Glossa a journal of general linguistics

Boeg Thomsen, Ditte. 2017. Children's felicitous use of intersubjective particles evidences sensitivity to constellations of perspectives. *Glossa: a journal of general linguistics* 2(1): 19. 1–30, DOI: https://doi.org/10.5334/gjgl.194

RESEARCH

Children's felicitous use of intersubjective particles evidences sensitivity to constellations of perspectives

Ditte Boeg Thomsen
Lancaster University, Lancaster, LA1 4YL, UK
ditte.boeg@lancaster.ac.uk

Discourse particles specify how interlocutors' understandings converge and differ, and appropriate use requires ability to represent propositions from two perspectives simultaneously. This makes discourse particles a highly useful case for investigating developments in children's ability to monitor and compare mental states, a controversial issue in child language research. Being neither salient, nor obligatory, the particles further allow us to assess children's motivation to look for interpersonal meanings without strong linguistic incentives. By means of a corpus analysis of peer group conversations (123 hours, 19 children: 1;9–6;3 years), the present study examines at which ages Danish kindergarteners demonstrate stable mastery of the interpersonal contextual demands of five particles marking shared knowledge, disagreement and differential access to knowledge. As background for evaluating children's particle use as well as order of occurrence, adult consensus on particle meanings was substantiated with a gap-filling test and relative input frequency estimated in caregiver speech. Children were significantly above chance in producing intersubjective particles in felicitous contexts and differentiated clearly between the particles. While there was a strong increase in token frequency over the kindergarten years, children evidenced sensitivity to context from their first productions, and particle felicity did not improve significantly with higher age or production experience. The results suggest that 3-to-6-year-olds routinely monitor and compare representational states, and that they are highly motivated to coordinate conversations as joint actions by pointing to interlocutor perspectives.

Keywords: discourse particles; viewpoint constructions; mental states; perspective taking; language acquisition

1 Introduction

Human children are born into social niches abundant in perspectives of fellow humans (Tomasello et al. 2005; Harder 2010). During early childhood, typically developing children come to grasp these visual, attentional and mental perspectives in ever more sophisticated ways, eventually coming to understand other people as mental beings whose representation of reality may differ both from the child's own and from reality (Wellman et al. 2001; Tomasello & Rakoczy 2003). With a wide variety of specialized viewpoint constructions the languages of the world provide speakers with linguistic tools for putting these invisible human perspectives on stage, and in their input children will typically encounter many different linguistic strategies for explicating their own and others' perspectives in order to coordinate and manage differences between them (Verhagen 2005; Evans 2010; San Roque et al. 2012).

The ability to take another's perspective is involved in many different types of human engagement, including orienting to others' different visual fields, to their emotional

evaluation of situations and to their intentions (Hobson 1991; Tomasello et al. 2005). The present paper focuses on just one aspect of perspective taking, human beings' metarepresentational understanding of their own and others' representations of states of affairs, i.e. their keeping track of what people know and (truly or falsely) believe (Perner 1991). This is the type of understanding typically measured with false-belief tasks and often described as an aspect of Theory of Mind (Wellman et al. 2001), and in this paper the term "perspective" will refer to representational state, a specific propositional attitude.

Many languages have repertoires of discourse particles such as German *ja* and *doch* that are fine-tuned to exactly this kind of perspective taking – as they allow interlocutors to specify how their understandings converge and differ (Zimmermann 2011). Thus, a speaker can present a proposition such as 'that is a desert island' in (1) as e.g. shared knowledge (*ja*), shared knowledge that the addressee may have forgotten (*doch*) or uncertain knowledge (*wohl*):

(1) *German*

Das	ist	ja/doch/wohl	eine	unbewohnte	Insel.
that	is	DP	a	desert	island

'That is a desert island (as we both know/as we both know, but which you might have forgotten/I think).'

With such perspective-explicating functions, discourse particles help interlocutors monitor each other's attention to coordinate conversations as joint actions (in the sense of Croft 2009), and a growing amount of evidence from different languages points to their great utility for marking propositions as e.g. shared, new, uncertain, surprising or desirable information to speaker, hearer or somebody else (Zimmermann 2011; San Roque et al. 2012). Many of the particles are intersubjective in the sense that they point not only to single perspectives, but to constellations of attitudes, typically between the interlocutors, as in the German examples above, and to acquire them, children must be able to represent propositions from two perspectives simultaneously. Further, languages differ crosslinguistically in the perspective bundles they categorize. For instance, it is not unusual for languages with discourse particles to mark speaker uncertainty (see Zimmermann 2011), but in Danish, three different particles mark speaker uncertainty, combining it with three different privileged sources of knowledge (Hansen & Heltoft 2011). Such combinations have not been reported for other languages, and similarly, the meanings covered together by two particles, *ja* and *doch*, in German appear to be covered by just one particle in Finnish, but by three in Czech (Zimmermann 2011: 2032).

Therefore, children can only figure out the specific particle functions in their target language by recognizing balances in knowledge and attitude between themselves and their interlocutors and by generalizing over situations where configuration of perspectives is the critical recurring trait. This means that children's acquisition of intersubjective discourse particles can provide us with a window on their developing perspective-taking skills.

There is a rich body of literature on children's acquisition of viewpoint constructions, focusing especially on complement-clause constructions and evidential morphology, but the findings from these studies are mixed, and discourse particles have formal characteristics that make them especially useful for examining children's *spontaneous* attention to others' perspectives. Complement-clause constructions such as *the sailor thought it was a desert island* are typologically widespread highly explicit viewpoint constructions allowing speakers to anchor a proposition (*it was a desert island*) in a conceptualizer (*the sailor*) and specifying this conceptualizer's perspective on the proposition (*thought:* past belief).

Children begin to use complement clauses during their third year, e.g. in English (Diessel & Tomasello 2001), German (Brandt et al. 2010) and Danish (Boeg Thomsen 2015a), and there is some evidence that children's experience with this kind of explicit verbal viewpoint marking supports their developing mental-state reasoning skills (de Villiers & de Villiers 2003; Hale & Tager-Flusberg 2003; Lohmann & Tomasello 2003; Schick et al. 2007). However, it is controversial how sophisticated perspective-taking skills children's early use of complement clauses can be taken to imply. Diessel & Tomasello (2001) interpret the early matrix clauses with mental verbs they find in parent-child interactions as chunks without mental reference, and Moore et al. (1989) report inaccurate comprehension of mental verbs in complement-clause constructions below age 4.

Another type of viewpoint marking examined in different languages is evidential morphology indicating the knowledge source and status for propositions. For Korean children, Choi (1991) has found productive and appropriate use of epistemic-evidential suffixes during the third year, and she suggests that the obligatory presence as well as perceptually salient clause-final position of the suffixes invite children to search for associated functions. Similar ages have been reported for child speakers of Turkish, another language with obligatory evidentiality coding (Aksu-Koç et al. 2009). In both languages, comprehension experiments have indicated much later mastery of evidential morphology, at about age 4 (Aksu-Koç et al. 2009: Turkish) or even later (Papafragou et al. 2007: Korean), but this delay may depend on difficulties in designing natural and pragmatically felicitous comprehension experiments (cf. Aksu-Koç et al. 2009).

Studies presenting children's acquisition of viewpoint constructions as a slow and challenging process support their findings with reference to results from developmental psychology where children only begin to pass false-belief tests consistently at age 4–5 (Wellman et al. 2001). Such false-belief tests require children to assign mental states to self and others and either remember their own previous false belief or predict another's false belief when these beliefs clash with what the child knows about reality, i.e. to hold two perspectives on the same situation in mind simultaneously. If young children's viewpoint-marking language is found to be immature below age 4–5, it is interpreted as a reflection of the children's immature Theory of Mind (Moore et al. 1990; Diessel & Tomasello 2001; Schmerse et al. 2014). However, many factors beside false-belief understanding go into passing false-belief tests, and studies enhancing pragmatic felicity of the test questions (Hansen 2010) or using indirectly elicited measures such as gaze (Onishi & Baillargeon 2005; Kovács et al. 2010; Southgate et al. 2010) report sensitivity to others' belief states at much lower ages. It is therefore highly plausible that children should demonstrate some sensitivity to others' perspectives also before age 4 and be able to use their nascent understanding of others' mental states for acquiring linguistic viewpoint constructions.

Here, discourse particles provide us with a particularly illuminating opportunity to examine children's attention to linguistic viewpoint marking. Not only do their intersubjective meanings (constellations of interlocutor attitudes) demand sensitivity to *double* perspectives on the same propositions, but their formal properties also differ from more well-examined viewpoint constructions in interesting ways. In contrast to the perceptually salient matrix clauses in complement-clause constructions, discourse particles are models of non-saliency: monosyllabic, stressless and (in Germanic languages) sentence-medial. On the other hand, they also lack the obligatoriness of evidential suffixes (as the ones in Korean and Turkish) whose constant recurrence may stimulate children to compare utterances and discover their perspectival differences. Being both optional and inconspicuous, discourse particles thus allow us to assess whether young children are motivated to look for interpersonal meanings in the absence of salient linguistic incentives to look

for similarities. Acquisition of these subtle double-perspective markers has not attracted much attention in child language research, but an experiment by Schmerse et al. (2014) tested German 5-year-olds' comprehension of one particle, *doch,* which in its stressed version indicates belief revision. Children's sensitivity to this belief-revision function was measured by means of a forced-choice task where children watched a puppet search for a toy that could be hidden in either of two boxes. Before looking into a box, the puppet would utter a positive or a negative statement about the possible location of the toy in the chosen box, then look into the box and upon discovering the contents of the box state: "It is DOCH in [NAME OF FRIEND]'s box". If children were sensitive to *doch*'s belief-revision function, they would expect the toy to be hidden in the same box if the puppet had uttered a negative statement before looking, and in the other box if the puppet had uttered a positive statement first. In this condition where original belief was explicitly stated, German 5-year-olds evidenced a sophisticated understanding of *doch*, performing at the same level as adults, but in an implicit condition with increased inferential load, Schmerse et al. (2014) found poorer performance in children than in adults. Apart from this single-particle study, little is known about how and when children acquire discourse particles.

If children are highly interested in fellow humans' perspectives (Tomasello et al. 2005), and if they are further able to represent diverging mental states much earlier than age 4–5 as suggested by newer studies in developmental psychology, then they could be expected to be highly sensitive to markers in their verbal input categorizing these perspectives. That is, keeping track of convergence and divergence between their own and others' mental states, which is a necessary precondition for acquisition of inconspicuous discourse particles, may not be as tough a challenge for children as previously thought, but something children spontaneously do, even below age four.

By means of a longitudinal spontaneous-speech analysis, the present study examines the hypothesis that children's sensitivity to and interest in others' mental states as well as their motivation to monitor conversations as joint actions spur them to acquire discourse particles before age 4–5 where traditional theory of mind tests are passed. Contrary to earlier investigations, this study uses a kindergarten corpus of group conversations between peers (123 hours, 19 children: 1;9–3;8 to 5;0–6;3 years), i.e. interactional contexts with many perspectives available and relevant to the speakers and thus especially suited for investigations of child mastery of perspective-marking language. The spontaneous-speech analysis investigates the following questions:

- How young are children when they begin to mark perspectives on their propositions with discourse particles?
- Do children use the particles in felicitous contexts from the beginning, i.e. evidencing awareness of their perspectival functions?

As a background for evaluating children's use, Section 2–4 corroborate the perspective-marking functions of the particles in the target language as well as their availability to children. Section 2 presents the formal and functional characteristics of Danish discourse particles, comparing them to discourse particles in other languages. To validate the theoretical descriptions of intersubjective particle functions empirically, Section 3 then demonstrates adult consensus on the elusive meanings of a subset of the particles by means of a gap-filling test, whereafter Section 4 specifies the relative frequency of the five discourse particles in caregiver speech. Section 5 presents the spontaneous-speech analysis examining Danish preschoolers' own use of intersubjective particles and their sensitivity to their perspective-marking functions while Section 6 compares the results

to other studies in the ontogeny of linguistic viewpoint constructions and places them with respect to controversies within psychology as to the timing of children's developing mental-state understanding.

2 Danish discourse particles

Like many other Germanic languages, Danish has a series of grammatical particles marking interlocutors' perspectives on the propositions they scope over, many of them with cognate particles in the language family. This paper follows Davidsen-Nielsen (1996), Zimmermann (2011) and Schmerse et al. (2014) in characterizing the particles as *discourse particles*, but unfortunately there is no terminological consensus in the particle literature, and the same particles have also been termed *dialogic particles* (Hansen & Heltoft 2011), *dialogue particles* (Engberg-Pedersen & Boeg Thomsen 2016) and *modal particles* (Christensen 2007). Further, some authors use *discourse particles* in a very different sense (e.g. Fischer 2007), but the formal and semantic characterization below should clarify which type of particles the present study targets. The paper focuses on five of the core members of the discourse particle class, *jo, da, nok, vel* and *vist,* which share the following formal traits (Davidsen-Nielsen 1996; Christensen 2007; Hansen & Heltoft 2011):

– monomorphemicity,
– monosyllabicity,
– stresslessness,
– medial (or final) clause position,
– dependence on a finite verb,
– inability to occur as independent answers,
– inability to be modified by other constituents as heads,
– inability to be focused in cleft constructions,
– inability to participate in word formation processes.

Together, these characteristics mark the five discourse particles as standard background markers, and their inability to be focused (no stress, no cleft constructions) points to their status as grammatical, not lexical items in Danish (cf. Boye & Harder 2012).

What the Danish particles share functionally is the core function of discourse particles crosslinguistically as defined by Zimmermann (2011: 2013): "Discourse particles provide the discourse participants not with descriptions of particular states of affairs, but rather with clues as to which propositions count as mutually accepted, as controversial, or as uncertain. That is, they establish a link between the proposition expressed by an utterance and the knowledge and belief systems of the discourse participants". For the five particles under investigation, the list of core meanings below sums up the semantic descriptions in Davidsen-Nielsen (1996) and Grammar of the Danish Language (GDS, Hansen & Heltoft 2011):

jo: shared knowledge, presupposed agreement
da: shared knowledge, opposing viewpoint
nok: uncertainty, privileged speaker knowledge
vel: uncertainty, privileged addressee knowledge
vist: uncertainty, privileged external source

This is just a subset of the perspective constellations Danish discourse particles provide speakers with. If a speaker wants to point out the existence of an opposing viewpoint without presupposing shared knowledge (*da*), she can choose between three other particles: *nu* (opposing viewpoint, correction), *skam* (opposing viewpoint, reassurance) and

dog (opposing viewpoint). These three particles are not included in the study as they turned out to be so rare in both caregiver speech and child speech that there were not enough data to quantify the results. For the same reason, the study only focuses on particle use in declarative sentences: among the five particles investigated, only *da* can occur in interrogative and imperative sentences, and the data set only contained three occurrences of each.

The sections below give details on the meanings and thus felicity conditions of the two markers of shared knowledge with or without opposing viewpoint, *jo* and *da*, and the three markers of uncertainty with distinct source assignment, *nok, vel* and *vist*. It should be noted that all of the particles also have (near-)homophones, other functions and derived uses, and that debates about polysemy vs. homophony are not all settled (cf. Therkelsen 2001; Hansen & Heltoft 2011; Engberg-Pedersen & Boeg Thomsen 2016). However, this study focuses solely on *jo, da, nok, vel* and *vist* in their *discourse particle* versions, where the formal traits listed above (most importantly stresslessness and positional restrictedness) single them out as special class, and where none of the particles are polysemous.

2.1 Shared knowledge with or without contrast: Jo *and* da

Two of the particles, *jo* and *da,* both mark the propositions they scope over as shared knowledge, i.e. as already part of the common ground, but *da* simultaneously indicates the existence of an opposing viewpoint contrasting with the knowledge expected to be shared. *Jo* thus parallels its German cognate *ja* in signalling that the speaker expects the addressee to recognize the propositional content as an uncontroversial already established fact (cf. Karagjosova 2003 and Zimmermann 2011 on *ja*), and crosslinguistically, this appears to be a highly useful function that many languages categorize (cf. Zimmerman 2011 on Greek, Czech and Hungarian). It is worth stressing that the speaker's sources for expecting something to be uncontroversial shared knowledge do not have to be present in the previous discourse or the perceptual context, but can also derive from shared cultural models licensing default inferences of typical outcomes (cf. Verhagen 2005 on *topoi*). This means that it is possible to present new information and at the same time mark it as something the addressee should be assumed to expect already, as in (2):

(2) Hun hørte ikke noget fra dem i en uge, og så blev hun jo bekymret.
'She didn't hear a word from them for a week and then she *jo* got worried.'

Treating shared cultural models and perceptual evidence on a par with discourse information as sources for common ground is also characteristic of German discourse particles (Fischer 2007: 53) and of Dutch (Hogeweg 2009: 14).

As for *da*, this particle signals the same assumptions about shared knowledge between the interlocutors, but at the same time it acknowledges the existence of an opposing viewpoint held by either the addressee or a third person. By using *da* in (3), the speaker, B, instructs the addressee, A, to treat their financial situation ('we can't afford a yacht') as shared knowledge, but simultaneously signals awareness of the possible conflict with the opposing viewpoint ('we can afford a yacht') implied by A's suggestion:

(3) *A: Lad os købe en yacht.*
A: 'Let's buy a yacht'.
B: Det har vi da slet ikke råd til.
B: 'We can't *da* afford that at all.'

This makes *da* a practical tool for signalling non-naïve awareness of opposing viewpoints to forestall upcoming objections or to mark that already uttered objections have been heard, and sentences with *da* thus share intersubjective function with concessive clauses as analysed by Verhagen (2005: 183): "A speaker has just asserted something or wants to assert something, and foresees a possible objection; *although* allows her to acknowledge and try to override that objection immediately, thereby managing her relationship with the addressee". But in addition to this, *da* presents the reason for discarding the opposing viewpoint as part of the interlocutors' common ground already.

With its complex combined reference to shared knowledge and opposing viewpoint, *da* serves similar functions as German unaccented *doch*: "*doch* expresses that the speaker regards the proposition in the scope of the MP [: modal particle, DBT] as common knowledge between him and the addressee. In all cases it also indicates a slight contradiction between the common knowledge assumption and a suggestion that the hearer is not aware of it" (Karagjosova 2003: 5). German *doch* is thus particularly useful when the speaker wants to remind the addressee of apparently forgotten common ground knowledge (Zimmermann 2011; Schmerse et al. 2014), which is also the case for Danish *da*.

Finally, it should be noted that it is not uncommon for *jo* and *da* to be used with functions deriving from their prototypical functions in contexts not satisfying their core perspectival requirements, but that these uses are infrequent and restricted enough to be characterized as derived used. Thus, *jo* is occasionally used with persuasive and mirative functions in contexts without shared knowledge (Engberg-Pedersen 2009), and in one lexically restricted construction *da* can be used for subjective evaluation in contexts lacking an opposing viewpoint. This use is restricted to the construction *det COPULA da* [subjective evaluation] where a speaker responds to the presentation of a situation by expressing exactly that emotional evaluation which the interlocutor herself has already expressed or would be expected to hold, e.g. "That was *da* wonderful/horrible" when the interlocutor has just related something undeniably wonderful or horrible. Boeg Thomsen (2012) tentatively describes this as a kind of relevance-making use activating the idea of potential opposing viewpoints in order to motivate agreement-marking utterances that would otherwise seem superfluous and banal in situations that are completely free from opposition.

2.2 Speaker uncertainty and source of authority: nok, vel *and* vist

The three particles *nok, vel* and *vist* share the function of indicating speaker uncertainty about the propositions they scope over, a particle function found in many unrelated languages (Zimmermann 2011). However, the Danish epistemic modal particles present traits that would appear to be crosslinguistically particular. They do not differ in the degree of uncertainty they signal, but they combine speaker uncertainty with different assignments of source of authority, and Grammar of the Danish Language (Hansen & Heltoft 2011: 1058f) therefore characterizes them as an evidential subsystem among the discourse particles:

> **Source of authority** (accompanying speaker uncertainty):
> *Nok*: the speaker
> *Vel*: the addressee
> *Vist*: an external source

Nok signals that the speaker has sufficient evidence to assert the proposition with a reservation, and it is therefore felicitous in contexts such as (4a) and infelicitous in (5a) and (6a), where the addressee and an external source, respectively, are explicitly present as holders of more certain knowledge about the proposition. *Vel* signals that the speaker has

uncertain knowledge and expects the addressee to confirm it as the more certain source of authority, and with its appeal to more certain addressee knowledge it comes close to marking the proposition as a question. Since it privileges addressee knowledge, *vel* is felicitous in contexts such as (5b), where there is incongruence between what the interlocutors know and where the addressee is the most reliable source of knowledge. In (6b) with its reference to an external source, *vel* is decidedly inappropriate, and it does not fit well in (4b) either, even though it is possible to imagine contexts where the speaker would appeal to the addressee for reassurance as to the typical process of recovery. *Vist* signals that the speaker has uncertain knowledge building on an external source, whether this consists in one or more third persons (hearsay) or external criteria to be checked (such as a budget or a timetable). Thus, *vist* is felicitous in (6c) with its explicit pointing to others' utterances while being infelicitous in (4c)'s speaker-authority context and (5c)'s addressee-authority context.

(4) **a. I'll *nok* feel better tomorrow.**
b. I'll *vel* feel better tomorrow.
c. *I'll *vist* feel better tomorrow.

(5) A: My father called yesterday to tell me my uncle had a stroke.
a. B: *Oh, then you *nok* couldn't concentrate on the presentation.
b. B: Oh, then you *vel* couldn't concentrate on the presentation.
a. B: *Oh, then you *vist* couldn't concentrate on the presentation.

(6) a. *He lives *nok* quite secluded as far as I've heard.
b. *He lives *vel* quite secluded as far as I've heard.
c. He lives *vist* quite secluded as far as I've heard.

3 Validation of the semantic analysis: A gap-filling test

Pinpointing the exact meanings of discourse-sensitive markers of interlocutors' mental states is a methodological challenge calling for subtle and precise tools (San Roque et al. 2012; Burton & Matthewson 2015), and indeed, previous intuition-based analyses of Danish discourse particles disagree on various points (cf. the discussion in Boeg Thomsen 2015b). To substantiate Danish language users' agreement on the perspective-mixing functions of the two most frequent particles, *jo* and *da*, as well as one of the uncertainty-marking particles, *vel*, this section therefore presents data from one recent and one new study. Both studies employ a gap-filling test with a forced choice between these three particles, developed by Boeg Thomsen and Engberg-Pedersen (Boeg Thomsen 2012; Boeg Thomsen & Engberg-Pedersen 2012).[1] The gap-filling test exploits the supposedly distinct felicity conditions different particles introduce on the mental states of interlocutors concerning the propositional content they scope over (cf. Zimmermann 2011: 2013) by presenting small stories building up different configurations of perspectives between the fictive characters interacting. If the semantic analyses of the differences between the particles hold, and if the interpretational freedom of the contexts could be sufficiently restricted, only one of the three particles should be felicitous in each context. (7) presents a translated test item with *jo*:

[1] The detailed summary of Boeg Thomsen (2012) below ensues from this previous study being only available in Danish.

(7) It's Sunday, and Peter calls his friend Jakob. Peter asks: Shouldn't we go to the beach?
Jakob answers: Great idea, the weather is ____ lovely today!

This is a prototypical *jo* context because the weather is available to both interlocutors, and Danes culturally agree on what counts as lovely weather so the speaker can expect his addressee to be aware of the truth of the proposition already, which has also been indicated by his suggestion to go to the beach. The test item in (8) combines such expectation of shared knowledge with disagreement, exemplifying a typical *da* context:

(8) It's winter, and Signe and Anne go for a walk in the forest. They notice some beautiful flowers. Signe says: Look at those pretty snowdrops!
Anne says: That's ____ not snowdrops. Those are winter aconites.

This story presents two explicitly opposing viewpoints (the flowers are snowdrops vs. the flowers are winter aconites), but at the same time it draws on shared cultural knowledge that the addressee can be expected to share. Snowdrops can be assumed to be well-known to all Danish children from kindergarten age onwards because of a pervasive pre-Easter tradition of children sending secret letters with snowdrops to others each year. (8) thus meets the felicity conditions of *da* (opposing viewpoint, shared knowledge), but not of the other two particles. Finally, example (9) presents a *vel* item:

(9) In the evening, Peter and Jakob do their homework together. Jakob says: Next week is going to be really busy for me! Peter says: Well, then you ____ won't want to go to a concert with Signe and me this Friday. I had forgotten to ask you about it.

This context is felicitous for *vel*, but not for any of the other two particles, because it presents a combination of speaker uncertainty and privileged addressee knowledge: the addressee can be expected to know more about his own time schedule and inclinations than his friend, the speaker.

In the original study (Boeg Thomsen 2012), a pilot version was developed with 24 gaps, 8 for each of the particles *jo*, *da* and *vel*. This pilot test was filled out by 60 Danish adults, and one point was given per expected gap-filling, so each item could score 0–60 points, reflecting the degree of agreement between adults on the adequacy of the particle in each specific context. The results showed a very high degree of consensus on particle felicity in different contexts, with the 24 items getting a mean score of 95% expected answers (57 out of 60 possible; variance 11.9; SD 3.4). Danish adults thus appear to share an understanding of the configurations of perspectives presented by each of the three particles *jo, da* and *vel* that matches the semantic analyses presented above in Section 2. However, the first test also revealed that the contexts in a few items had not been sufficiently specified as they enabled different readings of the fictive characters' mental states and thus allowed for more than one appropriate particle (Boeg Thomsen 2012; Engberg-Pedersen & Boeg Thomsen 2016). When shortening the test to the final 15-item version (to be used for comparing school children), the items that had proven most open to different mental-state ascription were removed, and a couple of items had more cues added to make sure the context was unequivocal (Boeg Thomsen & Engberg-Pedersen 2012).

Since the adult data in Boeg Thomsen (2012) derived from a pilot version of the test, the results should be confirmed with new, independent data. For the present study, the revised 15-item test was therefore given to 45 new subjects (all students). Responses from

four L2 speakers of Danish were excluded, leaving responses from 41 L1 speakers with a mean age of 22 years (range: 19–41). With the test contexts now presenting minimal interpretational openness, adult agreement on particle felicity was even higher, the 15 items on average eliciting 97% expected answers (40 out of 41 possible; variance 3.03; SD 1.74). The meanings of discourse particles have often been thought to be elusive and difficult to determine, but a comparison of the responses on the 15 items common to the new 41-subject test and the original 60-subject pilot test shows an impressive robustness of consensus among Danish adults: for 7 out of the 15 gaps there was *not one* deviant answer in the responses from 101 subjects. For the remaining 8 gaps, expected answers ranged between 94 and 99 out of 101 responses (Fleiss' Kappa = 0.933, items = 15, raters = 101, z = 363).

For *jo, da* and *vel,* the semantic analyses presented in Section 2 can thus be expected to capture Danish language users' understanding of the intersubjective particle functions, which is a prerequisite for evaluating children's acquisition of the particles and assessing the perspective-taking skills they demand. However, acquisition of discourse particles does not only depend on children's skills, but also on the availability of the markers in their linguistic input. Since the particles are optional, it is worthwhile ascertaining that they actually occur in child-directed speech, and Section 4 below therefore examines the frequency of discourse particles in caregiver speech in Danish adult-child interactions.

4 Input analysis: Discourse particles in child-directed speech

As seen in Section 1, discourse particles vary crosslinguistically in the types of perspective constellations they categorize, and, indeed, many languages do not have discourse particles at all. To build up language-specifically appropriate repertoires of discourse particles, children must therefore be expected to depend on actually hearing the concrete particles in contexts with those perspective constellations that their own target language categorizes. Unlike obligatory evidential suffixes marking perspective information in Korean and Turkish, discourse particles are optional, and as child-directed speech may differ markedly from adult-directed speech, it is important to ascertain whether caregivers actually use them in child-directed speech, providing children with opportunities to generalize over the situations they occur in. Further, an input analysis makes it possible to analyse the relative frequency of the five particles, which is crucial for evaluating their relative order of acquisition. If the particles occur with comparable frequency in the input, systematic differences in age of occurrence in child speech could suggest that some perspective constellations are more complex than others and depend on more sophisticated sociocognitive skills. If, on the other hand, there are large differences in input frequency, such a conclusion would be unwarranted as two other factors might explain acquisition order: Firstly, children might have had less experience with a specific particle and thus have had fewer chances of parcelling out its contribution to the utterances it occurs in. Secondly, the finding might simply be a sampling effect; if both adults and children use a particle very rarely, the sampling could be too thin to catch early uses (cf. Tomasello & Stahl 2004).

To give a nuanced picture of discourse particles in children's input, two different analyses were carried out: one in the kindergarten corpus used for the child-speech analysis (Section 5) and one in a traditional parent-child corpus. Measuring adult discourse-particle use in the kindergarten corpus has the advantage of giving information on particles actually heard by those specific children whose own particle use is to be examined. In a 52-hour subcorpus of the Trørød Corpus, the adult investigator produced 399 discourse particles in declarative clauses, with large differences in the frequencies of individual particles: the

two markers of shared knowledge with and without an opposing viewpoint, *jo* (58%) and *da* (23%), together accounted for about four fifths of all productions. The three uncertainty markers were much rarer, together accounting for the last fifth, with *nok* (1st person source: 8%) and *vist* (external source: 8%) being more frequent than *vel* (2nd person source: 4%).

This input analysis has the disadvantages of 1) only providing information on *one* adult's, the investigator's, use, 2) underestimating particle frequency since adult interference was deliberately kept at a minimum, and 3) giving no indications of particle use in adult-adult interactions in children's input. To supplement it, another input analysis was carried out in Odense Twin Corpus (OTC), a spontaneous-speech corpus compiled by Centre for Child Language (University of Southern Denmark) and consisting in interactions between families in their own homes during everyday activities such as playing and dining (Basbøll et al. 2002). In the 5.5-hour subpart used for this CDS analysis, two sets of parents, a nanny and an investigator partake, and the samples contain sessions from the child age points 0;9, 0;10, 0;11, 2;4, 2;5 and 2;6 years old. All utterances containing discourse particles were extracted by hand and classified as either CDS (child-directed speech) or ADS (adult-directed speech, overheard by the children). The OTC analysis indicated that discourse particles are highly frequent in children's linguistic input: during 332 minutes, the six adults produced 368 particles, i.e. more than one per minute. A few (13) of the *da* tokens occurred in interrogative or imperative sentences, and only the 355 particles used in declarative sentences will be treated here. Comparing CDS and ADS, the particles appear to be more frequent in the speech children overhear between adults (210 occurrences) than in utterances directed to themselves (145 occurrences), but part of the explanation for this may be that the children were very young at the first three age points (9–11 months), and the balance may change with more samples from higher age points. Table 1 shows the contribution of different particles in CDS, ADS and all in all.

As in the Trørød Corpus, *jo* and *da* occur with much higher frequency than any other particle, together accounting for 92%. However, there are also interesting differences: whereas *jo* occurred more than twice as often as *da* in the Trørød Corpus, this balance appears to be reversed in CDS in OTC, with *da* (58%) occurring almost twice as often as *jo* (30%). *Jo* is still a bit more frequent than *da* in ADS (51% vs. 42%). Further, the uncertainty markers are comparatively rare in OTC, with the three particles comprising 9% all in all (12% in CDS), compared to 20% in the Trørød Corpus, again with *vel* as the least frequent uncertainty marker in CDS (2 occ.). The differences in discourse-particle use in the two corpora cannot be taken to reflect general differences between children's input in daycare and home settings for also among the adult participants in the OTC analysis, individual particles are used to different degrees by different individuals. Figure 1 illustrates these differences, presenting investigator productions in

	jo	*da*	*nok*	*vel*	*vist*
CDS	44	84	4	2	11
	30%	**58%**	**3%**	**1%**	**8%**
ADS	107	89	3	7	4
	51%	**42%**	**1%**	**3%**	**2%**
All	151	173	7	9	15
	43%	**49%**	**2%**	**3%**	**4%**

Table 1: Adult productions of discourse particles in Odense Twin Corpus.

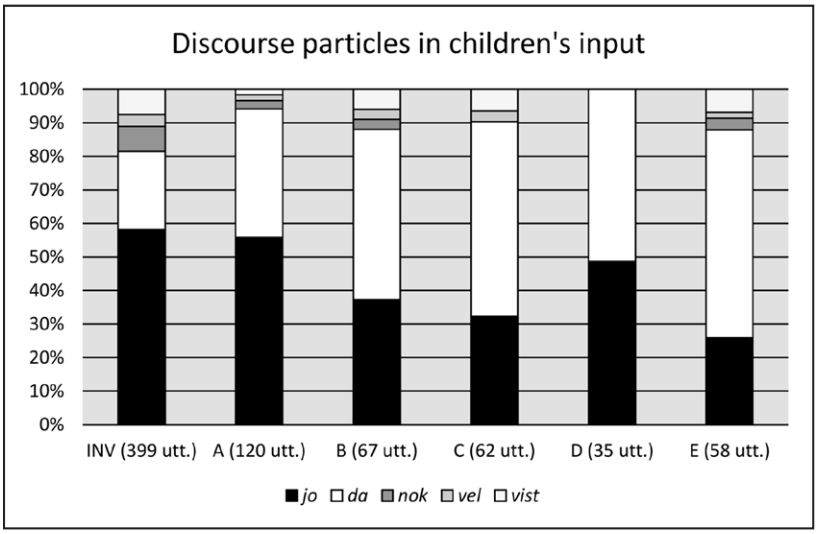

Figure 1: Individual differences in adults' particle use in children's input.

the kindergarten corpus in the first column, productions by four parents from OTC in the four middle columns (A–D) and productions from the OTC investigator in the last column (E).

This comparison reveals substantial interindividual differences, with *jo* ranging from 26% to 58%, *da* from 22% to 59%, *nok* and *vist* from 0% to 8% and *vel* from 0% to 4% so much appears to depend on individual interactional style, and there will be some variation in children's input as to the availability of individual particles. However, across subjects, the epistemic-evidential markers are consistently much less frequent than *jo* and *da*.

In sum, the two input analyses firstly demonstrate that discourse particles are highly frequent in children's linguistic environment, giving children plenty of occasions to generalize over the situations they occur in. Secondly, across subjects there is a substantial and systematic difference in frequency among the particles. When a language has three specialized uncertainty-marking particles, it is not surprising that each of them would occur less frequently than one general uncertainty marker would have done, but even counted together, *nok, vel* and *vist* still occur with much lower frequency than each of the markers of shared knowledge. As children apparently have less experience with the three uncertainty markers, they can be expected to take longer time to acquire them, and potential later age of occurrence cannot straightforwardly be attributed to higher cognitive complexity. Comparing *jo* and *da*, there is much interindividual variability, but none of the two particles appear to be systematically more frequent than the other, allowing no predictions of relative order of acquisition.

5 Spontaneous-speech analysis: Danish children's particle use

Having established the intersubjective functions of discourse particles (Sections 2–3) and their ample availability in children's linguistic input (Section 4) makes it clear that children's acquisition and appropriate use of discourse particles will depend on their developing perspective-taking skills. This section presents a spontaneous-speech analysis aimed at evaluating the hypothesis that kindergarteners monitor mental states so routinely that they are able to acquire optional inconspicuous markers of perspective configurations, and that they do so even before age 4–5 employing sociocognitive skills that traditional explicit theory of mind tests underestimate. The analysis therefore investigates both how young children are when they begin to mark perspectives on their propositions with

discourse particles and whether children use the particles in a mature manner from the beginning. For the first question, the spontaneous-speech analysis also examines differences between the five particles as regards age of occurrence, checking whether acquisition order can be predicted by input frequency balances alone. For the second question, the analysis utilizes the different felicity conditions discourse particles introduce on the mental states of the interlocutors to evaluate intersubjective appropriateness of children's productions in context stringently.

5.1 Method

The spontaneous-speech analysis was carried out in a 123-hour longitudinal subpart of the Trørød Corpus, a video corpus consisting of group conversations between Danish children in their daycare institution north of Copenhagen (Boeg Thomsen 2012)[2]. The children are recorded in 1-hour sessions in groups of four peers interacting while participating in everyday activities such as drawing, having lunch, playing board games, playing with a doll's house and looking in books in a secluded room. With the youngest children, the investigator is usually present too, and this is occasionally also the case in sessions with the older children, but the main part of the corpus consists of pure peer conversations with no adult scaffolding. Compared to traditional child-adult corpora, this corpus is especially suited for investigations of perspective-marking language because group interactions make the mental perspectives of several interlocutors available and relevant to the conversation, and because the lack of predetermined hierarchical parent-child roles invites alignment processes involving reference to own and others' attitudes.

5.1.1 Participants and sampling

19 children (10 male, 9 female) were followed longitudinally from ages 1;9–3;8 to ages 5;0–6;3 (2 hours at 4-month intervals). All children speak Danish as their first language; three are bilingual with Swedish, Faeroese and English as their other L1.

5.1.2 Excerption

All utterances with discourse particles in declarative clauses were excerpted directly from the videos and transcribed in Danish standard orthography along with stretches of preceding and succeeding discourse context as well as notes on the visual context when relevant. The few occurrences in interrogative and imperative clauses will not be treated here.

5.1.3 Context coding

A central question in the analysis was whether children used particles in felicitous contexts with appropriate constellations of perspectives, and it was thus important to make particle felicity quantifiable. Coding felicity in context is not a trivial task, however, as many real-life contexts allow different perspectival interpretations, making different particles felicitous in the same context, depending on the speaker's purposes. While contexts supporting the particles with a shared-knowledge component, *jo* and *da*, can typically easily be distinguished from contexts allowing any of the three uncertainty markers, many contexts with shared knowledge lend themselves to both *jo* and *da*. Since *jo* marks the *absence* of any opposing viewpoint and *da* marks the *presence* of an opposing viewpoint, this may seem contradictory, and in the majority of cases they are indeed disallowed in each other's contexts. Nevertheless, both are felicitous in contexts with implied or potential opposing viewpoints – as when somebody utters something that would usually presuppose "not P" or when somebody asks "whether P". In such cases, the speaker can either choose to address and activate the inferred opposing viewpoint ("escalate the dispute")

[2] A 94-hour subset of this 123-hour subpart was analysed in Boeg Thomsen (2015b).

with *da* or ignore it with *jo* and thus smooth over any potential conflict. Similarly, in some uncertainty contexts no knowledge source is obviously privileged over the others, and the speaker can choose to stress either her own inference or 2nd or 3rd person potential knowledge.

If children only produce the five particles in felicitous contexts, this is in itself an indication that they master their interpersonal functions, but production in contexts disallowing the other particles counts as even stronger evidence of mastery. That is, systematically preferring *jo* to *da* in contexts excluding opposing viewpoints and *da* to *jo* in contexts with explicit opposing viewpoints can tell us whether children differentiate the two particles whereas production of either in contexts with shared knowledge and implicit or potential opposing viewpoints only demonstrates sensitivity to shared knowledge.

Consequently, the coding process involved the following steps:

1) All contexts were coded for presence/absence of a) shared knowledge, b) potential opposing viewpoint, c) implied opposing viewpoint, d) explicit opposing viewpoint, e) speaker uncertainty, f) privileged speaker access to uncertain knowledge, g) privileged addressee access to uncertain knowledge, h) external source to uncertain knowledge, i) none of these. Coding was done directly from the videos, which had the advantage of making it possible to check both the visual context and children's gaze directions, i.e. what they knew about what others had seen. In real-life interaction, assumptions about others' belief and knowledge derive from a variety of local and global sources, and context was therefore interpreted broadly as encompassing everything from present visual cues to shared cultural norms. The investigator had worked in the kindergarten for more than ten years and could draw on rich knowledge about the children's shared routines. **Shared knowledge** was coded as present if it could be derived from one or more of the following sources[3] (examples from the child corpus in parentheses): *Shared experience*: Prior or simultaneous shared visual access, Session-internal prior discourse, Session-internal non-verbal experience, Session-external experiences from the children's shared daycare-institution life. *Common knowledge*: Real-world facts (fish do not breathe on land), Psychological phenomena (being in love, having nightmares). *Norms*: Rules of games (whose turn is it), Kindergarten norms (eat bread before snacks), Cultural norms (furnishing houses, girls liking to wear lipstick), Ethics (no stealing, no teasing, good things should be shared). **Opposing viewpoints** were identified in either the verbal, visual or behavioural context. **Speaker uncertainty** was primarily identified in propositions regarding the future, distance in space, hypothetical scenarios, others' feelings. **"None"** covers contexts with other perspectives as well as contexts with unidentifiable perspectives.
2) The fit between each particle and the perspective constellation in its context was rated on a four-point-scale: 1: infelicitous (context does not present any relevant perspectives); 2: partly felicitous (context only satisfies one of

[3] Note that shared knowledge can be derived, not ascertained. In the whole analysis, the expression *shared knowledge* is used as a practical shorthand for "reasonable expectations about shared knowledge". This also means that perspectives in the context have to be identified taking speaker knowledge as basis. If, for instance, the children hear an instruction together, and the rest of the children later hear another counter-instruction while the speaker is away, the speaker's reference to the original instruction as shared knowledge (with *jo* or *da*) would count as felicitous even if it is not actually shared knowledge between the speakers.

the particle demands, e.g. only presenting either shared knowledge *or* an opposing viewpoint for *da*); 3: felicitous (context satisfies particle demands, but is open to at least one other particle); 4: uniquely felicitous (chosen particle is the only felicitous particle in the context).[4]

5.1.4 Interrater reliability

To test rating reliability, 20% of the utterances were also coded by a second coder who was blind to the hypothesis and followed a coding manual going through both coding steps, first identifying perspectives in the transcripts and then rating particle-context fit. 70 utterances with *jo* (14% of 489), 39 with *da* (21% of 182) and all 30 utterances with *nok, vel* and *vist* were double-coded. Interrater agreement – evaluated with a weighted Kappa statistics taking into account the ordered character of the ratings – was high (κ = 0.92, weights: squared, utterances: 139, raters: 2, z = 10.9). Perspective constellations in natural interaction can never be as controlled as in an experiment, and it should be noted that both raters often experienced degrees of doubt. Nevertheless, the high degree of interrater agreement indicates that the contexts generally lend themselves to reliable identification of the types of perspectives relevant to particle categorization.

5.2 Results

The spontaneous-speech analysis shows that discourse particles are a common phenomenon in Danish kindergarteners' conversations, and that children's use of them undergoes substantial development during their kindergarten years, in both frequency and repertoire size. During 123 hours, the 19 children produce 701 utterances with the five particles, but for the youngest children (1–2-year-olds), they are exceedingly rare. Table 2 shows the increase in types and tokens over the four age stages.

Children use the five different particles to very different degrees, with *jo* (67%; first occurrence at 2;9) and *da* (25%, first occ. at 3;1) being both the earliest particles to occur and the far most frequently used at all age stages. As evidenced by Figure 2, which shows the proportion of children having produced each particle at or up to each age stage, the increase in type and token frequency does not just depend on a few children expanding their repertoires, but on the different particles being used by more and more individuals with each year.

During 31 hours of recordings with 1–2-year-olds, only two children produce a discourse particle, in both cases *jo* at 2;9. For individual children, the age of first occurrence ranges between 2;9 and 4;2 (mean: 3;6), but since the sampling is very sparse (two hours

Age stage	1–2 years	3 years	4 years	5–6 years
No. of children recorded	16	19	19	19
Hours recorded	31	32	30	30
Average particle tokens per hour per child	0.02	0.52	2.05	3.92
Particle types	1	4	5	5

Table 2: Danish children's particle use at four age stages.

[4] As noted in Section 2, both *jo* and *da* may occur with derived functions (*jo*: persuasive or mirative, *da*: relevance-making). These uses are completely unremarkable for mature language users, but since they do not evidence sensitivity to the same perspective requirements as the prototypical uses, they were counted as either infelicitous or partly felicitous in the present analysis.

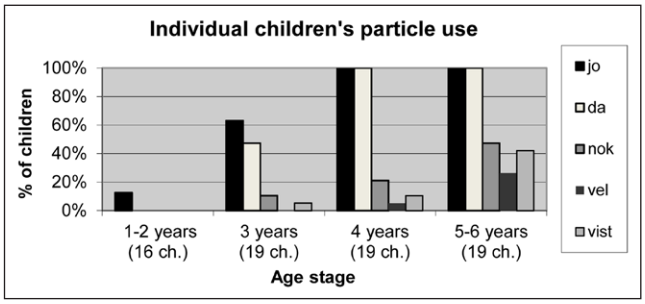

Figure 2: Proportions of children evidencing use of each particle at different age stages.

at 4-month-intervals) these ages of first occurrence can only count as minimum points and children should be expected to use the particles long before they turn up in the corpus (cf. Tomasello & Stahl 2004). Before their fourth birthday, the majority of the children (15 of 19) use at least one type of discourse particle, more than half of them producing *jo*, followed closely by *da*. All 4-year-olds use discourse particles, producing at least both *jo* and *da*, and at age 5–6, most children also produce at least one of the three epistemic-evidential particles, *vel, vist* and *nok*.

These results would seem to suggest that the three uncertainty markers are acquired later than *jo* and *da*, but a look at the relative frequencies of the particles at different age stages indicates that their proportion does not change notably over the kindergarten years, and that their higher ages of occurrence may be artefacts of thin sampling. The low frequency of *nok, vel* and *vist* might still suggest that children find it more challenging to mark uncertainty than shared knowledge, but exactly these three particles were also used with much lower frequency by adults in children's input, so children can be expected to have had less situations to generalize over. Low input frequency would thus explain both low output frequency and later corpus occurrence without implying increased cognitive complexity.

Figure 3 shows the shares of each particle in child speech at three age stages put side by side with adult data (summing over both input analyses in Section 4). This comparison illustrates that production patterns in the child group roughly follow adult use, with *nok, vel* and *vist* occurring less often than *da*, which again occurs less often than *jo*.

However, a preference for *jo* over *da* is much clearer in the child corpus, especially considering the interindividual variability among the adults (cf. Figure 1). The lower frequency of *da* relative to *jo* cannot straightforwardly be explained by differences in children's input, and in this case, an explanation hinging on differences in cognitive complexity could be justified. A plausible explanation would be that children find it sociocognitively more challenging to hold two different perspectives on one proposition simultaneously (as required by *da*) than to recognize the existence of two converging perspectives on one proposition (as required by *jo*). An alternative explanation would be that the interactional contexts in the kindergarten present children with fewer *da*-motivating conflicting viewpoints. Intuitively, this does not seem to be the case, but neither of the corpora lend themselves to quantification of "all potential conflicts" so the second explanation cannot be discarded.

The simple usage measures reported above demonstrate that kindergarteners have noticed the discourse particles in their input in spite of their inconspicuousness, and that they generally find them useful in their own production as well from at least the middle of their fourth year. However, these measures do *not* reveal whether children have also discovered the specific interpersonal functions of the particles and use them in manners sensitive to constellations of their own and others' perspectives. To assess this, it is necessary to scrutinize the usage contexts.

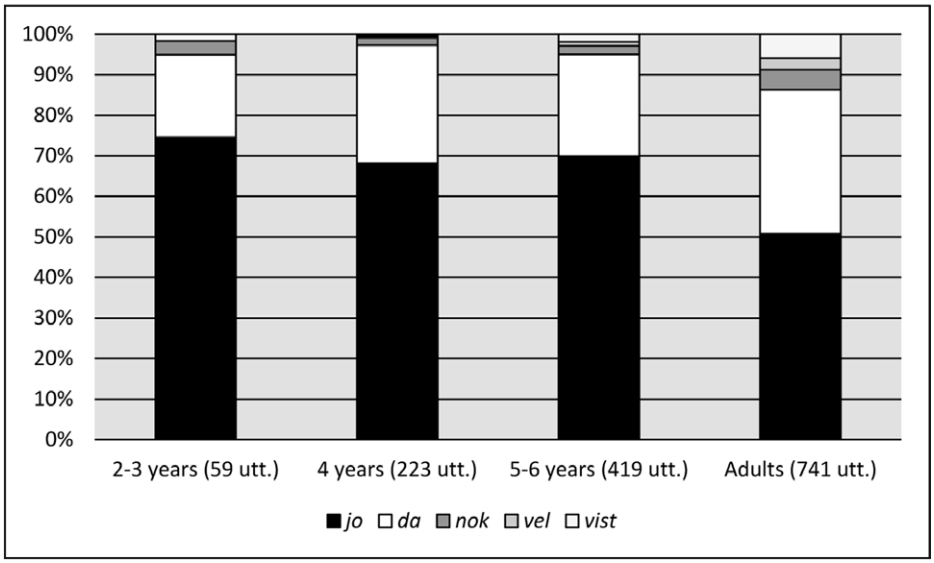

Figure 3: Discourse particle productions at different age stages in children and adults.

5.2.1 Felicity in context

For all occurrences, the fit between the particle's felicity conditions and perspectives in the context had been rated on a four-point-scale evaluating whether the context did *not* present any relevant perspectives (1: infelicitous), satisfied *one* of a particle's perspective demands (2: partly felicitous), satisfied all a particle's perspective demands, but would also allow another (3: felicitous) or satisfied all a particle's perspective demands and disallowed all the other particles (4: uniquely felicitous). Table 3 shows the distribution of particle occurrences in the ordered categories.

Children produced discourse particles in contexts fully satisfying their felicity conditions (3 and 4 together: 84%) much more often than in contexts that did not (1 and 2 together: 16%), and they did so significantly more often than what could have occurred by chance ($\chi^2 = 312.9049$, $df = 1, p < 0.00001$). That children rarely produce discourse particles in contexts without the expected perspective constellations provides strong support in itself for the hypothesis that children attend to the relationships between their own and others' mental states in conversation. However, as some contexts can be construed to allow more than one particle (e.g. letting speakers address or smooth over *implicit* opposing viewpoints), production in contexts where the particles are uniquely felicitous would count as even stronger support. This was tested by leaving out the particles in partly open contexts (3) and comparing uniquely felicitous (4: 79%) with partly felicitous and infelicitous occurrences (1 + 2: 21%). With this stricter test, children were still significantly above chance ($\chi^2 = 181.0887$, $df = 1, p < 0.00001$), providing even stronger support for the hypothesis. Since *jo* accounts for 70% of all occurrences, proficient use of this specific particle might mask less proficient use of the other four particles so separate tests were conducted to check whether children were also significantly above chance when *jo* was left out of the analyses. Testing against chance, children produced *da, nok, vel* and *vist* significantly more often in fully felicitous (3 + 4: 75%) as opposed to not fully felicitous (1 + 2: 25%) contexts ($\chi^2 = 53.504$, $df = 1, p < 0.00001$), as well as in uniquely felicitous (4: 68%) as opposed to not fully felicitous contexts (1 + 2: 32%) contexts ($\chi^2 = 22.5515$, $df = 1, p < 0.00001$).

5.2.2 Predictors of particle felicity: Age, production experience and gender

It was plausible that age and/or production experience would affect children's ability to produce particles in felicitous contexts. To test whether older kindergarteners were more

	Fully felicitous		Not fully felicitous	
	Uniquely felicitous (4)	**Felicitous (3)**	**Partly felicitous (2)**	**Infelicitous (1)**
jo	314	108	6	56
da	93	39	34	14
nok	10	4	0	1
vel	5	0	0	0
vist	5	2	2	1

Table 3: Distribution of particle occurrences (raw numbers) in contexts with different felicity degrees.

likely to produce discourse particles in felicitous contexts than younger kindergarteners, and whether a particle would be more likely to occur in a felicitous context the more particles the child had previously produced, a linear mixed-effects regression model was fitted with felicity (with the two levels Fully felicitous and Not fully felicitous) as the dependent variable. The model was fitted in the statistical environment R (version 3.1.1, R Development Core Team 2014) using the lme4 package[5], and it tested the explanatory variables Age (in months) and Number (in the line of particles a child produced) as well as the control variable Gender, and Child was included as a random variable because children contributed with different numbers of particles at different age stages. Table 4 summarizes the model.

The control variable Gender contributed significantly to explaining variance in particle felicity, with boys being less likely than girls to produce fully felicitous particles. Indeed, if this variable is not included in the analysis, no other significant effects emerge.

As for the explanatory variable Age, no main effect was found, and the results thus indicate that even if children produce more and more particles over the kindergarten years, sensitivity to particle context demands is already sophisticated in the young children from their first productions. The model does, however, show a marginally significant interaction between Age and Gender, suggesting a positive effect of higher age for boys, but *not* for girls. As the interaction is only marginally significant, it must be interpreted with caution, but since the boys were generally found to be less proficient than the girls in producing fully felicitous particles, the increase in particle felicity evidenced only by the boys suggests the reasonable scenario that the boys go through a process of catching up with the girls. Since Gender had only been included as a control variable, with no specific hypothesis about its effect, no strong conclusions can be drawn from this result. It should only be noted that the results are not overly surprising in light of the robust crosslinguistic finding that girls score significantly higher than boys (though slightly so) on general language development measures (Bornstein et al. 2004), which has also been established for Danish children (Bleses et al. 2008). If girls' advantage with discourse particles simply reflects such a general verbal advantage, the difference can be expected to be temporary and disappear during childhood (Wallentin 2009). It is of course also possible that girls are socialized to communicate more about

[5] Bates et al. (2011); lme4: Linear mixed-effects models using S4 classes. Downloaded 14 June 2016.

Random effects				
Groups	**Name**	**Variance**	**Std. Dev.**	
Child	(Intercept)	0.1297	0.3602	
Number of observations: 694, Children: 19				
Fixed effects				
	Estimate	**Std. error**	**z Value**	**Pr(>|z|)**
(Intercept)	1.24785	1.46349	0.853	0.3939
Gender: Male	–3.43436	1.56500	–2.195	0.0282*
Number	–0.02531	0.01220	–2.075	0.0380*
Age	0.02245	0.02666	0.842	0.3997
Gender: Male × Age	0.04704	0.02555	1.841	0.0656.
Significance codes: '***' .001; '**' .01 '*' .05				

Table 4: Summary of the linear mixed-effects regression model fitted to particle felicity for the predictors Age, Number and Gender (with female as the reference level) and including random intercept for Child.

relationships (cf. Wehberg et al. 2008), but this question is beyond the scope of the present study.

Finally, the explanatory variable Number (reflecting production experience) emerged as a significant predictor of particle felicity, but it did so with a surprising negative main effect. Particles were significantly more likely to be produced in fully felicitous contexts, the *fewer* particles the child had previously produced. This finding goes against the expectation that children might begin to produce particles before mastering their context demands fully and slowly "zoom in" on these demands through production experience. One plausible explanation could be that children generally only begin to produce discourse particles once they are sensitive to the contextual requirements of the particles, and that they only extend their use to derived functions (cf. section 2.1 above) once they have a solid grasp of the interpersonal core functions.

5.2.3 Shared knowledge, opposition and uncertainty

The calculations above do not tell us what happens when particles are uttered in contexts where they are not uniquely felicitous. A more illuminating indication of children's understanding of particle meanings is given by Figure 4, which specifies the distribution of particles in context types. The occurrences of *nok, vel* and *vist* are pooled in this figure because they are so few compared to *jo* and *da* that their internal differences become invisible, but Section 5.3.3 will return to them.

This figure gives a very clear indication that children assess perspectives in contexts and match them with particle demands. In contexts with shared knowledge and no opposing viewpoint, where *jo* is uniquely felicitous, the occurrence of other particles is vanishingly small. A typical example can be seen in (10), one of the two earliest particle occurrences in the corpus. Here, children have been playing a game with a coloured dice indicating in which bag they are to search for toy animals, and many of the children, among them Olga (2;9 years) have thrown blue. All children have observed the others' throws closely and talked about them, and now another child throws blue.

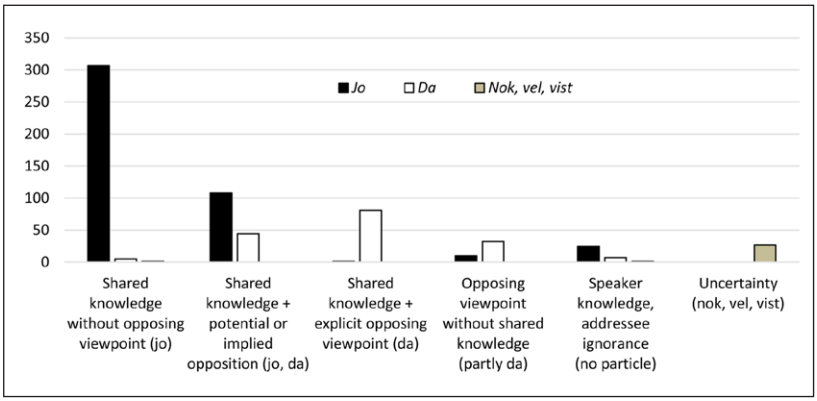

Figure 4: Distribution of particles (raw numbers) in different context types with felicitous particle(s) for each context specified in parentheses.

(10) Adult: Yes, you got a blue one too.
There are many blue ones today and they are the animals living in the sea.
Olga: Jeg fik jo også en blå.
I get.PST *jo* also a blue
'I got a blue one too (as we all know).'

In contexts with shared knowledge and an explicit opposing viewpoint, on the other hand, *jo* is almost completely absent. In these prototypical *da* contexts, the majority of *da* tokens occur, almost to the exclusion of other particles. A representative example is seen in (11), where both opposing viewpoint and shared knowledge have been explicitly verbalized in the preceding context. Four children are playing with a doll's house, and for a while the play has centred on marriage, with two boys imprisoning dolls who do not want to marry. The immediate prelude to the exchange in (11) is that Ketil's doll has told Kristof's doll that it wants to marry him, but Kristof's doll has disregarded it.

(11) Kristof 3;7: Boohoo, I have nobody to marry.
Ketil 3;10: Jeg gid-er da gerne gifte-s med dig.
I feel.like-PRS *da* readily marry-PASS with you.SG
'I would like to marry you (as you know, but seem to have forgotten).'

Here, Ketil addresses the opposing viewpoint ("Kristof's doll has nobody to marry") while reminding Kristof of the already established common-ground fact that Ketil's doll *does* want to marry Kristof's doll (and the scene continues with a happy wedding).

Comparing the distribution of *jo* and *da* in shared-knowledge contexts where an opposing viewpoint is either excluded (307 *jo*, 5 *da*) or explicit (1 *jo,* 81 *da*) shows that children differentiate the two shared-knowledge particles ($\chi^2 = 359.37$, $df = 1$, $p < 0.00001$). In more open shared-knowledge contexts with potential or implied opposing viewpoints, this difference cannot be examined, and here, children produce both *jo* and *da*. In all three types of shared-knowledge context, uncertainty particles are infelicitous, and indeed, only a single *vist* occurs in such a context (compared to 416 *jo* and 130 *da*). Conversely, *jo* and *da* are infelicitous in uncertainty contexts, and whereas 27 out of 29 instances of the epistemic-evidential particles occur in these contexts, children appear to avoid the shared-knowledge markers here (*jo* or *da*: 0, *nok, vel* and *vist*: 27).

A small number of particles occur in contexts with neither shared knowledge, nor uncertainty, where the speaker presents the addressee with information that is known to the

speaker and unknown to the addressee, i.e. a typical informative context. Here, all five particles are infelicitous, and children appear to be aware of this restriction, as they rarely produce discourse particles when they present their listeners with new information. The majority of cases involve utterances with *jo* where the speaker tries to convince the addressee to take her viewpoint by presenting new information as if it were already uncontroversial shared knowledge between the interlocutors, and this persuasive use accounts for a negligible share of all *jo* occurrences (5%).

Finally, a share of *da* tokens occur in informative contexts without shared knowledge, but *with* an opposing viewpoint. Here, *da* is partly felicitous, and the occurrences may either reflect persuasive use (trying to frame one's own viewpoint as shared knowledge) or that (some) children may treat *da* as a simple marker of opposition in the beginning and only come to master its complex combination of shared knowledge and opposing viewpoint gradually.

5.2.4 Uncertainty with differential access to knowledge

In Figure 4 above, the occurrences of the epistemic-evidential particles as well as the different types of uncertainty contexts were pooled, but they are differentiated in Figure 5.

The numbers are small and do not allow strong conclusions, but children do appear to differentiate the three particles with their respective sources so that they predominantly produce *nok* in uncertainty context with privileged speaker access, *vel* in uncertainty contexts with privileged addressee access and *nok* in uncertainty contexts with external sources of possible knowledge. Thus, the majority of *nok* tokens occur in contexts such as (12) where the speaker has reasons to be uncertain, but has sufficient evidence on his own to assert the proposition with a reservation.

(12) Context: some toys that the children usually play with during the recording sessions have disappeared; all interlocutors, including the adult experimenter, have stated their ignorance.

Adult:	And they weren't here when I arrived this morning so I don't know what has happened to them.						
Jane 5;11:	Så	er	der	nogle	der	nok	har
	then	be.PRS	there	somebody	that	*nok*	have.PRS
	tag-et	det.					
	take-PRF	it					

'Then somebody probably took it.'

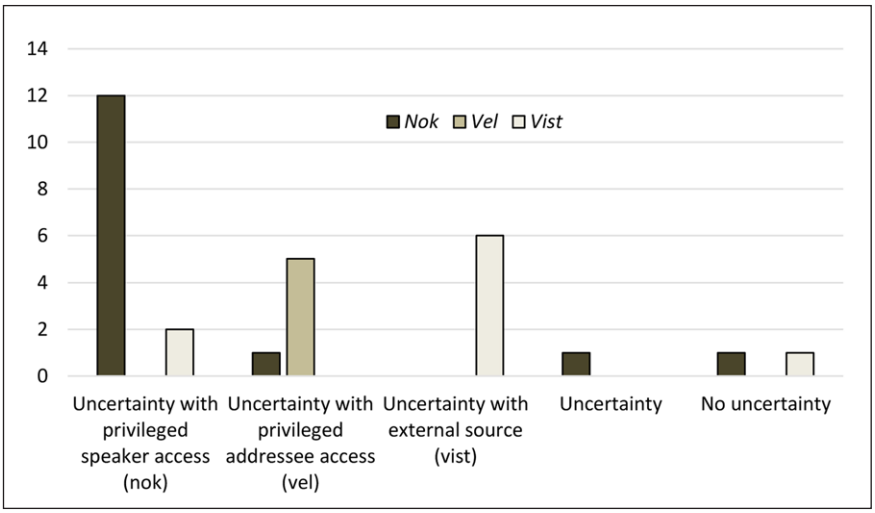

Figure 5: Distribution of epistemic-evidential particles (raw numbers) in different context types with felicitous particle(s) for each context specified in parentheses.

This is a situation of perfect uncertainty where nobody knows what has happened in the room when none of the interlocutors were present. The speaker suggests a probable explanation using her own logical reasoning (speaker as source), and since there is no chance of checking the guess with an external source, *vist* is inappropriate as is *vel* since all interlocutors have stated their ignorance.

Addressee-oriented *vel* only has 5 occurrences in the whole corpus, all of them in felicitous contexts with speaker uncertainty and privileged addressee knowledge because the speaker addresses affairs concerning the addressee's actions or feelings, as in (13) where a child is responding to the investigator's statement that she is about to leave and tries to predict her future actions:

(13) Carl 5;0: Du komm-er vel ikke herned igen vel?
you come-PRS *vel* not down.here again TAG
'You're not coming down here again I guess, are you?'

Finally, *vist* predominates in contexts where the speaker has uncertain knowledge building on an external source, pointing to either external criteria to be checked or to one or more third persons' knowledge, as in (14), where it points to an absent third person (the investigator) as authority:

(14) Context: The children are playing a game, finding different types of animals in different bags.

Hilde 5;8: Der er vist komm-et lidt forkert-e.
there be.PRS *vist* come-PRS a.few wrong-PL
'It seems that some wrong ones ended up here'.

In a previous session, the investigator had discovered that somebody had put some animals in a wrong bag, making the game impossible, and the children, who do not know enough about the game to be able to judge if there has been a mistake again, will have to wait for the investigator's authoritative judgment to have the suspicion confirmed.

6 Discussion

The spontaneous-speech analysis aimed at evaluating the hypothesis that kindergarteners monitor mental states so routinely that they are able to acquire discourse particles, which requires sensitivity to the co-occurrence of stressless monosyllables in their verbal input and configurations of their own and others' perspectives. This hypothesis was strongly supported by the results. The spontaneous-speech analysis demonstrates that Danish children are able and highly motivated to mark perspectives on their propositions with double-perspective particles, also before age 4–5 where traditional theory of mind tests are passed. For two-year-olds, particle use was almost absent, but the majority of three-year-olds evidenced use of at least one of the particles. Crucially, by producing discourse particles significantly above chance in fully felicitous contexts as opposed to partly felicitous or infelicitous contexts, children evidenced sensitivity to the different felicity conditions on interlocutors' mental states that discourse particles introduce. Using particles almost exclusively in appropriate contexts, children thus demonstrated sensitivity to shared knowledge between themselves and their interlocutors (*jo, da*) as opposed to uncertainty (*nok, vel, vist*) and exclusive speaker knowledge (no particles). Sensitivity to opposing viewpoints was corroborated by significantly distinct distribution of *jo* and *da* in contexts where opposing viewpoints were either excluded or explicit.

As for developments across time, there was a strong increase in token frequency over the kindergarten years, but no main effect of age on particle felicity, and this indicates that the three-year-olds are as sensitive as the six-year-olds to perspective configurations when they *do* produce particles. This conclusion is supported by the surprising finding of a negative effect of production experience on particle felicity suggesting that children are *less* likely to produce fully felicitous particles when they have *more* experience producing discourse particles. This result can be interpreted as reflecting that children generally only begin to use particles in derived functions (e.g. for persuading others) once they master their intersubjective core functions, but it would be necessary to track individual extension patterns in corpora with denser sampling for each subject to substantiate such a conclusion. For the present purposes of investigating children's sensitivity to mental states and their ability to express perspective linguistically, the important point is that the proficiency with particles children evidenced in the dataset as a whole was present from children's first particle productions.

The results do point at one potential developmental effect. A marginally significant interaction between age and gender was found, suggesting that boys, who were found to be slightly less proficient – as a group – than girls in producing particles in felicitous contexts, *may* start out with a less solid grasp of particle meaning than girls and develop a more precise understanding with higher age. However, as gender had only been included as a control variable with no hypothesis about its influence, and as the interaction was only marginally significant, this potential relationship should be targeted directly with new studies before any conclusions on it can be drawn.

Turning to acquisition of the individual particles, *nok, vel* and *vist* would at first sight appear to pose more of a cognitive challenge for children than *jo* and *da* as they are much more infrequent and have higher ages of first occurrence. However, the input analysis showed that these epistemic-evidential particles are also much rarer in children's input, and their sparsity in the youngest age groups may either reflect that children truly do take longer to acquire them (presumably because they have less experience with them) or be an artefact of thin sampling in combination with low frequency in child speech, conforming to adult patterns. However, the advantage of *jo* over *da* in both frequency and age of first occurrence cannot be explained by input patterns and could suggest that children find it sociocognitively harder to hold two diverging perspectives on the same proposition than to hold two converging perspectives. Further support for such an interpretation comes from the finding of a share of *da* occurrences in contexts presenting only one of its required perspectives, the opposing viewpoint.

6.1 Acquisition of perspective-marking constructions

As optional unfocusable, stressless, utterance-medial monosyllables Danish discourse particles cannot act as salient linguistic incentives for children to look for similarities between situations. Kindergarteners' ability to associate these inconspicuous sound strings with recurring constellations of shared knowledge, conflicting viewpoints and differential access to information is therefore a strong indicator of children's spontaneous interest in and sensitivity to others' mental states. Studies in sociocognitive linguistics, such as Verhagen (2005) and Evans (2010), emphasize the central role of intersubjective coordination in language, demonstrating that specialized linguistic strategies for coordinating psychological states by pointing to divergence and convergence between them are pervasive in the grammars of the world. By establishing that even 3-year-olds monitor configurations of perspectives so robustly that they notice their co-occurrence with imperceptible particles and that they are motivated to put these perspectives on stage linguistically, this study supports the thesis that intersubjective coordination is a core function of language. The

Danish children preferredly produced *jo* with its crosslinguistically widespread function of marking shared knowledge and *da* with its at least in Germanic languages widespread function of marking a proposition as simultaneously shared knowledge and contentious. However, children also evidenced sensitivity to the highly language-specific constellations of perspectives categorized by the set of Danish epistemic-evidential particles, *nok, vel* and *vist*.

That discourse particles are within the reach of kindergarteners has already been indicated by the comprehension experiment in Schmerse et al. (2014), where German 5-year-olds evidenced understanding of the belief-revision function of accented *doch*. The present study supports this finding while expanding it with more particles, importantly of the double-perspective kind, combining speaker perspective with others' perspectives, and with much younger children.

When Danish 3-year-olds are able to flag propositions as shared knowledge in appropriate contexts, this ability in itself is not surprising, however. Choi (1991) found that Korean children use the sentence-ending suffix *-ci*, which like *jo* marks information as both certain and already shared with the interlocutor, productively and appropriately already in their third year, producing it e.g. when reiterating information from previous utterances or describing regularly occurring events. Korean children also begin to mark their own uncertainty and indirect source of information with *-tay* in appropriate contexts during the third year, a few months later. In that light, it is not surprising that Danish 3-year-olds should be able to communicate about perspectives, but given that the Korean suffixes are both obligatory *and* perceptually salient (utterance-final position) in contrast to the Danish particles, what this new study adds is how *spontaneously* motivated young children are to look for these types of meaning.

Another type of *not* obligatory linguistic viewpoint marking comes in the shape of matrix clauses in complement-clause constructions, and children have also been found to attend to these in their input at an early age and to use them skilfully to point to own and others' perspectives during kindergarten age (Brandt et al. 2010; Boeg Thomsen 2015a). The present study strengthens these findings of children's early interest in (communicating about) perspectives in two ways. First, it shows children's proficiency with much less salient perspective markers that – unlike matrix clauses with their explicit pointing to one or more conceptualizers (the subject), an attitude (the verb stem) and a point in time (tense) – carry no morphological clues to their complex meanings. Second, it demonstrates children's ability to simultaneously present two perspectives on the same proposition whereas a complement-clause construction will often just present one perspective at a time.

6.2 Perspective-marking constructions and sociocognitive development

The finding of early child competence with viewpoint constructions would, however, seem to conflict with conclusions from a couple of studies reporting limited capacities with perspective-marking language in young children and explaining this lag with reference to studies in children's Theory of Mind development. Thus, Diessel & Tomasello (2001) argue that the predominantly formulaic use of mental verbs they find in preschoolers' productions in parent-child interactions may reflect children's limited understanding of mental representations (2001: 136f), and Moore et al. (1990) present experimental evidence suggesting that children's understanding of mental terms depends on advances in Theory of Mind at age 4. If children below age 4–5 should be unaware that they and others have mental states that may differ from each other and from reality, then it would be hard to explain how the Danish 3-year-olds in this study should be able to produce the complex perspective-marking particles *jo* and *da* in felicitous contexts. However, *within*

developmental psychology, it is by no means uncontroversial that children's passing of traditional explicit false-belief tests at age 4–5 should reflect substantial advances in mental-state reasoning and not in skills necessary for understanding the task. First, there is an unsolved debate as to how to interpret the discrepancy with findings on implicit false-belief tasks where gaze measures indicate sensitivity to others' belief states in children below 1 year of age (Onishi & Baillargeon 2005; Kovács et al. 2010; Southgate et al. 2010). Secondly, even slight manipulations of explicit false-belief tasks such as ensuring that children do not interpret the test questions as requests for indirect knowledge (Hansen 2010) or making it easier for them to track the protagonist's perspective by keeping her in the child's visual field (Rubio-Fernández & Geurts 2013) appear to be sufficient to make 3-year-olds pass.

The awareness of others' mental states prerequisite for acquiring intersubjective particles should thus not be expected to be absent in 3-year-olds, and using immature perspective-taking skills as an explanation for immature perspective-marking language below age 4 may not be warranted. Indeed, as Boeg Thomsen (2015a) argues, the lack of diversity Diessel & Tomasello (2001) find in preschoolers' mental verbs may well be a product of the restricted interactional contexts of their parent-child corpora as opposed to group interactions teeming in salient perspectives and motives for aligning them. As for the oft-cited studies by Moore and colleagues (Moore et al. 1989; Moore et al. 1990) reporting limited understanding of terms indicating degrees of certainty in 3-year-olds, the youngest children's mistakes need not reflect limited understanding of representations, but could also be caused by pragmatic misunderstanding of the task.[6]

Even if the Danish spontaneous-speech analysis shows early skills with discourse particles below age 4, the results would also appear to point to important developments in the children's perspective-marking language during the fifth and sixth year with increases in both type and token frequency. For many children, it is only at these ages the three epistemic-evidential particles begin to occur, and it is possible that these later developments depend on improved source-monitoring skills in the 4- and 5-year-olds (cf. Aksu-Koç et al. 2009 on Turkish, Papafragou et al. 2007 on Korean). However, the input analysis suggests that the relative delay of *vel, vist* and *nok* compared to *jo* and *da* could also very well be an effect of frequency since the epistemic-evidential particles were much rarer in children's input (1–3% vs. 41–45%). Finally, the relatively late occurrence of these particles might simply be an effect of the thin sampling. That is, the spontaneous-speech analysis cannot exclude the possibility that all 3-year-olds know e.g. *vist*, but do not find occasion to use that exact particle during the only six hours each of them was recorded at that stage. Again, the richness found in Danish kindergarteners' use of intersubjective particles can only constitute a minimum picture of children's capacities, and it would therefore be highly enlightening to check early comprehension with experiments of the kind developed by Schmerse et al. (2014) with younger children and more particles.

7 Conclusion

All in all, this investigation has established that kindergarteners spontaneously monitor convergence and divergence between their own and their interlocutors' mental states stably enough to notice co-occurrence of intersubjective perspective constellations and

[6] Children's task was to find candies in boxes based on information from two puppet speakers who uttered contrasting statements regarding the same situation, e.g. "I know it's in the red box" vs. "I think it's in the blue box". Subjects are expected to attend to the speakers' differing certainty, but the second speaker's explicit contradiction of the first statement implies distrust in the first speaker's knowledge, thus inviting the child to doubt it as well.

inconspicuous discourse particles, and that they are motivated to manage conversations as joint actions by explicating their own and others' expected perspectives on the propositions they produce. Since the particles are not obligatory, children's early acquisition strongly supports the thesis within sociocognitive linguistics that intersubjective coordination is at the heart of language (Verhagen 2005; Croft 2009; Evans 2010). At the same time, the sensitivity to others' mental representations evidenced by 3-year-olds' appropriate use of the double-perspective markers *jo* and *da* supports accounts within developmental psychology that children below age 4–5 have more sophisticated mental-state-reasoning skills than measured by traditional false-belief tests. Comparisons with acquisition of discourse particles in other languages would be useful for assessing to which degree some discourse particles are inherently more difficult for children to acquire because of their specific perspective constellations and how much differences in timing reflect differences in input frequency. Further, since investigations of children's acquisition of Turkish and Korean evidential morphology suggest that such *obligatory* grammatical viewpoint constructions in children's input further their attention to perspectives (Choi 1991; Aksu-Koç et al. 2009), crosslinguistic experiments would make it possible to evaluate whether *optional*, but *frequent* grammatical viewpoint constructions would be of similar or less support for children's developing perspective-taking skills.

Abbreviations

DP = discourse particle, PASS = passive, PL = plural, PRF = perfect, PRS = present, PST = past, SG = singular, TAG = tag question marker

Acknowledgements

Many thanks to three anonymous reviewers for their thorough feedback and for their keen and valuable suggestions. A very special thanks to Karen Trier Clausen for scrupulous context coding for the reliability analysis. I am also grateful to children, parents and teachers in Ellesletten kindergarten for their participation in and support for the spontaneous-speech study, to those students at University of Southern Denmark who participated in the new gap-filling test, and to Center for Child Language, University of Southern Denmark, for temporary access to Odense Twin Corpus.

Competing Interests

The author has no competing interests to declare.

References

Aksu-Koç, Ayhan, Hale Ögel-Balaban & I. Ercan Alp. 2009. Evidentials and source knowledge in Turkish. In Stanka A. Fitneva & Tomoko Matsui (eds.), *Evidentiality: A window into language and cognitive development, new directions for child and adolescent development*, 13–28. San Francisco: Jossey-Bass. DOI: https://doi.org/10.1002/cd.247

Basbøll, Hans, Dorthe Bleses, Teresa Cadierno, Anne Jensen, Hans Jørgen Ladegaard, Thomas O. Madsen, Sharon Millar, Chris Sinha & Pia Thomsen. 2002. The Odense language acquisition project. *Child Language Bulletin* 22(1). 11–12.

Bleses, Dorthe, Werner Vach, Malene Slott, Sonja Wehberg, Pia Thomsen, Thomas O. Madsen & Hans Basbøll. 2008. The Danish Communicative Developmental Inventory: Validity and main developmental trends. *Journal of Child Language* 35. 651–669. DOI: https://doi.org/10.1017/S0305000907008574

Boeg Thomsen, Ditte. 2012. Viet til vinkler, viernes vinkler: typisk udviklede danske børns beherskelse af synsvinkelmarkerende diskurspartikler [Typically developing

Danish children's mastery of perspective-marking discourse particles]. Copenhagen: University of Copenhagen MA thesis.

Boeg Thomsen, Ditte. 2015a. Ontogenetic paths to the parenthetical construction. In Stefan Schneider, Julie Glikman & Mathieu Avanzi (eds.), *Parenthetical verbs* (Linguistische Arbeiten 557), 189–222. Berlin: De Gruyter. DOI: https://doi.org/10.1515/9783110376142-009

Boeg Thomsen, Ditte. 2015b. Én stavelse, to synsvinkler: Danske børns tilegnelse af dialogiske partikler [One syllable, two perspectives: Danish children's acquisition of dialogic particles]. *NyS* 48. 138–163. DOI: https://doi.org/10.7146/nys.v48i48.21138

Boeg Thomsen, Ditte & Elisabeth Engberg-Pedersen. 2012. JDV-test. University of Copenhagen.

Bornstein, Marc H., Chun-Shin Hahn & O. Maurice Haynes. 2004. Specific and general language performance across early childhood: Stability and gender considerations. *First Language* 24(3). 267–305. DO1: https://doi.org/10.1177/0142723704045681

Boye, Kasper & Peter Harder. 2012. A usage-based theory of grammatical status and grammaticalization. *Language* 88(1). 1–44. DOI: https://doi.org/10.1353/lan.2012.0020

Brandt, Silke, Elena Lieven & Michael Tomasello. 2010. Development of word order in German complement-clause constructions: Effects of input frequencies, lexical items, and discourse function. *Language* 86(3). 583–610. DOI: https://doi.org/10.1353/lan.2010.0010

Burton, Strang & Lisa Matthewson 2015. Targeted construction storyboards in semantic fieldwork. In Ryan Bochnak & Lisa Matthewson (eds.), *Methodologies in semantic fieldwork*, 135–156. Oxford: Oxford University Press. DOI: https://doi.org/10.1093/acprof:oso/9780190212339.003.0006

Choi, Soonja. 1991. Early acquisition of epistemic meanings in Korean: A study of sentence-ending suffixes in the spontaneous speech of three children. *First Language* 11. 93–119. DOI: https://doi.org/10.1177/014272379101103105

Christensen, Tanya Karoli. 2007. *Hyperparadigmer – en undersøgelse af paradigmatiske samspil i danske modussystemer* [Hyperparadigms: An investigation of the paradigmatic interplays in Danish mood patterns]. Roskilde: Roskilde University dissertation.

Croft, William. 2009. Toward a social cognitive linguistics. In Vyvyan Evans & Stéphanie Pourcel (eds.), *New directions in cognitive linguistics*, 395–420. Amsterdam/Philadelphia: John Benjamins Publishing Company. DOI: https://doi.org/10.1075/hcp.24.25cro

Davidsen-Nielsen, Niels. 1996. Discourse particles in Danish. In Elisabeth Engberg-Pedersen, Michael Fortescue, Peter Harder, Lars Heltoft & Lisbeth Falster Jakobsen (eds.), *Content, expression and structure: Studies in Danish functional grammar*, 283–314. Amsterdam/Philadelphia: John Benjamins Publishing Company. DOI: https://doi.org/10.1075/slcs.29.11dav

de Villiers, Jill G. & Peter A. de Villiers. 2003. Language for thought: Coming to understand false beliefs. In Dedre Gentner & Susan Goldin-Meadow (eds.), *Language in mind*, 335–384. Cambridge, MA: The MIT Press.

Diessel, Holger & Michael Tomasello. 2001. The acquisition of finite complement clauses in English: A corpus-based analysis. *Cognitive Linguistics* 12(2). 97–141. DOI: https://doi.org/10.1515/cogl.12.2.97

Engberg-Pedersen, Elisabeth. 2009. Det er *jo* Lisbeths fødselsdag! Om nytten af instruksse-mantik [It is *jo* Lisbeth's birthday! On the use of instructional semantics]. In Ken Farø, Alexandra Holsting, Niels-Erik Larsen, Jens Erik Mogensen & Thora Vinther (eds.), *Sprogvidenskab i glimt: 70 tekster om sprog i teori og praksis* [Linguistic glimpses: Text on language theory and language use], 225–229. Odense: Syddansk.

Engberg-Pedersen, Elisabeth & Ditte Boeg Thomsen. 2016. The socio-cognitive foundation of Danish perspective-mixing dialogue particles. In Barbara Dancygier, Wei-lun Lu & Arie Verhagen (eds.), *Viewpoint and the fabric of meaning: Form and use of viewpoint tools across languages and modalities* (Cognitive Linguistics Research), 125–142. Berlin: De Gruyter. DOI: https://doi.org/10.1515/9783110365467-006

Evans, Nicholas. 2010. Your mind in mine: Social cognition in grammar. In *Dying Words: Endangered languages and what they have to tell us*. Chicester/Malden/Oxford: Wiley-Blackwell.

Fischer, Kerstin. 2007. Grounding and common ground: Modal particles and their translation equivalents. In Anita Fetzer & Kerstin Fischer (eds.), *Lexical markers of common grounds* (Studies in Pragmatics 3), 47–66. Amsterdam: Elsevier.

Hale, Courtney Melinda & Helen Tager-Flusberg. 2003. The influence of language on theory of mind: A training study. *Developmental Science* 6(3). 346–359. DOI: https://doi.org/10.1111/1467-7687.00289

Hansen, Erik & Lars Heltoft. 2011. *Grammatik over det danske sprog, bd. II: Syntaktiske og semantiske helheder* [Grammar of Danish: Syntactic and semantic units]. Copenhagen: Det Danske Sprog- og Litteraturselskab.

Hansen, Mikkel B. 2010. If you know something, say something: Young children's problem with false beliefs. *Frontiers in Psychology* 1(23). 1–7. DOI: https://doi.org/10.3389/fpsyg.2010.00023

Harder, Peter 2010. *Meaning in mind and society: A functional contribution to the social turn in cognitive linguistics*. Berlin/New York: Walter de Gruyter. DOI: https://doi.org/10.1515/9783110216059

Hobson, R. Peter 1991. Against the theory of 'Theory of Mind'. *British Journal of Developmental Psychology* 9. 33–51. DOI: https://doi.org/10.1111/j.2044-835X.1991.tb00860.x

Hogeweg, Lotte 2009. The Dutch particle *wel* as a denial of a negation. *Sprache und Datenverarbeitung: International Journal for language Data Processing* 1–2. 61–75.

Karagjosova, Elena. 2003. Modal particles and the common ground: Meaning and functions of German *ja*, *doch*, *eben/halt* and *auch*. In Peter Kühnlein, Hannes Rieser & Henk Zeevat (eds.), *Perspectives on dialogue in the new millennium,* 335–349. Amsterdam/Philadelphia: John Benjamins Publishing Company. DOI: https://doi.org/10.1075/pbns.114.19kar

Kovács, Ágnes Melinda, Ernő Téglás & Ansgar Denis Endress. 2010. The social sense: Susceptibility to others' beliefs in human infants and adults. *Science* 330(6012). 1830–1834. DOI: https://doi.org/10.1126/science.1190792

Lohmann, Heidemarie & Michael Tomasello. 2003. The role of language in the development of false belief understanding: A training study. *Child Development* 74(4). 1130–1144. DOI: https://doi.org/10.1111/1467-8624.00597

Moore, Chris, Dana Bryant & David Furrow. 1989. Mental terms and the development of certainty. *Child Development* 60. 167–171. DOI: https://doi.org/10.2307/1131082

Moore, Chris, Kiran Pure & David Furrow. 1990. Children's understanding of the modal expression of speaker certainty and uncertainty and its relation to the development of a representational Theory of Mind. *Child Development* 61. 722–730. DOI: https://doi.org/10.2307/1130957

Onishi, Kristine H. & Renée Baillargeon. 2005. Do 15-month-old infants understand false beliefs? *Science* 308(5719). 255–258. DOI: https://doi.org/10.1126/science.1107621

Papafragou, Anna, Peggy Li, Youngon Choi & Chung-hye Han. 2007. Evidentiality in language and cognition. *Cognition* 103. 253–299. DOI: https://doi.org/10.1016/j.cognition.2006.04.001

Perner, Josef 1991. *Understanding the representational mind*. Cambridge, MA/London: MIT Press.

R Development Core Team. 2014. R: A Language and Environment for Statistical Computing. R Foundation for Statistical Computing, Vienna, Austria. http://www.R-project.org/.

Rubio-Fernández, Paula & Bart Geurts. 2013. How to pass the false-belief task before your fourth birthday. *Psychological Science* 24(19). 27–33. DOI: https://doi.org/10.1177/0956797612447819

San Roque, Lila, Lauren Gawne, Darja Hoenigman, Julia Colleen Miller, Alan Rumsey, Stef Spronck, Alice Carroll & Nicholas Evans. 2012. Getting the story straight: Language fieldwork using a narrative problem-solving task. *Language Documentation & Conservation* 6. 135–174. http://hdl.handle.net/10125/4504.

Schick, Brenda, Peter de Villiers, Jill de Villiers & Robert Hoffmeister. 2007. Language and theory of mind: A study of deaf children. *Child Development* 78(2). 376–396. DOI: https://doi.org/10.1111/j.1467-8624.2007.01004.x

Schmerse, Daniel, Elena Lieven & Michael Tomasello. 2014. Discourse particles and belief reasoning: The case of German *doch*. *Journal of Semantics* 31. 115–133. DOI: https://doi.org/10.1093/jos/fft001

Southgate, Victoria, Coralie Chevallier & Gergely Csibra. 2010. Seventeen-month-olds appeal to false beliefs to interpret others' referential communication. *Developmental Science* 13(6). 907–912. DOI: https://doi.org/10.1111/j.1467-7687.2009.00946.x

Therkelsen, Rita. 2001. The Danish discourse particles *jo*, *da* and *vel*. In Arthur Holmes, Jan-Olof Svantesson & Åke Wiberg (eds.), *Proceedings of the 18th Scandinavian conference of linguistics* 2, 255–270. Lund: Lunds Universitet.

Tomasello, Michael & Daniel Stahl. 2004. Sampling children's spontaneous speech: How much is enough? *Journal of Child Language* 31(1). 110–121. DOI: https://doi.org/10.1017/S0305000903005944

Tomasello, Michael & Hannes Rakoczy. 2003. What makes human cognition unique? From individual to shared to collective intentionality. *Mind & Language* 18(2). 121–147. DOI: https://doi.org/10.1111/1468-0017.00217

Tomasello, Michael, Malinda Carpenter, Josep Call, Tanya Behne & Henrike Moll. 2005. Understanding and sharing intentions: The origins of cultural cognition. *Behavioral and Brain Sciences* 28(5). 675–691. DOI: https://doi.org/10.1017/S0140525X05000129

Verhagen, Arie. 2005. *Constructions of intersubjectivity: Discourse, syntax, and cognition*. Oxford: Oxford University Press.

Wallentin, Mikkel. 2009. Putative sex differences in verbal abilities and language cortex: A critical review. *Brain & Language* 108. 175–183. DOI: https://doi.org/10.1016/j.bandl.2008.07.001

Wehberg, Sonja, Werner Vach, Dorthe Bleses, Pia Thomsen, Thomas O. Madsen & Hans Basbøll. 2008. Girls talk about dolls and boys about cars? Analyses of group and individual variation in Danish children's first words. *First Language* 28(1). 71–85. DOI: https://doi.org/10.1177/0142723707081729

Wellman, Henry M., David Cross & Julanne Watson. 2001. Meta-analysis of theory-of-mind development: The truth about false belief. *Child Development* 72(3). 655–684.

Zimmermann, Malte 2011. Discourse particles. In von Klaus von Heusinger, Claudia Maienborn & Paul Portner (eds.), *Semantics* (HSK 33.2), 2011–2038. Berlin/Boston: Walter de Gruyter.

How to cite this article: Boeg Thomsen, Ditte. 2017. Children's felicitous use of intersubjective particles evidences sensitivity to constellations of perspectives. *Glossa: a journal of general linguistics* 2(1): 19.1–30, DOI: https://doi.org/10.5334/gjgl.194

Published: 13 March 2017

]u[*Glossa: a journal of general linguistics* is a peer-reviewed open access journal published by Ubiquity Press.

OPEN ACCESS