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Definite-indefinite article choice development in Dutch child language

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Many acquisition studies indicate that across languages, children overgenerate definite articles in indefinite contexts. However, proportions and ages at which children make this error vary, and so do theoretical accounts. Attempting to resolve some of the mixed results, we combined the methods of two different studies (Schaeffer & Matthewson 2005 (SM) and van Hout, Harrigan & de Villiers 2010 (HHV)) and administered them to one group of 82 Dutch-acquiring children aged 2–9 and adult controls ($N = 23$).[1] The results show that definite article overuse takes place in (a) only the youngest age group (2;1–3;7) in the relevant SM indefinite condition, (b) only the two oldest child groups (6;0–9;4) in the HHV indefinite condition, and (c) adults score at ceiling in the SM conditions, while only around 70% correct in the HHV conditions. We argue that (a) the indefinite conditions of the two article choice experiments test different types of knowledge, and therefore their results cannot be compared, (b) the HHV task has more methodological drawbacks than the SM task, rendering its results difficult to interpret, and (c) the results provide less evidence for HHV's unranked-constraint hypothesis than for SM's lack-of-Concept-of-Non-Shared-Assumptions hypothesis.

Keywords: L1 acquisition, article choice, definiteness, concept-of-non-shared-assumptions, optimality theory, scalar implicatures

1. Introduction

Previous studies on the acquisition of article choice show that monolingual children acquiring a two-article system based on definiteness often overgenerate definite articles in indefinite contexts (Maratsos 1976; Karmiloff-Smith 1979; Schaeffer

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& Matthewson 2005; van Hout, Harrigan & de Villiers 2010; Kremer, van Hout & Hollebrandse 2015, a.o.). See for example the (fictitious) situation in (1):

(1) Situation: discourse-initial utterance from one friend to another; no shared beliefs about particular mouse.
   a. Adult/child: 'I have chased **a** mouse away with my broom this morning'
   b. Child: 'I have chased **the** mouse away with my broom this morning'

The current study investigates the varying results of two sets of studies on article choice in child language, namely, Schaeffer (1999) and Schaeffer & Matthewson (2005) (S/SM) (English), and van Hout, Harrigan & deVilliers (2010) (HHV) (English) and Kremer, van Hout & Hollebrandse (2015) (KHH) (Dutch). Whereas S/SM report 25% *the* overgeneration until age 4, HHV find 46% *the*-overuse until age 5;8, and KHH still find 30% *de* overgeneration at age 10. In the present study, both the experiments of S/SM and HHV/KHH are carried out with the same, Dutch-speaking children, aged 2–10, allowing a comparison of the two experiments while controlling for differences between participant pools. Our aim is to investigate potential methodological differences and whether and why these would lead to different results. Related to this, we are interested in the different theories accounting for the findings by S/SM and by HHV/KHH. In what follows, first a brief overview will be provided of these theories on definite article overgeneration. Section 3 is dedicated to the different methodologies of this study, while Section 4 presents and discusses the results of each experiment in relation to S/SM's and HHV/KHH's previously reported English and Dutch results and the predictions following from SM's and HHV's hypotheses. Section 5 discusses how the methodological differences could lead to different results, and Section 6 concludes the paper.

2.   Background

2.1   Concept of Non-Shared Assumptions (CNSA)

Based on Stalnaker (1974) and Heim (1982), SM argue that the choice between a definite and an indefinite article (as in (2) and (3)) depends on knowledge of speaker/hearer assumptions regarding the referent of the noun.

(2) Gisteren zag ik **een** (bepaalde) man lopen. **De** man droeg een hoed.
   'Yesterday I saw **a** (certain) man walking by. **The** man was wearing a hat.'

(3) Ik heb zin om **een** cake te bakken (wat voor cake dan ook).
   'I feel like baking **a** cake' (whatever cake it may be).

The first sentence in (2) contains the noun *man* ('man') which is introduced by the speaker while the referent is still unknown to the hearer, rendering the use of the indefinite article *een* ('a'). In the second sentence in (2), the referent is known to both speaker and hearer (also referred to as 'common ground'), and therefore, the definite article *de* ('de') is chosen. In (3) the referent of the noun *cake* is unknown to both speaker and hearer, also leading to the choice for indefinite *een* 'a'. In short, there are three possible belief states regarding the existence of the referent that can be accessed by article systems, as schematized in (4):

(4) The referent is believed to exist
    A   by speaker and hearer   part of common ground   *the*
    B   by speaker only   not part of common ground *a*
    C   by neither speaker nor hearer not part of common ground *a*

SM propose that up until age 4 children lack the Concept-of-Non-Shared-Assumptions (CNSA). This pragmatic concept states that speaker and hearer knowledge are always independent. If the CNSA is lacking, speaker and hearer knowledge are not independent and the speaker will sometimes attribute his/her own knowledge to the hearer. In such a case, the distinction between environment B and environment A disappears. As a result, the child will incorrectly use the definite article in environment B. For context C, the lack of the CNSA has no consequences, as not even the speaker believes the referent to exist.

To test this hypothesis, SM conducted an experiment in which the three contexts were tested. 26 monolingual English-speaking children aged 2–4 and 38 adult native English speakers were tested with an Elicited Production Task. The results show that the children produced 25% occurrences of *the* instead of *a* in B contexts (adults: 2%), whereas they performed adult-like in the C condition (5% *the*-overuse and 3% in the adult group). In an oral presentation of the same experiment, Schaeffer (1999) showed that English-acquiring children older than 4;2 no longer overgenerate definite articles in B-contexts (or C-contexts, for that matter). These results support the hypothesis that the CNSA is lacking up until age 4.

2.2 Unranked constraints

HHV explain *the*-overuse in an Optimality Theory framework by assuming that the relevant semantic constraints are unranked. According to HHV, two constraints play a role in determining article choice: DETERMINED REFERENCE and AVOID INDEFINITES. Following Farkas (2002), HHV assume that "[...] a discourse referent has determined reference if it is unique and/or has anaphoric reference" (HHV 2010: 1976). They further argue that definite NPs typically express determined reference, referring to previously introduced referents which are familiar to speaker

and hearer. In adult language, the DETERMINED REFERENCE constraint is ranked highest. Unlike SM, HHV do not distinguish between different types of indefinites.

Employing these constraints, HHV present the following bidirectional tableaux for determined and non-determined referents in adult English as seen in Table 1 and Table 2. In these tableaux, "*" indicates a violation of a constraint; "*!" indicates a fatal violation of a constraint, and "☞" indicates the optimal candidate.

Table 1. Optimal form expressing determined reference meaning

Meaning input Determined referent	DETERMINED REFERENCE	AVOID INDEFINITES
a		*!
☞*the*		

Table 2. Optimal form expressing non-determined reference meaning

Meaning input Non-determined referent	DETERMINED REFERENCE	AVOID INDEFINITES
☞*a*		*
The	*!	

In both Tables 1 and 2, the indefinite article *a* violates the constraint AVOID INDEFINITES, since indefinites should be avoided in general. However, in Table 1, AVOID INDEFINITES is the only constraint that is violated, making *the* the optimal candidate. In Table 2, DETERMINED REFERENCE is violated, because the intended meaning is a non-determined referent. Since DETERMINED REFERENCE is the highest-ranked constraint, this is the fatal violation, indicated by the exclamation mark. This makes *a* the optimal candidate when the meaning input is a non-determined referent.

HHV propose that language learners, when acquiring the article system, have not yet ranked the two constraints. Having unranked constraints does not affect the production for a determined referent, since *the* wins, irrespective of the ordering of the constraints. For a non-determined referent, however, there are "two equal winners" (van Hout, Harrigan & de Villiers 2010: 1987), namely, *a* and *the*, as can be seen in Table 3:

Table 3. Optimal form expressing non-determined reference meaning with unranked constraints

Meaning input Non-determined referent	DETERMINED REFERENCE	AVOID INDEFINITES
☞*a*		*
☞*the*	*	

HHV thus predict that children arbitrarily choose between *a* and *the* when referring to a referent that is non-determined from an adult point of view.

This prediction was borne out in a verbal NP elicitation task (without visual support) conducted by HHV on 25 English monolingual children between the ages of 3;1 and 5;8 and 6 native English-speaking adults. Overuse of *the* by the children was found at a rate of 46% in a condition with a non-unique referent for which the target was *a*. As a follow-up study, KHH conducted HHV's NP elicitation task with 57 monolingual Dutch-acquiring children between the ages of 3;3 and 10;1 and 26 native Dutch-speaking adults. They report substantial overuse of *de* in all children, even in the 9–10-year-olds (30%).

Comparing S/SM's results with those of HHV/KHH, our questions are (a) why these studies show such variation in terms of error proportions and ages (as schematized in Table 4), (b) whether this would also be the case in Dutch, and (c) how long *de*-overgeneration persists in Dutch-speaking children.

Table 4. Variation in error proportions and age

S(1999)/SM(2005)	25% *the*-overuse until age 4 in English
HHV(2010)	26–46% *the*-overuse until at least age 5;8 in English
KHH(2015)	30% *de*-overuse until at least age 10 in Dutch

Of course this raises the question as to how the article systems of English and Dutch compare. We assume that, although the two systems slightly differ in terms of gender (the Dutch definite article can appear in common (*de*) and in neuter (*het*) gender, whereas English articles show no gender distinctions), this has no repercussions for the choice between a definite and an indefinite article. As such, the Dutch and English article systems are comparable. Note that in the current study, we have restricted ourselves to studying singular articles only.

We set out to answer our questions by administering both SM's and HHV's elicited production tasks on article choice in the same group of Dutch-acquiring children. SM's theory (that children up until age 4 lack the CNSA) predicts that until age 4, children overuse *the* in indefinite referential conditions, while HHV's and KHH's theory predicts that children overuse *the* in all indefinite conditions as long as they have unranked constraints. The empirical data of KHH's study suggest that this lasts until at least age 10. The details of our methods are provided in the following section.

3. Method

3.1 Participants

In total, 82 Dutch-speaking typically developing monolingual children and 23 adult native speakers of Dutch were tested. More detailed information on the participants can be found in Table 5:

Table 5. Participants

Age group	Mean age	# of females	# of males	Total #
2;1–3;7	2;6	6	8	14
4;2–5;11	5;3	9	9	18
6;0–7;11	6;9	9	19	28
8;0–9;4	8;6	9	13	22
Adults	>20	13	10	23

3.2 Article choice Sentence Elicitation Task adapted from S/SM[2]

During the experiment, two experimenters were present. The first experimenter showed pictures or short movie clips of cartoon characters to the participant on a computer screen, while the second experimenter played the role of a hand-puppet, sitting opposite the participant and the first experimenter facing the back of the screen. The children were instructed to orally describe to the hand puppet, who could not see the screen, what was happening. When they did not use a full sentence, the first experimenter prompted their response by starting the response with the subject. In order to avoid deictic reference, the participants were told not to point at the pictures or props, because the hand-puppet could not see that.

The experiment had three conditions, corresponding to the three different contexts of speaker-hearer beliefs, as schematized in Table 6:

Table 6. Experimental conditions Sentence Elicitation Task

Condition	# items
1-Definite (referential)-*de* ('the')	6
2-Indefinite referential-*een* ('a')	18
3-Indefinite non-referential-*een* ('a')	6
Fillers	18

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2. See also Schaeffer, van Witteloostuijn & de Haan (2014).

Examples of the respective conditions can be found in (5a–c):[3,4]

(5) a.

Exp:	Hé, wie zie je op het plaatje?
	('Hey, who do you see in the picture?')
Part:	*Katrijn*!
Exp:	En wat nog meer? ('What else do you see?')
Part:	**Een** trein! ('A train!')[5]
Exp:	En wat deed Katrijn daarnet?
	('And what did Katrijn just do?')
Part:	Ze duwde **de** trein ('She pushed the train')
	*Ze duwde een trein ('She pushed a train')

b.

Exp:	Hé, wie zie je op het plaatje?
	('Hey, who do you see in the picture?')
Part:	Ernie!
Exp:	En wat heeft Ernie net gedaan?
	('And what did Ernie just do?')

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3. All experimental items made use of nouns with common gender, to avoid confounds related to the use of neuter gender (which English does not have).

4. Note that Conditions 1 and 2 make use of the past tense, emphasizing the existence of the object referent, while Condition 3 utilizes future tense and a creation verb to ensure that the referent of the object is non-existent.

5. This part of the definite condition was also used as an item in the indefinite referential condition, adding 6 more items to this condition.

Part: Hij heeft **een** pizza gebakken
('He made a pizza')
*Hij heeft de pizza gebakken
('He made the pizza')

c.

Exp 1:   Hé, wie zie je op het plaatje?
('Hey, who do you see in the picture?')
Part: Elmo!
Exp 1:   Elmo zegt: Ik verveel me zo, ik weet niet wat ik moet doen. Weet je wat, ik ga naar de keuken, en dan ga ik daar iets bakken!
('Elmo says: I'm so bored, I don't know what to do. I know, I'm going to the kitchen and I'm going to bake something')
Exp 2:   Wat denk je dat Elmo gaat doen in de keuken?
('What do you think Elmo will do in the kitchen?')
Part: Hij gaat **een** cake/taart/koekje bakken!
('He is going to bake a cake/ a pie/ cookies')
*Hij gaat de/het cake/taart/koekje bakken!
(*'He is going to bake the cake/ a pie/ cookies')

3.3   Article choice NP Elicitation Task adapted from HHV and KHH

In this task, no visual support was provided. The experimenter told the participant that s/he would hear some riddles and should try to answer them. As shown in Table 7, 6 items targeted a unique NP and 6 items targeted a non-unique NP. The task did not contain any fillers.

Table 7. Experimental conditions NP Elicitation Task

Condition	# items
1-Definite (unique referent)	6
2-Indefinite (non-unique referent)	6

The unique items consisted of a sentence in which a singleton entity was introduced into the discourse. The second sentence referred back to this singleton entity, targeting *de*, as in (6):

(6)   Exp: A rooster and a goat were walking in the meadow. One of the
                animals fell in a hole and said: "cock-a-doodle-doo"! What was it?
       Part: **The** rooster
             *****A** rooster

The non-unique items introduced a referent into the discourse by introducing a referent into the discourse which was a set of two or three entities of the same kind. The second sentence referred back to one of the entities from the set, targeting *een*, as in (7):

(7)   Exp: Three cows and a dog were walking over a bridge. One of them fell
                in the water and said: "Moo"! What was it?
       Part: **A** cow
             *****The** cow

3.4 Comparison conditions S/SM and HHV/KHH experiments

Comparing the definite conditions in both experiments, we conclude that they are similar: the referents of the nouns to be elicited are part of the common ground (familiar to both speaker and hearer), and unique in both definite conditions. In contrast, the non-unique indefinite condition in HHV/KHH's experiment is not entirely comparable to either S/SM's referential or non-referential indefinite condition. Whereas S/SM's indefinite conditions make use of the notion 'existence' (indefinite referential: referent is assumed to exist by speaker, but not by the hearer; indefinite non-referential: referent is assumed to exist by neither speaker nor hearer), HHV/KHH's indefinite condition relies on the notion of 'uniqueness': unlike in S/SM's indefinite conditions, the noun to be elicited is part of a set, but no unique, particular entity is targeted.

4.   Results and discussion

In this section we first present the results and discussion for the Dutch version of S/SM's Sentence ElicitationTtask, followed by a presentation of the results and a discussion for the Dutch version of HHV/KHH's NP Elicitation Task. Recall that both experiments were carried out with the same group of Dutch-speaking children and adults.

4.1 Results Sentence Elicitation Task based on S/SM's experiment

Table 8 displays the results for the indefinite referential condition:

Table 8. Proportions (M) and standard deviations (SD) of correct *een* responses, incorrect *de* responses, article omissions and other responses in the indefinite referential condition of the S/SM test per age group

	2;3–3;7	4;2–5;11	6;0–7;11	8;0–9;4	Adults
	M(SD)	*M(SD)*	*M(SD)*	*M(SD)*	*M(SD)*
Correct *een*	41.7% (23.8)	93.5% (6.0)	93.6% (7.2)	95.7% (7.7)	99.2% (1.9)
De-overuse	11.9% (11.5)	3.1% (3.9)	2.4% (3.2)	1.0% (2.8)	0.2% (1.2)
Article omission	33.3% (20.0)	1.2% (3.0)	2.0% (4.3)	1.3% (2.4)	0.5% (1.6)
Other[6]	15.9% (8.7)	2.2% (3.9)	2.0% (3.8)	2.0% (5.4)	0.0% (0.0)

There was a statistically significant difference in the percentages of *de*-overuse between the groups ($F(4, 100) = 14.133$, $p < 0.001$) as determined by a one-way ANOVA. A Bonferroni post-hoc test revealed that the difference (in *de*-overuse) was significant only between the youngest group and the adults ($p < 0.001$).

Table 9 below reports the results for the indefinite non-referential condition.

A one-way ANOVA revealed no significant differences between groups in percentages of *de*-overuse ($F(4, 100) = 1.054$, $p = 0.383$).

Table 10 below shows the results for the definite referential condition.

A one-way ANOVA on the percentages of *een*-overuse revealed a significant difference between groups ($F(4, 100) = 6.718$, $p < 0.001$). As shown in Figure 1, the 2;1–3;7-year-olds produced *een* in 16.7% of the instances. Adults showed no such overuse of the indefinite article. A post-hoc Bonferroni test shows that this difference in *een*-overuse was significant only between the youngest group and the adult group ($p < 0.001$).

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6. For all conditions in the Sentence Elicitation Task, examples of other responses were cases in which the participant could not give an answer to the question, used demonstratives or plural forms.

Table 9. Proportions and standard deviations of correct *een* responses, incorrect *de* responses, article omissions and other responses in the indefinite non- referential condition of the S/SM test per age group

	2;3–3;7	4;2–5;11	6;0–7;11	8;0–9;4	Adults
	M(SD)	M(SD)	M(SD)	M(SD)	M(SD)
Correct *een*	38.6% (23.2)	65.7% (27.1)	73.8% (25.8)	76.5% (22.2)	91.3% (12.2)
De-overuse	1.2% (4.5)	0.9% (3.9)	0.6% (3.2)	2.3% (5.9)	0.0% (0.0)
Article omission	9.5% (22.4)	8.3% (8.6)	16.1% (12.4)	5.3% (9.5)	3.6% (7.0)
Other	45.9% (30.7)	25.0% (21.6)	9.5% (18.9)	15.9% (18.9)	4.3% (7.5)

Table 10. Proportions (M) and standard deviations (SD) correct *de* responses, incorrect *een* responses, article omissions and other responses in definite referential condition of the S/SM test per age group

	2;3–3;7	4;2–5;11	6;0–7;11	8;0–9;4	Adults
	M(SD)	M(SD)	M(SD)	M(SD)	M(SD)
Correct *de*	44.0% (28.6)	84.3% (19.4)	85.3% (23.6)	95.5% (9.2)	100.0% (0.0)
Een-overuse	16.7% (21.7)	7.4% (13.1)	3.7% (8.5)	0.8% (3.6)	0.0% (0.0)
Article omission	33.3% (22.6)	3.7% (7.1)	2.9% (9.1)	0.8% (3.6)	0.0% (0.0)
Other	6.0% (10.6)	4.6% (11.1)	4.8% (11.9)	0.8% (3.6)	0.0% (0.0)

4.2 Discussion Results Sentence Elicitation Task based on S/SM's experiment

In the indefinite referential condition significant overuse of *de* (as compared to the adult results) was found only in the 2;1–3;7-year-olds, but no longer in the older age-groups. This result corroborates the English results in S/SM (*the*-overuse in 2;1–3;10-year-olds) and supports SM's hypothesis that the CNSA is lacking until about age 4.[7] It does not provide evidence for HHV's and KHH's hypothesis that children have unranked constraints up until age 10, predicting *de*-overuse until age 10 in this condition.

Turning to the indefinite non-referential condition, as in S/SM's English study, no *de*- overuse was found here, supporting SM's CNSA account, but not HHV/ KHH's account: Unranked DETERMINED REFERENCE and AVOID INDEFINITES

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7. Note that overuse of the definite article in the indefinite referential condition of the Sentence Elicitation Task (SM) cannot be due to a visual common ground, as suggested by one of the reviewers. As described in the Methods section, the hand-puppet asking the questions, could not see the screen with the picture.

constraints do not distinguish between different types of indefinites, and therefore *de*-overuse is also predicted in this condition.

A surprising result was found in the definite referential condition, in which the youngest age group overused *een* at a rate of 17%.[8] This was not found in S/SM's (2005) English study: the English-acquiring 2;1–3;10-year-olds behaved adultlike in this respect (2% *een*-overuse by both children and adults). As this *een*-overuse stopped by age 4, and was not found in the adult group either, it calls for further scrutiny. *Een*-overuse was not predicted by either SM's CNSA or by HHV/KHH's unranked constraint account. We believe that a possible explanation of *een*-overuse in the youngest age group in the definite conditions may be found in the scalar implicature account of indefinite comprehension, originally provided by HHV to explain children's overly liberal interpretation of indefinites.

Scalar implicatures contribute an implicit meaning and suggest that the speaker does not have a reason for using a more informative or stronger term that is part of the same scale. Horn (2006) proposes that adults draw a scalar implicature when they interpret indefinite NPs. In this analysis, *a* and *the* are part of the same (definiteness) scale < *a, the* > , in which the definite article *the* is the stronger and more informative member. The interpretation of indefinites renders the implicature that the definite article is too strong/too informative. Young children often fail to draw scalar implicatures (Noveck 2001; Papafragou 2006). For the interpretation of articles, this results in arbitrarily choosing between a determined referent meaning and a non-determined referent meaning.

Although HHV consider the scalar implicature for definiteness in terms of comprehension, it is quite possible that the scalar implicature can be applied to production as well (following Schaeffer, Van Witteloostuijn & de Haan 2014). This could explain overuse of *een* found in the definite referential condition of S/SM's test in the youngest age group: by failing to recognize the definiteness scale, young children can produce an indefinite article in definite contexts, because they do not anticipate that the hearer will draw the implicature that the definite article *de* will be too strong/informative. Since both the indefinite and the definite article are logically correct (i.e., the truth value remains the same), they can use either *een* or *de*. As mentioned above, overuse of indefinites was not found in S/SM's study on English-speaking children. As the English and the Dutch article systems do not differ in terms of definiteness, an explanation may be sought in the age of acquisition of scalar implicatures in the two languages. Further research and replication studies are needed to establish whether the difference between the English and Dutch results is real, and if so, why.

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8. Out of the 14 children in the youngest age-group (2;3–3;7) 9 overused *een*, e.g., this result is not due to just a few 'outliers'.

Overall, the results of the Sentence Elicitation task adapted from S/SM provide more support for SM's lack-of-CNSA hypothesis than for HHV/KHH's unranked-constraints hypothesis.

4.3 Results NP Elicitation Task based on HHV/KHH's experiment

The results for the indefinite non-unique condition are presented in Table 11:

Table 11. Proportions (M) and standard deviations (SD) of correct *een* responses, incorrect *de* responses, article omissions and other responses in the indefinite non-unique condition of the HHV/KHH test per age group

	2;3–3;7	4;2–5;11	6;0–7;11	8;0–9;4	Adults
	M(SD)	M(SD)	M(SD)	M(SD)	M(SD)
Correct *een*	35.7% (32.6)	41.7% (33.5)	25.0% (28.1)	31.1% (24.8)	71.0% (29.0)
De-overuse	3.6% (7.1)	11.1% (15.1)	51.2% (31.1)	50.0% (31.3)	17.4% (26.8)
Article omission	21.4% (19.0)	29.6% (33.1)	10.7% (15.9)	9.1% (19.1)	6.5% (14.0)
Other	40.5% (27.5)	14.8% (16.1)	10.7% (15.9)	8.3% (12.3)	2.9% (8.2)

Examining the proportions of *de*-overuse, we see that the highest overuse is found in the two oldest child groups (51% for the 6;0–7;11 group and 50% for the 8;0–9;4 group, as opposed to 17% for the adults). A one-way ANOVA determined that there is a statistically significant difference in percentages of *de*-overuse between the groups ($F(4, 100) = 12,422$, $p < 0.001$). A post-hoc Bonferroni test revealed that the two oldest groups differ significantly from the adult group ($p < 0.001$ for both groups), but that the two youngest groups do not. Article omissions decrease by age, but are still present in the adult group (7%).

Table 12 shows the results for the definite unique condition:

Table 12. Proportions (M) and standard deviations (SD) correct *de* responses, incorrect *een* responses, article omissions and other responses in the definite unique condition of the HHV/KHH test per age group

	2;3–3;7	4;2–5;11	6;0–7;11	8;0–9;4	Adults
	M(SD)	M(SD)	M(SD)	M(SD)	M(SD)
Correct *de*	19.0% (26.0)	24.8% (19.7)	52.4% (38.9)	63.6% (38.0)	73.2% (29.2)
Een-overuse	29.8% (35.3)	44.4% (28.0)	22.6% (29.1)	12.9% (20.5)	18.1% (23.0)
Article omission	20.2% (17.5)	25.0% (30.4)	21.43% (26.0)	19.7% (28.0)	9.4% (15.8)
Other	29.8% (22.8)	9.3% (13.1)	2.4% (5.9)	1.6% (7.3)	0% (0)

Regarding overuse of *een* in this condition, a one-way ANOVA on the percentages of *een*-overuse determined a significant difference between groups ($F(4, 100) = 3.660$, $p = 0.008$). A post-hoc Bonferroni test revealed a significant difference only between the 4;2–5;11 group and the 8;0–9;4 group, with overuses of 44% and 13%, respectively ($p = 0.011$). No significant differences between any of the child groups and the adult group were found. Note the relatively high percentages of article omissions: around 20% of the instances in all child groups and still 9% in the adult group.

4.4 Discussion Results NP Elicitation Task based on HHV/KHH's experiment

The indefinite non-unique condition (HHV/KHH test) shows a surprising pattern: as compared to the adults, significant *de*-overuse was found only in the older age groups and not in the younger age groups. As it is highly unlikely that the oldest age groups have unranked constraints, while the younger children do not, these findings do not support HHV's unranked-constraint account for *de*-overuse.

Similar to the Sentence Elicitation Task, unexpected *een*-overuse was also found in the definite condition of the NP Elicitation Task. However, in the definite unique condition of the NP Elicitation Task this was found in all age groups, including the adults. The explanation we provided in terms of scalar implicatures for the youngest group in Section 4.2 cannot explain *een*-overuse in the older children and the adults in the NP Elicitation Task: it is highly unlikely that the older children and the adults in our study and the HHV English study do not draw scalar implicatures.

Overall, the results of the Dutch NP Elicitation Task adapted from HHV/KHH support neither SM's, nor HHV/KHH's hypotheses. The results are difficult to interpret because of the non-continous developmental pattern in the indefinite non-unique condition and the substantial numbers of non-target overuse responses by the adults in both conditions.

5.   General discussion

As pointed out in the Methods section, the two article choice experiments test similar knowledge in their respective definite conditions, but tap different parts of knowledge regarding indefinites. Whereas the Sentence Elicitation Task adapted from S/SM employs the notion of 'existence' to distinguish between referential and non-referential indefinites, the NP Elicitation Task adapted from HHV/KHH makes use of the notion of uniqueness, defining indefinites to be non-unique. Turning to SM's and HHV/KHH's hypotheses, as uniqueness is not defined by speaker or hearer beliefs regarding the existence of a referent, SM's lack-of-CNSA

hypothesis does not make any predictions regarding the production of non-unique indefinites that are part of a set, i.e., the indefinites in the NP Elicitation Task. Vice versa, as HHV/KHH's unranked-constraint hypothesis does not distinguish between different types of indefinites, it predicts *de*-overuse in both the referential and the non-referential indefinite conditions of the Sentence Elicitation Task. Nevertheless, *de*-overuse is not observed in the non-referential indefinite condition, providing evidence against the unranked-constraint hypothesis.

Another issue concerns the rates of non-target overuse responses by the adult control group. In the Sentence Elicitation Task, the English-speaking ($N = 38$) and the Dutch-speaking ($N = 23$) adult controls virtually never produced non-target overuse responses (maximally 3% in the English study and maximally 0.2% in the Dutch study), confirming the ecological validity of the experiment. In contrast, both conditions of the NP Elicitation Task yielded up to 17% non-target overuse responses by the English-speaking adult controls ($N = 6$) in HHV's study, and 18% by the Dutch-speaking adults ($N = 23$) of the current study.[9] In KHH's Dutch NP Elicitation study the non-target overuse proportions in the adult group ($N = 26$) were small: up to 4.5%.

Furthermore, recall that the NP Elicitation Task did not contain any fillers. As the experimental items in the two conditions were very similar, this may have raised confusion regarding the choice of the articles.

Another striking result is the relatively high rate of article omission in the NP Elicitation Task by all groups, which was also found in HHV's and KHH's study. We believe that this may be due to the fact that HHV's and KHH's task elicited NPs, rather than sentences. This creates a naming environment, which facilitates the mentioning of a bare noun, rather than a full noun phrase. This problem is avoided in the Sentence Elicitation Task.

The relatively high adult overuse rates, the lack of fillers, and the naming environment in the NP Elicitation Task raises questions regarding the task's validity.

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9. Note that the pre-amble of the indefinite non-unique condition introduces the referent, albeit in plural. One could argue that because of this introduction into the discourse, the referent has become part of the common ground. This may have led to the use of *de* by the older children and the adults. As for the definite unique condition in the NP Elicitation Task, perhaps not all participants linked the pre-amble to the test sentence: it is logically correct to use *een* when one imagines an animal different from the ones introduced in the pre-amble making the relevant sound. This was also pointed out by one of the reviewers.

6.   Conclusion

In summary, we argue that (a) the indefinite conditions of the two article choice experiments test different types of knowledge, and therefore their results cannot be compared, (b) HHV/KHH's NP Elicitation Task has more methodological drawbacks than S/SM's Sentence Elicitation Task, rendering its results difficult to interpret, and (c) the results of both tasks provide more evidence for SM's lack-of-CNSA hypothesis than for HHV's unranked-constraint hypothesis.

The unexpected *een*-overuse in the 2- and 3-year-olds was explained as a failure to draw the scalar implicature related to the definiteness scale. This difference with English-acquiring 2- and 3-year-olds, who do not overuse *a* in definite contexts, calls for further replication studies and research into potential relevant differences between English and Dutch.

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