Explaining children's over-use of definites in partitive contexts

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Abstract

Partitive contexts are those in which a set of similar individuals has been introduced, and the speaker needs to refer to one of them. If that referent has not yet been individualised in the context, the only adult-like option is to refer to it with an indefinite. But in such contexts, children have been shown to often produce (illicit) definites. In comprehension, if children are made to identify a referent in a partitive context, they do not always interpret correctly the definiteness clues in the input, and tend to interpret definites as if they were indefinite. This paper reviews production and comprehension studies in light of new experimental data, and argues that children's errors in this type of context are due to processing limitations.

Keywords: definiteness, discourse, partitive, processing, uniqueness

1 Introduction

In spite of clear limitations on their language production, children are surprisingly good at conveying information from the onset of expressive syntax. For instance, in recent years, evidence from spontaneous and elicitation studies have revealed that early sensitivity to newness contrasts has a significant impact on the speech of two-year-olds (Allen 2000, 2007), and that the information structure primitives *topic* and *focus* are already mastered by 2;6-year-olds (De Cat in press).

Among information-structural phenomena, the acquisition of definiteness distinctions has received the most attention over the past three decades. Some studies show close-to-adult-like performance on the use of definites vs. indefinites to encode information status (e.g. Emslie and Stevenson 1981); others reveal poorer performance, at least in some contexts (e.g. Karmiloff-Smith 1979; Schafer and de Villiers 2000). In spite of these discrepancies, children's use of definiteness is never reported to be random: their tendency is always to use indefinites for reference establishment and definites for reference maintenance. It has been suggested that the *linguistic* competence at stake is in place early, and that children's definiteness errors can be explained by non-linguistic factors: De Cat (under review) argues the marginal over-use of indefinites is due to independently acknowledged difficulties with discourse integration (i.e. the ability to remember and identify the members of a previously introduced set of referents), and that the marginal over-use of definites is due to children's tendency to assume a wider common ground than adults.

What remains to be explained is why performance is much degraded in some particular tasks, as revealed most strikingly by Karmiloff-Smith (1979) and Schafer and de Villiers (2000). In this paper, I explore the possibility that poor performance in these tasks/contexts is due to processing limitations, which hamper the implementation of otherwise intact linguistic competence.

2 On the over-use of definites in partitive contexts

Partitive contexts are those in which a set of similar individuals has been introduced, and the speaker needs to refer to one of them. If that referent has not yet been individualised in the context, the only adult-like option is to refer to it with an indefinite. But in such contexts, children have been shown to often produce (illicit) definites. Schafer and de Villiers (2000) show that this poor performance in partitive contexts is in sharp contrast to children's adult-like performance in other tasks requiring to choose between definites or indefinites.

2.1 The impact of who picks the individual in elicitation experiments

Schafer and de Villiers (2000) elicited definite vs. indefinite singular noun phrases (with *the* vs. *a* respectively) from 37 English-speaking children between 3;6 and 5;5 and 10 adult controls. The contexts determining which form to use were entirely verbal: there was no visual support, as this could have provided a source of familiarity or uniqueness (and hence licensed the use of definites on first mention). After one or two sentences setting an imaginary scene, the participants were asked a question aimed to elicit a DP response. There were 40 questions, evenly distributed across 8 conditions. Noun phrases corresponding to a total of 6 interpretive types were elicited (two of which resulted from the combination of two conditions).

Definites were either (i) *part-the* (an inherent part of a previously mentioned object) or (ii) *familiar-the* (a previously mentioned object). Indefinites were (iii) *specific* (a referent known to the speaker only), (iv) *multipcac* (one of a previously mentioned set), (v) *non-referential* (but assumed in the situation) or (vi) *predicational* (a nominal following *have*). Examples of elicitation contexts are given below:

(1) i Part *the*: Adrienne got a pet hamster for her birthday and put it in a nice cage. It tried to escape so she quickly closed something. What did she close?

ii Familiar *the*: Emily has two pets: a frog and a horse. She wanted to ride one of them, and so she put a saddle on it.

Condition (2): Guess which.

Condition (7): What was it?

iii Specific *a*: I'll bet you have something hanging on the wall of your room at home. What is it?

iv Multipac *a*: Three ducks and two dogs were walking across a bridge. One of the animals fell off the bridge and said "Quack".

Condition (4): Guess which.

Condition (8): What was it?

v Non-referential *a*: Cindy is going to the pond. She wants to catch some fish. What will she need?

vi Predicational *a*: Think of a baseball player. Can you imagine what one looks like? What does he have?

No significant effect was observed between groups. Performance was close to adult-like in contexts (i), (iii), (v) and (vi) above. This excludes instances of determiner omission (which in average remained below 10% in the relevant conditions). I interpret these results as indicators of the following aspects of linguistic competence:[1]

1. Specific indefinites for first mention: Referents known to the speaker but unknown to the hearer have to be introduced using an indefinite (context iii).
2. Definites for first mention: A new referent can be introduced as unique (and hence definite) when it is in a bridging relation with a previously established referent (context i): the hearer accommodates the use of a definite by deriving its reference from

the bridged referent (see e.g. Avrutin and Coopmans 2000).[2]

3. Non-specific indefinites: Referents known to neither speaker nor hearer have to be introduced using an indefinite (contexts v and vi).

In contrast to the uniformly good performance in the above contexts, there was a lot of between-group variation in children's answers in context (ii), and generally poor performance in contexts (ii) and (iv). Children's determiner omission was also the highest in these contexts (ranging from 16% to 31% of answers).

Interestingly, adults also did less well in condition 7 (context ii above): they only provided 94% of the expected definites, which suggests that some repair strategy may have been necessary to justify the use of a definite. Indeed, the prompt question *What was it?* encourages a predicative answer (such as *It was a duck*), and this needs to be over-ruled by the speaker remembering that there is only one duck in the context. In that condition, children used an indefinite 15% (Group 1)[3] to 31% of the time (Group 4). In condition 2 (context ii), supposed to elicit the same kind of definites (i.e. *familiar the*), children used indefinites only 3 or 7.5% of the time (groups 1 and 3 respectively) or 18% to 26% of the time (groups 4 and 2 respectively). This almost random error pattern across age groups, coupled with the very low percentage of illicit use of indefinites by children from groups 1 and 3, suggest that a confounding factor may be at play here — although I have no speculation to offer at this point as to what it might be. However, the close-to-adult-like performance of children in groups 1 and 3 in this condition indicates that they know that referents identifiable by both speaker and hearer must be definite.

Context iv (which aimed to elicit *multipac a*) is the most relevant to the topic of this paper. In this context, instantiated in conditions 4 and 8, participants were made to mention a referent previously introduced as a member of a set but not individualised (so that definite reference should be ruled out). Adults produced a surprisingly high proportion (30%) of supposedly illicit definites in both conditions. The rest of their answers were *one*

of the x (50%) or indefinites (20%). This renders children's results difficult to interpret. Out of the 41 to 64% of definites they produced in these conditions, should we assume that only 11 to 34% were illicit, and that 30% of definites are in fact licit, as in adults' responses? The breakdown between *one of the x* and *a* responses is also not provided. Schafer and de Villiers (2000: 618) claim that the use of *a* in this context requires an operator choice of one object from a set of like-objects (i.e. a kind of partitive structure). This is said to motivate the projection of structure (a Quantifier Phrase) to host the operator, which they argue is initially too complex for children.[4]

Early, successful attempts at using partitive structures have however been reported in De Cat (in press), an experimental study in which topic vs. focus subjects were elicited from French-speaking children between 2;6 and 5;6. In the topic condition (which is the one relevant here), children were presented with a first picture showing three individuals involved in the same activity. Each was described in turn, highlighting what made it different from the other individuals. The next page showed each of the individuals involved in a different activity and the child was asked: *Qu'est-ce qu'ils font maintenant ?* 'What are they doing now?'. This question aimed to prompt three propositions in which the target referents would be addressed in turn. From 3;10, children started to attempt producing partitive structures of the type *il y en a un qui xxx* 'there is one (of them) who xxx', as in (2), in which the clitic pronoun *en* refers to a d-linked set, i.e. a set of referents previously introduced in the discourse.

(2) Là il y en a un qui mange une branche. (4;3.0)
there it there of-them has one who eats a branch
'There, one of them is eating a branch.' (Literally: There there's one of them who is eating a branch.)

Schafer and de Villiers (2000: 618) claim that the children in their study are not yet able

to handle the complexity involved in projecting the quantificational structure required to host the Q operator that identifies the relevant individual among a set of like-objects. However, the children involved in the De Cat (in press) study produced structures like (2) from 4;3, i.e. below the median age of the children in Schafer and de Villiers (2000). In French, the numeral *un* 'one' and the indefinite article are homophones. Admittedly, such structures may involve a NumP for *un* 'one' rather than a full DP (NumPs being mastered earlier than DPs according to Schafer and de Villiers), and the QP isn't projected overtly. But the use of the clitic *en* has itself been argued to involve the projection of a (covert) right-dislocated PP endowed with quantificational properties to identify the relevant set (see e.g. Hulk 1996). From the age of 4;3.0, children produce the full structure with *en*, as illustrated in (2). Before that, the structure is truncated above *un*, as in (3).

(3) Un qui lit. (3;10.7)
one who reads
'One who reads.' (Part of an enumeration, and accompanied by pointing.)

Children thus appear to be able to pick a referent out of a d-linked set implicitly from at least 3;10, and explicitly (using *en*) from at least 4;3.

The comparison between Schafer and de Villiers (2000) and De Cat (in press) suggests that preschool children know to use an indefinite to identify a not-yet-individualised member of a d-linked set, as long as they can choose which member it is. If their addressee tries to make them guess who the relevant member is, children will tend to use definites to designate it. This use of definites would be licit if the speaker estimates that the referent is identifiable as unique in the context. Could it be that this is precisely what children are assuming in this situation, prompted by the fact that their interlocutor appears to know which individual is the relevant one?

2.2 Definites as 'unique' in the context

In story-telling experiments, children have been reported to produce (illicit) definites in partitive contexts up to the age of 4 (Maratsos 1974) or 9 (Karmiloff-Smith 1979: 144). In both studies, children were told stories in which an 'antecedent' was introduced, with the aim of eliciting either a definite or an indefinite form designating (a member of) that antecedent. The antecedents consisted of individuals (X) or groups of Xs (e.g. a boy vs. a group of boys). The referents introduced in the context were either *de re* (e.g. a particular group of boys) or *de dicto* (e.g. a cat (any cat) somebody would like to have). After each story, the child was asked a *who* subject-question. For instance, at the end of a story about a man who saw some monkeys and some pigs, and was hoping one of them would come out and be his friend, the question was: *And one of them did. Who went out to the man?*. Maratsos (1974) found that 4-year-olds used illicit definites significantly more in partitive contexts (where a particular X has to be identified among a set of Xs) than in 'singleton' contexts (where a particular X is mentioned after an arbitrary X has been introduced in the context): they produced 58% illicit definites in partitive contexts, compared with 12% in uniqueness contexts. Karmiloff-Smith (1979: 144) does not give the breakdown for these two types of contexts, but reports for the same age group (4;0-4;11) an overall rate of 48% of illicit definites in contexts where an indefinite was expected. Error rates remain above 40% in that context in 5, 6 and 7-year-olds.

An important difference between the partitive contexts in Maratsos (1974) and Karmiloff-Smith (1979) and those in De Cat (in press) is that in the latter study, children's formulations clearly involved a choice-function, with reference to the d-linked set (as shown in the use of *un* 'one' and the partitive clitic *en*). In the former two studies, children were prompted to use a full noun phrase, in answer to a *who* question. Such a question presupposes uniqueness and implies that the experimenter knows the answer (as s/he is the one who tells the children that one of the individuals in the set did something

and then asks them who that was). Children's illicit use of definites in this context could arise from the fact that they consider the identification of the relevant individual among the d-linked set to have already been performed by the experimenter. Their task is therefore simply to guess which individual that is. If this hypothesis is correct, it would mean that children are able to correctly use an indefinite noun phrase to select and identify a particular member of a d-linked set of yet unindividualised members, but only if they do not assume that their interlocutor knows in advance which member that is.

3 Knowledge of the role of definiteness in partitive contexts

Additional evidence that children know that reference to a random member of a d-linked set requires the use of an indefinite comes from Modyanova and Wexler's (2007) replication of Experiment 15 in Karmiloff-Smith (1979: 200-206). The design consisted of an act-out task. Several groups of objects were presented to the child, who was given two puppets to manipulate, following instructions from the experimenter. In each condition, they were prompted to make one puppet perform an action on a random object, and then to make the other puppet repeat the action either on the same object (if a definite was used) or on a different object (if an indefinite was used). Typical contexts are given in (4) and (5) (from Modyanova and Wexler 2007). The objects available were: six fences, three balloons, three spoons and three logs.

(4) a. Kanga, push a balloon.
b. And then Froggy, push a balloon. (Indefinite condition)

(5) a. Kanga, kiss a spoon.
b. And then Froggy, kiss the spoon. (Definite condition)

Children's response patterns were significantly different with indefinites vs. definites. In the indefinite condition, they tended to pick a different object for the second action roughly at chance level (i.e. around 30% depending on the number of objects in the set). Modyanova and Wexler (2007: 302) attribute children's good performance with the indefinite to the fact that "the indefinite implies no context consideration". This may be too strong a claim: children still need to consider the d-linked set in order to pick an item from it. What these results do demonstrate is children's knowledge that the indefinite article introduces a referent not yet individualised in the context. Children's performance with indefinites indeed remains stable in all age groups (from 3;2 to 10;10), indicating that the relevant knowledge is already in place in the youngest group of participants (mean age 3;7).

In contrast, with the definite determiners *the* and *that*, children tended to pick the same object for the second action significantly more often than in the indefinite condition. While the rate at which they did so was much lower than the adults' (who performed at ceiling), the trend goes in the right direction: with the definite determiner *the*, the 'young' children (3;2-6;5, mean age 4;8) picked the same referent 45% of the time, and the older children (6;6-10;10, mean age 8;4) 66% of the time. Performance was even better with the demonstrative *that*: 55% for the younger children, 74% for the older ones. Modyanova and Wexler (2007) interpret children's poorer performance with definites as an indication that children know that definites refer to familiar referents, but have difficulties with "the uniqueness presupposition of *the*" (p. 307): they do not know that the definite article identifies "exactly one referent in a given context set (for example one where there are several identical Xs that may be distinguished by various means, in order to make one X unique/salient)" (p. 299). In other words, children's version of *the* is equivalent to adults' *one of the* (Modyanova and Wexler 2007: 299).

In De Cat (in press), however, a clear difference is observed between (the French equivalents of) *one of the* and *the* in children's speech production. As explained above, there were

two experimental conditions in that study: one in which children were made to refer to a newly introduced agent (the Focus condition) and one in which three agents previously introduced as a set had to be mentioned in turn (the Contrastive Topic condition). Children almost never used definites in the Focus condition (11/258 cases, i.e. 4%). Out of these 4%, only 4 instances (i.e. 1.5%) were truly illicit.[5] This is to be expected if they know that new referents can only be introduced as definite in exceptional cases. In the Contrastive Topic condition, the way children and adults encoded the 3 referents depended on whether they considered them to have been sufficiently individualised in the context. That context consisted of one picture in which the 3 agents were involved in a common activity. The experimenter pointed to each of them in turn and highlighted something that made them different from the other two. If the individualisation was considered sufficient, children and adults encoded the referent as a topic (using either a dislocated structure as illustrated in (6)) or a subject clitic, or with a presentational structure (*il y a* 'there is') with a definite, as illustrated in (7). Referents in a dislocated position were always definite, as required by their topic status. This is again an indication of preschool children's knowledge that definites are used to encode referents uniquely identifiable in the context.

(6) La petite fille, elle joue aux balles. (2;9.17)
the little girl she plays at-the balls
'The little girl is playing with the balls.'

(7) Il y a la fille qui regarde les images. (2;7.14)
there is the girl who looks the pictures
'The girl is looking at the pictures.'

If the individualisation was considered insufficient, children and adults reintroduced the referent in an *il y a* 'there is' structure with an indefinite, as illustrated in (8). Such structures are used in adult spoken French to bring a referent to the focus of attention (Lambrecht 1994; Côté 1999; De Cat 2007). Children used *il y a* structures in 16% of cases

in the Contrastive Topic condition (133/824). Out of these, 91% (122/133) were partitive structures, i.e. they involved the pronoun *un* 'one', and most of the time the partitive clitic *en* 'of them' (as in (2)).[6] Partitive structures were never used in the Focus condition. This indicates that children know when there is a d-linked set to consider.

(8) Il y a un poisson qui mange. (2;7.14)
there is a fish who eats
'A fish is eating.'

It is interesting to note that, especially in the youngest group in the De Cat (in press) study (2;6-3;4, mean age 2;11), children often failed to mention all three individuals in the d-linked set. This happened in 22% of cases (68/313) in the youngest group, dropping to 6% of cases (20/304) in the oldest group (4;6-5;6, mean age 5;2). A plausible hypothesis for children's difficulties with definites in partitive contexts (as reported in e.g. Modyanova and Wexler 2007) may be that initially they tend to be unable to keep in mind or evaluate the relevant set: the knowledge of uniqueness is there, but children are not yet able to identify the relevant domain within which it applies. Similar difficulties in establishing the right domain have been oberved in children's comprehension of quantifiers: Geurts (2003) points out that children erroneously interpret universal quantifiers as ranging over an entire set of individuals if that set is particularly salient.[7]

Children's difficulties with the identification of the relevant set have also been highlighted Munn, Miller, and Schmitt (2006), who investigated children's knowledge of maximality in their interpretation of definites. Maximality is the plural version of uniqueness: it is "a presupposition of the definite determiner, and not part of the asserted content" (Munn et al. 2006: 378).

In the experiment carried out by Munn et al. (2006), children acquiring English or Spanish as their L1 (between the ages of 3;0 and 5;5) were tested on their interpretation of *the+singular* vs. *the+plural*. The set-up consisted in a house and a barn, with a set of

three frogs next to the house and another set of three frogs next to the barn. In the plural condition (9), children were expected to pick the latter set of three frogs, i.e. the maximal set of frogs next to the barn. In the singular condition (10), children were expected to pick the frog that was closest to the barn, i.e. the maximal single frog next to the barn.

(9) Give me the frogs next to the barn. (Plural condition)

(10) Give me the frog next to the barn. (Singular condition)

Among the entire set of frogs, three of them were close to the barn (compared with the other three, which were close to the house). The two groups of frogs were easily distinguishable visually, as there was a clear gap between the two sets (with the house and barn on the outer side of each series of frogs). Maximality errors did not arise in the plural condition, even among the younger children. Children were aware of the implicit restrictor and able to compute it successfully.

The evidence discussed above indicates that children are able to evaluate whether there is a context set to consider when interpreting definites vs. indefinites, but that they cannot always evaluate adequately what that set is exactly. Their above-chance performance with definites suggests that they are aware of the uniqueness presupposition of definites, but not always able to identify the relevant domain within which it applies. The next section takes a closer look at what computing the uniqueness presupposition entails.

3.1 Restricting the relevant set - comprehension data

In the above-mentioned study by Munn et al. (2006), performance was significantly poorer in the singular condition, with 30.2% incorrect responses from the English-speaking children and 35.1% from the Spanish-speaking children. The younger children (both languages combined) also gave significantly more singular responses to the definite plural than the older children. In the singular condition, the implicit restrictor for the definite was much

more difficult for children to compute than in the plural condition. In this case, it required computing a superlative *the most X* (i.e. in this case, the closest).[8]

The children in this study were clearly able to distinguish (and pay attention to) singular and plural and they showed an awareness of the existence of an implicit restrictor on definites in a partitive context. Their difficulties depended on the type or restrictor involved: they performed well on maximality in the plural condition (correctly picking the entire subset of frogs matching the explicit closeness requirement — aided perhaps by the visual divide between the two groups of frogs), but they performed less well when the implicit restrictor involved a superlative.

In the experiment carried out by Karmiloff-Smith (1979) and replicated by Modyanova and Wexler (2007), children were tested on their interpretation of definites vs. indefinites in a context where a second action was performed on the same member of a set of similar-looking objects. There were two conditions: indefinite (4-b) and definite (5-b).

Children's performance was significantly poorer in the definite condition (5). In that case, the restrictor implied by the use of the definite expression as "the ... *that has been Xed before*" (here: *kissed*).

To answer successfully in that condition, the children need to

1. pay attention to the difference between definite and indefinite determiner;
2. know that the use of a definite signifies that a particular item in the set is being referred to;
3. look for the relevant implicit restrictor identifying that item;
4. identify the restrictor as *has been Xed before*;
5. remember which object was manipulated before;
6. target that object.

As was the case in the study by Munn et al. (2006), the significantly different perfor-

mance with definites vs. indefinites shows that children know and pay attention to definiteness distinctions. The problem, once again, appears to arise from the need to identify the correct restrictor.

Interestingly, the follow-up comments from children in the Karmiloff-Smith study show that children were in general aware that the experimenter referred to a particular object among the set of similar objects, but that they were confused as to which clue to follow in order to identify that object. She interprets this as an indication that "part of the child's activity is directed at trying to understand what the *experimenter* is aiming at, when a word carries a heavy communicative burden" (Karmiloff-Smith 1979: 206). Some of these comments from the children are reproduced below (in their English translation).

(11) a. I suddenly realised that it's the same cow if you say *the cow* (stressed).

b. Ah yes, for the other one I understand now, the girl touches a shoe and then the boy *another* shoe. I got it wrong before.

A training effect was also observed:

> The discovery of the experimental problem is not immediate. Many children make a few errors at first and then become aware of the importance of the definite article. Karmiloff-Smith (1979: 206)

An interpretation of these facts will be proposed in section 4. Before that, in order to complete the picture on children's (lack of) ability to identify the implicit restrictor on definites in partitive contexts, I look at an elicitation experiment carried out by Karmiloff-Smith (1979) as a language production counterpart to the one discussed above.

3.2 Restricting the relevant set - production data

Karmiloff-Smith (1979) carried out an elicitation experiment involving partitive contexts,

in which children between the ages of 3;3 and 11;11 were presented with a set of objects and asked to describe actions performed on these objects by a boy (first action) and then a (second action) girl. The conditions most comparable to the comprehension experiments mentioned above are those in which the set contained identical objects. In the condition where the second action was performed on the same class member, children rarely used (illicit) indefinites: the 4-year-olds did so in 20% of cases, the 5-year-olds 12%, and the older age groups less than 10% (except the 7-year-olds: 28%) (Karmiloff-Smith 1979: 130). In the condition where the second action was performed on a different class member, children tended to (appropriately) use either indefinites, or definites accompanied by an attempt to identify the object as different from the first action. These attempts were not always successful and sometimes actually signified (erroneously) a repetition of the action on the same object (as in (12)) or identified the object as different but in a way that wrongly implied that there were only two objects in the set in total (the one targeted in the first action and the one targeted in the second), as in (13).

(12) a. La fille a poussé la X aussi.
the girl has pushed the X also
'The girl has also pushed the X.

b. La fille a rebougé la X.
the girl has RE-moved the X
'The girl has moved the X again.

(13) La fille a poussé l'autre X.
the girl has pushed the other X
'The girl has pushed the other X.

In other words, children attempt to identify the restrictor for the definite, but sometimes unsuccessfully. Errors like (12) are attested in the two youngest groups (4;0 to 5;11) and

errors like (13) are attested up to 10-11 years of age. Raw numbers are not provided so it is difficult to estimate the frequency of such errors among definite descriptions. It is however clear that they were far more frequent than responses where the child omitted the restrictor altogether and only produced a definite noun phrase without modifier. A summary of the results is given in Table 1, adapted from Karmiloff-Smith (1979: 133).

[Table 1 about here.]

The only fully illicit answers were those with a definite alone (which erroneously suggests that the second action was performed on the same object), and those in which the child uses the wrong restrictor to identify which object was targeted in the second action.

From the youngest age, children clearly attempted to provide information to identify the relevant individual in the set (i.e. they attempted to define the restrictor licensing the use of a definite). But they only managed to do so consistently in an adult-like fashion by 10 or 11 years of age.

One can conclude that in partitive contexts, children *tend to* correctly produce definites to refer to previously identified referents and indefinites for hitherto unidentified ones. As in the comprehension experiments discussed in section 3.1, the main difficulty seems to lie in the identification of the restrictor rather than a lack of knowledge that such a restrictor is necessary.

This means that children's linguistic representation of definites and indefinites is not different to that of adults: they know that indefinites are used for reference establishment and definites for reference maintenance, and they know that, in partitive contexts, definites call for a restrictor to pick the relevant item(s) out of a d-linked set.

In the next section, I argue that children's difficulties in identifying the relevant restrictor may be best accounted for in terms of processing limitations.

4 Processing limitations?

If definite errors in partitive contexts were due to a deficient linguistic representation, one would expect the following:

- a fairly uniform response pattern within each age group,
- with a clear developmental trend across groups
- and no lingering of errors after a certain age (or only in exceptional contexts, e.g. those in which variation is observed even in adults).
- Also, depending on the type of deficit:
  - either overall poor performance (especially in the youngest age groups), with close to 100% error rate at least in some conditions (Reinhart 2006)
  - or a performance reflecting a statistical combination of possible grammars allowed by UG (Yang 2002). This latter option cannot be entertained at this point as no two competing representations for the use of definites in partitive contexts have been proposed in the literature. Modyanova and Wexler (2007: 304) qualify the phenomenon as "inconsistent knowledge of 'the'" but do not identify a competitor.

Instead, what we observe across studies is a clear tendency towards adult-like performance (in all studies surveyed here), sometimes with random variation across age groups (as seen e.g. in Schafer and de Villiers 2000), and a lingering of 'errors' lasting until around 9 or possibly 11 years of age, i.e. long after the core components of grammar are in place (Karmiloff-Smith 1979; Modyanova and Wexler 2007). There is also a clear task effect. For instance, if children can choose which item to mention in the d-linked set, they use definiteness distinctions correctly (De Cat in press); but if they are prompted to identify one (suggesting that the interviewer knows which one that is), they tend to over-use definites (Maratsos 1974; Karmiloff-Smith 1979; Schafer and de Villiers 2000). Another example of task effect is observed in the comparison between Modyanova and Wexler (2007) and

Munn et al. (2006) — discussed in section 3.

This kind of error pattern is close to what one would expect if a computational deficit rather than a linguistic deficit was at stakes (Reinhart 2006: 199-200). Children's relatively poor performance in partitive contexts may thus reflect their computational inability to evaluate what the relevant set is. They may not have the processing capacity required to keep the candidates in short-term memory. Under that account, an improved performance where visual aid is available in the physical context (as observed in Munn et al. 2006) is clearly expected.

The exact nature of children's difficulties may have to do with their executive function skills, and in particular working memory and inhibitory control, i.e. the ability to inhibit responses to irrelevant stimuli while pursuing a cognitive goal. These have recently been found to correlate with children's perspective-taking abilities in the use of referential expressions (Nilsen and Graham 2009). If children's evaluation of the relevant set in partitive contexts is demanding in terms of working memory and inhibitory control, better performance is expected from older groups (in which these aspects of the executive function have matured — see e.g. Garon, Bryson, and Smith 2008) and possibly from same-age bilinguals (who outperform monolinguals in executive function skills — see Bialystock 2008).

An alternative explanation could be that children simply fail to see the importance of the set (e.g. they do not see the need to mention all members of the set, as observed in De Cat (in press)). Similar effects would then be expected in different areas of cognition.

Further research is needed to explore these avenues.

5 Conclusion

The evidence reviewed in this paper indicates that preschool children know that referents introduced in the context as a d-linked set need to be encoded as indefinites if they have not yet been properly individualised, and with a definite otherwise. They are also aware

of the need for a(n implicit) restrictor when using a definite in such contexts.

Their performance can however be hampered due to non-linguistic factors. First, if they are made to guess who/what a particular member is, they tend to assume that that member has been identified in the context and can be encoded as a definite. If they are free to choose which member to refer to, they do use indefinites correctly. Second, if they try to identify a member of the d-linked set that has already been individualised in the context (which requires the use of a definite), they have trouble working out the implicit restrictor for the definite. The error patterns observed across studies and the clear task-effects observed suggest that the cause of children's error is extra-linguistic, and possibly due to processing limitations.

Notes

[1]See Kadmon (2000) for an overview of the rules governing the use of definiteness distinctions in the adult language.

[2]Here is an example of bridging context:

(14) I've been given a box of chocolates, but I can't open *the* lid.

[3]The exact ages were as follows. Group 1: 3;6 to 3;11.30. Group 2: 4;0 to 4;6;26. Group 3: 4;7 to 4;11.23. Group 4: 5;0 to 5;5.

[4]A reviewer suggests that the poor performance of adults in this context may indicate misleading or at least variable input and that this may explain children's difficulties. Adults' performance in this context is indeed surprisingly poor, if we assume that definites are truly illicit in this context. Is it an effect of the experimental design (in which a factor encouraging the use of definites may have been overlooked), or does it truly reflect variability? A corpus study of adults' definiteness choices in such contexts would help shed light on this issue.

Definiteness choices in partitive contexts are based on the speaker's evaluation of the salience of the referent, which is by nature a subjective process. Adults have been shown to monitor others' knowledge state only if explicitly required to do so (Apperly, Riggs, Simpson, Chiavarino, and Samson 2006). This may lead them to assume some of the time that their addressee is able to identify which referent of the d-linked set they are talking about, without explicit identification. Variability between communicational contexts — and possibly between adult speakers — is therefore expected too.

[5]Definites can be used to introduce referents if they are unique in the context (e.g. the sun, the forest,...) or if their reference can be derived from an entity previously identified in the context (as in (14)). Among the 11 cases of definites produced by children in the Focus condition, there were 2 instances of unique referents (including one name), and 5 instances of bridging.

[6]The "*il y a* + indefinite noun phrase" option was only used by one child, in the youngest group. It could have been an early attempt at using a partitive structure, prior to the acquisition of the partitive clitic *en*.

[7]Thanks to an anonymous reviewer for bringing this to my attention.

[8]Munn et al. (2006: 386) define it instead as "the first frog next to the barn", which in their view explains why children who failed to interpret the restrictor correctly tended to pick the leftmost frog (which happened to be furthest away from the barn).

[8] 4% of items are missing from Karmiloff-Smith's table for that age group.

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Age group	Indefinite	Definite + localiser	Definite + deixis	Definite	Unsuccessful restrictor	Pronoun alone
4;0-4;11	10	0	15	15	51	9
5;0-5;11	36	4	0	21	35	4
6;0-6;11	46	10	5	13	26	0
7;0-7;11	69	12	0	5	14	0
8;0-8;11	27	35	2	13	23	0
9;0-9;11	36	26	2	8	28	0
10;0-11;1	63	20	2	4	7	0[9]

Table 1: Referring expressions for second action on another class member of identical objects, expressed in percentages