The Acquisition of Recursive Possessives in Child Tamil

Usha Lakshmanan

1. Introduction

Previous research on the acquisition of recursive possessives supports a two-step acquisition path for language-specific recursion: (1) Direct-Recursion with a conjunctive interpretation (via a simple Merge operation) and (2) Indirect-Recursion, namely, iterative embedding of a phrasal-category within another of the same type, which, unlike Direct Recursion, may (or may not) involve an interpretative step that changes the meaning (Roeper, 2011). Studies on Child English (e.g., Gentile, 2003; Limbach & Adone, 2010; Perez-Leroux et al., 2012) assessed children's understanding of recursive possessives, using tasks involving pictures (without a story context) or a picture-cum-story context and showed that 3-5 year-olds had difficulties going beyond single possessives (i.e., Direct Recursion as for example, *Tom's dog*). Instead, the children incorrectly interpreted two-part possessives (i.e., Indirect Recursion, as for example, *Tom's friend's dog*), as a conjunctive (e.g. 'Tom's dog and Tom's friend's dog') or a reduced possessive ('Tom's dog'). Similarly for Child Japanese, Fujimura's (2010) study, which used a picture-cum-story context task, found that young Japanese speaking children (< 5 years) incorrectly interpreted 2, 3, and 4-part possessives while older Japanese speaking children (< 7 years) grasped them all at the same time (but see Terunuma et al. [2017] for evidence of step-wise progression from 3 to 4-part possessives).

To date, there are no studies on the acquisition of recursion in Tamil and other Dravidian languages. Tamil is primarily spoken in India (in the southern state of Tamil Nadu and the Union territory of Puducherry). Besides India, Tamil is also spoken in Malaysia, Sri Lanka, and Singapore; it is also used in immigrant communities in the U.S. and Canada. The current study sought to address the gap in research on the acquisition of recursion in Tamil by

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investigating Tamil children's comprehension of multiple recursive possessives. Specifically, I sought to determine whether there is a two-stage developmental path leading to adult-like understanding of indirect recursion, similar to what has been attested in Child English, Child Japanese and other languages.

Similar to Japanese, but unlike English, Tamil is a consistently left branching (head-last) language, with rich agglutinative morphology. The basic word order is S(ubject)-O(bject)-V(erb), which has a pragmatically neutral interpretation. However, other surface orders (e.g., OSV, SVO, OVS and so on), which have a pragmatically marked interpretation, are also possible as a result of the scrambling of phrases to the left and the right of the verb. Possessive phrases precede the noun that they modify (i.e. they are left branching). Tamil instantiates indirect recursion in possessives (as well as in other phrasal types). Some examples of possessive phrases in Spoken (colloquial) Tamil are provided in (1). The example shown in (1a) is an example of direct recursion, whereas the ones in (1b) and (1c), which are two part and three part possessives respectively, are examples of indirect recursion.

(1) a. Balu-(v)-ooDu pai
Balu-GEN bag
'Balu's bag'

b. Balu-(v)-ooDu akka-(v)-ooDu pai
Balu-GEN elder sister-GEN bag
'Balu's elder sister's bag'

c. Balu-(v)-ooDu nanban-ooDu akka-(v)-ooDu pai
Balu-GEN friend-GEN older sister-GEN bag
'Balu's friend's elder sister's bag'

As can be seen from the examples in (1) the possessive phrase in Tamil is marked overtly by the genitive suffix (*-ooDu*). Unlike in the case of Japanese, where the genitive case marker *–no* is homophonous with the locative morpheme (Terunuma et al, 2017: p. 627), the genitive case marker in Spoken Tamil is not homophonous with another case morpheme.

I hypothesized that indirect recursion in the possessive domain in Child Tamil would emerge early (prior to the age of 5 years), based upon certain distinguishing aspects of Tamil. Tamil is consistently left-branching (unlike English); unlike in Japanese, the genitive case form in Spoken Tamil is not homophonous with the locative or other case forms, and the form-function mapping in relation to the genitive case is a more direct one. Additionally, another aspect that sets Tamil apart from both English and Japanese relates to kinship terminology. As shown by the Tamil equivalents for kindship terms such as 'aunt' 'uncle' and 'cousin' in Table 1, Tamil has complex kinship terminology. Importantly, there are specific (single) lexical items which encode or represent complex (hierarchical) kinship relationship concepts, which Tamil

children are exposed to from an early age. I hypothesized that Tamil children's early experience with such complex kinship terms could provide them with an advantage (vis-à-vis English and Japanese speaking children) in the processing and interpretation of indirect recursive possessives.

Table 1. Some Examples of Complex Kinship Terms in Tamil ('aunt', 'uncle', 'cousin')

Periyamma : 'X's father's older brother's wife or X's mother's older sister.' *periyappa* : 'X's father's older brother or X's mother's older sister's husband.' *chithi* : 'X's father's younger brother's wife or X's mother's younger sister.' *chithappa* : 'X's father's younger brother or X's mother's younger sister's' husband.' *athai:* 'X's father's older or younger sister.' *athimber* : 'X's father's sister's husband ' *maama* : 'X's mother's older or younger brother' *maami* : 'X's mother's brother's wife'
Terms for Cousin: Different or specific kinship terms for female/male parallel cousins (X's father's brother's son or daughter; or mother's sister's son or daughter) VS female/male cross-cousins (X's father's sister's son or daughter or X's mother's brother's son or daughter).

2. Methodology

2.1. Participants

The participants recruited for this study were 26 Tamil children from low income households residing in the city of Chennai in Tamil Nadu, India. The children ranged in age from 2;10 to 7;5. The children were recruited from local day care centers, kindergarten and elementary schools in the Mylapore area of Chennai. They were assigned to two age groups: Group 1 and Group 2. Group 1 consisted of 12 children (7 Females and 5 Males) below the age of 5 years, with a Mean age of 3;7 (Age Range = 2;10 - 4;10). Group 2 consisted of 14 children (7 Females and 7 Males) above the age of 5 years with a Mean Age of 6;6 (Range = 5;3 - 7;5). The language of the home for all the children was Tamil, which they were exposed to from birth. Group 2 (older children) were attending an English medium school when the study was conducted.

2.2. Materials and Procedures

A picture-cum-story task, adapted from the one developed by Tom Roeper and colleagues (Roeper 2011; Terunuma et al 2017), was used to elicit the children's comprehension of recursive possessives. The story (in Tamil) revolved around two friends (Balu and Sanjay) and their families--their elder sisters (Kavya and Asha, who were also friends) and their parents. Balu and Sanjay and their family members as well as Balu's dog and Asha's dog were depicted in the picture with each one holding a different colored balloon. I interviewed each child on an individual basis. I showed the children the pictures of Balu and Sanjay and their two families and narrated the story in Tamil. The English translation of the Tamil story is presented in (2).

(2) English translation of the Tamil story:

> 'Balu's family: This is Balu and his family. This is his sister. Her name is Kavya. This is their mother and that's their father. Balu loves dogs. Look, he has a little dog! They all went to the beach. They had a great time. They each got a balloon. Look, each one is holding a balloon!'
>
> 'Sanjay's family: This is Sanjay. Sanjay and Balu are friends. This is Sanjay's family. That's his mother and that's his father. That's his sister Asha. She and Kavya are friends. Asha loves dogs. Look! She has a little dog! They all went to the beach. They had a great time. They each got a balloon. Look, each one is holding a balloon!'

The children were asked to identify the characters/objects and the colors in the pictures. After they had done so, questions (in Tamil) were asked to assess their comprehension of single possessives (i.e. Level 1, Direct recursion), two-part possessives (Level 2, Indirect Recursion), three-part possessives (Level 3, Indirect Recursion) and four-part possessives (Level 4, Indirect Recursion). Examples of the comprehension questions used to assess the children's comprehension of recursive possessives are presented in Table 2. The interview session with each child was auditotaped and their responses to the comprehension questions within each of the four recursion types were transcribed and categorized based on their accuracy.

The proportion of correct responses to questions in the four categories of recursive possessives (Levels 1 to 4) was computed for each child. Repeated Measures ANOVA with AgeGroup (between-subjects variable) and Possessive-Recursive-Type (within-subjects variable) was carried out with proportion of accurate responses to questions as the dependent measure to determine whether there was significant interaction between Age Group and Recursive Possessive Type.

Table 2. Comprehension Task Items: Recursive Possessive Phrases

Recursion Level Type	Number of target items	Example in Tamil with English Translation
Level 1 (Direct Recursion)	4	BaluvooDu balloon enna niram? 'what is the color of Balu's balloon?'
Level 2	8	BaluvooDu akkaavooDu balloon enna niram? 'What is the color of Balu's sister's balloon?'
Level 3	4	KavyavooDu tambiooDu pirenDooDu balloon enna niram? 'What is the color of Kavya's younger brother's friend's balloon?'
Level 4	2	AshavooDu tambiooDu pirenDooDu naayooDu balloon enna niram? 'What is the color of Asha's younger brother's friend's dog's balloon?'

3. Results

Table 3 shows the Mean Proportion of target (correct) responses to the recursive possessive questions (Levels 1 to 4) by the children in the two age groups. Fig. 1 shows the Mean Proportion of target responses given by the younger (Group 1) and older (Group 2) children for each Possessive Recursion type. Fig. 2 shows the Mean Proportion of target responses by Possessive Recursion Type (for Group 1 and Group 2 combined).

Overall the predictions of the study were confirmed. The results of the Repeated Measures ANOVA showed that the interaction between Age-Group and Possessive Recursion Type did not significantly impact the proportion of correct responses to the comprehension questions. Nor were there any significant Main-Effects for Age-Group. The Tamil children (regardless of their age) were equally successful in understanding indrect-recursion in possessives. However, the Main Effects of Possessive Recursion Type (Level 1, Level 2, Level 3, and Level 4) was found to be significant, Greenhouse-Geisser Correction ($F_{1.77,42.56} = 12.056$, *$p < .000$, Partial Eta Squared=.334, Power=.987).

Table 3. Descriptive Statistics: Mean proportion of Target (correct) Responses to Recursive Possessive Questions by Age group and Recursion Type

Age Group	Level One Recursion	Level Two Recursion	Level Three Recursion	Level Four Recursion
Group 1 (N=12; Mean Age=3;7)	.9583 (SD=.09731)	.91667 (SD=.12309)	.8750 (SD=.19943)	.708 (SD=.3965)
Group 2 (N=12; Mean Age= 6;6)	1.000 (SD=.00000)	1.000 (SD=.00000)	.8036 (SD=.32785)	.500 (SD=.4804)
Total: Group 1 & Group 2 (N=26; Mean Age=5;2)	.9808 (SD=.06794)	.96154 (SD=.091987)	.8365 (SD=.27333)	.596 (SD=.4476)

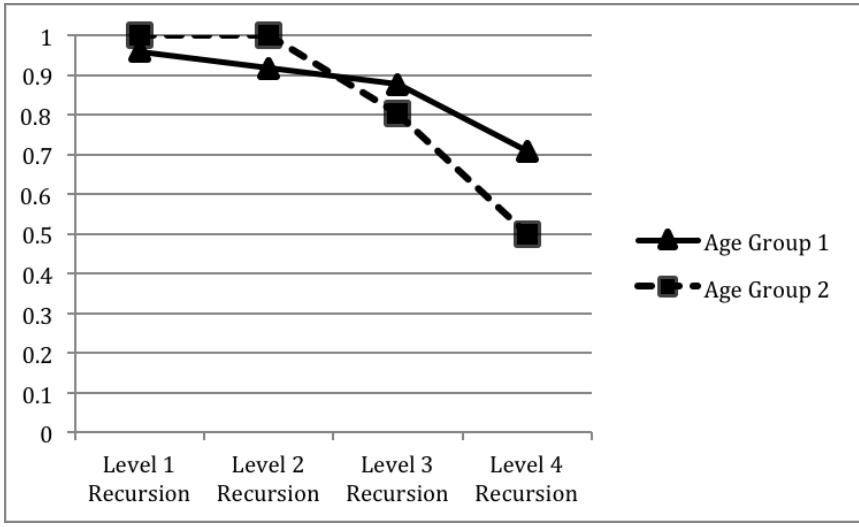

Figure 1. Mean proportion of target responses given by Age Group 1 and Age Group 2 children for each Possessive Recursion Type

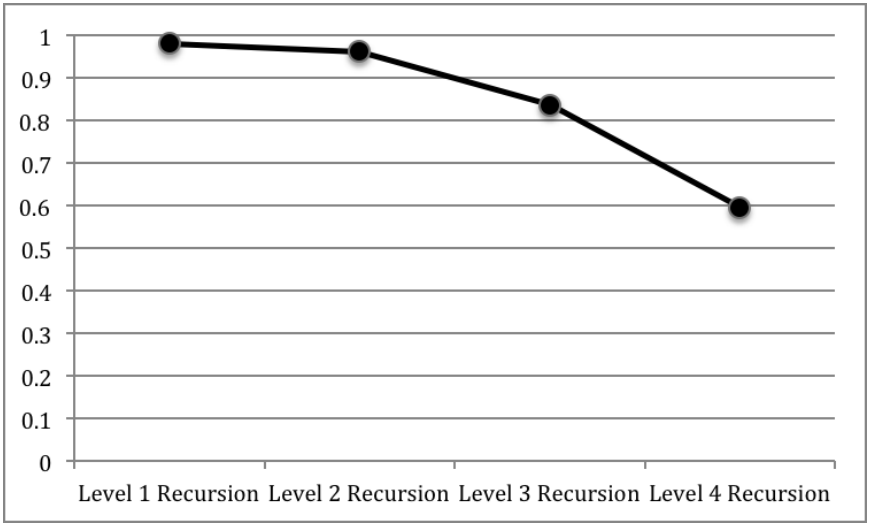

Figure 2. Mean proportion of target responses by possessive recursion type (for Group 1 and Group 2 combined)

Pairwise comparisons (with Bonferroni correction) revealed significant differences in the Mean proportion of accurate responses between the following Recursion Types: (i) Level 1 and Level 4: (Mean difference: .375*; p=.002), (ii) Level 2 and Level 4: (Mean difference: .354*; p=.003). The Mean differences in the proportion of accurate responses between Level 1, Level 2 and Level 3 recursive pssessives was not found to be significant: Level 1 and Level 2 (Mean difference: .021; p=1.000); Level 1 and Level 3 (Mean difference: .140; p=.139); Level 2 and Level 3 (Mean difference: .119; p=.359).

In sum, the pairwise comparisons showed that the Tamil children were significantly more accurate on single possessives (Level 1: Direct Recursion) and two-part possessives (Level 2: Indirect Recursion) vis-à-vis four part possessives (Level 4: Indirect Recursion) but not vis-à-vis three-part possessives (Level 3: Indirect Recursion). The Mean differences (.235) in the proportion of accurate responses for three-part possessives and four-part possessives approached significance (p=.087), suggesting that the children experienced relatively more difficulty with four-part multiple possessives (than three-part possessives), which may stem from performance factors (i.e., working memory constraints).

It is relevant to note here that in Group 1 (< 5 years), there were eight children who were below the age of four years (age range: 2;10 to 3;4). Of these 8 children, 7 (including a child aged 2;10.24) were successful 100% of the time in accurately interpreting three-part possessives and 1 child was successful 75% of the time. As for four-part possessives, 4 of the 8 children below the age of 4

years (including the child aged 2;10.24), were successful 100% of the time, and 2 were successful 50% of the time.

The inaccurate responses of the children to the questions involving three-part and four-part possessives were analyzed to determine the patterning of the non-target interpretation. Level 4 constituted 39.6% of the total number of non-target responses. Of these, the predominant type of interpretation (47.4%) was the conjunctive type (List this and this and this and this), as for example, 'red, yellow, blue and white' ('Balu's balloon, his sister Kavya's balloon, her friend Asha's balloon and Asha's dog's balloon'). The other interpretations included deletion of two possessives (21.1%), Chunking (15.8%; i.e. triple possessive and double possessive) and deletion of one possessive (5.3%) and Confusion (10.5%). As for Level 3, the non-target responses constituted only 16.1 % of the total number of inaccurate responses. The predominant interpretation type (62.5%) involved deletion of one possessive. Chunking (double possessive and double possessive) constituted 16.75% and Conjunctive (List this and this and this) as for example, 'red, yellow, blue' [Balu's balloon, his sister Kavya's balloon, Kavya's friend's balloon) also constituted 16.75%.

4. Discussion and Conclusion

The findings of the current research indicate that there are no age related differences in relation to the acquisition of recursion in possessive structures by Tamil children. Crucially, Tamil children below the age of 5 years and children above the age of 5 years were equally successful in understanding indirect recursion in possessives, regardless of recursion type. These findings are very different from what has been reported for other languages including Child English and Child Japanese. The early emergence of indirect recursion in Child Tamil was not restricted to two-part possessives but was also evidenced in multiple possssessives. The findings suggest that crosslinguistic differences could help account for the advantage evidenced in child Tamil development. Unlike English, Tamil is consistently left branching and the branching directionality of possessive phrases is in line with other Tamil phrasal types. Japanese, similar to English is also consistently left branching, and the difference in the findings in relation to Child Tamil may stem from the fact that the Form-Function mapping in relation to Genitive case is more direct in Tamil, compared to Japanese where the genitive case form is homophonous with the loactive morpheme. A third factor relates to the existence of complex kinship terminology in Tamil which provides the Tamil speaking child with early experience with specific labels that represent complex hierarchical (possessive) relationships in the familial domain. An interesting finding was that in relation to multiple possessives, both the younger and older children performed better on three-part possessives, than on four-part possessives. This suggests that the difficulties experienced with the four-part possessives could stem from working memory constraints on computing the grammar of level 4 indirect recursion. Another interesting finding was that the Tamil children above the age of 5 years

(Group 2), received numerically lower scores than the younger children in the case of the four-part possessives. Recall that the children in Group 2, unlike the younger children (Group 1) were attending an English medium school. It is possible that their increased eposure to and use of English, which is predominantly right branching (with albeit left branching genitive 's possessive phrases), could have negatively impacted their processing of more complex (four-part) recursive possessives in their mother-tongue. Further research is needed to examine the impact of exposure to English on the development of indirect recursion in Tamil-English bilingual children's mother tongue.

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