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Children's engagement and caregivers' use of language-boosting strategies during shared book reading: A mixed methods approach

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Abstract

For shared book reading to be effective for language development, the adult and child need to be highly engaged. The current paper adopted a mixed-methods approach to investigate caregiver's language-boosting behaviours and children's engagement during shared book reading. The results revealed there were more instances of joint attention and caregiver's use of prompts during moments of higher engagement. However, instances of most language-boosting behaviours were similar across episodes of higher and lower engagement. Qualitative analysis assessing the link between children's engagement and caregiver's use of speech acts, revealed that speech acts do seem to contribute to high engagement, in combination with other aspects of the interaction.

Keywords: shared book reading; engagement

Introduction

The goal of the present paper was to use a mixed-methods approach to investigate caregiver's language-boosting behaviours and children's engagement during shared book reading, and to determine the role these factors might play in explaining why shared book reading is such an effective child language promoting tool.

Shared book reading is the act of an adult sharing a book with a child or group of children (Noble et al., 2019). There are many different forms of shared book reading, one of which is interactive shared book reading, which involves the adult using a specific set of techniques to create a conversation about the book, as opposed to simply reading the text aloud. Interactive shared book reading has been shown to support a range of early language skills

including vocabulary (e.g., Elley, 1989; Farrant & Zubrick, 2013), narrative and conversation skills (e.g., Morrow, 1988; Reese, 1995), future reading ability (e.g., Bus, van IJzendoorn & Pellegrini, 1995), print awareness (e.g., Justice & Ezell, 2000, 2004), grammatical development (e.g., Valdez-Menchaca & Whitehurst, 1992; Whitehurst, Falco, Lonigan, Fischel, DeBarshye, Valdez-Menchaca & Caulfield, 1988) and phonological awareness (e.g., Chow, McBride-Chang, Cheung & Chow, 2008; Lefebvre, Trudeau & Sutton, 2011). Shared book reading exposes children to a wide variety of complex sentence structures, and lexically diverse language (Dawson, Hasio, Tan, Banerji & Nation, 2021; Montag, Jones & Smith, 2015). Furthermore, compared to other contexts such as free play, during shared book reading, caregivers have been found to produce higher levels of lexically and syntactically diverse child-directed speech (Noble, Cameron-Faulkner & Lieven, 2018).

Another reason that interactive shared book reading supports children's language development is that it provides a good context for learning language. During interactive shared book reading, the child and adult are said to be in joint attention with one another: that is, they are engaging in 'the visual sharing of attention with a social partner, in reference to an object or event of mutual interest' (Carpenter, Nagell, Tomasello, Butterworth & Moore, 1998). This has been linked to positive language outcomes in preschoolers (Farrant & Zubrick, 2013; Rees, Nadig & Rvachew, 2017). Having a clear joint attentional focus during shared book reading also provides the opportunity for the child and adult to engage in conversation. For example, it encourages the child to take turns and to produce and practice language, as well as providing an opportunity for the adult to model language boosting behaviours such as prompts, open questions, descriptions, expansions and recasts. The evidence also shows that parents tend to talk more, ask more questions, and use more non-immediate or decontextualised talk during shared book reading than in other play contexts (e.g., Curenton, Craig & Flanigan, 2008; Korat, 2009; Leech, Salo, Rowe & Cabrera, 2013).

Strategies like those described above also encourage children's active involvement. For example, techniques such as prompting the child with questions, expanding the child's responses, and asking open questions are all designed to engage children (Bojczyk, Davis & Rana, 2016). The quality of the interaction and how engaged the child is during shared book reading is, therefore, somewhat determined by what the adult does. Describing what is happening in the book, initiating turntaking, using wh-questions, and attentional directives during shared book reading have all been shown to promote children's language development (Bojczyk et al., 2016; Fletcher, Cross, Tanney, Schneider & Finch, 2008; Pine, 1991; Romeo et al., 2018; Snow et al., 1976). Conversely, asking fewer open-ended questions (Crowe, 2000), using more direct attentives (Bojczyk et al., 2016) and behavioural regulation strategies (Chang & Luo, 2020) can limit conversational opportunities (though for an alternative view, see Pine, 1991; Son & Tineo, 2016).

What is clear from the literature is that the highest quality shared book reading interactions rely upon reciprocal interactions to scaffold children's learning (Fleury & Hugh, 2018). High quality shared book reading interactions encourage children to ask questions, make predictions, form inferences, which then leads children to use and hear different new words (Chang & Luo, 2020; Hindman, Connor, Jewkes & Morrison, 2008). To describe these processes, we can borrow terms from the sociolinguistics literature: shared reading can be viewed as a 'transactional framework' in which the caregiver and child are operating as a community of practice (CofP) during shared book reading.

A CofP is defined within the field of sociolinguistics as "an aggregate of people who come together around mutual engagements in an endeavour. Ways of doing things, ways of talking, beliefs, values, power relations – in short, practices – emerge during this mutual

endeavour. As a social construct, a CofP is different from the traditional community, primarily because it is defined by its membership and by the practice in which that membership engages" (Eckert & McConnell-Ginet, 1992, p. 464). This definition implies that practices, be they linguistic or social, are negotiated and shared through interaction and engagement in a joint goal which, in our case, is shared reading. The definition and configuration of a CofP derives from the activities in which the members are involved, which thus certify their common bonds. A CofP involves the following three dimensions (Wenger, 1998, pp. 76-85):

1. Mutual engagement

This involves dense relations and regular interaction. When it comes to a main carer/child relationship, spending time together and jointly engaging in activities gives rise to shared experiences and an (inevitable) mutual engagement in different types of endeavours (e.g., shopping, bath time, bedtime routine, playing, cooking to name a few).

2. A joint enterprise

This relates to a shared goal, but it is not just a stated shared goal. It is the result of a collective process of negotiation. Shared reading works in this way as carers voluntarily agree to the intervention and carer/child mutually become involved in the shared reading activity. As we discuss in the qualitative analysis below, every dyad engaged with the activity differently and observed moments of low to high engagement are a result of this process of joint negotiation.

3. A shared repertoire

This is the discourse associated with being a member of the community and is acquired throughout the process of being a member and negotiating one's membership. It includes ways of saying, doing, thinking and acting in the world as well as shared values which are produced and reproduced through language. The concept of CofP shows how members of a group/community share ways of thinking, doing and acting, since a CofP is seen as "a group of people whose joint engagement in an enterprise is sufficiently intensive to give rise over time to a repertoire of shared practices" (Eckert and McConnell-Ginet, 1999, p. 185). A shared repertoire develops during shared reading between a caregiver and their child and reflects a similar worldview. Aspects of such a repertoire could include humorous strategies such as laughing at specific activities, repetition and uptake of each other's words and phrases but also wider evaluative comments and paralinguistic features.

Additionally, it is important to consider the role of the book itself. Although an under researched aspect of shared book reading, there is evidence that different elements of a book can provide children with different learning opportunities. For example, the use of an informational text in shared book reading can encourage more cognitively challenging discussions between children and adults (Price, Bradley & Smith, 2012), whereas books with illustrations have been shown to aid children's comprehension of those illustrations (Mantei & Kervin, 2014). In the current study an array of different age-appropriate books were used but with varied styles and word counts.

To summarise, interactive shared reading boosts children's language development partly because, during shared book reading, the adult and child work together in a CofP

with a clear joint attentional focus. This provides the opportunity for the child and adult to engage in real conversation and as a result, the adult can model language boosting behaviours such as prompts, open questions, descriptives, expansions and recasts, whilst producing more varied vocabulary and complex sentence structures.

However, what is often not considered in the shared reading literature is the fact that, for all the above to apply, the child and adult both need to be highly engaged in the book reading task. If either the child or the adult is not engaged (e.g., engagement is low, they are distracted, or not really listening), then it is unlikely that the adult gets the opportunity to model these language boosting behaviours, or that the child gets the opportunity to benefit from them. Given that shared book reading interactions are often of a reciprocal nature, it is thus important to understand both the caregiver's and the child's role in the interaction.

The first aim of this paper was, thus, to investigate what characterises high and low engagement during shared book reading and how engagement results from the quality of the interaction. In the past, engagement has been measured by concepts like child interest (Cline, 2010; Moody, Justice & Cabell, 2010) and components have included sustained visual attention to the storybook, coordinated attention to the parent, and verbal communication related to book content (Richter & Courage, 2017). Those studies that have measured engagement have often employed STATIC summative measures across the entire interaction, but the issue with such static measures is that they do not necessarily capture the dynamic aspects of engagement – namely, how engagement fluctuates over the duration of the interaction (Wicks, Paynter & Westerveld, 2020).

Additionally, very few studies have investigated the link between children's engagement and parental behaviours during shared book reading. One of the few studies to do so reported that, in a sample of 51 low-income families, mother's use of attention-getting utterances was associated with children's verbal engagement (as measured by several indicators; Son & Tineo, 2016). Conversely, visual engagement (measured by parent's and child's combined looks to the storybook) was not associated with mother's use of attention-getting utterances. However, Son and Tineo employed static engagement measures and did not explore the link between engagement and any other language-boosting behaviours during shared book reading, other than attention-getting utterances.

Only one study to our knowledge explored the relationship between engagement and several parents' language-boosting behaviours (Wicks et al., 2020). They measured parents' (i) use of book vocabulary, (ii) teaching of print-related skills, (iii) explicit teaching of story structure, and (iv) use of questions, in a sample of 40 preschoolers on the autistic spectrum. They found strong significant associations between children's visual attention, verbal engagement, and parents' use of questions and prompts during shared book reading. But again, verbal engagement was a static summative measure that may not adequately capture how engagement and parental language-boosting behaviours are related to one another, throughout the interaction.

Therefore, to date there has been very little work that acknowledges the role of dynamic measures of engagement and language-boosting behaviours in book reading interactions. As a result, it is not always clear how much children are engaging during shared book reading and what effect this may have on the quality of the interaction. In the current study, we measured how engaged children were during thirty second intervals, so that we got a measure of how engagement changed dynamically across the interaction.

The second aim of this paper was to identify the strategies that adults and children are using to encourage moments of high engagement. This will be explored through a CofP framework to establish the interactive and conversational features that are used by dyads,

and how they are used to set up a successful CofP. In the context of shared book reading, it has been argued that engagement is a dynamic process that fluctuates throughout the interaction (Fleury & Hugh, 2018; Ortiz, Stowe & Arnold, 2001). Therefore, there is an argument that engagement may not necessarily be tied to one variable. Related to this, Kucirkova, Messer and Whitelock (2013) have previously advocated that engagement should be measured with a range of qualitative and quantitative techniques. Qualitative approaches to shared book reading have focused on shared reading practices (Levy, Hall & Preece, 2018), and barriers to reading (Lingwood, Levy, Billington & Rowland, 2020b; Preece & Levy, 2018), but no studies to our knowledge have investigated children's engagement during shared book reading using a qualitative approach. To address this, we will use a qualitative approach to assess the link between children's engagement and caregiver's language practices during shared book reading.

In the current study, six dyads took part in a pre-intervention shared reading session where they were asked, using books provided by the researcher, to read with their child as they would normally for 10 minutes. Following this, they then took part in a Shared Reading 'intervention' group run by a local charity called the The Reader once a week for eight weeks. These families then took part in a post-intervention shared reading session where they were again asked to read with their child for 10 minutes the same books provided at pre-intervention stage. The shared reading sessions were video-recorded for offline coding and analysis.

Our research questions were as follows[1]:

Research Question 1: Are there more language-boosting behaviours in moments of high engagements than low engagement? The language-boosting behaviours were all based on previous coding schemes in the wider language development literature. We predicted that there would be more language-boosting opportunities in periods of high engagement such as longer joint attention, increased number of caregiver turns, desirable speech acts, and desirable speech act responses (see Tables 2 & 4 for more details on how language-boosting behaviours were chosen and categorised).

Research Question 2: Using a qualitative analysis approach, can we identify strategies that adults and children, together, use in interaction to produce moments of high engagement; i.e., can we establish what interactive and conversational features are used by dyads to set up a successful CofP.

Method

Sample

For this study, six primary caregivers and their 3- to 4-year old children ($M = 44.83$ months, SD = 4.22 months) were chosen for in-depth analysis from a wider sample of 85 families who took part in a randomised control trial testing the effectiveness of The Reader's shared reading programme (see Lingwood, Billington & Rowland, 2020a). Demographic details are displayed in Table 1. Participants were recruited from preschools in socially deprived areas of a large Northern city in the UK, as measured by English Indices of Deprivation (IMD), preschool size and Ofsted inspection and regulation ratings. Ethical approval was granted

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[1]In an original version of the manuscript we also tested 2 other hypotheses. These analyses were removed after the 1st round of reviews, but are available on Open Science Framework: https://osf.io/76x23/

Table 1. Demographic characteristics of sample at baseline. Numbers refer to mean (SD) for Children's age, and N (%) for all other rows.

Demographic characteristic	
Child age (Months)	44.83 (4.22)
Child sex	
Male	3 (50%)
Female	3 (50%)
Mother/Primary caregiver years of education[2]	
No formal qualifications	1 (17%)
1-4 GCSEs/O Levels (at any grade) NVQ Level 1	1 (17%)
5+ GCSEs (grades A*-C)/ O levels (passes)/NVQ level 2	3 (50%)
1 A Level/ 2-3 AS Levels	0 (0%)
2+ A Levels/NVQ Level 3	0 (%)
University degree/HND/HNC/NVQ Level 4 or 5	0 (0%)
Postgraduate degree or similar (e.g., PGCE, PhD, MA)	0 (0%)
Unknown	1 (17%)
Family household income per year	
£0–£14000	4 (67%)
£14001–£24000	1 (17%)
£24001–£42000	1 (17%)
£42000 or more	0 (0 %)

by the University of (Anonymised) ethics committee. All participating caregivers gave informed consent. At the end of the study, all caregivers were reimbursed with vouchers and books.

Materials

We identified four popular children's books for child and caregiver to read together during the shared book reading session. We wanted to choose books which families would not necessarily be familiar with. Therefore, we excluded any book titles or authors who had appeared in the title and author checklists that caregivers filled out, as described in Lingwood et al. (2020a). Taking these restrictions into account, the following children's books were used during the shared book reading session: King Jack and the Dragon by Peter Bently (Bently, 2011); Beautiful Bananas by Elizabeth Laird (Laird, 2004); The

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[2]GCSEs are exams taken at the end of British high school when the student is 15 or 16 years old. Five passes at Grade C or higher are considered roughly equivalent to a U.S. high school diploma. A-Level exams are generally taken 2 years later when students are 17 or 18 years old. A-Levels are most similar to American Advanced Placement courses.

Storm Whale by Benji Davies (Davies, 2011); and Goodnight Gorilla by Peggy Rathmann (Rathmann, 1994).

A video camera on a gorilla pod was used to capture the shared reading session. The camera was usually placed towards the back of the living room, rather than directly in front of the caregiver and child.

Procedure

Primary caregivers and their children were a subsample of those who took part in a larger study that is described in Lingwood et al. (2020a). The aim of that study was to evaluate how families from lower SES backgrounds responded to The Reader's shared reading intervention: which emphasised the enjoyment of reading, rather than its educational value. In Lingwood et al., 85 lower SES families and their 3- to 4-year old children from 10 different preschools were randomly allocated to take part in The Reader's shared reading programme (intervention) or an existing 'Story Time' group at a library (control), once a week for eight weeks. Those who participated in the intervention group (n = 43) were additionally invited to take part in the current study, in which they were asked to read with their 3- to 4-year old child in the home as they would normally, for 10 minutes, before and after the intervention. Six families consented to take part in the study. A trained research assistant visited each family in the home to conduct the shared reading session, before (pre-) and after (post-) the intervention.

At the start of the first home visit, the research assistant spent 5-10 minutes establishing rapport with the caregiver and child, before going through the information sheet with caregivers, to ensure they were aware of what the study involved. Once caregivers were happy to participate, they signed a consent form. The research assistant asked the caregiver to read the books provided with their child, as they would normally, for 10 minutes[3]. They were also told that they could read the books in any order they wished, and did not need to read all of them. The research assistant positioned the camera on a tripod towards the back of the room, and started recording before leaving the room.

Measures

Language boosting behaviour coding

During shared book reading, we coded incidents of turn taking, head direction, caregiver's speech acts, and caregiver's speech acts responses. These behaviours were all based on previous coding schemes in the wider language development literature. Turntaking was based on Snow and Ferguson (1977); head direction was based on Cameron-Faulkner (2014); speech acts were based on the categories derived from Pine (1991); and speech act responses were based on Chouinard and Clark (2003). A full description of these tiers is shown in Table 2. Coding was done in ELAN (ELAN, version 5.2). In order to measure the inter-rater reliability of the behavioural coding scheme, a second researcher, unaware of condition, coded two of the videos (one pre-intervention, one post-intervention). The coding was almost identical, with 99% agreement between videos.

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[3]N=1 dyad did not complete the full ten minutes of shared book reading for the pre-intervention visit and therefore their recording was terminated after seven minutes. Their data is included in all analyses.

Table 2. Coding scheme used to measure turntaking, head direction, speech acts, and speech act responses during shared book reading[4]

Tier	Description	Code	Label
Turntaking	Turn-taking simply refers to how often the mum and child take turns. A turn lasts until the next person speaks.	T-ADU	Adult turn
		T-CHI	Child turn
		T-PAUSE	Pause: no one speaking
		T-BOTH	Both adult and child speaking
Head direction	Used as a proxy for eye gaze. Refers to where the caregiver and child are looking at. Window of 5 seconds of alternative direction to change the code i.e., if the child looks away from the book for more than 5 seconds, they are no longer engaged in joint attention.	HEAD-BOOK	Caregiver and child head direction are both towards book
		HEAD-CARE	Adults head direction only is towards book
		HEAD-CHI	Childs head direction only is towards book
		HEAD-NO	Caregiver and child's head direction are not towards book
		HEAD-UNK	Caregiver or child head direction is not clear
		HEAD-UNK	Caregiver and child's head direction are towards each other
Speech act	Codes the function of each adult's utterance	S-DESC	Description of the immediate environment. Adult is commenting on what is going on.
		S-WHQ	Open question with a wh-word – what, who, how, where, when, why, which
		S-YNQ	Yes/No question (a question that requires a yes or no answer)
		S-BEHDIR	Behavioural Directives which instruct the child to do/say something.
		S-ATTDIR	Attentional directives which attract the child's attention to something
		S-ROUT	Routines: adult is reading/ singing/reciting a rhyme,

[4]These behaviours were all based on previous coding schemes in the wider language development literature. Turntaking was based on Snow and Ferguson (1977); head direction was based on Cameron-Faulkner (2010); speech acts were based on the categories derived from Pine (1991); and speech act responses were based on Chouinard and Clark (2003).

Table 2. *(Continued)*

Tier	Description	Code	Label
			songs, reading from a book etc
		S-PRO	Prompt: Prompting child to say something but not using a question
		S-OTH	Other response including those that aren't intelligible,
Speech act response	Codes how the adult responds every time the child speaks or gestures (e.g., points, holds a toy up for the adult etc)	R-IGN	No response: Adult doesn't say anything/ignores child's utterance
		R-COPY	Copy/imitation of correct child utterance: Adult repeats what child says without adding any real new material
		R-REPH	Rephrase: Adult rephrases what CHILD says but doesn't add any real information
		R-EXP	Expand: Adult repeats all/some of what child says and adds some new information
		R-MOVE	Move on: adult continues on same topic as child (moves the conversation on)
		R-CHANGE	Topic change: Adult changes topic of conversation
		R-NV	Non-verbal response: responds with a gesture (e.g., a point)
		R-OTH	Other response, unintelligible, or one that you don't know how to code

Engagement coding

We used the Leuven Scale of Active Engagement (Laevers, 2008) to measure how engaged children were during the shared book reading sessions, at thirty second intervals. This was chosen as an appropriate interval so that we could measure how engagement changes across the interaction, rather than just at one time point. The Leuven Scale of Active Engagement assesses how engaged children are when completing a particular activity such as book reading. As shown in Table 3, the scale ranges from 1 (extremely low

Table 3. The Leuven Scale of Active Engagement, taken from Laevers (2008)

Level	Engagement	Examples
1	Extremely low: the child shows hardly any activity	No concentration: staring, daydreaming; an absent, passive attitude; no goal-oriented activity, aimless actions, not producing anything; no signs of exploration and interest; not taking anything in, no mental activity
2	Low: the child shows some degree of activity which is often interrupted	Limited concentration; looks away during the activity, fiddles, dreams; is easily distracted; action only leads to limited results.
3	Moderate: the child is busy the whole time, but without real concentration	Routine actions, attention is superficial; is not absorbed in the activity, activities are short lived; limited motivation, no real dedication, does not feel challenged; the child does not gain deep-level experiences; does not use his/her capabilities to full extent; the activity does not address the child's imagination.
4	High: there are clear signs of involvement, but these are not always present to their full extent	The child is engaged in the activity without interruption; most of the time there is real concentration, but during some brief moments the attention is more superficial; the child feels challenged, there is a certain degree of motivation; the child's capabilities and its imagination to a certain extent are addressed in the activity.
5	Extremely High: during the observation of learning the child is continually engaged in the activity and completely absorbed in it.	Is absolutely focussed, concentrated without interruption; is highly motivated, feels strongly appealed by the activity; even strong stimuli cannot distract him/her; is alert, has attention for details, shows precision; its mental activity and experience are intense; the child constantly addresses all its capabilities: imagination and mental capacity are in top gear; obviously enjoys being engrossed in the activity.

engagement) to 5 (extremely high engagement) and the scale contains a number of examples demonstrating the varying levels of engagement. A research assistant conducted the engagement coding for each of the videos and did not know which videos were pre- and post-intervention. To check the inter-rater reliability of the engagement coding, a second researcher checked two of the videos (one pre-intervention, one post-intervention). The coding was almost identical and where there were disagreements in scores, these were resolved.

Analysis approach

The first author used a quantitative approach to analyse (i) children's engagement scores at each 30 second interval, (ii) the proportion of time spent in each language boosting

behaviour for periods of high and low engagement. Data and code can be found online: https://osf.io/2pdm3/

The same twelve shared book reading videos were analysed by the second author using a qualitative approach. We focused on the transitions from low to high engagement to examine whether these transitions were associated with specific parental behaviour. We transcribed these extracts by adapting the Jefferson transcription system. Transcription conventions are included in the results section. We conducted a discourse analysis of these transition moments and analysed them in their local context of occurrence (i.e., the whole video). Specifically, we focused on linguistic features such as collaborative overlaps and rising intonation that create a high involvement style (Tannen, 1994) and analytical tools from narrative discourse (Georgakopoulou, 1997; Lampropoulou, 2012; Ochs & Capps, 2001) to interpret collaborative moments during the act of storytelling. To do this we looked at several moments of very low engagement (coded in the Leuven coding scheme as scores of 1) and we observed the caregiver's last utterance in the 30 second clip, and noted what this speech act was (e.g., wh-question, behavioural directive, attentional directive, closed question etc). We then looked at what the next engagement score was, and whether it changed from low engagement (coded in the Leuven coding scheme as scores of 1 or 2) to high engagement (coded in the Leuven coding scheme as scores of 4 or 5).

Results

Research question 1

Our first aim was to examine whether caregivers produced more language-boosting behaviours in episodes of high engagement than in episodes of low engagement. The language-boosting behaviours we examined were joint attention, caregiver turns, descriptions, WH-questions, prompts, expansions, and attentional directives (see Table 4 for full details). We note that there is mixed evidence for whether attentional directives are 'language-boosting'.

Leuven engagement scores ranged between 1 to 5 and were collected at every 30 second interval during the interaction. We then calculated the proportion of time during each 30 second interval that was spent in each language boosting behaviour. This gave us, for each behaviour, an average proportion calculated over the number of 30 second intervals. We then used the Leuven engagement category descriptions, which states that scores of 4 and 5 are classified as 'high/very high', to binarise scores into low engagement [scores of 1, 2, 3] and high engagement [scores of 4, 5][5]. We then computed the proportion of time spent in each language boosting behaviour for periods of high and low engagement separately for each participant, before averaging across pre and post intervention sessions within participants. Finally, we ran a paired permutation t-test to compare the proportion of time spent in each language boosting behaviour when engagement ratings were high and low. The permutation approach is a common approach in corpus linguistics (Pastor & Seghiri, 2010) that allows us to analyse data from small samples where there are a lot of datapoints per participant. In the current study we have numerous datapoints per participant which enables us to run a parametric test on a small sample size (n = 6) because it avoids making assumptions about parametric distributions which are difficult

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[5]An additional analysis without binarization revealed similar results to our analysis reported for research question 1 (see appendix 1).

Table 4. Identifying which behaviours are associated with low and high engagement from the wider literature. Attentional directives have been characterised as both low and high engagement in the literature

| Tier	Individual behaviour	Engagement	Study
Turn taking	T-CHI	High engagement	Snow and Ferguson (1977)
Turn taking	T-ADU	High engagement	Snow and Ferguson (1977)
Head direction	HEAD-BOOK	High engagement	Cameron-Faulkner (2014); Hirsh-Pasek et al. (2015)
Head direction	HEAD-NO	Low engagement	Cameron-Faulkner (2014);
Speech act	S-ATTDIR	Low engagement	Bojczyk et al. (2016)
Speech act	S-ATTDIR	High engagement	Pine (1991); Son and Tineo (2016)
Speech act	S-DESC	High engagement	Bojczyk et al. (2016)
Speech act	S-BEHDIR	Low engagement	Pine (1991)
Speech act	S-WHQ	High engagement	Fletcher et al. (2008)
Speech act	S-PRO	High engagement	Fletcher et al. (2008)
Speech act response	R-EXP	High engagement	Chouinard and Clark (2003)
Speech act response	R-IGN	Low engagement	Chouinard and Clark (2003)

Note: See Table 2 for a full description of tiers and behaviours.

to make with smaller sample sizes. This approach has been shown to be optimal in comparison with samples with larger numbers of participants (Bowker & Pearson, 2002; Koch, 1997, 2001), giving us the statistical power that we need, but bypassing the assumptions that usually apply.

On average, children were in levels of 'high' engagement 58% of the time (SD = 50%) [Participant 1: $M = 55\%$, SD = 41%; Participant 2: $M = 75\%$, SD = 40%; Participant 3: $M = 30\%$, SD = 46%; Participant 4: $M = 58\%$, SD = 37%; Participant 5: $M = 50\%$, SD = 43%; Participant 6: $M = 83\%$, SD = 24%]. The results of this analysis are illustrated in Figure 1. We found low and high engagement differences in the proportion of joint attention (JA) towards the book ($t(5) = -7.44, p < .05$, mean difference = 0.31), suggesting that children and adults were more likely to focus their joint attention towards the book in periods of high engagement. However, note that this is, in fact, a circular finding, since high engagement was defined, in part, as both child and adult paying attention to an activity which, in this case, was defined by the experimenter as book reading. More interestingly, we also found that adults were more likely to use prompts in periods of high engagement ($t(5) = -2.61, p < .05$, mean difference = 0.02), than low engagement, though the mean difference effect size was very small. We found no other differences in proportion of time spent eliciting language boosting behaviours for low and high engagement periods (all p-values >.05, see Table 5).

Research question 2

Our second research question asked if we could identify strategies that adult and children use to produce moments of high engagement. The twelve shared book reading videos
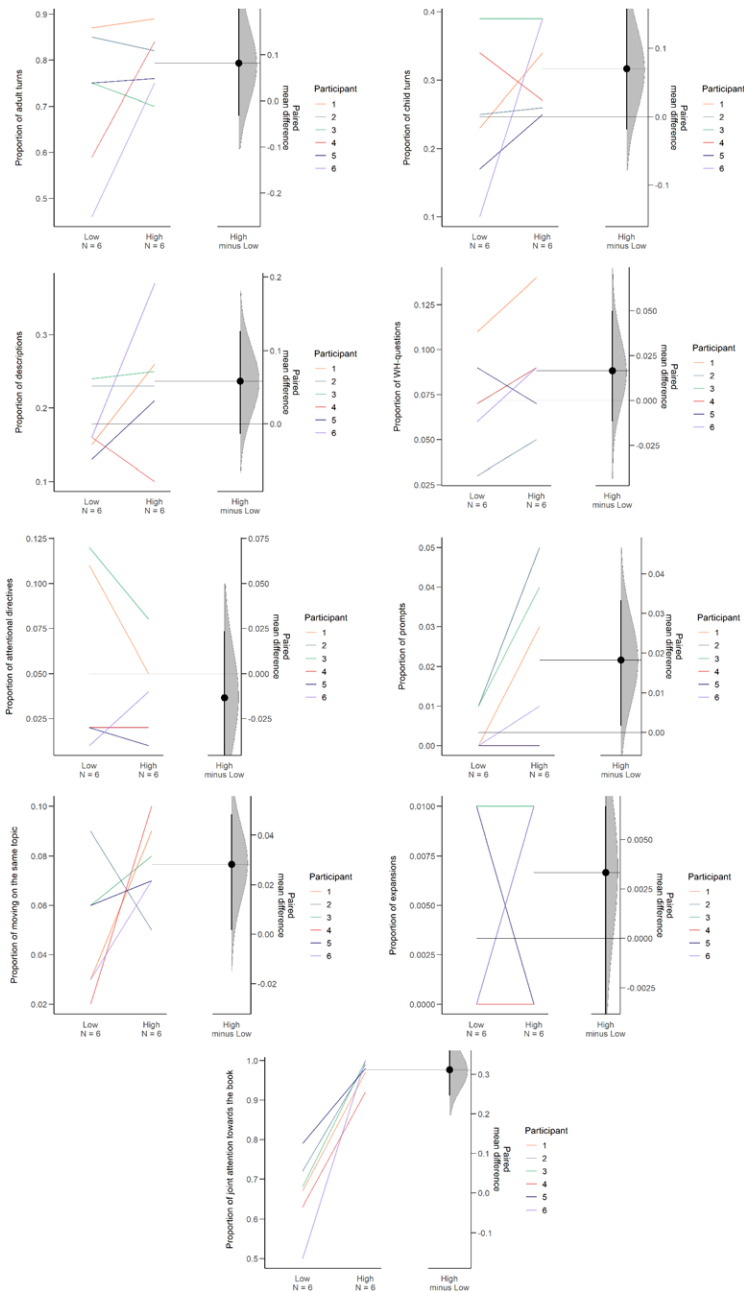
Figure 1. The paired mean difference between low and high engagement is shown in a series of Gardner-Altman estimation plots below. Both groups are plotted on the X axes as a slopegraph: each paired set of observations is connected by a line. The paired mean difference is plotted on a floating axis on the right as a bootstrap sampling distribution. Mean difference is depicted as a dot. The 95% confidence interval is indicated by the ends of the vertical error bar.

Table 5. T-scores, P-values, and mean difference effect size for proportion of time spent in each language-boosting behaviour across moments of low and high engagement.

Language boosting behaviour	T	P	Mean difference	Mean difference (95% CI)
Adult turntaking	−1.35	0.39	0.08	−0.03–0.22
Child turntaking	−1.37	0.18	0.07	−0.02–0.16
JA towards book	−7.44	0.01	0.31	0.25–0.40
Descriptions	−1.49	0.12	0.06	−0.01–0.13
Open questions	−2.19	0.13	0.03	−0.25–1.22
Att. Directives	1.02	0.37	−0.01	−0.06–0.23
Prompts	−2.61	0.01	0.02	0.01–0.03
Move on topic	−1.65	0.11	0.03	0.01–0.05
Expansions	−1.00	0.36	0.01	−0.01–0.01

were analysed by the second author using a discourse analysis of selected extracts that included transitions from low to high engagement. The findings were interpreted using a CofP approach that views the shared reading activity as an interactional process between caregiver and child throughout which a repertoire of shared practices develops. This repertoire is different for every dyad observed and reflects different social practices as well as different negotiating techniques that lead to the accomplishment of the activity.

For example, in video 3: [participant 117, post intervention)] the caregiver developed a narrating pattern that was mainly characterised by shifts in pitch – namely, from rising to low intonation, loud voice as well as WH- questions that enabled the child to comment on the storytelling world. We specifically analysed the strategies used by the caregiver in moments of movement from low to high engagement. In particular, from 12.10 minutes to 13.10 minutes we observed a transition from low (coded as 2 in the quantitative analysis) to high engagement (coded as 4 and then 5 in the quantitative analysis).

Transcription conventions are as follows:

[ ]	Overlap
//	Interruption
(( ))	Comment added by transcriber
Underlining	Raised volume or emphasis
↑	Rise in intonation
↓	Drop in intonation
CAPITALS	Louder or shouted words

Extract 1
1 MOT: ↑A BIG CARDBOARD box an old sheet and some //[sticks]
2 CHI: //[mum] can you take my ribbon out ((MOT takes CHI's ribbon out of her hair))
3 MOT: ↑a couple of bin bags a few broken bricks what do you think they're gonna make
4 CHI: A BIG CASTLE
5 MOT: ↑a fine royal throne from a ragged old quilt A DRAW bridge a flag and a CASTLE was built oh look at the castle

6	CHI:	the baby will be happy
7	MOT:	I know they look all excited dont they
8	CHI:	yeah
9	MOT:	↑PREPARE to do battle brave knight cried King Jack

While the caregiver in turn 1 is dramatizing the story through loud speech and rising intonation, the child interrupts her by asking her to remove the ribbon out of her hair. This can be seen as a moment of low engagement as both child and caregiver temporarily stop being involved with the reading activity. However, the caregiver quickly responds to the child's request and immediately shifts back her attention to reading in turn 3 by dramatizing the narrative, mainly through rising intonation, which is immediately followed by a direct, WH-question "what do you think they're gonna make": In line with our quantitative analysis findings, dyads were in periods of low and high engagement with equal frequency (engagement was high 58% of the time, on average). The child's immediate involvement is evidenced in turn 4 "a big castle" which consists of the response to the caregiver's question. The response here is given promptly, without delay. This indicates the child is following the story and the manner of her answer – namely, loud speech, signals excitement. In line with the quantitative findings, dyads are in joint attention, and high engagement is mostly maintained, throughout the video, via direct, WH- questions on the part of the caregiver to which the child responds.

Another involving strategy can be seen in turn 5 where the caregiver encourages the child to see the picture book "oh look at the castle". The child uptakes this attentional directive invitation; instead of merely repeating the caregiver's sentence, she expands upon it by adding an evaluative statement to the plot in turn 6 "the baby will be happy". This consists of an assessment of a book character. She has retrieved this information from the story itself with which she seems to be familiar. The caregiver moves along the same topic (R-MOVE) and follows up the child's evaluative statement with further character assessment in turn 7 "I know they look all excited don't they" to which the child agrees in turn 8. It follows that caregiver and child do not only read from the book but they also talk about the story itself by hypothetically portraying the represented characters' emotions.

The above shared reading practices reflect a high involvement style (Tannen, 1994) giving priority to the need of 'positive face' (Brown & Levinson, 1987), to show involvement and familiarity. We argue that this high involvement style is a resource that reflects, among other things, familiarity with and pleasure in reading, which characterises the specific dyad. Overall, the videos of the specific dyad display mostly high engagement which is evidenced via several strategies that were only qualitatively considered as adding to the contextual understanding of the dyad's shared practices. Specifically, the caregiver engages the child via shifting pitch, dramatizing narrative and quotations, and formulating direct questions which the child consistently reciprocated. Other parameters of high engagement include the child being familiar with the stories and having developed her own preferences, as evidenced by, among other behaviours, the immediacy with which she responds to the reading options her carer offers earlier in the video. Additionally, the child often offers evaluative statements in response to the caregiver as in turn 6; this shows they have practised shared reading before and they both know what to expect from the activity.

High engagement is achieved via different strategies in the rest of the dataset and among different CofPs. For example, in video 6 [participant 40, post-intervention] both

intensity and pace of intonation characterise the caregiver's reading style which is, primarily, performance oriented. Specifically, she chooses to vividly imitate different animal voices while reading. In accordance with the quantitative analysis, caregivers' speech acts were categorised as reading the text (S-ROUTINES) or not reading the text, which included all other non-reading behaviours e.g., WH-questions, descriptions, attentional directives etc. But qualitatively, a specific pattern can be observed in her reading style; she clearly distinguishes, mainly via changes in pitch and intonation, between reading out the story plot, quoting speech and addressing the child. She also uses a lot of paralinguistic features to imitate the action described in the story. The next extract is representative of how the caregiver handles a specific instance of low engagement in moment 6'30 to 7'30.

Extract 2
1 MOT: suddenly out jumps a ((points: book))
2 CHI: LI//[ON]
3 MOT: //[Aaaah] she screams she is very very scared she drops the mangoes ((dropping mango)) and they A:::LL roll away ((imitates mangoes rolling away)) silly ↑IT'S ALRIGHT says the lion ↑I didn't mean to frighten you he pulls out one of his whiskers and gives it to her Beatrice runs along ho:lding the whisker in her hands ((points book)) ↑a parrot sees the whisker ((points book)) ↑he thinks it's a twig he ↑swoops down ((swooping)) and carries it off to build his nest COME back shouts Beatrice that whisker's for my grandad he doesn't know does he ((points book)) he's took it away to his nest ↑my mistake squawks the parrot he pulls a lo::ng feather out of his tail and gives it to Beatrice what colour are his feathers on his his tail ((points book)) can you see
4 CHI: red ((points book)) and yellow ((points book)) and green ((points book))
5 MOT: well done ((turning page)) on she goes again but what's that long grey thing dangling down ((points book)) beside the path
6 CHI: I think it's a elephant
7 MOT: do ya let's wait and see

The above transcript represents a transition from moments of high engagement to low and back to high. The exchange begins with the adult prompting the child to say something. As described in the quantitative findings, prompts occurred more often in periods of higher engagement. But it may also be that the overlap itself between caregiver and child in turns 2 and 3 also indicates high engagement. Specifically, the child not only finishes off the caregiver's prompt, but the overlap is done in a loud voice signalling excitement about the complicating action part of the story (Labov, 1972). This can be seen as a collaborative interruption (Tannen, 1983; Murata, 1994) that contributes to the advancement of the plot or the addition of elements of orientation and/or of evaluative comments. As Ochs and Capps (2001, p. 2) point out 'the difference between telling a story *to* another and telling a story *with* another is an important one'. In the latter case, 'narrative becomes an interactional achievement and interlocutors become co-authors'.

The caregiver continues narrating via systematically changing pitch (rising intonation) every time she quotes the story characters' voices which is followed by falling intonation every time she describes the characters' physical actions. Additionally, she consistently points to the book when physical action is described and uses paralinguistic features (hand gestures) to selectively imitate physical action i.e., swooping.

Quantitatively, this might suggest that they are in joint attention with one another. However, the child does not seem to be fully engaged at this stage as he does not contribute to the reading activity. So, the caregiver attempts to attract his attention by commenting on the plot in turn 3 "he doesn't know does he ((points book))". This can be seen as an indirect prompt as the child is not explicitly invited to respond to it. Indeed, the child does not follow-up this indirect prompt. Then, the caregiver chooses a relevant transition point to use a wh- question "what colour are his feathers on his tail ((points book)) can you see" to which the child immediately responds in turn 4. The caregiver evaluates the response in a positive way in turn 5. Subsequently, high engagement is maintained in turns 6 and 7 when the child uninvited provides an assessment of the described story plot and the caregiver responds to it. At this moment, the dyad is talking about the plot in a contextualised way rather than merely reading out.

The above analysis showed that engagement is a dynamic process that is constructed moment to moment in the local reading context. It is also a result of negotiation as evidenced by the caregivers' first failed attempt to actively engage the child: which had to be revised later on. The reading practices the specific dyad has developed not only reflect their exposure to reading in the past but also their mutual engagement in several other activities that has given rise to shared understandings of said activity's norms and expectations.

Discussion

Our first research question explored whether language-boosting behaviours occurred more frequently in moments of higher engagement during shared book reading. We found evidence to suggest that during these periods, (i) caregiver and child's head direction tended to be towards the book and (ii) caregivers' increased their use of prompts. However, no other language-boosting behaviours occurred more often in periods of higher engagement.

All other language-boosting behaviours remained stable between moments of high and low engagement. This is in contrast with the small degree of evidence from previous literature – namely, Son and Tineo (2016), who found that mother's use of attention-getting utterances was associated with children's overall verbal engagement and Wicks et al. (2020) who found strong significant associations between children's visual attention, verbal engagement, and parents' use of questions and prompts during shared book reading. There is no consensus on how engagement is operationalised and so this may explain the difference in findings between these studies and the current study. In particular, in the current study we used a broad engagement measure, whereas both Son & Tineo and Wicks et al. both measured whether children were not engaged or fully engaged on several indicators such as text reading, story description, story inference, and responsivity.

Notwithstanding this, our quantitative results suggest that the dynamic between child and adult is more subtle and active than we predicted (Fleury & Hugh, 2018; Ortiz et al., 2001). In other words, it is not the case that being in a higher state of engagement allows parents to use language boosting behaviours or conversely that such language boosting behaviours inevitably encourage higher engagement. Rather, the process of shared reading is more nuanced whereby engagement fluctuates over the course of the inter-action. This suggests that the caregiver may dynamically use several strategies (i) in response to child's lack of attention/focus, to encourage higher engagement, as well as

(ii) during periods of high engagement. Importantly, many of these strategies are also what we would categorise as language boosting behaviours (e.g., asking questions), which may explain why we found no difference between language boosting behaviours in high and low engagement scenarios, because caregivers are using these as attention getters in moments of low engagement, as well as these being ways of teaching language during moments of high engagement. This suggests the role of such strategies may be multi-purpose – that they don't just fulfil the role of modelling language but of promoting engagement too.

Our qualitative analysis confirmed that caregivers were using several other strategies to engage their child that were not captured in our quantitative analysis. Drawing upon the transactional framework literature, we assessed whether changes in engagement from low to high coincide with associated changes in caregivers' speech acts, i.e., whether certain desirable speech acts are effective in turning moments of low engagement into moments of high engagement. Our qualitative analysis enabled us to understand in more detail the relationship between engagement and speech acts.

Collectively, the quantitative and qualitative findings showed that every caregiver engages with different strategies (as described in the sample analysis of two selected videos above) that appeal to their child, and that every caregiver is responsive to the child's preferences, abilities, and overall behaviour during reading. At the same time, the child responds to caregiver's prompts and recognises them as cues for maintaining shared reading attention. The cues not only contextualise the story book itself but also the wider shared reading activity, pointing to how it is meant to be perceived and negotiated in the local context of interaction. Therefore, every dyad seems to be working as a CofP who developed their own understandings and shared repertoire through exposure and mutual engagement in several other activities, the intervention itself being one of them. Negotiating strategies are shared between caregiver and child and reflect common values, practices and understanding of the shared reading activity. High engagement is relative to the CofP's shared understanding of book reading (reading for pleasure could be one). As a result, the type of speech acts we coded and quantified in our quantitative analysis (e.g., wh-question, behavioural directive, attentional directive, closed question etc) are tools, among many others, and in combination with others we observed qualitatively, that seem to contribute to high engagement. In other words, engagement is a complex process that cannot be predicted by and is not tied to individual variables; rather it is dynamically constructed in the local reading context. We have shown, for example, that a caregiver may often revise an engagement strategy e.g., dramatisation through constructed dialogue followed by performative reading. This is an indicator that caregivers respond to the local context that is dynamically constructed and negotiated throughout the process of shared book reading.

One aspect of the shared reading interaction that we have not considered in detail in this paper is the contribution of the book itself. The books that were shared by dyads in the current study varied on a number of variables such as content, genre, illustrations, and word count. Therefore, in addition to considering inter-caregiver differences in engagement strategies, it is important to also consider how differences in book might prompt certain language-boosting behaviours. For example, in 'Beautiful Bananas', the main character meets a number of animals. This may have encouraged the caregiver to use attentional directives, which attract the child's attention to each of the animals. Conversely, although animals featured heavily in 'Goodnight Gorilla', this book contains very few words and so it is likely that caregivers may have used more descriptions to describe what was happening to the child. Finally, 'The Storm Whale' is a tender and heart-

warming story about friendship and may have encouraged the caregiver to use WH-questions to probe the child on some of the emotions that characters were feeling. Exploring how the various components of a book influence the interaction is beyond the scope of this paper, it should be an avenue for future research.

We also note that there are some other limitations that should be borne in mind when interpreting our results. These shared reading interactions give a snapshot of shared book reading in the home on a day. We therefore recognise that the snapshot we recorded may not have necessarily been representative of each caregiver-child shared book reading interaction. Additionally, it is worth reiterating that the six dyads who participated in the current study were a self-selecting sample from a cohort of forty-three eligible families. Dyads were arguably all confident and well versed in the practice of shared book reading, whereas we know that not all families are (McCarthey, 1997). Therefore, the findings from these six dyads may not necessarily be representative of other dyads – we have considered barriers to shared book reading in this project elsewhere, in Lingwood et al. (2020b).

Summary

Although there were more instances of joint attention and caregiver's use of prompts during moments of higher engagement, instances of most language-boosting behaviours were similar across episodes of higher and lower engagement. Our qualitative findings suggest that caregivers are subtly navigating the child's engagement state; they are using language boosting behaviours throughout the interaction not just in moments of high engagement, responding when the child loses engagement, and taking advantage of high engagement. Caregivers need to use several strategies in response to a child's lack of attention/focus during low engagement, to encourage a move toward higher engagement, as well as sustaining these strategies during periods of high engagement.

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Appendices

Appendix 1. Mean proportion of time in language boosting behaviours across engagement levels. Standard deviations are in parentheses.

Language boosting behaviour	Leuven 1	Leuven 2	Leuven 3	Leuven 4	Leuven 5
Adult turntaking	0.54 (0.50)	0.81 (0.39)	0.83 (0.38)	0.79 (0.41)	0.74 (0.44)
Child turntaking	0.31 (0.46)	0.33 (0.47)	0.23 (0.42)	0.28 (0.45)	0.44 (0.50)
JA book	0.12 (0.32)	0.73 (0.38)	0.94 (0.24)	0.97 (0.17)	1.00 (0.06)
Descriptions	0.17 (0.38)	0.27 (0.44)	0.22 (0.41)	0.24 (0.43)	0.25 (0.43)
Open questions	0.10 (0.23)	0.17 (0.28)	0.16 (0.28)	0.16 (0.28)	0.14 (0.28)
Att. Directives	0.06 (0.19)	0.09 (0.28)	0.06 (0.23)	0.04 (0.19)	0.03 (0.16)
Prompts	0.00 (0.04)	0.02 (0.10)	0.01 (0.06)	0.02 (0.14)	0.03 (0.17)
Move on topic	0.06 (0.23)	0.06 (0.22)	0.06 (0.22)	0.06 (0.24)	0.09 (0.29)
Expansions	0.01 (0.10)	0.01 (0.05)	0.01 (0.05)	0.01 (0.09)	0.02 (0.11)

Inspection of the means in appendix 1 reveal a similar pattern of findings to the main analysis that was conducted for research question 1. That is to say that the proportion of time spent in language boosting behaviour was similar across level of engagement. The only exception to this was 'joint attention with the book' where the higher the engagement score, the more the larger the mean proportion of time spent in join attention with the book.