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Abstract

The Japanese verbal suffix -aw appears in reciprocal and non-reciprocal pluraction sentences. The syntax of the former instance has been studied in the literature (Ishii, 1989; Nishigauchi, 1992; Nakao, 2003; Bruening, 2004, 2006), while the semantics, especially in the latter use has not been studied (cf. Yamada, 2009). I present numerous examples of the non-reciprocal pluraction use of -aw and argue for a claim that the lexical meaning of -aw has a pluralization component over individuals and events and comes with a particular context dependent domain restriction for the event pluralization. Although I cannot discuss in detail, the present study will easily extend to the reciprocal use of -aw by adapting the idea of generalized pluralization operator n* (Sternefeld, 1999). Thus, it enhances the close connection between reciprocal and relational plural (Langendoen, 1978; Sternefeld, 1998; Sauerland, 1998; Beck, 2001, among others). Furthermore, the current study claims that -aw is a linguistic expression that gives the context dependent event/situation restriction that Beck (2001) speculates for one of the interpretations of English reciprocal sentences. Thus it also argues for the pragmatic nature of the event pluralization, in addition to the individual counterpart detailed in Schwarzschild (1998).

Non-Reciprocal Pluraction with *–Aw* in Japanese: Context Dependent Pluralization of Individuals and Events

Masahiro Yamada[*]

1 Introduction

The Japanese verbal suffix *-aw* appears in reciprocal and non-reciprocal pluraction sentences. The syntax of the former instance has been studied in the literature (Ishii, 1989; Nishigauchi, 1992; Nakao, 2003; Bruening, 2004, 2006), while the semantics, especially in the latter use, has not been studied (cf. Yamada, 2009). I present numerous examples of the non-reciprocal pluraction use of -*aw* and argue for a claim that the lexical meaning of *-aw* has a pluralization component over individuals and events and comes with a particular context dependent domain restriction for the event pluralization. Although I cannot discuss it in detail, the present study will easily extend to the reciprocal use of *-aw* by adapting the idea of the generalized pluralization operator $n*$ (Sternefeld, 1999). Thus, it enhances the close connection between reciprocal and relational plural (Langendoen, 1978; Sternefeld, 1998; Sauerland, 1998; Beck, 2001 among others). Furthermore, the current study claims that *-aw* is a linguistic expression that gives the context dependent event/situation restriction that Beck (2001) speculates for one of the interpretations of English reciprocal sentences. Thus it also argues for the pragmatic nature of the event pluralization, in addition to the individual counterpart detailed in Schwarzschild (1998).

2 Proposal

2.1 Overview

The whole proposal will capture the dual use of the verbal suffix *-aw* found in the following pair of sentences in Japanese. Many languages have this phenomenon, namely the same morpheme appears in reciprocal and non-reciprocal pluraction sentences (see Faller, 2007 for Cusco Quechua; Davies, 2000 for Madurese among others). The non-reciprocal pluraction sentence (1b) is not reciprocal in the sense that the putative reciprocal relation (e.g. 'compete' in the translation *competing with each other*) is not the main verb *odor-* 'dance' itself, which is lexically a syntactic intransitive verb.

(1) a. Kodomo-tachi-ga oikake-**at**-ta. Reciprocal
child-PL-NOM chase-*aw*-PAST
'The children chased each other.'
b. Kodomo-tachi-ga odori-**at**-ta. Non-reciprocal pluraction
child-PL-NOM dance-*aw*-PAST
'The children danced competing with each other/one after another/etc.'

The following ingredients account for the similarities and the differences between the two uses of *-aw*. The core meaning of this morpheme is the generalized pluralization operator $n*$ and the event restriction.

(2) a. $n*$-pluralization
-aw pluralizes the predicates denoted by its sister node (Sternefeld, 1998).

[*]Benjamin Bruening's article initiated my research on the reciprocal, Satoshi Tomioka's seminar on plurality developed my project on plurality, and Yasutada Sudo discussed over the topic with me from the very first idea of this study. I am grateful that these people have always been willing to support me on every occasion. I would also like to thank Roger Schwarzschild for his seminar and comments on the earlier versions of this paper, Satoshi Ito, Ai Matsui, and Narita Hiroki for doing judgment tasks and explanations of them. None of them but the author is responsible for any shortcomings in this paper.

b. Event restriction
-aw provides a context dependent restriction for the event pluralization.

The lexical meaning of *-aw* has the *n**-component and thus is type-flexible: Its type depends on the type of its sister node in the syntactic structure. This syntagmatic nature of the *n**-pluralization yields the following partial typology of the relational plural in Japanese. I follow Schwarzschild (1996) in that the pluralization operator comes with the context dependent cover variables in its restriction (also Beck 2001 (61)). The definition of the cover variable that is a part of the meaning of *-aw* is given in (3b). The intransitivization for the reciprocal use is speculated and the function *intr* that is responsible for it is defined in (3c).

(3) a. Partial typology of relational plural

Spell out	Semantic components	Type	Reading
-aw	intr-***-Cov(e)	<eevt,evt>	Reciprocal
-aw	**-Cov(e)	<evt,evt>	Non-reciprocal pluraction
∅	**	<eet,eet>	Cumulative/Codistributive

(*e,v,t* are the basic semantic types of individuals, events, and truth-conditions respectively.)

b. Event/situation restriction as a cover
Cov(e)=1 iff e contains two non-overlapping relevant individuals

c. Intransitivizer component
$[\![\text{intr}]\!] = \lambda R_{eevt}.\lambda x.\lambda e.\ R(x)(x)(e)$

2.2 Specific Proposal to be Defended in this Paper

In what follows, I will give a detailed description of the non-reciprocal use of *-aw* since it has not been a target of serious formal investigations in the literature. Then necessary formal mechanisms will be introduced and build up the lexical meaning of *-aw* from a quite general idea of the pluralization. I will briefly show how the proposal extends to the reciprocal use of *-aw* in the end. However, this paper focuses on illustrating the data that all argues for the following lexical meaning of *-aw* in (4) which appears in the non-reciprocal pluraction sentences.

(4) $[\![\textbf{-aw}]\!] = \lambda P_{evt}.\lambda X.\lambda E.\ {**}P(X)(E) \quad \in D_{<evt,evt>}$
Cover for E contains two non-overlapping relevant individuals
$= \lambda P_{evt}.\lambda X.\lambda E.\ \forall y(y \leq X\ \&\ Cov_1(y) \rightarrow \exists e(e \leq E\ \&\ Cov_3(e)\ \&\ P(y)(e)))\ \&$
$\forall e'(e' \leq E\ \&\ Cov_3(e') \rightarrow \exists z(z \leq X\ \&\ Cov_1(z)\ \&\ P(z)(e'))) \quad \in D_{<evt,evt>}$
where $C_3(e)=1$ iff e contains two non-overlapping relevant individuals

3 Non-Reciprocal Pluraction with *-Aw*

3.1 Surface Subject must be Plural

The surface subject must refer to a plural entity in the sentences with *-aw* in both reciprocal and non-reciprocal pluraction interpretations (see the references cited above for the reciprocal sentences). The following examples in (5) show that a plural direct object (a-i), multiplicity of the implicit manners (a-ii) or locations (a-iii), or iterated action (a-iv) do not license *-aw*. Explicit adverbs that indicate iterative actions such as *nandomo* 'many times' in (5b) do not save the sentence either. Only the surface subject can license the use of *-aw* as seen in (1) (see Yamada, 2009).

(5) a. #**Hiroki**-ga kodomo-tachi-o hihanshi-**at**-ta
Hiroki-NOM child-PL-ACC criticize-*aw*-PAST
Intended: 'Hiroki criticized the children i) …*child after child*.'
ii) ... *in many different ways*.'
iii) … *here and there*.'
iv) … *many times*.'

b. #Hiroki-ga	kodomo-tachi-o	**nandomo**	hihanshi-**at**-ta
Hiroki-NOM	child-PL-ACC	many.times	criticize-*aw*-PAST

Intended: 'Hiroki criticized the children many times.'

3.2 Subject Distributivity, and *Something Else*

There are some informal descriptions of the non-reciprocal use of *-aw* found in the literature. In general, this reading results when *-aw* appears with a verb whose arguments are fully realized, while the reciprocal reading is available when one of the internal arguments is absent.[1] Nishigauchi (1992:175), in his article on the syntax of the reciprocal use of *-aw*, mentioned the non-reciprocal use of *-aw*. He gave one example (6) and explained the meaning as follows; "…while John's and Bill's invitations of Mary are separate individual events, there is ***some sense of collaboration or competition*** that results from the activities."

(6) [John to Bill]-ga	Mary-o	shootai-shi-**at**-ta	
[John and Bill]-NOM	Mary-ACC	invite-do-***aw***-PAST	

'John and Bill invited Mary alternately.' (Nishigauchi, 1992 (51))

Nakao (2003:26) also makes similar observations: "[(7)a] means that Taro and Jiro showed joy ***at the same time***. [(7)b] means that Taro and Jiro played stereos ***competitively, or in collaboration***. The readings of the gap-less V-*aw* construction are classified into: (i) a simultaneous reading, (ii) a collaborative reading, and (iii) a competitive reading."

(7) a. [Taro to Jiro]-ga	yorokobi-**at**-ta.			
[Taro and Jiro]-NOM	be.pleased-***aw***-PAST			

'Taro and Jiro showed the joy together.'

b. [Taro to Jiro]-ga	ookina	oto-de	sutereo-o	kake-**at**-ta.
[Taro and Jiro]-NOM	loud	sound-in	stereo-ACC	play-***aw***-PAST

'Taro and Jiro competitively/collaboratively played stereos at a high volume.'
(Nakao, 2003:13)

Competition and collaboration seem to be one of the most natural readings associated with the non-reciprocal pluraction sentences with *-aw*. However, there are numerous cases like the following that do not necessarily have any sense of competition or collaboration. The observations so far suggest that the non-reciprocal pluraction sentences involve the subject distributivity and *something else*. In the next section I will illustrate context dependent nature of this additional meaning.

(8) a. Kodomo-tachi-ga	(achikochi-de)	tobihane-**at**-teiru.	
children-PL-NOM	here.and.there-at	jump-***aw***-PROG	

'The children are jumping here and there.'

b. Kodomo-tachi-ga	(junbanni)	minouebanashi-o	katari-**at**-ta.
child-PL-NOM	(alternately)	life.story-ACC	talk-***aw***-PAST

'The children talked about their life story one by one'

3.3 Context Dependency

The following examples clearly show that the subject distributivity is not the only meaning that -*aw* gives. They are odd without appropriate contexts even though the verbs are easily interpreted distributively.

[1]This is not an obligatory condition. Even when the internal argument of the verb that *-aw* attaches is missing, the non-reciprocal pluraction reading obtains if that internal argument is contextually salient. I assume the missing internal argument is *pro* that is coreferential with a contextually salient individual as in (i).

i) Yasu$_1$-ga	kurasu-de	happyooshi-te,	kodomo-tachi-ga	*pro*$_1$	hihanshi-**at**-ta
Yasu -NOM	class-in	present-and	children-PL-NOM		criticize-***aw***-PAST

'Yasu gave a presentation in the class, and the children criticized him alternately/one after another.'

(9) a.#Kodomo-tachi-ga umi-de oyogi-**at**-ta.
children-PL-NOM sea-at swim-***aw***-PAST
'The children swam in the sea alternately.'
b.#Kodomo-tachi-ga aruki-**at**-ta.
children-NOM walk-***aw***-PAST
'The children walked alternately.'

These examples are, however, perfectly fine in appropriate contexts such as the following.

(10) a. A local regulation says that there must be at least one watch on the beach while people are swimming in the sea. All the kids wanted to swim so they decided that each one does the watch for 15 minutes, one by one.
b. Kodomo-tachi-ga (junban'ni) umi-de oyogi-**at**-ta.
children-NOM (take.turn) sea-at swim-***aw***-PAST
'The children swam in the sea alternately.'

(11) a. A school project is assigned to the children. Their task is to measure a long distance by walking. Each child can measure a mile, but not longer than that because they get tired. The actual length that they were supposed to measure was 10 miles. So, they walked like this:
☺ ————> ☺ ————> ☺ ————> ☺ ————> ☺ - - - - ->
1 mile 1 mile 1 mile 1 mile

b. Juu-nin-no kodomo-tachi-ga aruki-**at**-te, juu-mairu-o hakat-ta.
10-CLperson-GEN child-PL-NOM walk-***aw***-and, 10-mile-ACC measure-PAST
'10 children walked alternately and measured 10 miles.'

Though it is clear that a context dependent part is involved in the meaning of *-aw*, it is difficult to nail down what exactly it is. Below I will propose a minimal approach to this issue making use of the pluralization over events, in addition to the pluralization over individuals that gives the subject distributive reading.

4 Formal Account

In describing the truth condition of the non-reciprocal pluraction sentences with *-aw*, I claim that those sentences are true with a group of individuals *X* and a relevant event *E* if and only if each member of *X* has the property described by the verb phrase, and each subpart of *E* consists of two non-overlapping members of *X*. Assuming that (tenseless) sentences denote a set of events, or an event type, the sentence in (1b), repeated here as (12a) denotes the event type in (12b) under this view. I ignore the tense and modal throughout the paper.

(12) a. Kodomo-tachi-ga odori-**at**-ta.
child-PL-NOM dance-*aw*-PAST
'The children danced competing with each other/one after another/etc.'
b. $\lambda E.\ \forall y(y \leq kids\ \&\ Cov_1(y) \rightarrow \exists e(e \leq E\ \&\ Cov_3(e)\ \&\ dance(y)(e)))\ \&$
$\forall e'(e' \leq E\ \&\ Cov_3(e') \rightarrow \exists z(z \leq kids\ \&\ Cov_1(z)\ \&\ P(z)(e')))$
where $Cov_1(x)=1$ iff x is one of the children[2]
$Cov_3(e)=1$ iff e contains two non-overlapping relevant children

The event type in (12b) is *collaborative*, using term in Nishigauchi (1992) and Nakao (2003), in the sense that it is divided into subevents each of which has the same property. (12)b is derived with the lexical meaning of *-aw* in (13); *-aw* takes an eventive intransitive verb *P* of type <e,vt>

[2] I will ignore the values of the cover variable for individuals and focus on those for the events hereafter.

and a plural entity *X*, returns an event property described above (see section 5.1 for compositionality). I will show below that a single idea of plulalization operation leads this denotation to a simpler and more general one.

(13) $[\![\textbf{-aw}]\!] = \lambda P_{evt}.\lambda X.\lambda E.\ \forall y(y \leq X \ \&\ Cov_1(y) \rightarrow \exists e(e \leq E \ \&\ Cov_3(e) \ \&\ P(y)(e)))\ \&$
$\forall e'(e' \leq E \ \&\ Cov_3(e') \rightarrow \exists z(z \leq X \ \&\ Cov_1(z) \ \&\ P(z)(e'))) \quad \in D_{<evt,evt>}$
where $C_3(e)=1$ iff e contains two non-overlapping relevant individuals

4.1 Individual distributivity

I use a direct extension of Link's (1983) *-operator to the syntactic pluralization illustrated in (14). When the *-operator in (14b) applies to a VP denotation such as (14a) in the syntax, the resulting predicate yields distributivity over the individual argument *X* of the VP denotation as in (14c). I follow Brisson's (2003) formulation here.

(14) a. $[\![\text{VP}]\!] = \lambda x.$ x filled the barn to capacity
b. $[\![*]\!] = \lambda P.\lambda X.\ {*P}(X) = \lambda P.\lambda X.\ \forall x[(x \leq X \ \&\ Cov(x)) \rightarrow P(x)]$
c. $[\![*\text{VP}]\!] = \lambda X.\ \forall x[(x \leq X \ \&\ Cov(x)) \rightarrow$ x filled the barn to capacity$]$
d. $Cov(x)=1$ iff x is a member of Cov

The free variable *Cov* in the above fomalization captures the pragmatic nature of the pluralization operator (Schwarzschild, 1996). Cover in (15) gives an idea on how the members of a given set are organized, or grouped. To illustrate, suppose the cows and the pigs are all that *the animals* refers to. There are young and old cows and pigs. In this case, (16d) holds, and the cover variable are responsible to distinguish the distributive readings of the sentences in (16a–c).

(15) Cov is a *cover* of P iff: Cov is a set of subsets of P
Every member of P belongs to some set in Cov
$\varnothing$ is not in Cov (Schwarzschild, 1996 (152))

(16) a. The animals filled the barn to capacity.
b. The cows and the pigs filled the barn to capacity.
c. The old animals and the young animals filled the barn to capacity.
d. [[the animals]] = [[the cows and the pigs]] = [[the old animals and the young animals]]

The above scenario demonstrates a case in which linguistic expressions, namely the subject noun phrases, fix the value of the cover variable of the pluralization operator. *The animals* is the set *U* in (17a), and the cover variable that is a part of the VP denotation in (14c) is; Cov_j (17b) in the case of (16b) with *the cows and the pigs*, Cov_k (16c) in (17c) with *the old animals and the young animals*, and Cov_l (17d) when each animal filled a burn to the capacity.

(17) a. $U = \{yc_1, yc_2, oc_1, oc_2, oc_2, yp_1, yp_2, yp_3, op_1, op_2\}$
b. $Cov_j = \{\{yc_1, yc_2, oc_1, oc_2, oc_2\}, \{yp_1, yp_2, yp_3, op_1, op_2\}\}$
c. $Cov_k = \{\{yc_1, yc_2, yp_1, yp_2, yp_3\}, \{oc_1, oc_2, oc_2, op_1, op_2\}\}$
d. $Cov_l = \{\{yc_1\}, \{yc_2\}, \{oc_1\}, \{oc_2\}, \{oc_2\}, \{yp_1\}, \{yp_2\}, \{yp_3\}, \{op_1\}, \{op_2\}\}$
where *y* stands for *young, o* for *old, c* for *cow*, and *p* for *pig*.

The *-operator applying to the VP denotation can account for the subject distibutivity of the sentences with *-aw*[3]; however, more is to be said for the complete analysis.

[3] I assume that the *-operator applies non-vacuously, or the cover is always a partition, in order to capture the plurality requirement of the surface subject.

4.2 Event distributivity

4.2.1 Pluraction marker

Linguistic expressions similar to the Japanese *-aw* are found crosslinguistically, called *pluraction markers* in Lasersohn (1995). Faller (2007) extends Lasersohn's formalization of the pluraction marker as defined in (18). A pluraction marker *PA* imposes the non-overlapping restriction on sub-events *¬(f(e)&f(e'))* based on a mapping function *f* . Faller (2007:274) demonstrates the data of Cusco Quechua and show that*"f* may be the temporal trace function [as in (19a)], resulting in a repetitive or repeated action interpretation, or *f* may be the spatial trace function [as in (19b)], resulting in the interpretation that the action is scattered in space. *f* may also refer to the thematic roles of an event, for example if *f* is instantiated to THEME, the resulting interpretation is that the action is performed on multiple themes."

(18) $[\![PA]\!] = \lambda P_{evt}.\lambda x.\lambda e.\ \neg AT(e)\ \&\ P(x)(e)\ \&\ \forall e',e''_{\in e}(e' \neq e'' \rightarrow \neg(f(e') \circ f(e'')))$

(19) a. …mana-n saru-**na**-wa-na-nchis-chu ka-sqa-nchis-wan.
…not-DIR step.on-**PA**-1O-NMLZ-1INCL-NEG be-NMLZ-1INCL-COM
'…(that) they must not discriminate against us (lit.: 'trample on us') for what we are'.
b. Maskha-**na**-ri-ku-spa puri-sha-n alqu.
search-**PA**-INC-REFL-NMLZ.SS walk-PROG-3 dog
'The dog walks, searching (for food) all over the place'.
(Cusco Quechua, Faller, 2007, (7))

Similarly to the pluraction marker in Cusco Quechua, *-aw* yields the event distributivity as seen in the previous section. In addition, the data below supports that *-aw* operates on the eventive predicates since non-eventive intransitive predicates are incompatible with *-aw*: Verbs suffixed by *-e* that yields 'be able to' interpretation as in (20b), and adjectives such as that in (21b) are both incompatible with *-aw*.

(20) a. Kodomo-tachi-wa odor-e-ta.
children-PL-TOP dance-POTENTIAL-PAST
'The children could dance.'
b.*Kodomo-tachi-wa odor-e-**at**-ta.
children-PL-TOP dance-POTENTIAL-*aw*-PAST
Intended: 'The children alternately had the ability to dance.'

(21) a. Kodomo-tachi-wa kashikokat-ta.
children-PL-TOP smart-PAST
'The children were smart.'
b.*Kodomo-tachi-ga kashikoku-ari-**at**-ta.
children-PL-NOM smart-V-*aw*-PAST
Literally: 'The children were alternately smart.'
(*-ari* is inserted to satisfy the categorical requirement of *aw*, which selects verbal elements.)

4.2.2 One More Star for Two-Place Predicates

As seen in the previous section, Japanese pluraction sentences with *-aw* is always licensed by the multiplicity of the participants, or more precisely the plurality of the subject noun phrase. In addition, the VP denotation that combines with the subject NP in the framework of the event semantics is a two-place predicate of type <e,vt>. This predicate is pluralized by **, defined in (23) that gives distributivity for both individual and event arguments ((22a) taken from Beck & Sauerland 2000, (3)).[4]

[4] I follow Beck (2001, (61)) in that the pluralization operations are in general associated with the context dependent domain restrictions, including the event pluralization. Also see Beck and von Stechow (2007) for

(22) a. $**R(X)(Y)=1$ iff $\forall x \in X\ \exists y \in Y\ R(x)(y)\ \&\ \forall y \in Y\ \exists x \in X\ R(x)(y)$
b. $[\![**]\!] = \lambda R.\lambda X.\lambda Y.\ **R(X)(Y)$
$= \lambda R.\lambda X.\lambda Y.\ \forall x[x \leq X \& Cov(x) \rightarrow \exists y[y \leq Y \& Cov(y)\ \&\ R(x)(y)]]\ \&$
$\forall y[y \leq Y \& Cov(y) \rightarrow \exists x[x \leq X \& Cov(x)\ \&\ R(x)(y)]]$

(23) $[\![**]\!] = \lambda P_{evt}.\lambda X.\lambda E.\ **P(X)(E)$ $\in D_{<evt,evt>}$
$= \lambda P.\lambda X.\lambda E.\ \forall y[y \leq X \& Cov(y) \rightarrow \exists e[e \leq E \& Cov(e)\ \&\ P(y)(e)]]\ \&$
$\forall e'[e' \leq E \& Cov(e') \rightarrow \exists z[z \leq X \& Cov(z)\ \&\ P(z)(e')]]$

Building the **-pluralization component in the denotation of *-aw* accounts for the distributivity of individuals and events, as well as the fact that the subject NP must refer to a plural entity. The final piece of the observations that needs to be accounted for is the context dependency of the interpretation. In the next section, I will show that the cover variable for the distributed event takes care of this.

4.3 Context Dependency for the Distributed Event

I propose that the pluralization operator in *-aw* comes with a type of the context dependent cover variables for the event *Cov(e)*. It requires each subevent to contain two non-overlapping relevant individuals, as in (24). To illustrate, take a concrete event of the type described by (25) and name it *E* (26a) with three children *Stan*, *Eric*, and *Kenny* dancing yesterday in Colorado. *E* has three subevents (26b) that stand in the individual part-whole relation with *E*. In other words, the subevents (26b) are still the events of *kids-dance-aw* and these are the ones that the pluralization operator quantifies over. In contrast, *E* also has three (and more) subevents in (26c) that do not stand in the individual part-whole relation with *E*. They are material parts of *E* in the sense that they are not the events of *kids-dance-aw* and hence disregarded for the universal quantification due to the domain restriction as a cover in (24). In this sense, *V+aw* is analogous to a predicate *be couple*; *Eric and Butters, Stan and Wendy are couples*, then *Stan and Wendy are a couple* but *#Stan is a couple, #Wendy is a couple.*

(24) Cov(e)=1 iff e contains two non-overlapping relevant individuals

(25) Kodomo-tachi-ga odori-**at**-ta.
child-PL-NOM dance-*aw*-PAST
'The children danced competing with each other/one after another/etc.'

(26) a. E Stan, Eric, and Kenny danced-aw
b. e_1 Stan and Eric danced-aw $\leq_i$ Individual part-whole relation
e_2 Eric and Kenny danced-aw
e_3 Kenny and Stan danced-aw
c. ε_1 Stan danced. $\leq_m$ Material part-whole relation
ε_2 Eric danced.
ε_3 Kenny danced.

Note that *competing with each other* or *one after another* parts in the translations of (25) are not a part of the logical formula, even after the value of the Cov(e) is assigned. In other words, as long as each relevant subevent, which has a child dancing, has another child in it, the actual interpretation of what this additional child is doing there is up to the pragmatic inference available in the utterance context. This is ideal because there are no-fixed meanings such as *competition* or *collaboration* as seen in the previous section. Thus, the common denominator for those readings observed in the section 3 is the restriction on the subevents of the form (24). The lexical meaning of *-aw* in (27) fully captures the observed facts.

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the analysis of the pluraction adverbs that makes use of **-pluralization for individuals and events.

(27) $[\![\textbf{-aw}]\!] = \lambda P_{evt}.\lambda X.\lambda E.\ {**}P(X)(E)$ $\in D_{<evt,evt>}$

Cover for E contains two non-overlapping relevant individuals

$= \lambda P_{evt}.\lambda X.\lambda E.\ \forall y(y \leq X\ \&\ Cov_1(x) \rightarrow \exists e(e \leq E\ \&\ Cov_3(e)\ \&\ P(y)(e)))\ \&$
$\forall e'(e' \leq E\ \&\ Cov_3(e') \rightarrow \exists z(z \leq X\ \&\ Cov_1(z)\ \&\ P(z)(e')))$

where $Cov_3(e)=1$ iff e contains two non-overlapping relevant individuals

5 Concluding Remarks

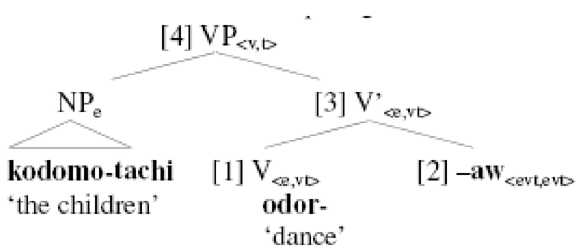
The lexical meaning of *-aw* in (27) is built up with the **-pluralization operator and a particular domain restriction as a context dependent cover for events. It accounts for the observations made in Section 3; the distributivity of the subject NP and the event, and the context dependency of the actual interpretation. In this last section, I will demonstrate the compositional calculation of a non-reciprocal pluraction sentence with *-aw*. Moreover, I will briefly show how the proposed lexical meaning of *-aw* is extended to yield the reciprocal interpretation. Needless to say, a detailed discussion of this point has to be done in another occasion due to the space limitation.

5.1 Compositionality

Assuming the VP internal subject hypothesis, the non-reciprocal pluraction sentence in (28a) is generated with the syntactic structure (28b). The semantic interpretations of each syntactic node is shown in (29). Once the value for the cover is assigned as in (30a), the non-reciprocal pluraction interpretation (30b) is obtained.

(28) a. Kodomo-tachi-ga odori-**at**-ta.
child-PL-NOM dance-*aw*-PAST
'The children danced competing with each other/one after another/etc.'

b.



(29) [1] $\lambda x.\lambda e.$ x danced in e $= \lambda x.\lambda e.\ dance(x)(e)$

[2] $\lambda P_{evt}.\lambda X.\lambda E.\ {**}P(X)(E)$
$= \lambda P.\lambda X.\lambda E.\ \forall y(y \leq X\ \&\ Cov_1(y) \rightarrow \exists e(e \leq E\ \&\ Cov_3(e)\ \&\ P(y)(e)))\ \&$
$\forall e(e \leq E\ \&\ Cov_3(e) \rightarrow \exists z(z \leq X\ \&\ Cov_1(z)\ \&\ P(z)(e)))$

[3] $\lambda X.\lambda E.\ {**}dance(X)(E)$
$= \lambda X.\lambda E.\ \forall y(y \leq X\ \&\ Cov_1(y) \rightarrow \exists e(e \leq E\ \&\ Cov_3(e)\ \&\ dance(y)(e)))\ \&$
$\forall e(e \leq E\ \&\ Cov_3(e) \rightarrow \exists z(z \leq X\ \&\ Cov_1(z)\ \&\ dance(z)(e)))$

[4] $\lambda E.\ {**}dance(kids)(E)$
$= \lambda E.\ \forall y(y \leq kids\ \&\ Cov_1(y) \rightarrow \exists e(e \leq E\ \&\ Cov_3(e)\ \&\ dance(y)(e)))\ \&$
$\forall e(e \leq E\ \&\ Cov_3(e) \rightarrow \exists z(z \leq kids\ \&\ Cov_1(z)\ \&\ dance(z)(e)))$

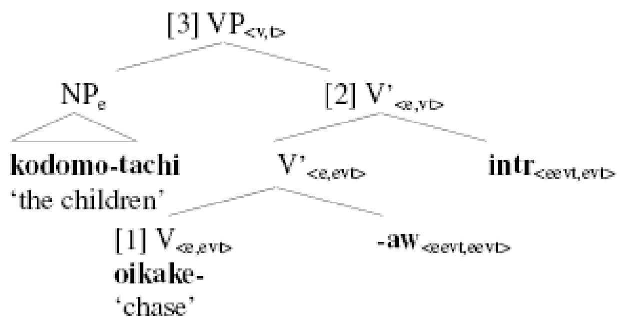
(30) a. $[[\ Cov_3(e)\ ]]^g = [g(3)](e) = 1$ iff e contains two non-overlapping relevant kids

b. Every child danced, and the relevant event consists of sub-events in which [some parts of the children]$_i$ dancing and [some other parts of the children]$_{j \neq i}$.

5.2 Extending to Reciprocal Interpretation

The lexical meaning of *-aw* stays the same across the two readings. The pluralization operator component of *-aw* is taken to be the generalized pluralization operator *n** of Sternefeld (1998). Since *-aw* in the reciprocal use combines with a transitive verb of type <e,evt>, the pluralization operator is instantiated as *** for three-place predicates of type <eevt,eevt> (cf. 'situation based cumulation' in Beck, 2001). The resulting logical form is basically that of the weak reciprocal, which is considered to be the core meaning of the eventive reciprocal sentences (Langendoen, 1978; Bruening 2004, 2006; cf. Beck, 2001). An additional silent material *intr(ansitivizer)* (32a) is speculated. Below is a reciprocal sentence with its syntactic structure and the semantic computation that results in the weak reciprocal logical form with distributive events.

(31) a. Kodomo-tachi-ga oikake-**at**-ta.
child-PL-NOM chase-*aw*-PAST
'The children chased each other.'
b.



(32) a. $[\![\,\textbf{intr}\,]\!] = \lambda R_{eevt}.\lambda x.\lambda e.\ R(x)(x)(e) \qquad \in D_{<eevt,evt>}$
b. $[[\![\,\textbf{intr}\,]\!]]([[\![\,\textbf{-aw}\,]\!]]([\![\,V\,]\!]))$
$= [\lambda R.\lambda x.\lambda e.\ R(x)(x)(e)]([\lambda R_{eevt}.\lambda X.\lambda Y.\lambda E.\ {*}{*}{*}R(X)(Y)(E)]([\![\,V\,]\!]))$
$= \lambda X.\lambda E.\ {*}{*}{*}[\![\,V\,]\!](X)(X)(E) \qquad = [2]$

(33) [1] $\lambda x.\lambda y.\lambda e.$ y chased x in e = $\lambda x.\lambda y.\lambda e.\ chase(x)(y)(e)$
[2] $\lambda X.\lambda E.\ {*}{*}{*}chace(X)(X)(E)$
[3] $\lambda E.\ {*}{*}{*}chase(kids)(kids)(E)$
$= \lambda E.\ \forall x(x \leq kids\ \&\ C_1(x) \rightarrow \exists y \exists e(y \leq kids\ \&\ C_2(y)\ \&\ e \leq E\ \&\ C_3(e)\ \&\ chase(x)(y)(e)))\ \&$
$\forall y(y \leq kids\ \&\ C_2(y) \rightarrow \exists x \exists e(x \leq kids\ \&\ C_1(x)\ \&\ e \leq E\ \&\ C_3(e)\ \&\ chase(x)(y)(e)))\ \&$
$\forall e(e \leq E\ \&\ C_3(e) \rightarrow \exists x \exists y(x \leq kids\ \&\ C_1(x)\ \&\ y \leq X\ \&\ C_2(y)\ \&\ chase(x)(y)(e)))$

(34) a. $[\![\,C_3(e)\,]\!]^g = [g(3)](e) = 1$ iff e contains non-overlapping relevant kids
b. Every child chased some children, every child was chased by some children, and the relevant event consists of sub-events in which [some parts of the children]i chased [some parts of the children]j and [some non-overlapping parts of the children]k≠i.

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