# The Acquisition of Word Order of Ditransitive Constructions Based on Typological Perspective

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## ABSTRACT

In this article, the researchers investigated children's order preference of ditransitive constructions in Japanese, German, Mandarin and Cantonese based on typological conclusions. The researchers found consistency in order preferences between children and worldwide languages. ARTV (linear sequence of Agent-Recepient-Theme-Verb) was more preferred by children and most languages in the world than ATRV (linear sequence of Agent-Theme-Recepient-Verb); similarly, AVRT (linear sequence of Agent-Verb-Recepient-Theme) was more preferred by children and worldwide languages than AVTR (linear sequence of Agent-Verb-Theme-Recepient). It is believed that this consistency heralds the existence of general cognitive abilities and innate cognitive mechanisms. Besides, data indicated that language input was a necessary and inadequate condition for the acquisition of ditransitive order. Thus, the researchers hold the point that children gradually acquire the order of the ditransitive constructions in interactive use, and they are processing language knowledge from the input based on the general cognitive abilities and innate cognitive mechanisms.

*Keywords: ditransitive constructions, order preferences, language acquisition, typological perspective*

## I. INTRODUCTION

The ditransitive constructions mainly express conscious ownership transfer events, involving the three semantic roles of agent (A), theme (T) and recipient (R). These constructions are typical samples for studying children's order preferences because of their flexible order. They usually take two objects, but sometimes one of these objects can be omitted, and the order of objects can be reversed in some languages. Although amounts of studies are concentrated on children's early acquisition of ditransitive constructions, few studies have directly examined the acquisition of ditransitive order. Exceptions are mainly including the studies of Suzuki et al. (1999), Sugisaki & Isobe (2001), Cho et al. (2002), Hohle et al. (2013), Yongxian Liang (2017) and Sauerman & Hohle (2018),etc. However, these studies drew conclusions just basing on one single language sample, so they could not answer the question if most children in the world used the same mechanism to acquire ditransitive order. With the deepening of typological research on ditransitive order, maybe now we have sought the new way to solve this problem. That's to say, we can adopt the analysis model of cross-linguistic comparison of typology and draw on the typological conclusions about the ditransitive order to explore the common characteristics of children's word order acquisition and the influencing factors behind it.

From the perspective of typologists, there were mainly four types of ditransitive order in the worldwide languages, namely RTV, TRV, VRT and VTR. In general, RTV and TRV can coexist in the same language, and the same applies to VRT and VTR. Typological statistics showed that RTV was more popular than TRV in most languages in the world and VRT was more preferred than VTR in worldwide languages. The popularity of the four order types from high to low was: RTV>VRT>VTR>TRV. Some typologists attributed these order preferences of worldwide languages to two principles, namely the identifiability hierarchy iconicity and semantic proximity iconicity.

Now we wonder whether the order preferences of children whose mother tongues are Japanese, German, Mandarin and Cantonese are consistent with that of most languages in the world. Also we wonder how children use these two principles in the process of acquiring ditransitive order. In order to find answers to these questions, this article analyzes the children's acquisition data of Japanese, German, Mandarin and Cantonese under the consideration of the existing typological research conclusions to explore the problem of children's acquisition mechanism of ditransitive order.

## II. DITRANSITIVE CONSTRUCTIONS

We only focus on the ditransitive constructions with two objects that have the same case marks, considering that the asymmetry of the case marks may affect children's order preferences. The ditransitive constructions with order of ARTV and ATRV in Japanese and German, and double-object constructions with AVRT order in both Mandarin and Cantonese, and also the inverted double-object construction with AVTR order in Cantonese are within the scope of our study.

The order of ditransitive constructions in Japanese and German is relatively free.

The ditransitive constructions in Japanese are as follows:

(1)Taroo-ga    Hanako-ni    nimotu-o    okut-ta. (ARTV)

Taroo-Nom  Hanako-Dat package-Acc  send-Pst

(2)Taroo-ga    nimotu-o    Hanako-ni    okut-ta. (ATRV)

Taroo-Nom nimotu-Acc Hanako-Dat  send-Pst

"Taro sent Hanako a package." (Miyagawa and Tsujioka 2004: 5)

The ditransitive constructions in German are as follows:

(1) Der  Mann hat dem  Jungen das    Buch gegeben. (ARTV)

the.Nom  man  has the.Dat  boy  the.Acc  book given

"the man gave the boy the book."

(2) Der  Mann hat das    Buch dem  Jungen gegeben. (ATRV)

the.Nom  man  has the.Acc  book the.Dat  boy given

"The man gave the book to the boy."(Sauerman & Hohle 2018:2)

The double-object construction in Mandarin is:

(1) yue1han4 gei3 le ma3li4    yi4 ben3 shu1. (AVRT)

John        gave PFV Mary    one  CL    book.

"John gave Mary a book."

The double-object construction and the inverted double-object construction in Cantonese are as follows:

(1) Ngo5 bei2 lei1 bun2 syu1 lei5 aa1. (double-object construction, AVRT)

I      give DET CL   book you SFP

"I give you this book."

(2)Ngo5 bei2 zo2    cin2  keoi5. (inverted doubleobject construction, AVTR)

I    give  PERF    money  3sg

"I have given money to her/him." (Angel Chan 2010:67-68)

## III. DITRANSITIVE CONSTRUCTIONS FROM THE PERSPECTIVE OF TYPOLOGY

Lu (2009) suggested that it was identifiability hierarchy iconicity and semantic proximity iconicity that constrained the formation and distribution of ditransitive order. The former was a pragmatic factor and the latter was a semantic factor. The identifiability hierarchy iconicity can be defined as the more easily that a component or a category can be identified, then the more likely it tend to be at the front of a linear sequence. This principle requires that the linear order of agent, recipient and theme from left to right is agent>recipient>theme. The semantic proximity iconicity stipulates that components with close semantic relations are also close to each other in a linear sequence. Verb and theme have the closest semantic relationship, so in a linear sequence, they should be close to each other to form the "VT" or "TV" sequences. He examined the distribution of ditransitive order by 128 minority languages in China, as shown in the "Table I" below:

TABLE I.        LANGUAGE DISTRIBUTION OF DITRANSITIVE ORDER OF MINORITY LANGUAGES IN CHINA

| V at the end | | V at the beginning | | V in the middle | | uncertain |
|---|---|---|---|---|---|---|
| RTV | TRV | VRT | VTR | RVT | TVR | |
| 45 | 6 | 25 | 10 | 0 | 0 | 42 |

In his opinion, the principles we mentioned above had effect on the order preferences of worldwide languages. First, RTV was the most widely distributed order of ditransitive constructions in worldwide languages, because it obeyed both two principles. However, TRV violated both principles, so its distribution was very limited. Second, VRT obeyed identifiability hierarchy iconicity, and VTR followed semantic proximity iconicity. Because the role of pragmatic factors far exceeded the role of semantic factors in the process of affecting the distribution of the ditransitive order in languages, thus VRT was preferred

over VTR in most languages in the world. Finally, languages with RVT and TVR as the basic word order of ditransitive constructions had not been found in statistics. One possible reason was that the two semantic roles of recipient and theme had a strong tendency to appear on the same side of the verb.

Based on the conclusions above, the word order of ditransitive constructions examined in this article and the principles they obey can be summarized as shown in "Table II".

TABLE II. DITRANSITIVE ORDER INVOLVED IN THIS STUDY AND ITS RESTRICTIVE RULES

|  | Ditransitive Constructions | Word Order | identifiability hierarchy | semantic proximity |
|---|---|---|---|---|
| Japanese & German | Ditransitive | ARTV | + | + |
|  |  | ATRV | − | − |
| Mandarin | Double-object | AVRT | + | − |
| Cantonese | Double-object | AVRT | + | − |
|  | Inverted double-object | AVTR | − | + |

a. "+" means to obey the principle, "" means to violate the principle.

In short, the ditransitive order is generally subject to the two principles of identifiability hierarchy iconicity and semantic proximity iconicity. Once the impacts of these two principles conflict, the ditransitive constructions of most languages tends to obey identifiability hierarchy iconicity, reflected the pragmatic>semantic competition mechanism which means pragmatic factor has a greater effect on the distribution of ditransitive order in languages than semantic factors.

## IV. WORD ORDER PREFERENCE OF CHILDREN IN THE ACQUISITION OF DITRANSITIVE CONSTRUCTIONS

### A. Acquisition preference of ARTV and ATRV

Sugisaki & Isobe (2001) investigated the order preferences of twenty Japanese children aged 3, 11-5, 0 by truth-value verification task. The results showed that Japanese children aged 3-5 understood ARTV significantly better than ATRV. It indicates that children prefer ARTV comparing with ATRV in the acquisition of ditransitive constructions.

Sauerman & Hohle (2018) examined the impact of animacy, definiteness, givenness and type of referring expression on the ordering of double objects in the spontaneous speech of German-speaking two to four-year-old children and the child-directed speech of their mothers. The results showed remarkable parallels between children's and adults' ordering of objects in utterances with ditransitive verbs. First, the majority of these utterances followed the ARTV order in both groups with stable proportions across age. This means that children and adults prefer the ARTV order. Second, there were also high similarities between children's and adults' production concerning the dimensions that are relevant for the ordering of the objects. Most utterances of children and adults followed the pattern of placing a given, definite or pronominal object in the first object

position. This indicates that children and adults tend to obey the principle of identifiability hierarchy iconicity which requires components of high degree of identifiability such as given, definite or pronominal objects to be precede those with low degree of identifiability such as new, indefinite or nominal objects in the linear sequence.

### B. Acquisition preference of AVRT and AVTR

According to Zou (2012), Mandarin children interpreted the noun before "Gěi" as agent or theme, and interpreted the noun after this verb as recipient or theme. To investigate which semantic role children prefer, Liang (2017) investigated the order comprehension preference of double-object construction with "Gěi" of 72 Mandarin children by picture selection task. She found that children aged 3-5 had a clear understanding of double object construction, they interpreted this construction mainly according to its typical order AVRT, it meant that children tended to interpret the noun before "Gěi" as agent, and to interpret the one after "Gěi" as the recipient. She assumed that Mandarin children preferred the order of AVRT and obeyed the identifiablity hierarchy iconicity when understanding double-object sentences. This principle defines the degree of identifiability of semantic roles from high to low as agent>recipient>theme. So it is more likely to happened for children to interpret the noun before "Gěi" as agent when having to choose between the semantic roles of agent and theme. And also it is more likely to happen for children to interpret the noun after "Gěi" as recipient when having to choose between recipient and theme.

The order of the inverted double-object construction with "bei2" in Cantonese is AVTR. We examined spontaneous speech of eight Cantonese children aged 1;05-3;08 from the Cantonese corpus (CANCORP, Lee et al., 1996), and found that Cantonese children

produced the non-canonical double-object construction whose order is AVRT before they acquired the target construction with AVTR order.

TABLE III.    OUTPUT OF "BEI2-R-T" AND "BEI2-T-R" FOR EIGHT CANTONESE CHILDREN

| Name | Age | Bei2-R-T | | Bei2-T-R | |
|---|---|---|---|---|---|
| | | *Time* | *Quantity* | *Time* | *Quantity* |
| CKT | 1;05.22～2;07.22 | 2;00.09 | 2 | 2;02.15 | 2 |
| MHZ | 1;07.00～2;08.06 | —— | 0 | 1;10.10 | 1 |
| CCC | 1;10.08～2;10.27 | —— | 0 | 2;10.13 | 1 |
| CGK | 1;11.01～2;09.09 | 2;03.11 | 6 | 2;03.11 | 5 |
| ITF | 2;02.10～3;02.18 | 2;03.30 | 4 | 2;04.27 | 4 |
| WBH | 2;03.23～3;04.08 | 2;09.19 | 2 | —— | 0 |
| HHC | 2;04.08～3;04.14 | 2;10.13 | 1 | —— | 0 |
| LLY | 2;08.10～3;08.09 | 2;11.01 | 5 | 3;01.13 | 4 |
| Total | | | 20 | | 17 |

The data shows that five of the eight children produced "bei2-R-T" earlier than the target construction "bei2-T-R", and another child produced both constructions simultaneously. Besides, "bei2-R-T" has a larger amount of output than that of "bei2-T-R". This is incredible because "bei2-T-R"is the dominant order in adult input, yet Cantonese children ignore the adult input and give more attention to"bei2-R-T" .It seems that Cantonese children prefer AVRT over AVTR. As we know, AVRT obeys the identifiability hierarchy iconicity, while AVTR obeys the semantic proximity iconicity, AVRT is preferred implying the pragmatic>semantic competition mechanism is followed by Cantonese children.

## V.    FACTORS AFFECTING CHILDREN'S ACQUISITION OF DITRANSITIVE ORDER

### A. *The role of adult input*

As we all know, language input plays an important role in language acquisition. Zou (2012) analyzed the spontaneous speech of a Mandarin child aged 1-4, she found that the amount of output of ditransitive constructions with AVRT order was highly correlated with that of adult input. We believe that the adult input attributes to children's preference of the AVRT order in Mandarin. According to Suzuki et al. (1999) and Sauerman & Hohle, the amount of ARTV in adult input far exceeded that of ATRV in Japanese and German. And we believe that ARTV's quantitative advantage in input is what causes ARTV preference. Although we can see that both the principles and language input affect the acquisition of ditransitive order in Mandarin, Japanese and German, it is difficult to determine which factor plays a greater role in children's acquisition of ditransitive order.

Fortunately, the input in Cantonese conflicts with the role of the pragmatic>semantic competition mechanism. Thus we can see which factor has the greater influence by examining the Cantonese children's acquisition of the target construction "bei2-T-R" .We assume that if Cantonese children are mainly influenced by language input in the process of acquiring this construction, they will prefer AVTR; if they are affected by the pragmatic>semantic competition mechanism followed by most languages, they will prefer AVRT. Data from Section 4.2 shows that Cantonese children prefer "bei2-R-T", it indicates that the pragmatic>semantic competition mechanism has a greater influence comparing with language input.

Generally, we think that language input plays an important role in children's language acquisition, yet the acquisition of the target construction "bei2-T-R" by Cantonese children reveals another perspective that the role of input is not decisive, and the pragmatic>semantic competition mechanism seems to play a more important role in this acquisition process. Therefore, we infer that language input is a necessary and inadequate condition for children's acquisition of ditransitive order, and that Children need adult input in this acquisition process, but for adults' input, children will not "take it all".

### B. *General cognitive ability and innate cognitive mechanism*

Based on a comparative analysis of typological and acquired research data, we found that children's order preferences were consistent with that of most languages in the world. That is, ARTV was more preferred by children and most languages than ATRV; similarly, AVRT was more preferred by children and worldwide languages than AVTR. This consistency shows that the two principles of identifiability hierarchy iconicity and semantic proximity iconicity affect the order preferences of children and worldwide languages in the same way. Children are sensitive to the way these two principles work, and they tend to prioritize the acquisition of ARTV order that obeys both principles. When the impact of these two principles conflict, the child's ordering acquisition reflects the pragmatic>semantic competition mechanism. "Table IV" shows the consistency of the order preferences of

children and most languages and the consistency of the way the two principles affect them.

TABLE IV.    CONSISTENCY OF ORDER PREFERENCES AND PRINCIPLES AFFECTING METHODS

| | Ordering preferences | | Principles Affecting Methods | |
|---|---|---|---|---|
| | *ARTV& ATRV* | *AVRT & AVTR* | *Identifiability iconicity* | *Semantic proximity* |
| Languages | ARTV | AVRT | + | + |
| Children | ARTV | AVRT | + | − |

Now we wonder what the nature of the two principles is and we are curious why do they have more influence on children's ditransitive order acquisition than language input? Typologists regarded these two principles as cognitive principles. Based on this conclusion, we consider these two cognitive principles as the concrete manifestations of general cognitive ability and innate cognitive mechanism, because they have a greater influence in acquisition of ditransitive order than language input, and we believe that influencing factors higher than language input must be innate. In short ,we assume that the identifiability hierarchy iconicity and the semantic proximity iconicity are the concrete manifestations of this innate cognitive mechanism in the linear ordering of language components, and once the impacts of these two principles conflict, this cognitive mechanism shows pragmatic>semantic cognition tendency.

## VI.    CONCLUSION

Based on the above analysis, this article basically supports the used-based theory of language acquisition. We hold the point that children gradually acquire the word order of transitive constructions based on general cognitive ability and innate cognitive mechanism in interactive use. In the process of this ordering acquisition, children need adult language input, but they do not just take it all without thinking. Language input is a necessary and inadequate condition for children's acquisition of ditransitive constructions. It needs to be emphasized that this innate cognitive mechanism manifests itself in the linear ordering of linguistic components as the principle of identifiability hierarchy iconicity and semantic proximity iconicity, and once the impacts of these two principles conflict, it shows pragmatic>semantic cognition tendency.

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