A unified semantics for associative plurals and plural pronoun constructions

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Introduction: This paper proposes a novel unified analysis of associative plurals (Den Besten 1996; Moravczik 2003), focusing on the Japanese associative morpheme *-tachi* (Nakanishi & Tomioka 2004). The analysis accounts for the strong non-homogeneity associated with associatives when attached to singular definites, and weak non-homogeneity when attached to plural expressions such as conjunctions and number-neutral predicates (Tatsumi 2017). I further extend the resulting system to Plural Pronoun Constructions (Vassilieva & Larson 2005).

Associative plurals: Associative plurals can attach to names and other definites, and, roughly speaking, refer to a plurality that includes the person named and some of their *associates*, such as a friend, family member, or colleague.

1) Taro-tachi -ga ki -ta (Tatsumi 2017: 233).
Taro-ASSOC -NOM come -PST
'Taro and his associates came.'/*'Taro came'

Associatives applied to names and definites are *strongly non-homogeneous;* they must refer to a plurality consisting of at least one thing not named by the object to the which they apply. The non-homogeneity of associatives applied to conjoined names, however, is *weak*. The associative plural in (2), for instance, may refer to Taro, Hanako, and others, or simply to Hanako and Taro.

2) Taro to Hanako-tachi -ga ki -ta (Tatsumi 2017: 240)
Taro and Hanako-ASSOC -NOM come -PST
'Taro, Hanako, and their associates came.'/'Taro and Hanako came.'

While associatives typically only apply to definite expressions, this is not true of Japanese *-tachi*: *-tachi* may apply to common nouns with an indefinite interpretation, as Nakanishi & Tomioka (2004) demonstrate. These too possess only a weak form of non-homogeneity: (3) may be interpreted as meaning that professors came along with some associate, or it could simply mean that professors came. Tatsumi (2017) refers to the former reading as the *associative reading*, and the latter as the *additive reading*.

3) Kyooju -tachi -ga ki -ta
professor-ASSOC -NOM come -PST
'Professors and their spouses/colleagues came.'/'Professors came.'

Previous approaches to the semantics of *-tachi* typically unify two properties of the associative while positing lexical ambiguities for other aspects. Nakanishi & Tomioka (2004), for instance, are able to treat the associative and additive readings in (3) with a single analysis, but must posit two different morphemes pronounced as *-tachi* for type e and <e,t> arguments. Tatsumi (2017), on the other hand, treats the associative and additive readings as fundamentally distinct.

Analysis: I propose an analysis on which *-tachi* is assigned a single meaning, combining with predicates of individuals uniformly, and which generates an underspecified meaning that is compatible with both associative and additive meanings. The ingredients of the analysis are as follows. First, I define a set of social relations SOCREL $\subseteq \wp(D \times D)$, with each relation conceived standardly as a set of ordered pairs of individuals. I then apply a choice function f to this set of relations, which will pick out a particular relation in this set depending on the context.

4) a. SOCREL = {PARENT, SPOUSE, FRIEND, COLLEAGUE, ...} b. f(SOCREL) $\in$ SOCREL

I then define two operations on relations. The first, notated R_P, restricts a relation to those pairs whose first element is an individual with a particular property (5). The second, FLAT, takes a

relation *R* and returns a set of sum individuals, where each individual is a sum of the first and second elements of the pairs in *R* (6), with *p* variable over pairs, and π_1 a function that returns the first element of a pair.

5) $R_P = \{p \mid p \in R \ \& \ P(\pi_1(p))\}$ 6) FLAT(*R*)={x⊕y | <x,y> ∈ *R*}

Finally, I extract a set from its characteristic function, and define the *association set* of a predicate P, written ASET(P), as the union of P *qua* set and the cumulative closure of FLAT(*f*(SOCREL)P), using Link's (1983) * operator.

7) extract(P) = {x | P(x) = 1} 8) ASET(P) = extract(P) ∪ * FLAT (f(SOCREL)$_P$)

I now present my analysis of *-tachi* in (9). *-tachi* takes a predicate P of type <e,t>, predicates an individual of the association set of P, and requires that that individual be non-atomic.

9) ⟦*-tachi* ⟧ = λP.λX. ASET(P)(X) & ¬atom(X)

Definites combine with *-tachi* via Partee's (1987) IDENT. Extracting the underlying set from this function will produce a singleton set containing just Taro/Taro and Hanako.

10) IDENT(x) = λy.y = x 11) ⟦Taro-*tachi*⟧ = λX.ASET(λy.y = Taro)(X) & ¬atom(X)

When *-tachi* combines with a name, it will produce a set of individuals containing Taro, as well as sums of Taro and his associates. The non-atomic condition excludes Taro, leaving only sums of Taro with his associates. This can then be converted into an individual by Partee's IOTA shifter, as in Nakanishi & Tomioka's analysis. We thus only expect strong non-homogeneity with associatives formed from singular definites. On the other hand, when combining with a sum individual like *Taro to Hanako* or with a number-neutral predicate like *kyooju*, *-tachi* does not exclude the sum individual composed of Taro and Hanako, nor does it exclude sums of professors. In these cases, we predict that associatives formed from these kinds of expressions are compatible with Tatsumi's additive and associative contexts. Furthermore, treating names as common nouns that are shifted to individuals (Muñoz 2019, a.o.) accounts for Tatsumi's "additive" reading with names, where *Taro-tachi* may refer to a group of people named Taro.

12) ⟦Taro-*tachi*⟧ = λX. ASET(λy.*Taro(y))(X) & ¬atom(X)

Finally, by making explicit use of *social relations* in the semantics of associatives, the analysis makes the correct prediction that associative plurals like *-tachi* are only acceptable with expressions denoting (sets of) *animate* entities (Moravcsik 2003). This is because inanimate objects, such as books, do not stand in social relations, unlike humans and other animals.

Plural Pronoun Constructions: A recurring idea in the typological and syntactic literatures is that associatives have a connection with *inclusive* readings of plural personal pronouns in some languages (Moravczik 2003; Yuan 2017). In these *plural pronoun constructions,* a first-person plural pronoun on its own will be interpreted as a plurality containing the speaker, but one appearing with a comitative phrase may be interpreted as containing only the speaker and the individual denoted by the comitative. (13) gives Russian examples (Vassilieva & Larson 2005).

13) a. My pojdëm domoj
we go-FUT home
'We will go home.'

b. My s Petej pojdëm domoj
we with Peter-INST go-FUT home
'Peter and I/we and Peter will go home.'

This can be analyzed by decomposing the plural pronoun into an individual corresponding to the speaker and an associative head, with distinct structural positions in the syntax. The comitative is treated as a function taking its complement and the speaker as an argument and producing their sum, which serves as input to the associative morpheme. When the comitative phrase is absent, the associative acts as a choice function *f* picking a non-atomic individual from the association set of the speaker, thereby requiring that the pronoun refer to a sum individual containing the

speaker. When the comitative phrase is present, the sum individual containing only the speaker and the individual in the comitative phrase may be selected.

14) $[\![my]\!] = [\![\text{ASSOC}(\lambda y.y = \text{speaker})]\!] = f(\lambda X.\text{ASET}(\lambda y.y = \text{speaker})(X) \,\&\, \neg\text{atom}(X))$

15) $[\![my\ s\ Petej]\!] = [\![\text{ASSOC}(\lambda y.y = \text{speaker} \oplus \text{Petej})]\!]$