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ARTICLE

To what extent do children's expressions of time actually refer to time? An investigation into the temporal and discursive usages of temporal adverbs in family interaction

Maija Surakka[1] and Minna Kirjavainen[2]

[1]Tampere University, Kalevantie 4, 33014 Tampere and [2]University of the West of England, Coldharbour Lane Bristol, BS16 1QY
Corresponding author: Maija Surakka; Email: maija.surakka@tuni.fi

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Abstract
Many studies have explored children's acquisition of temporal adverbs. However, the extent to which children's early temporal language has discursive instead of solely temporal meanings has been largely ignored. We report two corpus-based studies that investigated temporal adverbs in Finnish child-parent interaction between the children's ages of 1;7 and 4;11. Study 1 shows that the two corpus children used temporal adverbs to construe both temporal and discursive meanings from their early adverb production and that the children's usage syntactically broadly reflected the input received. Study 2 shows that the discursive uses of adverbs appeared to be learned from contextually anchored caregiver constructions that convey discourse functions like urging and reassuring, and that the usage is related to the children's and caregivers' interactional roles. Our study adds to the literature on the acquisition of temporal adverbs by demonstrating that these items are learned also with additional discursive meanings in family interaction.

Keywords: construction grammar; discourse function; Finnish language; language acquisition; temporal adverbs

Introduction

Children's language use can inform us as to how they experience the world and what kinds of strategies they use to convey meaning while their linguistic abilities are developing. In relation to these, researchers have been interested in how children develop in expressing abstract and difficult concepts such as time (Ames, 1946; Chejnová, 2017; Liang et al., 2019; Parm, 2013; Surakka, 2019; Weist, 1989; Weist & Buczowska, 1987). According to these studies, children start using temporal adverbs (e.g., *soon*, *yesterday*) during their third year of life indicating that children can refer to abstract concepts (time) relatively early on in development. This is interesting as lexical items referring to easily identifiable

and imaginable concepts are easier to learn than those referring to items that are more difficult to identify or imagine (e.g., Ibbotson, 2020; Kranjek & McDonough, 2011), such as time. Thus, young children's use of adverbs is informative not only in relation to their ability to refer to time, but it also provides a window to children's conceptual, cognitive, and interactional development. However, even though the order of appearance of temporal adverbs, the temporal meanings of adverbs and the development of temporal concepts in children have received a fair amount of attention from researchers (Ames, 1946; Chejnová, 2017; Liang et al., 2019; Parm, 2013; Surakka, 2019; Weist & Buczowska, 1987), we still do not fully understand how/why children use temporal adverbs at an early age, given their highly abstract nature. The current study aims to widen the scope of our understanding of adverb acquisition and addresses adverb use in child-parent interaction that emerges through the association of adverbs to specific discourse contexts like urging, threatening, and reassuring.

From the linguistic viewpoint, adverbial expressions form somewhat independent syntactic-semantic units (see Langacker, 2014) that, in the case of temporal adverbs, position the topic or events expressed in an utterance into a temporal frame (telling WHEN something happened or will happen). Examples (1) and (2) represent the kind of uses of temporal adverbs where TEMPORAL FRAME is semantically foregrounded. In (1), the mother is talking to a child (*Piia*) aged 3 years and 10 months (3;10).

(1) 1 MOT: *Kolme* 'three'
2 MOT: *Neljä* 'four'
3 MOT: *Viisi* 'five'

4 MOT: *Piia kato*
Piia look.$_{\text{IMP.2SG}}$
'Piia look!'

5 MOT: *sie oo–t* ***koht*** *kotipesä–ssä.*
you BE–2SG in.a.moment home.base–INE
'You will be in a home base in a moment'

In (1), Piia is playing a board game with her parents. The mother is counting steps forward the child must take on her turn (lines 1 to 3). The mother perceives (line 4) that the child is approaching the home base, i.e., the end of the game, and elaborates that the child will reach it 'in a moment' (line 5). The temporal adverb *kohta* ('soon', 'imminently', 'in a minute', 'in a moment') formulates a time frame adverbial for the mother's declarative clause.

In example (2), a child (*Mari*), aged 2;1, is having a conversation with her mother.

(2) 1 2;1 *Mis(sä) on pieni motto?*
where be.3SG small scratch
'Where is the small scratch'

2 MOT: *On–ko Mari–n kyynärpää–ssä?*
be.3SG–Q Mari–GEN elbow–INE
'Is it in Mari's elbow?'

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3 MOT: *Paran–i–ko* *se* ***jo?***
get.well–PST–Q it already
'Did it get well already?'

4 2;1: *Palan–i.*
get.well–PST
'Yes, it did.'

Mari has scratched her elbow. The mother asks if the scratch has healed already (line 3), to which the child replies 'yes' (line 4). Also in this example, temporal adverb, here *jo* ('already' on line 3) temporally frames the referred action (elbow healing). In the current study, we refer to the temporal adverb usage in examples (1) and (2) as TEMPORAL.

On the other hand, when a specific discourse function is construed or reinforced by a temporal adverb, the adverb is more difficult, or even impossible, to separate from the other parts of the sentence structure. In these instances, the adverb typically has both temporal and discursive meanings. See example (3), in which Piia (3;6) uses both *jo* and *kohta* discursively (but with temporal undertones) as she demands that her mother brings her some paper to cut.

(3) 1 3;6: ***Tule–e–ko*** ***sieltä*** ***jo?***
come–3SG–Q from.there already
'Is it coming already?'

2 MOT: *Mikä*?
what
'What?'

3 3;6: *Papeli–a.*
paper–PAR
'Some paper.'

4 MOT: *Sie* *oo–t* *kyl* *semmonen* *pomo.*
you BE–2SG DM a.kind.of boss
'You are such a boss!'

5 3;6: ***Kohta*** ***leikkaa–n*** ***sun*** ***housut***
in.a.moment cut–1SG your trousers

jos *ei* *löydy* *paperi–a.*
if NEG be.found paper–PAR
'I will cut your trousers if there is no paper'

6 MOT: *Hetkinen* *hetkinen.*
just.a.moment just.a.moment

First, even though *jo* has some temporal meaning, on line 1 Piia is using it to URGE her mother to bring some paper; the use of *jo* reinforces the urgency that is expressed by an interrogative clause. Piia then proceeds from urging to threatening to cut her mother's trousers if she does not bring the paper (line 5). Similarly to *jo* with an urging function,

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kohta with a threatening function (line 5) reinforces the discursive content that is expressed by the utterance, here by a declarative clause. In the current study, we will refer to this kind of adverb use as DISCURSIVE use.

The temporal meaning can be considered prototypical for temporal adverbs and thus it has been the focus in previous studies of children's acquisition of these items (e.g., Ames, 1946; Chejnová, 2017; Liang et al., 2019; Parm, 2013; Weist, 1989; Weist & Buczowska, 1987). Our focus on both TEMPORAL and DISCURSIVE uses in child and caregiver language is thus novel and provides a more detailed account of the development of temporal adverbs. In our study, we analyse naturalistic child-parent interaction. The naturalistic contexts allow us to observe various semantic and pragmatic adverb uses relating to children and parent's interactional roles in relation to functions like urging, threatening or reprimanding, that are more difficult to observe – for example, in experimental contexts or when spontaneous data are collected in a lab or research assistants present (see e.g., Tamis-LeMonda et al., 2017).

By adopting the broad framework of Usage-based-constructivism (e.g., Tomasello, 2003), we will present two studies that explore the acquisition of two temporal adverbs *jo* 'already' and *kohta* 'in a moment' in two Finnish child language corpora (Kirjavainen-MPI Finnish corpus child, Kirjavainen et al., 2017a; Laalo, 2021) between the ages of 1;7 and 4;11 years. Study 1 investigates how *jo* (JO) and *kohta* (KOHTA) are syntactically positioned within utterances, the meanings expressed in those positions and whether these positions and meanings mirror the usage in the input the child has received. Study 2 addresses the usage of temporal adverbs as discursive tools of interaction from the perspective of the child's development and the caregivers' role in it. Together these two studies shed light on the extent to which children's early temporal language actually has temporal meaning, or if temporal adverbs are learned and used additionally as discourse items (e.g., to urge or reprimand). They also inform us whether the children's adverb functions correspond to the functions used by adults.

The development of temporal adverbs in child language

The development of temporal adverbs has been described for a number of languages (e.g., Ames, 1946; Chejnová, 2017; Liang et al., 2019; Parm, 2013; Surakka, 2019; Weist, 1989; Weist & Buczowska, 1987). This body of research suggests that temporal adverbs emerge in children's language between the ages of 2–3 years, depending on the language.

The development of a conceptual temporal system underlies the linguistic capability of producing temporal adverbs. The temporal system first supports adverbs and particles that refer to the speech time (Weist, 1989), i.e., to the event where the child can experience themselves in a concrete manner. Consequently, the adverbs that structure the speech time or the immediate past or future like 'now', 'already', 'a moment ago' and 'in a moment' are used more accurately from early in development than the expressions referring to the further past or future (e.g., 'last week', 'in the future') (e.g., Surakka, 2019; Weist & Buczowska, 1987). Even when semantic errors are made and the concepts of time that children express in their utterances are not fully analysed or (completely) accurate (e.g., Child aged 3;4: *Ne tuli meille huomenna* 'They came for a visit tomorrow'; Surakka, 2019, p. 34 where the adverb *tomorrow* is used with a past tense verb), children seem to have an established grammatical understanding that syntactic structures have slots reserved for temporal adverbs (Surakka, 2019, p. 7). This has led to the conclusion that children's syntactic ability develops early and is relatively well-matured at the age of

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2;6 years whereas the abstract and complex conceptual domain of time continues to develop at least until the age of 8 years (Surakka, 2019, p. 78) – after which there is no research-based evidence available.

Given that research shows that adverbs are often polysemous (Hakulinen & Saari, 1995) and that the meaning of the abstract concepts can change depending on the context (Lebois et al., 2015) we assume that our target adverbs JO and KOHTA can also have multiple meanings (see examples (1) – (3) above). The only previous studies that we are aware of that consider discursive meanings in children's adverb use are Liang et al. (2019) and Surakka (2019). Liang et al. (2019) studied the acquisition of temporal adverbs in Mandarin Chinese, and suggested that by varying the positions of temporal adverbs in utterances, it is possible either to highlight certain meaning components or to constitute a discourse function concerning an ongoing action (e.g., URGING). However, Liang et al. reported that their data only contained temporal uses, albeit with some variation in semantic emphasis. Surakka (2019) studied temporal adverbs in Finnish children's language and gave some examples of discursive usages of temporal adverbs, especially in relation to *kohta* ('in a moment'). Even though Surakka did not systematically analyse temporal and discursive uses, her study indicated that from four years of age, Finnish children can use temporal adverbs to express, for example, politeness and patience (4;1 *Voikko sä **kohta** kiivettää mua siinä isossa kivessä* 'Can you **in a moment** help me to climb on the big rock' when the child wants to climb and needs help but also acknowledges that the potential helper is in the middle of garden work), but also as a means of construing threats (5;0 *Pistän ton telkkarin **koht** kiinni* 'I will turn the TV off **in a moment**' when the child was playing with memory cards with their caregiver who from time to time stopped and glanced at the television). The present study aims to provide a systematic analysis on Finnish-speaking children's use of temporal adverbs in discursive (and temporal) manner early in development.

Discursive linguistic units

Reference to DISCURSIVE linguistic units has been made in child language literature before. In their study on children's acquisition of verbal aspect, Ibbotson et al. (2014) divided verbs into two categories: the ones that referred to actions taking place "here-and-now" (CONTEXTUALLY GROUNDED) and those that referred to actions outside of the "here-and-now" (DISPLACED). Their study showed that approx. 30% of the verbs that children aged 2;0 to 3;6 produced were contextually grounded. Additionally, speech directed to young children seemed to carry more grounded references than speech directed to older children. Because we analyse the development of adverbs, which are verb modifiers (and not verbs), it is not as straightforward to identify the meaning of a given target item as being ongoing or displaced as it is with verbs. We will use the term TEMPORAL when the temporal adverb refers to time only and DISCURSIVE when the temporal adverb containing utterance is contextually grounded and additionally has an identifiable discourse function (i.e., directing or impacting the interlocutor's behaviour).

Diessel and Tomasello (2000) state that when examined from the usage-based, contextual basis, propositional meanings of the target units may not be fully expressed in children's utterances but they may function as operators guiding the hearer's interpretations of the associated discourse and joint actions – as markers of the illocutionary force of an utterance. They explored the development of finite complement clauses in English child language and concluded that complex sentences as constructions convey

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specific features in child language – instead of two clausal propositions, they convey only one, typically expressed by a complement clause while the main clause functions as an epistemic marker, attention getter or marker of illocutionary force. Linguistic expressions forming certain discourse functions in children's speech have previously been referred to also as SPEECH ACT SENTENCES (e.g., De Ruiter et al., 2021, p. 1153; Tomasello & Brooks, 1999). For the purposes of our work, the term 'discourse function' is illustrative as it explicitly emphasizes the centeredness of the ongoing discourse in our analysis. Discourse function also covers the idea of interactional intent(ion) being a motive for formulating utterances with such functions (Athanasiadou, 1991; Ervin-Tripp & Mitchell-Kernan, 1977, p. 19). When a temporal adverb has a marked discourse function (e.g., warning, threatening), we refer to this as a DISCURSIVE instance of the adverb. However, importantly, even when JO and KOHTA are denoting discursive aspects, the temporal-propositional (henceforth TEMPORAL) meaning is typically not completely absent from these uses.

The term DISCOURSE CONTEXT (e.g., Orsolini, 1993) in the present study refers to the event of interaction, more specifically to the sequences of conversation where the target adverbs take place. As we conducted an analysis on the transcripts of audio recordings, we analysed the conversational participants, their utterances and actions in 10 lines of discourse context surrounding the target utterance. Our method thus adopts features of Interactional linguistics (Hall, 2019) and Conversation Analysis (Hakulinen, 1998; Hakulinen & Saari, 1995). As usage-based constructivism, construction grammar and interactional linguistics share the usage-based view of language, the described methodological combination is theoretically justified (Hall, 2019).

The Usage-based-constructivist viewpoint and Construction Grammar

The usage-based-constructivist stance assumes that language acquisition is closely related to usage events and to the language input children receive (e.g., Tomasello, 2003), children's general cognitive development (Chejnová, 2017, p. 32) and the development of social cognition (e.g., Liszkowski, 2006; Olineck & Poulin-Dubois, 2005). Because language is input driven and children initially base their assumptions of language on the exemplars of constructions they have heard (and their type and token frequencies), children's language heavily mirrors that of the caregivers' language (e.g., Tomasello, 2003). However, other factors are also at play in children's language acquisition. For example, Kauppinen (2020, p. 14, 121, 123) emphasizes the role of the linguistic constructions as "coping strategies" in interaction whereby early in development children will produce utterances as coherent wholes (constructions) with specific discourse functions rather than process the meanings of the utterances' each individual word separately (see also Tomasello & Brooks, 1999). Also, Ellis (2017) suggests that emotional, cognitive, and motivational factors affect the SALIENCE of stimuli: personally and socially significant events and language are easily remembered and learned. Furthermore, in terms of efficiency, children seem to prefer short rather than long and complex constructions (Goldberg, 2019, p. 8).

The concept of CONSTRUCTION originates from the field of Construction Grammar (see Hoffmann & Trousdale, 2013) that together with the usage-based approach fall under the broader cognitive linguistics framework. Because they have similar assumptions theoretically, the usage-based approach uses the term CONSTRUCTION when referring to conventionalized linguistic items with a specific form and a meaning (Langacker, 2008,

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p. 167–168). Usage-based child language research has investigated the development of constructions on different levels of language including the analysis of single word and multi-word units (Diessel, 2013; Diessel & Tomasello, 2000; Goldberg, 2005; Kirjavainen et al., 2017b; Lieven & Tomasello, 2008).

We will conduct a corpus analysis between the children's age on 1;7–4;11. The current study will examine when the target adverbs start to appear in the children's language and what their functions are, to investigate if early adverb use consists of temporal and/or discursive uses, and whether this is impacted by the parents' use of these adverbs. Thus, our investigation follows the usage-based-constructivist theoretical viewpoint.

Finnish

Finnish language has a rich case system and thus does not have many syntactic constraints for word order. Having said that, discourse function and word order patterns are linked in that different word order patterns can give rise to slightly different meanings – even though SVO is considered the unmarked alternative (Vilkuna, 1989, 1998). Consequently, the adverbial position can affect the interpretation of the whole sentence in Finnish (Huumo, 1997) as in many other languages (Austin et al., 2004). Furthermore, some adverbials allow a wide range of possible syntactic positions, while others display more restricted behavior (Austin et al., 2004).

Despite the rich inflection systems in Finnish, there are no morphological future tense markers. Instead, adverbs play an important role in conveying information about time/tense; KOHTA ('in a moment') being one example of such an adverbs.

The present study

In the present study, we will first take a syntactic, word-order-based approach to children and their caregivers' language production and explore if the children's adverb use syntactically (i.e., in relation to locations within utterances) mirrors that of their parents.

Second, we will investigate the functions (temporal vs. discursive) of the target adverbs in the children and their caregivers' language – an analysis which, as far as we are aware, has not been reported in the previous literature. For this, we established a discourse context consisting of 10 speaker turns (5 before, 5 after) for each target adverb instance which we used to analyse the function of the target adverb (see also Hakulinen & Saari, 1995). We coded the target adverb uses based on the actions taking place and topics talked about in the discourse contexts (see examples 1–3) as either being temporal or discursive (or ambiguous when the discourse context did not give enough information about the function of the adverb).

For the above, we conducted two corpus analyses (Study 1 and Study 2) that explore the usage of two temporal adverbs, JO 'already' and KOHTA 'in a moment', in two Finnish-speaking children's (Piia and Mari) and their caregivers' language.

These two adverbs were selected as they refer to the immediate past and/or future (*jo* 'already', *kohta* 'in a moment') and are thus among the earliest accurately used temporal adverbs in child language (Surakka, 2019, p. 7; Weist, 1989).

Study 1 is a quantitative analysis, in which we investigate the children and their caregivers' usage of the target adverbs in relation to syntactic (word order) and semantic (temporal vs. discursive) characteristics between the ages of 1;7-4;11. Study 1 seeks answers to the following questions:

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1a. What are the syntactic positions the adverbs JO and KOHTA occur in in the corpus children's language? Does the children's syntactic usage correspond to that of their parents?

1b. Do the children use adverbs temporally or discursively? – and does this correspond to their parents' usage?

1c. Are particular meanings (temporal vs. discursive) of JO and KOHTA typically expressed in particular locations within utterances? And are these locations the same in the children and their parents?

Study 2 expands upon Study 1 and investigates how the target adverbs are used as tools of family interaction. We will analyse the discursive uses of JO and KOHTA in child–caregiver interaction in a qualitative manner and will address the following question:

2a. What kinds of discursive constructions do the adverbs JO and KOHTA occur in in child and adult language?

Our predictions are as follows:

1a. The children's adverb use should mirror the parents' usage in terms of location within the utterance (Surakka, 2019). However, due to young children's non-adult-like language representations and language processing, the child vs. adult usage might not be completely identical.

1b. Children's production of temporal vs. discursive uses of adverbials should broadly reflect adult language (e.g., if a given meaning is infrequent or absent from input it is likely to occur relatively late in development).

1c. Given that in the Finnish language, different word order patterns can give rise to different meanings or functions (Vilkuna, 1989, 1998) we predict some adverb-location related form-meaning tendencies to occur.

2a. Our prediction is that discursive uses of adverbs occur as part of constructions that have specific discourse functions in interaction (Tomasello & Brooks, 1999) and that the children's different participant role from their parents in family interaction can have an impact on the usage (Kauppinen, 2020).

If we find that the children's usage corresponds to their input, that would support the usage-based-constructivist theoretical viewpoint. However, because constructions express communicative intentions (Kauppinen, 2020; Tomasello & Brooks, 1999), children's differential use of adverbs from their caregivers might be to some extent related their own and their parents' different communicative intentions.

Study 1: Syntactic positions and meanings foregrounded by the target adverbs

Study 1 investigates two aspects of adverb use: syntactic positioning and distinction between temporal and discursive usage of JO and KOHTA in the children's and their caregivers' language.

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Corpora

Two corpora consisting of child-parent interaction were analysed. These are the only naturalistic transcribed child corpora that sampled child-caregiver language available for Finnish for the relevant age range.

Piia-corpus

The Kirjavainen-Max Planck child corpus (Kirjavainen et al., 2017a) consists of spontaneous interaction between the corpus child, Piia, and her caregivers – predominantly her parents. Piia is a monolingual first-born child in an upper-working/middle-class family in Kotka, Finland. She was audio-recorded by her parents approx. 3 hours per week between the child's ages of 1;7–4;1, totaling approx. 255 hours data (278 recordings, approx. 915,000 word tokens, approx. 91,000 child utterances, approx. 185,000 adult utterances). The data were collected in naturalistic contexts without the situations being manipulated in any way. Piia's younger sibling who was born when Piia was 2;5 was often present in the recordings but did not have a significant role in the interactions – although Piia and her parents did occasionally address her during the sessions. The data were collected in child-caregiver interactional contexts, typically during mealtimes, play sessions, arts and crafts and bath times. The data are transcribed in the CHAT format (MacWhinney, 2000) in Kotka-dialect and also in standard Finnish.

Mari-corpus

Mari-corpus (see Laalo, 2021) was audio collected between the child's ages of 1;7–4;11, by the parents, one of whom is also a child language researcher. For the current study, we only had the data available between the ages of 2;0–4;11. The corpus contains spontaneous interaction between the child and her caregivers typically during free play, joint book-reading or mealtimes. Socio-economically the family can be described as middle-class. The total number of recordings is 24, totaling approx. 12 hours of data – 13 of the recordings are from the age range of 2;0-2;11 years, 7 from 3;0–3;11, and 4 from 4;0–4;11. The data were transcribed in standard Finnish and also in their phonetic forms.

Method

Searches

As the transcripts of the Piia corpus are in the CHAT format (MacWhinney, 2000), we used the KWAL command in the CLAN software (ibid.) to extract all utterances that contained the words JO and KOHTA (or their variants) along with their 10-utterance discourse contexts (5 utterances before, 5 utterances after the target utterance). As we wanted to only include utterances that showed productivity in the children (and were not retrieved from working- or long-term memory as potentially unanalysed coherent wholes), child utterances that were direct repetitions of the interlocutors' (coded in the transcripts as [+ I]) or the child's own speech (coded as [+ SR]) and rote-learned utterances, such as songs and rhymes (coded as [+ R]), were excluded. The child's utterances that had a target adverb but that were not completed, or that were interrupted by an interlocutor (coded in the transcripts as [+ IN]) were also excluded as it can be difficult to identify the function of the adverb in partial utterances.

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Due to the large number of utterances with JO/KOHTA in Piia's caregivers' language, and our partially manual analyses (coding each target utterance for their discourse vs. temporal function), we only included every fifth instance of parental use of each adverb in our Piia analysis. Our random sample of Piia's parents' data is likely to give us sufficient and reliable information about their usage of JO and KOHTA.

Due to the fact that the Mari corpus is relatively small, the target adverb searches were conducted manually and all child and adult instances of JO and KOHTA were included in the analysis (with the exclusions described above applied to the child's data).

Coding

The children and caregivers' data were coded for the following: speaker; age of the child (speaking or spoken to); number of words per utterance; and position of the target adverb in an utterance (utterance-initial; utterance-medial; utterance-final). For the Piia corpus, the coding was done electronically by a Perl script that extracted the above information for the CLAN output into Excel. This Perl output was manually checked by the first author. For the Mari data, the coding was done manually by the first author and checked by the second author. We also coded the data manually for the adverb function (temporal vs. discursive) as we explain below.

Coding of temporal vs. discursive uses of JO and KOHTA

To differentiate temporal and discursive adverb uses, we analysed the 10-turn discourse context. Adverbs that express temporal reference give information about WHEN the action or topic referred to takes or took place, which is typical, for example, in narrative speech. The occurrences of this kind were coded as temporal. In contrast, the criteria for discursive usages were the following:

1) by the adverb-including utterance, the speaker comments on an action that is either taking place or that immediately preceded or will immediately follow the current event (i.e., is grounded), and
2) the adverb points out the illocutionary aspects of the utterance by which the speaker typically aims to influence their interlocutor's behavior.

Both authors (separately) coded all instances of each adverb into the following three categories: temporal, discursive, ambiguous. Target utterances coded as discursive were further coded into specific discursive usages of JO and KOHTA: *action completion*, *urging*, *reprimanding*, *reassuring*, *warning*, *threatening*, *complaining*, *giving permission*, *correction*, *directive*, *indirect no*, *instruction*, *invitation*, *justification*, *negotiation*, *persuasion*, *prohibition*, *request*, *suggestion.* If the 10-turn discourse context did not provide enough information for assessing the adverb use as being temporal or discursive, the target adverb was marked as ambiguous. The agreement rate between the authors was 89%. The authors negotiated the meanings of differently coded adverbs to reach an agreement of 100%. The aforementioned specific discursive usages were only analysed in Study 2 but we present the coding here to demonstrate that the coding between temporal vs. discursive functions (relevant to Study 1) was carried out by carefully considering the meaning of each target utterance.

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Analyses

We do not assume that the development of the two target adverbs is closely related for any other reason than them referring to the immediate past/future and thus likely to occur early in development (Weist, 1989). Therefore, we will report our analyses separately for JO and KOHTA.

We utilized generalized linear mixed-effects models (Bates et al., 2015) to examine the development of Piia's and Mari's JO and KOHTA, and whether their usage over time reflects that of their parents regarding utterance position and function. In this context, we follow Van Veen et al. (2013), who refer to this type of modeling interchangeably as either a growth curve analysis or as a multilevel logistic regression. However, we prefer to call these models generalized linear mixed-effects models, as they are referred to in Bates et al. (2015).

In our first analysis in which we investigated the occurrence of JO and KOHTA (see Tables 2 and 3 below), in line with Van Veen et al. (2013. p. 1011), we categorized our dependent variables – namely, the utilization of KOHTA and JO, as binary outcomes: either they were present or absent. That is, we employed generalized linear mixed-effects models to assess the likelihood of KOHTA or JO appearing in a recording. Therefore, the analysis does not yield information regarding the frequency of adverbs in a recording. Similarly, as emphasized in Van Veen et al. (2013, p. 1012), by treating our data as binary, we sidestep the question as to how frequently adverbs should typically be employed. We acknowledge a limitation in our current GLM analysis pertaining to the frequency of adverb use (our approach focused on the probability of occurrence per recording, rather than per utterance). This methodological choice potentially overlooks finer nuances in the developing frequencies of adverb usage. However, to address the frequencies in more detail, in our other models (syntactic position of the adverbs (Table 5 in Supplementary Materials and Table 6); discursive vs. temporal uses (Tables 8 and 9)), we analysed each specific instance of adverb usage (with the minor exceptions explained below). These analyses move beyond merely noting the presence or absence of an adverb in a recording, aligning with methodologies used in studies by Tribushinina et al. (2013, 2014).

Our independent variable was Age (Table 2) as a fixed effect, with Family (Piia's and Mari's) as a random effect. We also included Age as a polynomial of degree 2 or 3; however, these quadratic or cubic polynomials did not yield better predictions. To compare our models with more parameters to a simpler model with fewer parameters, we utilized the *anova* function. If the model with more parameters demonstrated a significantly improved fit to the data (indicated by a p-value < 0.05 and a smaller AIC (Akaike's Information Criterion) index), we selected the more complex model. If the comparison did not yield a significant difference, we opted for the simpler model.

Results

We will first report the broad developmental observations for the two adverbs. The total number of occurrences of JO and KOHTA included in the analyses is presented in Table 1.

Our data show that both children started to produce temporal adverbs soon after turning two years of age (Mari: *jo*: 2;1, *kohta*: 2;1; Piia: *jo*: 2;2, *kohta*: 2;2). Given that for Mari we do not have data before the age of 2;0, it is possible that her earlier data might have had instances of JO and KOHTA. Figures 1 and 2 display the outcomes of generalized linear mixed-effects models for JO and KOHTA, respectively (see also

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Table 1. The total number of occurrences included in the analyses.

Adverb	Piia	Piia caregivers	Mari	Mari caregivers
JO	148	229	19	33
KOHTA	77	169	25	22
Total	225	398	44	55

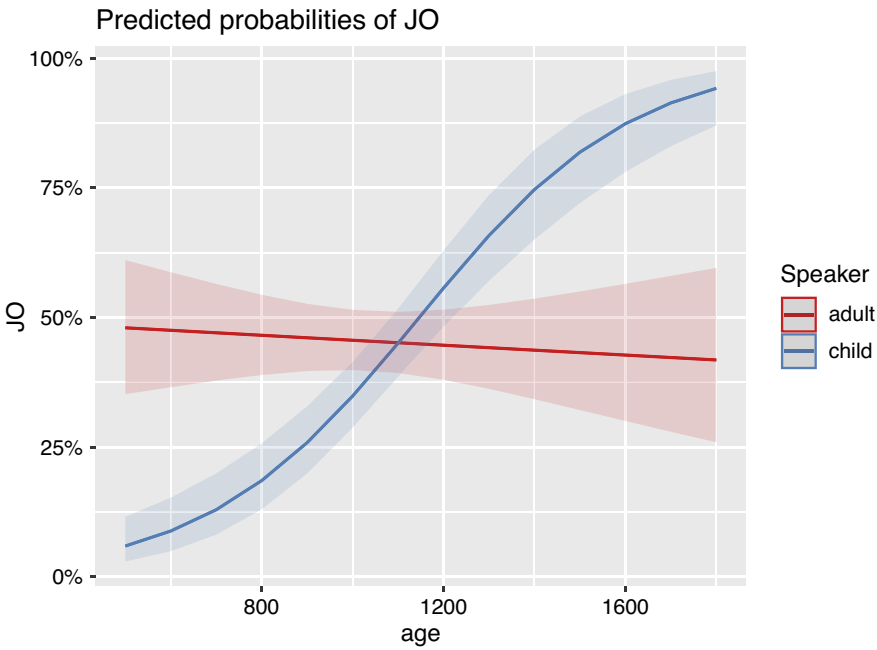

Figure 1. The predicted probabilities of JO (y-axes) for both the children and their parents (shown over the period of data collection; x-axes represent children's age measured in days).

Tables 2 and 3). These figures illustrate that a child's use of both JO and KOHTA increases with development, whereas the adults' usage of neither adverb changes with the children's development. Note that the figures suggest that approximately 40-50% of the recordings contain at least one instance of JO, and around 60% contain an instance of KOHTA in adult language. However, recall that we only included every fifth instance of adult target adverbs in the analysis, which led to the adult production predictions being lower than they should be. If all instances of JO and KOHTA were included, the adult usage would have been (almost) 100%.

Second, we investigated the syntactic positions in which the children and adults produced JO and KOHTA. Table 4 shows the number of utterance initial, medial and final uses of JO and KOHTA. All speakers produce JO typically in medial and final positions. In fact, the only utterance-initial uses of JO were produced by Piia's parents in frozen idiomatic phrases *'Jo nyt on kumma'* (Lit: Already now is weird 'Have I not told you already'). When it comes to KOHTA Piia produced a relatively similar number of

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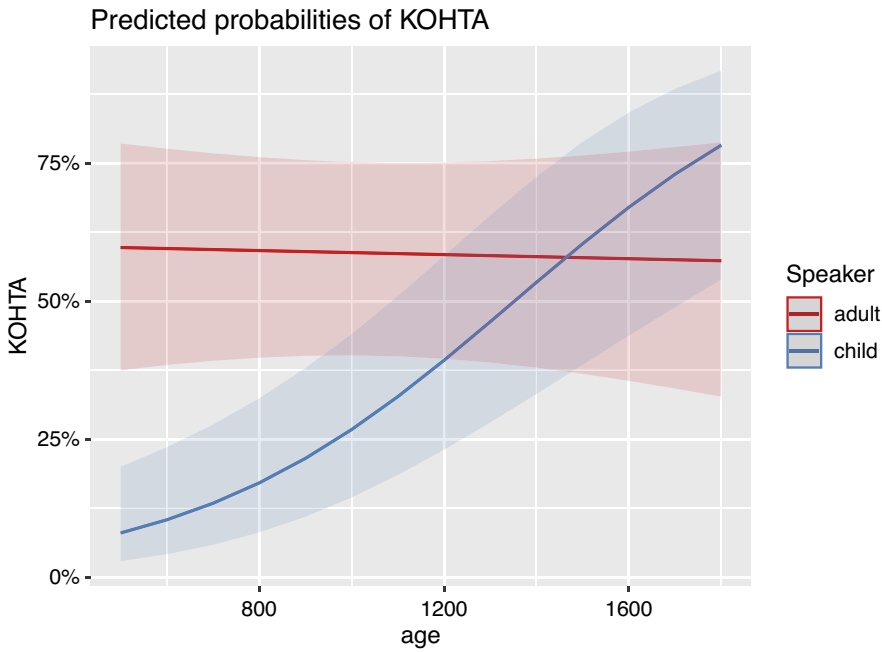

Figure 2. The predicted probabilities of KOHTA (y-axes) for both the children and their parents (shown over the period of data collection; x-axes represent children's age measured in days).

Table 2. Estimated coefficients, standard errors, z-values, and p-values for the generalized mixed model fitted to the occurrence of the adverb JO in recordings.

Fixed effects	Estimate	Std. Error	*z*-value	*p*-value
(Intercept)	0.018	0.484	0.037	0.971
Age	–0.0002	0.0005	–0.426	0.670
Speaker (child)	–4.909	0.81	–6.063	<0.001
Age:Speaker(child)	0.004	0.0007	6.006	<0.001

utterances with the initial, medial and final uses, Mari seemed to favour utterance initial and medial uses, while both Piia and Mari's parents used KOHTA typically in utterance medial positions.

For a generalized mixed-effects model, we excluded all one and two-word utterances because in these utterances it is impossible for the adverb to occur in utterance medial positions. Initially, we analyzed whether the children's usage changes with development, and then we investigated if the children's language mirrors the usage in adults.

The model for the adverb JO suggests that there are no significant differences in the syntactic position of JO usage between the adults and the children (see Table 5 in Supplementary Materials). However, the model for the adverb KOHTA

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Table 3. Estimated coefficients, standard errors, z-values, and p-values for the generalized mixed model fitted to the occurrence of the adverb KOHTA in recordings.

Fixed effects	Estimate	Std. Error	*z*-value	*p*-value
(Intercept)	0.431	0.621	0.694	0.487
Age	$-7.6*10^{-5}$	$-4.7*10^{-4}$	–0.163	0.871
Speaker (child)	–4.293	0.857	–5.009	<0.001
Age:Speaker(child)	0.003	0.0007	3.826	<0.001
Random effects				
Groups	Name	Variance	Std.Dev.	
Family	(Intercept)	0.21	0.458	

Table 4. Instances of utterances with JO and KOHTA, that had at least 3 words.

	JO			KOHTA		
	Initial	Medial	Final	Initial	Medial	Final
Piia	0	70	54	18	24	24
Piia's parents	9	134	86	17	104	33
Mari	0	16	2	10	11	1
Mari's parents	0	30	3	3	16	1
Total	9	250	145	48	155	59

(see Figure 3 and Table 6) indicates that while children and adults used KOHTA in initial positions with no significant difference, adults are significantly more likely to produce KOHTA in utterance-medial positions than children. On the other hand, children are more likely than adults to produce KOHTA in utterance-final positions. Table 6 illustrates that there is no developmental change in the distribution of KOHTA usage between children and adults; while there are differences between child and parent uses, these distributions remain consistent over time. Put simply, within the model, 'age' as a fixed effect emerges as a significant predictor (Table 6). However, the interaction term between 'age' and 'position' does not demonstrate statistical significance. This model diverges from our first analyses (Tables 2 and 3) in its approach to the response variable. Instead of utilizing a binary coding to represent the presence or absence of the target adverb in a recording, it employs a binary coding based on the speaker: 0 for an adult using KOHTA and 1 for a child using KOHTA. Consequently, Figure 3 depicts the distribution of KOHTA within a sentence, showing the probabilities of its usage. The lower end of the y-axis represents adult usage, while the upper end indicates child usage. The red lines in the graph represent the confidence intervals.

Third, we analysed the functions (temporal vs. discursive) of the adverbs JO and KOHTA. Table 7 lists the first instances of temporal and discursive uses for JO and KOHTA for the two corpus children. The first instance of JO, at 2;2, that were found in Piia's data was used discursively (*Mä söin jo* 'I finished eating already' (action completion)). Temporal uses were found about a month later. On the other hand, Mari's data

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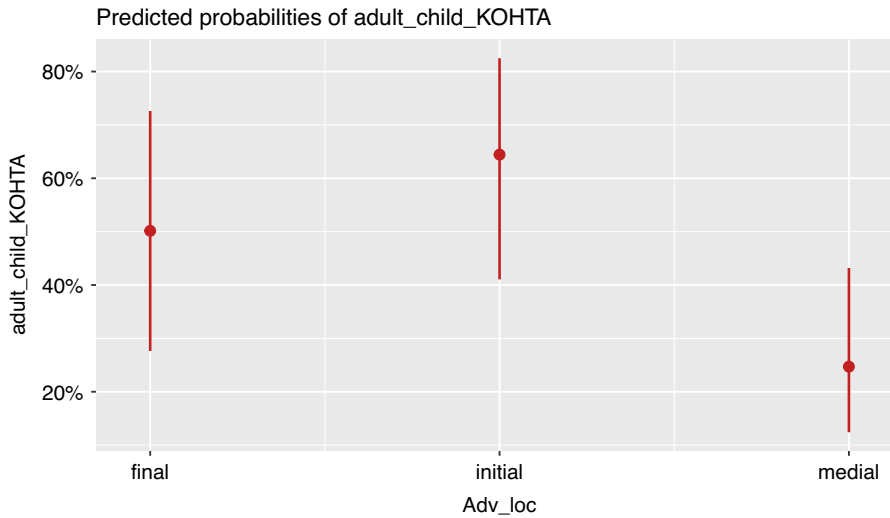

Figure 3. The predicted probabilities of KOHTA for the children and their parents (y-axes) (x-axes represent the adverb's location in the utterance: final, initial, or medial).

Table 6. Estimated coefficients, standard errors, z-values, and p-values for the generalized mixed model fitted to the occurrence of the adverb KOHTA in adult vs child utterances.

Fixed effects	Estimate	Std. Error	*z*-value	*p*-value
(Intercept)	–3.497	0.92	–3.802	<0.001
Initial	0.588	0.428	1.374	0.169
Medial	–1.12	0.357	–3.14	0.002
Age	0.003	0.0007	4.508	<0.001
Random effects				
Groups	Name	Variance	Std.Dev.	
Family	(Intercept)	0.251	0.501	

Table 7. The first occurrence of temporal and discursive usage of JO and KOHTA in the children's data.

	JO		KOHTA	
	Temporal	Discursive	Temporal	Discursive
Piia	2;3	2;2	2;2	2;8
Mari	2;1	2;5	2;1	2;6

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Table 8. The number of temporal, discursive and ambiguous uses of JO and KOHTA.

	JO			KOHTA		
	Temporal	Discursive	Ambiguous	Temporal	Discursive	Ambiguous
Piia	39	100	9	39	34	4
Piia's parents	154	75	0	57	111	1
Mari	17	1	1	13	9	3
Mari's parents	26	7	0	11	11	0
Total	236	183	10	120	165	8

only had temporal uses initially and the first discursive use was found several months after the temporal JO usage. For KOHTA, the first occurrences in Piia and Mari's language were temporal. The discursive usages were found several months later (Piia: 2;8 *Saat ruokaa kohta* 'You'll get some food in a moment' (reassuring) Mari: 2;6 *Tulen kohta* 'I'll be there in a moment' (reassuring)). Table 8 illustrates the number of temporal, discursive and ambiguous uses of JO and KOHTA Piia, Mari and their parents' language. When it comes to JO, the table shows that when Mari, Mari's parents and Piia's parents produce JO, they typically express temporal meanings. However, Piia typically uses JO discursively.

We then ran a generalised mixed effects model on children's and their parents' data for function (temporal vs. discursive). We applied binary coding: 0 for temporal use and 1 for discursive use. These dummy coded variables function as the dependent variables. Figure 4 and Table 9 show that the children are predicted to start by using JO initially temporally but to produce increasingly more discursive meanings with development. This is driven by Piia's usage given that Mari's data contained only one discursive use of JO. The parents produce JO typically temporally and do not change their behaviour with the children's development.

Table 8 above shows that overall Piia, Mari and Mari's parents produced similar proportions of temporal and discursive uses of KOHTA. We ran a generalised mixed effect model on the children and the adults' data (see Table 10). Figure 5 shows that the children are initially predicted to produce more temporal uses of KOHTA but with age start producing more discursive uses. The model predicts that the parents produce more discursive than temporal uses of KOHTA, i.e., the children's usage starts mirroring the caregivers' language with development.

Finally, we examined the interaction between semantics (temporal vs. discursive) and the syntactic location of the adverb (initial, medial, final) for both children and adults (Tables 11 and 12). To address this research question, we ran a model separately for JO and KOHTA in which the temporal/discursive distinction was dummy coded as 0 and 1, functioning as the dependent variable. The variables Age, Speaker (child vs parent), and Location (Initial, Medial, Final) were utilized as independent variables, including terms for their interaction. This interaction term did not yield significance in either the model for JO or for KOHTA (See Tables 13 and 14 in Supplementary Materials).

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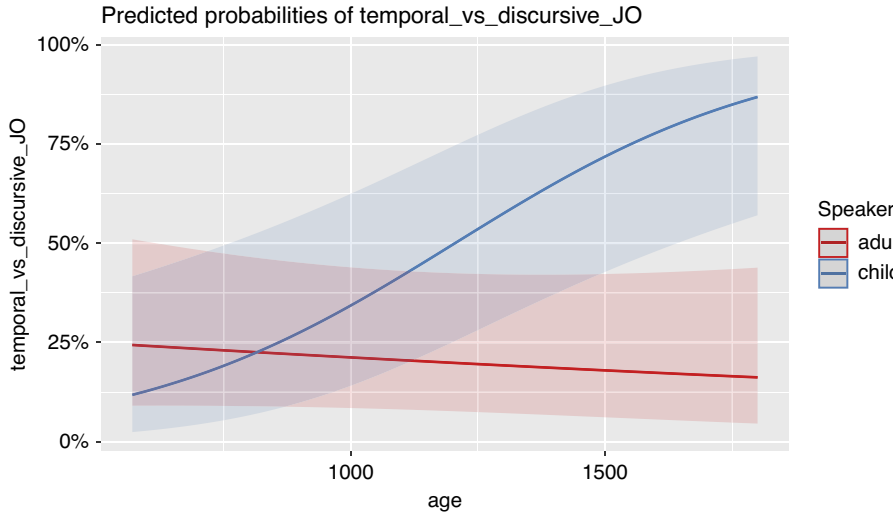

Figure 4. The predicted probabilities of JO in its temporal vs. discursive function (in the y-axis, *discursive* is coded as 1 and *temporal* is coded as 0, thus, 100% probability means discursive use only and 0% means temporal use only) in adults' and children's utterances (shown over the period of data collection; x-axis represent children's age measured in days).

Table 9. Estimated coefficients, standard errors, z-values, and p-values for the generalized mixed model fitted to the occurrence of the adverb JO in its temporal vs. discursive function in adult and child utterances.

Fixed effects	Estimate	Std. Error	*z*-value	*p*-value
(Intercept)	–0.896	0.792	–1.132	0.258
Age	0.004	0.001	3.069	0.002
Speaker (child)	–2.919	1.401	–2.084	0.037
Age:Speaker(child)	0.004	0.001	3.069	0.002
Random effects				
Groups	Name	Variance	Std.Dev.	
Family	(Intercept)	0.485	0.696	

Discussion

We investigated the syntactic (utterance initial, medial, final) and semantic (temporal vs. discursive) development of adverbs JO 'already' and KOHTA 'in a moment'. We found that both adverbs emerged in the children's data roughly at the same time (2;1-2;2), which is likely to be related to the input of both being present in the caregiver data but also due to these adverbs having similar, immediate future/past, meanings. As expected, there was an increase in the children's usage of both adverbs with development. Even though initially there was no distinct difference between the frequency of use of the two adverbs, the children produced more instances of JO than KOHTA later in development. This might

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Table 10. Estimated coefficients, standard errors, z-values, and p-values for the generalized mixed model fitted to the occurrence of the adverb KOHTA in its temporal vs. discursive function in adults' and children's utterances.

Fixed effects	Estimate	Std. Error	*z*-value	*p*-value
(Intercept)	0.715	0.638	1.12	0.263
Age	–0.0001	0.0006	–0.21	0.834
Speaker (child)	–4.1	1.629	–2.517	0.012
Age:Speaker(child)	0.003	0.001	2.04	0.041
Random effects				
Groups	Name	Variance	Std.Dev.	
Family	(Intercept)	0	0	

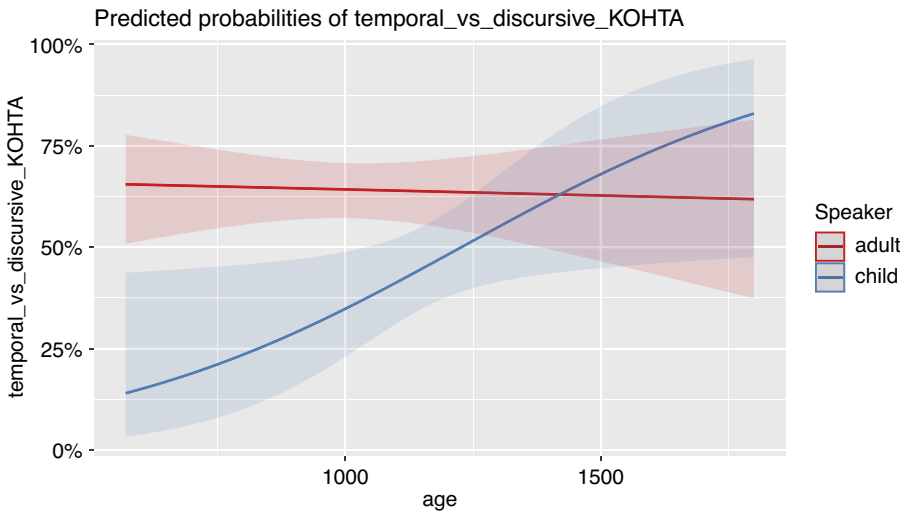

Figure 5. The predicted probabilities of KOHTA in its temporal vs. discursive function (y-axis) in adults' and children's utterances (shown over the period of data collection; x-axis represent children's age measured in days).

be explained to some extent by the differences in the frequency of JO and KOHTA in the parental use (Piia's input: JO: 1181, KOHTA: 940; Mari's input: JO: 33, KOHTA: 22) but also by the fact that JO is compatible with past and present tense verb forms while KOHTA is only compatible with the present tense, providing different levels of opportunity to use the two adverbs. In addition, as we explain above, in this analysis, we coded occurrences as 0 or 1 depending on whether there was at least one instance of the target adverb in a given recording. Consequently, our method does not take into consideration the overall frequencies of the adverbs.

In terms of the syntactic locations, the children's usage of JO was similar to that of the parents' use; JO typically occurred in utterance-medial, and, to some extent, final positions in all speakers. However, Piia seemed to produce more utterance-final uses, which reflects her parents' usage, while Mari typically produced utterance-medial uses,

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Table 11. Meanings of JO by position in utterances that had at least 3 words.

	JO							
	Children				Parents			
	Temporal	Discursive	Ambiguous	Total	Temporal	Discursive	Ambiguous	Total
Initial	0	0	0	0	1	8	0	9
Medial	38	42	6	86	120	44	0	164
Final	14	39	3	56	59	30	0	89
Total	52	81	9	142	180	82	0	262

Table 12. Meanings of KOHTA by position in utterances that had at least 3 words.

	KOHTA							
	Children				Parents			
	Temporal	Discursive	Ambiguous	Total	Temporal	Discursive	Ambiguous	Total
Initial	19	7	2	28	5	15	0	20
Medial	16	16	3	35	44	75	1	120
Final	11	12	2	25	12	22	0	34
Total	46	35	7	88	61	112	1	174

reflecting her parents' usage. JO's unpopularity in the initial position overall can be explained by the fact that JO does not have a completely free sentence internal distribution – it occurs sentence initially only in some fixed, idiomatic, phrases (e.g., *Jo nyt on kumma* Lit: Already now is weird 'Have I not told you already').

The positioning of KOHTA within utterances was more mixed. Both children and the adults were found to produce KOHTA in all three syntactic positions. However, while the children and adults were equally likely to produce KOHTA utterance initially, the adults were more likely to produce KOHTA in utterance-medial positions than the children, and the children were more likely to produce KOHTA utterance finally than the adults. This preference for beginnings and ends of the utterances (recency/primacy effects) is likely to relate to processing limitations in early development (e.g., Freudenthal et al., 2015; Seidl & Johnson, 2006). That is, from a processing perspective it is easier to attach complements to the initial or final positions of already acquired utterances than insert them in an utterance internally. Adding extra/new material to the beginning/end of phrases/utterances can be seen, for example, in children's relative clause acquisition, as relative clauses modifying sentence subjects (e.g., *The dog **that chased the cat** is over there*) are practically absent from children's early naturalistic language production, while those utterances where relative clauses modify, for example, a predicate nominal and are attached to the end of the utterance (*That's the dog **that chased the cat***), are produced early in development (Diessel & Tomasello, 2000). An additional explanation for the children's initial/final adverb use is that the children's utterances are shorter than those of the caregivers and therefore the children's adverbs have fewer opportunities to occur utterance medially.

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Semantically (temporal vs. discursive), the children became more adult-like with development for KOHTA, going from typically producing temporal uses initially to using KOHTA more discursively. However, the children and adults' semantic use of JO showed some differences. Namely, while Piia's parents produced significantly more temporal uses of JO, Piia started to produce JO typically with a discourse function with development. Mari seemed to mirror her parents in the semantic use of JO. We assume that the difference in the functions of JO between Piia and Mari can be explained by the different data collection contexts – Piia's data were typically sampled when engaging in family routines while Mari's data contained frequent joint book reading contexts which can create different levels of opportunity to express discursive meanings. In addition, family dynamics and children's personalities can impact the discursive usage of adverbs.

To recap, even though syntactically the children's adverb usage was relatively similar to that of their parents' usage, there were some major differences in the semantic usage. To investigate these differences further, we conducted Study 2.

Study 2: Temporal adverbs in discursive constructions

In study 2, we will conduct a qualitative analysis on utterances in which JO and KOHTA have discursive uses in the Piia corpus. We are especially interested in the ways that children use established linguistic constructions for the purposes of expressing their communicative intentions (see Tomasello & Brooks, 1999, p. 163–164). The target constructions are closely related to events in the child–caregiver interaction in which the participant aims to influence the ongoing or immediately following actions (i.e., they all have discursive functions). In study 2, we shed further light onto the usage of JO and KOHTA in Piia's and her caregivers' language found in Study 1.

Method

Like a number of studies in the field of usage-based approach to language acquisition (e.g., Diessel & Tomasello, 2000; Goldberg, 2005; Lieven & Tomasello, 2008), in our study 2 we will adopt the views and analytical tools from the field of Construction Grammar. We analyze the use of adverb-containing discursive constructions in child and adult language and take into consideration that the child's repertoire of constructions might not correspond to that of the adults' due to different interactional roles (caregiver vs. cared).

Data

Study 2 further analyses the occurrence of JO and KOHTA and their discourse contexts in the Piia data that were coded as *discursive* in Study 1. The Mari-corpus was not included in this analysis because of the low number (JO: 1; KOHTA: 9) of discursively used adverbs in her data.

Coding and analyses

When temporal adverbs are used in their typical function i.e., as time-frame adverbials, they are syntactically and semantically independent from their host sentences (see Langacker, 2014) – sometimes so much so that the sentence can be fully comprehensible and its propositional value remains largely intact even in the absence of the adverb ('I am

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already two years of age' vs. 'I am two years of age'). On the other hand, when temporal adverb reinforces the discourse functions of its host utterance, the adverb can be regarded as being inseparable from the structure of the utterance. This distinction between independent and inseparable is the main linguistic-methodological starting point when identifying and describing adverb containing constructions in our study 2.

Discursive usages were first coded into the following categories:

action completion, *urging*, *reprimanding*, *reassuring*, *warning*, *threatening*, *complaining*, *giving permission*, *correction*, *directive*, *indirect no*, *instruction*, *invitation*, *justification*, *negotiation*, *persuasion*, *prohibition*, *request*, *suggestion.*

We then identified expressions that met the criteria of a conventionalized construction, i.e., those that were repeatedly used (i.e., at least three times) in a somewhat similar linguistic structure and function (Langacker, 2008, p. 167–168). Next, we described the constructions by their discourse function and syntactic structure (re S=subject, V=verb, O=object), separately for JO and KOHTA.

We ended up with the constructions listed below. The constructions contain fixed and variable parts. The variable parts or parts with more than one possible syntactic location are marked with parenthesis. In the analysis, the form of each instance is given in brackets.

Discourse functions of the constructions containing *jo*

Action completion
Form: [(S) V_{PST} (O) (JO)]
Form: [$V_{PST\text{-}Q.CLI}$ (S) (O) JO]
Criteria: The speaker comments on their own action that has ended in the immediate past OR asks the interlocutor if the interlocuter has completed the action the interlocutor had been engaged in.

Urging
Form: [$V_{IMP/PASS}$ (O) (JO)]
Form: [$V_{Q.CLI}$ (S) (O) JO]
Form: [NIIN KUIN 'as if' $V_{BE.COND}$ JO], urging-reprimanding idiom construction
Criteria: The speaker expects something from their interlocutor and urges them.

Reprimanding
Form: [JO NYT ON X_{DA}]; disapproval (DA) idiom construction 'have I not told you already'
Criteria: The speaker takes a stand against the interlocutor's ongoing action with an affective idiom construction.

Discourse functions of the constructions containing *kohta*

Reassuring
Form: [(S) V (O) ($_{MOD}$) (KOHTA) (*joo*)]
Criteria: Reassuring utterances contain meaning structures of 'demand to wait' (typically implicit) and 'promising the expected action to take place soon'.

Warning
Form: [(S) (V) (O/P) ($_{MOD}$) (KOHTA)]
Criteria: The speaker expresses that the interlocutor's ongoing action can result in a negative consequence.

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Threatening
Form: [(S_{1SG}) V_{1SG} (KOHTA) (O)]
Criteria: The speaker expresses the interlocutor's ongoing action can result in a negative reaction from the speaker.

(MOD = modifier; *joo* = affirmative discourse marker, O/P = In the copular clause in the Finnish language, the verb complement is called PREDICATIVE (VISK § 943; Hakulinen et al., 2004). It alternates with the grammatical object in the warning construction.)

From the basis of the discourse context, we will next analyse instances of these constructions: their forms and meanings in relation to the ongoing actions. The forms of the instances are given in brackets above the numbered examples, and the pieces of contextual information are given in parentheses after the samples.

Results

JO

Action completion

Action completion construction was the earliest (2;2) and the most common (n=38) discourse function in the child's data. The verb *syödä* 'to eat' occurs in more than one third of the instances of the action completion construction (examples 4, 5). This highlights the construction's grounded nature: eating is a core routine in a family-life context and the one action pattern to which the child is expected to contribute at the early age. However, with development (3;4-4;1), a number of different verbs emerged in the construction (e.g., *tein* 'I made'; '*pesin* 'I washed'; *kokeilin*; 'I tried'; *osasin* 'I was able to').

In the child's use of the action completion construction, the verb occurred in the 1st person past tense form and the adverb was typically in the utterance-final position (n = 29/50), but later in development JO was also often found in utterance-medial positions (e.g., *Mie isi tein jo sen* 'Daddy, I already did it'). The salience of agency in the construction reflects the child's developing ability to conceptualise the action-related person perspective, and means–end differentiation as the basis of behaving according to the expectations (Ibbotson, 2020, p. 103). From that viewpoint, action completion is also a token of the child experiencing success in social events.

A small number of action completion utterances was found also in the caregivers' data (n=8). On these occasions, the agent was rarely in the 1st person form, reflecting the differences in the communicative content between children and their caregivers. The parents were more likely to produce, for example, questions with the action completion function (FAT: *Söit sie kaikki jo?* 'Have you finished eating already?') that most probably motivated the child's usage of action completion construction with a first-person reference.

(4) 2;2 [S_{1SG} V_{PST} JO]
Mä *söi–n* ***jo.***
I eat.PST–1SG already
'I finished eating'
(The child tells her mother that she has finished the food.)

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(5) 3;10 [S_{1SG} V_{PST} O JO]
Minä söi–n sen juusto–n ***jo.***
I eat.PST–1SG that cheese–GEN already
'I finished eating the cheese'
(The mother thinks there is still some food left on the child's plate, but the child expresses that she has already eaten it all.)

From the cognitive viewpoint, JO in the action completion construction seems to reinforce the action boundary expressed by the past tense verb form (see Ibbotson, 2020, p. 59). When the ongoing action is referred to, the boundary effect of the past tense verb form is more concrete compared to references to actions completed further in the past. Consequently, within the ongoing event, by marking the action boundaries, a speaker can influence the action taking place next, which can be considered a root for the construction's discursive nature.

Urging

The urging function occurs in Piia's data from the age of 2;8 (n = 28). Together with action completion, the urging construction makes up the majority of the discursive utterance-final JO instances in the children's language (see Table 11). The urging construction is rare in the input data (n = 6, FAT: *Ota se tyttö täält jo* 'take the girl from here already') which suggests that caregivers use some other linguistic patterns to urge. In the child's urging construction, the function is construed by a verb in a second person imperative form (6), or passive form (7), and the utterance is typically two to four words long.

(6) 2;8 [V_{IMP} JO]
Helä–ä ***jo.***
wake.up–IMP.2SG already
'wake up already'
(The mother is pretending to snore in the middle of the conversation.)

(7) 3;7 [V_{PASS} JO]
Mennä–ä ***jo.***
go–PASS already
'let's go already'
(The father is hiding; the child urges the mother to look for the father with her.)

Throughout, the verbs instantiated in the construction refer to concrete actions. The ones found in the imperative form were *tule* 'come'; *mene* 'go'; *anna* 'give'; *kato* 'look'; *kokeile* 'try'. When the imperative form is applied, the urge is directed at the interlocutor (6). The passive form (7), which in Finnish is used similarly to the phrase *Let's*-Verb in English, occurs only with the verb *mennä* 'go' reflecting the fact that the action of going is often a collaborative action in child-caregiver contexts and is speaker-inclusive: the action referred to will be accomplished together with the caregiver who also makes decisions about these joint actions. However, the child can influence those decisions, for example, by urging the decision maker.

In the data, Piia's caregivers urge only by one construction (8).

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(8) MOT [V_{IMP} O NIIN KU(I)N BE_{COND} JO]
Vie *se* *nyt* *tonne* *roskikse–en*
take.IMP.2SG it now there rubbish.bin–ILL

niin ***kun*** ***ol–isi–t*** ***jo.***
so as be–COND–2SG already
'put it to the rubbish bin as if you already had done it'
(The child is making a mess.)

The construction NIIN KU(I)N BE_{COND} JO is an example of a far conventionalised IDIOM CONSTRUCTION.[1] The construction is emotionally loaded and implies that the child is not performing the needed action as quickly as expected or is refusing to do something requested. As an idiom construction, it allows no variation in word order, which is also the case for the reprimand construction that will be looked at next.

Reprimand

Another idiom construction occurring only in the input data constitutes the function of reprimand (n = 6). The form of the construction is fixed JO NYT ON X_{DA}, the only lexically open slot being reserved for the various expressions of disapproval (X_{DA}). This construction also has emotional dimensions, and the rate of intensity expressed can be modified by the lexical choice made in the utterance-final slot. The construction is applied in the events where the child does not appear to be following instructions from the caregiver.

(9) MOT [JO NYT ON X_{DA}]
Jo *nyt* *on* *kumma.*
already now be.3SG weird
'Have I not told you already'
(The child is putting pearls in her mouth when the mother has already told her not to do so.)

In (9), the adjective *kumma* 'weird' constitutes a relatively neutral stance whereas *Jo nyt on himputti* that occurs twice in the data is a modification of the swear word *Helvetti* 'Hell'. However, *himputti* is so remote in regard to the source swear word that it suits the family context as an expression of intensity, similarly to using 'What the heck' for 'What the Hell' in English.

The reprimand construction is the only context in the data where JO does not seem to construe any temporal reference at all but has become a marker of a certain discursive practice. In this construction, JO additionally co-occurs with NYT from which the temporal reference has reduced to the point where the word is considered only homonymous with the adverb *nyt* ('now;' *No emmä nyt tiedä* 'Well, I don't NOW know' (Hakulinen, 1998, p. 87), meaning 'Well, I don't think so'). The similar grammaticalization

[1]Hoffman and Trousdale (2013) introduce the idea of constructions taking places in the lexicon-syntactic continuum. The meaning of idiom construction is not completely compositional (i.e. transparent by meaning built by the "bricks" involved) but must be stored in a speaker's mental lexicon like words. Constructions at the other end of the continuum are those that occur in the child's speech also. They are more schematic by nature (i.e., allow lexical variation) and are thus more compositional and transparent by meaning.

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processes can be found also from other languages, the bi-partite clause negation *ne…**pas*** in French as one example (see Hansen, 2009).

With the reprimand and urging idiom constructions, the caregivers strongly set limits for the child's behavior. This supports the child's developing understanding of the event-based action patterns and the related desirable behavior. The likely explanations as to why these constructions are not manifested in the child's language are that these constructions are more tightly linked to the caregivers' interactional role and that children acquire abstract idiomatic expressions relatively late (e.g., Theakston et al., 2003).

KOHTA

Reassuring

Caregivers use KOHTA frequently (n = 55) in situations where they acknowledge that the child is expecting something from them. The reassuring construction consists of all possible adverbial word order variants (utterance-initial, -medial, and -final).

Example (10) with KOHTA in utterance-medial position illustrates the nature of reassurance as a discourse function. The mother encourages the child to wait some more (*oota hetki* 'wait a moment') and additionally promises that the action referred to will take place in the immediate future. In typical instances of the reassuring construction, however, asking the child to wait remains implicit.

(10) MOT [S KOHTA V]
Oota *hetki* *äiti* ***kohta*** *laitta–a* *su–lle* *sinne.*
wait.2SG.IMP moment mum in.a.moment put–3SG you–ALL there
'wait a moment, mum will put [it] there for you in a moment'.
(Baking; the child asks for more sugar but the mother has some butter in her hands.)

In 12 occasions, the reassuring *kohta* is utterance-initial. In (11), KOHTA occurs with an intensifier *ihan* 'just'/'quite'/'right'. In (12), the utterance ends with an affirmative discourse marker *joo* that also reinforces the given promise. The slots of the potential intensifiers *ihan* and *joo* are open in the construction.

(11) MOT [$_{MOD}$ KOHTA V]
Ihan ***kohta*** *kulta* *muovailla–an.*
just in.a.moment darling play.with.Play.Doh–PASS
'darling, we will play with Play–Doh just in a moment'
(The mother suggests crafting a card; the child says she wants to play with playdough instead.)

(12) FAT [KOHTA V *joo*]
Kohta *saa–t* ***joo.***
in.a.moment get–2SG AFF.DM
'you will get[it] in a moment, yes'.
(The child asks to get an object from the father's hands.)

In 16 occasions, *kohta* takes place is in an utterance-final position (13).

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(13) MOT [S V KOHTA]
Hanna sie saa–t ***kohta.***
Hanna you get–2SG in.a.moment
'Hanna you will get [food] in a moment'
(While the mother gives food for Piia the baby sister, Hanna, makes noises.)

The reassuring KOHTA together with the child's urging construction illustrate the impact that interactional roles have on the linguistic patterns in language use between children and caregivers. There are, however, instances (n = 23) of the reassuring construction in Piia's data, starting already before the age of 3;0. Even if Piia follows the construction model relatively early in development, these early instances of KOHTA are often (n = 13) in the utterance-final position, suggesting that the child is not necessarily fully integrating the adverb into the utterance yet.

(14) 2;8 [V O $_{MOD}$ KOHTA]
Saa–t ruoka–a ***kohta.***
get–2SG food–PAR in.a.moment
'You will get some food in a moment'
(Talks to her baby sister; the mother has told that the joint activities will continue after the baby sister has got some food.)

In (14), the child is talking to her baby sister and reformulates what the mother had said earlier. The example illustrates the usage-based learning of language: the child adopts form-meaning pairings from the caregivers' language. Thus, language acquisition, adverbs included, and social interaction are interconnected.

Warning and threatening

In the input data, warning is one salient function construed by KOHTA (n = 38). The construction is tightly connected to the caregivers' role, and is absent from the child's data. By warnings, the caregivers explicitly estimate the presumable outcome of the child's ongoing action. This way caregivers support the child's development in causal reasoning and behavior regulation and bind this conceptual causal knowledge to the affective, formulaic language making the learning contexts more salient (cf. Ellis, 2017).

The warning construction displays a lot of word-order-related variation – KOHTA takes place in utterance-initial (n = 6), utterance-medial (n = 25) and utterance-final (n = 7) positions. Example (15) illustrates the most frequent utterance-medial variant.

(15) MOT [S V KOHTA]
Se puuro on ***koht*** *su–n syli–ssä.*
that porridge be.3SG in.a.moment you–GEN lap–INE
'The porridge will be on your lap soon enough'
(The child is having porridge; the mother has previously asked the child to stop misbehaving.)

The warning function may additionally convey an aspect of a threat (n = 7, example 16). The threatening construction differs from the warning construction by its solely speaker-centered perspective.

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(16) MOT [KOHTA S_{1SG} V_{1SG}]
Kohta *mie* *hermostu–n.*
in.a.moment I get.cross–1SG
'I will get cross in a moment'
(The child leaves the table in the middle of having breakfast.)

From the variety of warnings in the input data, the child starts using the threatening construction between the ages of 3;4–4;0 (n = 5, see example 3).

Despite being relatively infrequent in the input data, the child starts using the threatening construction between the ages of 3;4–4;0 – probably due to the highly salient and memorable contexts they occur in. As in the input language, KOHTA in the threats produced by the child takes an utterance-initial (n = 3) or utterance-medial (n = 2) position.

Discussion

Discursive constructions containing JO in the child's data were ACTION COMPLETION and URGING, the first function emerging in the child language being ACTION COMPLETION (2;2). In this construction, JO was concluded to reinforce action boundaries expressed by the past tense verb form. ACTION COMPLETION also manifests the child's ability to co-ordinate agency and perspective co-ordination as the basis of acquiring event-related desirable behavior. The child using an urging construction conveys to the caregiver that they should transition from the current to the desired next action. JO in the URGING construction thus marks the "patience boundary" related to the implicit waiting process. The constructions containing JO in the input data were URGING and REPRIMAND. These were both highly idiomatic, and by using them the caregivers aimed to co-ordinate the child's behavior. In all, the constructions containing JO in the input are not neatly mirrored in the child's language, which can be explained by the difference in the interactional roles between the child and her caregivers affecting the usage.

Unlike the JO constructions, KOHTA constructions are similar in the child and the caregivers' data, both expressing REASSURING and THREATENING. However, the caregivers also use KOHTA construction with a WARNING function. In the input language, KOHTA constructions allow for several word order variations from which the child selects and practices some particular forms. KOHTA co-occurs with three variants of reinforcements in the caregivers' language: the intensifiers *ihan* 'quite'/'right' or *sitten* 'then', or an affirmative discourse marker *joo*.

We found that even though Piia and her parents used to some extent the same constructional types (e.g., reassuring), they also used different constructions that reflected their participant roles in family interaction (e.g., reprimand). These differences can at least partly explain the differences in the semantic and syntactic-semantic use between the children and their parents in Study 1. For example, the fact that we found that Piia's discursive use of JO significantly increased with development can be explained by her increased use of urging and action completion functions in which JO typically occurred in Piia's speech utterance finally. However, it is important to note that even though the constructional repertoires seem to be different in the child's and the adults' use, this does not mean that the child does not have the ability to use adult-like constructions. For example, the child produces a relatively large number of KOHTA with a reassuring function (23). Even though many of these were directed at the parents, Piia also produced

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reassuring uses of KOHTA when interacting with her baby sister and mirrored adults lexically specific construction (*Saat ruokaa kohta* 'You'll get some food in a moment' 2;8). In the same vein, children's pretend play contexts in which they are a caregiver (for example, to a toy) can contain constructions that would more typically occur in adult language. However, other than reassuring, Piia's data contained only a small number of relatively typical adult constructions (reprimand: 0; warning: 2; threat: 5) probably due to the fact that the Piia-corpus consists of contexts in which the parent interacts with the child (i.e., the child was rarely left on her own to play with her toys during the recordings giving rise to pretend play opportunities).

General discussion

We investigated the syntactic and semantic acquisition of two temporal adverbs from their earliest occurrences (2;1/2;2) until 4;11/4;1. We found that both temporal and discursive uses emerged relatively early – before the age of 2;9 in both children's language for JO and KOHTA. Some previous studies have reported that while temporal uses are present early in development, discursive uses have been absent early on (Liang et al., 2019; Surakka, 2019) while others have not made a distinction between temporal and discursive meanings in their analyses (e.g., Weist, 1989; Weist & Buczowska, 1987). Thus, as far as we are aware, our study is the first to report both temporal and discursive meanings for early temporal adverbs. Due to lack of space, we only included two adverbs in our analysis. It is thus important to extend the work to other temporal adverbs to paint a clearer picture as to when different meanings emerge in child language. It is useful to point out that, to our knowledge, the two corpora included in the current study are the only naturalistic Finnish child corpora available in transcribed form for our target age range. The Piia corpus is relatively densely collected and large (approx. 3h per week between 1;7-4;1, approx. 255 h of data). Nevertheless, the occurrence of the target adverbs even in this corpus is relatively sparse. Thus, further analyses with bigger datasets, when available, are also encouraged.

Did the child's usage mirror that of the adults?

Syntactic use (word order) of adverbs

When it comes to the location of the adverbs within utterances, we found that the children's use of JO and KOHTA within utterances largely mirrored their parents' use. This fits in with the usage-based viewpoint of language development which holds that children's language use and acquisition is heavily influenced by the language they have been exposed to (e.g., Tomasello, 2003). In addition, this finding is in line with Surakka's (2019) study that found that children aged 2;6 years have a good syntactic understanding of how to position temporal adverbs in utterances. However, we did observe some important differences and developmental changes. First, the adults were more likely to use the adverbs, in particular, KOHTA, utterance medially than the children. It is likely that the early utterance-initial/final positions were produced at least partly due to the following two factors. First, as we discussed earlier, it is easier to add components to the beginning or end of units that the speaker has (some) ability over than somewhere in the middle of the unit. Second, it is possible that due to the early instances of JO and KOHTA occurring predominantly in short utterances (1–2 words long) the slot reserved for these adverbials was very specific and systematic (first/last word). This influenced the child's

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preferred positioning of these due to practice, even with longer utterances that gave the option for utterance medial use. Also, the following are likely to have had a role in the child's later production of adverbs in more varied positions: (a) the child's increasing linguistic ability and production of longer utterances; and (b) when it comes to languages like Finnish that have a relatively flexible word order, the child's developing understanding of the range of syntactic locations a given word can slot into.

Meaning

In Study 1, we found that even though syntactically the children's language broadly speaking corresponded to their parents' language, semantically (temporal vs. discursive) Piia's usage differed from that of her parents, from Mari and Mari's parents. More specifically, with age, Piia started to produce more discursive uses of JO while the other speakers produced JO more commonly with temporal meanings. The opposite was the case for KOHTA – with development the children's usage started to reflect that of their parents, i.e., the children, like the parents, used KOHTA typically discursively. The increase in discursive uses through development might be linked to the child's developing understanding of the different uses of a given adverb (e.g., urging, reassuring). This gives them an opportunity to produce discursive meanings more frequently (because they have a bigger repertoire of discursive meanings to express with a given adverb). One of our key findings thus is that discursive uses of temporal adverbs seem to be commonplace in early child language – a finding previous studies have failed to observe. This can be explained by the following. First, the relatively infrequent occurrence of discursive uses early in development means that densely collected corpora (such as the Piia corpus) are needed to find instances of relatively infrequent items, possibly explaining some of the discrepancy between our study and some previous studies. Second, the data analysed need to be collected in naturalistic family contexts where discursive meanings can surface (as opposed to e.g., in a lab where parents are less likely to reprimand, threaten or even urge their children, or in child-child interactions in which these might not be relevant). For example, Liang et al. (2019) found no discursive uses in their data which consisted of preschool children playing in peer dyads with toys instead of making conversation with each other. Consequently, the absence of discursive meanings in their data does not necessarily mean that the children do not know or use discursive adverbs – it is just that the contexts sampled might not have given rise to those meanings being expressed. Also, we observed some differences in the usage (temporal vs. discursive) between our two corpus children. These differences could be related to the differences in the interactional contexts of the two corpora. Namely, the Piia-corpus was much richer in discursive usages of temporal adverbs compared to the Mari-corpus, which we assume relates to the Piia-corpus having been typically sampled in daily routine contexts in which the joint activities with certain goals (e.g., finishing lunch at mealtime) are constantly negotiated (see Spagnola & Fiese, 2007). Mari's interaction with her parents was sampled in contexts in which the child and parents engaged in joint play and book reading sessions in which discursive usage of adverbs might have been irrelevant. Lastly, the child's and their parents' personalities are likely to impact the frequency with which the child uses language discursively. For example, some children might be more assertive and strong-willed and would be more confident to command, threaten, warn and reprimand their caregivers than some other children; and some parents might allow such behaviour more readily than others. Further studies on the topic with additional children's corpus data would be highly

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beneficial to make more far-reaching generalizations on the development of temporal adverbs.

Construction selection

Study 2 showed that interactional intentions affect the construction selection and thus the acquisition of constructions with a specific discourse function. In relation to JO, the child used constructions that reflected their subordinate interactional role. However, even the role-related choices were not invented in linguistic isolation, but the constructions produced by the child and caregivers seem to formulate functional pairs: for example, when a caregiver asked *Söit sie kaikki jo?* ('Have you finished eating already?'), the child learned that an affirmative answer is expected from them and that behaving accordingly (e.g., finishing her meals) will license the use of the ACTION COMPLETION construction. Orsolini (1993) suggests that through linguistic routines, children learn when certain speech acts are expected from them. For example, if the child has learned that the parent will commonly urge them to finish their dinner, they will produce the expected response already before the parent has urged them. We consider this script-based interactional setting a valid explanation for how the constructions that are used by the child in the absence of a parental prompt or significant input become part of the child's linguistic repertoire – like the ACTION COMPLETION construction (*Mä söin jo* 'I ate already').

Piia's selections of KOHTA constructions seemed to follow a more expected pattern of language acquisition: the child gradually developed in producing the same/similar constructions as her caregivers – highly abstract idiom constructions as exceptions (see also Theakston et al., 2003, p. 876). The acquisition of KOHTA constructions, especially REASSURING, indicated dependence in the discourse context: the child was practicing transition between her two social roles (being a child for the caregivers and a caregiver for her baby sister).

Our results suggest that in addition to expressing what seems to be temporal reference, temporal adverbs can also be used to express discursive functions from 2;2 years of age and that these uses are learned as tools of interaction. The variety of meanings construed by the target adverbs in the data thus supports the idea of Lebois et al. (2015) in that the meanings of abstract, polysemic concepts may vary from one context to another. The linguistic constructions adopted from the input language appeared to work as concrete communicative tools in interaction and offer formulaic models for children that ease the adverb production interaction (cf. Tomasello, 2003). Also, the analysis in Study 2 illustrated how abstract concepts develop from the contextual experiences as they are applied as tools that organize interaction with concretely perceivable results (see also Schwanenflugel & Shoben, 1983). For example, the affective and thus salient threatening construction was adopted by Piia from her caregivers at age of 3;6 (see example 3).

To what extent do children's early temporal adverbs refer to time?

Previous studies have found that even though children produce temporal adverbs already early in development, they might not have a fully-fledged understanding of the meaning of the adverb. For example, Surakka (2019) reports that the adverb *huomenna* 'tomorrow' was used with a past tense verb, indicating that the child had not fully understood the meaning of the adverb but was nevertheless using it.

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We found that our corpus children produced instances of JO and KOHTA from early in development (2;1-2;2), seemingly accurately (i.e., we did not find any instances of incongruent uses of an adverb with the rest of the utterance) and that the first 6 months of each target adverb instantiated both temporal and discursive meanings – in fact, for Piia, discursive meanings (2;2) of JO were found before temporal meanings (2;3). As discursive adverbs have complex meaning consisting typically of temporal reference and discourse function, it entails that at least some of the early adverb use cannot be taken as strong evidence for fully developed understanding of temporal meaning of JO 'already' and KOHTA 'in a moment'. Furthermore, given that even in the temporal uses of JO and KOHTA, their temporal meaning is relatively vague (for example, in comparison to adverbials such as 'yesterday' or 'in an hour') the temporal adverbs that were found in the early data might not give us strong evidence of the child's understanding of the relevant temporal meanings, but are using the adverbs as learned parts of utterances (Lieven & Tomasello, 2008) in relation to the concrete joint actions (Mazzuca et al., 2021; Schwanenflugel & Shoben, 1983). That is, it might be that even when children produce utterances like *Nalle syö kohta* ('Teddy will eat in a moment') in which they appear to express temporal reference with KOHTA 'in a moment' , they might not fully understand what the time reference is, but are producing the adverb because they have heard it being used by parents in similar contexts (mother saying *Mummo tulee kohta* 'grandma is coming over in a moment' or *Isi nousee ylös kohta* 'daddy will get up in a moment').

Conclusion

We investigated early temporal adverb acquisition by looking at adverbs JO 'already' and KOHTA 'in a moment'. Our study showed that the children used the target adverbs to construe both temporal and discursive meanings, that the syntactic location of the adverbs relatively closely reflected that of the adult use and that the discursive uses appeared to be learned from interactional contexts and typically had the functions of urging, action completion and reassuring in the child's language. The daily-routine-related everyday discussions evoked linguistic patterns corresponding to the child's and caregivers' interactional roles. Further study into this area with additional languages and corpora is highly encouraged.

Abbreviations used in glossing

aff	affirmative
all	allative
cli	clitic
cond	conditional
dm	discourse marker
gen	genitive
ill	illative
imp	imperative mood
ine	inessive
neg	negative
pass	passive voice
par	partitive
pst	past tense

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q question
1sg first person singular
2sg second person singular
3sg third person singular

Supplementary material. The supplementary material for this article can be found at http://doi.org/10.1017/S0305000924000114.

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