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A-chain Maturation Reexamined: Why Japanese Children Perform Better on “Full” Unaccusatives Than on Passives

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This paper suggests that the theory of A-chain maturation can account for an asymmetry in the development of “full” unaccusatives and passives in Japanese. Sano, et al. note that children acquire the full unaccusative earlier than the passive, which, according to them, argues against the ACDH. We show that the early success with full unaccusatives is due to the availability of unergative misanalysis. The nominative case marker drop phenomenon and the syntactic analysis of the full unaccusative also support this hypothesis. We claim that the delay in the acquisition of the full passive is due to the ACDH and also the non-existence of the adjectival-passive strategy in Japanese.

1. Introduction

Recently, Sano (2000), Sano, Endo, & Yamakoshi (2001), Okabe & Sano (2002), and Sano (2003) argue against the A-Chain Deficit Hypothesis (hereafter, the ACDH) (Borer & Wexler 1987, 1992), which states that A-chains are ungrammatical for a child until a certain age or level of maturation. Their major argument against the ACDH is based on experiments using what they call “Full unaccusatives” and “Full passives” in Japanese, which are shown in (1).

- (1) a. Buta-san ga zou-san ni tukamat-ta. (full unaccusative)
Pig NOM elephant by catch (unacc.)-PAST
'The pig was caught by the elephant.'
- b. Buta-san ga zou-san ni tukamae-rare-ta. (full passive)
Pig NOM elephant by catch (v.t.)-PASS-PAST
'The pig was caught by the elephant.'

(Sano, 2000:7)

By “Full passive/unaccusative” they mean that the construction contains a dative phrase that corresponds to the “*by* phrase.” According to them, children can comprehend Full unaccusatives early, but there is a noticeable delay in the comprehension of Full passives. They claim that this discrepancy between the unaccusative and the passive poses a problem for the ACDH because an A-chain is presumably involved in both. They consider two alternative explanations and conclude that neither can account for the discrepancy between the Full passive and Full unaccusative. One of these possibilities is what is called the “unergative misanalysis” in which unaccusatives are misanalyzed as unergatives, hence ACDH does not inhibit comprehension (Borer and Wexler (1987), Babyonyshev, Ganger, Pesetsky and Wexler (2001)). Sano (2000) and Sano, Endo & Yamakoshi (2001) suggest that this cannot account for the early development of Full unaccusatives because children behave differently between unaccusatives and unergatives concerning the omission of nominative *ga*. The second alternative that Sano (2000) and Sano, Endo, and Yamakoshi (2001) argue against is the non-raising misanalysis (Miyamoto, Wexler, Aikawa and Miyagawa (1999)), in which the nominative NP of the unaccusative sometimes (when *ga* is missing) does not raise. They point out that children do not produce sentences such as (2a) and they do not have any problem in interpreting transitives with null objects as in (2b).

- (2) a. *Zou-san *ga* buta-san *ga* sizume-ta.
 elephant NOM pig * sank
 ‘The elephant sank the pig.’ (Sano 2000: 16)
- b. Zou-san *ga* (~~buta-san-o~~) umeta ka na?
 Elephant NOM (pig ACC) buried Q
 ‘Did the elephant bury (pro)?’ (Sano, Endo, & Yamakoshi 2001: 674)

Their reasoning is that, if it is possible for the nominative NP of an unaccusative to stay in its complement position, we should also see the nominative case marking on the direct object of transitives as in (2a), something that is not attested in any significant measure. Using a similar line of thought, they note that children ought to misinterpret the nominative subject in a transitive sentence as Theme if the direct object is missing, as shown in (2b), a problem that in reality does not arise.

The argument based on (2) has a completely different, and we believe a straightforward, account. Case marking of an NP within the VP—the NP of an unaccusative verb or the direct object of a transitive verb—is based on considerations of argument structure, etc. It is not a mechanical issue whereby an NP inside the VP is automatically assigned a particular case marking. Transitive verbs on the whole require their direct object to be assigned accusative case. That is simply part and parcel of the (argument) structure. In particular, the argument from the ACDH is that when *ga* is assigned to the

subject of an unaccusative, this subject has raised to T. (This is a possibility under the ACDH as we will explain.) Since direct objects of transitive verbs do not raise to T, *ga* cannot be assigned to them. What Sano and Sano, Endo & Yamakoshi showed (and what is consistent with Miyamoto et al. and, more generally, with Wexler's (1998) *Very Early Parameter-Setting*) is that children acquire the necessary knowledge early on, so that they do not show any confusion on this matter. In this paper we will defend the ACDH for Japanese by taking up the other arguments given by them as well as new arguments that question their analysis.

This paper consists of four parts. First, we will summarize the issues concerning A-chain maturation in Japanese by reviewing recent acquisition studies of Japanese passives and unaccusatives. We will confirm that Miyamoto et al. (1999) is correct in attributing the young child's (2;3-3;0) frequent omission of the nominative case marker to the unaccusative construction. Secondly, we will show that the strategy of interpreting unaccusatives as unergatives is available for young Japanese children precisely during the time when Sano (2000) and Sano, Endo & Yamakoshi (2001) claim that the children perform better with Full unaccusatives than with Full passives. Thirdly, we will take up the syntax of what Sano (2000) calls Full unaccusatives and Full passives and show that the "agent" *ni*-phrase in the two constructions occurs in different places in the syntactic structures. We argue that the unergative analysis of Full unaccusatives by children is possible because of the structure we propose for Full unaccusatives. Lastly, why do young Japanese children have problem comprehending the Full passive? Sano, Endo and Yamakoshi (2001) claim that this fact, in comparison to the ease of comprehension of the Full unaccusative, makes it difficult to maintain the ACDH. We will argue that Japanese children show difficulty with these actional passives because there are no homophonous adjectival passives in Japanese. Unlike English, the adjectival passive strategy for actional passives is not available in Japanese. This parallels Terzi and Wexler's (2002) finding that in Greek, which also does not have s-homophone adjectival passives, children's comprehension of the passive is delayed. We claim that the development of the Japanese passive is also accounted for by the ACDH and the non-existence of the adjectival strategy. Theoretical and empirical implications of this study will also be discussed.

2. A-chain maturation in Japanese

Sugisaki (1999) and Minai (2000) argue that the ACDH accounts for the acquisition of passives in Japanese. Sugisaki (1999) showed that the direct passive, which presumably involves an A-chain (cf. Miyagawa 1989), was delayed compared to the adversity passive, which does not involve an A-chain. Minai further confirmed that the adversity passive precedes the gapped (A-chain) passive.¹ (Harada and Furuta (1998) obtained a different result that

¹ Harada and Furuta (1998) obtained a different result that showed that the adversity passive was delayed. Minai suggests that it might be because the topic marker *wa* instead of nominative *ga* was

showed that the adversity passive was delayed. Minai suggests that it might be because the topic marker *wa* instead of nominative *ga* was used in their experiment. Minai notes that *wa* would emphasize the subject and, as a result, children's responses would be pragmatically biased. Although it is not clear what "pragmatically biased" exactly means, the fact that the choice of topic marker *wa* or nominative *ga* led to opposite results is not trivial. Recently, Wexler (2004), in his new theoretical approach (based on the development of phases) to the ACDH, argues that there are theoretical reasons to expect the result that topicalized gapped (A-chain) passives will not be delayed. Although it is beyond the scope of this paper to go over his argument, it seems very important to account for this fact.)

In a series of studies of unaccusatives and passives, Sano (2000), Sano, Endo, & Yamakoshi (2001), Okabe & Sano (2002), and Sano (2003) showed that Japanese children do very well with unaccusatives although they display considerable delay with passives. Particularly, children do much better with Full unaccusatives (with the *by* phrase) than with Full passives (long passives with the *by* phrase). They point out that this is a problem for the ACDH because both constructions are supposed to involve an A-chain. We take up this issue below and argue that studies by Miyamoto et al. (1999) and Ito and Wexler (2002) on nominative case drop for unaccusative verbs provide evidence that Japanese children's development of unaccusatives reflects the ACDH.

2.1 Unaccusatives and the nominative case drop phenomenon

In this subsection we note how the nominative case drop phenomenon for unaccusative verbs in Miyamoto et al. (1999) and Ito and Wexler (2002) show that children have difficulty with A-chains at a certain stage of language development. It is well known that case markers in Japanese are often omitted in adults' informal speech, although obligatory in formal writing. Two sorts of conditions have been proposed. The topic *wa* can always drop (Kuno 1973). The accusative *o* can drop if the direct object is adjacent to the verb (Saito 1985, Takezawa 1987). Miyamoto, et al. (1999) examined the transcripts of Aki, ages 2;3 to 3;0, in the CHILDES (MacWhinney 1991, Miyata 1995) and found that the child only omitted case markers in syntactic environments acceptable in adult speech except for the subject of unaccusative verbs. They found that the omission rate for topic marker *wa* is 80% and that of the accusative marker *o* when the NP is adjacent to the verb is 94%. These results are consistent with the adult grammar of topic omission (Kuno 1973) and accusative marker *o* (Saito 1985, Takezawa 1987). Importantly, however, they also found that the

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nominative case marker *ga* omission is most common with existential and lexical unaccusatives. (3) is the result of their study

(3) Rates of Nom omission for NPs according to verb type

Lexical unaccusatives	<i>aru</i> (there's)	<i>nai</i> (there isn't)	Other verbs
63%(47/75)	76%(25/33)	95%(42/44)	23%(13/57)

(Miyamoto et al.: 450, Table 4)

Note that Nom *ga* omission is much higher with lexical unaccusatives and existentials than with other verbs. The child exhibited a low omission rate with other verbs. In this last category, Miyamoto et al. point out that five out of 13 omissions are with the object of stative verbs and two with adjective phrases, both of which can be considered as being inside the VP, leaving only six omissions that are external arguments that would have the nominative case. From these results, they conclude that the child drops case markers in the environments which an adult would find acceptable, with one exception found with unaccusative verbs. Namely, Miyamoto et al. observes that the child's frequent omission of the nominative case marker is most frequent with the unaccusative construction. They invoke the ACDH to explain the case drop with unaccusatives. The A-chain has not fully formed, and as a result the NP of the unaccusative verb does not raise to Spec of TP, but instead stays adjacent to the unaccusative verb. This adjacency with the verb licenses the NP to occur without case marking (the nominative omission), in the same way that Saito (1985) and Takezawa (1987) observed for the accusative case marker. As we have observed, the child typically does not omit the nominative case marker *ga* on the subject NP of unergatives and transitives verbs. This is predicted because the subject NP in these constructions does not occur adjacent to the verb at any point in the derivation. It is important to note that Lee and Wexler (2001) also found a very similar pattern of nominative marker drop in Korean. The omission rate in unaccusatives is much higher than that in unergative/transitives at the age of two. Lee and Wexler attributed this fact to the ACDH, following Miyamoto et al.

Ito and Wexler (2002) did a similar study of nominative marker omission. They used a different corpus—the transcripts of a Japanese child, Sumihare, during ages 1;11-3;7 (MacWhinney 2000; Noji 1973-77). Their study is particularly important in examining the nominative case omission at a later stage. (4) shows the results of their study that are relevant here.

(4) Rates of nominative omission according to verb type

(only NPs)

	unaccusatives	existentials	unergatives/ transitives

1;11-2;1	90.6	88	80.8
2;2-3;0	34.2	32.7	17.6
3;1-3;7	9.1	11.0	7.9

(Ito and Wexler 2002: 36, Table 7, raw frequencies omitted)

Following Miyamoto et al., Ito and Wexler (2002) carefully excluded possible topic omissions by counting only indefinites in terms of the discourse context, pragmatics, and argument types. In the spirit of Miyamoto et al, but with somewhat different details, for reasons that they give, they excluded proper names, quasi-proper names and demonstratives. The table in (4) shows their results for the three stages of development. Ito and Wexler report that the difference between unaccusative (whether counting existentials or not) and unergatives/transitives is highly statistically significant in the second stage ($p < .001$) but that at stages 1 (1;11-2;1) and 3 (3;1-3;7), the difference between unaccusative and unergative/transitives is not significant. Ito and Wexler summarize the three stages for nominative case omission as in (5).

(5) Three stages of nominative Case-marker omission in child Japanese

The first stage, ages 1;11-2;1

Nominative case marking is omitted both in unaccusatives and unergatives/transitives.

The second stage, ages 2;2-3;0

Nominative case marking is much more frequently omitted for unaccusatives than for unergatives/transitives.

The third stage, ages 3;1-3;7.

The omission rate of nominative markers is not different between the two categories.

(Ito and Wexler 2002: 34 (38))

Ito and Wexler further examine the nominative case omission pattern in environments where topicalization is syntactically prohibited, that is, in subordinate clauses. Again the same patterns in terms of the developmental stages in (4) are observed and statistically confirmed.² What is crucial in their findings is that nominative case omission is significantly higher for unaccusatives than for unergatives and transitives at the second stage, but at the third stage it goes down to a level such that no significant difference between unaccusatives and unergatives/transitives is observed. ~~We will take this phenomenon as evidence that the child applies the unergative structure to the unaccusatives at the third stage. We will argue for this unergative misanalysis hypothesis in the following sections.~~ **What does this pattern of nominative case marking indicate? What we suggest is that at the third stage, when there is**

² See Ito and Wexler (2002) p.36-45 for the detailed results and discussion about the nominative case omission in subordinate clauses.

surprisingly no significant difference in the omission of the nominative case marking between unergatives and unaccusatives, the two types of verbs are in fact being analyzed as the same type. Given that the unaccusative replicates the nominative case marking pattern of unergatives – there is a highly reduced rate of nominative case marking drop with unaccusatives at the third stage – we surmise that the learner is “misanalyzing” unaccusatives as unergatives at this stage. We will show that this hypothesis provides a very different way to look at the results of Sano and Sano, et al.

Why is there only optional omission of *ga* (34.9%) for unaccusatives at the second stage? In the spirit of other analyses of optionality in child grammar productions (e.g. Wexler (1998), Babyonyshev et al (2001)), Ito and Wexler argue that the child knows the EPP, which requires raising (or at least Agree) of a DP to T. Thus, for an unaccusative structure, the child is presented with a choice. Either satisfy the EPP and violate the ACDH (thus producing *ga*) or violate the EPP and satisfy the ACDH. By *Minimize Violation* of Wexler (1998), the child will choose either of these possibilities for production, thus sometimes producing *ga* on the subject of an unaccusative, sometimes not.

But why ~~is it that~~ at the third stage, ~~where~~ when children still have such ~~trouble~~ difficulty with passives, ~~is there~~ is such a small amount of *ga* omission for unaccusatives? We ~~will assume an~~ follow the idea first mentioned in Borer and Wexler (1992), and ~~also~~ further discussed in Babyonyshev et al (2001), that children ~~will~~ sometimes give an unergative analysis to the unaccusative, in an attempt ~~to not~~ to violate the ACDH. The idea is not that children don't know the difference between unaccusative and unergative semantics. Rather, the child will sometimes violate the mapping of an unaccusative argument onto the object position just so as to not violate the ACDH.³

3. Development of A-chains

In the previous section, we observed that the nominative case drop phenomenon reveals that children under three years of age treat unaccusatives differently from unergatives/transitives. We can account for this fact by the ACDH as we discussed in 2.1. The NP that is not raised due to the lack of an A-chain remains adjacent to the verb inside the VP. This is where omission of the accusative case marker is often observed in adult Japanese grammar. What about the child at the third age? Ito and Wexler's (2002) study indicates that the child begins treating unaccusatives as being in the same category as unergatives because the grammatical A-chain does not exist. We can see this from the fact that the passive is delayed. To see this, observe the result of Sano's (2000)

³ Ito and Wexler offer reasons to prefer the EPP as the reason for the child sometimes using *ga*, and their analysis can be extended to say that the reason that in stage 3 there is so little *ga* omission is that the child is attempting to match the input, subject to grammatical constraints including EPP and ACDH, and that as the child ages, the child opts for violating ACDH more often, so as to input match. The topic of whether the Ito and Wexler analysis is completely compatible with further results that we present is beyond the scope of this paper, but we believe that at first blush they are. See Miyagawa (2001) for arguments that the T in Japanese has the EPP feature.

comprehension study in (6), which clearly shows that understanding of the passive form of the verb *tukamaeru* ‘catch’ is delayed compared to the unaccusative verb *tukamaru* ‘get caught.’ Note that in Sano’s (2000) comprehension experiment, two native speakers of Japanese act out scenarios with two animal puppets in front of a subject and one experimenter asks the subject a yes-no question about what happened.

(6) Unaccusatives and passives

	G1 3;1 – 3;8	G2 3;10 – 4;7	G3 4;6 – 6;0	Total
tukamaeru (v.t.)	58.3% (7/12)	87.5% (14/16)	87.5% (14/16)	79.5% (34/44)
tukamaru (unacc.)	53.8% (7/13)	76.9% (10/13)	87.5% (14/16)	73.8% (31/42)
tukamaerareru (pass)	54.5% (6/11)	50% (7/14)	62.5% (10/16)	56.1% (23/41)

(Sano, 2000:14, Table 4)

Sano presents this as evidence against the ACDH because both unaccusatives and passives involve an A-chain. **There are at least two problems here. First, Sano (2000) uses only *tukamaru* ‘catch_{unaccusative}’ as an example of a “full” unaccusative. In fact “full” unaccusatives – those that allow an “agentive” *-ni* phrase – are extremely rare. Sano, Endo and Yamakoshi (2001) also use *mitukaru* ‘find’, which they claim has the same pattern of acquisition as *tukamaru* ‘catch’. We are not aware of other “full” unaccusatives in the language. Second, while giving up on the ACDH is one option, that per se can only explain the pattern in (6). It would have nothing to say about the discovery in Ito and Wexler (2003) that the pattern of nominative case marker drop suggests that unaccusatives begin behaving like unergatives at around the age of three. As mentioned already, a plausible way to explain this is that at this stage ACDH is still in effect, hence there is no grammatical A-chain. The children therefore “misanalyze” the unaccusatives as unergatives in order to avoid violation of the ACDH.**

In this regard, there is one crucial point Sano does not mention concerning the unaccusative verb *tukamaru* ‘get caught’. There exists a homophone of the unaccusative verb *tukamaru*. Note that *tukamaru* in (7) is an unergative verb that means ‘hold on to (something).’

(7) Taro-wa sikkari roopu-ni tukamat-ta.
Taro—Nom firmly rope-to catch-Past
‘Taro took a firm hold on the rope.’

(8) (=1a) Buta-san-ga zoo-san-ni tukamat-ta. (full unaccusative)
Pig-NOM elephant-by catch (unacc.)-PAST
‘The pig was caught by the elephant.’

The unergative verb *tukamaru* ‘hold on to (something)’ in (7) is not tested in Sano (2000), but the children would not have a problem in interpreting (7) because it does not involve an A-chain. Until an A-chain is available, children would utilize the unergative structure to interpret unaccusatives such as (8). Importantly this unergative verb *tukamaru* ‘hold on to (something)’ takes a *ni*-phrase PP as shown in (7), which makes the Full unaccusative in (8) and the unergative in (7) completely homophonous. We therefore ~~assume~~ **surmise** that the unergative strategy is available. We will argue for this unergative misanalysis from the perspective of syntactic differences between Full unaccusatives and Full passives in the next section.

Observe other unaccusative verbs in (9). They further confirm that children can start interpreting unaccusatives early, at the age of three. Even G1 children perform well in understanding unaccusatives, which is consistent with our hypothesis that the unergative misanalysis is available once children reach the age of three.

(9) Unaccusatives

	G1 3;1 – 3;8	G2 3;10 – 4;7	G3 4;6 – 6;0	Total
sizumu ‘sink’	78.6% (11/14)	87.5% (14/16)	100% (16/16)	89.1% (41/46)
agaru ‘rise’	92.9% (13/14)	100% (16/16)	100% (16/16)	97.8% (45/46)
Unaccusative (total)	85.7% (24/28)	93.8% (30/32)	100% (32/32)	93.5% (86/92)

(Sano, 2000:12, Table 2)

The children in Sano’s (2000) experiment performed almost perfectly on the unergatives as shown in (10), which is expected.

(10) Unergatives

	G1 3;1 – 3;8	G2 3;10 – 4;7	G3 4;6 – 6;0	Total
naku ‘cry’	100% (14/14)	100% (16/16)	93.8% (15/16)	97.8% (45/46)
warau ‘laugh’	76.9% (10/13)	100% (16/16)	100% (16/16)	93.3% (42/45)
Unergative: (total)	88.9% (24/27)	100% (32/32)	96.9% (31/32)	95.6% (87/91)

(Sano, 2000:10, Table 1)

Note that the unaccusative verb *agaru* ‘rise’ has a homophone, the unergative verb *agaru* ‘go up, climb’. *Sizumu* ‘sink’ arguably has a homophone *sizumu* ‘go down’.

Let us summarize our claims.

- (11) a. Nominative case omission shows that the NP is not raised for unaccusatives because A-chains are not fully formed for young children under three. (Miyamoto et al. 1999, Ito and Wexler 2002);
- b. Children start utilizing the structure of unergatives to interpret unaccusatives in the third year. Therefore, nominative case omission reduces to the level of transitive/unergatives at this stage. Their interpretation of unaccusatives improves once they acquire the unergative strategy.
- c. Passives are delayed because A-chains are not fully formed throughout the three stages.

4. Syntax of Full Unaccusatives

In this section we will consider the structure of what Sano (2000) calls Full unaccusatives in Japanese and show that the unergative misanalysis hypothesis with the ACDH is on the right track precisely because of the structure of Full unaccusatives. There are a very limited number of unaccusative verbs that allow the *ni*-phrase. These include *tukamaru* ‘be caught’ and *mitukaru* ‘be found’. The *ni*-phrase is roughly equivalent to the *by*-phrase in English. Observe the following Full unaccusative and Full passive pairs in Japanese.

- (12) a. Buta-san ga zou-san ni tukamat-ta. (full unaccusative)
Pig NOM elephant by catch (unacc.)-PAST
‘The pig was caught by the elephant.’
- b. Buta-san ga zou-san ni tukamae-rare-ta. (full passive)
Pig NOM elephant by catch (v.t.)-PASS-PAST
‘The pig was caught by the elephant.’
- (Sano, 2000:7)
- (13) a. Buta-san ga zou-san ni mitukat-ta. _full unaccusative_
pig Nom elephant found (unacc.)-Past
‘The pig was found by the elephant.’
- b. Buta-san ga zou-san ni mituke-rare-ta.
pig Nom elephant-by find (v.t.)-Pass-Past (full passive)
‘The pig was found by the elephant.’
- (Sano, Endo and Yamakoshi 2001)

Sano (2000)⁴ and Sano, Endo and Yamakoshi (2001)⁵ show that the children in their experiment perform better with Full unaccusatives than with Full passives.

⁴ The result of the experiment in Sano (2000) is seen in (7, 10).

They claim that this poses a problem for the ACDH because both Full unaccusatives and Full passives involve an A-chain.

A question we wish to pose here is, is the position of the *ni*-phrase in the passive structurally the same as the *ni*-phrase of the unaccusative? If not, it would cast doubt on conclusions one would draw from directly comparing them, as Sano and his colleagues have done. We will show that, in fact, the *ni*-phrase in the passive and the unaccusative are positioned differently. The implication of this analysis is that the unergative analysis will be available as a grammatical s-homophone for the full unaccusative, but no such grammatical s-homophone for the passive.

⁵ Sano, Endo and Yamakoshi (2001) 's results in the folloing are very similar to those of Sano (2000).

Correct response rates of active controls:

	3-year old	4-year-old	5-year-old	Total
tukamaeru 'catch'	57.1% (8/14)	87.5% (14/16)	93.8% (15/16)	80.4% (37/46)
mitukeru 'find'	66.7% (10/15)	81.3% (13/16)	87.5% (14/16)	78.7% (37/47)
active control	62.0% (18/29)	84.4% (27/32)	90.6% (29/32)	79.6% (74/93)

(Sano, Endo and Yamakoshi 2001: 677, Table 4)

Correct response rates of full unaccusatives:

	3-year old	4-year-old	5-year-old	Total
tukamaru(unacc) 'catch'	53.3% (8/15)	76.9% (10/13)	93.8% (15/16)	75.0% (33/44)
mitukaru(unacc) 'find'	40.0% (6/15)	73.3% (11/15)	85.7% (12/14)	65.9% (29/44)
full unaccusatives	46.7% (14/30)	75.1% (21/28)	90.0% (27/30)	70.5% (62/88)

(Sano, Endo and Yamakoshi 2001:677, Table 5)

Correct response rates of full passives

	3-year old	4-year-old	5-year-old	Total
tukamaerareru 'be caught'	53.8% (7/13)	50.0% (7/14)	68.8% (11/16)	58.1% (25/43)
mitukerareru 'be found'	40.0% (6/15)	53.3% (8/15)	40.0% (6/15)	44.4% (20/45)
full passive:	46.4% (13/28)	51.7% (15/29)	54.8% (17/31)	51.1% (45/88)

(Sano, Endo and Yamakoshi 2001: 678, Table 6)

4.1 *Ni*-phrase as PP

First let us examine the categorical status of the *ni*-phrases in Full unaccusatives and Full passives. Here, we will see that they are identical in being a PP. Miyagawa (1989) argues that the DP and Numeral Quantifier (NQ) associated with it must mutually c-command each other. This requirement accounts for the ungrammaticality in (14), as noted by Haig (1980) and Kuroda (1980).

- (14) *gakusei-ga sake-o san-nin nonda.
student-Nom sake-Acc 3-CL drank
'Three students drank sake.'

Miyagawa argues that the same requirement accounts for the distinction between NP and PP, as seen in (15) (cf. Shibatani 1978).

- (15) a. *boku-wa sono hanasi-o gakusei-kara san-nin kii-ta.
I-TOP that story-ACC student-from three-CL hear-PAST
'I heard the story from three students.'
b. gakusei-ga san-nin sono hanasi-o sensei-kara kii-ta.
Students-NOM three-CL story-ACC teacher-from hear-PAST
'Three students heard the story from the teacher.'

Examples in (16) show that the *ni*-phrase with both the Full unaccusative and the Full passives are PPs.

- (16) a. *gakusei-ga sensei-ni san-nin tukamat-ta.
student-NOM teacher-by three-CL catch (unacc.)-PAST
'The students are caught by three teachers.'
b. *gakusei-ga sensei-ni san-nin tukamae-rare-ta.
student-NOM teacher-by three-CL catch-PASS-PAST
'The students are caught by three teachers.'

(16a) and (16b) are ungrammatical in the meaning that *san-nin* 'three CL' modifies *sensei* 'teacher'. Therefore, the *ni*-phrases are PPs in both constructions. Now, these examples have a completely different interpretation that is grammatical—the NQ in both are associated with the subject phrase. Thus, (16a) is interpreted as "Three students are caught by a teacher," and (16b) is interpreted as "Three students are caught by a teacher." This provides evidence that both Full unaccusatives and Full passives involve an A-chain. That is, locality requirement imposed on the interpretation of the NQ is met by the NP-trace of the externalized DP.

Based on the observation above, we assume that the *ni*-phrases in both Full unaccusatives and Full passives are PPs and that both Full unaccusatives and Full passives involve an A-chain.

4.2 Syntactic positions of the *ni*-phrases

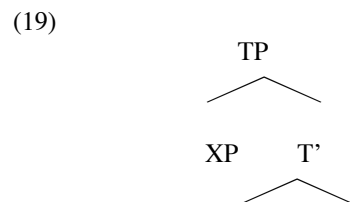
Next, let us compare Full unaccusatives and Full passives in terms of syntactic positions of the *ni*-phrase. Our first test uses indeterminate pronoun binding. Indeterminate pronouns such as *dare* ‘anyone’, *doko* ‘anywhere’, and *nani* ‘anything’ are generally allowed to serve as negative polarity items when they are bound by *mo*. Kishimoto (2001) suggests that the distribution of indeterminate pronoun binding allows us to determine the clause structure of Japanese. For example, the following contrast indicates that the external argument lies outside its scope, hence ungrammatical, whereas vP-internal arguments lie within it.

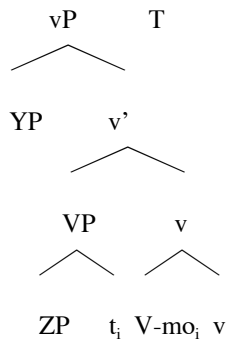
- (17) a. Taroo-wa nani-o kai-mo si-nakat-ta.
Taroo-TOP what-ACC buy-Q do-NEG-PAST
‘Taroo did not buy anything.’
b. *Dare-ga Hanako-o home-mo si-nakat-ta.
Anyone-NOM Hanako-ACC admire-NEG-PAST
‘Anyone did not admire Hanako.’
(Kishimoto 2001:600)

Kishimoto proposes that an indeterminate pronoun can be bound by *mo* if it falls within the scope of *mo*. The scope of *mo* is defined by the notion of domain given in (18).

- (18) Y is in the domain of a head X if it is contained in Max (X), where Max (X) is the least full-category maximal projection dominating X.
(Kishimoto 2001: 601)

Kishimoto assumes that V and *mo* constitute a complex head that raises to *v* at the level where indeterminate pronoun binding applies. This is shown in (19). In (19) YP and ZP, but not XP, are included in the domain of V, that is, only YP and ZP fall under the scope of *mo*. Kishimoto assumes that the subject is raised to [Spec, TP] overtly to satisfy the EPP requirement on T (cf. Miyagawa 2001). Thus, Kishimoto’s indeterminate pronoun binding accounts for the fact that vP-internal arguments and adjuncts (YP or ZP) are bound by *mo* but that subjects and other TP related adjuncts (XP) cannot be bound by *mo* when *mo* occurs with a verb.





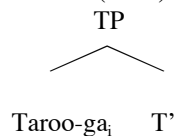
(Kishimoto: 602 (10))

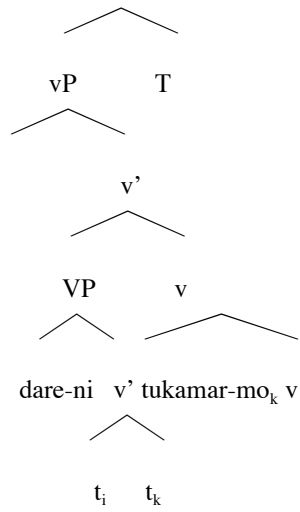
Let us examine what indeterminate pronoun binding tells us about the position of the *ni*-phrase in Full unaccusatives and Full passives. (20a) indicates that the *ni*-phrase of Full unaccusatives lies within the domain of the verb, *tukamar* ‘be caught.’ On the other hand, (20b) and (20c) show that the *ni*-phrase of Full passives lies outside of the domain of the verb *tukamae* ‘catch’, but in the domain of the passive verb (*r*)are.

- (20) a. Taroo-wa dare-ni tukamari-mo si-nakat-ta.
 Taroo-TOP anyone-by caught-Q do-NEG-PAST
 ‘Taroo was not caught by anyone.’
- b. Taroo-wa dare-ni tukamae-rare-mo si-nakat-ta.
 Taroo-TOP anyone-by catch-Pass-Q do-NEG-PAST
 ‘Taroo was not caught by anyone.’
- c. *Taroo-wa dare-ni tukamae-mo s-are-nakat-ta.
 Taroo-TOP anyone-by catch-Q do-PASS-NEG-PAST
 ‘Taroo was not caught by anyone.’

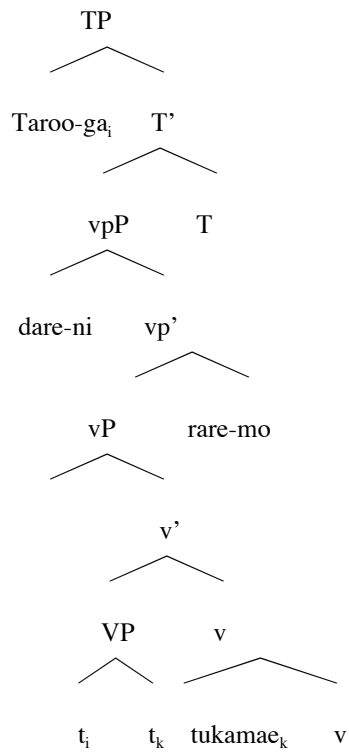
(21), (22) and (23) illustrate the position of the *ni*-phrase in (20a), (20b) and (20c) respectively in the structures we propose for Full unaccusatives and Full passives. Note that the *ni*-phrase in the Full unaccusative lies within the VP as it is the PP that the unaccusative verb *tukamaru* selects. What this shows clearly is that the *ni*-phrase of the unaccusative is fundamentally different from the *ni*-phrase of the passive. The *ni*-phrase of the unaccusative is an internal argument of the verbal head. But the *ni*-phrase of the passive is outside the VP, hence not an argument of the verbal stem of the passive verb.

(21) Full unaccusative (=20a)

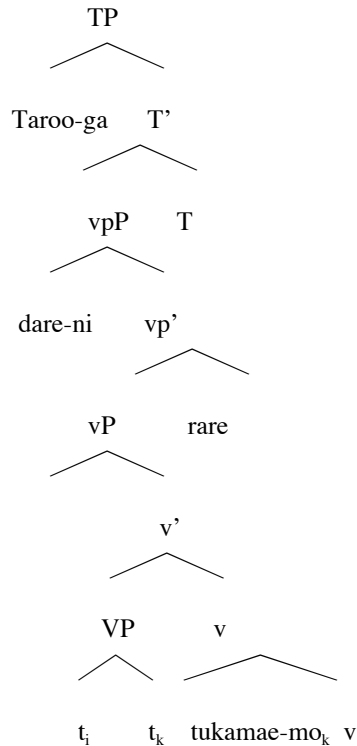




(22) Full passive (=20b)



(23) Full passive (20c)



If what we have said is correct, any conclusions one might draw from comparing these two constructions must be viewed with skepticism.

Further evidence for the two structures comes from looking at focus structures. When a focus element such as *-sae* 'even'/'-dake 'only' attaches to the verb, the scope of the focus element is limited to the VP (Kuroda 1970, Ogino 1990, Aoyagi 1999).

- (24) Taroo-ga [VP hon-o kaesi]-sae sita.
 Taro-NOM [VP book-ACC return]-even did
 (i) 'Taro returned even the book.'
 (ii) 'Taro even returned the book.'
 (iii) *'Even Taro returned the book.'

Based on what we have observed about unaccusatives and passives, we predict that the focus element can take the *ni*-phrase in its scope in the unaccusative but not in the passive. The prediction is borne out.

- (25) a. Taroo-ga omawari-san-ni tukamari-sae sita.

Taro-NOM policeman-DAT caught(unacc.)-even light-verb
 Taro was caught even by a policeman.'

- b. Taro-ga omawar-san-ni tukamae-sae s-are-ta.
 Taro-Nom policeman-DAT caught (tr.)-even light-verb-PASS
 'Taro was even CAUGHT by the policeman.'

In (25a) with the unaccusative *tukamari* 'catch', the *ni*-phrase "by the policeman" is clearly in the scope of *-sae* 'even', showing again that the *ni*-phrase is selected by the unaccusative and occurs in the VP headed by the unaccusative. In (25b), *-sae* 'even' attaches to the transitive verb *tukamae* 'catch', which is passivized. As we can see, the *ni*-phrase here is outside the scope of the verb, so that the only item that can be focused is the verbal head. This is an indication that the *ni*-phrase here is simply an external argument that is introduced by some head outside of the VP (cf. Kratzer 1996, Marantz 1984). Finally, we predict that for the passive, *-sae* may have scope over the *ni*-phrase if *-sae* occurs higher than on the verb. This is shown below.

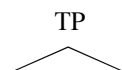
- (26) Taro-ga omawari-san-ni tukamae-rare-sae sita.
 Taro-NOM policeman-DAT catch-PASS-eve light-verb
 'Taro was caught even by a policeman.'

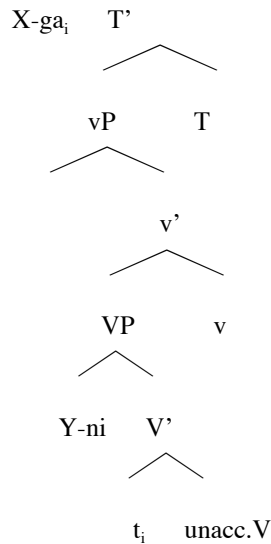
The pattern of focus scope confirms what we found with indeterminate pronouns — the *ni*-phrase of the unaccusative and the passive are fundamentally different, the former being an internal argument of the unaccusative while the latter is an external argument introduced by a higher head. Hence, although Sano and his colleagues speak of parallel "Full" constructions of unaccusative and passive, they are parallel only in surface resemblance. ~~Structurally they differ so basically as to make the comparison between them unsuitable.~~ **Structurally they differ so basically that any conclusion drawn from comparing them must be viewed with reservation.** More positively, the difference between the structures leads to clear ideas about why children perform much better on full unaccusatives than on passives, as we demonstrate in the next section.

4.3 The unergative misanalysis and the structure of Full unaccusative

In Section 3, we argued that the unergative misanalysis is a plausible explanation for the fact that children perform better with Full unaccusatives than with Full passives. Let us look at the structure we proposed for Full unaccusative and see if it is a tenable proposal. The structure for Full unaccusative is shown in (27), repeated here.

- (27) Full unaccusative





Since the *ni*-phrase lies within the VP and is selected by the unaccusative verb (a very small number in the language, as it turns out), it is plausible that children utilize the structure of unergatives to interpret the Full unaccusative. The *ni*-phrase is just like a locative or a goal PP selected by unergative verbs. Such a PP occurs within the VP. On the other hand, as the *ni*-phrase in Full passive is in the domain of the passive verb *rare* and not in the domain of the main verb as we argued in 4.2, children would not utilize the structure of unergatives to interpret the Full passive. Therefore, the unergative analysis is not available for Full passives.

5. Development of passives in Japanese

As we have observed in Section 3, young Japanese children have a problem in comprehending the Full passive compared with the Full unaccusative. Sano (2000) and Sano, Endo, and Yamakoshi (2001) claim that this fact makes it difficult to maintain the ACDH. In Section 3 and Section 4, we demonstrated that we can account for the early development of unaccusatives in terms of the availability of the unergative misanalysis for unaccusatives. This is consistent with the ACDH. The detailed examination of the nominative case-drop phenomenon also confirmed that the ACDH is a plausible explanation for the development of unaccusatives in Japanese.

What about passives? We suggest that Japanese children show difficulty with actional passives because there are no homophonous adjectival passives in Japanese. Wasow (1977) proposed the analysis of the two different types of passives, namely, verbal passives and adjectival passives in English. Perhaps the most important hypothesis of Wasow's analysis is that adjectival passive is formed in the lexicon and does not involve NP movement. It is widely accepted that verbal passives do involve NP movement of the internal argument

to the subject position, hence the dependence on an A-chain. Borer and Wexler (1987) and Babyonyshev et al. (2001), among others, propose that children can use the structure of adjectival passives to interpret verbal passives. Therefore, children should perform well with verbal passives prior to the development of A-chains if corresponding adjectival passives are available to them. Borer and Wexler (1987), for example, propose that English speaking children do much better with passives of actional verbs than non-actional (experiencer verb) passives (Maratsos et al., 1985) because they interpret actional verb passives as adjectival passives. They suggest that actional verbs make good adjectival passives. Babyonyshev et al. suggest that a crucial factor to decide whether children can utilize adjectival passives to interpret verbal passives is whether the adjectival passives are “syntactic homophones” (abbreviated as s-homophone) of verbal passives in the language. According to Babyonyshev et al, the definition of s-homophone is formulated in (28).

(28) A phrase_i is an s-homophone of _j if _i and _j have distinct structure but common pronunciation.

(Babyonyshev et al. 2001:7)

If their language has s-homophone adjectival passives, children under certain age substitute the structure of adjectival passive for the verbal passive — this is how they get around the ACDH.

Machida (2004) argues that the passive of psychological verbs followed by an aspect morpheme *-te i (ru)* (resultative) is the only possible adjectival passive in Japanese. The degree adverb *totemo* ‘very’, which typically modifies adjectives, can modify the passive of the psychological verb *ais* ‘love’ with *-te i (ru)* as we can see in (29a). But it cannot modify a verbal passive such as ‘was eaten’ as shown in (29b).

- (29) a. Taro-wa kazoku-ni totemo ais-are-te i-ru.
 Taro-Top family-by very love-Pass-Past-te i-Pre
 ‘Taro is loved by his family very much.’
 b. Kaeru-ga hebi-ni *totemo tabe-rare-ta.
 frog-Nom snake-by very eat-Pass-Past
 ‘lit. A frog was very much eaten by a snake.’

Other than these psychological verbs, which number few, Japanese lacks adjectival passives. And, the psychological adjective passives are not an s-homophone of regular passives in Japanese because of the requirement that the aspect morpheme *-te i (ru)* accompany the passivized psychological verb for it to be an adjectival passive. Therefore, unlike English, the adjectival passive strategy for actional passives is simply not available in Japanese. This parallels Terzi and Wexler’s (2002) finding that in Greek, which also does not have s-homophone adjectival passives of the verbal passive, children’s comprehension of even the actional passive is delayed. Hence, in Japanese and Greek, the delay

in the development of the passive is due to a combination of the ACDH and the lack of the adjectival passive strategy.⁶

6. Concluding remarks

Saito (1985) suggests that the accusative case marker on direct objects may optionally drop if the direct object with the case marker is adjacent to the verb. This adjacency condition is similar to the condition proposed by Stowell (1981) for English objects. In child Japanese, it has been observed that the nominative as well as the accusative case marker drops frequently. This is a puzzle for the adjacency theory of case-marker drop, since DPs with nominative case marking are not adjacent to the verb in adult grammar (e.g., the external argument). Miyamoto et al. (1999) argues that the most typical cases of nominative-case drop are with unaccusatives. They suggest that the adjacency theory of case marker drop would explain the nominative case marker drop with unaccusatives if we assume the ACDH. By the ACDH, the sole DP of an unaccusative, which normally is marked with the nominative, is adjacent to the verb; it fails to raise to Spec of TP because grammatical A-chains are not available yet. Sano (2000) and Sano, Endo, and Yamakoshi (2001) argue against the general approach in

⁶ Okabe and Sano (2002) argue against the ACDH based on the result of their experiment on implicit arguments. They argue that the ACDH and adjectival strategy predict that children should lack implicit argument before A-chain maturation since adjectival passives lack implicit arguments. Their experiment found that children acquired implicit arguments early, which they claimed, is a problem for the ACDH. As we have discussed in Section 5, we assume that the adjectival passive strategy is not available in Japanese because Japanese lacks s-homophone adjectival passives. Therefore, the early acquisition of implicit arguments is not a problem for the ACDH with the adjectival strategy. However, if it is the case that Japanese children acquire implicit argument early, we have to account for the fact. Recall that the adversity passive in Japanese does not involve an A-chain and is acquired before gapped (A-chain) passives (Sugisaki 1999, Minai 2000). One of the important characteristics of the adversity passive in Japanese is that it obligatorily requires the *ni*-phrase. That is, if Sugisaki and Minai are correct that the adversity passive is acquired before gapped passives, the theta transmission which consists of absorption by passive morpheme and discharge to the by-phrase is not a problem in Japanese even before A-chains are formed.

(i) Taroo-wa * (Hanako-ni) mise-o yame-rare-ta.

Taroo-Top Hanako-by store-acc quit-Pass-Past

Taroo was affected adversely by Hanako's quitting the store.

It is plausible that the existence of the passive morpheme will make children seek for a possible implicit argument. If the context gives them a clue about a possible implicit agent as in Okabe and Sano's study, it is not surprising that children interpret implicit arguments fairly easily even before A-chain maturation. On the other hand, we should point out that the most important evidence in Okabe and Sano (2002) for children's knowledge of the implicit arguments in verbal passives comes from an experiment in which the passive stimuli were *wh*-questions. Following the arguments in Wexler (2004) that we mentioned in section 2, it is predicted that children will do well on passives of *wh*-questions. Okabe and Sano's experiments is not a test of whether children have knowledge of implicit arguments in declarative passives. The empirical questions remains open.

Miyamoto et al. by attempting to show that unaccusatives and passives differ markedly despite the fact that they are both supposed to have an A-chain (or a lack thereof). They claimed to have shown that children do well with unaccusatives but not with passives. According to them, this is a problem for the ACDH since A-chains are supposedly involved in both. We gave ample evidence that their approach is, at best, questionable. The early success with unaccusatives is due to the unergative misanalysis, and the delay in the development of the passive is due to the lack of homophonous adjectival passives. Also, we showed that the *ni*-phrase that occurs with unaccusatives and passives, which Sano and his colleagues utilize crucially, turn out to be fundamentally different for unaccusatives and passives, thereby casting doubt on the results they obtained from comparing these two forms. The net result of what we have presented gives further credence to the kind of approach in Miyamoto et al. (1999) which assumes the ACDH.

References

- Aoyagi, Hiroshi (1999). On association of quantifier-like particles with focus in Japanese. In Masatake Muraki and Enoch Iwamoto, (eds.), *Linguistics: In Search of the Human Mind – a Festschrift for Kazuko Inoue*, Tokyo: Kenkyusha, pp.24-56.
- Babyonyshev, Maria, Jennifer Ganger, David Pesetsky, & Kenneth Wexler (2001). The maturation of grammatical principles: Evidence from Russian unaccusatives, *Linguistic Inquiry* 32:1-44.
- Borer, Hagit and Kenneth Wexler (1987). The maturation of syntax. In Thomas Roeper & Edwim Williams (eds.), *Parameter Setting*, Dordrecht: Reidel, pp.23-172.
- Borer, Hagit and Kenneth Wexler (1992). Bi-unique relation and the maturation of grammatical principles. *Natural Language and Linguistic Theory* 10: 147-189.
- Fox, Danny and Yosef Grodzinsky (1998). Children's passive: A view from the by-phrase. *Linguistic Inquiry* 29: 311-332.
- Haig, John (1980). Some observations on quantifier float in Japanese. *Linguistics* 18: 1065-1083.
- Harada, Kazuko I., and Tomoko Furuta (1999). On the maturation of A-chains: A view from Japanese passives. *Grant-in-aid for COE research report* (3) (Kanda University of International studies): 397-426.
- Ito, Msayo & Kenneth Wexler (2002). *The Acquisition of Japanese unaccusatives*, Ms., MIT.
- Kishimoto, Hideki (2001). Binding of indeterminate pronouns and the clause architecture of Japanese, *Linguistic Inquiry* 32: 597-634.
- Kratzer, Angelika (1996). Severing the external argument from its verb, in Johan Rooryck and Laurie Zaring (eds.), *Phrase Structure and the Lexicon*, Kluwer, Dordrecht, pp. 109-137.
- Kuno Susumu (1973). *The Structure of the Japanese Language*. Cambridge, Mass: MIT Press.
- Kuroda, Shige-yuki. (1971). Remarks on the notion of subject with reference to words like *also*, *even*, or *only*, illustrating certain manners in which formal systems are employed as auxiliary devices in linguistic descriptions Part II, In *Annual Bulletin* 4: 127-152. Logopedics and Phoniatrics Research Institute, University of Tokyo. (Reprinted in *Papers in Japanese Linguistics* 11: 157-202.)

- Kuroda, Shige-yuki (1980). Bunpoo-no hikaku [Comparative Grammar]. In Tetsuya Kunihito (ed.), *Nichi-ei-go Hikaku Kooza 2: Bunpoo [Comparing Japanese and English 2: Grammar]*, Tokyo: Taishukan, pp.23-61.
- Lee, Hyeonjin and Kenneth Wexler (2001). Nominative case omission and unaccusatives in Korean acquisition. *Selected Papers from the Twelfth International Conference of Korean Linguistics*, pp. 263-279.
- Machida, Nanako (2004). A note on adjectival passives. *Nanzan Studies on Japanese Language and Culture* Vol. 4: 11-37.
- MacWhinny, Brian (1991). *The CHILDES Project: Tools for Analyzing Talk*. Hillsdale, N.J.: Lawrence Erlbaum Associates.
- MacWhinny, Brian (2000). *The CHILDES project: Tools for Analyzing Talk*. Third Edition. Mahwah, N.J.: Lawrence Erlbaum Associates.
- Marantz, Alec (1984). *On the Nature of Grammatical Relations*. Cambridge, Mass.: MIT Press.
- Minai, Utako (2000). The acquisition of Japanese passives. In Nakayama Mineharu and Charles J. Quinn (eds.), *Japanese/Korean Linguistics*. Vol. 9: Stanford: CSLI.
- Miyagawa, Shigeru (1989). *Structure and Case Marking in Japanese. Syntax and Semantics*. Vol.22. San Diego: Academic Press.
- Miyagawa, Shigeru (2001). The EPP, scrambling, and wh-in-situ. In *Ken Hale: A life in language* ed. Michael Kenstowicz, Cambridge, Mass.: MIT Press, pp. 293-338.
- Miyamoto, Edson T., Kenneth Wexler, Takako Aikawa, and Shigeru Miyagawa (1999). Case-dropping and unaccusatives in Japanese acquisition. *BUCLD* 23: 443-452.
- Miyata, Susanne (1995). The Aki corpus—Longitudinal speech data of a Japanese boy aged 1.6-2.12. *Bulletin of Aichi Shukutoku Junior College* 34: 183-191.
- Noji, Junya (1973-77). *Yooji-no gengo seikatsu-no jittai [Substance of the language use in child age] I -IV*. Hiroshima, Japan: Bunka Hyoron Shuppan.
- Ogino, Megumi (1990). *An Analysis of SAE*. M.A. thesis, Ohio State University.
- Okabe, Reiko, and Tetsuya Sano (2002). The acquisition of implicit arguments in Japanese and related matters. *BUCLD* 26: 485-499.
- Saito, Mamoru (1985). *Some Asymmetries in Japanese and their Theoretical Implications*. Doctoral dissertation. MIT. Distributed by MITPL.
- Sano, Tetsuya (2000). Issues on unaccusatives and passives in the acquisition of Japanese,” in *Proceedings of the Tokyo Conference on Psycholinguistics* Vol.1: 1-21, Hituzi Shobo.
- Sano, Tetsuya (2003). Revealing hidden continuity of innateness in children’s errors: some examples of child Japanese. Paper presented at Keio University.
- Sano, Tetsuya, Mika Endo, and Kyoko Yamakoshi (2001). Developmental issues in the acquisition of Japanese unaccusatives and passives, *BUCLD* 25: 668-683.
- Shibatani, Masayoshi (1978). Mikami Akira and the notion of 'subject' in Japanese grammar. In J. Hinds and I. Howard (eds.), *Problems in Japanese Syntax and Semantics*, Tokyo: Kaitakusha.
- Stowell, Timothy (1981). *Origin of Phrase Structure*. Doctoral dissertation, MIT. Distributed by MITPL.
- Sugisaki, Koji (1999). Japanese passives in acquisition. *UCONN Working Papers in linguistics* 10: 145-156.
- Takezawa, Koichi (1987). *A Configurational Approach to Case-marking in Japanese*. Doctoral dissertation University of Washington.
- Terzi, Arthonto and Ken Wexler (2002). A-chains and s-homophones in children’s grammar: Evidence from Greek passive. *NELS* 32: 519-537.
- Wasow, Thomas (1977). Transformation and the lexicon. In Peter Culicover, Thomas Wasow, and Adrian Akmajian (eds.), *Formal Syntax*. New York: Academic Press, pp. 327-360.

- Wexler, Kenneth (1998). Very early parameter setting and the unique checking constraint: A new explanation of the optional infinitive stage. *Lingua* 106: 23-79.
- Wexler, Kenneth (2004). *Theory of Phrasal Development*, Ms., MIT.