

“SALISH STAGE” AND THE DEVELOPMENT OF ENGLISH DETERMINER SYSTEM IN CHILDREN WITH AUTISM: A PRELIMINARY STUDY*

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1. Introduction

Recent research on the acquisition and use of English determiner system points to the inappropriate/problematic use of definite determiner *the* in two groups of English-speaking children: 1) young typically developing (TD) children (Matthewson, Bryant & Roeper, 2001; Schaeffer & Matthewson, 2005); 2) children with autism (Hewitt, 1997). In regards to the first group, it was shown that typically developing children tend to “overuse” the definite article *the*, in that they produce definite particles (DP’s) when the corresponding discourse referents are not yet familiar to all discourse participants. In the literature, this developmental stage is being referred to by the authors as “Salish stage” or “Salish period” where the article system of children is similar to the adult determiner system of Salish rather than to the adult determiner system of English. Although this specific term is not used in the studies examining the acquisition of determiners by children with autism, it was shown that this group of children seem to manifest similar difficulties in that they use definite determiner *the* when introducing new referents into discourse.

The research presented in this paper focuses on exploring a possible parallel between the development of English determiner system in English-speaking children with autism and in English-speaking typically developing children and the adult determiner system of Salish languages. One of the distinctive features of this analysis is the fact that unlike earlier studies that examine the acquisition of English determiners exclusively in one group of children (either autistic or typically developing), the analysis presented here uses a matching technique, comparing the two groups. This study has two major objectives. First, we attempt to demonstrate that while acquiring English determiner system, both children with autism and their typically developing counterparts go through “Salish stage” where their article system is similar to the adult determiner system of Salish rather than to the adult determiner system of English. Second, we attempt to investigate the extent to which a morpho-syntactic phenomenon such as production/comprehension of definite DP’s can be incorporated in the study of pragmatic deficits found in children with autism. More specifically, we seek to answer the following question: what role does the inappropriate use of definite determiner *the* play in communicative deficits found in children with autism?

The structure of the present paper is as follows. In section 2, we provide a brief contrastive analysis of the two adult determiner systems: Salish and

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English. Following the analysis, we briefly outline the hypothesis about a “Salish stage” in the development and the acquisition of English determiner system. In the last part of this section, we describe the experiments and present the results of several similar studies that have examined the acquisition of English determiners in typically developing children as well as in children with autism. The last section of this paper (section 3) introduces a brief quantitative analysis, where, using the CHILDES corpora, we compare the use of determiners of a typically developing child (Brown database) with that of the child with autism (Flusberg clinical database) to see if they do indeed go through the “Salish period” in their acquisition of English determiners.

2. Background

2.1 English ≠ Salish Determiners

There are two major closely related distinctions between the two adult determiner systems. The first distinction is that while the English determiner system heavily depends on the familiarity-based definite/indefinite contrast, the Salish determiner system is completely independent of this contrast (Matthewson, Bryant & Roeper, 2001).

- (1) *English:*
A girl sang [unfamiliar] ≠ The girl sang [familiar])
- (2) *Salish:*
ít-em [ti smém’lhats-a]
Sing-INTR [DET girl-DET]
‘The/a girl sang.’

This has a direct impact on the second distinction between the two systems, which in fact is just an extension of the first one: the differentiation between different states of speaker and hearer beliefs. In English, the DP can be part of the shared beliefs between speaker and hearer (common ground of speaker and hearer - A-type context) either by being already established in the previous discourse or by being a long-term shared belief between speaker and hearer.¹

- (3) *Previous Discourse:*
This is a story about *a girl*. The girl lived in a big castle.
- (4) *Common Ground:*
The sun is shining.

¹ This is a simplified description of the English determiner system, which suffices for current purposes. Namely, its main aim is to demonstrate how English article system relates to the three states of speaker and hearer beliefs. Examples are taken from Matthewson, Bryant & Roeper, 2001 and from Schaeffer & Matthewson, 2005.

There are also instances (B-type context) where the speaker but not the hearer believes in the existence of an entity corresponding to the noun phrase.

(5) I saw *a movie* last night.

Lastly, there are situations (C-type context) where neither the speaker nor the hearer has grounds for an existential assertion.

(6) My mother might write *a book*.

Three possible belief states in English determiner system are summarized in Table 1 (Schaeffer & Matthewson, 2005).

Table 1: Three possible belief states in English determiner system

A-type context	believed by speaker and hearer	part of common ground	<i>the</i>
B-type context	believed by speaker only	not part of common ground	<i>a</i>
C-type context	believed by neither speaker nor hearer	not part of common ground	<i>a</i>

Salish determiner system divides semantically into two classes: 1) existence-asserting determiners and 2) non-existence-asserting determiners. These are illustrated in Table 2.

Table 2: Salish determiner system

		existential assertion			no existent.
		present	absent	remote	
- plural		<i>ti...a</i>	<i>ni...a</i>	<i>ku...a</i>	
+ plural	- collective	<i>i...a</i>	<i>nelh...a</i>	<i>kwelh...a</i>	<i>ku</i> (<i>kwelh</i>)
	+ collective	<i>ki...a</i>			

Existence-asserting determiners result in an existential assertion and encode distinctions of number and of distance of the referent from the speech situation. To mark the distance, a three-way distinction between 'present' (visible to the speaker at the time of utterance – 7a), 'absent' (invisible at the

time of utterance – 7b) and ‘remote’ (invisible but sensed in some other way – 7c) has to be considered.²

- (7) a. wa7 t'-em [ti smúlhats-a]
 IMPF sing-INTR [DET woman-DET]
 ‘A/The woman (visible to the speaker) is singing.’
- b. wa7 ít'-em [i smelhmúlhats-a]
 IMPF sing-INTR [DET.PL woman (PL)-DET]
 ‘Some women (visible to the speaker) are singing.’
- c. wa7 ít'-em [ku smúlhats-a]
 IMPF sing-INTR [DET woman-DET]
 ‘A/The woman (invisible to the speaker) is singing.’

Non-existence asserting determiners, on the other hand, do not result in an existential assertion as illustrated in (8).

- (8) cw7aoz kw-s ít'-em [ku smúlhats]
 NEG DET-NOM sing-INTR [DET woman]
 ‘No women sang.’

As can be seen from the above-mentioned examples, in the Salish determiner system the choice between the article *ti...a* (existence-asserting determiner) and *ku* (non-existence-asserting determiner) is independent of hearer beliefs and is consequently independent of the common ground. What is important is whether the existence of a referent corresponding to the relevant description is believed to exist by the speaker. So how does the Salish determiner system relate to the three states of speaker and hearer beliefs?

In the Salish determiner system, the determiner *ti...a* is used in the A-type context where the referent of the DP is part of common ground of both speaker and hearer either by being already introduced in the preceding discourse (9) or because it represents a long-term shared knowledge between speaker and hearer (10).

- (9) cw7aoz kw-a-s ka qwál'-a ti smúlhats-a
 NEG DET-IMPF-NOM OOC speak-OOC DET woman-
 DET
 ‘The woman didn’t say anything.’

² Once again, we present a simplified description of the Salish article determiner system, which suffices for current purposes. Namely, it aims to demonstrate how the Salish article system relates to the three states of speaker and hearer beliefs. Examples are taken from Matthewson, Bryant & Roeper, 2001 and from Schaeffer & Matthewson, 2005.

- (10) ka hál'h-a ti snéqwem-a
 OOC show-OOC DET sun-DET
 ‘The sun appeared.’

The same determiner *ti...a* is used in the B-type context where the referent of the DP is familiar to the speaker, but the hearer is unfamiliar with any referent satisfying the description. An example of the B-type context is given in (11).

- (11) ka hál'h-a ti nkakúsent-a
 OOC SHOW-OOC DET star-DET
 ‘A star appeared.’

Lastly, the determiner *ku* is used in the C-type context where the referent of the DP is believed to exist by neither the speaker nor the hearer. An example of the C-type context is given in (12).

- (12) cuz' mets-cál ti n-skícez7-a ku
 pukw
 going.to write-INTR DET 1SG:POSS-mother-DET DET
 book
 ‘My mother will write a book.’

The three possible belief states in the Salish determiner system are summarized in Table 3 (Schaeffer & Matthewson, 2005).

Table 3: Three possible belief states in the Salish determiner system

A-type context	believed by speaker and hearer	believed by speaker	<i>ti...a</i>
B-type context	believed by speaker only	believed by speaker only	<i>ti...a</i>
C-type context	believed by neither speaker nor hearer	not believed by speaker	<i>ku</i>

Previous research studies demonstrate that in both children with autism and typically developing children acquiring English determiners, the article system parallels that of the adult Salish determiner system rather than that of the adult English. According to these findings, this similarity can be explained by the fact that the Salish determiner system does not differentiate between common ground (A-type) contexts from speaker beliefs-only (B-type) contexts. It is precisely these two contexts that pose great problems for both groups of children (evidently, much more for the autistic group because of their greater

impairment in the Theory of Mind Hypothesis), as they believe that their own beliefs are shared by their interlocutor/hearer.³ As a result of this, English-speaking children with autism and without, produce one article (*the*) in both adult A-type and B-type contexts and another one (*a*) on C-type contexts, which is parallel to Salish adult speakers. This next part of the paper will provide a slightly more detailed account of the previous research studies mentioned above.

2.2 Earlier Studies in Acquisition

In his book *A first language: the early stages* (1973), a psycholinguistic analysis of language acquisition, Brown found that English-speaking children often use the definite determiner *the* out of-the-blue, as illustrated in (13).

- (13) Sarah: Where's the black tape?
Mother: What black tape?

Similarly, in his study (1979) Karmiloff-Smith found that francophone children up till eight years-old produce substantial numbers (63%) of definite determiners in indefinite contexts. Lastly, similar results were found in the study by Zehler and Brewer (1982) where the authors observed an over generation (38%) of definite determiners in indefinite contexts by English-speaking children (ages 2;9-3;1).

2.3 Recent Studies in Acquisition

Schaeffer & Matthewson Study (2005)

The main objective of Schaeffer & Matthewson study is to describe and examine a striking similarity between the usage of the article system by English-speaking children and Salish adults. According to the authors' hypothesis, young TD children lack the Concept of Non-Shared Assumptions (CNSA) that states that speaker and hearer are always independent. The lack of this pragmatic concept leads to the speaker automatically attributing his/her own beliefs to the hearer. As a result, if a child attributes his/her beliefs to the hearer, he/she will not be able to differentiate between the context B (believed by speaker only) and the context A (believed by both speaker and hearer). Based on this hypothesis, one of the authors' major predictions is that the English-speaking child will "over generate" the definite article *the* to (adult) B contexts which require the indefinite article *a*. In order to undertake their study, the authors carry out an elicited production task with 26 monolingual English-speaking children (age 2-4 years old), and with 38 adult native

³ A Theory of mind is a psychological theory used to describe the ability to attribute and predict mental states of others, such as beliefs, intentions, feelings, desires, knowledge and point of view.

speakers of English. The results obtained in this study are summarized in Table 4.

Table 4: Overgeneration of *the* in B-type contexts

Age group	<i>the</i> in B contexts
Children (2;1-3;10)	25% (19/76)
Adults	2% (2/13)

The results show that unlike the adults who almost never “overgenerate” the definite article *the* in B contexts (2% occurrences), the 2-3-year-old children produce 25% occurrences of *the* instead of *a* in B contexts, confirming the hypothesis that due to the lack of the pragmatic Concept of Non-Shared Assumptions, English-speaking children do sometimes fail to differentiate between B contexts and A contexts, which leads to their striking similarity with the adult Salish speakers. An example of this overgeneration is given in (14).

(14) Situation: picture of Minnie Mouse who just finished drawing a car

Elmo: Hey, who is this?

Child: Minnie Mouse!

Elmo: And what did Minnie Mouse just do?

Child: draw the car

(TO, 3;0)

Child: paint the car

(AS, 2;8)

Matthewson, Bryant & Roeper Study (2001)

The main objective of this study is to conduct an experiment which tests English-acquiring children’s comprehension of definite and indefinite articles. The authors of the study propose the following hypothesis: English-acquiring children go through a “Salish stage” in their determiner system. Hence, during the experiment, these children should accept sentences containing *the* even when the “familiarity” condition is not met. The children participating in the study are 25 English-speaking children (3-7 years old). The adult participants are 25 university students. The participants are first presented with the acted-out scenarios that they have to watch and after each scenario they are asked a yes-no question. The experiment consists of four types of test questions: *a NP* (predicted answer for English – Yes, for Salish – Yes), *the NP* (predicted answer for English – No, for Salish – Yes), *it* (predicted answer for English – No, for Salish – No), *out-of-the-blue NP* (predicted answer for English - challenge, for Salish – challenge or No). During the experiment, the authors are particularly attentive to the cases involving uses of the definite article (*the*)

that should lead to either a presupposition failure, or to a “no” answer, for English-speaking adults, but to a “yes” answer for Salish-speaking adults. The results of the study as well as an example of *the NP* question are given in Table 5.

Table 5: Overgeneration of *the* in B-type contexts

Experimental question	Adult English prediction	Salish stage prediction	Adult English Results	Child Results
Did Earnie wear the necklace?	no	yes	24/148 (16%)	108/150 (72%)

The results show that 72% of children examined answered “yes” to *the NP* questions, which is not acceptable in the English determiner system but is in the Salish. Based on these results, the authors conclude that younger English-speaking children do indeed go through a “Salish stage” in their acquisition of the English determiner system.

Hewitt Study (1997)

The main objective of the study is to examine the relationship between a deficit in the ability to consider the mental state of the listener and the pragmatic difficulties found in children with autism. One of the domains selected for the analysis is the use of definite vs. indefinite articles. The authors hypothesize that children with autism will not have difficulty introducing referents into discourse with indefinite articles, but that definite articles will pose a greater problem due to their heavier inferential burden. In order to undertake this study, the authors explore a large corpus of naturalistic conversational data, where the children with autism share their personal experiences in a naturalistic context. The children participating in this study are 6 young adult males with autism, ranging in age from 18 to 21. The results obtained in this study are summarized in Table 6.

Table 6: The misuse of *the* by young adults with autism

Referring Expressions	Percent problematic
<i>a/an</i>	3% (7/227)
<i>the</i> (definite references)	27% (48/180)

The results confirm the authors' hypothesis and show that the autistic children have much more difficulty using definite reference (*the*), at 27% problematic, than indefinite reference (*a/an*), at 3% problematic. An example of this problematic use of definite determiner '*the*' is shown in (15).

- (15) A: I went on the train ride.
 L: Oh, you went on the train ride too?
 A: Come out the tunnel, train
 L: Was there a tunnel?
 A: Train

3. Present Analysis

The purpose of the present analysis is to explore if children with autism and their typically developing counterparts go through the "Salish period" in their acquisition of English determiners. As the results of the previous research studies show, the use of definite articles poses a particular challenge for both typically developing children and for children with autism. While children with autism misuse the definite article (*the*), in that they use it even when introducing new referents into discourse, typically developing children "over generate" definite article (*the*) in B contexts which leads to the striking similarity between the article use of English-speaking children and the article use of Salish-speaking adults. In a brief quantitative analysis presented here, we will examine if this is also the case when comparing the two groups of children: the English-speaking children with autism and the English-speaking typically developing children. This analysis will allow us to investigate how a grammatical phenomenon such as definite DP's can be incorporated in the study of pragmatic deficits in children with autism.

3.1 Method

In order to undertake this brief quantitative analysis, we select two corpuses from the CHILDES corpora: one corpus from the Flusberg clinical database (a child with autism - Rick 4;7 years old) and one corpus from the Brown database (a typically developing child - Eve 1;6-2;3). The two corpuses are matched based on their MLU. We have analyzed the use of the definite articles in five files from each corpus. We identified the problematic use of the definite determiner by isolating cases where a subject used the definite DP in the indefinite context (B context – when it is not part of common ground between the speaker and the hearer). During the analysis, we excluded utterances involving the definite DP that were imitated. In order to see whether an entity has been introduced earlier in the discourse, we took into account the contextual information.

3.2 Results

PARTICIPANT	AGE	MLU	RESULTS
Rick 11	4;7	2.93	55% problematic (11/20)
Rick 10		2.48	45% problematic (5/11)
Rick 09		2.67	33% problematic (2/6)
Rick 07		2.29	20% problematic (1/5)
Rick 06		2.50	7% problematic (2/28)

The results of the analysis for the corpus Rick (4;7) show that the autistic child uses the definite determiner *the* in B-type context (believed by speaker only – not part of common ground). These results are summarized in Table 7.

Table 7: Use of definite articles by a subject with autism

In other words, the child introduces a new referent by using the definite article *the*, which leaves the listener disoriented and obligated to request clarification. This confusion can, in turn, lead to a significant number of conversational breakdowns. An example of this is given in (16).

- (16) CHI: Where's the bonnet?
 MOT: The bonnet? (Rick 11)

It is worthwhile to note that in the case of the file Rick 06, the use of the definite determiner (*the*) is only at 7% problematic due to the presence of an entity in the speaker's visual fields.

Similarly, the results of the analysis for the corpus Eve (1;6–2;3) show that a typically-developing child uses the definite determiner (*the*) in indefinite B-type context (believed by speaker only – not part of common ground). These results are summarized in Table 8.

Table 8: Use of definite articles by a typically developing subject

PARTICIPANT	AGE	MLU	RESULTS
Eve 10	1;6–2;3	2.86	20% problematic (5/24)
Eve 09		2.84	18% problematic (4/22)
Eve 08		2.51	40% problematic (8/20)
Eve 07		2.25	50% problematic (2/4)
Eve 06		2.27	0% problematic (0/2)

Once again, the child introduces a new referent by using the definite article *the*, leaving the listener disoriented and obligated to request clarification. This confusion leads, in turn, to a significant number of conversational breakdowns. An example of this is given in (17).

- (17) MOT: Where are you going to be writing?
 CHI: Write the paper
 MOT: Oh, on Frasier's paper. (Eve 08)

In the case of the file Eve 06, the use of the definite determiner (*the*) is at 0% problematic due to the omission of the articles in this file.

3.3 Discussion and Conclusion

The findings of the present study support the hypothesis that both groups of children examined go through “Salish stage” in their acquisition of English determiner system. In both cases, for the child with autism and for the typically developing child acquiring English determiners, the article system parallels that of the adult Salish determiner system rather than that of the adult English. This similarity can be explained by the fact that the Salish determiner system does not differentiate between common ground (A) contexts from speaker beliefs-only (B) contexts. It is precisely these two contexts that pose great problems for both groups of children, as they mistakenly believe that their own beliefs are shared by their interlocutor/hearer. As we have shown in our preliminary analysis, the use of the definite determiner *the* in B-type context leaves the hearer disoriented which, in turn, causes certain social awkwardness in the conversation. Since children with autism manifest a particular difficulty in conversational skills, further studies examining the use of definite determiners by these children may be of value. More specifically, a morpho-syntactic phenomenon such as production/comprehension of definite DP's could be incorporated into the study of pragmatic deficits in children with autism to see if the problematic use of the definite DP's by children with autism results in the significant number of conversational breakdowns found in this population.

3.4 Limitations

In interpreting these findings, it is important to take into consideration the following limitations. Firstly, a far more detailed data analysis and a larger sample size are needed to deliver more definite conclusions. Secondly, because we are using data from a pre-existing database, we are unable to control for any of the contextual variables which may or may not have contributed to the choice of the determiner used. Finally, in order to allow for a more complete analysis, future studies should take into account not only the use of definite DP's, but also the use of indefinite DP's.

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