The interpretation of 'some': Experimental evidence

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Abstract

Previous developmental studies have shown that the computation of scalar implicatures based on the scale *<some, all>* represents a problem for children that significantly exceeds the difficulty of the computation of scalar implicatures based, e.g., on scales of exact numbers or scales of conjoined referring expressions such as *<a dog; a dog and a cat; a dog, a cat and a cow>* (Papafragou and Musolino 2003; Barner et al. 2011, among others). Barner et al. claim that young children accept *some* in situations which could be more appropriately described by *all* (e.g., they say *yes* to the question *Are (only) some of the animals sleeping?* when all three of the animals are sleeping) because they are still not aware of the fact that *all* is a member of the same scale that includes *some*. This paper argues that the source of children's difficulties with interpreting *some* and its Hungarian equivalent *néhány* is that *some/néhány* is ambiguous. It has a non-partitive interpretation, corresponding to 'a few', which forms a scale with non-partitive *many*, and a partitive reading, corresponding to 'a subset of', which forms a scale with *all*. The two variants of *néhány/some* have different distributions; they are selected by different predicates, and in Hungarian, they occur in different structural positions. For adults, the structural position, the prosody, the internal structure of the *some* phrase, and/or the selectional properties of the predicate determine the interpretation of *some* in most cases. We hypothesized that young children are not sensitive to the partitivity feature of *some* phrases arising in different contexts; they first acquire the non-partitive reading, which they overgeneralize for a while. The paper gives account of two experiments testing and confirming this hypothesis. Experiment 1, a forced choice sentence-picture matching task, showed that the primary, default reading of *some* NPs for six-year old Hungarian children is the 'a few' interpretation. Experiment 2, a truth value judgement task, demonstrated that children also accept the 'not all' interpretation of *some*, and the acceptance rates of the 'a few' and the 'not all' readings are similar irrespective of the partitivity feature of the *some* NP in the given context.

Keywords: scalar implicature, *some*, counting quantifier, partitive, Hungarian, language acquisition

1. Introduction

Whereas adults interpret *some* e.g. in *Some horses jumped over the fence* as 'some but not all', children understand it as 'some and possibly all' (Noveck 2001; Papafragou & Tantalou 2004; etc.). It has been claimed that the basic meaning of plural *some* is 'some and possibly all', and the 'some but not all' reading is a pragmatic inference, a scalar implicature, which children cannot access – see Noveck (2001), Chierchia et al. (2001), Papafragou and Musolino (2003), Guasti et al. (2005), Foppolo et al. (2012), Huang and Snedeker (2009), Katsos and Bishop (2011), Barner et al. (2011). The assumption that children generally have problems with computing scalar implicatures cannot explain though why pragmatic inferencing has proved to

be much easier for them in the case of scales involving cardinal numbers than in the case of the scale involving *some* and *all* (Papafragou & Musolino 2003).

Recently it has been proposed that a scalar implicature is often a problem for children because they lack knowledge of the relevant scalar alternatives. That is, young children accept *some* in situations which could be more appropriately described by *all* because they are still not aware of the fact that *all* is a stronger alternative of the same scale that includes *some* (Barner et al. 2011; Foppolo et al. 2012; Pagliarini et al. 2018).

We argue that the source of children's difficulties with interpreting *some* and its Hungarian equivalent *néhány* is that *some/néhány* is ambiguous. It has a non-partitive interpretation, corresponding to 'a few', which forms a scale with non-partitive *many*, and a partitive reading, corresponding to 'a subset of', which forms a scale with *all*.[1] The two variants of *néhány/some* have different distributions; they are selected by different predicates, and in Hungarian, they occur in different structural positions. We have hypothesized that for young children, the primary reading of *some* NPs is the non-partitive reading; this is what explains their behaviour in the experiments cited above. We tested this assumption with two experiments to be presented in this paper.

The paper is organized as follows: section 2 introduces *néhány*, the Hungarian existential quantifier. In section 3, we present linguistic evidence demonstrating that a *néhány* 'some' NP has either a partitive group-denoting reading, or a non-partitive counting interpretation, or both, depending on the context. Section 4 surveys previous experiments testing children's interpretation of *some*. Section 5 presents our own experiments with *néhány*. Section 6 is a conclusion.

2. 'Some' in Hungarian

The Hungarian equivalent of *some* is *néhány*. Hungarian developed two series of indefinite pronominal/proadverbial elements prefixed with an existential quantifier, namely:

né-ki	*vala-ki*
some-who	some-who 'somebody'
né-mi	*vala-mi*
some-what	some-what 'something'

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[1] *Many* also has a non-partitive reading, paraphraseable as 'a large number of', and a partitive or proportional reading, paraphraseable as 'a large subsection of'. This well-known ambiguity is discussed in connection with examples (14a,b), and (17a,b)-(18a,b).

né-hány	*vala-hány*
some-how.many	some-how.many 'some'
né-hol	*vala-hol*
some-where	some-where 'somewhere'
né-ha	*vala-ha*
some-when 'sometimes'	some-when 'sometime'

In Old Hungarian, the pairs appear to have been synonyms, but by now a semantic split has taken place between them: the elements of the *né*-series denote a set of multiple individuals, whereas the elements of the *vala*-series denote a single indefinite individual, e.g.:

(1) a. Péter **néha** boldog volt.
Peter sometimes happy was
'Sometimes Peter was happy.'

b. Péter **valaha** boldog volt.
Peter sometime happy was
'Sometime [in the past] Peter was happy.'

(2) a. **Néhol** -15 fokot mértek az éjjel.
somewhere -15 centigrade-ACC measured.3PL the night
'At some places, -15 centigrades was measured at night.'

b. **Valahol** -15 fokot mértek az éjjel.
somewhere -15 centigrade- ACC measured.3PL the night
'At a certain place, -15 centigrades was measured at night.'

(3) a. Írtam **néhány** levelet.
write.PAST.1SG some letter.ACC
'I wrote some letters.'

b. Írtam **harminc-valahány** levelet.
write.PAST.1SG thirty-some letter.ACC
'I wrote thirty-some letters.'

Presumably as a consequence of the meaning split, *néki* 'somebody' has fallen out of use,[2] and *valahány* 'some' has become very rare. In present-day Hungarian, the equivalent of *some* as a countable determiner is *néhány*.[3]

3. Group-denoting versus counting *néhány*: linguistic evidence

For adults, a *some* NP in English or a *néhány* NP in Hungarian is often ambiguous, e.g.:

(4)   Találkoztam   **néhány diákkal**.
       meet.PAST.1SG   some   student.with
       'I met some students.'

The Hungarian sentence and its English equivalent in (4) can mean both that I met a small indefinite number of students, and that I met a (small) subset of a contextually given set of students. (To what extent the 'small' component is part of the latter, partitive meaning, as well, appears to be individual dependent – as was revealed by the reactions of the adult control group of our experiments. In the experiments of Degen and Tanenhaus (2015), the default set size associated with *some* by English adults is 6-8.)

In certain structural positions in the functional left periphery of the Hungarian sentence, the *néhány* phrase ceases to be ambiguous. The neutral Hungarian sentence contains three preverbal fields: a topic field (the specifier of an iterable TopP), a distributive quantifier field (the specifier of an iterable DistP[4]), and an immediately preverbal slot harboring a non-referential, predicative complement of the verb (the specifier of PredP) – as shown in (5) (for details, see Szabolcsi (1997) and Author (2008; 2010) among others).
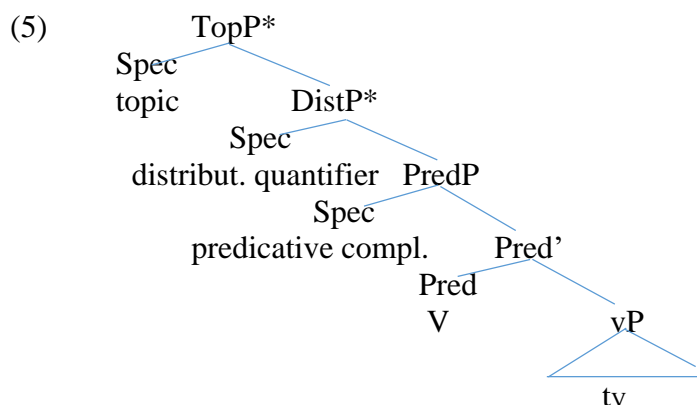
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[2] An Old Hungarian example:
(i) s **neky-k** kewueket hagÿtnak uala ew rÿa (Jókai Codex 1370/1448: p. 21)
    and somebody-PL stones throw-3PL be-past he onto
    'and some people were throwing stones at him'
[3] The equivalent of the modifier *some*, which can also be used with uncountables, yielding a referentially vague item, is *valami*:
(i) Akarok venni neki **vala-mi** ajándékot.
    want.1SG buy.INF him some-what present
    'I want to buy her some [sort of] present.'
[4] The distributive quantifiers also have postverbal scope positions, therefore they are assumed to be left- or right-adjoined to PredP by Author (2010).

(5)

```
                    TopP*
        Spec
        topic           DistP*
              Spec
              distribut. quantifier   PredP
                           Spec
                           predicative compl.   Pred'
                                        Pred
                                        V              vP
                                                    tv
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The evidence for the separation of the three fields includes syntactic, prosodic, and semantic arguments. Namely, elements in the three fields have different distributions, i.e., different relative positions with respect to sentence adverbials and to one another. Primary stress falls on the left edge of the post-topic section, i.e., on the filler of Spec,DistP, or, if no DistP is projected, on the filler of Spec,PredP. The filler of Spec,PredP and the verb following it form one phonological word. The three slots are associated with different logical functions.

In topic position, the *néhány* phrase is understood to denote a (small) subset of a contextually given set – see example (6), where the topic status of the *néhány* phrase is ensured by its position preceding the universal quantifier in Spec,DistP, the locus of primary stress (denoted by ′). (6a) and (6b) represent the same structure, with the grammatical functions distributed in different ways; they illustrate that word order in the preverbal section of the Hungarian sentence is determined by logical role rather than grammatical functions.

(6)   a. [TopP **Néhány diák** [DistP ′minden professzorral [PredP konzultált]]]
                some   student   every   professor.with   consulted
          'Some students consulted with every professor.'
      b. [TopP **Néhány diákkal** [DistP ′minden professzor [PredP konzultált]]]
                some student.with   every   professor   consulted
          'With some students, every professor consulted.'

The topic of the sentence represents the logical subject of predication, therefore, it must have restricted reference, i.e., must be specific. Partitivity corresponds to a type of specificity (Enç 1991; Farkas 2002), thus the partitive interpretation associated with *néhány* is a manifestation of its specificity feature.

The non-partitive interpretation of *néhány*, corresponding to 'a few', is evoked in the specifier of the PredP projection, a slot reserved for the non-referential complement of the verb (e.g., a verbal particle, a predicative nominal, or a non-specific theme or goal nominal). The filler of Spec,PredP has the smallest possible scope (Szabolcsi 1983), and this is also true of the *néhány*-phrase in Spec,PredP (see 7b). Whereas in partitive *néhány* NPs, e.g., those in (6a,b), phrasal stress falls on *néhány* – as required by the regular stress rules of Hungarian, in non-partitive *néhány* NPs, e.g., those in (7a,b), phrasal stress falls on the nominal determined by *néhány*.

(7) a. [PredP **Néhány ′diák**   érkezett]

          some   student arrived

      'Some students arrived.'

   b. [DistP ′Mind-három   professzor [PredP **néhány ′diákkal**   konzultál]]

          all-three   professor   some   student.with   consults

      'Each of the three professors are consulting with some students.'

The left periphery of the Hungarian sentence can include a focus slot between PredP and DistP, in the specifier of a focus phrase (FocP). The focus elicits verb movement from Pred to Foc.

(8)
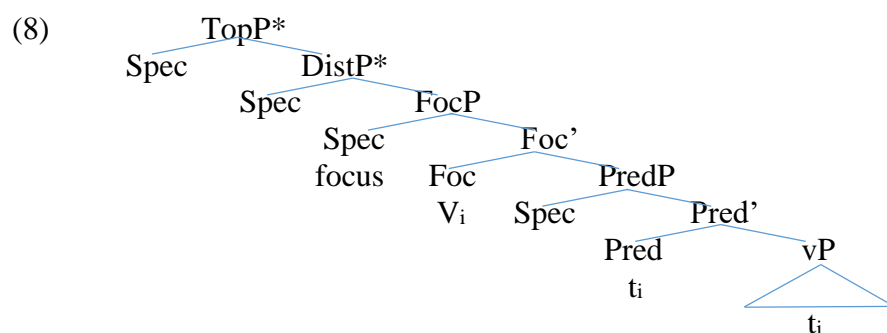
A *néhány* phrase in Spec,FocP can be [+/-partitive], i.e., it can either mean 'a few, not many', or it can mean 'a (small) subset of a contextually given set, not the whole set' – see *néhány diák* 'some students' in (9). When it is understood as [+partitive], its alternative also has this feature, hence what *néhány diák* 'some students' excludes is 'all students'. When the *néhány* phrase is understood as [-partitive], the excluded alternative is the [-partitive] reading of 'many students'.

(9) [FocP (Csak) NÉHÁNY   DIÁKKAL   konzultáltam$_i$ [PredP t_i …]]
            only some   student.with consult.PAST.1SG
        'It was only some students that I consulted with.'

Since the verb always moves up into the Pred head, and in the presence of a focus, it moves on into the Foc head, an immediately preverbal constituent can, in principle, occupy either Spec,PredP or Spec,FocP. However, the filler of Spec,FocP and the filler of Spec,PredP behave differently under negation. FocP negation elicits no further verb movement, resulting in a 'Neg–Spec,FocP–V' order – which is just as ambiguous as the non-negated focus construction in (9):

(10)a. [NegP Nem [FocP (csak) ′NÉHÁNY DIÁKKAL   konzultáltam$_i$ [PredP t_i ...]]] hanem sokkal.
              not   only   some   student.with consult.PAST.1SG   but   many-with
        'I consulted not only with some students but with many.'
      b. [NegP Nem [FocP (csak) ′NÉHÁNY DIÁKKAL   konzultáltam$_i$ [PredP t_i ...]]] hanem minddel.
              not   only   some   student.with consult.PAST.1SG   but   all-with
        'I consulted not only with some students but with all.'

PredP negation, on the contrary, elicits V-to-Neg movement, yielding a 'Neg –V– Spec,PredP' order (11a; 12a). A non-partitive *néhány* phrase inside a negated PredP is marginal; it tends to be replaced by the negative polarity indefinite *egy… sem* 'not even one; no' (11b; 12b):

(11) a. ?[NegP ′Nem érkezett$_i$ [PredP **néhány diák** t_i …]]
                not   arrived   some   student
          'It is not the case that some students have arrived.'
      b. [NegP ′Nem érkezett$_i$ [PredP egy   diák   sem t_i …]]
              not   arrived   one   student even
          'No student arrived.'

(12) a. ? [TopP A   professzor [NegP ′nem konzultált [PredP **néhány diákkal** t_i …]]]
                  the professor   not   consulted   some   student.with
          'It is not the case that the professor consulted with some students.'
      b. [TopP A professzor [NegP ′nem konzultált [PredP egy   diákkal   sem t_i …]]]
              the professor   not   consulted   one   student.with even
          'The professor did not consult with any student.'

The claim that the different preverbal positions of the Hungarian sentence let in different types of quantifiers was first made by Szabolcsi (1994; 1995). She claimed that the topic position is open to group-denoting quantifiers such as *a fiú* 'the boy', *hat fiú* 'six boys'; the distributive quantifier position is open to universals, among others; whereas the specifier of PredP can take so-called counting quantifiers such as *pontosan hat fiú* 'exactly six boys', *kevés fiú* 'few boys', *hatnál kevesebb fiú* 'less than six boys', *SOK fiú* 'MANY boys' etc. The difference between the counting and non-counting quantifiers is procedural. The mode of operation of group-denoting (and distributive) quantifiers is "predicate and +/-distribute", and that of counting quantifiers is "count". Group-denoting and distributive DPs are monotonically increasing quantifiers whose witness sets serve as logical subjects of predication. Their combination with a predicate asserts that the predicate holds, or does not hold, of that witness set or its elements. In contrast, the counting quantifiers specify the size of a participant of the atomic or plural event described by the verbal predicate in conjunction with the counting quantifier's restriction. Szabolcsi (2010) associates the two interpretations with Brentano's categorical and thetic judgments, citing Ladusaw (1994).

Szabolcsi (1994; 1995; 2010) also called attention to the fact that a noun phrase can belong to more than one quantifier type, and its behavior and interpretation in Hungarian depends on which position it occupies in the sentence structure. For example, *sok fiú* 'many boys' can stand both in Spec,DistP (13a) and in Spec,PredP (13b), and it is obligatorily distributive only in the distributive quantifier position (13a):

(13) a. [DistP ′**Sok**   **fiú**   [PredP ′fel   emelte   az   asztalt]]
　　　　　　　many   boy　　　　up   lifted   the   table
　　　　'Many boys each lifted the table.'
　　b. [PredP ′**Sok**   **fiú**   emelte$_i$ [vP fel t_i az   asztalt]]
　　　　　　　many   boy   lifted　　　up   the   table
　　　　'Many boys lifted the table.'

When functioning as a non-counting quantifier, *sok* assumes a partitive interpretation; it marks a value of the scale involving *all*. When used as a counting quantifier, it lacks partitivity; it forms a scale with *few*, among others. Compare the interpretations of *sok* in Spec,DistP and in Spec,PredP! While (14a) is a meaningful statement confronting two large subsets of a

contextually given set, (14b) involves a contradiction, making two opposing statements about an event.

(14) a. [DistP **′Sok diák** [PredP ′el jött a tüntetésre]], **sok diák** ′nem jött el.

many student off came the demontration.to many student not came off

'Many students have come to the demonstration; many students haven't come.'

b.*[PredP **′Sok diák** jött a tüntetésre]], ′nem jött **sok diák**.

many student came the demontration.to not came many student

'*There arrived many students at the demonstration; there didn't arrive many students.'

Notice that the *sok* phrase in Spec,DistP of the second clause of (14a) precedes the negative particle and is outside the scope of negation, whereas the *sok* phrase in Spec,PredP of the second clause of (14b) follows the negated verb, and is inside the scope of negation.

The different partitivity features of non-counting and counting quantifiers are manifested in further facts of Hungarian. Hungarian syntactically distinguishes verbs of creation and coming-into-being from their change-of-state counterparts (Szabolcsi 1986; Piñón 2006). Verbs stating the existence, or appearance, or creation of an individual have an obligatorily non-specific, hence non-partitive, internal argument – that whose existence or coming into being is asserted or negated (15a; 16a). Notice that if these verbs take a telicizing verbal particle, they express the change-of-state of an individual that has already been existing partially or in the form of a plan, and the noun phrase denoting this individual is obligatorily partitive-specific (15b, 16b). (In English, the existence/coming-into-being/creation interpretation and the change-of-state interpretation are not distinguished formally. The '*there is…*' construction enforces the existence/coming-into-being reading, but a 'preverbal subject, verb' complex is ambiguous. For a detailed semantic analysis of the two readings, see Piñón (2006).)

(15) a. Vendégek/*a vendég/*Mari vendége /*minden vendég **érkezett**.

guests /the guest /Mary guest-3SG/ every guest arrived

'There arrived guests/*the guest/*Mary's guest/*every guest.'

b. *Vendégek/a vendég/Mari vendége /minden vendég **meg érkezett**.

guests /the guest /Mary guest.3SG/every guest PRT arrived

'Guests/the guest/Mary's guest/every guest arrived.'

(16) a. Dolgozatot/*minden dolgozatot **írtam**.

　　　paper.ACC /every　　paper.ACC write.PAST.1SG

　　　'I wrote (a) paper/every paper.'

　　b. *Dolgozatot/minden dolgozat-ot **meg　írtam**.

　　　paper.ACC /every　paper.ACC PRT　write.PAST.1SG

　　　'I wrote (a) paper/every paper.'

The *sok* determiner of a noun phrase complementing a particleless verb of existence, coming-into-being or creation is understood as 'a large number of' (17a, 18a), whereas the *sok* determiner of a phrase complementing a particle verb expressing the change-of-state of a presupposed referent is understood as 'a large subset of' (17b, 18b):

(17) a. Sok　vendég　**érkezett**.

　　　many guest　　arrived

　　　'There arrived a large number of guests.'

　　b. Sok　vendég　**meg　érkezett**.

　　　many guest　　PRT　arrived

　　　'A large subset of the guests arrived.'

(18) a. Sok　hibát　　　**találtam**　　a　　dolgozatban.

　　　many mistake.ACC find.PAST.1SG　the paper.in

　　　'I found a large number of mistakes in the paper.'

　　b. Sok　hibát　　　**meg találtam**　　a　　dolgozatban.

　　　many mistake.ACC PRT　find.PAST.1SG the paper.in

　　　'I found a large subset of the mistakes in the paper.'

　　In Hungarian, *néhány* 'some' NPs behave similarly to *sok* phrases in that they can occur in different preverbal positions, where they represent different quantifier types. A *néhány* phrase can stand in Spec,TopP, where it behaves as a group-denoting quantifier, or it can stand in Spec,PredP, where it acts as a counting quantifier. The test demonstrating the interpretive difference of the partitive-specific non-counting use in Spec,TopP/DistP and the non-partitive counting use in Spec,PredP yields the same result in the case of *néhány* as in the case of *sok*. Compare with (14a,b):

(19) a. [TopP **Néhány diák** [PredP ′el jött a tüntetésre]], **néhány diák** ′nem jött el.

 some student off came the demontration.to many student not came off

 'Some students have come to the demonstration; some students haven't come.'

 b.*[PredP **Néhány ′diák** jött a tüntetésre]], ′nem jött **néhány diák**.

 some student came the demontration.to not came **some student**

 '*There arrived some students at the demonstration; there didn't arrive some students.'

We attest the same correlation between the interpretation of the quantifier and the partitivity requirement imposed on it by the selecting predicate in the case of *néhány* phrases as we observed in the case of *sok* phrases. Thus a *néhány* phrase representing the non-partitive internal argument of a verb of existence or coming-into being means 'a small number of …'. A *néhány* phrase representing the partitive-specific internal argument of a change-of-state particle verb, on the contrary, means 'a (small) subset of a contextually given set of…':

(20) a. [PredP Néhány ′vendég **érkezett**]]

 some guest arrived

 'There arrived a small number of guests.'

 b. [TopP Néhány vendég [PredP ′**meg érkezett**]]

 some guest PRT arrived

 'A (small) subset of the guests arrived.'

(21) a. [PredP Néhány ′hibát **találtam** a dolgozatban]

 some mistake.ACC find.PAST.1SG the paper.in

 'I found a small number of mistakes in the paper.'

 b. [TopP Néhány hibát [PredP ′**meg találtam** a dolgozatban]]

 some mistake.ACC PRT find.PAST.1SG the paper.in

 'I found a (small) subset of the mistakes in the paper.'

In sum: the countable determiner *néhány* 'some' is ambiguous between a partitive (more precisely, partitive-specific) reading, corresponding to 'a (small) subset of', and a non-partitive, non-specific reading, the equivalent of 'a small number of'. The partitive *néhány* 'some' forms a scale with *mind* 'all', whereas the non-partitive *néhány* 'some' forms a scale with the non-partitive (or non-proportional) reading of *sok* 'many'. Certain sets of verbs select one or the other variant of *néhány*. Hungarian formally distinguishes the coming-into-being/creation

variants and the change-of-state variants of many accomplishment verbs. The former select a non-specific internal argument; the latter only accept a specific internal argument. *Some*-phrases representing the internal argument of coming-into-being/creation verbs only have the 'a few' reading, whereas those representing the internal argument of the change-of-state variants only have the 'not all' interpretation. The two types of *some*-phrases also have different distributions across sentence positions. In the Hungarian sentence, the topic position is only open to partitive-specific *some* phrases, whereas the immediately preverbal Spec,PredP slot only accepts non-partitive *some* NPs. (In focus position, and postverbally, both variants are possible.)

A question is to what extent the above observations hold of the English *some*. Szabolcsi (2010: 173) identifies counting quantifiers in English on the basis of two properties: they can host a binominal *each*, and they are poor inverse scope takers, and she lists *some* NPs among the non-counters. We have found in an inquiry of adult native English speakers that the acceptance rate of the test sentence in (22), containing a *some* NP hosting a binominal *each*, is 30%.

(22) The boys have seen some films each.

The following comment of a participant suggests that the marginal acceptability of (22) is due to the difficulty of constructing an appropriate context for it. Namely: "The kind of context in which it seems okay [is] where these boys didn't make much of an effort, say, in the context of a course. So *The boys saw some films each, but otherwise they didn't make a whole lot of effort to engage with the course content or the prescribed work*."

The other criterion of counting quantifiers is satisfied more straightforwardly: where the predicate enforces a non-partitive, counting reading on a *some* NP, it cannot take wide scope:

(23) In front of every house, there are some trees.
      every > some; *every < some

A topicalized *some* phrase, on the contrary, clearly behaves like a group denoter; it is partitive-specific, it has wide scope (24a), and does not support a binominal *each* (24b):

(24) a. In front of some houses, every tree is in blossom.
      b.*Some films, the boys have seen each.

Although these facts may not be conclusive as regards the counting quantifier status of the non-partitive *some*, *some* NPs in [-specific] contexts, e.g. in the subject position of thetic, presentative sentences such as (25a), and those in [+specific] contexts, e.g. in the subject position of categorical sentences such as (25b), show the same interpretive difference as we attested in Hungarian – as was already observed by Diesing (1992) and was confirmed by von Fintel (1998):

(25)   a. There are some major mistakes in this manuscript.

         'A small number of major mistakes can be found in this manuscript.'

     b. Some mistakes in this manuscript are major.

         'A (small) subset of the mistakes in this manuscript are major.'

The Hungarian and English facts surveyed above raise the possibility that the non-adult-like interpretation that children assign to *some* phrases in acquisition experiments may not be due to their inability of carrying out scalar implicatures. It may be the case that of the two readings of *some* phrases, the non-partitive reading, corresponding to 'a small number of…' emerges first and remains the default reading for some time, because that is the cognitively simpler interpretation, not requiring the identification of two referents: the set denoted by the quantifier phrase, and a superset, as well.

4. The acquisition of *some*

The first experiment testing children's interpretation of *some* that has become widely known is that reported in Smith (1980). Smith tested how 4-7-year-old children understand the quantifiers *some* and *all*, and found that, while they correctly distinguish these quantifiers in felicitous contexts, most of them give a *Yes* answer not only to questions like (26a) but also to questions like (26b), which would still be true if the quantifier were *all.*

(26)   a. Do some birds live in cages?

     b. Do some birds have wings?

Noveck (2001) conducted a similar experiment with older French children, testing how they interpret affirmative sentences involving the existential quantifier *certains* in sentences of the type *Some giraffes have long necks*. He found that the acceptance rate of such sentences is still

89% among 7-8-year olds, and 85% among 10-11-year olds, as opposed to the 41% acceptance rate of adults. Noveck concluded that children treat scalar terms logically; they acquire the pragmatic skill to draw scalar implicatures only at an older age.

Subsequent experiments tested children of different mother tongues, among them Greek (Papafragou and Musolino 2003; Papafragou and Tantalou 2004), German (Doitchinov 2005), Italian (Guasti et al. 2005; Foppolo et al. 2012), French (Noveck 2001; Pouscoulous et al. 2007), English (Chierchia 2001, 2004; Gualmini et al 2001; Skordos and Papafragou 2016), Hungarian (Authors 2018), etc. They involved tasks of various kinds, for example, sentence judgement task based on world knowledge (e.g., Smith 1980; Noveck 2001), truth value/acceptability judgement task based on visual evidence (Papafragou and Musolino 2003; Pouscoulous et al. 2007); felicity judgement task, i.e., selecting between alternative linguistic descriptions of a visual stimulus (Chierchia et al. 2001; Foppolo et al. 2012), picture selection task (Doitchinov 2005), action-based judgement task (Papafragou and Tantalou 2004).[5]

These experiments have all confirmed that young children have difficulties with computing scalar implicatures, but, at the same time, they have also shown that children's achievement depends on several factors, among them the experimental conditions, the scalar elements involved, the syntactic structure of the linguistic stimulus, and the age of the children.

Various aspects of the experimental conditions have been shown to influence children's performance. If the sentence containing the scalar element is embedded in a rich naturalistic context, especially, if the context highlights the difference between its alternative interpretations, children are more likely to react in an adult-like fashion (Papafragou and Musolino 2003; Papafragou and Tantalou 2004; Foppolo et al. 2012). A training session also improves children's achievement – as demonstrated by Papafragou and Musolino (2003), although Guasti et al. (2005) showed that this is not a long-term effect.

The evaluation metric used by the experimenter also influences the results obtained. Katsos and Bishop (2011) tested the false, underinformative, and informative uses of *some* by introducing a ternary evaluation scale (represented by a 'small', a 'big' and a 'huge' strawberry, respectively). Whereas only 26% of Katsos and Bishop's 5-6-year-old subjects rejected underinformative *some* in a binary truth value task, 89% of them assigned the middle value to underinformative descriptions, which is unexpected if children's use of *some* is determined by logic. Katsos and Bishop's conclusion is that children are sensitive to underinformativeness,

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[5] The visual world paradigm, too, has appeared in experiments testing adults' interpretation of scalar implicatures – see, e.g., Huang and Snedeker (2009), Grodner et al. (2010), Degen and Tanenhaus (2016).

and their acceptance of underinformative *some* in binary judgement tasks is not evidence of their incompetence with implicatures but is due to their tolerance of pragmatic violations.

The question may arise why children didn't accept under-informative *some* expressions as optimal answers under the 'a few' interpretation of *some*. Our hypothesis is that the animation used in the stimuli, reinforced by the experimenter's comments, evoked the distributive determiner *each* so strongly that *some* under any interpretation seemed suboptimal. Namely, the animation always showed members of the relevant set manipulated by the protagonist one by one, with each action acknowledged by the experimenter separately. In the case of the sentence *The mouse picked up some of the the carrots*, for example, the mouse moved from the right side of the screen to the set of five carrots five times, and each time carried one carrot back to its starting position. Each time the mouse came back with a carrot, the experimenter commented 'Look, he picked up a carrot'. The emphasis was clearly on repeating the action as long as each carrot has been affected.

As demonstrated by several former experiments, children's success with scalar implicatures varies with the type of scale involved. Numerical scales, scales formed by such verb pairs as *start* and *finish*, and scales formed by disjunction and conjunction are difficult to a different degree for children (see Noveck (2001) Papafragou and Musolino (2003), and Barner et al. (2018), among others). Papafragou and Musolino (2003), testing Greek preschoolers' ability to draw scalar implicatures, found a significant difference also between the interpretations of the scale *<some, all>* and the scale *<two, three>*. Their subjects had to judge the truth value of sentences involving *some (of)* in contexts which satisfied the semantic content of *all (of)*, and sentences involving *two (of)* in contexts which satisfied the semantic content of *three (of)*, e.g., they had to judge the truth value of (27a) and (27b) in a situation where all three members of a group of three horses jumped over a log.

(27) a. Two of the horses jumped over the log.
      b. Some of the horses jumped over the log.

Whereas the children rejected 65% of the sentences involving *two*, they only rejected 12.5% of the sentences involving *some*. In a follow-up experiment, a preliminary training, and the introduction of contexts that made the stronger alternative salient, led to higher rejection rates, but they did not eliminate the difference between the *<some, all>* scale and the numerical scale (the rejection rate rose to 90% in the case of the *<two, three>* scale, but only to 52.5% in the case of the *<some, all>* scale).

Barner et al. (2011) compared children's ability to access a stronger scalar alternative in the case of context-dependent scales versus context-independent scales involving *some*. Four-year-old children were shown pictures in which three out of three objects fit a description (e.g., three animals were sleeping), and were asked to answer questions that relied on context-independent alternatives (e.g., *Are (only) some of the animals sleeping?*) or contextual alternatives (e.g., *Are (only) the cat and the dog sleeping?*). The children answered *yes* to questions involving a context-independent scale in two thirds of the cases even when the word *only* was used, but correctly answered *no* to questions involving a context-dependent scale. The authors concluded that children fail to compute scalar implicatures because they lack knowledge of the relevant scalar alternative to the word *some*. Children know that *some* and *all* denote different set relations; what they need is additional learning in order to rapidly and automatically access lexical items as scalar alternatives. They become aware of scale members by a gradual association of syntactically replaceable alternatives. The scale that the authors associate with *some* is *<a, some, many, most, all>*. However, as we argued in Section 3, this scale is a conflation of two scales: the „counting" scale *<a, some, many>*, and the partitive scale *<some, most, all>*, the members of which cannot replace each other in various syntactic contexts. We assume that the source of children's difficulties is the fact that *some* belongs to two different scales (in fact, more than two if we also regard the singular *some*), and children's default choice may be the scale that does not include *all*.

Miller et al. (2005) noticed that *some* is interpreted differently in the presuppositional context of (28a), and in the non-presuppositional context of (28c), where the *some* phrase represents the object of a verb of creation. Their main research question was the role of stress in the interpretation of presuppositional *some* (28b), though. In various act-out tasks, they tested the following three constructions:

(28) a. C1: Make some faces HAPPY   (unstressed *some*/presuppositional)
     b. C2: Make SOME faces happy   (stressed *some*/presuppositional)
     c. C3: Make some HAPPY faces   (unstressed *some*/non-presuppositional)

They found that children correctly associate no scalar implicature with non-presuppositional – i.e., non-partitive – *some* (the percentage of partitive responses in C3 was 10%). However, unlike adults, they also fail to enforce a scalar implicature with unstressed presuppositional (i.e., partitive) *some* (the percentage of partitive responses in C1 was 50%). At the same time, children are able to access the quantity implicature associated with presuppositional *some* when

it is focused (the percentage of partitive responses in C2 was 90%). In the view of Miller et al., scalar implicatures are made more salient by contrastive focus on the quantifier because the implicature is part of the alternative set generated by the focus. Miller et al., however, did not test the interpretation of stressed non-presuppositional *some*, i.e., they did not test (29), and did not mention, let alone resolve, the apparent contradiction between the non-presuppositionality of the object of a creation verb and the implicature arising with the alternative set generated by its focusing.

(29) Make SOME happy faces

In fact, focused presuppositional/partitive and non-presuppositional/non-partitive *some* phrases generate partitive and non-partitive alternative sets, respectively – as was discussed in connection with the Hungarian examples in (8)-(9). The excluded alternative of the partitive-specific *SOME faces* in *Make SOME faces happy* is *ALL faces*, whereas the excluded alternative of the non-partitive *SOME happy faces* in *Make SOME happy faces* is the non-partitive *MANY happy faces* – in accordance with our claim that *some* is semantically ambiguous.

The first experiments apparently did not attribute any significance to the presence or absence of a partitive *of the* in the scalar expression. Foppolo et al. (2012), testing how five-year-old Italian children interpret sentences of the type *Some Smurfs went by a boat*, carried out an experiment in two versions: first using the simple determiner *qualche* 'some', and then replacing it by the partitive *alcuni dei* 'some of'. They found that the use of the partitive form did not help children "to focus on a certain "quantity" in relation to a given set"; on the contrary, children's rejection rate dropped from 42% to 38.5% (Foppolo et al. 2012: 371).

The experiments surveyed tested children of various age groups, including children as young as 2:6 – 3;5 (Huang et al. 2013) and children as old as 10-11 (Noveck 2001). It has been found that children's achievement improves with age, but the improvement is not gradual. Foppolo et al. (2012) tested the interpretation of sentences like *Some smurfs went on a boat* embedded in a story satisfying the condition of plausible dissent, discussing the possibility of some of the Smurfs taking a boat, others taking a car, or all of them taking a boat. They found that 4-5-year-old children are bimodally distributed; the turning point in the interpretation of *some* is at the age of 6, after which children soon attain adult-like performance. The turning point obviously depends on the conditions discussed above; e.g. in Noveck's experiment testing the interpretation of the French *certains* in out-of-the-blue sentences, the achievements of 7-8-year-

old and 10-11-year-old children are equally far from the achievement of adults (89% and 85% acceptance rates of underinformative *some* as opposed to the 41% acceptance rate of adults).

5. Experiments

The theoretical considerations discussed in section 3 and the questions raised by the experiments surveyed in section 4 prompted us to formulate the hypothesis that young children react to stimuli involving a *some* phrase in a non-adult-like manner because *some* means for them 'a few'. Below we give account of two experiments testing this hypothesis. Experiment 1, a forced choice task, tested whether children associate with a topicalized, hence partitive-specific, *néhány* NP the meaning 'not all of the NPs' or the meaning 'a few NPs'. If children most often select the picture where the *néhány* phrase denotes all the members of a small set, this would be evidence that for the majority of them, the default meaning of *néhány* is the non-partitive meaning 'a few', i.e., the children are not sensitive to the specificity feature associated with topics in adult language.

5.1. Experiment 1: A forced choice task

Participants: Children of three age groups participated in the experiments: 24 children from the 'big kids' group' of a Budapest kindergarten (mean age 6;1, age range 66–84 months), as well as 20 first graders (mean age 7;6, age range: 82–96 months), and 20 third graders (mean age 9;6, age range: 112–121 months) of a Budapest primary school. (The tests were carried out shortly before the end of the schoolyear, that is why children may seem older for their grade than expected.) We also tested 16 adults.

Materials and methods: The children were shown 11 pairs of pictures, each pair accompanied by a sentence. They had to decide which of the two pictures the sentence describes. Six picture-sentence combinations were test stimuli; the rest of them were fillers. The test cases involved Hungarian sentences with a *néhány* 'some' NP in topic position, where it is expected to give rise to a partitive reading (e.g., (30) and (31)). The visual stimuli accompanying these sentences were pairs of pictures shown next to each other on a computer screen. One of the pictures represented the situation described by the sentence under the 'a few' interpretation of *néhány*; it showed 2-4 participants, and the property or activity described by the predicate was true for all of them (see Figures (1b) and (2a)). The other picture represented the 'not all' reading of *néhány*; it showed a larger number of participants (5-10 participants, roughly 2.5 times as many as the picture representing the 'a few' reading – see Figures (1a) and (2b)), and, crucially, the property or activity described by the predicate held only for a subset of them. The assumption

that 2-4 participants in a picture occupying half of a laptop screen are regarded as few by children was based on a pilot study.

(30) Néhány hattyú fehér.
      some   swan   white
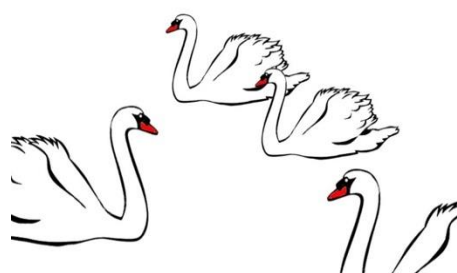   'Some swans are white.'

Fig. 1a: 'not all' reading of (30)   *Fig. 1b: 'a few' reading of (30)*

(31) Néhány gyerek bicikizik.
      some   kid   bicycles
      'Some kids are bicycling.'
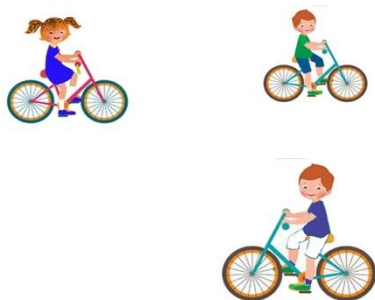

*Fig. 2a: 'a few' reading of (31)*   *Fig. 2b: 'not all' reading of (31)*

The filler stimuli involved quantifiers other than *some*, among them *minden* 'every', *csak négy* 'only four', *ötnél több* 'more than five'.

Procedure: The children were tested individually by the experimenter and a helper in a quiet room of their school. The pairs of pictures appeared on a computer screen, and they were accompanied by a sentence allegedly uttered by a puppet, recorded in advance. The child had to tell which of the two pictures the puppet was talking about. The child's answers were recorded both on paper, and by a video camera.

Results: Responses were encoded as binary data, 1 for 'a few', 0 for the 'not all' interpretation of *néhány*. The mean responses of the age groups are shown in Table 1.

Table 1: 'a few' choices in Experiment 1
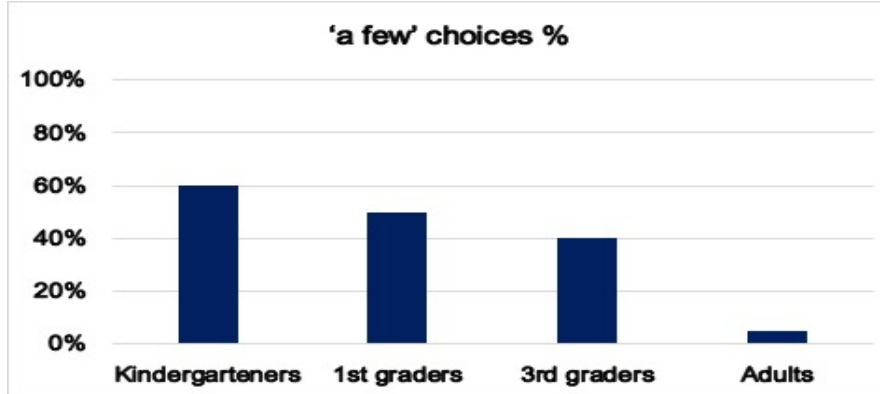
Binomial generalised mixed-effect models with random intercepts were run, with response as the dependent variable, group as the fixed effect, and participant and item as random effects. Calculations were carried out in R (R Core Team 2019), using glmer() from the lme4 package (Bates et al. 2015) and Anova() from the car package (Fox & Weisberg 2018) for the calculation of simulated p-values.

The effect of the group was highly significant ($\chi 2(3) = 25.356$, $p < 0.001$). Pairwise comparisons of the age groups revealed that the response patterns of adults differed significantly from those of kindergarteners ($z = 4.949$, $p < 0.001$), 1st graders ($z = 4.211$, $p < 0.001$), and 3rd graders ($z = 3.579$, $p < 0.001$), whereas that there was no significant difference among the performance of the three groups of children (all three $z > -1.897$, $p > 0.058$).

Discussion:

Our experiment aimed to test how young children interpret *néhány* 'some' NPs. Our hypothesis has been that *some*, and its Hungarian equivalent *néhány* have a partitive and a non-partitive reading. For adults, the interaction of the structural position, the prosody, the internal structure of the *some* phrase, and the selectional properties of the predicate usually supports one of the readings and blocks the other one. For young children, however, the cognitively simpler non-partitive reading may be more easily accessible in all conditions than the partitive reading requiring the identification of two discourse referents (the set denoted by the quantified phrase, and a superset). Our experiment tested this hypothesis by a forced choice test, where subjects listened to sentences involving a topicalized, hence partitive, *néhány* 'some' phrase, and they

were offered both the 'not all' and the 'a few' readings. The results confirmed that for adults, *néhány* occurring in a topicalized phrase clearly means 'not all'. For six-year-olds, on the contrary, the 'a few' reading is primary; it was chosen significantly more times than the 'not all' interpretation.

Although the mean results of all three age groups were relatively close to 50%, the great majority of children were apparently not guessing but followed clear strategies. The proportion of those giving very consistent answers, choosing the same type of interpretation in 5 or 6 cases ouf of 6 was 83% among the kindergarteners, 75% among the first graders, and 65% among the 3rd graders. The proportion of the children consistently opting for the 'a few' interpretation, and the proportion of those consistently choosing the 'not all' reading changed from age group to age group as shown in Table 2.

Table 2: Proportions of children giving consistent answers (5 or 6 identical choices out of 6)

	Kindergarteners	1st graders	3rd graders	Adults
'a few'	54%	35%	25%	0%
'not all'	29%	40%	40%	88%

In the older groups of children, both the proportion of the inconsistent answers and the proportion of consistent 'not all' choices was higher, which supports the hypothesis that the 'a few' reading appears first, and the partitive 'not all' reading emerges – and the ambiguity of *néhány* solidifies – with some delay.

The fact that children show a clear preference for the 'a few' interpretation around the age of six and for the 'not all' interpretation around the age of nine provides evidence against the view that their choices are based on the reading 'some and possibly all', the so-called logical meaning of *néhány/some*. This meaning is compatible with both members of the picture pairs, hence if the children had relied on the meaning 'some and possibly all', their choices would have been random.

The relevant distinction that children become sensitive to around the age of nine is the [+/-partitive] feature attributable to *some*. It is the recognition of the [+partitive] feature of topics that opens the way to realizing that *some* and *all* are scale members, and the use of *some* implicates the under-informativeness of *all*.

5.2. Experiment 2: A truth value judgement task

Experiment 1 served to identify children's default interpretation of topicalized *néhány* phrases; however, it left open the question whether the reading chosen by the children is the only accessible reading or the preferred reading for them. So as to answer this question, we carried out a second experiment. Experiment 2 also aimed to clarify whether children's interpretation of a *néhány* phrase is affected by its structural position and prosody, more precisely, by the [+/- partitive] feature associated with that position and stress pattern.

Participants: The children participating in Experiment 2 were the same as those participating in Experiment 1. We also tested an adult control group of 16 adults.

Materials and methods: The children had to judge the truth value of 23 sentence–picture pairs, 12 test cases and 11 fillers. The test sentences involved a *néhány* phrase in 2 x 2 conditions. The factors the effect of which we tested were (i) topic position (in Spec,TopP, preceding the pitch accent), associated with a [+partitive] feature, versus non-topic position (in Spec,PredP, bearing a pitch accent), associated with a [-partitive] feature in adult Hungarian, and (ii) 'a few' versus 'not all' reading shown in the visual stimulus. These factors yielded the following four conditions:

C1: [+topic] *néhány* NP, 'not all' reading, e.g.:

(32) [TopP Néhány szamár [PredP szürke]]

        some   donkey   grey
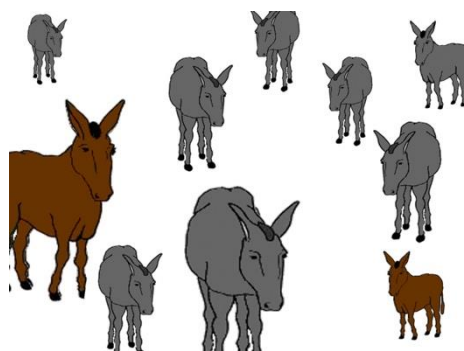
    'Some donkeys are grey.'

Fig. 3: Picture accompanying ex. (32)

C2: [+topic] *néhány* NP, 'a few' reading, e.g.:

(33) [TopP Néhány ceruza [PredP ki van hegyezve]]

        some   pencil   PRT is   sharpened

'Some pencils have been sharpened.'

Fig. 4: Picture accompanying (33)

C3: [-topic] *néhány* **NP, 'a few' reading**, e.g.:

(34) [PredP Néhány barack nő   az ág-on]
           some   apricot grows   the branch-on
      'Some apricots are growing on the branch.'

Fig. 5: Picture accompanying (34)

C4: [-topic] *néhány* **NP, 'not all' reading**, e.g.:

(35) [PredP Néhány alma   van a   kosár-ban]
           some   apple   is   the basket-in
      'There are some apples in the basket.'

Fig. 6: Picture accompanying (35)

Each condition was represented by 3 examples. The fillers were sentence involving quantifiers such as *minden* 'every', *legtöbb* 'most', *legalább három* 'at least three', *csak négy* 'only four', etc.

Procedure: Experiment 2 was carried out in the same session as Experiment 1. The pictures were presented to the child on a computer screen one by one, together with the corresponding sentence allegedly uttered by a puppet, recorded in advance. The child was told that the puppet explaining what she saw in each picture did not have her glasses on, hence she did not always see the picture properly. The child had to judge whether the puppet said correctly what the picture showed. The child's answers were recorded both on paper, and by a video camera.

Results:

The sentences were found to be true in the great majority of cases in all conditions. The proportions of *yes* answers in the four conditions are shown in Table 3.

Table 3: Acceptance rates of sentenes with a néhány *phrase in the four conditions*

	C1:[+topic] 'not all'	C2:[+topic] 'a few'	C3:[-topic] 'a few'	C4:[-topic] 'not all'
Kindergarteners	78%	82%	83%	65%
1st graders	80%	70%	82%	77%
3rd graders	80%	62%	77%	77%
All children:	79%	71%	81%	73%
Adults:	69%	49%%	98%	55%

Responses were encoded as binary data, 1 for 'true', 0 for 'false'. Binomial generalised mixed-effect models with random intercepts were run, with response as the dependent variable, the interaction of structural position ([+topic] versus [-topic]) and picture type ('a few' versus 'not

all'), as well as group as fixed effects, with participant and item as random effects. Calculations were carried out in R, using glmer() from the lme4 package and Anova() from the car package for the calculation of simulated p-values.

While age group did not have a significant effect on the response patterns (all three z > 1.350, p > 0.126), the effects of sentence type (z = -2.821, p = 0.005), picture type (z= -2.528, p = 0.011) and the interaction of sentence type and picture type (z= 2.710, p = 0.007) were all significant. In the case of 'a few' pictures, the acceptance rate of sentences with a topicalized *néhány* phrase was lower, while that of sentences with a non-topical *néhány* phrase was exceptionally high. When 'not all' pictures were evaluated, the difference between the two sentence types was considerably smaller, but in this case, it was the sentence type with a topicalized *néhány* phrase that was accepted more frequently.

Discussion: Among the adults, the acceptance of non-topic *néhány* phrases under the 'a few' interpretation was practically unanimous. The acceptance of topicalized, hence partitive, *néhány* phrases under the 'not all' reading, however, was merely 69%, lower than expected. Those rejecting some of the sentence-picture combinations, e.g. that in (32), explained that for them, the topicalized *néhány* means 'a relatively small subset of', i.e., it has both the 'not all' and 'a few' meaning components. Example (32) would be true of Figure (3) if the subset of grey donkeys were smaller than the subset of brown donkeys. The acceptance of topicalized *néhány* phrases coupled with a visual representation corresponding to the 'a few' interpretation, as well as the acceptance of non-topic *néhány* phrases coupled with a visual representation corresponding to the 'not all' reading was stimulus dependent to a large extent; apparently, it depended on whether or not the participant could coerce the reading determined by the structural position of the *néhány* NP. For example, the topicalized *néhány ceruza* 'some pencils' in (33) coupled with a picture showing a few pencils (Figure 4) was accepted by less participants than example (36) coupled with Figure (7).

(36) [TopP Néhány   gyerek   [PredP tanul]]
          some   child   studies
     'Some children are studying.'

Fig. 7: Picture accompanying (36)

The adults accepting this sentence–picture combination explained that they can assume these children to represent the subset of a class where the rest of the children are not studying – i.e., they can coerce a partitive reading. In the case of a set of sharpened pencils it is harder to imagine the presence of a superset that is out of view.

Similarly, the non-topic *néhány* phrase in (35) under the 'not all' reading in Figure 6 was accepted by more adults than sentence (37) coupled with Figure 8 presumably because the apple near the basket can be considered to be outside the relevant domain of quantification more easily than the non-red pencils in the mug.[6]

(37) [PredP Néhány piros ceruza van   a   bögrében]
           some   red   pencil   is   the mug-in
      'There are some red pencils in the mug.'

Fig. 8: Picture accompanying ex. (37)

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[6] Authors (2018) present experimental evidence demonstrating the interaction of the visual representation of the domain of quantification and children's ability to carry out scalar implicature.

The children, too, found non-topic *néhány* phrases under 'a few' interpretation (C3) and topicalized *néhány* phrases under the 'not all' reading (C1) the most acceptable. Crucially, however, they also accepted both 71% of the topicalized *néhány* NPs with 'a few' reading, and 73% of the non-topic *néhány* NPs with a 'not all' reading, and these acceptance rates are significantly different from the 49-55% acceptance rates of the adults. Whereas adults assign to non-topic *néhány* phrases the 'a few' reading, and tend to assign to topicalized *néhány* phrases the 'not all' interpretation, for kindergarteners and 1st graders, there is no significant difference between the acceptability of *néhány* phrases in the four conditions. We attested a significantly higher acceptance of the 'a few' reading in [-topic] contexts than in [+topic] contexts only among the 3rd graders. In the case of younger children, there is no significant correlation between the structural and prosodic conditions determining the partitivity feature of the *néhány* phrase and the interpretation they assign to it.

6. Conclusion

A series of former experiments (Noveck 2001; Papafragou and Musolino 2003; Miller, Schmitt, Chang and Munn 2005; Papafragou and Skordos 2016; Pouscoulous et al. 2007; etc.) found that children tend to accept sentences with a topical subject represented by a *some* NP (or its Greek, French etc. equivalent), e.g., *Some (of the) donkeys are grey*, in situations where the predicate holds of all the subject referents, i.e., where all the donkeys are grey. Our experiments carried out with Hungarian children have yielded similar results. Adults are believed to interpret such sentences based on Grice's Maxim of Quantity, assuming that the speaker has been as informative as possible. A situation where all the donkeys are grey could have been truthfully described by the sentence *All (of the) donkeys are grey*, hence the speaker's use of *some* indicates that s/he had reasons not to use a stronger term, e.g. *all*. Therefore, *Some (of the) donkeys are grey* gives rise to the scalar implicature that not all donkeys are grey. Children's failure to carry out such implicatures was initially attributed to their pragmatic inexperience; it was claimed that for them, pragmatics does not overwrite logic (Noveck 2001). This explanation, however, cannot account for the fact that children have much less difficulty with scalar implicatures involving definite numbers (cf. e.g., Papafragou and Musolino 2003; Authors 2018). In Experiment 1 of Papafragou and Musolino (2003), children's success rate with a scalar implicature involving the numbers *two* and *three* was 65%, whereas their success rate with a scalar implicature involving *some* and *all* was merely 12.5%. In their Experiment 2, which involved some training and some contextual manipulations, the success rate of scalar implicatures rose to 90% in the case of *two* and *three*, however, it rose only to 52.5% in the

case of *some* and *all*. These facts indicate that the particular way children relate *some* and *all* also involves a factor other than their ability to derive scalar implicatures.

The alternatives-based theory of Barner et al. (2011) claims that children's difficulties with scalar implicature in the case of specific scales are due to a failure to generate relevant alternatives for the given scale. Thus, although children may know already at the age of two that *some* and *all* denote different set relations, they do not know that they are members of the same scale. The hypothesis we tested shares an element of this claim: in our view, children do not realize that *some* and *all* are scale mates because they identify *some* with its non-partitive variant, which forms a scale with the non-partitive *many*.

The starting point of our explanation of children's interpretation of *some* was that *some* is inherently ambiguous; it has a [+partitive] meaning corresponding to 'not all', and a [-partitive] meaning corresponding to 'a few'. For adults, the structural position, the prosody, the internal structure of the *some* phrase, and/or the selectional properties of the predicate determine the partitivity of the *some* phrase in most cases; for instance, the subject-topic *some* phrases of the test sentences of former experiments are clearly [+partitive]. Young children, however, are not sensitive to the partitivity feature arising in various contexts, or they are not aware of its significance in the interpretation of *some*. Children presumably acquire the easier, non-partitive reading first, and tend to overgeneralize it for a while. For English adults, the genitive construction in cases like *some of the donkeys are grey* would strongly suggest that the grey donkeys represent a proper subset of a relevant set of donkeys. However, *all of the donkeys* means the same as *all donkeys*, *each of the donkeys* means the same as *each donkey*, *which of the donkeys* means the same as *which donkey*, so it may not be obvious for children that the interpretation of *some of the donkeys* may be different from the interpretation of *some donkeys*.

We tested these assumptions with two experiments. The first experiment, a forced choice sentence-picture matching task, showed that six-year old Hungarian children significantly more often assign to topicalized *néhány* NPs the 'a few' reading than the 'not all' reading. Furthermore, the proportion of children who consistently (5 or 6 times out of 6) select the 'a few' reading is 54% among the six-year-olds, and is still 35% among the seven-and-half-year-olds, and 25% among the nine-and-half-year-olds. These results are in accord with the assumption that the reading that is first associated with *some* by young children and which remains the default reading for them for some time is the non-partitive 'a few' interpretation.

The second experiment, a truth value judgement task aimed to clarify whether the 'a few' reading of *néhány* is the only reading for the majority of children, or it is merely its primary interpretation. We tested whether children can access both readings of *néhány,* and whether

they are aware of the correlation between the structural position and prosody, and the interpretation of the *néhány* NP. It has turned out that children also accept the 'not all' interpretation of *some*, and the acceptance rate of both the 'a few' and the 'not all' readings is roughly the same irrespective of the partitivity feature of the *some* NP in the given context. The acceptance of the 'not all' interpretation is not significantly higher in the case of topicalized *néhány* phrases than in the case of non-topic *néhány* phrases.

The two findings: children's initial bias towards the 'a few' interpretation of *some*, and their insensitivity to the partitivity feature of the *some* NP can explain children's non-adult-like behaviour with respect to *some* NPs. They accept the sentence *Some (of) the donkeys are grey* in a situation where all of the donkeys are grey because *some* means for them 'a relatively small number', or 'a non-empty set', i.e., they interpret the sentence as 'a relatively small number of donkeys are grey'. They realize that *some* and *all* can be scale members, and the use of *some* can implicate the infelicity of *all* only when, around the age of nine, they become aware of the partitivity of *some* phrases in topic position and in some other specific contexts.

References:

Barner, David, Neon Brooks, and Alan Bale. 2011. Accessing the unsaid: The role of scalar alternatives in children's pragmatic inference. *Cognition* 118(1), 84–93.

Chierchia, Gennaro, Stephen Crain, Maria Teresa Guasti, Andrea Gualmini, and Luisa Meroni 2001. The Acquisition of Disjunction: Evidence for a Grammatical View of Scalar Implicatures. *Proceedings of the 25th Boston University Conference on Language Development.* Somerville, MA: Cascadilla Press.

Chierchia, Gennaro, Maria Teresa Guasti, Andrea Gualmini, Luisa Meroni, Stephen Crain, and Francesca Foppolo. 2004. Semantic and pragmatic competence in children's and adults' comprehension of *or*. In Ira Noveck and Dan Sperber (eds.), *Experimental Pragmatics,* 283–300. New York, NY: Palgrave Macmillan.

Degen, Judith, Michael K. Tanenhaus. 2015. Processing scalar implicature: a constraint-based approach. *Cognitive Science* 39(4), 667–710.

Degen, Judith, Michael K. Tanenhaus. 2016. Availability of alternatives and the processing of scalar implicatures: a visual world eye-tracking study. *Cognitive Science* 40(1), 172–201.

Diesing, Molly. 1992. *Indefinites*. Cambridge, MA: MIT Press.

Doytchinov, Serge 2005. Naturalistic and experimental data in language acquisition: The case of epistemic terms. In S. Kesper & M. Reis (eds.), *Linguistic Evidence: Empirical, Theoretical, and Computational Perspectives,* 123–144. Berlin: Mouton de Gruyter.

Enç, Mürvet. 1991. The semantics of partitivity. *Linguistic Inquiry* 22, 1-25.

Farkas, Donka. 2002. Partitivity distinctions. *Journal of Semantics* 19(3), 201–243.

Fintel, Kai von. 1998. Evidence for presuppositional indefinites. Ms. Cambridge, MA: MIT. web.mit.edu/fintel/fintel-1998-presupp-indef.pdf

Foppolo, Francesca, Maria Teresa Guasti, and Gennaro Chierchia. 2012. Scalar implicatures in child language: Give children a chance. *Language Learning and Development* 8, 365–394.

Grodner, Daniel J., Natalie M. Klein, Kathleen M. Carbary, and Michael K. Tanenhaus. 2010. "Some," and possibly all, scalar inferences are not delayed: Evidence for immediate pragmatic enrichment. *Cognition* 116(1), 42–55.

Guasti, Maria Teresa, Gennaro Chierchia, Stephen Crain, Francesca Foppolo, Andrea Gualmini, and Luisa Meroni. 2005. Why children and adults sometimes (but not always) compute implicatures. *Language and Cognitive Processes* 20(5), 667–696.

Huang, Yi Ting and Jesse Snedeker. 2009. Online interpretation of scalar quantifiers: Insight into the semantics-pragmatics interface. *Cognitive Psychology*. 58(3), 376–415.

Huang, Yi Ting, Elisabeth Spelke, and Jesse Snedeker. 2013. What exactly do numbers mean? *Language Learning and Development* 9(2), 105–129.

Katsos, Napoleon and Dorothy Bishop 2011. Pragmatic tolerance: Implications for the acquisition of informativeness and implicature. C*ognition* 120(1), 67–81.

Ladusaw, William 1994. Thetic and categorical, stage and individual, weak and strong. *Proceedings of Semantics and Linguistic Theory IV*, 200–229. Cornell, Ithaca.

Miller, Karen, Cristina Schmitt, Hsiang-Hua Chang, and Alan Munn. 2005. Young children understand 'some' implicatures. *The Proceedings of the 29th Boston University Conference on Language Development (BUCLD 29)*, 389–400. Somerville, MA: Cascadilla Press.

Noveck, Ira A. 2001. When children are more logical than adults: Experimental investigations of scalar implicature. *Cognition* 78, 165–188.

Pagliarini, Elena, Cory Bill, Jacopo Romoli, Lyn Tieu and Stephen Crain. 2018. On children's variable success with scalar inferences: Insights from disjunction in the scope of a universal quantifier. *Cognition* 2018, https://doi.org/10-1016/j.cognition.2018.04.020

Papafragou, Anna and Julian Musolino. 2003. Scalar implicatures: Experiments at the semantics-pragmatics interface. *Cognition* 86, 253–282.

Papafragou, Anna and Dimitrios Skordos. 2016. Scalar implicature. In Jeffrey L. Lidz, William Snyder, and Joe Pater (eds.), *The Oxford Handbook of Developmental Linguistics*. Oxford University Press, Oxford.

Papafragou, Anna and Niki Tantalou. 2004. Children's computation of implicatures. *Language Acquisition* 12, 71-82.

Piñón, Christopher. 2006. Definiteness effect verbs. In *Event Structure and the Left Periphery*, 75-90. Springer, Dordrecht.

Pouscoulous, Nausicaa, Ira Noveck, Guy Politzer, and Anne Bastide. 2007. A developmental investigation of processing costs in implicature production. *Language Acquisition* 14(4), 347–375.

Smith, C. L. (1980). Quantifier and question answering in young children. *Journal of Experimental Child Psychology* 30, 191–205.

Szabolcsi, Anna. 1983. A specifikus/nem specifikus megkülönböztetésről [On the partitive/non-partitive distinction]. *Nyelvtudományi Közlemények* 85, 83-92.

Szabolcsi, Anna. 1986. From the Definiteness Effect to Lexical Integrity. In Werner Abraham and Sjaak de Meij (eds.), *Topic, Focus, and Configurationality*, 321-348. John Benjamins, Amsterdam.

Szabolcsi, Anna. 1994. All quantifiers are not equal. The case of focus. *Acta Linguistica Hungarica* 42–43, 171-187.

Szabolcsi, Anna. 1995. On modes of operation. In Paul Dekker and Martin Stokhof (eds.), *Proceedings of the Tenth Amsterdam Colloquium*, 651–669. ILLC/Department of Philosophy, Amsterdam.

Szabolcsi, Anna. 1997. Strategies for scope taking. In Anna Szabolcsi (ed.) *Ways of Scope Taking*, 109–154. Kluwer.

Szabolcsi, Anna. 2010. *Quantification*. Cambridge University Press, Cambridge.