The Role of Joint Attention in Argument Realization in Child Inuktitut

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1. Introduction

One characteristic feature of child language is its high frequency of argument omissions. To explain this phenomenon, various proposals have been offered, including grammatical, performance and discourse-pragmatic accounts. Recently, the discourse-pragmatic approach has been shown to successfully predict the form of the argument based on its informativeness features (Clancy 1997; Allen 2000). The results of a study on argument structure in child Inuktitut suggested that informativeness features, such as the presence or absence of a referent in the physical context or its discourse status (i.e., whether a referent is discourse new or discourse given), have a strong effect on the form in which an argument appears (Allen 2000). Allen (2000) found that the more informative the argument is, the more likely it is to be expressed by an overt argument, and, conversely, that the less informative an argument is, the more likely it is to be expressed by an omitted argument. Although this prediction seems to be upheld most of the time, in certain instances children are still found to frequently omit new referents and overtly produce given referents.

In this study we attempt to address this limitation in the discourse-pragmatic approach by identifying an additional factor that may underlie argument realization in child language in the particular instances when children omit new referents and produce given referents. We propose that the omissions of new referents can be explained by the presence of the factor, joint attention, a social activity wherein the child and the interlocutor focus on the same referent while aware of each other's attention. Additionally, we propose that the production of overt arguments to represent given referents can be explained by the absence of joint attention.

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2. Previous Studies

Numerous studies have addressed the question of argument omissions in child language, falling into three major categories: grammatical, performance, and discourse-pragmatic approaches. Although not mutually exclusive, each approach attempts to explain this phenomenon by emphasizing its own distinct factor responsible for children's argument omissions. The grammatical account attributes the argument omissions to children's sensitivity to syntactic structure, for example to pro-drop parameter (Hyams, 1986) or the topic-drop parameter (Hyams & Wexler, 1993). Contrastingly, the performance account attributes the omissions to children's initial processing difficulties (Bloom 1990). Finally, the discourse-pragmatic account claims that it is children's sensitivity to the information representation in discourse that causes them to omit arguments (Clancy 1997; Allen 2000).

In her previous study on argument realization in child Inuktitut, Allen (2000) examined 8 discourse-pragmatic features (newness, contrast, inanimacy, query, absence, differentiation in context, differentiation in discourse, third person) that had been previously suggested to influence argument representation (Givón 1983; Chafe 1987; DuBois 1987; Clancy 1993, 1997). Her results showed that these features, when considered together, have a significant effect on the argument form. Her study indicated that children have a strong tendency to omit arguments that are less informative and are likely to represent overtly arguments that are more informative. However, when considering examples with only one feature, newness, a feature widely discussed in the literature and recognized as one of the most relevant discourse-pragmatic features (Chafe 1976; Greenfield & Smith 1976; Bloom 1990; Allen 2000), Inuktitut-speaking children are found to omit new referents with a frequency as high as 45% and in some instances still overtly produce given referents (Allen 2000). This is contrary to the predictions of the discourse-pragmatic approach, predictions that are only upheld when considering the effect of several discourse-pragmatic features together.

Consequently, in this study we seek to further the results from the discourse-pragmatic approach by attempting to find an explanation for argument omissions in the examples containing newness as the only discourse-pragmatic feature, examples that are problematic to the predictions of the approach. In order to account for these examples, we propose the consideration of a new factor, joint attention, a triadic social activity during which a speaker and interlocutor are both focused on the same referent while aware of each other's attention (Tomasello 1999). We hypothesize that new (and perhaps given) referents with joint attention in progress may be represented by omitted arguments and, conversely, that new (and perhaps given) referents without joint attention in progress may be represented by overt arguments.

Joint attention is not a new concept in the field of language acquisition. Its importance in children's understanding of intentions as well as its importance in many aspects of children's early language development has long been
ernphasized (Bruner 1983, 1995; Butterworth 1991; Tomasello 1999, 2001). Notably joint attention has been widely recognized as a crucial component in early word learning (Bruner 1995; Tomasello & Todd 1983; Tomasello & Farrar 1986; Tomasello 1999; Baldwin 1993, 1995). However, to our knowledge, its specific role in argument realization has never been previously investigated.

3. Methodology

To test our hypothesis concerning whether joint attention underlies the choice of argument form in early language, we explored the representation of third person arguments in child Inuktitut. We examined data previously collected by Allen (1996) from four monolingual Inuktitut-speaking children, ranging in age from 2;0 to 3;6, videotaped in naturalistic communication situations.

Two hours of video footage per child at three 4-month intervals were selected and transcribed by native speakers in CHAT format. All subjects and objects were coded for morphological form and discourse-pragmatic features. The original data set yielded a total of 3,168 arguments.

Out of this total, we selected only third person arguments since only these have the binary distinction of discourse given and new. In other words, the first and second person arguments, I and you, were not considered because they are always known as given since they refer directly to the participants in discourse (Chafe 1976; Givon 1983). Third person arguments in both subject and object positions with newness as the only discourse-pragmatic feature were selected and examined in videotapes and coded for joint attention. In this preliminary study, all demonstratives and given referents older than 2 utterances were excluded and left for future analysis. This selection process limited our data from the total of 3,168 arguments to the final subset of 347 third person, discourse new/given arguments for this study. These 347 arguments were analyzed for correlations between argument form, newness, and joint attention.

3.1. Argument forms: overt and omitted

Inuktitut is a polysynthetic, morphologically ergative language of the Eskimo-Aleut family with SOV word order. It employs nominal case-marking affixes and verbal cross-referencing affixes (Allen 2000). The arguments in Inuktitut are realized in two possible forms: as obligatory verbal cross-referencing affixes or optional independent lexical or demonstrative NPs. It is important to note that only third person arguments have three possible morphological forms of argument realization: an independent lexical NP plus a verbal cross-referencing affix, an independent demonstrative plus a verbal cross-referencing affix, or a null argument with a verbal cross-referencing affix only. First and second person arguments appear only as null arguments plus verbal cross-referencing affixes. Thus, third person arguments may appear as either overt or omitted, where overt refers to the production of an independent lexical NP or an independent demonstrative plus the verbal cross-referencing affix, while omitted refers to the null argument plus the verbal cross-referencing affix or the null argument alone, if the verbal cross-referencing affix is omitted altogether. Each type of third person argument is illustrated in the following examples from Allen (2000):

OVERT THIRD PERSON ARGUMENTS:

(1) **Lexical NP plus verbal affix**
   
   Panik, piarait sinisijuq.
   
   panik piaraq-it sinik-si-juq
   
   ‘Daughter, your baby is sleeping.’
   
   (Paul 3;3)

(2) **Demonstrative plus verbal affix**
   
   Una sinisimmat.
   
   u-na sinik-si-mmat
   
   ‘This one is sleeping.’
   
   (Lizzie 2;10)

OMITTED THIRD PERSON ARGUMENTS:

(3) **Null argument plus verbal affix**
   
   Sinilirmat.
   
   0 sinik-liq-nimat
   0 sleep-INCP-CSV.3sS
   ‘(He/she) is sleeping.’
   
   (Elijah 2;9)

Note that there are no third person pronouns in Inuktitut.

The following grammatical abbreviations are used in glosses:

**Nominal case:**
- ABS=absolutive
- SG=singular

**Verbal modality:**
- CSV=causative
- PAR=participial
- IND=indicative
- IMP=imperative

**Word-internal morphology:**
- INCP—inceptive aspect
- PRSP=prospective aspect
- POL=politeness (preceding imperative)

**Verbal inflection:**
- 1=first person
- 2=second person
- 3=third person
- s=singular
- 0=object

**Nominal inflection:**
- SG=singular

**Possessed nominal inflection:**
- 2=second person possessor
- S=singular possessor
- sg=singular possessum
3. Newness: new and given

Newness is a binary discourse-pragmatic feature that refers to whether a referent is new or given to the discourse. In coding the data, a referent was considered to be new if it had not been introduced to the discourse before, as defined by it not having been mentioned in the previous 20 utterances (Allen 2000). Similarly, a referent was considered to be given if it had been mentioned in the discourse, as defined by occurring one or more times in the previous 20 utterances.

3.3. Joint attention: JA-P(present) or JA-A(absent)

In coding for joint attention, we operationally defined joint attention to be a triadic interaction between the child, interlocutor, and third referent, lasting a minimum of 3 seconds (Tomasello & Todd, 1983). We examined the video footage with all selected third person arguments and recorded the following indicators of joint attention: eye gaze, body direction, gesture (particularly, pointing).

A typical example with joint attention in progress is illustrated by the following interaction as captured by the video footage:

(5) Two boys he next to each other an the ground, playing and laughing. One of them, Elijah, stands up and throws a cap at a woman who is holding the video camera and recording them. When she gets hit with the cap, Elijah sits back down, laughs, looks at the woman, then at the other boy who is meanwhile pretending to shoot the woman. Then Elijah says:

Milurpara!
miluq-vara
Hit-IND.3sS.3s0
'I hit (her)!'
(Elijah 2;9)

The whole scene lasts about 12 seconds. We coded and analyzed Elijah’s and the other boy's eye gaze, body direction, and pointing, and determined that they were involved in joint attention, focused upon the woman with the camera. A similar procedure was followed in each of the 347 examples. 33 arguments were excluded from the set of 347 for the following reasons: 25 examples occurred in a context where the child and interlocutor were not visible within the video frame, 8 examples were part of a game of repetitive questions and so represented conditioned rather than spontaneous responses.

4. Results

4.1. Newness and Argument Form

First, we examined the data (N=347) from the discourse-pragmatic perspective, irrespective of joint attention, to evaluate the correlation between newness alone and the argument form. The data is displayed in the following table 1:

<table>
<thead>
<tr>
<th></th>
<th>Overt arguments (N=38)</th>
<th>Omitted arguments (N=309)</th>
<th>Total (N=347)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Given referents</td>
<td>8% (20)</td>
<td>92% (244)</td>
<td>100% (264)</td>
</tr>
<tr>
<td>New referents</td>
<td>22% (18)</td>
<td>78% (65)</td>
<td>100% (83)</td>
</tr>
</tbody>
</table>

The total of 347 arguments consisted of 264 given referents and 83 new referents. The data confirmed the prediction of the discourse-pragmatic approach that given referents are more likely to be represented by omitted arguments: out of a total of 264 given referents, 244 (92%) were represented by omitted arguments while only 20 (8%) were represented by overt arguments.

However, out of a total of 83 new referents, only 18 (22%) were represented by overt arguments while 65 (78%) were represented by omitted arguments. The finding that a high percentage of new referents were in fact represented by omitted rather than overt arguments is contradictory to the predictions of the discourse-pragmatic approach.

4.2. Joint attention, newness, and argument form

Subsequently, we examined the video footage of the same data set (N=347), coding for the additional factor of joint attention in order to evaluate its role in argument realization. The results are displayed in the following table 2, where JA-P signifies the presence of joint attention, JA-A signifies the absence of joint attention, and EXCL signifies the excluded examples.

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3 See Section 3.3.
Table 2: Joint attention

<table>
<thead>
<tr>
<th>Given referents</th>
<th>Overt arguments (N=18)</th>
<th>Omitted arguments (N=309)</th>
<th>Total (N=347)</th>
</tr>
</thead>
<tbody>
<tr>
<td>JA-P</td>
<td>25% (4)</td>
<td>60% (135)</td>
<td>264</td>
</tr>
<tr>
<td>JA-A</td>
<td>75% (12)</td>
<td>40% (89)</td>
<td></td>
</tr>
<tr>
<td>Total:16 (EXCL-4)</td>
<td></td>
<td>Total:224 (EXCL-20)</td>
<td></td>
</tr>
</tbody>
</table>

| New referents   | JA-P                   | JA-A                   | JA-P          | JA-A                   |
|-----------------|------------------------|------------------------|---------------|
| JA-P            | 18% (3)                | 86% (49)               | 14% (8)       |
| JA-A            | 82% (14)               | 14% (8)                |               |
| Total:17(EXCL=1) |                       | Total:57 (EXCL=8)      |               |

Out of the total of 16 given referents represented by overt arguments, 12 (75%) were produced in the absence of joint attention while 4 (25%) were produced in the presence of joint attention. This trend to represent a given referent by an overt argument in the absence of joint attention is demonstrated in the following example:

(6) Elijah sits on the bed while his mother helps him put his shoes on. She is focused on tying his shoe as he asks her an unrelated question:

Anaana, qajuq unaqtuq?
anaana qajuq- 0 unaq-juq
mother soup-ABS.SG be.hot-PAR.3sS
'Mom, is the soup hot?'

(Elijah 2:5)

In this example, the given referent, the soup, is not in the attentional focus of either Elijah or his mother—there is no joint attention in progress between them.

Out of the total of 224 given referents represented by omitted arguments, 135 (60%) were produced in the presence of joint attention while 89 (40%) were produced in the absence of joint attention. This somewhat weaker tendency to represent given referents with omitted arguments in the presence of joint attention is illustrated by the following example from the video footage:

(7) Louisa kneels on the stairs below the person holding the camera. Louisa has a stuffed toy in her hand. She throws the toy up toward the camera holder. After this, she utters the following command, as she looks from the camera holder to the toy, after which the toy is thrown back to her by the camera holder:

Qaiguk!
qai-guk
come-IMP.2sS.3s0
'Give (it) to nie!'

(Louisa 3:2)

In this example, the given referent, the toy, is the focus of both Louisa and the camera holder there is joint attention in progress between them.

Out of the total of 17 new referents represented by overt arguments, 14 (82%) were produced in the absence of joint attention while only 3 (18%) were produced in the presence of joint attention. This high correlation between the new referents represented by overt arguments and the absence of joint attention is illustrated in the following example from the video footage:

(8) Elijah lies on a couch watching television. When he suddenly sees Nuishish, his favorite T.V. character, he calls out to his mother who is in the other room and then jumps up and runs past the television to get her:

Nuishish nuimmat!
Nuishish nui-mmat
appear-CSV.3sS
'Nuishish is on the air!'

(Elijah 2:9)

In this example, the new referent, Nuishish, is not in the focus of the interlocutor, Elijah's mother, for she is not in the room there is no joint attention in progress between them.

Finally, out of the total of 57 new referents represented by omitted arguments, 49 (86%) were produced in the presence of joint attention while only 8 (14%) were produced in the absence of joint attention. Note that in these 8 cases, the omissions of new referents led to a communication breakdown, which in 6 out of 8 cases lead to a consequent repair by the children.

This strong correlation between the new referents represented by omitted arguments and the presence of joint attention is illustrated in the following example from the video footage:

(9) Lizzie sits on the floor, playing with a toy. Her cousin runs toward her, sits down next to her and holds up a doll close to her face. After that, he takes the doll back and starts examining it while Lizzie says the following utterance, after which she holds mit her hand for the doll:

Nuishish nuimmat!

Nuishish nui-mmat
appear-CSV.3sS
'Nuishish is on the air!'

(Elijah 2:9)

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In this example, the new referent, it—the doll, is in the attentional focus of both Lizzie and her cousin—there is joint attention in progress.

5. Discussion and Conclusion

Although the discourse-pragmatic approach had previously demonstrated that a combination or subset of 8 discourse-pragmatic features have a significant effect on argument form (Allen 2000), it failed to correctly predict argument form when considering examples with only one feature, newness, alone. In this study we attempt to address this limitation of the discourse-pragmatic approach by examining these problematic cases when examples contain newness as the only discourse-pragmatic feature. We have tested whether joint attention underlies the choice of argument form in these cases.

Our data shows that for new referents, 82% of overt arguments were produced in the absence of joint attention. Moreover, 86% of omitted arguments were produced in the presence of joint attention. These findings demonstrate that for new referents, the presence of joint attention was highly predictive of the production of omitted arguments whereas the absence of joint attention was highly predictive of the production of overt arguments. The strikingly high correlation between the argument form and joint attention in new referents strongly supports the hypothesis that joint attention is an important factor underlying the choice of argument form in child language.

Similarly, we have found that for given referents, 75% of overt arguments were produced in the absence of joint attention, while 60% of omitted arguments were produced in the presence of joint attention. Although less strongly correlated, these data follow the same tendency as those for new referents. This suggests that while joint attention appears to strongly influence the choice of argument form with new referents, its firmento in the context of given referents may be more optional, perhaps as a consequence of the salient nature of given referents.

In this study we examined only one of the two types of overt arguments in Inuktitut, the independent lexical nouns. Future research must include the examination of the role of joint attention in the production of the second type of omitted arguments, the demonstratives. Furthermore, it will be important to examine the role of joint attention not only in cases containing single discourse-pragmatic features but also in those containing combinations of features. Additionally, the distinction between new and given referents being defined by a distance of 20 utterances, although based on the literature on discourse status (Chafe 1976; DuBois 1987; Allen 2000), may be somewhat arbitrary. A thorough examination of the relationship between the role of joint attention and the precise degree of newness of referents is highly warranted and may indeed lead to even stronger conclusions about the role of joint attention in argument realization. As well, it will be enlightening to investigate separately the role of joint attention in each of the two types of omitted arguments, the null argument plus the verbal cross-referencing affix and the null argument alone. Joint attention may appear to influence the production of one type of omitted argument more than the other.

In conclusion, our study introduces joint attention as an additional important factor in argument realization in child language. It indicates that children’s social and pragmatic skills—their sensitivity to the interlocutor and the social context of their interactions as well as their awareness of discourse status play a significant role even in syntactic phenomena, such as verb argument realization. These socio-pragmatic skills demonstrate children’s early understanding of the interpersonal and intentional nature of their communication patterns. This implies that the onset of Theory of Mind, children’s awareness of interpersonal intentionality, may be revealed to occur at an earlier age through the examination of naturalistic data than has been previously determined in experimental settings.

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