INTERNATIONAL JOURNAL OF
Practical and Pedagogical Issues in English Education
ISSN: 2980-9533
Arad Institute of Higher Education

The Acquisition of Relative Clauses by Turkmen Speaking Children

Mehdi Sarkhosh

English language Department, Urmia University, Urmia, Iran

Mdsarkhosh@gmail.com

Negin Samoudi

English language Department, Urmia University, Urmia, Iran

Samoudi.n@gmail.com

Abstract

Researchers have engaged in a spirited debate regarding the acquisition of relative clauses for the past two decades Early studies on the comprehension of relative clauses, referred to as RCs, utilized interactive tasks involving toys, revealing that children performed randomly until the age of five. However, a subsequent study by Hamburger & Crain (1982) on American children, which controlled for probable processing and pragmatics effects in experimental tasks, demonstrated that four-year-olds exhibited comprehension and production abilities above chance levels. Similarly, a later study by Crain et al. (1990) observed the production of such sentences by two- and three-year-old Italian children. The conflicting findings in studies on RC acquisition have prompted extensive research primarily focused on postnominal languages like English, German, and other European languages Conversely, there is a scarcity of studies on the L1 acquisition of RCs in prenominal languages. It is crucial to consider typologically diverse languages to ascertain both the universal and specific aspects of language acquisition.

Keywords: Relative Clauses, Turkmen speaking, Acquisition

Introduction

For the past twenty years, researchers have been deeply involved in a heated discussion about how relative clauses are acquired (de Villiers, Tager Flusberg, Hakuta & Cohen, 1979; Sheldon, 1974; Slobin, 1971; Tavakolian, 1981). Early research on the understanding of relative clauses, or RCs, used interactive exercises with toys and found that children up until the age of five performed at random. Nevertheless, a later study on American children by Hamburger & Crain (1982) showed that four-year-olds had comprehension and production capacities above chance levels after

controlling for potential processing and pragmatics effects in experimental tasks. In a related vein, Italian youngsters aged two and three were observed producing similar statements in a subsequent study conducted by Crain et al. (1990). The contradictory results of studies on RC acquisition have led to a great deal of study, mainly focused on postnominal languages like English, German, and other European languages (Sheldon, 1974; Flynn & Lust, 1980; Tavakolian, 1981; Goodluck & Tavakolian, 1982; Hamburger & Crain, 1982; Lebeaux, 1990; Labelle, 1990; 1996). On the other hand, little research has been done on RCs' L1 acquisition of prenominal languages. To determine the general and particular features of language learning, typologically varied languages must be taken into account (e.g., Arnon, 2010; Courtney, 2006; Ozeki & Shirai, 2010). Accordingly, by examining the Turkmen language, the current study adds to the corpus of research and broadens the range of languages that are studied. In order to achieve this, we first give a summary of RCs in Turkmen before reviewing the most recent theoretical and empirical concerns regarding RC acquisition.

Relative clauses are learned relatively late, according to prior research on the subject and object relative clauses (Diessel & Tomasello, 2005; Gibson, Desmet, Grodner, Watson, & Ko, 2005; Holmes & O'Regan, 1981; King & Just, 1991; MacWhinney & Pléh, 1988; Hsiao & Gibson, 2003). It is also consistently observed that subject relative clauses are produced and understood before object relative clauses. The Noun Phrase Accessibility Hierarchy Hypothesis (NPAH), put forth by Keenan and Comrie in 1977, has been linked to the observed variations in difficulty for learners of first and second languages (L1 and L2, respectively) (Gibson, 1998; Gibson & Schutze, 1999 for L1 acquisition and Doughty, 1991; Gass, 1979; Izumi, 2003; O'Grady, 1999 for L2 acquisition). Given that lexical frequencies, discourse context, and real-world plausibility are not factors that are typically controlled in studies comparing the two types of relative clauses (Gibson, 1998; Hsiao & Gibson, 2003; O'Grady, Lee & Choo, 2003), one may wonder why the acquisition process follows this pattern. Consequently, structural factors—more precisely, "processing considerations"—must be held responsible for the variance in complexity. This question has been addressed by a number of options, which fall into the following categories:

According to the Linear Distance Hypothesis (LDH), which favors minimal distance for processing efficiency, learning various relative clause types can be challenging due to the distance between the gap and the filler, or the head of the relative clause (Tarollo & Myhill, 1983; Hawkins, 1989; O'Grady, Lee, Choo, 2003).

According to the Structural Distance Hypothesis (SDH), variations in the gap's embedding depth are the cause of the problem. Stated differently, the number of intervening nodes between the gap and the head of the relative clause can be used to predict the challenges that arise with subject and object relative clauses (Collins, 1994; Hamilton, 1995; Hawkins, 1999; O'Grady, 1997, 1999).

In contrast to subject relatives, the Word Order Difference Hypothesis (WDH) suggests that the noncanonical word order of object relative clauses—such as Object-Verb-Subject in English—

is the source of the difficulty and that a person's prior knowledge of standard word order is less significant when it comes to direct object relatives. (MacDonald & Christiansen, 2002; Tabor, Juliano, & Tanenhaus, 1997).

Taking into account both structural and processing factors, these hypotheses (Tarollo & Myhill, 1983; Hawkins, 1989; Collins, 1994; Hamilton, 1995; O'Grady, 1997, 1999; MacDonald & Christiansen, 2002; Tabor, Juliano, & Tanenhaus, 1997) offer plausible explanations for the observed patterns in the acquisition of relative clauses.

The three theories on English relative clauses are in agreement with one another, as the discussion above suggests: "Subject relative clauses should be easier than direct object relative clauses." On the other hand, the assumptions of the various theories may not converge in a language like Turkmen, making it possible to distinguish the influences of the LDH, SDH, and WDH. Before going back to Turkmen language, the cross-linguistic literature on evidence for the psycholinguistic theories in both L1 and L2 language-processing literature is briefly discussed. Head-final languages with pre-nominal relative clauses have been the main focus of recent research examining the effects of various theories on relative clauses (RCs). Tarallo and Myhill (1983), for example, studied how RCs are acquired in Chinese and Japanese. Based on their findings, they concluded that the Linear Distance Hypothesis (LDH) is supported, i.e., that direct object relatives (OCs) are preferred over subject relatives (SCs). The Word Order Difference Hypothesis (WDH), which might help to explain the findings, was not taken into account in this investigation. Similarly, O'Grady, Lee, and Choo (2003) looked into this matter using Korean RCs, however they neglected to take the WDH into consideration. In their investigation on native Chinese speakers, Hsiao and Gibson (2003) took the WDH into account but were unable to distinguish its effects from those of the other two hypotheses. By carefully separating the impacts of the LDH and the Structural Distance Hypothesis (SDH) while maintaining the effects of the WDH constant, Ozçelik (2004) successfully investigated the acquisition of Turkish as a foreign language. The results showed that OCs were simpler than SCs, indicating that the LDH's predictions about the difficulty pattern of RCs are likely to be accurate. Xu (2009) examined how second language (L2) learners understood and produced various kinds of Chinese RCVs. Their production task results also supported the SDH. In a study using event-related brain potentials (ERPs), Yano et al. (2014) found that OCs preferred the subject gap (S-gap) and that they had greater trouble integrating the filler into their gap than SCs. According to the authors, this finding supports the consistent S-gap preference observed in Japanese and other languages by favoring the SDH over the LDH. The LDH was supported by the finding that SCs were more difficult to interpret than OCs in a different ERP study conducted by Yano and Sakamoto (2014) on the development of causal clefts in Japanese.

The three approaches (SDH, LDH, and WDH) struggle to explain the cross-linguistic results, as the discussion above makes clear. In that regard, it remains unable to determine which of them best explains the observed processing preference between SCs and OCs across different pre-post nominal languages. In this work, we provide data from Turkmen, a language that has not yet been the subject of any experimental research on RC acquisition, adding one more data point to the endeavor.

INTERNATIONAL JOURNAL OF
Practical and Pedagogical Issues in English Education
ISSN: 2980-9533
Arad Institute of Higher Education

One language that belongs to the large Turkic language family is Turkmen. Turkmen, like all Turkic languages, is agglutinative, has no prefixes, is head-final, and has prenominal modification structures. Subject-Object-Verb is the most common word order, with other ordering only being conceivable in specific discourse contexts. Turkmen, on the other hand, offers an intriguing topic for study in the field of RCs due to their unusual usage of relative clauses preceding the verb and their use of postpositions rather than prepositions to indicate specific grammatical relationships. As of right now, it is unclear whether Turkmen exhibit the same picture that is represented by various psycholinguistic theories, such as the three aforementioned possibilities. In order to close this gap, the current study starts with a succinct explanation of Turkmen RCs provided here.

Relative Clauses in Turkmen

Turkmen relative clauses are formed simply by using verb suffixes based on the tense and vowel harmony of the verb as in (1). The relative markers (Who, that, and etc.) commonly used in English, are not used as such in Turkmen. In Table 1, the suffixes applied in subject RCs with verbs of different tenses and vowel harmonies are presented and, in the examples, the relative clauses including them are bolded.

Table 1
Suffixes of subject relative clauses

Verb stem	Positive			Negative		
	Present	Past	Future	Present	Past	Future
-mak	-ýan	-an	-jak	-maýan	-madyk	-majak
-mek	-ýän	-en	-jek	-meýän	-medik	-mejek

Aşgabatdan gelýän adamlar biziň kafemizde naharlanýarlar.(1)

Ashgabat-from coming people our cafe- (they) eat.

"**The people who are coming from Ashgabat** usually eat at our cafe."

(2) **Tejenden gelen adamlar** köp iýdiler.
Tejen-from-came-people-much-(they) ate
The people who came from Tejen ate a lot.

On the other hand, the noun being modified is not always the subject of the relative clause, but sometimes it is the direct object of a RC, as in "the money that he borrowed." To convey this in Turkmen, the appropriate possessive suffix is added to the noun being modified for example in (3) the suffix, *-yň,* is added to show the accusative case of *okuwçylaryň***.** The "owner" of the modified

INTERNATIONAL JOURNAL OF
Practical and Pedagogical Issues in English Education
ISSN: 2980-9533
Arad Institute of Higher Education

noun may also be included, in genitive case, but is not necessary (e.g., in (3), - *iň* is added to *Seniň,***)**. Table 2 shows the genitive case suffixes that are applied to nouns based on their phonetic systems.

Table 2
Suffixes of genitive case

Case	Vowel Endings	Consonant Endings
Genitive	**-nyň, -niň (-nuň, -nüň)**	**-yň, -iň (-uň, -üň)**

(3) Sen**iň** okadýan okuwçylar**yň** ýaman samsykdyr!
The students that you teach are so stupid!
(4) Meniň iýen kökä**m** gaty süýjüdi.
The cookie that I ate was delicious.

The Study

The current study has attempted to investigate the difficulty Turkmen-speaking children may experience in the comprehension of two types of relative clauses (subject and object). To this end, we examined the predictions of each hypothesis mentioned above: SDH, LDH, WDH. In the following specific predictions of each complexity merit with reference to sentences (5and 6) are outlined:

(5) CP **[**Tejenden IP [-- VP [gelen]]] adamlar
Tejen-from -- came PAST people-plural
The people who came from Tejen

In (2a) that is a subject relative clause, the linear distance between the head noun (*adamlar*) and the gap is one word (*gelan*), but the structural distance between them is 2 nodes (CP and IP). The word order within the relative clause is identical to the canonical word order of Turkmen – SOV.

(6) CP **[**Seniň IP [VP [okadýan] --]] okuwçylaryň
You-GEN teach-PRES-- student-plural
The students that you teach

In the object RC (6) there is no linear distance between the head noun and the gap, the structural distance of them is two nodes, i.e., CP and IP. The word order is not canonical, i.e., OSV. The contrasting predictions of each of the above theoretical predictions are presented in Table 1.

INTERNATIONAL JOURNAL OF
Practical and Pedagogical Issues in English Education
ISSN: 2980-9533
Arad Institute of Higher Education

Table 1
Linear and structural distance between the head and the gap and the word order in the two RC types

Hypothesis	*Subject RCs*	*Object RCs*	*Prediction*
LDH	1	0	Obj > Sub
SDH	2	2	Obj= Sub
WDH	canonical	Non-canonical	Obj > Sub

Note: ‘‘>’’ means less dificult.

Method

Participants

All the participants of the present study were bilingual Turkmen and Persian speaking children whose mother tongue is Turkmen but their formal language is Persian. They were at 41 to 78 months of age. They were recruited for this study from one day care and a primary school in Gonbade Kavoos of Iran. The sample was divided into four groups of age, the 3- to 4-year-old age group (3;5–4;0, Mean age 3;7) included 10 participants, the 4- to 5-year-old age group (4;1–3;9, Mean age 4) consisted of 10 participants, the 5- to 6-year-old age group (4;11–5;7, Mean age 4;9) had 9 participants, and the 6- to 7-year-old age group (6;0-6;6, Mean age 6;3) consisted of 11 children. The whole children participated in this study were normally developing ones and no language impairments, neurological difficulties, and social, behavioral or hearing deficits were noted among them.

Instruments

A picture selection task was performed by the participants. The material used was a booklet consisted of 15 items: 5 subject-, object- RCs, and five fillers (see the Appendix). There were three pictures on each page of the test booklet that were presented vertically and the participants were supposed to choose the picture that matched the sentence read to them by the experimenter. In all the RCs verbs were in the present tense, noun phrases were animate to control for possible animacy effects that can have effect on children's acquisition (e.g., Brandt, Kidd, Lieven, and Tomasello, 2009; Correa, 1995). Therefore, having the different predictions of the processing theories mentioned above, it was essential to test children only on animate noun phrases. Like English, in Turkmen language also verbs agree with the subject in person and number, so to factor out the cues of agreement the RCs had the same person and number. In Figure 1, an example of the experimental booklet is shown.

INTERNATIONAL JOURNAL OF
Practical and Pedagogical Issues in English Education
ISSN: 2980-9533
Arad Institute of Higher Education

Figure1. Sample pictures used for the item "The cat loves the woman."

Procedure

All the participants were tested in a single experimental session. Children were tested individually and the test took about 15 minutes for each child. At the onset of the session, the booklet was shown to the children and the experimenter told them that after hearing a sentence read out by the experimenter, they should choose a picture that matches the sentence best. Two trial items were provided to the participant to make sure that the child has understood the experimental procedure. During the practice if they had wrong answers, feedback on the responses was provided. But during the entire session there was no feedback to the answers and only if it was requested by the child, there was one repetition.

Results

Data collected through the experiment were first scored as ether correct or incorrect. If they pointed to the correct picture their score on that item was one, but in case of choosing a wrong picture they received zero point. The participants' correct performance is presented first in Table

INTERNATIONAL JOURNAL OF
Practical and Pedagogical Issues in English Education
ISSN: 2980-9533
Arad Institute of Higher Education

2. The means and standard deviations of each age group's performance on each sentence type are presented in Table 2. The table indicates that the children's performance improved with age on the two RC types. To analyze the data, a 2 × 4 repeated measures analysis of variance (ANOVA) among the two subject and object RC Types and the four age groups was implemented. A main effect for Age Group, $F = 2.112$, $p < .001$, a main effect for RC Type, $F = 193.737$, $p < .001$, but no RC Type by Age interaction, $F = 26.489$, $p < .001$. To identify the source of the main effects, post hoc analysis was performed. Regarding the RC type variable, LSD post hoc results revealed that, subject RCs (Mean= 3.88) were learned better than object RCs (Mean= 3.35), i.e., subject RCs > object RCs.

Table 2
Descriptive statistics

Age group (years)	Age group (months)		Subject RC	Object RC
3-4	41 to 48 months	Mean	3	2.20
	(N=10)	SD	1.15	0.78
4-5	49 to 57 months	Mean	3.20	2.60
	(N=10)	SD	0.42	0.51
5–6	59 to 67 months	Mean	4.30	3.60
	(N=10)	SD	0.48	0.51
6–7	72 to 78 months	Mean	4.83	4.75
	(N=12)	SD	0.38	0.45
	Total	Mean	3.88	3.35
	(N=42)	SD	1.01	1.16

Based on Table 3, The comparison among the age groups that was made using the post hoc analysis showed indicated that the difference among the performance of the 6-7- year-old age group and the 3- to 4- and the 4- to 5-year-old age groups was significant, but The post, but there was not a significant difference between the 6-7- year-old and the 5- 6-year-old groups.

Table 3
The difference among the age groups

Age group	3–4	4–5	5–6	6–7
6-7	P<.01**	P=.002**	P=.123	-
5-6	P<.001***	P=.253		
4-5	P<.01**			
3-4	-			

Note: *p5.05; **p5.01; ***p5.001.

In order to identify any developmental trend, the performance of each age group was analyzed. To this end, a series of one- way ANOVAs with LSD post hoc tests were done and the performance of each group on each RC type were compared. A summary of results presented in Table 4, showed

INTERNATIONAL JOURNAL OF
Practical and Pedagogical Issues in English Education
ISSN: 2980-9533
Arad Institute of Higher Education

that, with the exception of the 3- to 4-year-old age group, the participants performed significantly better on the subject RCs than on the object RCs.

Table 4
The difference among the three RC types

Age group	Subject RC vs. Object RC
3-4	P=.112
4-5	P=.002**
5-6	P=.006**
6-7	P=.025*

Error analysis

Under the assumption that children's processing strategies may be affected by their errors, an error analysis was conducted to investigate any significant effects. A primary analysis of the children's error patterns on the subject RCs showed that there was not any significant pattern; the participants overall performed well on subject RCs, and pictures were chosen on random when they could not interpret them correctly. Therefore, here we only report on the participants' errors on the object RCs.

The distribution of the main error types for the participants' performance on the object RCs are shown in Table 5. Generally, children pointed to the correct picture on 60% of occasions. On 40% occasions, they interpreted the object RC incorrectly and chose the wrong picture. However, the prevalence of the errors diminished over development due to age range, from 60% in the youngest group to 35% in the eldest group.

Table 5
The percentage of participants' errors on object RCs

Age group (years)	Age group (months)	Correct	Incorrect
3-4	41to 48 months (N=10)	40.12%	59.88%
4-5	49 to 57 months (N=10)	44.55%	55.45%
5-6	59 to 67 months (N=10)	57.89%	42.11%
6-7	72 to 78 months (N=12)	64.72%	35.28%
	Total(N=42)	60.22%	39.78%

INTERNATIONAL JOURNAL OF
Practical and Pedagogical Issues in English Education
ISSN: 2980-9533
Arad Institute of Higher Education

Discussion

In the present study the comprehension of relative clauses in Turkmen-Persian speaking children aged 3 to 7 was investigated. Turkmen language has some typological characteristics that makes it an interesting data point in the field of research on relative clauses' complexity. Like East-Asian languages such as Japanese and Korean, it is a head final language; however, like European languages such as German and English, it is a pre nominal language with relative clauses that come before the verb. The two broad language types have been shown to have different features in researches investigating RCs. We particularly examined the predictions of the three hypotheses proposed to sentence complexity (LDH, SDH, and WDH), which are evaluated against our obtained data here.

The results indicated that, with the exception of the youngest children in this study (the 3- to 4-year-olds), the children found subject RCs easier to interpret than the object RCs. This finding is consistent with the predictions made by one of the theoretical approaches under investigation, i.e., WDH, but it is not in line with the other two proposals, i.e., LDH and SDH. The WDH hypothesis argues that the processing difficulty is predictable based on whether the word order in the RC compare to the one of the corresponding language or not. In the case of Turkmen, subject RCs but not the object RCs have the canonical word order of the language (see Table 1), so they are supposed to be comprehended earlier than the later ones. A prediction that was supported by our results in the current study.

On the contrary, the finding of this study did not support the proposal suggested by the LDH hypotheses. As predicted by the LDH, the less the distance between the filler and the gap, the easier the RC to be acquired. However, based on the result of the present study, despite the subject RCs of Turkmen have more linear distance between the head and the gap (see Table 1), but they were comprehended by the children better than the object RCs.

This result is also inconsistent with the SDH hypothesis. Based on the SDH, if in two RC types there are the same number of the nodes between the gap and the head of the relative clause, then both of the RCs should be comprehended alike. In other words, since in Turkmen language the structural distance for both subject and object RCs are the same (2 nodes, see Table 1), so the two RCs are supposed to be comprehended equally, but on the contrary, the children's performance on the subject RCs outperformed their performance on the object RCs.

One reason we may suggest for the inconsistencies observed between the result of this experiment and the claims made by the LDH and SDH hypothesis again can be the stronger effect of the WDH than the other two structural hypotheses.

The findings of the present study raise an important question regarding the acquisition of relative clauses in Turkmen. It was observed that Turkmen exhibits a similar pattern to Indo-European languages, where subject relative clauses are comprehended earlier than object relative clauses. However, recent studies by Brandt et al. (2009) and Kidd et al. (2007) have shown that the processing order of subject and object relative clauses is not always consistent. These studies have provided evidence that the asymmetry between subject and object relative clauses diminishes

when object relative clauses adhere to discourse conditions that typically lead to their use. For example, when object relative clauses involve a pronominal subject and an inanimate head noun, such as "It is the application that I usually use" (compared to "This is the rabbit that the child hugged"). While our experiment only focused on animate noun phrases, it remains to be seen if a similar effect exists in Turkmen. Additionally, the processing preferences of children for other types of relative clauses, such as genitive, indirect object, and object of preposition relative clauses, are still unclear and require further research to explore their processing complexity (Brandt et al., 2009; Kidd et al., 2007).

References

Arnon, I. (2010). Rethinking child difficulty: The effect of NP type on children's processing of relative clauses in Hebrew. Journal of Child Language, 37, 27–57.

Bates, E., & MacWhinney, B. (1982). Functionalist approaches to grammar. In E. Wanner & L. Gleitman (Eds.), Child language: The state of the art (pp. 173–218). New York: Cambridge University Pres.

Bates, E., & MacWhinney, B. (1989). Functionalism and the competition model. In B. MacWhinney & E. Bates (Eds.), The crosslinguistic study of sentence processing (pp. 3–73). New York: Cambridge University Press.

Bever, T. G. (1970). The cognitive basis for linguistic structures. In J. R. Hayes (Ed.), Cognition and the development of language. New York: Wiley.

Brandt, S., Kidd, E., Lieven, E., & Tomasello, M. (2009). The discourse bases of relativization: An investigation of young German and English-speaking children's comprehension of relative clauses. Cognitive Linguistics, 20, 539–570.

Collins, C. (1994). Economy of derivation and the Generalized Proper Binding Condition. *Linguistic Inquiry*, 23, 45-61.

Correa, L. M. (1995). An alternative assessment of children's comprehension of relative clauses. Journal of Psycholinguistic Research, 24, 183–203.

Courtney, E. H. (2006). Adult and child production of Quechua relative clauses. First Language, 26, 317–338.

Crain, S., McKee, C. & Emiliani, M. (1990). Visiting relatives in Italy. In L. Frazier & J. de Villiers (eds), Language processing and language acquisition, 335–56. Dordrecht: Kluwer.

de Villiers, J. G., Tager Flusberg, H. B., Hakuta, K. & Cohen, M. (1979). Children's comprehension of relative clauses. Journal of Psycholinguistic Research 8(5), 499–518.

Diessel, H., & Tomasello, M. (2005). A new look at the acquisition of relative clauses. Language, 81, 882-906.

Doughty, C. (1991). Second language instruction does make a difference: Evidence from an empirical study of SL relativization. *Studies in Second Language Acquisition,13,* 431-469.

Flynn, S. & Lust, B. (1980). Acquisition of relative clauses: developmental changes in their heads. *Cornell Working Papers in Linguistics* 1, 33-45.

Gass, S. (1979). Language transfer and universal grammatical relations. In S. M. Gass, & L. Selinker (2001). *Second language acquisition: An introductory course (2nd edition)* (pp. 146-147). Mahwah, NJ: Erlbaum.

Gibson, E. (1998). Linguistic complexity: locality of syntactic dependencies. *Cognition, 69,* 1- 76.

Gibson, E., Desmet, T., Grodner, D., Watson, D., & Ko, K. (2005). Reading relative clauses in English. *Cognitive Linguistics, 16,* 313–353.

Gibson, E., & Schutze, C. (1999). Disambiguation preferences in noun phrase conjunction do not mirror corpus frequency. *Journal of Memory and Language, 40,* 263-279.

Goodluck, H. & Tavakolian, S. (1982). Competence and processing in children's grammar of relative clauses. *Cognition* 16, 1-28.

Hamburger, H. & Crain, S. (1982). Relative acquisition. In S. Kuczaj (ed.), Language development, vol.1 : Syntax and semantics, 245–74. Hillsdale : NJ : Erlbaum.

Hamilton, R. (1995). The noun phrase accessibility hierarchy in SLA: Determining the basis for its developmental effects. In W. O'Grady (1999). Toward a new nativism. *Studies in Second Language Acquisition, 21,* 621-633.

Hawkins, R. (1989). Do second language learners acquire restrictive relative clauses on the basis of relational or configurational information? The acquisition of French subject, direct object, and genitive restrictive clauses by language learners. *Second Language Research, 5,* 156-188.

Hawkins, J. (1999). Processing complexity and filler-gap dependencies across grammars. *Language, 75,* 244-285.

Izumi, S. (2003). Processing difficulty in comprehension and production of relative clauses by learners of English as a second language. *Language Learning*, 53, 285-323.

Kidd, E., Brandt, S., Lieven, E., & Tomasello, M. (2007). Object relatives made easy: A crosslinguistic comparison of the constraints influencing young children's processing of relative clauses. Language and Cognitive Processes, 22, 860–897.

Labelle, M. (1990). Predication, Wh-movement and the development of relative clauses. *Language Acquisition*. 1, 95-119.

Labelle, M. (1996). The acquisition of relative clauses: movement or no movement? *Language Acquisition* 5, 65-82.

Lebeaux, D. (1990). The grammatical nature of the acquisition sequence: adjoin-a and the formation of relative clauses. In Frazier, L. & de Villiers, J. (eds), *Language processing and language acquisition*. Dordrecht: Kluwer.

MacDonald, M. C., & Christiansen, M. (2002). Reassessing working memory: comment on Just and Carpenter (1992) and Waters and Caplan (1999). *Psychological Review, 109*, 35-54.

MacWhinney, B. & Pleh, C. (1988). The processing of restrictive relative clauses in Hungarian. *Cognition, 29*, 95–141.

O'Grady, W (1997). *Syntactic Development*. Chicago: University of Chicago Press.

O'Grady, W. (1999). Toward a new nativism. *Studies in Second Language Acquisition, 21*, 621-633.

O'Grady, W., Lee, M., Choo, M. (2003). A subject-object asymmetry in the acquisition of relative clauses in Korean as a second language. *Studies in Second Language Acquisition, 25*, 433-448.

Ozeki, H., & Shirai, Y. (2010). Semantic bias in the acquisition of relative clauses in Japanese. Journal of Child Language, 37, 197–215.

Sheldon, A. (1974). The role of parallel functions in the acquisition of relative clauses in English. Journal of Verbal Learning and Verbal Behavior 13, 272–81.

Slobin, D. (1971). Developmental psycholinguistics. In W. O. Dingwall (ed.), A survey of linguistic science, 298–411. College Park, MD: University of Maryland Linguistics Program.

Slobin, D. I., & Bever, T. G. (1982). Children use canonical sentence schemas: A crosslinguistic study of word order and inflections. Cognition, 12, 229–265.

Tabor, W., Juliano, C., & Tanenhaus, M. K. (1997). Parsing in a dynamical system: an attractor-based account of the interaction of lexical and structural constraints in sentence processing. *Language & Cognitive Processes, 12*, 211-272.

Tarollo, F., & Myhill, J. (1983). Interference and natural language processing in relative clauses and wh-questions. *Studies in Second Language Acquisition, 14*, 39-70.

Tavakolian, S. L. (1981). The conjoined-clause analysis of relative clauses. In S. L. Tavakolian (ed.), Language acquisition and linguistic theory, 165–86. Cambridge, MA: MIT Press.

Townsend, D. J., & Bever, T. G. (2001). Sentence comprehension: The integration of habits and rules. Cambridge, MA: MIT Press.

Xu, Y. (2009). The syntax, processing and second language acquisition of Chinese relative clauses. (Doctoral Dissertation). The University of Arizona.

Yano, M., Tateyama, Y., & Sakamoto, T. (2014). Processing of Japanese cleft constructions in context: Evidence from event-related brain potentials. *Journal of Psycholinguistic Research*, doi:10.1007/ s10936-014-9294-6.