Scottish Book Trust
inspiring readers and writers

Evidence review: How sharing stories, songs and rhymes can support early language development, bonding and attachment, and parental wellbeing

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Introduction to the Bookbug programme: Bookbug bags, Sessions and digital resources

The Bookbug programme gifts free bags of books and resources to all children at four different stages from birth to Primary 1. Each bag contains three age-appropriate books (new books are selected by an independent panel each year), and additional resources for supporting reading, singing, and rhyming in the home. Bookbug bags with Scottish Gaelic books/resources are also available and there is a selection of tactile books for families and children who need additional support. Bookbug Baby Bags (gifted at 3–5 weeks) and Bookbug Toddler Bags (gifted at 13–15 months) are distributed by Health Visting teams, as specified in the Universal Health Visiting Pathway in Scotland; Bookbug Explorer bags (gifted at 3 years) are distributed through early years settings; Bookbug Primary 1 family bags (gifted during first year of primary school) are distributed by schools.

Families are supported to read and sing with their children and use their Bookbug bags with free Bookbug Sessions which take place in libraries and community venues across Scotland. Bookbug Sessions are led by trained Session Leaders, who facilitate the sharing of stories, songs, and rhymes between caregivers and their children. Bookbug Sessions are also run in languages other than English (e.g., Gaelic, Spanish, and Polish) in some areas of Scotland. Scottish Book Trust also supports Bookbug for the Home, which involves providing training for home visitors, family support workers, and others seeking to read, sing, and rhyme with infants at home. The online Bookbug Story Library and the Bookbug app also enable caregivers to find new stories, songs and rhymes, with exemplary video/audio content to encourage families to find ways to fit reading, singing and rhyming into their day.

Key elements of the Bookbug programme

The three key elements which extend across all aspects of the Bookbug programme are shared reading, singing and rhyming (in groups at Bookbug Sessions, guided by Bookbug for the Home facilitators at home, and between caregivers and their children throughout their daily activities). The Bookbug programme aims to help caregivers and children incorporate shared reading, singing, and rhyming into their

daily routines to help build an early love of stories and give children 'the best start in life'[1].

Shared reading

Shared reading involves a joint, interactive experience between a child, their caregiver, and a book. Shared reading is most effective when children are engaged[2], and when they and their caregiver share 'joint attention' on the book[3] (joint attention is discussed in more detail below). Book sharing and reading aloud can involve reading out loud directly from the text and/or 'extra-textual talk' – talking around the text and pictures (e.g., pointing to and naming illustrations, counting objects, asking comprehension questions, or using books to spark conversation).

Shared reading can form part of a literacy-supportive Home Learning Environment (HLE); indeed, a key feature of a literacy-supportive HLE involves starting shared reading early in a child's life and including it as part of a regular routine[4]. Within the HLE, shared reading can be thought of as a 'cultural praxis' (a process or activity) which is distinct from – although likely related to – 'cultural capital' (material aspects e.g., the number of books in the home). In this sense, shared reading can be a means of improving the quality of the HLE to support the development of children's linguistic and literacy abilities[5].

Songs and rhymes

Songs and rhymes are composed of rhythmic linguistic information, usually containing repeating structural patterns and lyrics (the difference between songs and rhymes being that songs tend to have a melody; rhymes have regular patterns of sounds but don't require a melody). Singing and rhyming may have played an important evolutionary role, for example, in promoting synchronisation and co-operation, group cohesion, and identity[6]; while research surrounding the origins of music as an evolutionary adaptation (and therefore a universal, human phenomenon) is inconclusive, it is true that musical outputs – from singing and rhyming to instrument playing – are found across cultures[7]. Young children often engage in 'spontaneous singing' – singing to themselves as they go about their everyday activities. These may be songs they have learnt, as well as improvised or

adapted songs used for their own purposes (e.g., play). In this way, a large repertoire of learnt songs and rhymes can act as a means of expression and exploration for children, and can support play, creativity, and connection with others[8].

By helping caregivers to share stories, songs and rhymes with their children from the earliest stages in their development, the Bookbug programme aims to support children's early language skills, bonding between caregivers and their children, and parental wellbeing. To explore the extent to which shared reading, singing and rhyming can support these aspects, this report will review existing research evidence which links these activities with language, bonding, and wellbeing outcomes for children (pre-birth–5 years old). The report will:

- Summarise what is known about early language development, both in utero and after birth, and explore how features of Bookbug (e.g., shared reading, rhyming, and singing) could support this
- Examine how shared reading, singing and rhyming can support bonding and attachment between caregiver and infant
- Outline how these activities can support the mental health and wellbeing of both caregivers and children

Early language development

The 2023 report on early child development from Public Health Scotland indicated that at 13–15 months most parental concerns were associated with children's speech, language, and communication development (6%; as well as gross motor movement, also 6%). At 27–30 months (13%) and 4–5 years (7%) most concerns were again noted about speech, language, and communication. Notably, at 27–30 months (about 2 and a half years), this proportion is 2.3 times higher among children living in the most deprived areas (26%) than those in the least deprived (11%)[9]. This indicates that speech and language difficulties are a significant area of concern for many parents, and that the role of socioeconomic status is especially important to consider (although the link between the two is complex and should not be overstated – discussed in more detail below). As well as parental concerns about speech and language development, a recent report by Speech and Language U.K. estimated that approximately 1.9 million (1 in 5) primary and secondary school-aged children are behind with speaking and/or comprehension. The organisation suggests that these children are six times less likely to reach the expected standard in English at age 11, are twice as likely to have a mental health problem and are twice as likely to be unemployed as an adult[10]. Additionally, as speech, language and communication skills are foundational for many aspects of child development, including social interaction, 'school readiness', academic achievement and emotional wellbeing, understanding and addressing concerns about early language development – and providing accessible resources to support parents and children during this period – are essential.

Language development in utero

The development of language begins before infants are born. Hearing is operational, although not adult-like, from around the 20th week of gestation. Sounds are transmitted to the fetus via bone conduction, through the amniotic fluid and fetal skull, into the inner ear. This means the fine detail of sound is lost but the melody, rhythm and stress of speech (prosody) are preserved. During gestation, babies become attuned to the prosodic aspects of the language(s) they are exposed to in utero – this is called 'prosodic bootstrapping'[11]. To give an example, English is a

stress-timed language, meaning that stressed syllables occur at regular intervals, usually on content words (e.g., nouns, main verbs, adjectives and adverbs; 'I'm **go**ing to the **shop** to **buy** some **milk**.'). In English, stress plays a crucial role in distinguishing words and conveying meaning. In the womb, babies exposed to English become sensitive to these specific stress patterns. However, a language like Japanese lacks stress-based distinctions like those found in English. Instead, pitch accent patterns play a crucial role in conveying meaning and grammatical distinctions; babies exposed to Japanese in the womb become attuned to these specific pitch patterns. This in utero exposure to different language features such as stress and pitch patterns may contribute to babies' early auditory processing skills and familiarity with the phonetic characteristics of their native language once they are born.

Studies have shown that newborn babies display preferences for speech sounds and rhythmic patterns that resemble those of their native language. For example, newborn babies can discriminate between unfamiliar languages if they are rhythmically different[12], recognise and prefer their mother's voice, and recognise and prefer stories which have been heard frequently in the womb[13]. This suggests that in utero exposure to the prosodic features of a particular language influences infants' preferences and sensitivity to those features after birth. While in utero exposure alone may not determine a child's ultimate language proficiency, it may create a predisposition or advantage for learning specific phonetic features of their native language. In cases where fetuses are exposed to multiple languages in utero (e.g., due to bilingual or multilingual parents), they may demonstrate enhanced phonetic flexibility (being able to adapt and modify the pronunciation of words or sounds in different contexts) and perceptual sensitivity (the ability to detect and discriminate between different stimuli) after they are born. Therefore, early exposure to diverse linguistic input through stories, songs, and rhymes may facilitate later language learning and bi/multilingual development[14]. Additionally, singing and rhyming often employ rhythmic patterns, repetitive structures and extended vowel sounds, features which are particularly conducive to fetal auditory processing as they can be more easily detected and processed by the developing auditory system. Therefore, engaging in activities such as singing, rhyming and storytelling whilst infants are in

utero could promote sensitivity to native language patterns, supporting subsequent language development after birth.

Language development after birth

After birth, children's language development generally progresses through a series of distinct but overlapping stages. Beginning with cooing (0–6 months) and babbling (6–12 months), children rapidly begin to develop and expand their vocabularies (12–24 months), learn about grammar and syntax (2–3 years), and develop conversation skills (3–5 years). Most children follow similar patterns of development in any given language, albeit at different rates. Some research has suggested that certain variables such as gender[15] and socioeconomic status[16] may account for variability in early language skills. However, these studies tend to rely on Western-centric (and often English-speaking) samples and methods and may not accurately reflect everyday language use. Indeed, as knowledge and language skills are not directly observable, proxy measurements – such as vocabulary size estimates or parental self-report – are usually used to quantify 'language ability'. These proxies likely vary in the extent to which they reflect children's everyday language behaviour[17]. Some more recent studies have used wearable recorders to capture what children hear and say across the course of a day[18]. As this approach reduces the potential for observer bias relative to analysing shorter video recordings or using parental report, it is considered more ecologically valid (more likely to be generalisable to 'the real world'). Use of this approach with a large (N=1,001; 2 to 48 months old) international sample indicated that the amount of adult talk that children are exposed to is related to the amount of speech they produce[19]. Longitudinal studies, which track children's language development over time, have also shown that language environments are strongly related to differences in vocabulary and grammar skills[20] (although the content / quality of communication may be more important than quantity[21 22], discussed in more detail below). Though compelling, it is important to emphasise that it is still not possible to determine causality from such findings. It may be the case that language-rich environments cause children to produce more speech. Alternatively, it could be that children who are more vocal elicit more speech from adults, or that a third variable (or variables; e.g., genetics, personality, childcare context) increases both child and adult speech. This emphasises the importance of

taking a nuanced perspective on language development, rather than taking a binary approach (e.g., that a certain variable either does or does not increase language ability).

In the last decade, the importance of the home learning environment in developing children's early literacy skills has become increasingly relevant to domestic policy[23]. In the late 1980s, the publication of *The Rumbold Report*[24] identified parents as the 'first educators' of their children and the home learning environment as being key to supporting learning and literacy outcomes well before school. It is now well established that literacy practices within families play a crucial role in developing children's literacy[25]. In particular, shared reading can support children's early language development by providing opportunities for exposure to new words and grammar. Books often contain high lexical diversity – varied vocabulary – exposing infants to words which are different from (and rarer than) those words encountered in everyday conversation. Indeed, one piece of research found that nouns and adjectives are more common in book language, whereas pronouns are more common in child-directed speech. They also found that the words in books are often more 'structurally complex' in terms of the lexical features[26]. Books also offer the opportunity to be exposed to the same word in different contexts, which can help infants to learn and recognise new vocabulary[27]. In a piece of research carried out with 3-year-old children, children learned more new words during shared storybook reading if they were read the same stories repeatedly over the course of one week[28]. This may be because just one encounter with a new word is not enough for it to be stored in infants' brains; as the word is repeatedly encountered, there are more opportunities to store relevant information (like how it sounded, who said it and what it means), facilitating the creation of a more robust 'mental representation', which makes the word feel more familiar. Through repeated exposures to the same books and illustrations, children can form a robust representation of each[29]. This is because a child's first encounter with a storybook often requires that they pay attention to many different aspects, such as the overall plot, the setting, who the characters are, etc.; as they become more familiar with these aspects, they can direct more attention towards understanding the meaning of the individual words present in the text.

Infants can also learn about sentence structure, word order and grammatical conventions through books, and listening to stories read out loud can help them

develop listening comprehension skills as they follow the storyline and try to understand the meaning of the text. Comprehension can be further supported through conversations about texts between caregivers and children, especially where caregivers ask comprehension questions or encourage children to explore connections between the text and their own lives. Indeed, the extent to which parents use book talk to sustain their child's interest during shared reading has been shown to predict children's later vocabulary development[30]. Furthermore, lexical diversity in infant-directed speech has been shown to predict children's (14–30 months old) language skills more effectively than the overall number of words spoken[31], partly because children produce more diverse words when caregivers use more diverse words[32]. In this sense, the extra-textual talk associated with books can also support early language development. Shared reading also gives children more opportunities to develop more general processing skills, such as attention and memory, that facilitate language development[33].

A recent meta-analysis (a type of analysis which uses data from multiple different studies to establish trends in the findings) of 25 longitudinal studies found that shared book reading interventions (average duration of 90 minutes, across 6 to 130 weeks), where parents had been explicitly trained to increase their use of 'language-facilitating strategies' had significant effects on children's (0–8 years old) expressive vocabulary (the language they use to express themselves). Language-facilitating strategies included non-verbal and verbal turn-taking, responding to children's cues for joint attention, following the child's focus of attention, modelling language during shared attention, verbally responding to children's vocalisations, and expanding child utterances by modelling more complete or complex language[34]. These are all strategies which caregivers could develop and use when reading with their child to further facilitate the development of their language skills. In another meta-analysis of 20 studies, book-sharing interventions had a small positive effect on children's (1–6 years old) expressive vocabulary and receptive vocabulary (words they can understand when they hear them but do not necessarily use actively in their own speech). The analysis showed a slightly larger effect for interventions with longer durations (i.e., over 90 minutes), and in both cases, there was a slightly larger effect on expressive vocabulary than receptive vocabulary. In this study, group-based interventions were more effective than one-on-one interventions for both language

outcomes, however the authors note that a lack of studies in their analysis which used a one-on-one format means this finding should be interpreted tentatively. Finally, child age and parental post-school education did not have an effect on language skills[35]. This means that younger children did not benefit more than older children, and children whose caregivers had higher levels of post-school education did not benefit more than those whose caregivers had fewer qualifications. This suggests that providing training for caregivers in how to share books with their children can be successful in supporting language development across contexts and ages, even if there has not previously been a routine of book sharing.

On a neuroanatomical level, at 4–6 years old, the amount of adult-child conversation has been shown to correlate with the strength of connectivity in the left hemisphere white matter pathway connecting two language regions (Superior Longitudinal Fasciculus and Arcuate Fasciculus), independent of sheer volume of adult speech and socioeconomic status[36]. This suggests that promoting caregiver–child conversation during joint reading activities may support the development of structural regions within the brain which facilitate language ability (in children from all backgrounds). Importantly, the degree of knowledge the caregiver has about their child's language skills and world knowledge plays a role in determining the amount and quality of the shared reading practice (e.g., caregivers need to have the knowledge and skills to be able to select appropriate books and ask questions of appropriate difficulty)[37].

Another means by which shared reading may support children's language development is by facilitating joint attention[38]. Joint attention occurs when two or more individuals share focus on an object, event, or topic, and is often accompanied by verbal (e.g., speech) or non-verbal (e.g., gesture) communication. During shared reading, both child and caregiver are focused on the same story, and caregivers can promote joint attention further by pointing at illustrations, encouraging children to take turns pointing out elements of interest, and discussing the story together (notably, a responsive caregiver does not direct their child's attention but follows the child's lead, watching and listening carefully for communication[39]). Instances of joint attention include reciprocal communication exchanges – such as pointing, gesturing, and vocalising – which lay the foundation for early language development[40] and enable infants to begin learning conversation skills such as turn-taking. During

periods of joint attention, caregivers also often provide verbal labels, descriptions, and commentary related to the shared focus of attention (i.e., the book). This linguistic input helps children link words to objects, actions, and events, expanding their vocabulary and comprehension skills. Indeed, some research has shown that the extent to which speech occurs in episodes of joint engagement and attention, where there is a connected and contingent back-and-forth conversation between a caregiver and child, is a better predictor of language learning than quantity of exposure[41].

Research involving shared reading interventions has also found that some features of books themselves can be more engaging than others and can provoke more dialogue between caregivers and children. For example, more complex stories may encourage rich caregiver extra-textual talk (talk about the text), as caregivers seek to support their child's understanding through discussion. Indeed, various elements of a story such as the inclusion of a false-belief narrative, the opportunity to make predictions, and the genre of the book, can be more complex or abstract, facilitating more conversation beyond the text itself[42]. Other features such as the amount of text and the presence of illustrations may also influence the amount and quality of discussion; stories with less text might require / provoke more extra-textural talk[43] and stories with illustrations may facilitate more interactive readings[44].

Like shared reading, shared singing and rhyming can continue to benefit children's early language developed after birth. Because songs and rhymes often have exaggerated stress and pitch patterns, they can help children to learn about language structure and develop their phonological awareness (the ability to recognise and manipulate the sounds of language at the phoneme / individual speech-sound level). Additionally, many songs and rhymes have a predictable structure and pattern, which helps children continue to learn about the basic elements of language, including sentence structure, grammar, and syntax. Many songs also introduce new information within this predictable structure (e.g., adding a new verse with different vocabulary), meaning infant-directed singing can provide a balance between predictable and unexpected information which can help attract and sustain attention and support linguistic processing and learning[45].

Language development and socioeconomic status

Discussion around early language development often considers the role of socioeconomic status (SES). Socioeconomic status can be described as an individual's 'access to financial, educational, and social resources, and the social positioning, privileges, and prestige that are derived from these resources'[46]. When aiming to measure socioeconomic status, most investigations focus on parental education, family income and parental occupation (Scottish government uses equivalised annual household income, area deprivation [SIMD] and highest household level of education, amongst others), yet there is not yet a consensus on the most effective means of measuring socioeconomic status. Despite this, correlations with language outcomes exist across different domains, indicating that there is likely a robust relationship between the two, even though the nature and extent of this relationship remains unclear. To give some examples, in one U.S. study where socioeconomic status was measured by the education level of the primary caregiver and the annual family income level, differences between children from high and low socioeconomic backgrounds on measures of pre-verbal, vocabulary, grammatical, phonological and literacy development were identified as early as 14 months old[47]. In 2011, data from Growing Up in Scotland (GUS) indicated that children (3 and 5 years old) from more advantaged households 'significantly outperformed' those from less advantaged households, with parental education level being the most prominent predictor of children's expressive vocabulary ability[48]. However, in this report, parental education level was also related to other factors, such as maternal age and experience with home learning activities, which may also affect children's developing cognitive ability. This means that while inequalities in expressive language ability could exist upon entry to primary school, with less advantaged children already falling behind their more advantaged peers, the relationship between socioeconomic status and language outcomes remains a complex picture of numerous and interacting variables.

Despite this, reports do indicate that the 'gap' between the most and least advantaged children tends to 'widen' as they move through primary school: 'children living in higher income households, children in less deprived areas, and children with parent(s) educated to degree level improved *more*, relative to their peers, than those in the lowest income households, those in the most deprived areas, and those

whose parents did not have a degree, respectively'[49]. Hart and Risley's widely cited and influential '30 Million Word Gap'[50] has often been used to explain the differences between high-SES and low-SES children in performance on language assessments. The researchers estimated that by 3 years old, children from high-SES families had heard 45 million words, while low-SES children had heard only 13 million words (a gap of over 30 million). However, the study has been challenged by more recent research, which has highlighted its focus on the language 'deficiencies' of low-SES groups, rather than recognising that there are different language patterns which exist between groups[51]. The '30 Million Word Gap' theory also overlooks other aspects of children's language environments that may influence language ability[52]. For example, differences in early gesture production – which serves as a bridge between pre-verbal communication and spoken language – have been observed between children from high and low socioeconomic backgrounds, but this difference appears to be mediated by parents' use of gestures[53]. A study in Singapore found that that although infant vocabulary size estimates were predicted by parental education levels, parent–child book reading activities subsequently mediated the relationship between parental education and infant vocabulary size[54]. This indicates environmental factors such as parent-child interaction may explain differences in language outcomes over and above socioeconomic status. Additionally, some specific aspects of child-directed speech may account for socioeconomic differences in children's verbal outcomes. These include the length of parental utterances, and the number of different words and different combinations of clauses children are exposed to. Other important aspects of parent–child interaction include the timing of parental response to the child ('temporal contingency') and how related the response is ('semantic contingency')[55]. In addition, parental sensitivity and supportiveness may also partially explain associations between socioeconomic status and children's expressive and receptive language skills[56].

Socioeconomic status is also associated with access to resources which could support child development (e.g. books). In 2023, a survey carried out by the National Literacy Trust of 3,057 parents of children aged 0 to 18 years old reported that, due to the cost-of-living crisis, 20% of parents were buying fewer books and 24.8% were buying fewer educational devices for their children. These figures increased to 36.1% and 42.9% respectively for parents who were struggling financially as a result

of the crisis[57]. This indicates that children growing up in homes that are struggling financially may have reduced access to reading material than their more financially stable peers; programmes like Bookbug provide opportunities for children to have books of their own (through book gifting) and for caregivers to become familiar with books and resources which are available for free in their local library (through Bookbug Sessions).

In summary, the way in which SES operates in relation to child language outcomes remains unclear and overestimating the relationship between the two overlooks other influential factors such as the quality of their language environment and parental input. Indeed, a meta-analysis of studies examining the relationship between socioeconomic status and developmental outcomes (0–19 years old) concluded that the relationship 'is almost always explained by some combination of individual, familial, and community-level factors'[58]. Family-level factors included family cohesion, qualities of the parent–child interaction, parental discipline, parental coping and depressive symptoms, parental stress, familial support and exposure to violence. Gender and temperament (individual-level factors) and neighbourhood safety (a community-level factor) also played a role. Additionally, over-emphasising the link between socioeconomic status and development also risks perpetuating deficit narratives about children from more disadvantaged backgrounds. Pace et al., (2017) note that '[t]he majority of standardized vocabulary tests are highly structured and deeply embedded in the mainstream, middle-class culture, and might therefore depress the test performance of children from lower-SES [socioeconomic status] backgrounds...[a]s a result, SES disparities might reflect cultural differences in language socialization, rather than the language deficits of children from lower-SES homes'[59]. Whilst caregivers and children from lower SES backgrounds may want or need additional support, it is important to be considerate of the diversity of contexts in which children acquire language and to help them adopt practices which are sensitive to – and which support – their own cultural and social experiences.

Caregiver responsiveness and language development

Responsive caregiver behaviours can be described as 'behaviours that are contingent [prompt, meaningful, and reciprocal], follow rather than re-direct, and build on the infant's focus of attention and activity'[60]. Caregivers who are highly

responsive are sensitive to their infants' cues and respond to them reasonably quickly in a way which is well-matched to their infants' developmental level. Caregiver responsiveness has been positively related to several infant language outcomes such as number of vocalisations, vocabulary learning, word combinations, and turn-taking[61 62], as well as cognitive development and child pro-social behaviour[63].

Parental responsiveness can be influenced by parental stress (i.e., higher levels of parental stress correlate with lower levels of responsiveness)[64]. The Family Stress Model[65] suggests that financial stressors exert an influence on parents' psychological states, which impacts how they interact with their children (e.g., engaging in fewer nurturing behaviours). Additional contributors towards parenting stress include child behavioural management, parent age (i.e., mothers under the age of 21 are more likely to experience parental stress than those older than 21), child age (i.e. parenting stress may be particularly high in the infant and toddler years), parenting experience, and the co-ordination of everyday activities; these stressors have previously been theorised to act as predictors of children's outcomes, with parental responsiveness acting as a mediating factor between the two.

Bonding and attachment

'Bonding' is most frequently defined as an ongoing process between parents and babies[66]. It can be thought of as the emotional connection formed between a parent and their child. It encompasses the feelings of love, trust, and security that develop through consistent interactions, affectionate gestures, and responsive caregiving. Parent–child bonding is crucial for children's emotional, social, and cognitive development. Notably, 'bonding' is not the same as 'attachment'. While bonding relates to specific interactions between parent and child, attachment is a psychological concept which relates to the extent to which the child uses the parent as a 'secure base' and a 'safe haven' from which to explore the world.

Formulated by psychoanalyst and psychiatrist John Bowlby (1907–1990), Attachment Theory proposes that there are four different types of infant–parent attachment: three 'organised' types (secure, avoidant, and resistant) and one 'disorganised' type. The quality of attachment that develops between a child and a caregiver is largely determined by the caregiver's response to the child when the child's feelings of safety and security are threatened. For example, consistent 'loving' responses to infant distress (e.g., providing reassurance and comfort) will elicit 'organised' (i.e., consistent and predictable) secure responses to stress from infants (e.g., approaching and maintaining contact with the caregiver until they feel safe). Children whose caregivers consistently respond to distress in insensitive or 'rejecting' ways (e.g., ignoring them, becoming annoyed, or amplifying the infants' own distress) also develop 'organised' responses, but these are likely to be avoidant (e.g., avoiding the caregiver when distressed or minimising displays of negative emotion in the presence of the caregiver) or resistant (e.g., exaggerating displays of distress in response to inconsistent or unpredictable behaviour from the caregiver). Atypical caregiver responses to infant distress, including those which are 'frightening, frightened, dissociated, sexualised or otherwise atypical'[67] may cause the infant to develop 'disorganised' responses, whereby their behaviour in response to stress lacks a consistent pattern. Importantly, the quality of the infant–parent attachment is thought to be a powerful predictor of a child's later social and emotional outcomes[68].

Previous research has linked mother–infant bonding and the related quality of mother–infant interactions with infants' cognitive development, social competence,

and general intelligence[69]. Early parent–child bonding may also predict successful longer-term relationships between parents and their children[70]. The hormone oxytocin – often called the 'hormone of attachment' – has become a major focus in research into the biological factors that promote bonding and attachment. Oxytocin is thought to increase social sensitivity and central nervous system response to stress, playing an important role in the development of attachment between infants and parents[71]. A recent systematic review established that increases in child oxytocin levels reduce child withdrawal and increase social engagement with their caregiver, promoting bonding[72].

In terms of practices which can promote infant–caregiver bonding and attachment, shared reading may help establish early bonds between caregivers and children. For example, an early study found that infants and their mothers who engaged in shared reading were more securely bonded than those who did not[73]. Notably however, as this finding was correlational, it is not possible to establish whether shared reading facilitates a closer bond between parent and child or whether those who already have a close bond are more likely to engage in shared reading. Increased frequency of early shared reading has also been linked with reduced socio-emotional problems in children aged 30 to 66 months[74]. Possible mechanisms for this effect include joint attention and physical contact, the latter being linked to the production of oxytocin[75].

As well as being important for the wellbeing of the child, bonding is also important for caregivers. Reading aloud with children can boost adults' mood, particularly when there is a high level of interactivity between child and adult during the reading activity[76]. Shared reading may also reduce parental stress, with parent–child engagement in cognitively stimulating activities bringing about improvements in the parent–child relationship that reduce parental stress[77]. One study of 403 mostly low-income mothers in the U.S. (New York City)[78] found that increased shared book reading was associated with reductions in parenting stress and increases in early 'relational health' (the quality and patterns of early relationships and interactions between caregivers and children). Shared book reading when children were 6 months old positively predicted parent-reported warmth and observed parental sensitivity at 18 months old and negatively predicted parental stress at 18 months old. This effect remained even when controlling for shared reading quality and quantity, indicating that it was the act of reading more broadly that led to these

outcomes. Interestingly, the reverse relationship was not found (i.e., parenting stress and relational health at 6 months did not predict amount of shared book reading at 18 months old) which is contrary to previous research which has identified a reciprocal relationship between the two.

Bonding during pregnancy and post-birth has been associated with parents' mental health, with mothers categorised as anxious-ambivalent (an insecure attachment style) styles exhibiting poorer mental health than women with more secure bonding[79]. However, the direction of causality between bonding and mental health is hard to confirm. For example, some research suggests that parents with experience of trauma or who are experiencing depression may find it more difficult to respond sensitively and effectively to their infant's needs, thus compromising the development of secure parent–child attachment[80].

Singing has previously been discussed as an evolutionary adaptation designed to support mother–infant bonding[81]. Longitudinal studies which have looked at the effects of group singing over periods of several months have shown that singing is associated with significantly faster development of perceived closeness than other social activities (sometimes called the 'ice breaker effect')[82], and singing in a single instance has been shown to have a stress-reducing effect, leading to a decrease in both cortisol and cortisone (glucocorticoids produced as a physiological response to stress)[83]. One study, which explored the effect of a prenatal group singing intervention, found group singing to be associated with increased perceived closeness to the unborn child, reduced cortisol levels and increased oxytocin levels[84]. Singing can also lead to significant increases in perceived mother–infant closeness after birth, over and above talking and playing, with a single 35-minute session leading to significantly greater increases in positive affect and decreases in negative affect and cortisol levels in mothers than talking/playing[85]. On a longer-term basis, longitudinal studies have also found that women who sing to their babies in the 3 months following birth have significantly higher self-reported mother–infant bond as well as lower perceived stress[86 87]. In group settings, engaging in musical activities can promote interpersonal synchrony (co-ordination of behaviours), which can encourage pro-social behaviour[88] and empathy[89].

Parental wellbeing and mental health

Traditionally, conceptualisations of mental health and wellbeing have focused primarily on mental illness and diagnosis of disorder (e.g. depression). However, contemporary conceptualisations extend beyond deficit-focused definitions (i.e. that mental wellbeing is simply the absence of mental illness/disorder) and propose that mental health and wellbeing lie along a continuum[90]. Some researchers have conceptualised wellbeing as having a tripartite structure: emotional (hedonic), social and psychological (eudaimonic). Emotional/hedonic wellbeing typically includes subjective judgements of 'life satisfaction' as well as positive and negative affect (feelings/emotions); social wellbeing refers to feelings of being accepted, integrated and able to make a contribution towards society; psychological/eudaimonic wellbeing refers to 'positive functioning', which encompasses a number of concepts including self-acceptance, personal growth, purpose in life and feelings of autonomy[91]. Each of these elements will be experienced differently by different people, and can change over time and in response to myriad social and structural factors.

Protective factors occur throughout our lives and can strengthen resilience to stress and distress. Protective factors include our individual social and emotional skills and attributes, as well as positive social interactions, quality education, decent work, safe neighbourhoods and community cohesion, among others[92]. The presence of informal and formal support systems during pregnancy and the transition to parenthood may help parents cope with the stressors of early parenthood. For example, home visitors often provide material support and links to community systems of care, especially for younger and first-time parents who have less informal support (e.g. from family members)[93]. In this sense, Bookbug Sessions in local libraries and other community venues, and support from Bookbug for the Home practitioners provide opportunities to experience positive social interaction and build connection with the community.

In comparison with research exploring the link between shared reading, singing and rhyming and outcomes for children, there is much less research exploring outcomes which extend from these activities for caregivers. One study in Finland which investigated the effects of daily maternal singing on mothers of preterm infants (born between 26 and 33 gestational weeks) found a statistically significant decrease in anxiety levels after 7 weeks in mothers who were assigned to the singing

intervention group in comparison with those in the control group. In the self-report questionnaire, mothers reported that singing relaxed both them and their children and supported their relationship by promoting emotional closeness and creating early opportunities for interaction[94]. In terms of shared reading, one study indicated that greater quality and quantity of shared book reading when infants were 6 months old was associated with improved parent outcomes when the child reached 18 months old. These outcomes included reductions in parenting stress and increases in parental warmth and feelings of enjoyment regarding interacting with/parenting their children[95].

Postnatal depression

Much work which explores postnatal parental wellbeing has focused on postnatal depression. In the U.K., postnatal depression is estimated to affect one in ten new mothers, and eight in ten experience 'the baby blues' (temporary low mood which begins a few days postpartum and lasts for up to a few weeks)[96]. Although screening for postnatal depression in new mothers is not recommended in the U.K., lack of support may lead to long-term negative outcomes for both mothers and children. For example, women who have developed postnatal depression can experience impaired mental and psychological health (for example, lower self-esteem, anxiety, or emotional problems) as well as subjective lower quality of life and fewer social relationships[97].

Some research has also indicated that maternal depression may affect joint attention. For example, in one study where infants (6 to 30 months old) completed a 'gaze following' task found that maternal postnatal depression predicted later gaze following[98]. As gaze following (a component of joint attention) is important for developing communication skills, programmes which help caregivers and children engage in joint activities could be especially important for those who face additional postnatal mental health challenges. As Bookbug Sessions involve small groups of caregivers and children sharing songs, stories and rhymes together, research into shared singing practices are useful to explore. For example, some research has explored the potential for community group singing to reduce symptoms of postnatal depression. One randomised control trial in England compared the effects of a 10-

week programme of 60 minutes (one session per week) of either singing, creative play or 'usual care' interventions for mothers (of 0–9 month old infants) who were displaying symptoms of postnatal depression. They found that group singing, but not group creative play, led to faster recovery from moderate–severe symptoms of postnatal depression than did usual care. Based on focus groups with participants, they identified that group singing could (a) provide an authentic, social and multicultural creative experience for mothers; (b) calm infants, both within and outwith the sessions; (c) provide relaxing and immersive 'me time' for mothers; (d) facilitate a sense of achievement, identity, and purpose; and (e) enhance the mother-infant bond[99].

Conclusion

Sharing stories, songs and rhymes with children – even before they are born – can contribute towards early language development, social and emotional development and the formation of secure bonds with their caregivers. These practices can also have positive outcomes for caregivers themselves, including feelings of warmth and closeness with their child, reduced stress and other positive wellbeing. Sharing stories, songs and rhymes in group settings may also promote feelings of community support and be particularly beneficial for mothers experiencing postnatal depression and/or other challenges.

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