenting programmes on a range of outcomes.

Key Messages:

1. Training parents in effective behaviour management strategies and modelling techniques has shown benefits for child behavioural outcomes and parental well-being. Yet there is limited evidence for improving other developmental domains such as language.
2. The Incredible Years Parent-Toddler Programme (IYPTP) is a behaviourally based parent programme that includes components that teach parents how to support their child's language development using positive praise and encouragement.
3. The IYPTP was delivered across Wales as part of community based early intervention services.
4. Of the five observed parental language measures the IYPTP demonstrated significant benefits for passive and encouraging language interactions. No benefits were found for the quantity and variety of parental speech, parent-led or critical language.

CHAPTER 8

General Discussion

Thesis Objectives

There were three objectives for the thesis: 1) create a reliable and valid tool that could be used for assessing parental language, 2) assess the impact of SED on parental language in FS areas in Wales, and 3) investigate the efficacy of using the IYPTP to enhance parental language.

Thesis Findings

study one: associations between SES and parenting behaviours.

The first study (Chapter Five) explored the strength of the relationship between SED and measures of parenting behaviours for the FS sample. Four demographic factors (parental education below GCSE level, parental unemployment, single parenthood, and overcrowding) provided the variables for predicting parent behaviour outcomes (IT-HOME, total words and total different words). After controlling for child age and gender housing quality (overcrowding and poor conditions) was the strongest predictor of poor parenting behaviours explaining 5-13% variance in parental total words and total different words, and 23% variance in IT-HOME scores. In addition, assessment of increasing risk indicated two or more factors as a threshold that predicted poorer parenting behaviours. In addition to child age, the presence of two or more risk factors explained 14-17% variance in parental language and 44% variance in IT-HOME scores. Subsequently, this study concluded that level of disadvantage has a substantial impact on parenting behaviours for a sample of parents living in designated FS areas in Wales. It was suggested that future research might pilot the use of the four demographic factors as an alternative method to target families most in need of intervention rather than targeting families by geographical location.

study two: developing a tool to measure parental language.

The second study (Chapter Six) distilled 25 categories of parental language using factor analysis to develop a coding scheme that could be used to assess the effects of intervention. Five categories from the data emerged (quantity and variety, encouraging, critical, passive and parent-led language interactions) and these were compared to two simple indices of parental language, total words and total different words, which are known to be highly associated with SED and child language outcomes. Results indicated that the five complex categories achieved high levels of intra-rater reliability but were not particularly stable over time. Only three of the five variables demonstrated construct validity via associations with SED after controlling for child age, gender and intervention. The threshold of two or more risks explained 18% variance in the quantity and variety of parental language, whilst only four risk factors contributed to 6-9% change in variance for parent-led and critical language outcomes. Furthermore, only quantity and variety was associated with child receptive language contributing to 14% variance in outcome whilst encouraging parental language explained 11% variance in child expressive language outcomes. In contrast, total words and total different words were strongly associated with multiple risk and were good predictors of both child receptive and expressive language six months later.

The findings for the complex categories contradict the conclusions drawn from Chapter Three that indicated a strong association between parental social communicative function and child language outcomes. It was concluded that based upon their high levels of attainable reliability and relations with verbal strategies taught on parenting programmes (Chapter Four) the five complex categories might provide a useful tool for evaluation purposes. However, based on their instability over time, lack

of construct and predictive validity it is suggested findings drawn from such categories should be taken with caution. A spin off finding from this chapter indicated that that simple measures of parental language were good, stable proxies of child language outcomes. Given the time and financial rewards associated with cheap and reliable measures in evaluation research it is suggested that of parental total words and total different words could be provide a useful tool to assess parents eligibility for intervention.

study three: the efficacy of the IYPTP to enhance parental language.

Previous evaluations of behavioural based parenting programmes have demonstrated benefits in both parent and child health and in child developmental outcomes, yet based on the evidence presented in Chapter Four there is inconsistent evidence regarding their benefit to parent and child language outcomes. As the IYPTP incorporates a component that teaches parents some specific techniques to enhance child language development the third study (Chapter Seven) investigated the efficacy of using the IYPTP to enhance parental language. Using the five categories developed in Chapter Six results indicated that for the intention to treat sample (all parents that provided complete pre-intervention data) the Childs age, parent's pre-intervention score and the intervention explained 52.7% variance in passive parental language six months later. For the per protocol analysis (parents who completed both pre- and post- intervention measures) both passive and encouraging language were shown to benefit from the intervention. Child age, pre-intervention scores and attendance on the IYPTP contributed 53.4% variance in passive parent interactions and 35.7% variance in encouraging language. It was concluded that whilst these results support the goals of the IYPTP to enhance positive

parenting behaviours and decrease negative behaviours, at the present time they provide only limited evidence that the IYPTP is beneficial to all aspects of parental language. In addition, based on the limitations associated with the measure developed in Chapter Four these results should be taken with caution.

Relevance of Research to Previous Literature

Chapter Four established that language and literacy programmes, such as the Dialogic Reading Intervention (Huebner, 2010) or Project PRIMER (Cronan et al., 1996), provide more benefit to parent and child language outcomes than programmes that only include a modest language component as part of a more comprehensive intervention. The findings from Chapter Seven support this conclusion indicating that whilst the IYPTP places a strong emphasis on modelling techniques for parents to help support child linguistic and emotional development, the quantity of the course content that is dedicated specifically to language development may not be sufficient to evidence substantial change. Despite this, other parenting outcomes such as well being and competence identified in the main RCT as improving following attendance of the IYPTP may be protective of other child risks (Griffith, 2012; Griffith et al., in prep).

The Hart and Risley (1995) study demonstrated the dramatic effect that that SED has on parental language and the consequences this has for child language outcomes. Consequently, the results from Chapter Five support this research using a sample of FS parents living in targeted areas in Wales. The findings also provide further evidence that chaotic housing and exposure to multiple risk has a substantial impact on parenting behaviours possibly by reducing the opportunities for the parent to engage with the child (Belsky & Pasco-Fearon, 202; Burchinal et al., 2008; Trentacosta et al., 2008).

Present Research: Policy Implications

The findings from the thesis have several implications for current FS policy and early intervention services more generally. Firstly, the data used for the current thesis was drawn from the first RCT of the IYPTP in Wales delivered as part of the FS funding requirements. Alongside the results from the main RCT (Griffiths, 2012; Griffiths et al., in prep) the current findings provide further limited support for the IYPTP as an intervention to enhance parenting behaviours for a sample derived from specified FS areas in Wales. Whilst the programme failed to evidence success for this particular population the IYPTP could prove more effective for parents considered more at risk of disadvantage. As a result, it is recommended that at the present time both local (FS) and national governments should strive to invest public money into those parenting programmes that have already established an evidence base through rigorous randomised controlled trials.

Secondly, the findings presented in Chapter Five have important connotations for the targeting of families to receive early intervention services. Previous assessment of the FS sample indicated that those parents that participated in the trial were not as disadvantaged as those families targeted in a previous community based early intervention study (Hutchings, Griffith, Bywater, Williams & Baker-Henningham, 2013). Consequently, it has been suggested that in addition to targeting families by geographical location other alternative methods should be explored. Chapter Five demonstrated the ease with which four indices of disadvantage could be easily obtained and the strength of their associations with negative parenting behaviours suggested that these four simple indices of disadvantage may offer a quick, easy and effective method

for targeting families for additional services. The collection of this data could be easily incorporated into the current FS scheme, utilising the role of the FS health visitor and the frequency with which they meet with families. It is recommended that a pilot assessment is undertaken using the four indices of risk to establish if such an approach to targeting is feasible on a larger scale.

Present Research: Strengths

The current data is drawn from the first RCT of the IYPTP and offers an insight to the effectiveness of the programme when delivered as part of a community based service. The strong emphasis of the IYPTP on modelling techniques for language and emotion development made this programme an ideal candidate to assess the benefits of the intervention on parental language use with their children. Results demonstrated benefits to passive and encouraging parental language in a sample that although were relatively disadvantaged were not necessarily those with children at the highest risk within their communities.

To date there has been limited research exploring the effects of behavioural parenting programmes on parental language outcomes. The use of objective observational data, in addition to standardised and validated measures of parenting behaviours, provided a unique opportunity to assess the evidence for an otherwise under studied topic.

Present Research: Limitations

The funding for and time-restrictions on the current thesis only enabled one PhD student to transcribe 15-minutes of each half-hour videotaped observation of parents and children in free-play, and for a research assistant to be employed to conduct inter-

rater reliability. Participants can take at least 10-minutes to become accustomed to being observed (Gardner, 2000). Based on this guidance only the final 15-minutes of both pre- and post-intervention videotapes were transcribed. As these speech samples were taken from forced naturalistic free-play sessions conducted six months apart the data may not be representative of typical parent-child interactions that occur across a variety of situations and settings.

The current findings are based on a relatively small sample of parent-child dyads in which the ages of the children varied between 12 and 36 months. The developmental differences in language between a child of 12 months and one of 18 months are astonishing and as a child becomes more language proficient parental language and interaction strategies are modified (Hart & Risley, 1995). The sample size in the study was too small to explore the effects of the intervention for sub-groups of children at different ages. Subsequently, future work should aim to assess this link in relation to the benefits of the IYPYP.

Finally, despite achieving acceptable levels of reliability the measure developed for the purpose of the thesis was not shown to achieve high levels of construct or predictive validity. Consequently, it is advised that the findings relating to the effects of the IYPTP are taken with caution.

Future Directions

Parenting programmes aim to change parent behaviour in order to impact on child behaviour. The research has highlighted the need for programme evaluators to consider outcomes for both parent and child language in addition to other standard behavioural and health measures.

For programmes that have demonstrated significant benefits to parental language future evaluations should seek to establish the optimal timing of intervention during the first three years. Landry et al., (2008; 2012) have suggested that changes in parental language may be more effectively influenced by a double-dose of intervention. These results suggest that parents may need to become familiarised with particular verbal strategies before acquiring and implementing them successfully. Infancy is the most obvious period for parents to be first provided with interventions. During this time children's verbal production is limited and provides an opportunity for parents to spend time learning different methods and situations for which certain techniques will be most effective. A follow-up dose of intervention in the toddler years may consolidate a parent's understanding and skill of using effective strategies at a time when the child begins to produce his or her first words and when there will be an increased demand on the parent to provide verbal scaffolding.

A key issue in evaluating parent education programmes using observational measures is the appropriate selection of parental language categories that are quick, reliable and also sensitive to change. Based on the current findings it is suggested that for evaluation purposes measures of social communicative function may be appropriate but should be interpreted in relation to their associated levels of the reliability and validity. Further assessment of the simple measures as a means of assessing parent's eligibility for intervention should also be explored.

Final Conclusions

The evidence for parent education programmes to improve parent and child outcomes has generated a substantial amount of political interest. The benefits of parent

education programmes on parental language have been demonstrated in the short and in the longer-term. The evidence for the IYPTP to enhance parental language is limited, providing only some support for the IYPTP when delivered to a population that was not entirely representative of the highly disadvantaged area from which they were recruited. Further research is required to establish the benefit of behaviour based parent programmes on language outcomes. Furthermore, an additional evaluation of the IYPTP using a sample that is more representative of families with high needs would serve to validate the current findings.

The thesis has been a huge undertaking and with hindsight I would have transcribed the full half-hour of each dyadic video to glean more data and a more representative assessment of parent-child interactions in naturalistic free-play situations. The opportunity to undertake the PhD has had many personal positives and I have learned a considerable amount from the process (Appendix P). In particular I recognise the need to support the children of parents that are living in challenging personal circumstances in order to give those children a Flying Start in life. The thesis also helped me to recognise the importance of evaluating the effects of parent education programmes on all aspects of child development in order to ensure that public money is well spent.

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APPENDICES

APPENDIX A

Incredible Years Parent-Toddler Project Protocol

Griffiths, N., Hutchings, J., & Williams, M. E.

The Evaluation of the Incredible Years Toddler Parent Programme: Project Protocol

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February 2011

ISBN 978-1-84220-126-8

Published by Incredible Years Wales, Bangor University

Introduction

This protocol explains the design of a randomised controlled trial to evaluate the Incredible Years toddler parent programme in Wales. It provides the rationale for the study and describes the plan, the evaluation measures and the rationale for their inclusion.

Aim

To evaluate a new twelve session intervention for parents of toddlers (from 12 to 36 months) that promotes positive parenting and child development and reduces the risk of children developing the behavioural and emotional problems that are the precursors of significant child mental health problems including Conduct Disorder (CD). The Intervention is the Webster-Stratton Incredible Years (IY) Toddler Parenting programme (Webster-Stratton, 2008).

Funding

The project is funded by:

a) a grant from the Welsh Assembly Government of £114k, to provide for a full time research officer and part-time administrative support for 18 months, for which Professor Hutchings is the Principal Investigator,

b) a Welsh Language Board funded PhD scholarship (awarded by the Centre for Developing Teaching through the Medium of Welsh) and

c) grant funding from Incredible Years Cymru, Charity for additional research assistant support to enable longer term data collection.

Funding Time Scale – October 2007 – September 2010

WAG funding of £114,000 was secured for the period Jan 2008 – June 2009. This covered the cost of administrative and research officer support for the period January 2008 – June 2009. Dr Karen Jones was appointed to the Research Officer post and Dilys Williams to the part-time administrative support

The PhD studentship was awarded to Nia Griffith, with funding from October 2007 to September 2010

Incredible Years Cymru provided additional funding in the final year for data collection and analysis for two part time Research Assistants, (Nicole Gridley and Kirstie Cooper) from July 2009 – September 2010

Objective:

To undertake a randomised controlled trial evaluation of the Incredible Years Toddler Parenting Programme in six or more Flying Start areas across Wales. Flying Start is an early-years programme introduced by the Welsh Assembly Government (WAG) to enhance the life outcomes of children, from birth to three years, living in disadvantaged areas across Wales. Areas designated by WAG were based on primary school catchment areas where schools have over 45% of children entitled to free school meals. Flying Start funding provides £2000 per annum for every child, from birth to three years of age. Flying Start service providers deliver four interventions, intensive health visiting from a dedicated Flying Start health visitor with a significantly reduced caseload, basic skills training for parents in language and play sessions, with each authority funded for a language and play co-ordinator, free nursery provision for all children aged two and over and parenting support.

Rationale for Study

A wealth of research evidence has demonstrated that the parent and child characteristics that predict future behavioural problems can be identified when children are as young as six months old (Bates, Bayles, Bennett, Ridge, & Brown, 1991). Furthermore developmentally maladaptive behaviour can be reliably identified by age two and such behaviour problems are far more persistent than previously thought (Rose, Rose, & Feldman 1989; Sroufe, Egeland, & Kreutzer, 1990; Weinfield, Sroufe, & Egeland, 2000). The circumstances and environment into which children are born have a powerful impact on their development (Rutter, Gille, & Hagell, 1998) and children living in deprived neighbourhoods, such as those identified as Flying Start areas, are at substantially increased risk of emotional and behavioural difficulties (Caspi, Taylor, Moffitt, & Plomin, 2000). Stressful environments affect parents and, for some, their capacity to care for their children is, in turn, compromised (Sampson, 1997).

The first three years of life are a period of remarkably rapid growth and development (National Research Council and Institute of Medicine, 2000; Greenough, Black, & Wallace, 1987). The importance of the child's early environment for supporting this development is well established (e.g., Collins, Maccoby, Steinberg, Hetherington, & Bornstein, 2000; Holden, 1997). For babies and very young children the developing relationship and bond with their parents and main carers is especially important. There are particular risks relating to family and parenthood in the first two years. These include maternal postnatal depression (Murray, Cooper, Wilson, & Romaniuk, 2003), impaired bonding/insecure attachment of children to their parents and impairments in maternal responsiveness towards the child (Campbell, Cohn, & Myers, 1995). Babies

born to depressed mothers are less active and socially responsive and are more irritable than babies born to mothers who are not depressed (Dawson, Frey, Panagiotides, Osterling, & Hessl, 1997). Murray et al. (2003) have shown that one of the casualties of postnatal depression is low levels of cognitive stimulation for the child, resulting in language and social delays which are themselves risk factors for criminality in adult life (Stattin & Klackenberg-Larsson, 1993).

The impact of parenting style on babies is profound (Raine, Brennan, & Mednick, 1994) and research into infant brain development has shown increases in the activity or reactivity of the brain stem caused by chronic, traumatic stress, or decrease in the capacity of the cortical areas to moderate that reactivity, may increase an individual's aggressiveness and impulsivity (Perry, 1997).

Early stimulation and social interaction are two of the most important components of a child's early environment. A home environment rich in social, emotional, and cognitive support is positively associated with a host of positive developmental outcomes including security of mother–child attachment (Jacobson & Frye, 1991) and social adjustment (Erickson, Sroufe, & Egeland, 1985). In addition, positive maternal involvement is associated with reduced problem behavior (Gardner, 1994; Shaw & Vondra, 1995) as well as lower levels of expressed anger and sadness in preschool (Morris, 2000). Conversely, poor quality of parenting and parent–child interaction are related to unfavorable attachment and poor social adjustment (Bromwhich, 1990; Collins et al., 2000; Holden, 1997). For example, low maternal sensitivity, warmth and emotional availability are related to children's insecure attachment (De Wolff & Van Ijzendoorn, 1997; Goldsmith & Alansky, 1987), poor subsequent adjustment/problem behavior (Campbell, 1997), and lower school readiness (Connell & Prinz, 2002).

Because of the beneficial effects of positive early experience and environment on child development, interventions for young children and their families can increase the chances of favorable developmental outcomes for high-risk children. However since the shift in political interest from cure to prevention is relatively new, there is little high-quality research in this area. The Nurse-Family Partnership programme, an intervention targeting high risk first time mothers throughout pregnancy and during the first year of life, has shown a range of benefits including reductions in child abuse and neglect compared with control group mothers, and reductions in teenage arrests and convictions compared with control group children (Olds, Hill, Mihalic, & O'Brien, 1998). The Department of Health in England are undertaking a demonstration trial of this programme in 10 sites, however this is a very resource intensive, targeted programme and may not be suitable as a universal programme in high risk areas.

The Incredible Years (IY) BASIC Parent Programme has a substantial evidence base for the prevention and reduction of CD for children aged 3 – 8 (Webster-Stratton, 1998; Scott, Spender, Doolan, Jacobs, & Aspland, 2001; Webster-Stratton, Reid, & Hammond, 2004; Hutchings, Bywater, Daley, Gardner, Whitaker, et al., 2007). This programme incorporates all of the identified specific and common factors known to demonstrate effective outcomes for those families whose children are at greatest risk of developing CD (Hutchings, Gardner, & Lane, 2004). The programme is delivered in a small-group format, in a collaborative manner. Key components are viewing video-clips to prompt discussion of important parenting principles, role-play/practice of strategies that will be effective in supporting the child and facilitating their learning of pro-social behaviour and home activities.

The strong evidence of effectiveness for this programme with high-risk 3- and 4-year-old children in North & Mid Wales Sure Start areas (Hutchings et al., 2007) prompted the Welsh Assembly Government (WAG) to fund group leader training across Wales (Parent Action Plan, DfTE, 2005) and to specify the IY Parent Programme as appropriate for parents in Flying Start areas.

The IY toddler parent programme

The IY Toddler Parenting programme was developed by Webster-Stratton (2008) and incorporates all of the key components demonstrated to have been effective in the IY programmes for parents of older children

The programme covers eight topics delivered over 12-weeks in two to two-and-a-half hour sessions that introduce parents to a set of key parenting skills. These include i) how to establish a positive relationship with your child through play and child centred activities, ii) ways to promote language skills and emotional regulation using academic, social and emotional coaching, iii) using praise and incentives for appropriate child behaviours, iv) how to handle separations and reunions, v) guidance in the use of effective limit setting and clear instruction giving, and vi) strategies for managing non-compliance. Parents acquire these skills through facilitator lead group discussion, brainstorming, discussion of video clips, role-play practice within the group setting, and homework assignments.

The groups are run by trained group leaders, who adhere to the programme delivery as specified in the programme manual.

The current research project is the first randomised controlled trial (RCT) evaluation of the Toddler programme as this is a new programme and to date the programme has no

published evidence. The current trial will establish an evidence base for the programme with parents of one and two year olds living in socio-economically deprived areas across Wales.

Overview of Evaluation Method

Participants

The aim is to recruit between ninety and one hundred and eight parent-child dyads for the research project. To be eligible to participate, families must meet following criteria:

Inclusion Criteria

Child aged 12 – 36 months at recruitment
Parent and child must live within a designated Flying Start area in Wales

Exclusion Criteria:

Families not to have been on an IY parenting programme in the past (e.g. for a sibling)

Study Design

The study will employ random allocation of families (stratified for the child's age and sex) to either intervention or to waiting list control groups. In each centre (of which there will be 6-9 centres) families will be allocated to Intervention and Control on a 2:1 ratio. Random allocation will occur after baseline measures have been taken, and will be undertaken by the North Wales Organisation for Randomised Trials (NWORTH).

Family assessment will occur at baseline and six months after baseline (during which period the intervention takes place). Control participants will be given the opportunity to take part in the parent-training programme after their six-month follow-up

assessment. The intervention group will also complete the battery of measures again 12-months after baseline.

Timetable

Between 90 and 108 eligible families will be recruited at two phases. Recruitment in North Wales will take place in August 2008 and the intervention will be delivered between September and December 2008. Recruitment in South Wales will take place in November and December 2008 and the intervention will be delivered between January and March 2009. Follow-up of all participants will be at six and 12 months post baseline.

Analysis strategy

Repeated measures analysis of covariance, change scores, and clinically significant change indices will be used to investigate the efficacy of intervention. Potential moderators (i.e. risk factors) of successful outcome will be examined using multiple linear regressions.

Assessment Battery

An assessment battery has been compiled as the result of a detailed literature search. This battery of measures was selected to match the objectives of the IY Toddler parenting programme, which is to promote child development, and collect information regarding the potential risk factors to child development.

In order to explore both outcomes and potential mediators and moderators of treatment outcome, the following outcome domains are examined: Parenting competencies;

parental mental health; child symptoms; child developmental status; and the quality of parent-child interaction. Demographic information will also be collected. Participant characteristics will be assessed using a combination of assessment techniques, including direct assessment of child developmental level, direct observation of the interaction between parent and child, and parent report on their child's behaviour, their own parenting style and their level of mental wellbeing or depression.

Demographics

Personal Data and Health Questionnaire **(PDHQ; Hutchings, 1996)**

The PDHQ is a semi-structured interview based on the work of Herbert (Herbert, 1993), and is used to obtain basic socio-demographic and general health data on family members. The interview is conducted with the primary carer, typically the mother, and covers aspects of the child's health and development, including birth complications, mother's health during pregnancy and birth. The PDHQ also includes questions about other members of the household, assesses the quality of parent relationships (if applicable), quality of housing, income, and level of primary carer's education.

Rationale for use

The literature suggests that the risk of a child developing conduct problems is increased by the prevalence of a variety of family factors, including disturbances in family and marital functioning (Johnston & Mash, 2001). The inclusion of this measure serves several important functions. It provides data for assessment of whether intervention and control groups are matched on key socio-economic variables that can also be used in subsequent moderator analysis. It provides a quantitative score of the key

disadvantaging circumstances associated with the development of child behavioural problems. It also provides an opportunity to establish rapport with the parent, and for the parent to mention any matters concerning their child prior to being asked to complete the subsequent battery of questionnaires. It has been used in a number of studies, including the RCT of the IY Basic parent programme with parents of three and four year old children (Hutchings et al., 2007) and the IY foster carer study (Bywater et al., 2010).

Administration

The PDHQ is a semi-structured interview administered by the researcher with the mother/primary carer. It takes approximately 15 minutes to administer. The full assessment is only administered at baseline. At follow-up data collection points a shortened version, assessing any change in circumstances, is administered (follow-up demographics).

***Socio-economic Disadvantage* (SED6; Hutchings, 1996)**

Data for the SED6 is derived from answers provided on the PDHQ. The SED6 is designed to assess matters concerning family socio-economic status. Six socio-economic risk factors are measured: employment status, marital status, number of children, maternal education, housing, and area of residence (high/low crime); these were selected based on the findings of Dumas and Wahler (1983), and Rutter and Quinton (1977).

Rationale for use

Literature suggests that parent training is less effective with socio-economically disadvantaged families (Webster-Stratton, 1998). This measure is included to provide data for attrition analysis and equivalency of intervention and control groups.

Scoring

Based on the answers provided to the PDHQ, the six SED6 factors are coded as follows:

- Employment status of primary provider: employed = 0, dependent on benefits = 1
- Marital status: married / cohabiting = 0; single parent = 1
- Number of children: Small family size = 0, large family size = 1 (based on the findings of Brown & Harris (1978), three or more children represent large family size).
- Maternal education: education up to sixteen = 1, education beyond 16 = 0
- Housing circumstances: poor quality/overcrowded/insecure = 1 (this rating is made on the basis of responses given by the primary caregiver in the interview, and the researchers observations).
- Area of residence: high crime = 1, low crime = 0.

Child Developmental Assessment

The IY Toddler parenting programme places a strong emphasis on promoting the child's development, and equipping parents with principles that support their child's communication, language, and self-regulation. The two developmental measures will enable the examination of the effects of intervention on child development both from the parent's perspective, via the parent reported Ages and Stages Questionnaire and through use of the more objective Schedule of Growing Skills which includes both parental report and observer rated assessment.

***The Schedule of Growing Skills II* (SGS II; Bellman, Lingam & Aukett, 1996)**

The SGSII is a developmental screening procedure designed for use by health visitors, general practitioners, paediatricians and other professionals involved in care of young children from birth to five years old. Prior to the commencement of this trial it had been selected by WAG for use in the evaluation of outcome for the Flying Start project in Wales and was included at their request as the developmental outcome measure.

The measure is divided into five broad developmental fields, and then into various sub-fields:

Field 1: Posture and large movements

Sub fields: passive postural skills (for babies only)

Active postural skills

Locomotor skills

Field 2: Vision and fine movements

Sub fields: Manipulative skills

Visual skills

Field 3: Hearing and speech

Sub fields: hearing and language skills

Speech and language skills

Field 4: Social behaviour and play

Sub fields: Interactive social skills

Self care social skills

Field 5: Cognitive

Rationale for use

To examine whether the intervention impacts on child development.

Administration

Ideally, the test should be administered on a table, with the child sitting opposite. However, this is not always possible in crowded or chaotic homes. It may be necessary to sit on the floor / or use a coffee table. The researcher must, however, be on roughly the same eye-level as the child. There is no specific order to follow when administering the items, it depends on personal preference and convenience. Start each subscale at the same level as the child's chronological age, and then work forwards or backwards on the subscale, depending on the child's responses. For example, if you are assessing a two-year-old child, who is clearly mobile, then there is no need to assess passive and active postural skills. Similarly, there will generally be no need to assess basic visual function and basic hearing function, as the children in the study are over one year of age (unless, of course, it is apparent that there is a problem in one of these areas). All cognitive items must be tested (the item numbers are circled). When finished testing with the child, ask parent the self-report questions.

Scoring

The highest-ranking item that the child performed on each sub-field is taken as their score. Scores are then summed to provide a score for each of the subscales. These scores are then transferred to the SGSII Profile form, by circling and shading the corresponding box denoting the child's score. A horizontal line is then drawn through the age (in months) that most closely represents the child's chronological age, always using the lower age if necessary.

Interpretation

The shaded boxes on the profile form give you some idea as to how the child is developing compared with what is considered normal for that age. Any shaded boxes that appear 2 or more boxes below the child's chronological 'line' could be indicative of developmental delay in that skills area.

Reliability and validity

From a sample of 348 children aged between birth and five years, Cronbach's alpha coefficients were calculated for each of the ten subscales. These ranged from .61 to .97 depending on the subscale being measured. The SGSII has also shown good concurrent validity when compared with the Denver Developmental Screening Test II (DDST; Frankenberg, Fabdal, Sciarillo & Burgess, 1981). The SGS II has several limitations that need to be addressed. Firstly, the developmental windows on the record form vary in width, from two-month during the first year of life, to 12-month by age three years. This could mean that it is not sensitive to developmental change. Secondly, as described above, the highest-ranking item on each subscale is taken as their score, resulting in a potentially unrealistic representation of the developmental trajectory of a child. Lastly, the concurrent validity data could be considered as flawed since the DDST has been found to have low detection rates (Sonnander, 2000, Glascoe, 2005) and a sample of only 15 children were used to determine the concurrent validity. As the use of this measure was specified by WAG work is being undertaken within the IY team to improve the sensitivity of the SOGS.

Ages and Stages Questionnaires **(ASQ; Bricker & Squires, 1999*)***

The ASQ is a parent-report based tool for screening child development during the first five years of life. The master set of questionnaires comprises 19 questionnaires, ranging from 4-60 months. The questionnaires are divided into 5 developmental subscales: Communication; Gross Motor; Fine Motor; Problem Solving; and Personal-Social.

Rationale for use

The IY Toddler parenting programme places a strong emphasis on promoting the child's development, and equipping parents with principles that support their child's communication, language, and self-regulation. The ASQ provides a snapshot of the parent's understanding of the child's developmental progress.

Administration

First, select the questionnaire the matches the child's chronological age, and give to the parent or primary care-giver to complete. The parent answers questions such as "*does your child pick up a cheerio with the tips of his thumb and finger*", and responses are made on a three-point scale (Yes / Sometimes / Not Yet). The questionnaire takes between 10-20 minutes to complete.

Scoring

'Yes' responses are scored as 10; 'Sometimes' as 5; and 'Not Yet' as 0. Then simply add the scores for each of the 5 subscales.

Interpretation

The scores can then be transferred onto a simple score-grid, which include cut off points indicating possible developmental delay.

Reliability and validity

The validity of the ASQ has been studied extensively. Psychometric studies based on normative samples of more than 8,000 questionnaires demonstrate high reliability (>90%), internal consistency, and specificity.

Parenting Competencies

Parental Sense of Competence **(PSoC; Johnston & Mash 1989)**

The PSoC contains 17 items developed to assess parenting self-esteem. The measure has two subscales, related to parent satisfaction (e.g., *A difficult problem in being a parent is not knowing whether you're doing a good job or a bad one),* and parent self-efficacy (e.g., *Being a parent is manageable, and any problems are easily solved).* Items are rated on a 6-point scale ranging from *strongly agree* (5) to *strongly disagree* (1).

Rationale for use

Both parenting self-efficacy and parenting satisfaction functions as a moderator of parent-child relationships and that caregivers with low levels of perceived control over their children's behaviour cope ineffectively with difficult child behaviour.

Administration

The scale is self-administered and takes approximately 10 minutes to complete.

Scoring

Scoring for Items 2, 3, 5, 7, 8, 9, 12, 14 and 15 is reversed in order that higher scores from all items indicate greater self-esteem. Once reversed, the items are then summed into one of two subscales, with item no 17 being the only item that does not fit into a sub-scale.

Items summed for Efficacy Subscale: 1, 4, 6, 10, 11, 13 and 16

Items summed for Satisfaction Subscale: 2, 3, 5, 7, 8, 9, 12, 14 and 15.

Possible Score for Total parent competence: 17-85

Possible Score for Efficacy Subscale: 7-35

Possible Score for Satisfaction Subscale: 9-45

Interpretation

The scores are summed (after reverse scoring the above items), to obtain a total score. A higher score indicates greater parenting competence.

Reliability and Validity

In a normative study of 297 mothers and 215 fathers of 4- to 9-year-old boys (Johnston & Mash, 1989), Cronbach's alpha coefficients were calculated for the total score and for each factor. For the entire sample, the total score (16 items) revealed an alpha of .79; the satisfaction factor (9 items) yielded an alpha of .75; and the Efficacy factor (7 items) revealed an alpha of .76. For the entire sample, the total PSoC score was significantly negatively correlated with to both the Internalising and Externalising subscales of the CBCL.

Parental Mental Health/Stress

***The Parenting Stress Index/short form* (PSI/SF; Abidin, 1990; 1995)**

This 36-item inventory measures the stress experienced by the respondent in relation to their role as a parent of a child up to the age of 12 years. Abidin (1990) argued that the total stress a parent experiences is a function of specific prominent child characteristics, parental characteristics, and situational variables associated with the role of being a parent. In reflection of this model, the PSI/SF contains three test subscales: Parental Distress (PD), Parent-Child Dysfunctional Interaction (P-CDI), and Difficult Child (DC). The PD subscale indicates the distress a parent is experiencing in his or her parental role as a function of personal factors related to parenting. The associated component stressors include: an impaired sense of parenting competence; stressors associated with the restrictions put on other life roles; conflict with the child's other parent; lack of social support; and, presence of depression. A sample item would be: *I feel trapped by my responsibilities as a parent.* The P-CDI subscale focuses on the parent's perception that his or her child does not meet their expectations. In addition, the parent-child interaction is not found to be reinforcing to the parent. A sample item would be: *my child is not able to do as much as I expected.* The DC subscale measures the presence of basic behavioural characteristics that could make children either easy or difficult to manage. These focus on temperamental characteristics but also include learned patterns of defiant, non-compliant, and demanding behaviour. A sample item would be: *my child seems to cry or fuss more often than most children.* Answers to each item are given by circling a response on a five-item scale, ranging from 5 (strongly agree) to 1 (strongly disagree).

A Defensive Responding subscale (seven items from the PD subscale) is also included. Scores of below 10 on this scale render the test invalid, as such a low score can imply that the parent is trying to portray him or herself in a favourable light, rather than responding truthfully to the scale items.

Rationale for use

Research has suggested that the benefits of parent training can be compromised by high levels of parental stress and distress (Dumas & Wahler, 1983; Webster-Stratton, 1990). The PSI has often featured as an outcome measure in parenting intervention studies (e.g. Hutchings et al., 2002; Webster-Stratton & Hammond, 1997) and as a predictor of intervention non-attendance. In the current evaluation, the PSI is used as an outcome measure contributing towards the assessment of parental competence. It will also contribute towards analyses of potential moderators of treatment outcome.

Administration

The inventory is self-administered and takes approximately 10 minutes to complete.

Scoring

The first 12 items on the scale relate to the PD subscale, items 13-24 to the P-CDI subscale, and items 25-36 to the DC subscale. The items score of between 1 (strongly disagree) and 5 (strongly agree) is summed for each subscale. A Total Stress score is calculated by summing the scores from the three subscales. The Defensive subscale is scored by summing items 1, 2, 3, 7, 8, 9, and 11.

Normative Information

Abidin (1995) reports normative data from a sample of 800 mothers, with target children of 10-84 months in age (mean age = 43 months). Mean scores obtained for the PSI/SF were 25 for PD, 19 for P-CDI, 25 for DC, and 69 for Total Stress.

Interpretation

The normal range of scores for the PSI/SF fall between the 15th and 85th percentile ranges. Interpretation of the PSI/SF is based on clinical judgement and research using the PSI, however as a guide Abidin (1995) suggest the following:

- Total Stress: Scores of 86+ fall above the 85th percentile. Parents who obtain a total stress score of 90 or above are purported to be experiencing clinically significant levels of stress.
- PD: Scores of 33+ fall above the 85th percentile. When the PD subscale is the highest of the three subscale scores, it is advised that the parent's personal adjustment be explored, as in some cases these problems may be independent of the parent-child relationship.
- P-CDI: Scores of 26+ fall above the 85th percentile. A high score suggests that the parent-child bond is either threatened or has never been effectively established.
- DC: Scores of 33+ fall above the 85th percentile. Abidin suggests that, regardless of the cause of the problem, parents who score high on this scale may require specialist assistance. In combination with a high DC score, the pattern of scores from the other subscales will indicate the focus of the direction of the intervention.

Reliability and Validity

From a sample of 800 participants, Abidin reports good test-retest reliability for each subscale, and internal reliability coefficients from .80. In an independent validation study assessing data from 103 Head Start parents, Roggman, Moe, Hart, and Forthum (1994) reported PSI/SF alpha reliabilities of .78 to .90.

At the time of constructing the 1995 PSI manual, the PSI/SF did not have a body of independent research evidence to support its validity. However, Abidin argues that

because it is a direct offshoot of the full-length PSI (and highly correlated at .94 for Total Stress), it is likely that it will also share the validity of the parent scale. The construct and predictive validity of the PSI have been examined through a multitude of studies. For example, in terms of convergent validity, Eyberg, Boggs, and Rodriquez (1992), report high correlation between the PSI domains of Parental Distress and Difficult Child, and ECBI Intensity and Problem scores, indicating that maternal stress covaries with child disruptive behaviour.

Beck Depression Inventory II **(BDI; Beck, Steer & Brown, 1996)**

This is a 21-item inventory measuring the severity of depression, and is suitable for use with adults and adolescents aged 13 years and over. Items on the measure have been complied based on descriptions of the experiences of depression sufferers and are consistent with the DSM-IV (1994) criteria for the diagnosis of depression.

Such attitudes and symptoms are reflected by the items, which are: sadness, pessimism, past failure, loss of pleasure, guilty feelings, punishment feelings, self-dislike, self-criticalness, suicidal thoughts or wishes, crying, agitation, loss of interest, indecisiveness, worthlessness, loss of energy, changes in sleeping pattern, irritability, changes in appetite, concentration difficulty, tiredness or fatigue, loss of interest in sex. Each item contains four possible responses, which range in severity from 0 (e.g. *I do not feel sad)* to 3 (e.g. *I am so sad or unhappy that I can't stand it)*. For each item, the respondent is required to select one statement that best describes the way that he or she has been feeling over the last two weeks including the day they are completing the measure.

Rationale for use

There are several reasons behind the inclusion of a measure of mental health like the BDI II in the current research. Attendance on parenting groups has been shown to reduce maternal depression (Hutchings et al. 2007). In addition, early maternal depression has been linked to delayed development in children (Murray & Cooper, 1997), difficulties with socio-emotional behaviour, (Maughan, Cicchetti, Toth & Rogosch, 2007) distorted perceptions of child behaviour problems and child conduct (Webster-Stratton & Hammond, 1988; Hutchings, Appleton, Smith, Lane & Nash, 2002), and tends to be higher in socially disadvantaged areas, like the Flying Start areas where the current research was conducted.

Thus, the monitoring of maternal depression in this investigation is of particular salience, given the potential impact on treatment outcome and completion of parent training.

The inclusion of a measure of depression will provide data for attrition analysis and equivalency of intervention and control groups. Moreover, monitoring depression levels over the course of the evaluation may provide data supporting the secondary benefits of parent training, that is, improvement in maternal mental health.

Administration

Respondents are required to provide answers based on the way they have been feeling over the past two weeks including the day they are completing the measure. The inventory is self-administered and takes approximately 10 minutes to complete.

Scoring

The scores from each of the 21 items are summed to generate a total score (minimum score = 0, maximum = 63). If more than one statement on an item has been circled, the highest scored statement is chosen.

Interpretation

The total score provides an index of overall severity of depression. By convention, total score levels of depression are interpreted in the following way:

Score 0-13 = Minimal
Score 14-19 = Mild depression
Score 20-28 = Moderate depression
Score 29-63 = Severe depression

Reliability and Validity

For the BDI-II the coefficient alphas (.92 for outpatients and .93 for the college students) were higher than those for the BDI- 1A (.8 6). The correlations for the corrected item-total were significant at .05 level (with a Bonferroni adjustment), for both the outpatient and the college student samples. Test-retest reliability was studied using the responses of 26 outpatients who were tested at first and second therapy sessions one week apart. There was a correlation of .93, which was significant at $p < .001$. The mean scores of the first and second total scores were comparable with a paired $t(25)=1.08$, which was not significant.

Warwick-Edinburgh Mental Well-being Scale **(WEMWBS; Tennant, Hiller, Fishwick, Platt, Joseph, Weich, Parkinson, Secker, & Stewart-Brown, 2007)**

The WEMWBS is a 14 item positively worded item scale with five response categories from ‘none of the time’ to ‘all of the time’. It has a time frame for assessment of the

previous two weeks, which is consistent with DSM-IV criteria. The instrument covers most aspects of mental health currently in the literature, including both hedonic (subjective experience of happiness and life satisfaction) and eudaimonic (psychological functioning and self realisation) perspectives: positive affect (feelings of optimism, cheerfulness, relaxation), satisfying interpersonal relationships and positive functioning (energy, clear thinking, self acceptance, personal development, mastery, and autonomy). It does not include items specifically on life satisfaction, but hedonic well-being is well represented. Items are summed to give an overall score that can be presented as a mean score or graphically

Rationale for use

The co-occurrence of maternal depression and child disruptive behaviour is well documented. Although pre-treatment levels of maternal depression have been found to be significantly related to poor outcomes in parent training intervention (Forehand, Furey, & McMahon, 1984), there is also evidence to suggest that levels of depression in mothers of children with conduct problems may decrease following parent training intervention (Webster-Stratton & Spitzer, 1996; Hutchings, Appleton, Smith, Lane, & Nash, 2002). Thus, the monitoring of maternal depression in this investigation is of particular salience, given the potential impact on treatment outcome and completion of parent training.

Administration

The scale is self-administered and takes approximately 10 minutes to complete. Individuals are required to tick the box that best describes their experience of each statement.

Scoring

The Likert scale represents a score for each item from 1 to 5 respectively, giving a minimum score of 14 and a maximum score of 70. All items are scored positively. The overall score for the WEMWBS is calculated by totalling the scores for each item, with equal weights.

Interpretation

A higher WEMWBS score therefore indicates a higher level of mental well-being.

Reliability and Validity

In a validation study (Tennant et al., 2007), WEMWBS demonstrated good content validity. A Cronbach's alpha score of 0.89 (student sample) and 0.91 (population sample) suggests some item redundancy in the scale. WEMWBS showed high correlations with other mental health and well-being scales and lower correlations with scales measuring overall health. Its distribution was near normal and the scale did not show ceiling effects in a population sample. Test-retest reliability at one week was high (0.83). Social desirability bias was lower or similar to that of other comparable scales.

Home Environment

Infant and Toddler Home Observation for Measurement of the Environment

(Caldwell & Bradeley, 2003)

This measure examines the child's behaviour and the interaction between the parent and child within the home environment. The instrument comprises 45 items, divided into six subscales: Responsivity; Acceptance; Organisation; Learning Materials; Involvement; and Variety.

Administration

After completing the DPICS observation, the items marked with an 'O' (observed) are marked with either a plus (+) or minus (-) depending on whether the behaviour was observed during the visit. Items marked with an 'I' (Interview), must be discussed with the parent (for example, "*child is taken to the grocery store at least once a week*"), and a plus or minus added to the items accordingly. Items marked with an 'E' (either interview or observation), are coded if the behaviour was observed. If the behaviour described on these items was not observed during the visit, then the parent is asked the question. The measure takes approximately 10 minutes to complete.

Scoring

The number of 'pluses' on each subscale are simply summed to give a total score for each domain. These scores are then entered on the front summary sheet. There are also some demographic questions to ask on the front sheet.

Interpretation

The front summary sheet provides information as to the maximum possible score as well as the median score, obtained from normative studies.

Reliability and Validity

There are numerous studies attesting to the validity and reliability of this widely used, and researched, tool.

Parent-child Interaction

***Dyadic Parent-child Interaction Coding System- Revised* (DPICS – R; Robinson & Eyberg, 1981)**

This is an observational measure designed to assist with the assessment of the quality of parent-child social interaction. Thirty-seven parent and child behaviour categories are employed, summarised in terms of: parent behaviours, child deviance, child responses to commands, and parent and child affect. Coding is continuous and results in the total frequency of each behaviour per specified interval. Each behavioural category is clearly defined and accompanied by a series of examples, specific guidelines to aid discrimination between categories, and decision rules designed to aid decision making when there is uncertainty between categories. Webster-Stratton (1985) modified the DPICS-R for use with the IY programmes, and this will be the version used in this evaluation.

Rationale for use

The DPICS represents an extensively researched observational measure of parent-child interaction that is well validated and incorporates measures of the behaviours that are

targeted by the intervention such as praise, descriptive comments, questions, and limit setting strategies. The DPICS-R has been previously used in many IY studies (Hutchings et al., 2007; Jones et al., 2007, 2008).

Coding/Procedure

The DPICS can be applied in a variety of settings. The current evaluation includes summary variables reported in the Hutchings et al. (7007) study to facilitate comparison across studies and ages. The evaluation uses two parent summary variables: (1) positive parenting (sum of praise, both labelled and unlabelled, positive affect, physically positive behaviour and problem-solving); and (2) critical parenting (sum of negative commands and critical statements). The two child summary variables were: (1) child deviant behaviours (sum of physical negative behaviour, destructive behaviour, non-compliance, smart talk and cry/whine/yell); and (2) child positive behaviour (sum of positive affect: verbal and nonverbal, and physical warmth).

The parent (typically the mother) is observed interacting with their child at home for 30 minutes. The following conditions were required of family during the coding interval: television to be switched off, no telephone calls out, incoming calls answered briefly, unexpected visitors asked to call back later, both the parent and child to remain in the same room for the duration of the observation. There are no specific instructions as to what the parent and child should do during the observation, but typically, parents get out some of the child's toys and play for half an hour.

Scoring

The frequency of each behaviour is recorded. A total score for each summary variable is then calculated by summing the frequencies of the component variables. Reliability checks of observational assessment will be carried out at random by a second coder for 20% of all observations. Reliability must equal or exceed 70% agreement across all categories These checks will occur at each assessment phase and will include both intervention and control conditions. Observers are blind as to the participants' experimental condition.

Reliability & Validity

The DPICS has shown good reliability as evidenced by a number of studies;
for example Robinson and Eyberg (1981) demonstrated mean reliability between raters of .91 for parent behaviours and .92 for child behaviours.

The discriminant validity of the DPICS has been established through a number of studies. For example, Eyberg and Matarazzo (1980) found significant differences in behaviour between pre and post-intervention observation of parents of speech and language disordered children. In addition, the DPICS differentiated a referred sample of parents with children with conduct problems from a matched comparison group of parents with developmentally normal children (Webster-Stratton & Lindsay, 1999).

Procedure

There are two recruitment phases, with the first being in North Wales in August 2008, and the second in South Wales in November and December 2008.

As near as possible to the target of fifty-four families will be recruited at each phase. Families will be recruited locally by health visitors, and they will obtain written consent. Families will be given an information sheet, and both the research and the parenting programme will be explained to them.

Families will then be contacted by the research team to arrange a home visit to collect baseline data. During this visit, the research and the parenting programme is explained again, and the interviews, questionnaires, and tests are administered, and the observational measures completed. After baseline is completed, the recruited families are randomly assigned to either treatment group or control group, on a 2:1 ratio. The treatment group will attend a parenting course within a month. When treatment groups have completed the intervention, all families are visited again to collect follow-up data. Once this process is completed, the control group receive their intervention. It is only the intervention group that will be visited again for a 12-month follow up.

Ethical Considerations

At the recruitment phase, a bilingual information sheet will be given to all participating families providing an overview of the research and the Incredible Years Parenting Programme. The health visitor will ask the parent for written consent. The health visitor will forward the details immediately to the research team. The research team will wait 5 days, and then contact the parent to arrange a convenient day to visit the parent. On this initial home visit, written consent will be obtained again using the identical written consent sheet.

The participant information sheet explains the purpose of the study, why the participating families were chosen, and what will happen should they decide to take

part. The participant will be reassured that all information provided by the family will remain strictly confidential, and be available to members of the research team only. The participant information sheet also explicitly states that participants, having given their consent, are free to withdraw from the study at any time without this affecting their quality of care, or access to other services or future parenting programmes.

In order to ensure that all information remains confidential, participants are assigned an identification number that is used on all measures instead of names. The database that relates participants to their identification number is stored on protected computer files, encrypted with a password that is known only by the chief investigator and supervisor. Note that the research team and the implementation team are entirely separate groups of individuals.

Dissemination

Over the last ten years, the IY Centre has been conducting research on the IY programmes and has published a vast number of. The IY Conference is held annually and consists of research updates from the current IY team, updates from across Wales and overseas (past talks include updates from Ireland, Norway, Finland and the United States). The IY Centre also publishes an Annual Newsletter containing research updates from the IY Centre and updates from services across Wales who are delivering the IY programmes.

The main outlets for dissemination will be published articles, conference presentations and posters, and contributions to both the IY Annual Conference and Newsletter.

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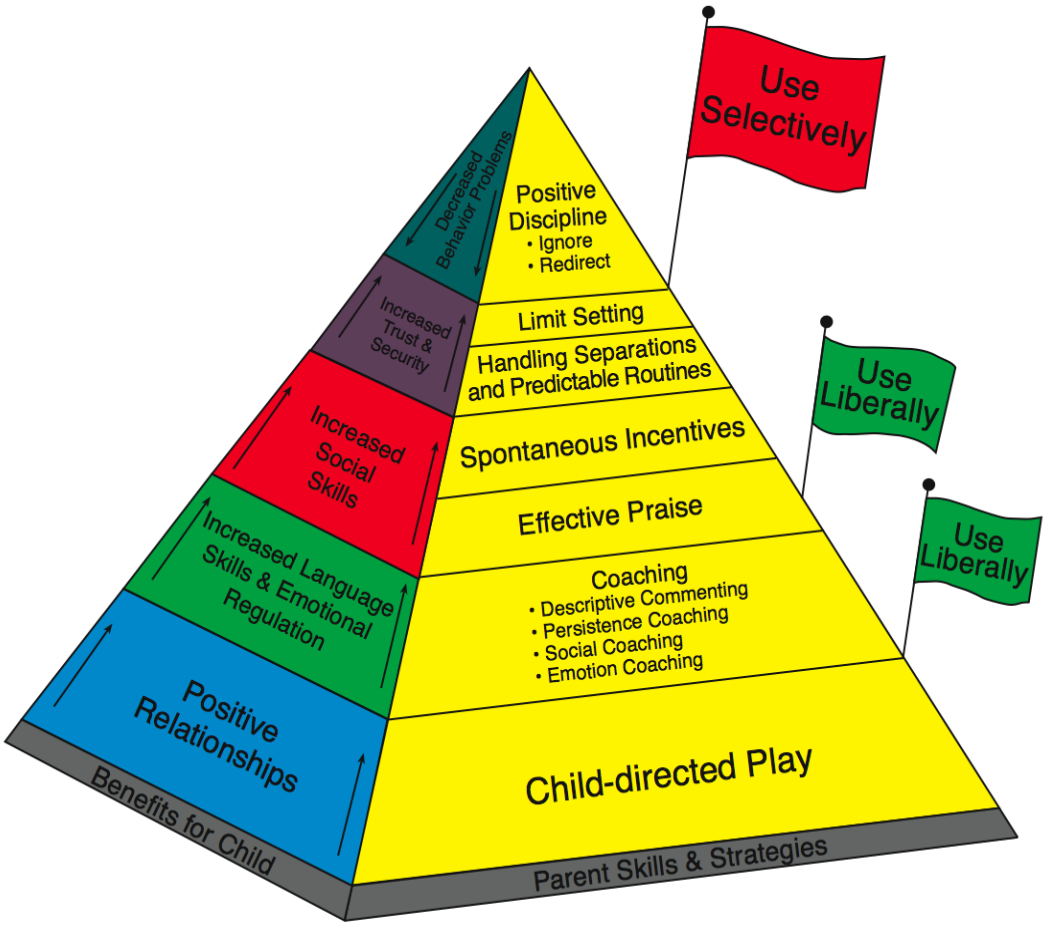
APPENDIX B

Incredible Years Parent-Toddler Programme Pyramid



Parenting Pyramid
Toddlers (1 - 3 years)

The Incredible Years ©Incredible Years

APPENDIX C

Summary Table of the Papers Reviewed in Chapter Two

Author(s), Location, & Date	Observation Length (minutes)	Transcription Method	Previous Scheme	Reliability	Language Classification[13]	Composite Variables[14]	Key Parental Measures	Type of Study	Associations with long-term Child Language	Measures of Child Language Used
Hart & Risley Kansas, USA 1992	60	Researcher	No	86-91% Assessed on 56% of randomly selected transcripts, and four transcripts per family	Lexical Diversity Discourse function Conversational Turn	Yes Amount of parent activity Performance as a social partner Contentive quality of parental utterances	Noun Verb Modifier Functor Declarative Imperative Interrogatives: Wh-questions Yes/no questions Auxiliary fronted yes/no Alternate question Affirmative Reflective Expansion Prohibition Prohibitory imperative Initiation Response Floorhold 2+ clauses Past, present and future tense	Longitudinal Observations conducted every two weeks for two and half years	Yes	MLU Initiations Response Floorhold

[13] Language Classification refers to the original scheme/theoretical stand point in which the language of the parent has been coded against. It was assessed via the description provided within each article.

[14] Composite Variables were defined as any variable that combines two or more categories together to create more meaningful chunks of data used for analysis purposes.

Author(s), Location, & Date	Observation Length (minutes)	Transcription Method	Previous Scheme	Reliability	Language Classification[13]	Composite Variables[14]	Key Parental Measures	Type of Study	Associations with long-term Child Language	Measures of Child Language Used
Hart & Risley Kansas, USA 1995	60	Researcher	No	77-100% Assessed on 56% of randomly selected transcripts, and four transcripts per family	Lexical Diversity Discourse function Conversational Turn	Yes Language diversity Guidance style Symbolic emphasis Feedback tone Responsiveness	Noun Verb Modifier Functor Declarative Imperative Interrogatives: Wh-questions Yes/no questions Auxiliary fronted yes/no Alternate question Affirmative Reflective Expansion Prohibition Prohibitory imperative Initiation Response Floorhold 2+ clauses Past, present and future tense	Longitudinal Observations conducted every two weeks for two and half years	Yes	MLU Total Vocabulary PPVT TOLD Initiations Response Floorhold
Girolametto et al., Toronto, Canada 2002	15	CHILDES SALT	Yes	84-100% Assessed on 20% of transcripts	Lexical Diversity & Discourse Function	No	TTR for 100 utterances Rate of words per minute MLUw Number of utterances Imitation Interpretation Expansions	Cross sectional	Yes	Sequenced Inventory of Communication Developmental Profile II MCDI Total productivity Number of word combinations Different words

Author(s), Location, & Date	Observation Length (minutes)	Transcription Method	Previous Scheme	Reliability	Language Classification[13]	Composite Variables[14]	Key Parental Measures	Type of Study	Associations with long-term Child Language	Measures of Child Language Used
Hoff & Naigles Florida, USA 2002	42.4	SALT	Yes	Joint attention ICC .98 Assessed on 6 of the 63 play transcripts Topic continuing replies 87% Assessed on 220 utterances from two transcripts	Lexical Diversity & Pragmatic	No	MLUm Word tokens Word types Number of utterances Joint attention Topic continuing replies Behavioural directives Conversation eliciting questions	Longitudinal Observed twice, ten weeks apart	Yes	Word types MLU
Cameron-Faulkner, Liven & Tomasello Manchester, UK 2003	120	CHILDES Previous transcripts	Yes	Kappa .96 Assessed on 20% of all transcripts	Discourse Function	No	Fragments Questions Imperatives Copulas Subject-predicate Complex	Longitudinal Observed every three weeks for 12 months	No	None
Hoff Florida, USA 2003	43	SALT	Yes	87% agreement Kappa .80 Assessed on 220 utterances	Lexical Diversity & Discourse Function	No	MLUm Word tokens Word types Joint attention Number of topic-continuing replies	Longitudinal Observed twice ten weeks apart	Yes	Word types
Rowland, Pine, Lieven & Theakston Liverpool, UK 2003	120	Pre-transcribed CHILDES	Yes	DNS	Discourse Function	No	Wh-questions	Longitudinal Observed every three weeks for 12 months	Yes	Wh-questions MLU
Yont, Snow, & Vernon-Feagans Cambridge, USA 2003	20	CHILDES	Yes	87% agreement Kappa .83 Assessed on 25% of all data	Pragmatics	No	Discuss a joint focus of attention Direct attention Negotiate an immediate activity	Cross-sectional	No	MLU Word tokens Word types
Blackwell Tennessee, USA 2005	30	CHILDES Previous transcripts	Yes	95% agreement Assessed on 10% of all utterances	Vocabulary & Lexical Diversity	No	Cumulative adjectives tokens Syntactic diversity	Longitudinal Observed twice a month for two years	Yes	Adjective utterances

Author(s), Location, & Date	Observation Length (minutes)	Transcription Method	Previous Scheme	Reliability	Language Classification[13]	Composite Variables[14]	Key Parental Measures	Type of Study	Associations with long-term Child Language	Measures of Child Language Used
Hoff & Tien Florida, USA 2005	40	SALT	Yes	DNS	Lexical Diversity	No	Word types MLU	Cross-sectional	Yes	Word types
Masur, Flynn & Eichorist Illinois, USA 2005	15	Researcher	Yes	Kappa .83-.85 Assessed on 16 random transcripts	Pragmatics	No	Descriptions Attentional directives Behavioural directives	Longitudinal Observed at 10, 13, 17 & 21 months	Yes	Words, sound and actions checklist Reported lexicon Observed lexicon Total vocabulary
Matychuk Berrien Springs, USA 2005	Varied	Researcher	Yes	DNS	Pragmatics	No	Instrumental Regulatory Interactional Personal Heuristic Imaginative Informative	Longitudinal Observed over 12 months	No	Instrumental Regulatory Interactional Personal Heuristic Imaginative Informative
O'Neill, Bard, Linnell & Fluck Plymouth, UK 2005	5	Researcher	Yes	97-98% agreement Assessed on random 10% of transcripts	Pragmatics	No	Gesture alone: Speech alone Gesture and speech:	Cross-sectional	No	Counting task
Pan, Rowe, Singer & Snow Harvard, USA 2005	10	CHAT	Yes	DNS	Lexical Diversity	No	Word types Word tokens Total gestures	Longitudinal Observed when child was 14, 24 & 36 months	Yes	Word types Word tokens

Author(s), Location, & Date	Observation Length (minutes)	Transcription Method	Previous Scheme	Reliability	Language Classification[13]	Composite Variables[14]	Key Parental Measures	Type of Study	Associations with long-term Child Language	Measures of Child Language Used
Vigil, Hodges & Klee Reno, USA 2005	20	Researcher	Yes	Kappa for initiations, responses and self-directed speech .83 Kappa for questions, gesture, label, descriptive, behavioural directive, interpretation, expansion and imitation .91 Assessed on 20% of all transcripts	Lexical Diversity, Discourse Function & Pragmatics	No	Responses to child initiation Self-directed speech Number of turns in the conversation Expansions Initiations Responses Self-directed speech Questions Gestures Labelling Descriptives Behavioural directives Interpretations Expansions Imitations MLUw Number of utterances Total words	Cross-sectional	No	Infant Mullen scales of Early Learning Total words MLU Language Development Survey

Author(s), Location, & Date	Observation Length (minutes)	Transcription Method	Previous Scheme	Reliability	Language Classification[13]	Composite Variables[14]	Key Parental Measures	Type of Study	Associations with long-term Child Language	Measures of Child Language Used
D'Ororico & Jacob Milan, Italy 2006	30	CHAT	Yes	Maternal utterances 93.2% agreement. Pitch kappa .99 Assessed on five mother transcripts	Lexical Diversity Discourse Function	No	Number of utterances per minute MLUw Number of different nouns per minute One word utterances formed by common nouns as a % of the total number of utterances TTR for common nouns Declarative Interrogative Imperative Exclamatory	Cross-sectional	No	Number of utterances per minute % of utterances with conventional word Number of different words
Pancsofar & Vernon-Feagons North Carolina, USA 2006	20	SALT	Yes	DNS	Lexical Diversity & Pragmatics	Yes Mother & Father vocabulary Mother & Father output Mother & Father complexity Mother & Father questions Mother & Father pragmatics	Total verbal utterances Total words Number of different word roots MLU Total questions Proportion of questions Wh-questions Total conversational turns	Longitudinal Observed when the child was 24 & 36 months	Yes	Sequenced Inventory of Communication
Flynn & Masur Illinois, USA 2007	15	Researcher	Yes	Kappa 84-.90 Assessed on 16 transcripts a randomly drawn	Pragmatics	Yes	Responsive Supportive directive Intrusive behavioural directives Intrusive attention directives Descriptions	Longitudinal Observed when child was 10, 13, 17 & 21 months	No	None

Author(s), Location, & Date	Observation Length (minutes)	Transcription Method	Previous Scheme	Reliability	Language Classification[13]	Composite Variables[14]	Key Parental Measures	Type of Study	Associations with long-term Child Language	Measures of Child Language Used
Goldin-Meadow, Goodrich, Sauer & Iverson Chicago, USA 2007	30	Researcher	Yes	98% agreement for words as translations 93% for identifying words in maternal speech Assessed on an unidentified subset of the data	Lexical Diversity & Maternal Responsiveness	No	Number of responses translating the child's utterances Number of words per sentence MLU	Longitudinal Observed monthly from 10 to 24 months	Yes	Communicative gestures Communicative vocalizations
Clark & Bernicot Stanford, USA 2008	10	Researcher	No	93% agreement Assessed on 14 of the 82 transcripts	Discourse Function	Yes	Repeats: Checking on intended meaning Correcting the form produced Any addition to the repeat No follow up at all Minimal acknowledgement A full acknowledgement	Cross-sectional	No	Checking on intended meaning Correcting the form produced Any addition to the repeat No follow up at all Minimal acknowledgement A full acknowledgement
Hurtado, Marchman & Fernald Stanford, USA 2008	20	CHILDES	Yes	DNS	Lexical Diversity	No	Number of utterances Word tokens Word types MLU	Longitudinal Observed at 18 & 24 months	Yes	MCDI Speech processing speed

Author(s), Location, & Date	Observation Length (minutes)	Transcription Method	Previous Scheme	Reliability	Language Classification[13]	Composite Variables[14]	Key Parental Measures	Type of Study	Associations with long-term Child Language	Measures of Child Language Used
Hwa-Froelich, Cook & Flick Missouri, USA 2008	30	CHAT	Yes	Kappa 79.1 for pragmatics 95% for Lexical Diversity Assessed on all transcripts	Pragmatics & Lexical Diversity	No	Directives and responses Speech elicitation and responses Commitments and responses Declaration and responses Statements and responses Performances Evaluations Comforting Directing attention Showing attentiveness MLU TTR	Cross-sectional	No	None
Campisi, et al., Montreal, Canada 2009	15	CHILDES	Yes	75-98% Assessed on 20% of transcripts	Lexical Diversity	No	MLU Word types Word tokens	Longitudinal Observed twice between 2 & 5 years	Yes	Bayleys Scale of Infant Development Language abilities Reading achievement
Chan, Brandane & Tardiff Michigan, USA 2009	10	CHAT/CLAN	Yes	Kappa .82 English .91 Mandarin Assessed on four transcripts for each language	Lexical Diversity	No	Common nouns Main verbs	Cross-sectional	No	None
Sung & Hsu Rhode Island, USA 2009	20	Researcher	Yes	Kappa .78 Assessed on 15% of sample	Pragmatics	No	Introducing Redirecting Following Simple Elaborative Prompting	Cross-sectional	Yes	MCDI

Author(s), Location, & Date	Observation Length (minutes)	Transcription Method	Previous Scheme	Reliability	Language Classification[13]	Composite Variables[14]	Key Parental Measures	Type of Study	Associations with long-term Child Language	Measures of Child Language Used
Taylor, Donovan, Miles & Leavitt Wisconsin, USA 2009	7	SALT	Yes	88-97% agreement Assessed on 25% of all transcripts	Lexical Diversity & Discourse Function	Yes Guidance Control Negative control	Asks if needs help Persuades/explains Suggests/asks Verbally assists Compromises Tells or tells not o Bribes Criticals Forces and restricts Behaves non empathetically Punishes Spanks/slaps Threatens MLU Word types Bound morphemes Word roots	Cross-sectional	Yes	MCDI MLU Word types Bound morpheme types Word roots Pragmatic functions of language
Huttenlocher,, Waterfall, Vasukyeva, Vevea & Hedges Chicago, USA 2010	90	Researcher	Yes	95% agreement Assessed on 20% of transcripts	Lexical Diversity	No	Word types Syntactic Diversity Constituent diversity Causal diversity Quantity of speech	Longitudinal Observed every four months from 14 months old	Yes	Lexical Diversity: Word types Syntactic Diversity Constituent diversity Causal diversity Quantity of speech

Author(s), Location, & Date	Observation Length (minutes)	Transcription Method	Previous Scheme	Reliability	Language Classification[13]	Composite Variables[14]	Key Parental Measures	Type of Study	Associations with long-term Child Language	Measures of Child Language Used
De Falcon, Venuti, Esposito & Bornstein Trento, Italy 2011	10	CHILDES CHAT	Yes	Kappa .80-.96 Assessed on 25% of transcripts	Lexical Diversity & Discourse Function	Yes Affect salient speech Information salient speech Other	Encouragement Discouragement Nonsense Greetings Mimics Repeats Singing and reciting Onomatopoeia Conventions Direct statements Questions Descriptions Childs action Child internal state Parent Environment Unintelligible speech Non-affect Non-information speech Mother speaking on behalf of toy MLU	Cross-sectional	No	None

Author(s), Location, & Date	Observation Length (minutes)	Transcription Method	Previous Scheme	Reliability	Language Classification[13]	Composite Variables[14]	Key Parental Measures	Type of Study	Associations with long-term Child Language	Measures of Child Language Used
Bernier, Carlson, Deschenes & Matte-Gagne Montreal, Canada 2012	10	Researcher	Yes	ICC .86 Assessed on 48.4% of randomly selected observations	Pragmatics	No	Mothers interpretation of the child's mental state Mothers interpretations of the child's mental process Mothers interpretation of the child's emotional engagement Mothers interpretation of the child's attempts to manipulate other peoples thoughts Mother spoke for the child	Longitudinal Observed when child was 12, 15, 18, 24 & 36 months	Yes	PPVT
Huang Taipei City, Taiwan 2012	60	CHAT	Yes	90-92%	Lexical Diversity	Yes Knowledge features Confusion features Search space features	Referential forms: Null forms Pronominal forms Nominal forms Informativeness: Knowledge features: Absence Newness Query Confusion Features: Contrast Differentiation in context Differentiation in discourse Search Space Functions: Inanimacy Third Person	Longitudinal Observed four times from 26 months to 37 months	No	Referential forms

Author(s), Location, & Date	Observation Length (minutes)	Transcription Method	Previous Scheme	Reliability	Language Classification[13]	Composite Variables[14]	Key Parental Measures	Type of Study	Associations with long-term Child Language	Measures of Child Language Used
Tamis-LeMonda, Song, Leavell, Kahana-Kalman & Yoshikawa New York, USA 2012a	12	Interact software	Yes	DNS	Pragmatics	Yes Referential language Regulatory language	Questions Commands Descriptions	Longitudinal Observed at 14 & 24 months	Yes	MCDI Mullen Scales of Infant Development
Venuti,, DeFalco, Esposito, Zaninelli & Bornstein Trento, Italy 2012	10	CHAT	Yes	Kappa .79-.96 Assessed on 25% of random transcripts	Pragmatics	Yes Affect salient speech Information salient speech Child name use Other	Encouragement Discouragement Nonsense Greetings Mimics Repeats Singing and reciting Onomatopoeia Conventions Direct statements Questions Descriptions Childs action Child internal state Parent Environment Unintelligible speech Non-affect Non-information speech Mother speaking on behalf of toy	Cross-sectional	Yes	Number of words Number of utterances MLU

APPENDIX D

Comprehensive Summary of the Papers Reviewed in Chapter Two

Author(s), Location, & Date	Aim	Sample	Method	Measures	Composite Variables	Findings
Hart & Risley Kansas, USA 1992	Longitudinal study to investigate which aspects of parenting are stable across families and time and how they may lead to individual differences in child development at 3 years old.	40 families *Parents:* Mothers mean age 31 years (21-41) education 13 years Fathers mean age 34 years (24-29) education 14 years *Children:* 9 months at baseline 3 years at conclusion of the study 15 children were black, 25 white. All first language English	Tape-recordings of naturalistic interaction in the home over 2.5 years for one hour Transcribed by researcher Reliability assessed twice	*Parents:* Nouns Verbs Modifier Functors Statements Questions Commands Reflections Expansions Extensions Positive feedback Negative feedback Clause Tense Initiations Response Floorhold MLU Demographics HOME *Children:* Stanford Binet IQ test at 3 years MLU Initiations Response Floorhold Peabody picture vocabulary test Test of language development Comprehensive test of basic skills	*Amount of parent activity:* Present (HOME) Joins (HOME) Words Different words *Performance as a social partner:* Responds Turns MLU distance *Contentive quality of parental utterances:* Repeats Questions Prohibitions	Parents differed considerably from each other on parent measures. On the HOME most parents joined in with child activities but some joined in less than half of all the child's activities. Many parents responded to less than half of the child's initiations and most parents used few, if any prohibitions. Parent's utterances averaged 2.5 more morphemes longer than the child's. Language exposure varied across parents ranging from 100 different words to 500 different words per hour. One third of all utterances the child heard were questions, but again this varied between 20-50%. There was a difference in the amount of talk directed at the child ranging from 200 to 4000 words per hour. Parent participation in the conversation also varied from less than 2 turns to 17 per hour. As the child began to talk and gain conversational skills there was a tendency for parents to be more responsive to the child's initiations and take more turns in the interaction. Questions and prohibitions remained stable over time. Family size and birth order significantly negatively correlated with present and joins. Family size also significantly negatively correlated to the number of parent turns, words and different words with younger children of larger families given less attention. There were no significant relationships between family size, birth order or child IQ or any other measure of parenting. There were also no significant correlations between child gender, SES, IQ and other parenting measures. Of all the parenting measures only 2 were not significantly correlated with SES; response to child initiations and the distance between parent MLU and child MLU. There was a significant relation between IQ and prohibitions. Principle component analysis used to group parenting measures into 3 factors; amount of parent activity, performance as a social partner and contentive quality of parental utterances. Stepwise regression for IQ and the 3 factors indicated that when they were all in the model IQ correlated highly significantly. Contentive quality related to SES with families in low SES groups using 20% of prohibitions in their speech. These were rarely heard in high SES families, however questions

					were frequent (45%), and repetitions and expansions (5%). All these measures correlated with child IQ. Results suggest prohibitions have unfavourable effects on child outcomes by displacing high quality parenting strategies such as questions.
Hart & Risley Kansas, USA 1995	A longitudinal study to investigate the relationships between family interaction and vocabulary growth rates	42 families Class based on income: 13 upper class 10 middle class 13 lower class 6 on welfare Mothers age ranged from 18-36 years Children: 17 African Americans 23 girls All children were aged 9 months at initial assessment and 3 years at the end of the study Observed over the course of 2.5 years	Observed in natural situations in the home for one hour Transcripts compiled by researchers Reliability assessed in the home and gained 86-91% on all parent categories Reliability assessed in the laboratory on 56% of randomly selected transcripts ranging from 77-100% Reliability assessed on 4 transcripts per family and ranged from 97-100%	*Parents:* Nouns Verbs Modifier Functors Statements Questions Commands Reflections Expansions Extensions Positive feedback Negative feedback Clause Tense Initiations Response Floorhold MLU Demographics HOME *Children:* Stanford Binet IQ test at 3years MLU Vocabulary Imitations Response Floorhold	Results showed considerable variability in parental speech. Professional parents used more words, different words, more multi-clausal sentences, past-tense verbs, declaratives and questions per hour than welfare and working class parents. In addition, they also used more affirmative feedback and responded more. Certain quality features of parental language were also richer; nouns, modifiers, past tense verbs, auxiliary questions, declaratives and affirmatives. Despite interacting more professional parents did not use more imperatives or initiations, but they did use less negative feedback per hour. Welfare parent utterances were fewer in quantity and less rich in nouns, modifiers, verbs, past-tense verbs and clauses. These parents were just as likely to respond to their child and ask questions but used fewer floor hold utterances. Generally they spoke less and half as often as working class parents. Welfare children received in one hour half the amount of language experience of working class children. Prohibitions showed the greatest difference between groups with professional parents using an average of 5 per hour compared to welfare parents who used an average of 11 per hour. Welfare parents initiated less than professional parents and used imperative less often. Overall these parents spoke less to their children which resulted in interactions richer in imperatives and initiations, however negative imperatives were more prominent. Affirmatives also differed between the groups of families. Professional parents gave affirmative feedback every other minute, resulting in 30 per hour. This was twice the amount of working class parent, who used five times more than welfare parents. Welfare parents used prohibitions twice as often as affirmatives in their interaction. Nouns were strongly related to the amount of utterances parents used and less related to the richness of nouns used. The amount of talk parents used contributed to the number of quality features children

heard per hour.
Welfare children received half the amount of language experience of working class as parents talk was less rich in quality features. Richness of quality features across families did not vary across sessions between those where the parent spoke least and where they spoke the most.
An average of 500 utterance per hour exposed the child to an average of 124 questions, 25 affirmatives and 341 different words. For an average of 250 utterances per hour the child heard 59 questions, 9 affirmatives and 208 different words. Therefore the child gained more experience of quality features when the parent spoke more.

Overall reductions of richness in utterances was demonstrated when parents spoke to young children. Here parents limited the number of topics they introduced, restricted the complexity of sentences and engaged in repetition of the same words over varying contexts.
When parents spoke more they used more auxiliary questions to prompt the child to participate, and they also held the floor more to keep the conversation going. This all contributed to increased richness of quality features of language.

Differences across SES groups were consistent across daily variations. Children of professional parents typically heard 2150 words per hour, working class children heard 1250 words, and welfare children heard 620 words. This suggest that in a week differences between working class and welfare children amounted to 60,000 words when aged between 1 and 2 years.

Children were shown to differ much like their parents but all were using language appropriately by 3 years. Vocabulary use, growth and IQ at 3 years all highly related with each other, and were all highly associated with SES. Vocabulary growth and use the most strongly related to SES.
Some quality features of parental language accounted for half the difference in child accomplishments at 3. Number of words was related to child rate of vocabulary growth, use and IQ at 3.
Nouns, verbs, modifiers, functors per hour, different

words, number of 2+ clausal sentences that were wh- or Y/N questions and the number of sentences that included past-tense verbs were all strongly related to all three child accomplishments at 3, but less so to vocabulary use.
Modifiers, functors, past-tense verbs, questions and affirmatives more strongly related to rates of vocabulary growth, use and IQ at 3 years than the amount of speech children heard.
Richness of nouns and declaratives were more strongly related to vocabulary growth than the amount of nouns and declaratives.
Parent initiations, imperatives and prohibitions made no difference to child accomplishments at 3 years but the richer the parental utterance were in these the less rapid the child vocabulary growth, the less varied the childs vocabulary and the lower their IQ at 3 years.
Vocabulary growth at 3 was strongly associated with SES, however, the richness of modifiers, auxiliary questions, greater numbers of affirmatives and the less imperatives were more strongly correlated with vocabulary growth than SES.
Vocabulary use was also strongly associated with SES. However, the number of different words heard in the two years prior was more related than SES. Total number of modifiers, past-tense verbs and affirmatives were more related to vocabulary use than SES.
IS was also related to SES but the richness of the nouns, modifiers, past-tense verbs, Y/N questions and less initiations, imperatives and prohibitions were strongly predictive of IQ over SES.

Five composite variables were more related to child accomplishments at 3 than SES. All were related to each other, SES and child accomplishments at 3 years. Multiple regression indicated that Language diversity and feedback tone were independent of each other and differentially related to child outcomes at 3. Language diversity was more related to child vocabulary use whilst feedback tone was more related to vocabulary growth and IQ. Symbolic emphasis, guidance style and responsiveness identified characteristics of language and interaction that refined and added to the amount and tone of child experience. Symbolic emphasis was related to vocabulary use. Guidance style was related to vocabulary growth and IQ and responsiveness was

			related to all three measures. SES accounted for 42% of variance in child vocabulary growth, 40% of vocabulary use and 29% of IQ variance at 3 years. SES and the five factors together accounted for 61% of variance in rates of vocabulary growth and use, and 59% of IQ scores. For 29 families the researchers followed up 7 years later rate of vocabulary growth at 3 years of age was strongly related to scores on the PPVT and TOLD at 9 and 10 years. Vocabulary use at 3 predicted language skills at 9 and 10 on the PPVT and TOLD, and reading skills. IQ at 3 predicted scores on the PPVT and TOLD at 9 and 10 years. There was no association between rate of vocabulary growth, reading, writing, spelling or arithmetic or verbal, or non-verbal reasoning. Nor were there an association with vocabulary use and IQ with these measures. Language diversity, feedback tone, symbolic emphasis and guidance style at 3 years predicted scores on the TOLD at 9 and 10 years. Feedback tone, symbolic gesture and guidance style were better predictors for the PPVT than child accomplishments at 3. Responsively was weakly associated with TOLD but not with PPVT. Family SES accounted for 30% variance in PPVT and 24% on the TOLD. The five factors of parenting style accounted for 61% variance on the PPVT and the TOLD. 86-98% of the words in the child's vocabularies consisted of those in their parents. Vocabulary size and IQ scores were strongly associated with parent-recorded vocabularies and scores on a vocabulary pre-test. By 34-36 months children were using number of different words similar to that of their parents.

Girolametto et al., Toronto, Canada 2002	To examine cross-cultural variation in linguistic responsiveness to young children in 10 English-speaking mother-child dyads and 10 Italian-speaking mother-child dyads	20 mother-son dyads *Parents:* 10 Italian mother and 10 Canadian mothers Samples closely matched for middle-class backgrounds and employment status *Children:* Aged between 23 and 34 months old at baseline 10 Canadian M age = 29 months 10 Italian M age = 30 All at single-word stage All identified as late talkers on the CDI, or Italian equivalent – below the 5th percentile Matched for age and vocabulary size	Videotaped naturalistic play in clinical setting using specific toys provided by researchers Duration of observation lasted 15 minutes. Full 15 minute transcripts were compiled using the CHILDES for Italian data and SALT for Canadian data. Both systems automatically generate the same grammatical indices* Additional categories coded by an independent Italian-Canadian research assistant† Inter-rater reliability 84-100%	*Parents:* Type –token ratio for 100 utterances* Rate of words per minute* Mean length of utterance (in words) on 100 utterances* Total number of utterances spoken* Responsive labelling† Imitation† Interpretation† Expansions† *Children:* Sequenced Inventory of Communication (Canadian) Informal Observation of response to commands (Italian) Stanford Binet IQ test (Italian) Developmental Profile II (Canadian) MCDI/PVB Productivity on CHILDES or SALT (intelligible utterances) Number of word combinations Different words	N/A	Results indicated that despite matching the same for vocabulary size and age Italian children used more utterances and more different words with their mothers than that of Canadian children. In addition, Italian children tended to be more active in using their word knowledge during interactions with their parents than children from Canadian backgrounds. Italian mothers used more utterances but this was not significantly different. For the structural measures of input the samples were shown to differ in their speaking rate and use of different words, with Italian mothers speaking quicker and using more different words than the Canadian mothers. Italian mother-child dyads tended to mirror each other. Despite this there were no further significant differences between the samples in the overall amount of speech that was measured in the total 15-minutes or their MLU. Results demonstrated differences between the two samples on the overall frequency of contingent interaction they used with their children. Canadian mothers were shown to use fewer expansions and more interpretations than Italian mothers. Further analysis demonstrated that Italians mothers used a significantly lower percentage of imitations and interpretations than Canadian mothers. Responsive labelling and expansions did not differ. For Italian mothers none of the structural input linked to the child's lexical size or productivity but imitation and expansions related to child output. Imitations were linked to children's different words and word combinations and total number of utterances. Expansions linked to total number of utterances and word combinations. For Canadian mothers structural type-token ratios linked to the number of different words used by the child. Contingency imitations linked to the number of child utterances. Interpretations were linked to the number of word combinations and expansions linked to the number of different words used by the child. In sum, results suggest that culture plays a role in a parents use of semantic contingency. Canadian mothers being shown to be more responsive.

Hoff & Naigles Florida, USA 2002	To investigate the individual contributions of properties of maternal input to children's vocabulary growth	63 mother-child dyads *Parents:* All English-speaking mothers 33 were high-SES families (college educated) 30 were mid-SES (high school-educated) *Children:* Aged between 18 and 29 months (*M* = 21.3 months, *SD* = 3.05) High-SES included 9 first born boys, 7 first born girls, 7 later-born boys, and 10 later-born girls Mid-SES included 8 first born boys, 8 first born girls, 8 later-born boys and 6 later-born girls All children comparable in terms of level of competency with productive language use. All just beginning to combine words.	Videotaped naturalistic routine activity, including mealtimes, getting dressed and toy play. Varied in duration of length Average duration at Time 1 = 42.4 minutes (*SD* = 8.4) SALT transcription methods* Tomasello & Farrar (1986); Tomasello & Todd (1983))† Hoff-Ginsberg (1987)Δ ICC = .98	*Parents:* Mean length of utterance* Total number of utterances* Number of word tokens* Number of word types* (different forms of the same word counted as one word) Joint attention)† Topic-continuing replies)Δ Behaviour directives Conversation eliciting Questions *Children:* 90 utterances were selected for analysis from SALT transcripts Word types MLU in morphemes	N/A	Number of word tokens/word types and mean length of mother utterance at Time 1 were found to correlate with children's lexical growth at Time 2 Of the 4 variables only MLU and number of word types were shown to be separate predictors Word types were shown to be a predictive variable on their own but MLU accounted for more variance in the model. When both were entered into the same model only MLU was shown to be significant. Regression analysis re-ran without controlling for variance in children's MLU at Time 2. Maternal MLU remained a significant predictor. Results suggest that the extent of lexical diversity and syntactic complexity in language input accounts for variation in children's productive vocabulary at around 24 months old

Cameron-Faulkner, Lieven & Tomasello Manchester, UK 2003	To document proportion distribution of the kinds of utterances children hear early in the third year of life. To identify the most frequently occurring initial words and phrases. To correlate item based frequency between parents and children to see if there was any discernable relationship.	12 mother-child dyads No information for mothers *Children:* 6 boys and 6 girls aged between 1:9 and 2:9 All first born monolinguals and middle-class Sample were taken from CHILDES database	Audio-recorded in the home during free-play on two occasions every 3 weeks for 12 months. Observations were 2 hours long Reliability assessed for two mothers on 20% of all transcripts with .96 Kappa In total 16,903 utterances were included in the analysis	*Parents:* Utterance level: Fragments Questions Imperatives Copulas Subject-predicate Complex Within these they were also coded for item-specific patterns i.e. frames, when the first word is used more than four times *Children:* None	*N/A*	At the utterance level questions represented 31%, imperative 9% and 24% contained subjects and full lexical verbs. It is suggested a higher proportion of questions maybe due to the presence of experimenter and the context of having to elicit conversation with child. The child heard on average 700 utterances per hour. One word utterances (7%) were content words, 50% of which were nouns. Multi-word fragments (14%) were made of multiple types. Noun phrase accounted for 43%, verb phrases 23%, propositional phrases 10% and other 24%. Questions made up a third of all CDS. Wh and Yes/No questions were in equal proportions (15 and 16%). Across all mothers the same 2-word beginning were used over and over to ask wh-questions. What and Where. 'What is' is the most common multi-word phrase accounting for 50% of all wh-questions. Yes/No questions were frequent and lexically specific. 'Are you' was the most common frame. Imperatives accounted for 9% of maternal utterances. These began mostly with lexical verbs rather than closed class items such as pronouns or auxiliary verbs. Copulas made up 15% of maternal utterances. 'It is', 'That is' and 'There is' were the most frequent and made up 2/3rds of all copulas. Subject predicate made up 18% of all maternal utterances, and complex made up just 6%. Correlations of mother-child use of object-naming in multi-word utterances showed a strong pattern, with three being statistically reliable; the, numerical and possessive nouns being matched across mother and child. Copulas also showed a strong pattern with three statistically reliable; there's, that's and its.

Hoff Florida, USA 2003	To assess if children in different SES groups differ in their rates of productive vocabulary because of their different learning experiences	63 mother-child dyads *Parents:* 33 high-SES (college educated) 30 mid-SES (no education beyond high school) *Children:* Age range between 16 to 31 months. High SES consisted of 16 first-borns (7 girls and 9 boys) and 17 later-burns (10 girls and 7 boys) Mean age = 20.8 months (SD = 3.1) Mean MLU was 1.26 Mid-SES consisted of 17 first-borns (9 girls and 8 boys) and 13 later-borns (5 girls and 8 boys) Mean age 21.6 months (SD = 3.0) Mean MLU was 1.28 All comparable in terms of language development All just beginning to combine words	Videotaped recordings of a series of naturalistic daily routines i.e. eating, getting dressed, and play in the home. The researcher provided toys for play session. Recordings took place twice with a 10-week interlude. Average duration for Time 1 recordings = 43 minutes, including 17 minutes for mealtime, 8 minutes of dressing, and 18 minutes of play. Transcription conducted by a trained research assistant using SALT software. Coding of 220 utterances yielded inter-rater reliabilities of 87% and a kappa of .80	*Parents:* Number of word tokens/types Mean length of utterance (morphemes) Number of different word roots Number of utterance in joint attention Number of topic-continuing replies *Children:* Used comparable 90 utterances from speech sample Number of word types	N/A	When controlling for birth order and child vocabulary at Time 1 (23%), SES accounted for an additional 5% of variance suggesting that the predictor (SES) was significantly associated with the outcome of children's vocabulary at Time 2 SES was also associated with the mediator properties of maternal language. Word tokens and types, MLU, number of utterances and number of topic continuing replies were significantly higher in the high-SES group than the mid-SES group. Three of the 5 related measures of maternal language were shown to be significantly associated with child vocabulary at Time 2: Number of word types, tokens and MLU. As the relations were highly inter-correlated with each other word tokens was dropped from further analysis. Analysis of the predictive power of word types and MLU on children's vocabulary at Time 2 demonstrated that only MLU was predictive, and accounted for 22% of the variance. In summary, MLU is a mediating property of maternal language that is related to outcome – that of a child's vocabulary. By removing any variance associated with mediation i.e. birth order and child vocabulary at Time 1 maternal speech accounts for 22% variance, and SES 1%. Once the mediator is controlled for the relation between SES and child vocabulary at Time 2 is no longer significant.

Rowland, Pine, Lieven & Theakston Liverpool, UK 2003	Longitudinal study to investigate how certain features of parent grammatical speech predict children's acquisition of wh-questions	12 mother-child dyads *Parents:* Predominantly middle class *Children:* Corpus drawn from CHILDES database (Manchester corpus; Theakston, Lieven, Pine & Rowland, 2000) All English-speaking monolinguals All firstborns 6 children from Nottingham 6 from Manchester Ages ranged from 20 to 25 months at baseline	Naturalistic free-play in the home Videotaped for 2x 1-hour sessions every three weeks for one year. Half of the session was with toys provided by the researcher, and the other half with their own toys. CHILDES transcription methods No stated reliability or validity	*Parents:* Wh-questions with verb or copula *Children:* Wh-questions with main verb or copula MLU	N/A	Initial analysis confirmed work of Bloom et al., that acquisition of certain wh-questions follows a particular pattern What & Where were the first acquired for all 12 children Second analysis demonstrated that children acquire verbs in wh-questions in a predicted order of complexity. 'To go' was the first acquired. Third analysis to ensure whether wh-complexity and verb semantic generality have an effect once input frequency is taken into account. Results demonstrated that semantic generality correlated significantly with order of acquisition for only 4 children. Wh-complexity correlated significantly with order of acquisition for 5 children. Significant correlations for order of acquisition and input frequency for 10 children. Regression analysis indicated that input frequency predicted over complexity of input. All had a significant impact on acquisition for 8/12 children but semantic generality only contributed to order of acquisition for 2/12. Wh-complexity for 3, and input frequency for had a significant effect on order of acquisition for 7 children. Results suggest that wh-complexity and verb semantic generality are not significant predictors of acquisition when considered separately. Analysis was re-ran using a combined composite variable of complexity. Analysis revealed that input frequency was still a more powerful predictor of acquisition order but only for 8 of the 12 children. For the 9 where regression was significant only complexity was significant for 4 children. There were significant correlations between order of acquisition for 10 of the 12 children. In regression analysis input frequency significantly predicted order of acquisition for 7 of the 9 children. Therefore, frequency of particular wh and verb combinations of input were better predictors of the order of acquisition of children's wh-questions than wh-complexity or wh-word or semantic generality of verb and were not grossly confounded by child frequency of use. In sum none of the measured variables of input were significant predictors of acquisition order for all 12 children.

Yont, Snow & Vernon-Feagans Massachusetts, USA 2003	To investigate mothers use of pragmatic features in two contexts.	25 mother-child dyads Mothers aged 33.1 years 12 males and 13 females all aged 12 months at assessment	Videotaped toy-play and book reading interaction in the home. Toys provided by the researcher Observation lasted for 20-minutes. Transcribed by the researcher using the CHILDES CLAN INCA-A used to code for communicative intents Reliability established on 25% of the data Percentage agreement = 87% Kappa .83	*Parents:* *Verbal interchange:* Discuss a joint focus of attention Direct attention Negotiate an immediate activity *Utterance level:* Make a statement Ask Y/N question Request/propose action *Children:* Same as parent plus: MLU in morphemes Word tokens Different word types	*N/A*	There were significant differences in maternal communicative intents based upon interactional context. Mothers would be more likely to use directive and negotiate child attention during free play than book reading. Mothers also negotiated the immediate environment, discussed a recent event and marked children's actions more during free play than book reading. During book reading there was a significant amount more of discussions of joint attention than toy play. Focused discussions tended to be more extended and involved less activity. There were also more discussions related to the present, of which most were onomatopoeic sounds. For children as young as 12 months old they showed a preference for certain types of pragmatic intents based upon context and engaged in different intents based on context. There were significant differences in children's communicative intents based upon interactional contexts. Children used more directive attentions during toy play than book reading. The majority of these occurrences were non-verbal. Children also used more discussion relating to the present. These mostly occurred when the child also made an onomatopoeic sound. It is suggested this occurred mostly as a communicative tool for conversation. During book reading children used more discussions of joint attention than toy play. These were mostly non-verbal, combined single words and consisted mostly of pointing gestures. Situational context also related to child early vocabulary and syntax. MLU was larger in toy play than book reading. More word tokens per minute in toy play. Different word types per minute were similar across contexts.

Blackwell Tennessee, USA 2005	To determine the relationship between these input factors and the order of acquisition of adjectives	2 mother-child dyads taken from CHILDES database No information for parents *Children:* Adam and Sarah Transcripts taken across the age range 2:3 to 4:11 Matched for MLU and age	Half-hour audio-recorded speech samples collected bi weekly across two years. Recorded in the home with the mother during a variety of discourse contexts Reliability percentage agreements 95% on 10% of utterances	*Parents:* Input of mothers speech: Cumulative adjective tokens Syntactic diversity Noun-type co-occurrence Human propensity Physical property Used 2501 of Adams mother utterances and 3817 of Sarahs mothers utterances *Children:* 4299 adjective utterances for Adam 2963 adjective utterances by Sarah	*N/A*	By 2:6 children had attained 8 adjectives. Between 2:6 and 3 children had acquired a further 16 common adjectives. There was a significant negative correlation between age of acquisition and each input characteristic of input frequency, syntactic diversity and noun-type diversity suggesting each play a role in acquisition Input adjective frequency and input syntactic diversity were significantly related to age of acquisition. It provided 33.5% variance for Adam and 37% variance for Sarah. Input frequency provided a larger portion of variance in Adam model compared to Sarah's once effect of input frequency and syntactic diversity were removed noun-type diversity and child frequency were not significant predictors. Syntactic diversity provided a larger syntactic diversity variance in Sarah. Frequency of use was slightly correlated that variety of syntactic environments in which adjectives occur. Input properties accounted for 35% variation in criterion variable suggesting something else plays a role in acquisition. By 2:4 most semantic categories were represented by only one adjective in productive adjective lexicon. By 3:0 both produced the majority of colour adjectives, all others grew across the 3 time points. Dimension and value adjectives appeared by 3:0. Several sub categories of physical properties appeared in 2-3 years. Human propensity adjectives appeared around 3:0.
Hoff & Tien Florida, USA 2005	To investigate SES affects on child language development	63 mother-child dyads Children were aged 16-30 months Comparable in levels of language development. Just at the 2-word stage Two groups comprising of high SES and mid-SES based on levels of education	Videotaped naturalistic interactions in the home, meal times, dressing and toy play. Toys provided by the researcher. Repeated 10 weeks after first recording. Average length of interaction was 40 minutes. No stated reliability	*Parents:* Different word types MLU *Children:* Number of word types in 90 utterances during time 2.	*N/A*	High SES children used more word types than children from mid-SES groups. SES accounted for 5% variance in child vocabulary. SES related to maternal speech with high SES using richer vocabulary and longer utterances than mid-SES mothers. Vocabulary richness and utterance length significant positive predictors of child vocabulary. No significant effect of SES on child language once differences in maternal speech had been accounted for.

Masur, Flynn & Eichorist Illinois, USA 2005	To examine predictive relations from maternal response and directive behaviours and utterances.	20 mother-child dyads 10 boys 10 girls Visits were conducted when the child was 10, 13, 17 and 21 months old	Videotaped interactions for 15 minutes during bath time and 15 minutes during free-play Transcripts compiled by researcher. Based on coding scheme by Pine (1992) Reliability for pragmatic .85 and .83 for attentional focus	*Parents:* Pragmatic: Descriptions Attentional directives Behavioural directives Attentional focus: Follow Lead Maternal behaviour rating scale Mother action and verbal imitation scores *Children:* Words, sounds and action checklist Child lexicon reported, observed and total vocabulary.	*N/A*	Specific verbal responsiveness significantly associated with lexicons at 1:1 and 1:5. Attentional directives negatively associated with all 3 indices of child concurrent vocabulary at 1:5. Directiveness positively associated with observed lexicons at 10 months. Significant positive predictive relationships for behavioural but not verbal measures of maternal responsiveness and supportive directives at 10 months. Response at 10 months predicted child total and reported lexicons at 13 months old. Directives at 10 months old predicted child total and reported vocabulary at 13 months old. Early lexical and mother achievement orientation positive predicators. At 1: responsive and directive maternal speech predicted all 3 measures of child language growth. Maternal verbal imitation at beginning of the second year predicted total and reported lexicons at 1:5. For observed lexicons verbal imitation and follow descriptives were predictive. At 1:1 directive speech predicted vocabulary at 1:5. Verbal intrusiveness was also a negative predictor for total and reported vocabulary. Follow behavioural directives were independent positive predictors. From 1:5 to 1:9 mothers verbal and behavioural response and supportive behavioural directives positively predicted child total, reported and observational vocabulary. Mother verbal intrusive directives negatively predicted child total, reported and observational vocabulary. Provision of fewer utterances, but greater proportion of follow descriptions were predictive of larger vocabularies. Maternal behaviour and verbal directives predicted child vocabulary at 1:9. Verbally intrusive lead attentional directives negatively predicted all 3 measures of child language.

Matychuk Berrien Springs, USA 2005	A longitudinal study to investigate how a system of knowledge arises.	Japanese boy and his mother and father Boy was 19 months at the beginning of the observation	Tape-recorded naturalistic interactions with parents in the home over the course of 12 months Coded using Hallidays coding scheme No reliability stated	*Parents:* Instrumental Regulatory Interactional Personal Heuristic Imaginative Informative *Children:* Same as for parents	*N/A*	Across all time point the mother spoke to the child more than the father. The regulatory function was the most common feature in the fathers speech. Therefore the father is more likely to use commands to engage the child in conversation. These are typically shorter in duration and contain less give and take than mother and child. The child's brothers and sisters use interactive function with the child so use less formal communication. Instrumental, personal and imaginative functions did not appear in the data at all. Mother and fathers often use regulatory, interactive, heuristic and information functions. Heuristic functions increase over time, which coincided with a decrease in regulatory and interactional functions. Looking at the chronological order of development regulatory and interactional functions dominate over the use of other functions. Interactional speech dominates in mother-child interaction. This type of function generates substantially more varied linguistic output form the child than the language from the father. Regulatory speech was more dominate in the fathers speech but when it was not present the father used substantially more varied functions than the mother.

O'Neill, Bard, Linnell & Fluck Plymouth, UK 2005	To describe the nature of maternal gestures used with infants at 20-months old. Explore differences in these gesture patterns across two different task settings and to compare two samples of English Americans mothers with Italian mothers.	12 mother-child dyads Children aged 20 months old at baseline 5 girls and 7 boys	Videotaped two 5-minute observations in the laboratory. One free-play and one counting task Coded using communicative acts scheme by Iverson et al (1999) Reliability conducted on random 10% of transcripts Gestures 97% Gestures and speech 98%	*Parents:* Gesture alone: Deictic Conventional Representational Emphatic Speech alone Gesture and speech: Emphasizing Disambiguating Adding Contradicting *Children:* Counting task	*N/A*	Use of gestures was high across both tasks (30%). However there were no significant differences between speech or gesture across contexts. 97% of gestures used in free-play were deictic. Conventional and representational were used infrequently. Mothers tended to use many point gestures and limited show, give or indicate gestures during free-play. In the count task deictic gestures were used the most. No representation gestures were used. There were no significant effect of task on points but there was a significant effect of task on indicate, show and give gestures. This was shown to be in the count task. Point gestures were used to disambiguate verbal utterances and to highlight the referent. Other gestures were used to add information or to emphasize the verbal utterance. However, there was no significant difference across tasks.

Pan, Rowe, Singer & Snow Harvard, USA 2005	To investigate vocabulary production in low-income families. To use growth modelling over time to explain growth over time. To explore the question whether change over time is predicted by the same things as mid-SES families.	108 parent-child dyads Assessed when the child was 14, 24, & 36 months old	Videotaped 10-minute interactions using toys provided by the researcher Transcribed using CHILDES CHAT No reliability stated	*Parents:* Total words Total Different Words Total gestures Education Maternal vocabulary and literacy using Wechsler Adult Intelligence Scale Maternal depression *Children:* Different word types and tokens	*N/A*	Variability in number of different words children produced increased with age. At 24 months children used 35.7 word types, by 36 months they used 97.1 observed word types and cumulative word types correlated. All children had one word by 14 months of age, this increased by two words per month. Over time this rate increased therefore child age is a good predictor of child vocabulary production. Usually at 14 months children can say 1.1 words types, 27.8 by 24 months and 67.7 by 36 months. Children whose mother consistently used more varied vocabulary had faster linear growth between 14 and 36 months. This was the same for pointing and was most pronounced at 24 months. This effect disappeared by 36 months. When looking at the effects of maternal lexical diversity on child growth whilst taking into account other factors found that child vocabulary production, education, language and literature were both predictive of linear and quadratic growth. Both were collinear so language and literature were retained. At 24 months children whose mothers scored at 90th percentile on language and literature produced 15 more word types than child whose mother was in the 10th percentile. This was upheld at 36 months. Maternal depression status also had an effect yet this was more evident in the 2nd year of life. For parents in the 90th percentile they used 4 less word types. By 36 months differences were approximately 20 word types. Maternal word types, language, literacy and depression all significant except for child language and literacy in quadratic growth model. When controlling for maternal literacy skills and depression there was 1SD difference in number of maternal word types which was positively associated with change of .01 word differences per month. When controlling for depression and types 1SD difference in maternal language and literacy was positively associated with .22 word differences per month. Maternal types and maternal literacy was associated with 1SD difference on depression scale, which was negatively associated with .02 word differences per month. Mothers with high levels of language and literacy, large word types and low depression predicted higher productive vocabulary between 14-36 months than low levels of language and literacy, high depression and fewer word types. The effect of maternal word types is strong during early infancy but is overshadowed by maternal language and literacy and depression by 3 years.

Vigil, Hodges & Klee Reno, USA 2005	To compare the language behaviours of parents of late talking toddlers (LD) with those of typically developing (TD)	64 parent-child English-speaking dyads *Parents:* 96% of the parents were mothers 90% constituted a two-parent family 80% of parents had high-school diploma 65% had a University degree *Children:* Assessed at age 25.7 months	Videotaped in naturalistic free-play setting in the home using researchers toys Duration of observation 20 minutes Only the first 10 minutes of observation was transcribed Transcription conducted by one trained researcher and two speech and language students 20% check on all transcripts. Kappa ranged between .83 and .91	*Parents:* *Grammatical Language:* Mean length of utterance Total number of utterances Total number of words *Discourse Functions:* Initiations Responses Self-directed speech Number of turns in the conversation Proportion of responses to child initiations *Behavioural or Pragmatic Functions:* Questions Gestures Labelling Descriptives Behavioural Directives *Response Functions*: Interpretations Expansions Imitations *Children:* Infant Mullen Scales of Early Learning Language sampling Total words MLU Language Development Survey – Total Vocabulary	N/A	*Grammatical Language:* No significant differences between groups of parents in terms of MLU, total number of utterances and number of words used *Discourse Functions:* Results showed no significant differences between parents in number of initiations, but there were significant differences in parent's use of responses to initiations and proportion of responses with parents of TD children responding more than parents of children with language delay. There were also noted differences in the number of turns taken, with parents of TD children taking more turns in conversation. Parents of LD children were also shown to use less self-talk. *Pragmatic Functions:* Results showed no significant differences between parents in their use of questions, labelling, descriptives, gestures, directives, interpretations or imitations. However, TD parents typically used more expansions than parents of LD. In sum, parents of LD children produce similar language to that of TD parents, and offer similar quantities of language. However, there are differences in their use of conversational discourse with TD parents using more responses and more turns.

Deodorise & Jacob Milan, Italy 2006	To verify if input addressed to a group of late talkers is the same as typically developing children	18 mother-child dyads *Parents:* Educated with 8 to 18 years of schooling. No significant differences between the two samples. *Children:* Selected on criteria of <30 words at 18 months based on scores using the Italian version of the MCDI. 9x late talkers toddlers 9x late starting toddlers whose vocabulary at 24 months of age was within normal range Children matched for sex (5 boys and four girls), play context (lab/home) and play episode (types of toys used) Assessed when the child was 20 months old	Videotaped naturalistic play sessions with toys provided by the researcher. 60% of dyads were filmed in a laboratory playroom. Sessions lasted 30 minutes Transcripts compiled using CHAT (MacWhinney, 1991) Reliability for maternal utterances 93.2%, for pitch and acoustics kappa .99	*Parents:* Number of utterances per minute Mean number of words per utterance Number of nouns per minute Number of different nouns per minute Common nouns as a % of overall words Type/token ratio for common nouns One word utterances as a % of total number of utterances One word utterances formed by common nouns as a % of the total number of utterances Declaratives Interrogatives Exclamatory Mean syllable duration Duration of final syllable of the utterance Fo max Fo min Fo range *Children:* Number of utterances per minute % of utterances with conventional word Number of different words	N/A	Results demonstrated that the acoustics of mothers of late talking toddlers differ to those mothers of late starters. LT mothers use flatter or less varied contours in their speech, and there are fewer utterances that contained varied pitch contours. There is also less prosodic marking used in the definition of the noun in this group of mothers. There was no effect for education status nor for fo max or min. Education was shown to significantly influence mean syllable duration with higher educated mothers talking at a slower rate and using drawn out final syllables. There was a marginal effect for education on the % of single-word utterances used when controlling for education. Mothers of LT children produce fewer utterances per minute suggesting that these children have less exposure to nouns and different types of common nouns. MLU was not shown to be significantly different between the two groups, and there were no further differences for lexical variety of nouns within input. Mothers of LT children did not seem to use an atypical verbal style during play, however children were exposed to less speech and therefore less nouns then children who were in the typical range. Frequencies of utterances, and the number of different words significantly differed between the two groups of children. In summary, children who use a greater number of different words during free-play had mothers who used more utterances per minutes that comprised of more nouns and different nouns. Therefore the language used by mothers of late talking toddlers is different to that of mothers of late starting children.
Pancsofar & Vernon-Feagons North Carolina, USA 2006	To examine differences in how mothers and fathers talk to their children	92 English-speaking mother-father-child triads *Parents:* Married and both living at home Average fathers age was 36 years old Mothers average age 35 years	Videotaped observations of mother-father-child play sessions recorded in the home when the child was 24 months old. The researcher provided toys. Observation sessions lasted 20 minutes.	*Parent:* Demographics Quality of child care Caregiver interaction survey Total verbal utterances Total words	*Mother vocabulary and Father vocabulary:* Number of different word roots *Mother output and Father output:*	Results demonstrated differences between the language of mothers and fathers. Fathers were shown to use less verbal utterances, total words, total wh-questions, and different word roots. Fathers were also shown to take less conversational turns and these turns were significantly shorter in both number of utterances and number of words.

		Majority of parents were middle-class or above, educated to college or above *Children:* Assessment when child was 24 and 36 months old All typically developing	Transcripts compiled by the SALT (Miller & Chapman, 1985) No reliability stated	Number of different word roots Mean Length of Utterance Total questions Proportion total questions Proportion wh-questions Number of types of wh-questions. Total conversational turns Mean turn length in words *Children:* Sequenced inventory of communication development Language test at 36 months	Total verbal utterances Total words *Mother complexity and Father complexity:* Mean Length of Utterance *Mother Questions and Father Questions:* Proportion total questions Proportion wh-questions Number of types of wh-questions. *Mother Pragmatics and Father Pragmatics:* Total conversational turns Mean Length of Utterance Mean turn length in words	Parental education at 24 months old was shown to account for 20% of variance in a child's expressive language skills at 36 months old. Mothers were the significant predictor. Quality of care at 24 months old was shown to add an additional 8% variance at 36 months old. Father vocabulary use at 24 months old, when accounting for education and quality of care, was shown to be a significant predictor of children's expressive language skills at 36 months adding an additional 9% of variance. No measures of maternal language, after accounting for education and quality of childcare, were shown to be attributable to children's expressive language skills at 36 months. Nor were any other measures for the father apart from vocabulary, which in itself was an individual predictor. An overall regression using all combined features of maternal and paternal language demonstrated to account for 11% variance of a child's expressive language score at 36 months. In summary, mothers and fathers do speak to their children differently, however a father's language input to a child is the most significant predictor of a child's expressive language skills.
Flynn & Masur Illinois, USA 2007	Longitudinal study to investigate mothers responsiveness and directive speech.	20 mother child dyads *Children:* 10 boys and 10 girls Observed at 10, 13, 17 & 21 months old	Videotaped naturalistic interactions during free-play with toys and at bath-time. Toys provided by researcher. Average 15 minutes in length Transcription conducted by the researchers Reliability conducted on a random 16 transcripts. Kappa was .85 for pragmatic intent and .83 for attentional focus.	*Parents:* Coded for (across sensitivity to child's focus and mother pragmatic intent): Responsive Supportive directive Intrusive behavioural directives Intrusive attentional directives Descriptions Behavioural directives Attentional directives *Children:* No measures	*Sensitivity to child's focus* *Mother's pragmatic intent*	All utterances interacted with gender and age. Boys didn't change over time and girls increased over time. There was a main effect for context with more utterances produced during free-play than during bath-time. Analysis of frequency of maternal utterances revealed significant main effect for context, with free-play over bath-time. There was also an interaction of gender and age. At 10 months boys and girls were equal. At 1:5 and 1:9 this was more to girls. This was the same as total utterances. Similar number of responsive and directives to girls and boys both at 10 and 1:1 but more to girls than boys at 1:5 and 1:9. There was a main effect for utterance category.

					Responsive utterances made ¼ total speech. Supportive utterances were used 14 per session. Intrusive behavioural and attentive directives made up 9 and 8% of all utterances. Production of utterance types differed by context. In behavioural directives there were more displayed in bath time, and more of the others in play time. Significantly more directives, twice more often, in play. Attentional directives occurred 50% more in play than bath time. Frequency of responsive and directives changed with development. Responsive and supportive directive utterances rose over times. Intrusive utterances decreased over time, with an increase between 10 and 1:1 but a decline thereafter. Responsive and directives differed between boys and girls. There were 50% more intrusive directives used with boys than girls, and 78% more responsive utterance with girls than boys. There was a 4-way interaction of gender, age, utterance category and context. More responses were used with girls, and more supportive directives during free play than bath time. There was an increase then a decline in intrusive directives with age. A peak for boys was shown at 1:1 and girls at 1:5. There were more intrusive directives for boys during free play than bath time but this decreased over time. Supportive directives were used more in bath time with girls at 1:1 and more in play with boys at 1:5. Responsive and intrusive directives showed consistency over contexts. Responsive were significant at 10, 1:1 and 1:9 but not at 1:5 when total speech was taken into account. Intrusive directives were significant at 1:1 and 1:5. When taking into account gender responsives remained significant at 10 and 1:1 but not at 1:9. Intrusive directives at 1:1 and 1:5. Stability was greatest for responsive and intrusive directives over time but all categories showed stability. Responsiveness was stable for 10, 1:1 but not 1:5. Intrusive directives were stable for free play across first two time points. Both disappeared from 1:5 and 1:9 as it declined. Supportive directives were significantly stable for 2nd and 3rd time points in both contexts. When taking into account maternal utterances these were stable across the first time point in free play. When controlling for gender all stayed significantly stable over time.

					Behavioural intrusive directives and attentional directives positively related at 10, 1:1 and 1:5 in free play but not bath time. When controlling for gender and utterance frequency the result did not change. Mothers use of responsive style negatively related to provision of intrusive directives in both contexts. Responsive speech and supportive directives found at 1:5 in free play and 1:5 and 1:9 in bath but mostly unrelated.

Goldin-Meadow, Goodrich, Sauer & Iverson Chicago, USA 2007	To explore if mothers translated their child's gestures into words. If so, are they related to the words that the child begins to use at the two-word combination stage.	10 mother-child dyads *Children:* 5 boys and 5 girls All monolingual English speaking Observed longitudinally from 10 to 24 months old All middle to upper class	Videotaped monthly for 30-minutes during natural situations or spontaneous structured play. Toys provided by the researcher Transcripts compiled by the researcher Reliability conducted and showed 93-98% reliability for parent measures and 92-100% for child measures.	*Parents:* Number of responses translating the child's utterances Number of words per sentence MLU *Children:* Communicative gestures: Deictic gestures Conventional gestures Communication vocalizations: Gestures + word Complementary Supplementary.	*N/A*	Children used more gestures for objects than name the object. 75% of objects appeared as a gesture first. Generally these names entered a child's vocabulary around 3 months after first use of gesture. Verbal equivalent of child's gesture significantly more likely to enter vocabulary when the mother had translated the gesture than when not. Verbal equivalent of gestures that had been translated on average fewer syllables than those that were not translated. Therefore words that had fewer syllables became part of the child's vocabulary. Controlling for syllable length found the same effect. These words were translated more and were more likely to be in the child's vocabulary. Mothers translated gestures that were part of the child's vocabulary more often than those words that were not. Therefore if part of the child's comprehension vocabulary they were also more likely to become part of speech vocabulary. Mother translated 50% of gestures that were in the child's comprehension and 42% of gestures that were not. All children used reinforcing and supplementary gesture and speech combinations before producing first 2-word combinations. Mother MLU were significantly longer for responses to the child's supplementary combinations than child reinforcing combinations. Sentence was longest when they incorporated information that the child used in both gesture and speech. MLU differed as a function of how much information they got from the child supplementary combination and were significantly longer when information was from speech or gesture than from no information at all. Typically children started producing 2-word combinations at 19 months old Children whose mothers used large numbers of translations started 2-word combinations earlier.
Clark & Bernicot Stanford, USA 2008	To explore the theory that parents used repetition to ensure the child has understood, and children use repeats to ratify what the parent has said.	41 French mother-child dyads *Parents:* All consisted of mothers *Children:*	Videotaped naturalistic mealtime settings in the home The younger sample were recorded twice for 8 minutes each time	*Parents:* Checking on intended meaning Correcting the form produced Any addition to the repeat	*Mother Repetitions:* Checking on intended meaning Correcting the form produced Any addition to the	*Mother Repetitions:* Results demonstrated that repetitions were frequent for both groups of children. Parents of the younger sample repeated their children's verbalisations 1.21 times per minute. Parents of the older sample repeated their children's

		24 middle class children aged 26 to 28 months old (M age = 27 months) 12 boys, 12 girls 17 middle and upper class children aged 37 to 50 months old (M age = 42 months) 7 boys, 10 girls Transcript corpus drawn from previous studies (Bernicot & Roux, 1999; Marcos, et al., 2004)	The older sample were recorded for one single 10 minutes session Transcription conducted by trained research assistants 93% agreement	No follow up at all Minimal acknowledgement A full acknowledgement *Children:* Same as parent	repeat *Child Repetitions:* Checking on intended meaning Correcting the form produced Any addition to the repeat *Third turn follow ups:* No follow up at all Minimal acknowledgement A full acknowledgement	verbalisations 1.45 times per minute Results also demonstrated that parents repeated their children's verbalisations in the second or third turn by 2 or three times more than their children. Analysis revealed that mothers of the younger sample used repetition to check up on their child's intended meaning more often than the older sample. In addition, they also used more repetition to check up on forms used by the children. Parents of younger children also tended to refrain from using any additional material when repeating child's verbalisation compared to older. After maternal repetitions child followed up with 3rd turn. This was more likely by the older children. Younger children were more likely to repeat the target form repaired by the adult repeat. Older children offered more semantically relevant information. Child repeats in 2nd turn acknowledged or ratified what the parent had said. Checking on intention came from the younger children, or used to mark agreement with the adult. Older children repeated and added new information. *Third turn follow ups:* Analysis of parents third turns demonstrated that parents of younger children were more likely to respond with further repeats of a target word or phrase than compared to parents of older children. This was followed up by offering new semantic information, which was usually towards younger children than the older ones. In sum results suggest parents of younger children use repletion as a means of understanding, checking up on, and correcting form of their children's verbalisations more than parents of older children,
Hurtado, Marchman & Fernald Stanford, USA 2008	Longitudinal study to explore how caregiver talk relates to child vocabulary knowledge and skill in lexical processing.	27 mother-child dyads 12 females and 15 males 18 and 24 months old at first assessment Primarily low SES	Videotaped in 20 minute naturalistic free-play with toys provided by researcher Observations reduced to 12 minutes for analysis Transcripts compiled by researcher using the CHILDES	*Parents:* Number of utterances Word tokens Word types MLU Socio-economic status *Children:*	*N/A*	Mothers who produced more utterances also used more word tokens and types than those who used fewer utterances. Mother who spoke more also used more different words and longer utterances. No significant differences between speech towards bys and girls, or those who were first or late born children. Maternal speech was not correlated with SES HI so not attributable to variation in SES

			Reliability completed but not noted on manuscript	MCDI Speech processing speed by gaze patterns		Child vocabulary increased between 18 to 24 months. In the looking whilst listening task the mean RT decreased between 18 to 24 months showing increase in processing speed. Maternal speech and child vocabulary was uncorrelated at 18 months. Number of utterances and word tokens used by the mother at 18 months was significantly correlated with child vocabulary at 24 months. This remained significant after controlling for vocabulary at 18 months. As opposed to child vocabulary 6 months prior. Therefore variability in vocabulary linked to amount of input. Spanish children whose mothers used more words and utterances at 18 months had larger increases in vocabulary from 18-24 months. Mean RT and vocabulary was uncorrelated at 18 months but was significant at 24 months. Mean RT at 24 months was associated with gains in vocabulary from 18-24 months. Faster RT children knew more words at 24 months and had significantly larger vocabulary gains between 18 and 24 months than those with slower RT. Maternal talk and child RT uncorrelated at 18 months but correlated at 24 months, accounting for 18-26% variance. This remained after partaking out RT so input had a greater influence. Mothers who used more words and complex talk had children who were faster at processing spoken language at 24 months. The effect of maternal speech accounted for 14% variance in child vocabulary. This reduced after controlling for RT. Maternal talk exerts effect on vocabulary via processing speed.
Hwa-Froelich, Cook & Flick Missouri, USA 2008	To investigate the relationship of maternal sensitivity and speech acts with people with depression and without living in poverty.	23 mother-child dyads 13 depressed mothers diagnosed via DSM-IV 10 non-depressed Mean age 25 years Children aged between 31 and 52	Videotaped interaction lasting 20-30 minutes using 3 sets of standard toys provided by the researcher Speech acts coded using the INCA-A Kappa reliability 83.1%	*Parents:* Speech Acts: Directives and responses Speech elicitation and responses Commitments and responses	*N/A*	Significant differences between groups for visual eye to eye gaze, or joint attention and for verbal and non-verbal responsiveness. No other significant differences between groups. Mothers who were not depressed used directives also were physically close to child, be social and

	months old (M = 40.17) 8 boys and 15 girls	Interchanges coded using CHAT and CLAN Kappa reliability 98-99%	Declaration and responses Markings and responses Statements and responses Performances Evaluations Demand for Clarification Text editing Vocalisation Interchanges: Comforting Discuss Directing attention Marking Negotiating Co presence, separation, attention, proximity Performing verbal moves Showing attentiveness Reading written text Maternal sensitivity using the Clarke Stewart Rating Scale *Children:* None	developmentally appropriate and when asking questions used physical touch. Parents without depression used sensitivity paired with speech acts of directives, statements, questions, performances and markings when child increased activity. Negative relationships when child activity increased, and they used less elicitation. Significant positive relationships found for maternal sensitivity behaviours and mother-child interchanges for mother without depression; when negotiating activities and object used eye gaze, touch and closeness. Mothers with depression used eye gaze and were physically close to child when they directive attention. Mothers with depression have different relationships for maternal sensitivity behaviours and speech acts. When using statements also used to express positive emotions, positive attitudes, audio and verbal stimulation and developmentally appropriate behaviours. Mothers without depression used verbal maternal sensitivity behaviours when expressing statements, performances, evaluations and declarations. As child level of activity increased the mothers directions decreased but commitments increased Sensitivity correlated with child interchanges of positive emotion, attitude and auditory or verbal stimulation when performing verbal moves for games. Therefore when mothers with depression performed verbal moves they did so with positive emotion and verbal stimulation. This was associated with child activity level, so when child activity level increased levels of maternal comforting interchanges decreased but interchanges for attentiveness increased. 7 sensitive behaviours were associated with statements as opposed to 4 sensitive behaviours by mothers with depression. There were differences for maternal sensitivity and child activity levels. Mothers with depression and those that had a more active child used less directive utterances. This was not significant for mother without depression. When child activity increased mothers with depression had a negative correlation with commitment, elicitation and statements communication. Mothers with depression showed a positive association with

				commitment and a negative association with direction Mothers without depression did not vary their directive communication and reduced commitments, elicitation and statements as activity levels increased. Mothers without depression who provide greater auditory and verbal stimulation also provided more direction. Mothers with depression showed more communication but of different types. These were more adult focused. Groups showed different relationship patterns for maternal sensitivity and interchanges. Mother with depression provided fewer comforting interchanges and more attentiveness as child activity levels increased. For mothers without depression comforting and maternal attentiveness independent of child activity levels. Mothers without depression were more likely to non-verbal sensitive behaviour during interchanges where they directed listener's attention or negotiated with the child. Mothers with depression showed no significant association with non-verbal behaviour and communication interchanges. Mothers without depression showed sensitive behaviour in 6 dimensions as they increased negotiations and directed attention, working at engaging in a sensitive manner. Mothers with depression showed significant association between positive emotion, attitude and auditory or verbal stimulation when performing verbal moves.

Campisi, Serbin, Stack, Schwartzman & Ledingham Montreal, Canada 2009	In investigate if parent childhood aggression and withdrawal reveals itself in linguistic interactions between mothers and children.	159 mother-child dyads *Children:* 74 boys and 85 girls aged between 2 and 5 years old	Videotaped 15-minute free-play in the home Standard set of toys provided by the researcher Transcribed by the researcher using the CHILDES Speech sample limited to 50 utterances Reliability conducted on 20% of transcripts using exact agreement procedure reliability ranged from 75-98%	*Parents:* MLU Word types Word tokens Level of childhood aggression and withdrawal Demographics Global Symptoms Index HOME *Children:* Bayleys Scale of Infant Development Language abilities Math ability Reading achievement	*N/A*	For mother-child language at time 1, predictors accounted for 16% of variance in maternal language complexity. Mothers with a history of childhood withdrawal produced less complex language when talking to their children. Childhood aggression levels were not significant predictors of maternal language complexity. For child language complexity all predictors accounted for 30% variance. Childhood withdrawal had a marginal significant effect, and child gender accounted for 8%. Girls were shown to produce more complex language at preschool than boys. Child cognitive skills accounted for 3% variance in child language. The HOME accounted for 13% variance. Maternal language remained a significant predictor when accounting for all other variables. For mediation analysis the predictor related to the mediator (maternal withdrawal) and outcome. Social withdrawal was negatively related to child language with 4% variance. The mediator (maternal language) was related to the outcome (child language) with both being positively related but maternal withdrawal was not longer significant but maternal language was (15%). When controlling for child age and gender maternal language was a significant predictor. In terms of prediction for school-related abilities all predictors accounted for 40% variance in child language. The main effects of parent withdrawal accounted for 13% variance in language attainment grade. There was also a main effect of age and gender accounting for 11% variance. Child IQ and language accounted for 10% variance in language arts grade. For reading all predictors were significant and accounted for 17% variance. Individually childhood withdrawal added 4%, gender and age 6%, HOME and maternal language 5% and child language and IQ 3%. For math ability all predictors accounted for 27%, individually childhood withdrawal and aggression accounted for 5%, age and gender 7% and child IQ 7%. Child language complexity at preschool predicted late performance in language related abilities.

Chan, Brandane & Tardiff Michigan, USA 2009	To investigate if culture specific patterns of common noun and main verb use remain when behaviour control utterances are excluded from book reading sessions	49 mother-child dyads *Parents:* English mothers had an average education of 6 years Mandarin mothers had average 3.5 years education *Children:* 25 English speaking children 11 boys and 14 girls 24 mandarin children 12 boys and 12 girls All 20 months old	Audiotaped speech samples in the home. Three contexts for 10-minutes each: picture book task, regular toys and mechanical toys Transcribed using CHAT and analysed using CLAN Reliability conducted on 4 English and 4 Mandarin speech samples. Kappa for English .82 and .91 for Mandarin	*Parents:* Common nouns Main verbs *Children:* None	*N/A*	Mandarin mothers produced significantly more word types than English speaking mothers during boo tasks.. Word tokens yielded similar results. English mothers produced more complex utterances with no effect of child gender. Mandarin mothers used more picture relevant speech. There was a significant interaction between word type and language with English speaking mothers using more common noun types than main verb types. Mandarin mothers used more main verb types than common nouns. Finally, English-speaking mothers used more noun types than verb. There was a significant interaction between word type and scene types that influenced mothers use of nouns and verbs. Mothers typically used more main verbs types when talking about transitive scenes, and comparable levels of common main types and main verb types when talking about agent scenes.. There were marginally more in object scenes and both were equal n frequency when looking at agent scenes. When looking at transitive scenes both English and Mandarin mothers focused on common nouns and verbs in different ways. English speaking mothers used both nouns and verbs equally whilst Mandarin mothers used more verbs. For object scenes English-speaking mothers used more nouns than verbs. Mandarin mothers used nouns and verbs equally. Scenes depicting agents interacted between word type and language was marginally significant. English speaking mothers used more common nouns than verbs. Mandarin mothers used them equally.
Sung & Hsu Rhode Island, USA 2009	To establish how Korean mothers attention regulation strategies were associated with toddler language and play skills. To replicate the linkage between referential speech and toddler vocabulary development and hw different types of referential speech contribute to toddler play development. Finally to discern the relative contribution of referential speech and	42 Korean mother-child dyads Mothers were all married Mean age 30 years old Children were aged 13-23 months old Mean age 17.55 months 21 males and 21 females	Videotaped free-play interactions in the home lasting 20-minutes Behaviour was coded by researchers Reliability was 90%, .73 Kappa Transcripts compiled by the researchers Reliability for speech was 98%, .78 Kappa	*Parents:* Behaviour: Introducing Redirecting Following Speech: Simple Elaborative Prompting *Children:*	*N/A*	Toddlers engaged in more exploratory and functional play than symbolic. Expressive and receptive vocabulary increased with age Mothers showed a significant difference in attentional strategies, such that they used more introducing than redirecting or following. This contrasted with western mothers who typically used more following than directing or redirecting. Korean mothers also showed a significant difference in referential speech using simpler than elaborative

	attention regulation to toddler language and play development.	MCDI Toddler play	speech or prompting utterances. Western mothers typically used more elaborative. Maternal attention regulation speech varied with child age. Redirecting decreased significantly with child age and elaborative referential and verbal prompting increased with child age. Less frequent attention redirecting and frequent attention following related to increases in child vocabulary, but introducing was not Frequent attention redirecting demonstrated increases in exploratory play and a decrease in functional play. Frequent attention following was associated with increases in symbolic play. Frequent elaborative referential speech was associated with increases in expressive and receptive vocabulary. Simple referential speech and prompting was not. All three types of referential speech associated with toddler symbolic play. Using hierarchical regression all three types of maternal attention regulation significantly predicted toddler expressive vocabulary but not receptive vocabulary. Maternal attention following significantly predicted a decrease in toddler exploratory play. Maternal elaborative referential speech predicted decrease in functional play. Maternal elaborative referential speech predicted increase in symbolic play.

Taylor, Donovan, Miles & Leavitt Wisconsin, USA 2009	To investigate if parenting styles mediates the relation between maternal and child language.	62 mother-child dyads Mean age of mothers was 32.7 years Children were 2 years old at assessment	Videotaped clean up task in the laboratory. Average observation lasted 7 minutes Transcripts compiled by the researcher using SALT Reliability on 25% of transcripts. Percentage agreements ranged between 88 and 97%	*Parents:* Asks if needs help Persuades/explains Suggests/asks Verbally assists Compromises Tells or tells not o Bribes Criticals Forces and restricts Behaves non empathetically Punishes Spanks/slaps Threatens MLU (morphemes) Grammatical word types Bound morphemes Different word roots Demographics *Children:* MLU Grammatical word types Bound morpheme types Different word roots Functions of language	Guidance: Asks if needs help Persuades/explains Suggests/asks Verbally assists Compromises Control: Tells or tells not o Bribes Negative Control: Criticals Forces and restricts Behaves non empathetically Punishes Spanks/slaps Threatens	Mother MU was associated with child MLU. MLU, total number of bound morphemes and NDW were associated with child bound morphemes. Number of grammatical word types, total number of bound morphemes and NDW were related to child language functions. There was a marginal significant multi-variety effect obtained for continuum of control. The was a linear effect for MLU where mothers in the High Guidance group had the greatest MLU and mother the HNC had the lowest, HC were in between. For NDW there was a significant leaner trend with the HG group having the greatest and the HNC the lowest proving that the parenting was the mediator between mother child language use. For a relationship between mother and child language there was a multi-variate effect. Child MLU there was a significant linear effect showing mothers of HG group has the highest MLU and HNC the lowest. For bound morphemes there was a significant linear effect for mothers in the HG group who had a higher frequency than the other 2 groups. For grammatical word types there was also a significant linear effect where the HNC group had fewer than the other two groups. For NDW again there was a significant linear effect children of HNC mothers had fewer NDW than the other two groups. For child language features there was a significant quadratic effect children of mothers in the HC group used more language functions than children of the other two groups. In summary the hypothesized mediator was associated with the outcome of childrens language. For associations between mother and child language when holding parenting constant results showed that all correlations remained significant. However these were reduced indicating that parenting is a significant mediator in mother-child language interchange.

Huttenlocker, Waterfall Vasilyeva, Vevea & Hedges Chicago, USA 2010	To examine how childrens syntactic growth is affected by caregiver input	47 parent child dyads All English 45 parents were mothers Children were 14 months at initial assessment Visited in the home every 4 months = 9 visits 26 boys and 21 girls	Videotaped naturalistic observations in the home for 90 minutes Transcribed by the researcher Reliability established for 20% of all transcripts = 95% accuracy Reliability established on 33% syntactic coding = 95% accuracy	*Parents:* Lexical Diversity: Word types Syntactic Diversity Constituent diversity Causal diversity Quantity of speech Demographics *Children:* Same as for parents	*N/A*	Child different lexical items increased from 7.86 to 283.49 from 14 to 46 months. Clausal diversity emerged later than constituent diversity, and it also increased more rapidly. Constituent forms emerged by 18months and clausal by 26 months. Acquisition of more frequent devices was developed earlier than less frequent devices. Rate of growth diminishes with age, growth for lexical and constituent diversity decreased over time but levelled by 46months. Diversity provide measures of growth at lexical, constituent and clausal levels. Child lexical diversity is predicted by caregiver lexical diversity and caregiver quantity, but there was a high overlap with each other and when assessed together became non-significant. Child constituent diversity is predicted by caregiver constituent diversity but is a stronger predictor than caregiver quantity of speech of child constituent diversity. When assessed simultaneously constituent diversity remains significant whilst quantity of speech does. Child clausal diversity is predicted by caregiver clausal diversity or by caregiver uses. Both independently were significant predictors but together caregiver clausal diversity is non-significant, whilst quantity is marginal. Caregiver constituent diversity and lexical diversity both predicted child lexical diversity, child constituent diversity and clausal diversity. Constituent diversity was not as strong a predictor as lexical diversity and lexical diversity remained significant for child lexical diversity. Later lexical diversity of the caregiver significantly predicted child lexical speech, with this relationship being bi-directional. Child gender and first-born status were not good predictors of child language measures. SES, measured by education or income produced significant growth curves for all child language levels. Income consistently emerged as the stronger predictor, predicting the intercept for both lexical and constituent diversity. SES and first born status predicted clausal diversity. SES predict growth curve for lexical diversity but SES effects were reduced when maternal lexical diversity was entered into the model suggesting mediation. This pattern was replicated for constituent speech. For clausal diversity SES and first-born status predicted growth rate.

De Falco, Venuti, Esposito & Bornstein Trento, Italy 2011	To compare functional features of parental speech directed to children with Downs syndrome and developmentally-matched typically developing children	44 English-speaking mother-father-child triads *Parents:* 22 mother-fathers were parents of downs syndrome children Mothers of downs syndrome age M= 37.41 years, SD = 6.34). Fathers aged M = 39.77, SD = 5.79) Mothers of typically developing age M = 35.47 years, SD = 4.98). Fathers M = 39.66, SD = 6.11) SES of downs syndrome parents was lower *Children:* 22 downs syndrome Mean age 40.27 months old (SD = 7.28) 22 typically developing Mean age = 24.09 months old (SD= 4.14) Children matched on developmental age (M = 22.14 months old, SD = 3.55)	Videotaped naturalistic observations in a familiar room in the laboratory. Transcripts compiled by using the CHILDES (CHAT) transcription methods. CLAN was used to calculate the child MLU Parental speech categories were based on existing schemes by Delia Corte, Benedict & Klein, 1983; Foliar & Chapman, 1978, Morikawa, Shand & Kosawa, 1988; Penman et al., 1983; Rondal, 1985; Sherrod et al., 1978; Toda et al., 1990. Reliability Cohen's kappa .80-.96	*Parents:* Direct statements Descriptions Questions Referent to: Child actions Childs internal state Parent Environment Vocatives Speaking for both the mother and the child Speaking in place of the child Speaking in place of a toy Unintelligible/Not coded *Children:* None	*Affect-salient speech:* Encouragement Discouragement Nonsense Greetings Mimic Singing and reciting Onomatopoeia Conventions *Information-salient speech:* Direct statements Descriptions Questions *Other:* Vocatives Speaking for both the mother and the child Speaking in place of the child Speaking in place of a toy Unintelligible/not coded	Child age associated with environment referents and negatively correlated with total number of parents speech units, affect salient and direct statements and child action referents. Main effect for parent gender on the total number of utterances, with mothers using more than fathers. This result was true for both groups of children. Information salient speech was more frequent than affect-salient speech for both parents in both groups. However a main effect for group demonstrated that parents of down syndrome use more than parents of typically developing children. No main effects were found for information-salient speech but using planned comparisons of subcategories the following results were shown: Group main effect for direct statements, with both mothers and fathers of down syndrome using more. Main effect for parent gender in use of descriptions. Mothers in both groups typically used these more than compared to fathers. There was also a group main effect for questions with both parents of children with down syndrome using less overall compared to parents of typically developing children.. For referent of information-salient speech there was only a group main effect. For referent to a child's action there was a significant main effect for group with parents of downs syndrome using more. In contrast the main group effect for referent to the environment demonstrated that mothers of down syndrome referred to the environment less than typically developing parents. In summary, the functions of speech directed towards downs syndrome and typically developing children matched on developmental age do significantly differ.

Bernier, Carlson, Deschenes & Matte-Gagne Montreal, Canada 2012	To assess executive functioning performance at three years old.	62 mother-father-child triads *Parents:* Mothers were aged between 20-45 years old (M = 31) 87% were Caucasian Fathers were aged between 22-55 years old (M = 33.3) 79% were Caucasian *Children:* 38 girls 24 boys Visits were conducted when the child was 12, 15, 18, 24 and 36 months old	Ten-minute videotaped free play observations conducted in the home. Time 3 was conducted in the laboratory. Coding scheme used was that developed by Miens, Fernyhough, Fardley & Tuckeys (2001) Inter-rater reliability conducted on 48.4% of randomly selected observations. ICC = .87	*Parents:* Mothers interpretation of the child's mental state Mothers interpretations of the child's mental process Mothers interpretation of the child's emotional engagement Mothers interpretation of the child's attempts to manipulate other peoples thoughts Mother spoke for the child Maternal sensitivity measured by the Maternal behaviour Q-sort Maternal autonomy and support Father-child interaction measured by mutually responsive orientation scale *Children:* Attachment behaviour Q-sort Child executive functioning at 2 and 3 years Peabody picture vocabulary test	*N/A*	SES index related to impulse control and conflict EF. Child verbal ability associated with impulse control and conflict EF. Parenting and attachment security correlated with two dimensions of EF at 3 years old; child is exposed to higher quality parenting and those securely attached to mother performed better on conflict EF and impulse control at 3 years old. Model accounted for 20.5% of variance in impulse control; impulse control 7.6%, SES and child language contributed 12.2% but parenting did not contribute significantly. Using only SES and child language, as covariates the results remained similar, only child language has a unique relation to impulse control. Model for conflict EF resulted in 31.6% variance explained. Each block explained a significant portion of variance in conflict EF. Conflict EF 5.3%, SES and language 8.3%, parenting 6.4% and attachment 11.6%
Huang Taipei City, Taiwan 2012	To investigate referential choices of Mandarin speaking mothers to determine the extent to which pragmatically sensitive referential strategies are a characteristic of input given to children acquiring Mandarin.	2 Mandarin mother-child dyads Children were both females and were observed from 2:2 to 3:1	Four 1-hour videotapes of naturalistic observation in the home Transcribed using CHAT conventions and analysed using CLAN – only utterances identified containing overt verb No reliability stated	*Parents:* Referential forms: Null forms Pronominal forms Nominal forms Informativeness: Knowledge features: Absence Newness Query Confusion Features:	Knowledge features: Absence Newness Query Confusion Features: Contrast Differentiation in context Differentiation in discourse Search Space	Both mothers used more uninformative arguments that informative. These proportions differed less notably for 3rd person. For features of inanimacy informed arguments and uninformed arguments differed less notably. For 3rd person there was the reverse pattern with more informative than uninformative. Higher rate of nominal forms for absent referents and lower for present referents. Nulls and pronominal forms were used more to refer to the present and this differed significantly for each. There was significantly lower percentage of null forms for absent referents than present. Significantly lower percentage of pronominal for absent than present and significantly

				Contrast Differentiation in context Differentiation in discourse Search Space Functions: Inanimacy Third Person *Children:* Referential forms	Functions: Inanimacy Third Person	higher percentage of nominal forms for absent than present. Referential choices were highly influenced by 7 informative features. Post hoc analysis showed consistent patterns in use of referential forms except for features of query and contrast. There was significantly lower percentage of null forms for referential with informative functions than uninformative. Significantly lower percentage of pronominal forms used for referential with informative than uninformative. Significantly higher percentage of nominal forms for referential with informative values than uninformative. Query and contrast had different patterns with queries having higher percentage of pronominal features for referential with informative values. For contrast there were no significant differences. Results also demonstrated that there were pragmatic strategies for referential choice from when the child is 2:2 years old. Childs speech was similar to the parents with more uninformative arguments for all forms except inanimacy and 3rd person. For inanimacy this differed less so, and for 3rd person the pattern was reversed. Where the mother's data used more uninformative arguments than informative ones for each informative feature accept inanimacy and 3rd person speech, the children's speech was similar.
Tamis-LeMonda, Song, Leavell, Kahana-Kalman & Yoshikawa New York, USA 2012	To examine gestural and verbal interactions between mother-child dyads across different ethnic groups	226 mother-child dyads *Parents:* 75x African American 80 x Dominican 71x Mexican All African Americans, 25% of Dominican, and 9% of Mexican mothers spoke English.	Videotaped semi-structured observations taken at 14 and 24 month visits Sessions included wordless number book, wordless emotion book and beads and strings. Each segment lasted 2-3 minutes. Mother and child transcripts were compiled using Interact Software	*Parents:* Mother-child interaction Number of mother gestures Point to an object Show object Object give Conventional Referential utterances Utterances that elicit	*Referential language:* Utterances that elicit information about an object or event *Regulatory language:* Utterances that direct attention or	All mothers used gesture, with points being the most prevalent, and conventional gestures being the least. For gesture there was a main effect for task with number book reading using more gestures than the bead task or the emotion book. Gestures were shown to increase with the child's age and Mexican and Dominican gestured more than African American. Mother referential and regulatory language accounted for 92% of all utterances used across the 3 groups but there were no significant differences. There were

	Age ranged from 18 to 46 years old (M = 26.24, SD = 6.20) African American and Dominican parents has average of 12 years education Mexican parents had average of 8 years education *Children:* Consisted of 105 boys and 118 girls Assessed when the child was 14 and 24 months old	(Mangold, 2008) No reliability stated	information about an object or event Regulatory utterances Utterances that direct attention or behaviour *Children:* MCDI or Spanish equivalent Mullen scales of language	behaviour	significant differences in language type and task with AA using more referential than regulatory language and D and M using more regulatory than referential. M and D were shown to talk more during the bead task than AA. Results showed that at 14 months old 21% of referential and 14% of regulatory speech was followed by gesture. At 24 months this had increased to 22% and 16%. A higher proportion of referential speech was followed by gestures. Mexican mothers were shown to use speech with gesture (21%) than AA (16%) and D (17%). At 14 months gestures were associated with referential language so that mothers who gestured more were more likely to use referential language. This association was stronger for AA than D or M. At 24 months gestures were related to referential language but ethnicity no longer moderated this association. Gestures were not associated with regulatory language at 14 months. However by 24 months there was an association between Latino status and gestures. Child gestures mirrored those results of parents use at both ages. There were age gains for points, objects and conventional gestures. There was an association for ethnicity and task interaction with Mexican children using more gestures than D or AA during number book task, and fewer in the bead task. Child speech results showed children used more during the number book task, and this increased over age, with larger vocabulary gains in this task above the others. There were also ethnicity difference vocalizations with M and AA using fewer than D. Results showed it was not necessarily the case that children who talked more used more gestures, instead when they did talk there was a higher probability that they would use a gesture Mother use of gestures at 14 and 24 months was significantly associated with infant gestures at 24 months. Mother gestures at 24 months were associated with infant vocalization at 24 months. Mother referential language at 24 months was associated with infant vocalizations and gestures at 24 months, Neither referential nor regulatory language related t infant speech at 14 months. M and D infants used more gestures than AA but did not differ from each other. M infants showed an

						advantage for receptive language but had smaller productive vocabularies than AA and D M and D mothers used more imitations and action sequencing than AA and the frequency of on all 3 tasks at 14 months also was shown to relate to outcome. By 24 months observed infant gestures were associated with higher action sequencing and imitations an M ethnicity related to receptive language at 24 months Gestures at 14 months related to infant 24 month old receptive language skills By 24 months both maternal referential language and infant gestures associated with higher scores Infant action sequencing and imitations gestures at 24 months negatively associated wt infant receptive language skills. In summary there are ethnical differences between groups in terms of use of gestures with verbalisations and these in turn impact upon several measures of child language development.
Venuti, de Falco, Esposito, Zaninelli & Bornstein Trento, Italy 2012	To compare the functional relations of parental speech directed to children with Autism, Down Syndrome, and age matched typically developing children	60 Italian mother-child dyads *Parents:* Mothers age M = 35.95 (4.93) All married Education differed between groups *Children:* 20x typically developing 20x downs syndrome 20x autism Children's chronological age M= 24.70 (SD = 3.91) developmental age M = 24.60 (SD = 8.31) and	Videotaped naturalistic joint play observations in a room familiar to the families. Set toys provided by the researcher Observations ran for 10 minutes Parental speech categories were based on existing schemes by Delia Corte, Benedict & Klein, 1983; Folgar & Chapman, 1978, Morikawa, Shand & Kosawa, 1988; Penman et al., 1983; Rondal, 1985; Sherrod et al., 1978; Toda et al., 1990. Transcripts were compiled using CHAT (CHILDES) methods 25% random check on all data Cohen's kappa .79-.96	*Parents:* Encouragement Discouragement Nonsense Greetings Mimics Singing and reciting Onomatopoeia Conventions Direct statements Questions Descriptions Childs action Child internal state Parent Environment Unintelligible speech Non-affect Non-information speech Mother speaking on behalf of toy Number of words, Number of utterances MLU on words *Children:*	*Affect-salient speech:* Encouragement Discouragement Nonsense Greetings Mimics Singing and reciting Onomatopoeia Conventions *Information salient speech:* Direct statements Questions Descriptions Childs action Child internal state Parent Environment *Child name use* *Other*: Non-affect Non-information	Results showed several significant differences between the groups for maternal language features. For affect salient speech there was a main effect for group. Mothers of children with downs syndrome used more salient speech than typically developing mothers. ASD mothers did not differ significantly form either group. There was also a main effect for group on use of the child's name. ASD mothers used more than TD mothers but did not differ from DS. Sub-category analysis revealed a main effect for group for direct statements, with ASD and DS mothers using significantly more than TD mothers, but were not significantly different from each other. For questions both ASD and DS mothers used significantly fewer frequencies than TD mothers, and again these differences were not significant. Referents to children's actions showed a main effect for group with ASD and DS mothers using more than TD mothers. Referents to the mother showed a main effect for group with ASD and DS retrieving similar results, with both less than TD. Child language results showed that ASD children used shorter MLU than TD, and fewer utterances than TD

			Number of words Number of utterances MLU in words	speech Mother speaking on behalf of toy	and DS. Correlations of children's MLU, utterances and maternal language properties showed that there were no significant relationships for utterances in any group. Positive correlations were found for maternal language and MLU in the TD group. These were found in descriptions and MLU, and referents to environment and MLU. DS and TD also differed significantly in descriptions and MLU, and referents to the environment and MLU. In summary mothers of ASD, DS and TD children use different frequencies of language during interaction, which relates to MLU outcomes for the children

APPENDIX E

Hart & Risley (1995) Category Definitions

Category	Description
Vocabulary*	
Noun	A noun identifies a person, thing or an idea, quality or state. Excludes proper nouns.
Verb	A verb describes what a person or thing does. An action, a change, a situation, or an event.
Modifier	A modifier changes, restricts or adds meaning to another word. Includes adjectives and adverbs.
Functor	A factor provides a link between words to join them together. Includes prepositions and conjunction words.
Social Communicative Function	
Declarative	A statement of fact.
Imperative	A direct request of the child to do or say something.
Wh- Question	A question that begins with what, where, how, when, why.
Yes/No Question	A question that requires simply a yes/no answer.
Auxiliary Fronted Yes/No Question	A question that requires simply a yes/no answer but the question begins with an auxiliary verb i.e. should, would, could.
Alternate Question	A question that asks the child to choose between two options.
Affirmatives	A verbal positive sign of affect. Includes praise, encouraging statements.
Reflections	A reflection of the child's previous verbalisation.
Expansions	An expansion of the child's previous verbalisation.
Prohibition	A verbal negative or critical sign of affect.
Prohibitory Imperatives	A direct request of the child to not do or say something.

Category	Description
Parent-Child Conversational Turn**	
Initiations	Any verbalisation that begins a conversation that occurs after 5 seconds of a previous verbalisation.
Response	Any verbalisation that follows within 5 seconds of a previous verbalisation from another speaker.
Floor Holding	Any verbalisation that follows within 5 seconds of a previous verbalisation of the same speaker.
Sentences	
Present, Past or Future Tense	Coded on the basis of the tense of the verb in the main clause
Two or more clauses	Coded when any utterance contained a noun clause, adverbial clause, a relational clause or a conjoined clause

*Standard Oxford Dictionary definitions **Applied to both parent and child

APPENDIX F

Chapter Three Summary Table

Author(s)	Context	Observation Length (minutes)	Age of child (months)		Recruitment Sample Size (dyads)	Assessment Sample Size (dyads)	Follow Up Assessment (months)	Data/Attrition
			Time 1	Time 2				
Hart & Risley Kansas, USA 1992	Daily Routines	60	9	36	50	40	30	Longitudinal study – 20% attrition
Hart & Risley Kansas, USA 1995	Daily Routines	60	9	36	50	42	30	Longitudinal study – 16% attrition
Giromaletto et al., Toronto, Canada 2002	Naturalistic Free-play	15	23-24	N/A	20	20	N/A	Cross-sectional one off assessment
Hoff & Naigles Florida, USA 2002	Daily Routines	43	16-31	18-33	NS	63	2.5	Selected - Drawn from longitudinal study
Hoff Florida, USA 2003	Daily Routines	43	16-31	18-33	NS	63	2.5	Selected - Drawn from longitudinal study
Rowland, Pine, Lieven & Theakston Liverpool, UK 2003	Naturalistic Free-play	120	20-25	32-37	12	12	12	Selected – Drawn from longitudinal study
Blackwell Tennessee, USA 2005	Daily Routines	30	27	51	2	2	24	Selected -Drawn from previous dataset

Author(s)	Context	Observation Length (minutes)	Age of child (months)		Recruitment Sample Size (dyads)	Assessment Sample Size (dyads)	Follow Up Assessment (months)	Data/Attrition
			Time 1	Time 2				
								CHILDES
Masur, Flynn & Eichorist Illinois, USA 2005	Bath time/Naturalistic Free-play	15	10	13, 17, & 21	20	20	11	Longitudinal study - 15% attrition but new families were recruited.
Pan, Rowe, Singer & Snow Harvard, USA 2005	Naturalistic Free-play	10	14	24 & 36	146	108	22	Longitudinal study. 16% attrition
Pancsofar, Vernon-Feagons North Carolina, USA 2006	Naturalistic Free-play	20	24	36	120	92	12	Selected -Drawn from longitudinal study. 23% attrition
Goldin-Meadow, Goodrich, Sauer & Iverson Chicago, USA 2007	Naturalistic Free-play	30	10	24	10	10	14	Longitudinal study – 0% attrition
Hurtado, Marchman & Fernald Stanford, USA 2008	Naturalistic Free-play	20	18 or 24	N/A	27	27	N/A	Cross-sectional one off assessment

Author(s)	Context	Observation Length (minutes)	Age of child (months)		Recruitment Sample Size (dyads)	Assessment Sample Size (dyads)	Follow Up Assessment (months)	Data/Attrition
			Time 1	Time 2				
Campisi, Serbin, Stack, Schwartzman & Ledingham Montreal, Canada 2009	Naturalistic Free-play	15	24-54	N/A	175	159	N/A	Longitudinal study follow up assessment. 9% attrition
Sung & Hsu Rhode Island, USA 2009	Naturalistic Free-play	20	13-23	N/A	42	42	N/A	Cross-sectional one off assessment
Taylor, Donovan, Miles & Leavitt Wisconsin, USA 2009	Clean-up task	7	24	N/A	63	63	N/A	Selected – Drawn from longitudinal study
Huttenlocker, Waterfall, Vasilyeva, Vevea & Hedges Chicago, USA 2010	Daily Routines	90	14	18	64	47	4	Selected - Drawn from longitudinal study. 27% attrition
Tamis LeMonda, Song, Leavell, Kahana-Kalman & Yoshikawa New York, USA 2012	Book reading, and play	12	14	24	324	226	10	Selected - Drawn from longitudinal study. 30% attrition

Author(s)	Context	Observation Length (minutes)	Age of child (months)		Recruitment Sample Size (dyads)	Assessment Sample Size (dyads)	Follow Up Assessment (months)	Data/Attrition
			Time 1	Time 2				
Venuti, de Falco, Esposito, Zaninelli & Bornstein Trento, Italy 2012	Naturalistic Free-play	10	24	N/A	60	60	N/A	Cross-sectional one off assessment

APPENDIX G

Comprehensive Table of Included Studies for Chapter Four Parenting Intervention Review

Intervention Author(s) Date & Location	Intervention Details	Sample Characteristics	Measures	Results
Mediation Strategies Klein & Alony (1993) Israel	1 x 1 hour weekly session in the home for 7 months. *Language Component* Taught meditational strategies that intend to change the child's behaviour, response of focus of attention. Affect, expand, reward and regulate.	*Randomised* 48 x Intervention 20 x Control *Attrition* 10% Intervention and 15% control. 88% retention overall. *Characteristics* Children mean age 12.07 months at beginning of study. *Assessment* 3-years post intervention	**Parents** 1. Observation for meditational interaction (OMI) *(reliability 0.85)* **Children** 1. Observed Mediational Behaviours *(reliability 0.87)* 2. PPVT No differences between groups at pre-intervention assessment	**Parents** *1.* E > C Focusing ($p < 0.001$) E > C Affective behaviours inc naming ($p < 0.001$) E > C Associating ($p < 0.01$) E > C Expanding ($p < 0.001$) E > C Requesting for expansions $p < 0.01$ E > C Encouraging with expansions ($p < 0.001$) E > C Encouraging with manipulation of task ($p < 0.05$) E > C Regulation with expansion ($p < 0.01$) E > C Request for regulation ($p > 0.01$) **Children** 1. E > C Naming ($p = 0.05$) E > C Association ($p = 0.03$) Significant effects for child sex and intervention: E > C Association ($p = 0.05$) Expansions ($p = 0.01$) 2. E > C ($p = 0.005$)

Intervention Author(s) Date & Location	Intervention Details	Sample Characteristics	Measures	Results
Project PRIMER (Producing Infant/Mother Ethnic Readers) Cronan et al., (1996) USA	Reading and literacy intervention. High intervention received 18 x 30 minute instructional visits in the home. Low intervention received three x 30-minute instructional visits in the home. Run by trained reading facilitators. *Language Component* Reading intervention that contains high level of literacy, teaching parents about conceptual development and modelling reading behaviours.	*Randomised* 83 x High Intervention 73 x Low Intervention 69 x Control *Attrition* 289 initially recruited. Data reported for only 225. 22% attrition. *Characteristics* Children aged 1, 2 or 3 years old at baseline. Mean age 29 months. Low-income, ethnically diverse Head Start families *Assessment* Upon completion of all instructional visits – approximately 4 months	**Parents** 1. Reading Frequency (self-report) 2. Duration (self-report) 3. Reading Styles (likert scale) 4. Reading ability (standardised test) 5. Teaching Behaviours (self-report) **Children** 1. Bracken Basic Concept Scale (3-year olds only) 2. MCDI (1 & 2 year olds only) 3. PRIMER language comprehension (1 & 2 year olds only)	**Parents** 1. HI > C ($p < 0.005$) LI > C ($p = 0.001$) 2. HI > C = LI ($p = 0.12$) 3. HI = LI = C 4. HI = LI = C 5. HI = LI > C number of concepts taught ($p < 0.005$) HI > C = LI asking questions ($p = 0.001$) **Children** 1. HI > C = LI ($p = 0.054$) 2. HI > C = LI ($p = 0.009$) 3. HI > C = LI ($p = 0.024$)
Parents as Teachers (PATS) Wagner & Clayton (1999) California, USA	Monthly home visits, lasting 45-60 minutes, until the child was 3 years old. Average 20 visits over the course of three years. All sessions delivered by trained parent educators. *Language Component:* Informational discussions about child development and preparing children for school.	*Randomised* 298 x PATS 199 x untreated control *Attrition* 43% attrition over three years. Data for 73% of the original sample. 70% retention for intervention and 77% control *Characteristics* Children recruited before 6 months. Low-income, ethnically diverse families *Assessment* Children assessed at 36 months	**Children** 1. PPVT (for children aged 3 pre-intervention only) 2. Developmental profile communication scale No differences between the samples at pre-intervention assessment	**Children** 1. E = C E > C for a sub-sample of Latina mothers ($d = 0.36$) E > C for a sub-sample that received the higher dosage of programme ($p < 0.01$) 2. E = C

Intervention Author(s) Date & Location	Intervention Details	Sample Characteristics	Measures	Results
Parents as Teachers (PATS teens) Wagner & Clayton (1999) Los Angeles, USA	Monthly home visits, lasting 60 minutes, until the child was 2 years old. Average 10 sessions. All sessions delivered by trained parent educators. *Language Component:* Informational discussions about child development and preparing children for school.	*Randomised* 177 x PATS Teens services alone 174 x Case management alone 175 x PAT teens + case management 178 x untreated control *Attrition* 57% attrition over three years. Data for 52% of original sample. 52% intervention and 51% control *Characteristics* Children recruited before 6 months. Mothers aged 15-18 years old. Low-income, ethnically diverse sample of Latino, African-American and Caucasian families *Assessment* Children assessed at 36 months	**Children** 1. PPVT (for children aged 3 pre-intervention only) 2. Developmental profile II communication scale No differences between the samples at pre-intervention assessment	1. E = C 2. E = C

Intervention Author(s) Date & Location	Intervention Details	Sample Characteristics	Measures	Results
Dialogic Reading Programme Huebner (2000) Seattle, USA	2 x 1 hour parent training sessions conducted 3 weeks apart. Conducted by trained librarian in small groups of 6 parents. *Language Component* Reading intervention that teaches parents to encourage child participation during story time. Aim is to reduce undesirable reading behaviours such as reading without child participation.	*Randomised* 2:1 88 x Intervention 41 x Control *Attrition* From baseline to post test 11% attrition. *Characteristics* Children aged 24 to 35 months at the beginning of the study Middle class, ethnically diverse families. Assessment: Post-test assessment 6 weeks after intervention and a 3-month follow up.	**Parents** 1. Parent Reading Behaviours *(reliability between 0.72 to 0.98)* Dialogic Reading Behaviours - wh-questions, questions about function or attributes, repetition, labelling, imitative, directives, praise, open ended questions, expansions, reading without child. Non-dialogic reading behaviours - yes/no questions, pointing questions and criticisms. **Children** 1. PPVT 2. Expressive one-word picture vocabulary test 3. Illinois test of psycholinguistic abilities 4. Child verbal behaviours *(reliability .61 to .98)* Including nonlexilised vocalisations, one-word utterances and multiword phrases No differences between groups pre-intervention except for living with partner and on child EOWPVT.	**Parents** 1. E > C for dialogic reading behaviours post-intervention ($p < 0.001$) (*NS*) at 3 month follow up E < C for non-dialogic reading behaviours post-intervention ($p < 0.001$) (*NS*) at 3 month follow up **Children** 1. E > C (*NS*) at 6 weeks or 3 month follow up 2. E > C (*NS*) post-intervention or 3 month follow up 3. E > C ($p = 0.003$) post-intervention E > C (NS) at 3 month follow up. *4.* E > C ($p < .001$) post-intervention.

Intervention Author(s) Date & Location	Intervention Details	Sample Characteristics	Measures	Results
Peers Early Education Partnership (PEEP) Evangelou, Brooks & Smith (2007) Oxford, England	Weekly attendance of group sessions ran by group leader. *Language Component* Literacy intervention that uses music, rhyme and rhythm.	*Randomised* Quasi-experimental – propensity score matching for randomisation based on 10 demographic factors. 301 x Intervention at community-based level 303 x Control 172 x Intervention at subgroup level where parents attended at least one session *Attrition* 29% attrition in PEEP and 34% attrition in control. *Characteristics* Low-income families in PEEP catchment areas. *Assessment* Conducted at child age 1, 2, 3, 4, and 5 years.	**Children** 1. Bayleys (2nd birthday) 2. MCDI (2nd birthday) 3. British Abilities Scale II (3rd & 4th birthday) 4. Phonological awareness Rhyme (4th & 5th birthday) 5. Phonological awareness Alliteration (4th birthday) 6. Concepts about print (4th & 5th birthday) 7. Writing (4th& 5th birthday) 8. British Picture Vocabulary Scale (4th birthday) 9. Picture similarities (5th birthday) 10. Letter identification (5th birthday)	**Children** 1. C > E at community level & sub-group 2. C > E at community level & sub-group 3. C > E at community level & sub-group 4. C > E at community level Over time E > C at community level from 2-5 (*d* = 0.29). Over time E > C at sub-group level from 2-4 years (*d* = 0.35), and 2-5 (*d* = 0.44). 5. C > E at community level Over time E > C at sub-group level from 2-4 years (*d* = 0.37). 6. C > E at community level Over time E > C at sub-group level from 2-4 years (*d* = 0.46), and 2-5 (*d* = 0.50). 7. C > E at community level Over time E > C at community level from 2-5 (*d* = 0.36), and 4-5 (*d* = 0.34). 8. C > E at community level Over time E > C at community level from 2-5 (*d* = 0.48), and 4-5 (*d* = 0.22) Over time E > C at sub-group level from 2-4 years (*d* = 0.41), 2-5 (*d* = 0.61), 4-5 (*d* = 0.25) 9. C > E at community level or sub-group level 10. C > E at community level Over time E > C at community level from 2-5 (*d* = 0.47), and 4-5 (*d* = 0.21). Over time E > C at sub-group level from 2-5 (*d* = 0.65) and 4-5 (*d* = 0.19).

Intervention Author(s) Date & Location	Intervention Details	Sample Characteristics	Measures	Results
Playing and Learning Strategies (PALS) Landry et al., (2008) Texas, USA	11 sessions lasting 1.5 hours in the home. Conducted by trained facilitators. *Language Component* Targeted responsive parenting strategies including contingent responses, emphasis on verbal scaffolding.	*Randomised* 34 x PALS I & II (E1) 49 x DAS I & II (C) 33 x PALS I & DAS II (E2) 50 x DAS I & PALS II (E3) *Attrition* From the original sample of 242 families that had previously participated in the first phase 222 were eligible, but only 166 agreed to participate – 75% retention. *Characteristics* Term and very low birth weight children (only results for term children reported here). Families recruited when the child was aged 24 to 33 months old. *Assessment* Baseline, assessment at session 5, one month following programme completion and a 3-month follow up.	**Parents** 1. Observed verbal behaviours *(reliability .64-.81)* Including affective emotional (contingent response, warm sensitivity and positive affect) Cognitively Responsive (maintaining/directing, verbal scaffolding/encouragement) **Children** 1. PPVT 2. Preschool Language Scale 3rd ed 3. Observed verbal behaviours *(reliability .62 - .85)* (responses and initiations, use of words, joint attention, child cooperation with requests, positive affect and quality of social engagement) Only parent age significantly different for groups pre-intervention.	**Parents** 1. PALS I & II > other three groups for contingent responsiveness* (p = 0.024, d = 0.51) PALS I > than other groups for warm sensitivity* (p = 0.021, d = 0.29) PALS I > than other groups for maintaining (p = 0.038, d = 0.32 PALS I & II > than other three groups for redirecting (p = 0.008, d = 0.39) PALS I & II for term children > other groups for rich maternal language (p = 0.032, d = 0.52) PALS II > other groups for verbal engagement (p = 0.013, d = 0.25) **Children** 1. PALS II > other groups (p = 0.022, d = 0.36) 2. PALS II term children > than other groups for comprehension (p = 0.022, d = 0.38) and expressive (p = 0.001, d = 0.38) 3. PALS II > other groups for cooperation (p = 0.044, d = 0.30) PALS II > other three groups for social engagement* (p = 0.006, d = 0.30) PALS II > other groups for use of words (p = 0.006, d = 0.37) Mediation: warm sensitivity and contingent responsively mediated the effect of PALS I on child co-operation, social engagement, word use and coordination of attention. Contingent responsivity mediated the effect of intervention on PPVT outcomes.

Intervention Author(s) Date & Location	Intervention Details	Sample Characteristics	Measures	Results
Dialogic Reading Intervention Huebner (2010) Washington, USA	2 x 1 hour parent training sessions conducted 3 weeks apart. Conducted by trained librarian in small groups of 6 parents. *Language Component* Reading intervention that teaches parents to encourage child participation during story time.	*Randomised* 2:1. 41 x intervention 37 x control *Attrition* 108 families eligible for follow up 28% attrition *Characteristics* Children aged 24 to 35 months at the beginning of the study. *Assessment* Children 4-years at follow up	**Parent** 1. Observational measures of reading behaviours (reliability .86) Dialogic Reading Behaviours - wh-questions, questions about function or attributes, repetition, labelling, imitative, directives, praise, open ended questions, expansions, reading without child. Non-dialogic reading behaviours - yes/no questions, pointing questions and criticisms. **Children** 1. Observational measures of reading behaviours (*reliability .95 to .99*) Multiword sentences MLU	**Parent** 1. E > C on dialogic reading behaviours at 4 years (d = 0.57) 90% more than control **Children** 1. E > C on the association between number of dialogic reading behaviours and number of multi-word sentences (p = 0.01) at 4-year assessment when adjusting for other predictors including child age, maternal education and frequency of reading.
Responsive stimulation and feeding intervention Aboud & Akhtar (2011) Klansman, Bangladesh	Control received regular health and nutrition programme for 7 months – 12x informational sessions Responsive stimulation delivered in 5x weekly sessions in addition to regular informational sessions Responsive feeding delivered in 6x weekly sessions *Language Component* Informational sessions on child development and maternal responsive strategies	*Randomised* Prior to recruitment 16x villages randomised 110 x Control 92 x Responsive Feeding stimulation 100 x Responsive Feeding + intervention *Attrition* At post-test 3% attrition. At follow up 6% attrition. *Characteristics* Mothers and children aged 8-20 months. Poor and very poor wealth samples. *Assessment* Baseline, 2-week post-test and a follow up	**Parents** 1. Responsive talk *(reliability > .90)* 2. Verbal Responsiveness *(reliability > .90)* 3. Directive Talk *(reliability > .90)* **Children** 1. Bayleys Scale of Infant Development (follow up only) Differences between groups at pre-intervention assessment.	**Parents** 1. E > C (p < 0.001, d = 0.40) at 2-week post test E > C (p = 0.003) at follow up 2. E = C (*NS*) at 2-week post-test and (*NS*) at follow up 3. E = C at 2-week post-test (NS) and follow up (NS) **Children** 1. E > C (p = 0.02, d = 0.35) at follow up

Intervention Author(s) Date & Location	Intervention Details	Sample Characteristics	Measures	Results
Playing and Learning Strategies (PALS) Landry et al., (2012) Texas, USA	1.5 hour sessions conducted in the home for 11 weeks. Conducted by trained facilitators. *Language Component* Targeted responsive parenting strategies during reading.	R*andomised* 34 x PALS I & II (E1) 33 x PALS I & DAS II (E2) 50 x DAS I & PALS II (E3) 49 x DAS I & II (C) *Attrition* 264 families originally participated in PALS I. 222 were eligible for inclusion in the current study, of which 166 participated – 75% retention. *Characteristics* Term and preterm low birth weight children aged 24 to 28 months. Data is only reported for term children here. Mid to upper class samples. *Assessment* Baseline, post test one month after home visit 11 and 3 months post intervention.	**Parents** 1. Observed maternal behaviours Affective (praise, encouragement, responses) Cognitive linguistic (scaffolding, verbal prompting) (*reliability > .80)* **Children** 1. Observed child behaviours (Response & initiations, use of words, joint attention, child expansions with requests, positive affect, quality of social engagement) Only different at pre-intervention assessment for parental age.	**Parents** 1. PALS I & II > other groups praise and encouragement (p = 0.05, d = 0.34) and higher levels of techniques to promote child talk, expansions, lead-ins and talk (p = 0.025, d = 0.30). PALS II > other groups for verbal support (p = 0.13, d = 0.76). PALS I & II > than other groups for questions that required the child to think more broadly (p = 0.025, d = 0.38). PALS II associated with greater gains in responsiveness (p = 0.020). **Children** 1. PALS I > than other groups for cooperation (p = 0.007, d = 0.68) at post-test and follow up PALS II > than other groups for verbally responses (p = 0.057, d = 0.30) post-test PALS II > than other groups for asking more questions and made more requests. (p = 0.010, d = 0.16). PALS I & II term children > than other groups for statements (p = 0.029, d = 0.23). Mediation: The effect of PALS II on children's verbal responses use was mediated by parental language facilitation (p = 0.05). Effect of PALS II on children questions mediated by time parent spent reading (p < 0.05) Effect of PALS I & II on children's comments mediated by parents use of praise and encouragement (p < 0.001). Effect of PALS I & II on child engagement mediated by maternal language facilitation techniques (p = < 0.001).

Intervention Author(s) Date & Location	Intervention Details	Sample Characteristics	Measures	Results
Parent-Child Mother-Goose Programme Terrett, White & Spreckley (2013) Melbourne, Australia	20x 2 hour sessions with trained facilitators ran in child development centres *Language Component* Promote positive parent-child relationship and language development using songs, nursery rhymes and stories.	*Randomised* Matched for child age and sex. 29 x Intervention 22 x Control *Attrition* None specified *Characteristics* Recruited from health centres Mean age at baseline 14.2 months (SD = 13) *Assessment* 15 weeks after baseline assessment	**Children** 1. Preschool Language Scale Auditory comprehension 2. Preschool Language Scale Expressive communication	**Children** 1. E > I (p = 0.07, d = 0.51) 2. E > I (p = 0.02, d = 0.65)

APPENDIX H

Data Extraction Sheet

Data Extraction Sheet

Title of Paper:

Author(s):

Date of publication:

Screening:

Eligibility criteria	Yes	No	Possibly
Study Type			
Population sample			
Child age			
Child language outcomes measures			
Control group			
Parent education programme			
Component of language included			
Experimental study			

Include article: Yes No

General information:

	Description in article
Participants (inc. gender, ethnicity)	
Sample size	
Randomisation	
Blinding	
Child Measures	
Parent Measures	
Attrition	
Aim of study	
Intervention Details	
Intervention Setting	
Risk of contamination	
Duration of follow up	
Results	
Explanation for missing data	
Conclusions	

Include article: Yes No

APPENDIX I

Personal Data Health Questionnaire, Hutchings (1996)

Personal Data and Health Questionnaire

(1) BACKGROUND DETAILS

1a. Child's DOB …… Child's Age …… Sex: M ☐ F ☐

1b. Carer's DOB …… Carer's Age …… Sex: M ☐ F ☐

1c. What is your preferred language for speaking……...……

1d. What is your child's preferred language for reading…….

1e. Relationship to child:

Biological parent Step-parent

Parent's partner (living together) Adoptive parent

Foster parent Other adult relative (state)

1f. How old were you when your first child was born?……..

2. PREGNANCY

2a. How did you feel when you discovered you were pregnant?

2b. Did you have any problems during pregnancy?

2c. Did you suffer from depression when you were pregnant?

2d. Were there any problems / difficulties at the time of the child's birth?

2e. How long were you in labour for?

2f. Did you have a normal or caesarean delivery? (if normal was it forceps / ventouse; if C-section was it planned or emergency?)

2g. How did you feel after the birth?

2h. Did your baby have special needs / Was your baby premature?

2i. How long did it take for you to bond with your baby?

2j. How did you feed your baby? (how long for?)

3. CHILD'S HEALTH AND DEVELOPMENT

3a. Was your child easy to manage as a baby?

3b. Has your child suffered any health problems so far, apart from normal childhood illnesses) or sustained serious injuries?

3c. Has your child ever been in hospital? (if yes, please state reason, and how many times)?

3d. How would you describe (child's) development so far (in terms smiling / babbling / walking / talking *deep on age).

3e. Do you have any concerns about your child's health / development? (if yes has your child been referred for these problems? Treatment?)

3f. How long have you had these concerns / how long have these problems been going on? Age of onset?

3h. Anything else that you would like to tell us about (child's) health or development?

3j. Have you ever attended a Webster-Stratton Incredible Years Parenting Programme?

4. CARER'S HEALTH

4a. Have you suffered any significant health problems since the birth of your child?

4b. Have you felt low/depressed following the birth of your child?

4c. Are you currently on any medication?

5. OTHER HOUSEHOLD / FAMILY MEMBERS

5a. What is your marital status?

Single, never married	Living together
Separated	Widowed
Divorced	In relationship but living apart
Married	

5b. Spouse / partner's relationship to child:

Biological parent	Step-parent
Parent's partner (living together)	Adoptive parent
Foster parent	Other adult relative

5c. How involved is your partner with the upbringing of your child (index)?

5d. Would they be available to join the parenting group?

5f. Who else shares your household?

(*include siblings of index child and ages and DOB*)

……

……

6. FAMILY HEALTH

6a. Have any other family members had serious health problems?

6b. To your knowledge, has any member of your family ever had problems with drugs and/or alcohol?

6c. So what is the current situation?

……

6d. Have ANY of your children (or any other member of your family) - to your knowledge - been in trouble with the police (or been involved in any form of criminal activity)?

7. RELATIONSHIPS (if applicable)

7a. Parents of children who show some difficult behaviour sometimes claim that these problems have an effect on their adult relationship(s). Do you feel that your child's behaviour is having such an effect on your relationship with your partner?

……

7b. (If in relationship) How would you rate the quality of your relationship with your partner?

Bad ☐

Poor ☐

Mixed ☐

Good ☐

Excellent ☐

8. HOUSING

8a. Is your home:

Owned

Council / housing association rented

Privately rented unfurnished
Privately rented furnished

Other

Please give details……..

8b. Condition of the building (RATED BY RESEARCHER)

Good……..Acceptable……..Substandard

8c. How many bedrooms do you have use of?

9. PRIMARY CARER'S EDUCATION

9a. How old were you when you left school?

9b. Did you gain any qualifications at school?

9c. Did you receive further or higher education after leaving school (e.g. College, NVQs, YTS etc.)?

10. INCOME

10a. Income: Which category would best describe your total weekly income? That is what you actually get in each week to spend on living costs.

£200 or below ☐

£201 - £250 ☐

£251 - £300 ☐

£301 or above ☐

10b. Is this income made up mostly of:

State benefits (such as Job seeker's allowance / income support) ☐

Other benefits that subsidise wages (e.g. WFTC) ☐

Maintenance payments for child(ren) ☐

Wages ☐

Other ☐

APPENDIX J

Coders Impression Inventory

Coder Impressions Inventory

(revised 2007)

Coder's Name _____

Coder
○ Primary
○ Secondary

CID ☐☐☐☐

Time ☐

Mom/Other ○ Dad/Other ○

Reliability?
○ No
○ Yes

Coder ID ☐☐

Date ☐☐ / ☐☐ / ☐☐

For each of the items in the inventory, fill in the circle that is the best description. Please fill in the bubble completely - ***use a black felt tip pen or a black pen, no pencils please!*** If the father is present, do a separate inventory for him.

1. The child's conduct during this observation session was generally:
   ○ Spectacular ○ Very good ○ Okay ○ Average ○ Below average ○ Very poor ○ Awful

		No basis	Did not occur	1-3 examples	4 or more examples
2.	The child did not comply with at least one parental request/command.	0	1	2	3
3.	The child did not comply, *and* the parent followed up with another command/reprimand.	0	1	2	3
4.	The parent threatened punishment for misbehavior. ("If you do that again, I'll hit you.")	0	1	2	3
5a.	The parent threatened punishment for misbehavior and followed through.	0	1	2	3
5b.	The parent warned child of consequence if misbehavior continued ("If you can't keep the crayons on the paper, I'll need to take them away.")	0	1	2	3
6.	The parent made unreasonable request(s) (e.g., age-inappropriate, too high standards, impossible to comply with.)		1	2	3
7a.	The parent showed disapproval or criticized child.		1	2	3
7b.	The parent said 'no'.		1	2	3
8.	The parent used guilt induction to get compliance.	0	1	2	3
9.	The parent gave rationales (not lecturing, but simple, clear reasons) when appropriate.	0	1	2	3
10.	The parent tried to pleasantly tease, kid or humor the child out of sour mood, conflict, etc.	0	1	2	3
11.	The parent clearly pinpointed the infraction/misbehavior when disciplining.	0	1	2	3
12a.	The parent labeled the misbehavior, but no follow-through or punishment.	0	1	2	3
12b.	The parent used distraction and redirection to divert child's attention.	0	1	2	3
13.	The child did something clearly prosocial (extra nice, volunteered, did something for family, was cooperative), and the parent gave a positive response.	0	1	2	3
14.	The child did something clearly prosocial (extra nice, volunteered, did something for family, was cooperative), and the parent ignored it (or paid no attention.)	0	1	2	3

Parent used any of the following

15.	Time out, other social isolation.	0	1	2	3
16.	A sticker program or contingent rewards (no evidence & didn't happen = 1, chart evident or uses once = 2, actively using = 3)		1	2	3
17.	Withdrawal of privileges.	0	1	2	3
18.	The parent seemed to provoke the child into arguments.		1	2	3
19.	The parent used sarcasm in a denigrating or hurtful way.		1	2	3
20.	The parent modeled or prompted positive behavior for child (gave child words to say.)		1	2	3
21.	Paid attention when child talked or asked questions.		1	2	3
22.	Problem-solved with child.		1	2	3
23.	Did not pay attention when child talked.		1	2	3
24.	Ignored child's inappropriate behavior in a planned way.	0	1	2	3
25.	Discussed/planned a future activity with child (in which both parent and child might participate.)		1	2	3
26.	Parent encouraged the child to try something new to promote skill development.		1	2	3

APPENDIX K

IT-Home (Caldwell & Bradley, 2003)

IT-HOME - 38

Infant/Toddler HOME Record Form

Place a plus (+) or minus (-) in the box alongside each item depending on whether the behavior is observed during the visit, or if the parent reports that the conditions or events are characteristic of the home environment. Enter the subtotals and the total on the Summary Sheet. **Observation (O), Either (E), or Interview (I) is indicated for each item.**

I. RESPONSIVITY		24. Child has a special place for toys and treasures. **E**	
1. Parent permits child to engage in "messy" play. **I**		25. Child's play environment is safe. **O**	
2. Parent spontaneously vocalizes to child at least twice. **O**		**IV. LEARNING MATERIALS**	
3. Parent responds verbally to child's vocalizations or verbalizations. **O**		26. Muscle activity toys or equipment. **E**	
4. Parent tells child name of object or person during visit. **O**		27. Push or pull toy. **E**	
5. Parent's speech is distinct, clear, and audible. **O**		28. Stroller or walker, kiddie car, scooter, or tricycle. **E**	
6. Parent initiates verbal interchanges with Visitor. **O**		29. Cuddly toy or role-playing toys. **E**	
7. Parent converses freely and easily. **O**		30. Learning facilitators—mobile, table and chair, high chair, play pen. **E**	
8. Parent spontaneously praises child at least twice. **O**		31. Simple eye-hand coordination toys. **E**	
9. Parent's voice conveys positive feelings toward child. **O**		32. Complex eye-hand coordination toys. **E**	
10. Parent caresses or kisses child at least once. **O**		33. Toys for literature and music. **E**	
11. Parent responds positively to praise of child offered by Visitor. **O**		34. Parent provides toys for child to play with during visit. **O**	
II. ACCEPTANCE		**V. INVOLVEMENT**	
12. No more than 1 instance of physical punishment during past week. **I**		35. Parent talks to child while doing household work. **I**	
13. Family has a pet. **E**		36. Parent consciously encourages developmental advance. **I**	
14. Parent does not shout at child. **O**		37. Parent invests maturing toys with value via personal attention. **I**	
15. Parent does not express overt annoyance with or hostility to child. **O**		38. Parent structures child's play periods. **I**	
16. Parent neither slaps nor spanks child during visit. **O**		39. Parent provides toys that challenge child to develop new skills. **I**	
17. Parent does not scold or criticize child during visit. **O**		40. Parent keeps child in visual range, looks at often. **O**	
18. Parent does not interfere with or restrict child more than 3 times during visit. **O**		**VI. VARIETY**	
19. At least 10 books are present and visible. **E**		41. Father provides some care daily. **I**	
III. ORGANIZATION		42. Parent reads stories to child at least 3 times weekly. **I**	
20. Child care, if used, is provided by one of 3 regular substitutes. **I**		43. Child eats at least one meal a day with mother and father. **I**	
21. Child is taken to grocery store at least once a week. **I**		44. Family visits relatives or receives visits once a month or so. **I**	
22. Child gets out of house at least 4 times a week. **I**		45. Child has 3 or more books of his/her own. **E**	
23. Child is taken regularly to doctor's office or clinic. **I**			
TOTALS I_____ II_____ III_____ IV_____ V_____ VI_____ TOTAL _____			

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APPENDIX L

Transcript Example

Transcript _XXX__
Toddler RCT BL COMPLETE
Last 15 minutes only

Time	Speaker	Adjacency	0.00 – 5.00
15.00	C	In	Cries
15.05	P	In	Whats that?
15.10		In	Whats that noise?
15.11		Fh	Plane?
15.15		Fh	Plane?
15.16	C	Res	Coos
15.17	P	In	Plane?
15.21		Fh	Can you hear it outside?
15.30	P	In	Whats the matter?
15.32		Fh	You're not taking that off look
15.37		In	Cheeky
15.40		Fh	You'll get cold
15.42		Fh	Can you see it?
15.44		Fh	You cant see it from down here cause it's too high look
15.48		Fh	See that one?
15.50		Fh	That one goes round
15.52		Fh	That one goes round
16.00	P	In	That one
16.04		Fh	Can you see?
16.08		Fh	Can you see?
16.12		Fh	No?
16.19	C	In	Babbles
16.22	P	Res	You want your blanket
16.27		Fh	Ta
16.27	C	Res	Babbles
16.30	P	In	Aw have a lie down then

APPENDIX M

Coding Sheet

Participant_____ BL/FU

	Tally	Total Score
Nouns		
Different Nouns		
Verbs		
Different Verbs		
Modifiers		
Functor		
Total Words		
Total Different Words		
Parent Initiation		
Child Initiation		
Parent Response		
Child Response		
Parent Floor-hold		
Child Floor-hold		
Declaratives (statements)		

Imperatives (commands)		
Wh-Questions		
Yes-No Questions		
Alternative Questions		
Auxiliary Fronted Questions		
Affirmatives		
Prohibitions		
Reflections		
Expansions		
Prohibitory Imperatives		

APPENDIX N

Coding Reliability Procedures Manual

PhD Coding Procedures – Reliability Checks

20% of transcripts, baseline and follow-up, need to be randomly selected by an independent observer. This second-coder needs to double-check all information displayed in the transcripts are correct and detailed sufficiently. This would include checking for missing information and filling in gaps.
Make sure all changes on the transcripts are made in **RED**

Transcripts

Reliability videos need to be played back alongside the original transcript. Originally they were coded using MPlayer on the Mac, please try and use the same programme for consistency. Coder will need to check that:

a. The transcripts contain all parent-child verbalisations. If either parent or child is talking to another person in the room then this is not included in the original transcript but a note should be made for periods of apparent silence.
b. The timings for each verbalisation made by the parent and the child are correct on the transcript
c. Each speaker is correctly identified for their specific verbalisation on the transcript

Coding

Each transcript must be coded for the following language categories:
Adjacency Condition – the turn of the speaker
Discourse Functions – the type of response the parent is trying to elicit from the child
Vocabulary – the types of words the parent is using with the child

Adjacency Condition

Initiations – any verbalisation made the speaker that is used to initiate a conversation OR any verbalisation made by a speaker that is made 5 seconds after the last speaker.
Response – any verbalisation made within 5 seconds of the previous speaker as a response to their verbalisation
Floor-holding – any verbalisation made by a speaker that follows within 5 seconds of that speakers last verbalisation

Discourse Function

Do not code – unless direct imitations of the child's previous verbalisation:

Any verbalisation that does not contain any content.
Uh-oh's
Oh
Uh-uh
Woo
Play noises including animal noises

Ah ah ah's
Laughing
Wow if not directed at the child or a product of the childs behaviour
Verbalisations at other people in the room
Ow – unless directed at child because they just caused the parent some pain.
Shhh
Code any book reading from the parent to the child as statements even if the prose has questions in.

Declarative (**D**) Statements
These are any verbalisations that are statements of facts. These can be one-word answers or an answer containing one or more words.

Examples:
This is pink
A giraffe
That's cool (to an object)
That's a lovely picture of a balloon (if the child has not drawn it)
The ball is blue
That's mummies hat
Tommy is at school
One. Two. Three (x3 statements)
One, two three (x1 if in succession with no pause)
No (if there is no intonation in the voice and is an answer to a question)
Yes
Its raining
The child is smiling
Thomas is happy
Sure

If unsure which category a verbalisation fits into always code Declarative.

Imperatives (**I**) Demands – these include any verbalisation that is used to change the child's behaviour. These can be attention ally directive i.e.
Look at this
Look
Tommy! (code any childs name alone as an imperative)
Or they can be used to change the child's behaviour:
Come here
Come on
Put that there
Sit down
Smell this
Leave that there
Do that for mummy
Go and pick that up
Show me your smile
Ready, steady go.

Go on

Any imperative used to stop a childs behaviour is coded as Prohibitory Imperative (**PI**) and must not be coded as a normal imperative. PI's must be included in the final total for all prohibitations. Examples:
Don't do that
Stop that
You mustn't touch that
You must not do that to your sister
Don't hit me
You shouldn't kick your brother

Further examples at the end

Interrogatives Questions – any verbalisation that is used to elicit a verbal response from the child. These are coded separately as:

Wh- Questions (Wh-)
Any questions that begins with ***What/Where/How/When/Why***

Examples:
Where is your hat?
What colour is this?
How many do we have here?
When do you want to leave?
Why did you hit me?
Where is fireman Sam?
When did you do that?
Why do you think Thomas is sad?
How does daddy do it?
Where are you going to now?
What are you up too?
Where is your aeroplane?
How do you think she will fit in there?

Yes/no Questions (YN)
These are any questions that require either a yes or a no answer – there is no other kind of response that could be elicited and therefore these are pretty easy to spot. They should not be confused with alternative questions.
Examples:
Is this postman pat?
Are you thirsty?
Is pink your favourite colour?
You having fun?
Are you ready?
You hungry?

Is that nice?
Are you being shy?
Is this one blue?
Has he fallen off the roof?
Am I being bob the builder?

Auxiliary fronted yes/no Questions (Aux)
These are any yes/no questions that begin with the following auxiliary verbs: ***Be/do/have/may/might/can/could/shall/should/will/would/must/ought to***.

Code this category only if the auxiliary verb falls at the beginning of the sentence. Code Auxiliary question even if the childs name appears before the question. For all other verbalisations if the verbalisation does not begin with an auxiliary verb then code as a simple yes/no question.
Examples:
Have you had enough now?
Can you try that piece of the puzzle?
Do you want another go?
Shall we try this one?
Could you pass me the block?
Should I have a go?
Tommy, **do** you want to have a go?
Sam **have** you got the hiccups?
Harry, **would** you like a drink?
Kai, **might** it be an idea to turn it around?
Can you think of another way?
Can you do it for mummy?
Should we try it this way?
Could we try that later?
Will you try for mummy?

Alternative Questions (Alt)
These questions are quite rare and can usually be hard to spot, or can even be spread over two verbalisations. In this event code the first half of the verbalisation as either wh-/YN/ or aux fronted but then the second verbalisation as the alternate. Alternate questions are higher order questions than Auxiliary fronted, therefore even if the alternate question begins with an auxiliary fronted verb i.e. if the point of the question is to give the child a choice between two options always code as an alternate question.
Examples:
Postman pat or fireman Sam?
Shall we try the puzzle or the blocks?
Is that pink or red?
Chocolate or biscuit?
Do you want Fireman Sam (Aux)…..or Postman Pat (Alt)

You will also need to code verbalisations from the parent as either

1. **Affirmatives**

2. Prohibitations

Affirmatives (Off)– This category is made up of all explicit positive parent approvals of the childs behaviour. This category includes Reflectives and Expansions but these must be coded separately then added to the final affirmative score.

Examples of normal affirmatives:
Yay
Well done
Clever girl
Thank you
I love you
That's it
Clever
Good girl
Excellent
Brilliant
Awesome
Amazing
That's good sharing
Good talking Sam
You have a beautiful smile.
Mummies so proud of you

These must all be in response to something the child has said or done.

Reflectives (Ref) – This category is made up of any parent verbalisation that merely repeats the childs verbalisation with no elaboration. For younger children who are not speaking in complete words yet a parent reflective is merely restating the childs verbalisation in a grammatically correct way with no elaboration

Examples of reflective:
Child says 'Ta. Parent says 'Ta'
Child says 'boo" parent says "blue"
Child says yeah parent says 'yeah'

Expansions (Exp) – This category is made up of any parent verbalisation that expands upon a childs verbalisation but still maintains the same content/message.

Examples of Expansions:
Child says 'blue" Parent says "Blue block"
Child says 'bear', parent says "the big brown bear"

If unsure as to which category of affirmative the verbalisation belongs to just code into affirmative.

Prohibitations (P) are any verbalisation made by the parent that is explicit disapproval of the child.

Examples:
You're cheeky
That's enough

That's naughty
That's disgusting
We!
No! if said with force)
Oi!
Acki y fi
Acki
Kai I mean it!
Dirty
You slobber
You minger
I said no
You're going to break that in a minute
You're really getting on my nerves

Prohibitory Imperatives (PI)
Any imperative used to stop a childs behaviour is coded as Prohibitory Imperative (**PI**) and must not be coded as a normal imperative. These can be distinguished from normal prohibitions by the fact *they are telling the child what not to do*. PI's must be included in the final total for all prohibitations. Examples:
Don't do that
Stop that
Stop messing about
You are **not** going outside
Pack it in now
Don't touch that
You **should not** be playing with that
You **mustn't** kick your sister
I'm telling you now **you are not** going to the party
Don't hit the wall
Not on mummies sofa!

Final scores for prohibitations also include **PI's** (described above). If unsure as whether verbalisation is a precipitation or a prohibitory imperative just code prohibitation.

Vocabulary

All parental vocabulary needs to entered into an Excel spreadsheet to allow for computation of total words and total different words. Go through each transcript word for word and enter into the database. Each new word should be entered in the left hand column, any repetitions of this word should be entered into the right hand column.

Vocabulary needs to be coded for:

a. Nouns
b. Verbs
c. Functors
d. Modifiers
    i. Adjectives
    ii. Adverbs

Use the online dictionary to code individual words into categories

Dictionary Instructions

Completed transcripts have already been assigned a database in the excel spreadsheet. Use the database for that specific transcript. For an 8-page transcript it is taking roughly 2 hours to complete 1 dictionary. I have already completed 2 for you in the excel file to have a look at and see what I'm doing. Only include parent verbalisations – do not input the childs verbalisations as I do not need these.

1. Each individual word **(from the parent only)** needs to be written in the far left hand column. This includes individual variations of words e.g. **that's (1 word)** and **that is (2 separate words)** or **ball** and **balls (2 separate words).** For toy names i.e. **Postman Pat** these will need to be entered as 2 separate words. For Welsh words such as **Yck-i-fi** enter as if English.

2. Each word needs to be tallied in the next column as you go along to avoid repetitions in the far left hand column – when the word appears the first time do not tally it in this second column – wait until the second repeat has occurred and stick a 1 in this column as I have a computational score set up for final total scores and this will mess up this calculation.

3. It helps to sort the data in alphabetical order as you go along – if you do this make sure you have selected both columns (word and repeat) otherwise it will mess up the totals for each word.

4. Save the data file as you go along – complete with a date for when this has been saved – also include your name in the file name so I can copy and paste over completed dictionaries in to the main one when you are done i.e. Participant Dictionary database 16.11.2011

5. Finally, do not use the final two columns on the right hand side as I need these for further analysis.

One more thing – a massive thank you from me to you if you manage to do any ☺

APPENDIX O

Schedule of Growing Skills II Scoring Sheet

chwarae • dysgu • tyfu
play • learn • grow
dechrau'n deg • flying start

RHESTR SGILIAU TYFU II
SCHEDULE OF GROWING SKILLS II

GL assessment
the measure of potential

Ffurflen Gofnod/Record Form

Rhif Achos/Rhif GIC	Case / NHS No.
Enw	Name
Cyfeiriad	Address
Enw a Chyfeiriad Meddyg Teulu	GP Name & Address
Dyddiad Geni □□/□□/□□ D M B	Date of Birth □□/□□/□□ D M Y
Dyddiad Geni Disgwyliedig □□/□□/□□ D M B	Expected Date of Birth □□/□□/□□ D M Y
Rhyw Gwryw / Benyw (cylchwch os gwelwch yn dda)	Gender Male / Female (please circle)
Grŵp ethnig	Ethnic Group
Dehonglwr (ticiwch os defnyddiwyd un)	Interpreter (tick if used)

	Asesiad Un Assessment One	Asesiad Dau Assessment Two	Asesiad Tri Assessment Three	Asesiad Pedwar Assessment Four
Aseswyd gan (ticiwch un) Assessed by (please tick one)	□ Lleoliad Dechrau'n Deg □ Ymwelydd Iechyd Dechrau'n Deg □ Flying Start Setting □ Flying Start Health Visitor	□ Lleoliad Dechrau'n Deg □ Ymwelydd Iechyd Dechrau'n Deg □ Flying Start Setting □ Flying Start Health Visitor	□ Lleoliad Dechrau'n Deg □ Ymwelydd Iechyd Dechrau'n Deg □ Flying Start Setting □ Flying Start Health Visitor	□ Lleoliad Dechrau'n Deg □ Ymwelydd Iechyd Dechrau'n Deg □ Flying Start Setting □ Flying Start Health Visitor
Dyddiad Date	□□/□□/□□ D/D M/M B/Y	□□/□□/□□ D/D M/M B/Y	□□/□□/□□ D/D M/M B/Y	□□/□□/□□ D/D M/M B/Y
Oed Age	□□/□□ M/M B/Y	□□/□□ M/M B/Y	□□/□□ M/M B/Y	□□/□□ M/M B/Y
Sylwadau Comments				
Gweithred Action				
Archwiliwr Examiner				

Gall llungopio anghyfreithlon arwain at erlyniad.

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APPENDIX P

Reflective Commentry

Reflective Commentary

After completing an undergraduate degree in Psychology at Bangor I decided to undertake an MSc in Clinical Psychology part-time to allow myself to gain experience in the work place whilst keeping my toes in the academic pool. It was half way through my MSc that I was employed by the Centre for Evidence Based Early Interventions (CEBEI; formally known as Incredible Years Wales) to undertake a 12-week GoWales placement working on a variety of research projects, including the Incredible Years Parent-Toddler Programme randomised controlled trial, as a research assistant. It would be an understatement to say this did not completely change my life. In the space of three months I went from not really knowing what field of Psychology to specialise in, to someone who was adamant that child development research was the right career path. I would like to think that my passion, drive and ambition for research shone through, because at the end of the 12-weeks Judy kindly offered me an extension to continue working in the centre until the end of my MSc, with the opportunity of starting a PhD thereafter.

I initially began the PhD with good intentions in October 2010 under the supervision of Tracey Bywater, with Judy as my second supervisor. The original aim was to design and validate an observational coding scheme to screen children for language difficulties. In the beginning I was incredibly driven, but after twelve months of continual issues, including recruitment, supervisory and committee changes, and the widespread availability of language screening tools, I had to face a difficult situation, and rethink the entire PhD.

At the end of the first year, when Tracey left for York and Judy took her place as my first supervisor, the PhD underwent a major overhaul. Judy proposed using an

established coding scheme, and coding the videotapes of parents and children interacting (collected during the IYPTP RCT that I had helped to collect) to measure parental language and assess the effects of intervention. After the initial panic wore off I set about planning my next two years. The first few months were spent redrafting the aims and objectives of the PhD, researching and understanding the coding scheme and calculating how much time I would need to transcribe and code all 160 half-hour videos. When I saw the figures in black and white I knew that, to turn this PhD around in two years, I needed a miracle.

I will never look back at the PhD process with regret or remorse. The last three years have enabled me to grow as an individual, and have given me a wealth of knowledge regarding the relationships between parents and children. However, it is the hard-calls, and the hurdles that I have had to overcome that I will be most thankful for. Whilst these challenges may have tested my patience, ability and sanity, they have also provided me with valuable life experiences that I will continue to apply in the future. Upon reflection, there are no regrets, just lessons learned.