Children's Comprehension of the Spanish Existential Determiners unos and algunos

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1. Introduction

Studies from the 1970s argued that children fail to understand the logical meaning of quantifiers such as “some”. These studies (e.g. Beilin & Lust 1975, Johansson 1977, Neimark & Slotnik 1970, Osherson & Markman 1975) typically used tasks which failed to cancel the pragmatic implicatures, such as the “some but not all” implicature associated with “some”, in their experimental design. There were instructions, for example, in Johansson (1977) such as “Encircle all figures that are blue, or all that are square.” Results generally showed low mastery of the logical, not pragmatically enriched meanings of, operators such as inclusive “or”. More recently it has been argued that children do understand the logical properties of quantifiers, if experimental methods take pragmatics into account. For example, Chierchia et al (1998) show that children understand the logical meanings of “some” and “or” by presenting them in experimental contexts that cancel the pragmatic implicatures. Specifically, Chierchia shows that implicatures are canceled in irrealis situations such as the following: in an experimental scenario, a puppet says, “I know what will happen: some ninja trolls will watch Batman on TV.” In the action played out for the children, in fact all four ninja trolls watched Batman on TV and children are asked, "Was the puppet correct?" If children say "yes", it implies a logical interpretation of "some" (which is the adult interpretation), while if they say "no", it implies that a pragmatically-enriched "some, but not all" interpretation. Children were largely able to say "yes", suggesting an adult-like, logical interpretation of "some".

Further research (e.g. Braine & Rumain 1981, Noveck 2001, Smith 1980) has argued that children are in fact limited to the logical meanings of quantifiers and are late in developing the ability to generate pragmatic implicatures. For example, Noveck (2001) shows that French-speaking children are much more likely to accept the logical interpretation of certain (some) than they are to accept the pragmatically enriched interpretation. Specifically, Noveck would present children with statements such as “Some giraffes have long necks.” and then ask whether they agreed with this statement. In this design, a “yes” answer implied the “some, but perhaps not all” - logical meaning, while a “no” answer implied a “some, but not all” - pragmatically enriched meaning.

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Most recently, Guasti et al (2005) have shown that children can comprehend the pragmatically-enriched meaning of “some” in English and Italian, if the experiment takes the conversational context into account. Guasti et al's context included, for example, a scenario in which 4 soldiers need to go somewhere to collect treasure and they have to decide whether to go on a motorbike or on a horse. They discuss it and all decide to go on a horse. At the end of this Truth Value Judgment Task (TVJT – Crain & McKee 1985), a puppet states, “Some of the soldiers are going on a horse.” 75% of the children tested reject this statement, which is quite similar to the adults - 83% of whom also reject it. The explanation offered by the authors for this rejection is that the statement should have used the stronger scalar term, as in “All of them are going on a horse.”

In order to explain his findings, Noveck (2001) appeals to the claim made in developmental syntactic literature (e.g. Thornton & Wexler 1999) to the effect that pragmatics is late to develop relative to syntax. Thus children's tendency in his experiment to produce a logical as opposed to a pragmatically enriched interpretation would be due to the late-developing nature of pragmatics. While the claim that pragmatics is late to develop may be true, it is typically made regarding the role it plays in discourse-sensitive syntactic constructions, including clitics, scrambling, null subjects and full pronouns. The pragmatics of scalar implicatures, however, are different from discourse pragmatics in that they are much more lexical and less syntactic and also much more particular and less general. Noveck makes his argument about 7 year-olds. Guasti et al respond by looking at 7 year-olds, however it has been shown with younger children (4 and 5 year-olds) that children can generate and suspend pragmatic implicatures. Consequently, the question we would like to address in this paper is whether there is an earlier stage where we can find the pragmatics of conversational implicatures and syntax-semantics dissociating in development.

2. Unos and Algunos

Spanish is different from the languages studied so far in that it has two lexically distinct existential quantifiers *algunos* and *unos*. (In order to distinguish them we are going to translate them as some-A and some-B, respectively). On the one hand, *algunos* allows a “some but not all” pragmatic implicature, which can be cancelled in downward entailing environments, such as the antecedent of a conditional. Thus, (1) is felicitous in a situation in which there are three of four cats in a house but it is not felicitous if all of them (four cats) are in the house because the scalar implicature arises. This implicature can be cancelled, so (2) is felicitous even if there are all cats in the house.

(1) Encontré *algunos* gatos en la casa.
found-I some-A cats in the house
‘I found some-A cats in the house.’
(2) Si hay *algunos* gatos en la casa, me das una moneda.
   if there-are some-A cats in the house me give-you a coin
   ‘If there are some-A cats in the house, you give me a coin.’

On the other hand, *unos* does not allow a “some but not all” interpretation as a pragmatic implicature, but rather as one of its fundamental semantic properties, which cannot be cancelled in downward entailing environments. *Unos* is claimed by Gutiérrez-Rexach (2001, 2004) to be a focus element which triggers the computation of alternative sets, as in Rooth (1992). Hence, (3) is felicitous in a situation where three of four cats are in a house because *unos* contrasts the three cats that are in a house versus the other cat that is not in the house. Similarly, the same sentence is felicitous in a situation in which all cats are in a house because the contrast is between the four cats in the house versus other cats not in the house. (4) is also felicitous in a situation where all cats are in the house since there is no implicature to cancel with *unos*.

(3) Encontré *unos* gatos en la casa.
    found-I some-B cats in the house
    ‘I found some-B cats in the house.’

(4) Si hay *unos* gatos en la casa, me das una moneda.
    if there-are some-B cats in the house me give-you a coin
    ‘If there are some-B cats in the house, you give me a coin.’

Given the similar kinds of sets calculated by using the pragmatic implicature associated with *algunos* and the alternative set calculated by using the lexical semantic meaning of *unos*, we have an opportunity to test the hypothesis that pragmatics develops more slowly than does syntax-semantics. Specifically, this hypothesis predicts that children should be more able to calculate the set associated with *unos* than they are the set calculated using the pragmatic implicature associated with *algunos*.

3. Experiment 1

Experiment 1 aims to answer the following questions:
- Will children, as a function of the linguistic context, be able to generate the pragmatic implicature associated with *algunos*?
- Will children, regardless of the linguistic context, be able to generate the alternative sets associated with the lexical meaning of *unos*?
3.1 Methods

Participants. Twenty-seven monolingual, Spanish-speaking children (age range = 4;9 – 6;7, mean age = 5;9) from a daycare center in Mexico City, and ten Spanish-speaking adults from Mexico City.

Materials. Children were introduced to a Donald Duck puppet, 6 sets of plastic animals\(^1\), and 3 plastic figurines (Ninja Turtle, King Kong, and a girl).

Procedures. We used a Truth Value Judgment Task (Crain & McKee 1985). Children were asked to watch a story and to judge whether the sentences presented to them by the puppet were appropriate or not as descriptions of the stories presented to them. There were four target sentences, one control sentence, and up to three training sentences. Children had to pass the control sentence and at least the third training sentence to be included in the study.

Stimuli. There were four target sentences that were used with either 2, 3 or 4 of 4 animals jumping over something. Two were used with *algunos* and two with *unos*. Additionally, there was a control sentence with one animal jumping over something. Also, there were three training sentences where less than all the animals of a set jumping over something

Target sentences:
(5) *Algunos* X saltaron sobre A.
    some-A X jumped over A
    ‘Some-A Xs jumped over A.’

(6) *Unos* Y saltaron sobre A.
    some-B Y jumped over A
    ‘Some-B Ys jumped over A.’

Control sentence:
(7) Un P saltó sobre A.
    a P jumped over A
    ‘A P jumped over A.’

Training sentences:
(8) Todos los Q saltaron sobre A.
    every the Q jumped over A
    ‘Every Q jumped over A.’

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1. Gutiérrez-Rexach (2001, 2004) argues that *unos* has a discourse novelty property. For that reason, we introduced different set of referents for each target sentence.
3.2 Results

One of the main findings of this experiment is that children seemed to distinguish unos and algunos at a young age. In contrast to the 7 year-old children in Noveck (2001), the 5 year-old children in our study were able to generate a “some, but not all” pragmatic implicature with algunos (70% rejection of algunos when all animals jumped). Unos was roughly as acceptable with less than all animals jumping (67%) as it was with all animals jumping (74%), which is consistent with relatively adult-like use of its focus property of calculating alternative sets. (See Table 1 and Table 2)

<table>
<thead>
<tr>
<th></th>
<th>Algunos</th>
<th></th>
<th>Unos</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Accepted</td>
<td>Rejected</td>
<td>Accepted</td>
</tr>
<tr>
<td>Children</td>
<td>30% (8/27)</td>
<td>70% (19/27)</td>
<td>67% (18/27)</td>
</tr>
<tr>
<td>Adults</td>
<td>20% (2/10)</td>
<td>80% (8/10)</td>
<td>100% (10/10)</td>
</tr>
</tbody>
</table>

Table 1. Percentages of responses when all 4 animals jumped

<table>
<thead>
<tr>
<th></th>
<th>Algunos</th>
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<th>Unos</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Accepted</td>
<td>Rejected</td>
<td>Accepted</td>
</tr>
<tr>
<td>Children</td>
<td>85% (23/27)</td>
<td>15% (4/27)</td>
<td>74% (20/27)</td>
</tr>
<tr>
<td>Adults</td>
<td>100% (10/10)</td>
<td>0% (0/10)</td>
<td>100% (10/10)</td>
</tr>
</tbody>
</table>

Table 2. Percentages of responses when 2 or 3 of 4 animals jumped

4. Experiment 2

Experiment 2 attempts to answer the following questions:
- Will children, as a function of the linguistic context, be able to cancel the pragmatic implicature associated with algunos?
- Will children, regardless of the linguistic context, be able to generate the alternative sets associated with the lexical meaning of unos?
4.1 Methods

Participants. The same as in Experiment 1.

Materials. The same as in Experiment 1, plus a bucket with a lid.

Procedures. Again, we used a Truth Value Judgment Task (Crain & McKee 1985). Children were told that after jumping, some animals were tired and would go rest in the bucket and that Donald Duck liked to guess who was in the bucket. They were asked to listen to the puppet and reward him with a coin if his description matched the situation. As in Experiment 1, there were four target sentences, one control sentence, and up to three training sentences. Children had to pass the control sentence and at least the third training sentence to be included in the study.

Stimuli. Following Gualmini et al. (2000), we used conditional sentences as target sentences because the antecedent of a conditional is an implicature-cancelling context. There were four target sentences that were used with either 2, 3 or 4 of 4 animals jumping over something. Two were used with algunos and two with unos. As in Experiment 1, there was one control sentence with only one animal in the bucket, and three training sentences where less than all the animals were in the bucket.

Target sentences:

(9) Si algunos X están en la cubeta, recibo una moneda.
  ‘If some-A Xs are in the bucket, I get a coin.’

(10) Si unos Y están en la cubeta, recibo una moneda.
  ‘If some-B Ys are in the bucket, I get a coin.’

Control sentence:

(11) Si un P está en la cubeta, recibo una moneda.
  ‘If a P is in the bucket, I get a coin.’

Training sentences:

(12) Si todos los Q están en la cubeta, recibo una moneda.
  ‘If every Q is in the bucket, I get a coin.’
4.2 Results

As illustrated in Table 3, we found, consistent with Chierchia et al (1998) and Gualmini et al (2000), that children could suspend the implicature associated with algunos in the downward-entailing environment created by the antecedent of a conditional (81%). Children showed that they understood that the downward entailing context has no impact on the lexically-determined focus properties of unos, showing adult-like competence both when all animals were in the bucket (96% acceptance) and when only 2 or 3 of the animals were in the bucket (89%), as we see in Tables 3 and 4. However, it is worth noting that two of the three children that rejected those sentences when asked about why they did not accept them, said: “because there are three (two)”. In other words, they were likely to have rejected “some” (unos/algunos) not because it was incorrect but because it was not specific enough.

Table 3. Percentages of responses when all 4 animals were in the bucket

<table>
<thead>
<tr>
<th></th>
<th>Algunos</th>
<th></th>
<th>Unos</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Accepted</td>
<td>Rejected</td>
<td>Accepted</td>
<td>Rejected</td>
</tr>
<tr>
<td>Children</td>
<td>81% (22/27)</td>
<td>19% (5/27)</td>
<td>96% (26/27)</td>
<td>4% (1/27)</td>
</tr>
<tr>
<td>Adults</td>
<td>80% (8/10)</td>
<td>20% (2/10)</td>
<td>90% (9/10)</td>
<td>10% (1/10)</td>
</tr>
</tbody>
</table>

Table 4. Percentages of responses when 2 or 3 of 4 animals were in the bucket

<table>
<thead>
<tr>
<th></th>
<th>Algunos</th>
<th></th>
<th>Unos</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Accepted</td>
<td>Rejected</td>
<td>Accepted</td>
<td>Rejected</td>
</tr>
<tr>
<td>Children</td>
<td>89% (24/27)</td>
<td>11% (3/27)</td>
<td>89% (24/27)</td>
<td>11% (3/27)</td>
</tr>
<tr>
<td>Adults</td>
<td>100% (10/10)</td>
<td>0% (0/10)</td>
<td>100% (10/10)</td>
<td>0% (0/10)</td>
</tr>
</tbody>
</table>

5. Discussion

At the youngest age that we found that our methodology could be used (4;9), children were equally able to access the truth conditions associated with set values generated by pragmatic implicature (algunos) as they were with set values generated by the lexically determined focus properties of unos. These children were similarly able to cancel the implicatures in a downward entailing environment. Consequently, this study shows that in this particular domain of pragmatics, at this age, children seem to have equal access to pragmatics as they
do to syntax-semantics, contrary to Noveck (2001) who proposes a delay in children’s pragmatic development of implicatures. However, with a methodology that could be used with younger children, we might still find dissociations.

Finally, regarding learnability, it is hard to imagine how 4 year-olds could learn that *algunos* has one kind of meaning in the antecedent of a conditional (pure existential), but that outside of downward-entailing environments it has another meaning (the implicature). In our receptive experiment, lexical storage of constructions will not help because the children do not choose the precise nouns and verbs which combine with the quantifiers. Generalization would also seem to be futile since it could lead children to erroneously generate implicatures for *unos* or to allow *algunos* to refer to 3 of 4 animals jumping, contrary to the implicature. It is also hard to understand how children ever learn the logical meaning of *algunos*, given that it mostly occurs in the input with the implicature. If it is learned, how can children possibly know which environments are downward-entailing and which are not, since they do not come labeled as such? All of these concerns point to a significant role played by an innate linguistic endowment which allows children to go beyond the input to make highly subtle judgments at a very young age. Exactly how this ability arises in language particular ways will the subject for future research.

**References**


