Hito-deverbal Compounds in Japanese
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Previous Studies: Based on the phonological data, Sugioka (2002) argues that Japanese deverbal compounds (henceforth VCs) can be classified into two types: direct argument VCs and adjunct VCs. (1a) is an example of direct argument VCs, and (1b) is an example of adjunct VCs.

   Taro-NOM letter-write-ACC did    Taro-NOM letter-ACC pen-write did
   ‘Taro wrote a letter.’

   In (1a), a non-head element followed by the infinitive form (ren’youkei) is a theme argument of the base verb. On the other hand, in (1b), a non-head element is interpreted as an instrument. Sugioka (2002) proposes that in direct argument VCs, a non-head constituent is incorporated into a base verb, and then the base verb becomes noun by conversion. As for adjunct VCs, she assumes that the head of a compound is a verbal noun (VN), and a non-head constituent is directly combined with this VN.

   One piece of evidence for this classification of Japanese VCs comes from Rendaku voicing. As shown in (2a) and (3a), a base verb of adjunct VCs shows Rendaku. In contrast, a base verb of direct argument VCs does not show Rendaku, as can be seen in (2b) and (3b).

2. a. imo-hori ‘potato digging’     b. kikai-bori ‘digging by machine’
3. a. te-huki ‘hand towel’        b. kara-buki ‘a wipe with a dry cloth’

   Sugioka (2002) accounts for this contrast by assuming that Rendaku applies only to a head of the compound. The base verb of adjunct VCs is a head of the compound, and hence it shows Rendaku. On the other hand, the base verb of direct argument VCs is not a head of the compound because direct argument VCs are derived by conversion. However, as pointed out by Yumoto (2010), the distinction based on the data from Rendaku cannot be extended to a case where a base verb of the compound is a triadic predicate (e.g., hako + tsune ‘box + pack’ → hako-zume ‘encase’, iro + tsuke ‘color + add’ → iro-zuke ‘coloring’ etc.). Thus, we have to refine Sugioka’s insight in another way.

   Data: In order to capture Sugioka’s insight, I provide a more elaborate syntactic structure by investigating another type of Japanese VCs, which I refer to as hito-VCs. Japanese abounds in hito-VCs. Some examples are shown in (4).

4. Hito-VCs
   hito-abare ‘one-rampage’, hito-are ‘one-rage’, hito-aruki ‘one-walk’, hito-hiki ‘one-pull’,

   In hito-VCs, the Japanese counterpart of ‘one’ is used as a non-head element. Note that the numeral ‘one’ appears without classifiers in hito-VCs. Given that Japanese numerals are basically combined with a classifier, hito ‘one’ in hito-VCs is obviously different from a cardinal use of the numeral ‘one’. That the non-head hito in hito-VCs is not merely a variation of compounding that is composed of a phonologically null numeral classifier and a base verb is evidenced by the availability of Rendaku. Japanese has many VCs that are composed of a numeral classifier and the infinitive form the lexical verb, as shown in (5).

5. Numeral classifier +Verb stem
   hitohude-gaki ‘a stroke of the pen + write = writing with a stroke of the pen’, hitori-gurasi ‘one person + live = living alone’, ikkai-barai ‘one time + pay = payment at one time’, ippon-zuri ‘one rod + fish = fishing with one fishing rod’.

   In (5), the base verbs show Rendaku. In other words, the compounds in (5) undergo the derivation as follows: hitohude + kaki → hitohude-gaki, hitori + kurasi → hitori-gurasi, ikkai + harai → ikkai-barai, and ippon + tsuri → ippon-zuri. Crucially, a base verb of hito-VCs does not show Rendaku, as shown in (6) and (7). This contrast shows that hito in hito-VCs cannot be analyzed as a combination of a numeral and a phonologically null classifier.

6. a. hito-hori ‘a dig’     b. *hito-bori ‘a dig’
7. a. hito-huki ‘a wipe’     b. *hito-buki ‘a wipe’

   Note that hito-VCs cannot be treated as adjunct VCs since a base verb of hito-VCs does not show Rendaku. Furthermore, even though hito-VCs does not show Rendaku, hito is not an internal argument of a base verb. Thus, it cannot be analyzed as a direct argument VC. Thus, this behavior of hito-VCs is not captured under Sugioka’s analysis without any stipulation.
Proposition: I argue that the data discussed above is best analyzed based on the phase-based model of Distributed Morphology developed by Arad (2003). To be more precise, I propose that hito-VCs have the structure (8a). As for VCs which show Rendaku, I offer the structure (8c).

(8) a. hito-VCs
   \[ \text{nP} \quad \text{vP} \quad n \]
   \[ \sqrt{vP} \quad v \]
   
   b. hito-VCs
   \[ \text{nP} \quad \text{vP} \quad n \]
   \[ \sqrt{vP} \quad (v) \]
   
   c. hito-VCs
   \[ \text{nP} \quad \text{vP} \quad n \]
   \[ \sqrt{vP} \quad (v) \]

Arad (2003) argues that the first category head merging with a root is a phase head. Once a root is combined with the first category head, the constituent is spelled out to PF and LF. In (8a), the verbalizer is attached to a root, and then a nominalizer is merged with the vP. Following Arad (2003), I assume that both a verbalizer and a nominalizer are phase heads. In hito-VCs, hito is adjoined to an nP. A non-head constituent appears in the same position in VCs which does not show Rendaku, as shown in (8b). On the other hand, a non-head constituent is directly combined with a root in VCs which show Rendaku, as shown in (8c). Both Sugioka (2002) and Yumoto (2010) assume that in VCs which show Rendaku, a non-head element is related to the LCS of the base verb in the lexicon. Given this, I propose that this kind of relationship between a non-head element and a base verb can be captured in syntax by assuming that information about the LCS of a deverbal compound is accumulated within a vP. The semantic content of a root has been the subject of ongoing discussion (cf. Marantz 2013, Harley 2014), but it would contain world knowledge and may take a phrasal complement. (See Harley (2009) for an independent argument that a vP in a nominalized verb can have a richer structure.) I assume that composition of the LCS is established within a vP. In (8a) and (8b), a non-head element appears outside of a vP, and there is an intervening phase head. This means that, a non-head element cannot have access to the LCS of a vP in this structure. On the other hand, in (8c), a non-head constituent appears within a vP, and hence it can modify the LCS of a vP. The proposed analysis nicely captures the fact that hito-VCs do not show Rendaku. Clearly, there is no compound in which Rendaku applies in (8a) and (8b). Moreover, the proposed analysis predicts that hito-VCs can contain another VCs since there are two potential positions for a non-head element. This prediction is borne out, as shown in (9).

   ‘Taro made a good haul,’  ‘Taro got a discount.’

In addition, the proposed analysis can capture the restriction on interpretation of hito-VCs. As shown in (10a), hito-VCs always denote an event or an activity. Based on the data from Hebrew, Arad (2003) argues that there is a crucial difference between word formation from roots and word formation from words. Of importance here is that Arad (2003) observed that interpretation of verb-derived nouns is defined based on the semantic content of the base verb. Following Arad (2003), I assume that the restriction on interpretation of hito-VCs comes from the presence of the verbalizer in a structure. Note that the availability of eventive reading does not correspond to the argument/adjunct distinction, as shown in (10). Under the proposed analysis, this variation of interpretation of VCs boils down to the presence/absence of the verbalizer.

(10) a. hito-huki ‘one + wipe = a wipe’  b. kara-buki ‘dry + wipe = a wipe with a dry cloth’
   c. te-huki ‘hand + wipe = a hand towel’  d. mado-huki ‘window + wipe = window cleaning’

Implications: One question immediately arises as to why only the numeral ‘one’ comes to acquire the non-cardinal use. Grammaticalization of the numeral ‘one’ has been observed in many languages (Givón 1981, Heine 1997 Geist 2013). Following these previous studies, I assume that hito in hito-VCs is also undergoing the grammaticalization process. Yumoto et.al. (2015) pointed out that hito in hito-VCs loses its cardinal property, and it has a meaning similar to chotto ‘brief’ or sukosi ‘little’. This means that hito in hito-VCs has undergone the process of semantic bleaching. In addition, Heine (1997) pointed out that in the grammaticalization process, the numeral ‘one’ gradually loses its morphosyntactic autonomy. This process is also attested in hito-VCs, and I assume that hito in hito-VCs could be analyzed as a prefix which requires a deverbal noun as its host. (See Thompson (2011) for a similar analysis of the honorific prefix in Japanese.)