

Transitivity and Unaccusativity in Child Japanese*

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Since Bowerman (1974) who observed that English-speaking children often misused intransitive verbs as transitives, children's errors on verb transitivity have been reported in many languages (e.g., see Berman, 1982, 1993 for Hebrew; Cheung, 1998 for Cantonese; Figueira, 1984 for Portuguese; Morikawa, 1989 for Japanese; Pye, 1985, 1994 for K'iche'). One of the central issues addressed in most studies involves the directionality of errors: whether children are more likely to overextend intransitive verbs or transitive verbs, or whether they equally overextend both. In spite of the existing data for each position (e.g., see Braine, Brody, Fisch, Weisberger, & Blum, 1990; Lord, 1979; Pinker, 1989), there seems to be little consensus on why such errors happen. The present study examines this directionality problem in the first language acquisition of Japanese in order to investigate why and how Japanese-speaking children make transitivity errors. In doing so, I will be concerned with verb unaccusativity, which plays a substantial role in current theories of syntax-semantics correspondences (e.g., Grimshaw, 1990; Hale & Keyser, 1986, 1987; Levin & Rappaport Hovav, 1992, 1995).

While certain classes of English verbs are used as both intransitive verbs and transitive verbs, Japanese does not allow transitive alternation with zero-derivation.¹ In Japanese, intransitive/transitive distinctions are manifested either as lexically separate entities like English 'kill' and 'die' or as a root suffixed with different morphology forming intransitive-transitive pairs as in (1).

(1)	<u>Intransitive</u>	<u>Transitive</u>
	nig-e-ru 'escape'	nig-as-u 'let escape'
	sim-ar-u 'close _{iv} '	sim-e-ru 'close _{tv} '
	kaku-re-ru 'hide _{iv} '	kaku-s-u 'hide _{tv} '
	ot-i-ru 'fall'	ot-os-u 'drop'

These paired verbs are only semi-productive, however. For example, both *nig-e-ru* 'escape' and *sim-ar-u* 'close' are intransitive; their transitive counterparts are *nig-as-u* 'let escape' and *sim-e-ru* 'close', respectively. The same morpheme *-e-* is used to indicate both intransitive as in *nig-e-ru* and transitive as in *sim-e-ru*. Jacobsen (1992, pp. 258-269) lists fifteen patterns of these paired verbs, with some idiosyncratic ones. Although there are a few productive patterns, considering the enormous number of irregular cases, it is likely that the child must record the transitivity of each lexical entry item by item.

Since paired verbs in Japanese mark transitivity by means of overt morphology, it is obvious that children do not receive enough positive evidence to overgeneralize intransitive to transitive or vice versa. However, transitivity errors

in child Japanese have been reported by Ito (1990), Morikawa (1989), and Nomura and Shirai (1996). What is common in these studies is the misuse of intransitive verbs as in (2), which seems to be compatible at least with the tendency observed in other languages (e.g., Berman, 1993; Bowerman, 1974, 1982; Figueira, 1984).

- (2) Moo oriru. (2;4)
 now get off
 'Now (I will) get off.'
 (intended meaning = 'Now let me off.') (from Ito, 1990)

The child used intransitive *oriru* 'get off' for transitive *orosu* 'let off' in (2) according to Ito (1990) whose judgments were made on the assumption that the dropped arguments and case-marking on them were those compatible with a transitive verb. Ito suggests that Japanese-speaking children go through a stage where they use intransitive verbs transitively, and this may continue until the age of 5 or 6. While he did not report overextension of transitive verbs at all, Nomura and Shirai (1996) observed such patterns as well in the spontaneous speech of the child they studied between the ages of 1;4 and 2;4. They posit that the errors are bi-directional and they occur due to the child's difficulties in lexical retrieval as suggested by Pinker (1989) and Pye (1994), among others. Nomura and Shirai (1996) suggest that the predominance of overextension of intransitive verbs may be due to input frequency. As intransitive verbs were more frequent in parental speech, the child may have used intransitive verbs more frequently than transitive verbs, and this may have resulted in the high ratio of intransitive overextension.

While the Japanese studies mentioned above analyzed children's spontaneous speech, it seems crucial to examine the errors in experimental situations as well. As Japanese allows argument ellipsis, it is necessary to recover the dropped argument(s) correctly for the examination of transitivity errors. However, this must be very difficult in some cases and the judgment is entirely up to the researchers in light of adult discourse in a particular situation. For example, Ito (1990) considered the child's utterance (2) as a request, 'please let me off'; however, this sentence may also be interpreted as the child's intention, 'I will get off'. Due to the argument drop, there is no way to examine whether the child's utterance aimed at a request or an intention. Although children's argument drop may be inevitable as it is natural in Japanese discourse, in experimental settings it is possible to attest children's errors on verbs in more discursively controlled circumstances, so that the judgments may be made in more objective ways.

What has not been investigated in the acquisition of Japanese transitivity is the involvement of the semantic properties of transitivity. The focus of this paper is on the semantic aspects of causation manifested in two types of intransitive verbs: unergative and unaccusative (e.g., Perlmutter 1978). In general, an unergative verb selects an agent-subject and an unaccusative verb a theme-

subject, and this distinction on the basis of semantic properties of verbs may also be manifested in syntax (for an overview, see Grimshaw, 1987). At the descriptive level, we observe that in English many unaccusative verbs alternate. For example, change of state verbs (e.g., *break*, *open*, etc.) and manner of motion verbs (e.g., *roll*, *bounce*, etc.) are used as transitive verbs as well. Narrowing down the semantic properties of verbs, Pinker (1989) proposes that one of the semantically cohesive subclasses for causative alternation in English consists of externally-caused change of state verbs such as *break* and *open*. According to Pinker (1989), children must be sensitive to the semantics for verb alternations whose subclasses are not clusters of verbs related by general cognitive similarity. In other words, in Pinker's view, the alternation is not dependent 'on the characteristic features of the event in the world that the verb can refer to, but on the aspects of the event that its semantic structure constrains' (p. 107).² While Japanese does not usually allow a causative alternation with zero-derivation, it is not unreasonable to predict that Japanese-speaking children are also sensitive to the semantically cohesive subclasses, and that their transitivity errors might somehow reflect them. In this study, I examine Japanese-speaking children's production of verbs in terms of unergative-unaccusative dichotomy,³ whose classifications and children's errors will be discussed in light of causation types in the following sections. As Japanese paired verbs include both unergative and unaccusative and their transitive counterparts, it is possible to compare children's performance on these two types under similar morphological conditions.

Experiment

Twenty-two Japanese-speaking children aged 3;5-4;11 (mean=4;2) served as subjects of the experiment. There were 10 three-year olds (mean=3;8) and 12 four-year olds (mean=4;6). All children lived in Tokyo area of Japan and had no consistent exposure to languages other than Japanese.

In order to elicit a verb from the child, an experimenter acted out a particular scene by using stuffed toys and props in a short story, frequently using onomatopoeia to denote a variety of events. Then, the child was asked to describe an event in response to a question *X-wa doo si-ta no?* 'As for X, what happened?' When the experimenter asked the question, he took up the toy or pointed at the props denoted by X so as to urge the child to talk about the event centering on X. It has been pointed out that question types--agent question 'What did X do?' and patient question 'What happened to X?'--effect children's choice of intransitive/transitive verbs (Braine et al., 1990). In order to avoid this problem, a neutral question *X-wa doo si-ta no?* was used, where the case information is suppressed by the topic marker *wa* and a predicate *doo suru* can be interpreted either as 'what to do' or 'what happens'.⁴

A total of twenty paired verbs were elicited from the children (Table 1). Half of the pairs included unergative verbs and the other half unaccusative verbs. In a story, an unergative verb was used for an action by an animate entity, and its

transitive counterpart for causer-causee relations between two animates. An unaccusative verb was used for an event pertaining to an inanimate entity, and its transitive counterpart was for an action by an animate entity to cause a change of state/location of an inanimate entity. The target verbs were elicited in a random order. The experimenter tried to elicit each verb until the child produced the target verb or its paired counterpart, but whenever the child appeared to be uncomfortable with the repeated questions, the experimenter went to the next verb. All subjects were tested individually in a quiet place, and all sessions were tape-recorded for later transcription. Each session lasted approximately 15 minutes.

Table 1. Target Verbs

Unergative Pairs		Unaccusative Pairs	
intransitive	transitive	intransitive	transitive
ok-i-ru 'get _{iv} up'	ok-os-u 'get _{tv} up'	ot-i-ru 'fall'	ot-os-u 'drop'
nak-u 'cry'	nak-as-u 'cause to cry'	koroga-r-u 'roll _{iv} '	koroga-s-u 'roll _{tv} '
kaku-re-ru 'hide _{iv} '	kaku-s-u 'hide _{tv} '	sizum-u 'sink _{iv} '	sizum-e-ru 'sink _{tv} '
no-r-u 'get on'	no-se-ru 'put on'	ak-u 'open _{iv} '	ak-e-ru 'open _{tv} '
or-i-ru 'get off'	or-os-u 'let off'	sim-ar-u 'close _{iv} '	sim-e-ru 'close _{tv} '

Results & Discussions

First, children's utterances irrelevant to my analysis were screened out. This excluded the cases where children did not answer an experimenter's question or answered 'I don't know', which leaves 380 cases for further analysis. Among these, children's utterances involving paired verbs⁵ (76.5%) were classified as either correct or inappropriate as shown in Table 2. As mentioned above, Japanese allows argument ellipsis, and many of the children's utterances were in fact lacking in argument NPs. Therefore, correct/inappropriate were classified on the basis of discourse context given in the experiment, unless the child produced the argument(s) of a verb to indicate grammatical relations. Correct cases were the target verbs used with appropriate transitivity. As Table 2 shows, the children were quite accurate on unergative verbs, whereas inappropriate utterances were observed in the transitive counterpart of unergative verbs and in unaccusative pairs, which were further classified into four categories: transitivity errors, causativization, passivization, and topic change, which I will look at one by one.

Table 2. Results on Paired Verbs

Target	<u>Unergative Pairs</u>		<u>Unaccusative Pairs</u>	
	intransitive	transitive	intransitive	transitive
Correct	101	31	52	54
Inappropriate Total	0	35	12	8
Transitivity Errors	0	3 (3)	8 (8)	1 (1)
Causativization	0	9 (8)	0	0
Passivization	0	0	4 (4)	0
Topic Change	0	23 (13)	0	7 (7)

Numbers in parentheses indicate the number of children.

Transitivity errors were the cases where the child used an intransitive verb in a transitive context and a transitive verb in an intransitive context. Such errors were observed in both unergative pairs and unaccusative pairs, although the proportion of the errors was only 21.9% in all inappropriate utterances. The results revealed that the children's errors were bi-directional in systematic ways. Overextension of intransitive verbs was almost completely restricted to unergative pairs. In contrast, overextension of transitive verbs was more common but was limited to transitive verbs whose intransitive counterpart was unaccusative.

The sentences in (3) and (4) exemplify the overextension of intransitive verbs.

- (3) Context: A dog hid a penguin.
 Question: As for the dog, what happened?
 Target verb: *kakusu* 'hide_{iv.}'
 Inu wa ne, kakureru. (4;11)
 dog top pcl hide_{iv.}
 'The dog hid.'
- (4) Context: A dog dropped a pencil.
 Question: As for the dog, what happened?
 Target verb: *otosu* 'drop'
 Okkot-tyat-ta. (4;10)
 fall-asp-pst
 '(The dog) fell.'

The child used unergative *kakureru* 'hide' for transitive *kakusu* 'hide' in (3), where an overt topic was used and is most naturally interpreted as an agent. Unaccusative overextension was observed as in (4), where intransitive *okkotiru* 'fall' (equivalent to *otiru*) was used for transitive *okkotosu* 'drop' (equivalent to *otosu*), but this is the only utterance classified as the overextension of an unaccusative verb. The other direction of overextension is exemplified in (5), where transitive *akeru* 'open' was used intransitively.

- (5) Context: A window opened (without an agent in the scene).
 Question: As for the window, what happened?
 Target verb: *aku* 'open_{iv.}'
 Ake-tyat-ta. (3;10)
 open_{tv.}-asp-pst
 '(It) open_{tv.} (the door).'

There was not a single instance of transitive overextension in unergative pairs. The directionality of overextension patterns seems to suggest that the children's transitivity errors reflect the unergative/unaccusative dichotomy. In order to account for the children's performance, I would like to express the semantic properties of unergative and unaccusative based on the notion of two types of causation: internal causation and external causation. According to Levin and Rappaport Hovav (1995), caused eventuality can be characterized as follows.

- (6) Internal causation: "... some property inherent to the argument of the verb [, which] is 'responsible' for bringing about the eventuality" (p. 91).

External causation: "... the existence of an 'external cause' with immediate control over bringing about the eventuality described by the verb ..." (p. 92).

For example, unergative *okiru* 'get up' is an internally caused verb, because the single argument of the verb is responsible for the event of getting up. Without an external force, the animate entity denoted by the argument may bring about the event. On the other hand, unaccusative *aku* 'open' does not have internal causation as the event of opening usually requires external cause such as natural force and agent; therefore, *aku* is an externally caused verb. Notice that this contrast in eventualities is a semantic one, as the contrast remains in their transitive counterparts. Even for transitive (causative) *okosu* 'get up', what is essentially responsible for bringing about the event is internal causation.

In the experiment, since all verbs in unergative pairs were internally caused verbs and those in unaccusative pairs were externally caused verbs, the children's transitivity errors are described in terms of the causation types. Overextension of intransitive verbs happened when the eventuality involved internal causation, and overextension of transitive verbs occurred only when the eventuality involved external causation. The question is why? I suggest that these reflect children's sensitivity to the causation types, and their strategy to express the cause according to (7).

- (7) Minimal Valency Strategy: Children prefer the simplest valency that expresses the cause.

For expressing causal events, the Minimal Valency Strategy tells Japanese-speaking children to use one and only one cause available in verb semantics. For an internally caused verb (i.e., unergative pairs), children may prefer to use an intransitive verb because its transitive counterpart involves an additional causation, which is not necessarily required for the event to occur. For an externally caused verb (i.e., unaccusative pairs), on the other hand, children may prefer to use a transitive verb because the causation is expressed only in a transitive sentence where the causer is manifested as a sentence subject. In the intransitive counterpart, the cause is not realized as an argument in syntax.⁶ These observations seem to be supported by the children's use of causativization and passivization.⁷

Causativization was observed only in unergative pairs, where the intransitive verb was used with the causative morpheme *-(s)ase-* as in (8).

- (8) a. Context: A dog got a cat up.
 Question: As for the dog, what happened?
 Target verb: *okosu* 'get up_{iv}.'
Oki-sase-te-ru no. (3;7)
Get_{iv}. up-caus-asp-prs pcl
 '(The dog) makes (the cat) get up.'
- b. Context: A rabbit let a penguin off from a box.
 Question: As for the rabbit, what happened?
 Target verb: *orosu* 'let off'
Ori-sasi-te age-ta no. (3;11)
get off-caus-asp aux-pst pcl
 '(The rabbit) made (the penguin) get off.'

The children causativized intransitive *okiru* 'get up' in (8a) and *oriru* 'get off' in (8b) to express the causative events. These utterances may be awkward in light of adult discourse in a given context, but the sentences are not ungrammatical. The causativization is possible because the unergative verbs involve internal causation. In (8a), for example, the patient entity 'the cat' has the potential for the voluntary action of getting up due to the internal causation inherent in it. There are two ways to express the event depicted in the context of (8a). One is simply using a transitive verb as the compatible linguistic form is available (i.e., *okosu* 'get up_{iv}.'), and the other is using an intransitive verb in a causativized form (i.e., *oki-sese-ru* 'get up_{iv}-cause'). The children's choice of causativization suggests that their device for transitivity is not limited to the use of transitive verbs, but also can involve causativization. Moreover, as the Minimal Valency Strategy predicts, the children's practice of restricting causativization to unergative verbs indicates their initial use of internal causation to describe the internally caused event. Since there is no internal cause in unaccusative events, causativization for

unaccusative verbs results in ungrammaticality (e.g., **aka-sase-ru* 'make (a window) open'), and the children never did so.

What happened to unaccusative pairs is, instead, passivization by which the children used transitive verbs with the passive morpheme *-(r)are-* as in (9).

- (9) a. Context: A window opened (without an agent in the scene).
Question: As for the window, what happened?
Target verb: *aku* 'open_{iv.}'
Ake-rare-tyat-ta. (4;5)
open_{tv.}-pass-asp-pst
'(The window) was opened.'
- b. Context: A door closed (without an agent in the scene).
Question: As for the door, what happened?
Target verb: *simaru* 'close_{iv.}'
Sime-rare-ta. (3;10)
close_{tv.}-pass-pst
'(The door) was closed.'

Although there was no agent or animate entity in the context (9), the children used passives to describe the change of state events: opening and closing. In describing the event, the use of a transitive verb would involve expressing the external cause as a syntactic subject. But it is also possible to suppress the subject. One way of doing this is to use an intransitive verb. In English this is possible with zero-derivation, but Japanese requires an overt morphology. The other way is to use the transitive verb in a passivized form. The children's passivization in (9) reflects this option as a device of intransitivization. If there is no external cause, passivization is impossible (e.g., **oki-rare-ru* '(a cat) is gotten up'),⁸ and the children never passivized transitive verbs whose intransitive counterparts were unergative.

In sum, the children's use of causativization and passivization represent other strategies for transitivity and intransitivity employed by the Japanese-speaking children. However, these are not unsystematic. The children's use of causativization and passivization reflects their sensitivity to causation types and to how they are lexicalized in Japanese verbs. The question is why they sometimes used these complex operations, instead of simply using transitive or intransitive verbs since the compatible linguistic forms were available in paired verbs. This must not be due to discourse factors because the use of causativization and passivization is discursively awkward in given contexts. I believe that the causativization and passivization reflect the Minimal Valency Strategy. As Japanese causativization and passivization are morphologically marked on a verb by affixations, a 'root + transitivity marker' is retained in their verbal forms. Then, in adopting causativization or passivization, the children initially used the 'root + transitivity marker' to express internal/external causation, but they also

added the causative or passive morphology so that a sentence could be consistent with a whole event. If, on the other hand, the children fail in this additional operation, a transitivity error would result. As Table 2 indicates, errors in unergative pairs go toward causativization (or transitivization), and the errors in unaccusative pairs go toward passivization (or intransitivization). This picture suggests that transitivity errors made by Japanese-speaking children are mainly due to causation types manifested in the contrast between unergative and unaccusative verbs.

Finally, I discuss topic change observed only in transitive contexts. By topic change, here I mean the children's shift of a topic from that given in an experimenter's question. For example, in the following (10), the children did not answer an experimenter's intended question which asked about the action taken by the lion for the elicitation of transitive *nakasu* 'make someone cry'.

- (10) Context: A lion made a dog cry.
 Question: As for the lion, what happened?
 Target verb: *nakasu* 'make someone cry'
- a. Kowai kara nai-tyat-ta no. (3;10)
 scared because cry-asp-pst pcl
 'Because (the dog) was scared, (he) cried.'
 - b. Nai-te nai. (3;11)
 cry-asp not
 '(The lion) is not crying.'

In (10a), the child described an on-going action of a dog. While the sentence does not involve an overt argument, the reason clause *kowai kara* 'because (he) was scared' is most likely to be interpreted to describe the mental state of the dog in the scene, which suggests that the null subject of a main clause is also the dog. In (10b), although the child talked about a lion, he simply described its state by saying *naite nai* 'not crying' in contrast to what was happening to a dog who was crying, and he did not refer to the action employed by the lion. Similar cases were observed for unaccusative pairs as in (11).

- (11) Context: A cat dropped a pen.
 Question: As for the cat, what happened?
 Target verb: *otosu* 'drop'
- Pen ga oti-tyat-ta. (3;10)
 pen nom fall-asp-pst
 'The pen fell.'

Despite the question asking about the action of a cat in (11), the child answered what happened to a pen, using *pen* as a subject of a sentence. Note that each question was asked while the experimenter picked up the toy or pointed at the

props asked as a topic in a question. While many correct answers and transitivity errors did not involve overt argument(s), in these cases, the children's responses were usually very quick, suggesting that they were answering the experimenter's question straightforwardly. On the other hand, for the responses classified as topic change, the children often had a little pause as if they were looking for the correct words. When they failed in finding a correct verb, they might have changed the topic. If this observation is correct, the children's topic change might reflect their difficulties in lexical retrieval.

However, the question arises as to why topic change occurred only in transitive contexts regardless of verb types. The lexical retrieval account suggests that the directionality of topic change is due to the children's incomplete mastery of transitive verbs. In fact, the children's perfect performance on unergative verbs is in sharp contrast with the inappropriate utterances frequently observed for their transitive counterparts. Whereas the incomplete mastery of the transitive pairs of unergative verbs is likely, which might have caused the difficulties in lexical retrieval and finally led to topic change, the same asymmetry in the correct responses for unaccusative pairs was not observed.

A more plausible account of topic change seems to involve the children's focus in an event. The children might focus more on the entity whose action/state is salient and noticeable in a scene. For example, in the context where a dog dropped a pen, the children's focus might be on the pen because the pen changes its location and this might be more salient than the dog whose action of dropping the pen lasted only a moment. Similarly, in the case where a lion made a dog cry, the children's focus might be on the dog because the dog started crying and it continued in the scene. This might be more salient than the lion, whose sudden appearance, which caused the dog to cry lasted only a moment. The children's focus in an event, as well as their difficulties in lexical retrieval for certain verbs, seems to contribute to topic change.

In intransitive contexts, no child changed topics. In light of focus and saliency, this is a natural consequence because in intransitive contexts only one entity was involved in the situation. This contrasts with transitivity errors in unaccusative pairs. Even though there was no visible causer in the intransitive context for unaccusative verbs, the children used transitive verbs. If this is because of topic change, a new topic must be a natural force of some sort. But it never appeared in children's utterance and moreover it is strange to change topics to a less salient entity in the scene. In case of unergative pairs, as the entity inherent to internal causation and a salient entity in the situation happen to correspond; therefore, the border between transitivity errors and topic change might be less distinguishable.⁹ However, I believe that topic change is crucially different from transitivity errors in that the former is a post-syntactic phenomenon depending on which aspects of a real world situation the children take to be central. On the other hand, transitivity errors may be attributed to the children's lexical competence. The errors are not dependent on real world situations, but on

how causation types are lexicalized in verbs and how children deal with the causation in syntax by the Minimal Valency Strategy.

Due to the relatively small number of subjects and the infrequent errors observed in the experiment, an important question remains as to how children retreat from errors. At the observational level, however, what might be worth reporting at this stage is that intransitivization seems to be productive for relatively younger children, while transitivization is more productive for older children. Overextension of transitive verbs in unaccusative pairs was observed for five 3-year-olds and three 4-year-olds, whereas overextension of intransitive verbs in unergative pairs was productive for 4-year-olds only. Also, two 3-year-olds and two 4-year-olds passivized transitive verbs in unaccusative pairs, but out of eight children who causativized unergative verbs, seven were 4-year-olds. It is not clear whether there is a correlation between the directionality and ages, or what it might suggest if such a correlation exists. Future research is needed to assess more tokens of each type of verb from wider age ranges. Also, the comparison between paired and unpaired verbs, and between existing verbs and novel verbs may help reveal a clearer picture of the acquisition of transitivity in Japanese.

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¹ There are a few exceptional cases where the same form is used as both intransitive and transitive verbs such as *hiraku* 'open', *toziru* 'close', and *masu* 'increase'. Also, Jacobsen (1989, p. 215) points out that some Sino-origin verbs are used intransitively and transitively (e.g., *kaisi-suru* 'start', *rakka-suru* 'fall/drop' etc.).

² Pinker (1989) proposes two types of lexical rules for verb alternations. Broad-range rules functioning as necessary conditions apply to broad conflation classes or what he calls thematic cores: the representations of semantic conflation patterns that define a possible verb meaning. In order for the child to learn the causative alternation, he or she also needs to identify semantically relevant subclasses among a set of the broad conflation class, to which narrow-range rules apply as sufficient conditions.

³ A variety of unaccusative diagnostics is proposed for the syntactic consequences of unaccusativity in Japanese (e.g., Kageyama, 1993; Kishimoto, 1996; Miyagawa, 1989). However, as I will mention in later sections, the distinction between unergative and unaccusative in this study is dependent on the semantic notion of causation, which may not necessarily be compatible with syntactic tests for the classification of the two types of intransitive verbs.

⁴ In fact, *suru* 'do' is a transitive verb and *naru* 'become' is a corresponding intransitive verb in Japanese. However, a typical agent question is *Nani o si-ta no?* 'What did (X) do?', where the interrogative 'what' is marked with the accusative case particle *o*, and a typical patient question is *Doo nat-ta no?* 'What happened (to X)?', where an intransitive verb *naru* 'become' is used. Different from either of them, the question used in the experiment can be considered neutral for the purpose of eliciting both intransitive and transitive verbs.

⁵ For the purpose of this study, verbs other than target paired verbs were not included in the table, as the children appropriately and inappropriately used a variety of verbs which formed or did not form pairs. Admittedly, however, children's transitivity errors are likely to occur in different manners depending on whether a verb has a counterpart form in a given language, and/or whether

a verb could form a conceptually similar pair differing in transitivity (Gropen, Blashkovich, & Dede, 1996; Pye, 1994). Hence, further analyses are required with this regard.

⁶ Assuming a single lexical semantic representation for externally caused verbs (e.g., *break*_{iv}, and *break*_{iv}), Levin and Rappaport Hovav (1995) suggest that for the intransitive syntactic structure, 'the binding of external cause takes place in the mapping from the lexical semantic representation to argument structure. Just as the binding of a position in argument prevents that position from being projected onto the syntax, so the binding of a position in the lexical semantic representation prevents the projection of that position to argument structure' (p. 108). A similar proposal is observed in Hale and Keyser (1987).

⁷ The children's causativization and passivization processes do not necessarily involve restructuring operations on mapping relations between thematic roles and grammatical relations in syntax. Rather, I believe that they happen at pre-syntactic level (i.e., lexical-conceptual level), although it is impossible to examine this possibility due to argument ellipsis. Therefore, the terms--causativization and passivization--are not used in their conventional sense referring to the syntactic operations.

⁸ Structurally, Japanese has two types of passives: direct passive and indirect passive. Here I refer to direct passive which has a corresponding active sentence just like an English passive sentence.

⁹ Especially, children's topic change might be less distinguishable from transitivity errors in their spontaneous speech in naturalistic circumstances than in elicited production tasks. Therefore, there may be a possibility that the predominance of overextension of intransitive verbs reported in previous studies might involve topic change.

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