Chapter 7

Root-based syntax and Japanese derivational morphology

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This paper argues that the formation of transitive and intransitive verb stems in Japanese, a process that has been widely seen as supporting the Distributed Morphology view of derivational stem-formation as performed by the syntax, cannot in fact be analyzed as syntactic. The Japanese data are thus consistent with Anderson's (1982) claim that it is precisely that morphology traditionally classified as inflectional that reflects syntactic operations.

1 Introduction

In a well-known paper, Anderson (1982: 587) proposes that "Inflectional morphology is what is relevant to the syntax," where syntactically relevant properties are those "assigned to words by principles which make essential reference to larger syntactic structures." He claims further that a delimitation of inflection on this basis closely mirrors the traditional understanding of where the boundary between inflection and derivation lies. In contrast, the Distributed Morphology literature, in treating syntax as root-based and stem formation of all types as syntactic, denies significance to the traditional distinction between inflection and derivation and renders vacuous the claim that inflection is just that portion of morphology that realizes elements and properties manipulated by the syntax.[1] The present paper takes up the formation of transitive and intransitive verb stems in Japanese, a case that has been widely seen as supporting the DM view of stem-formation as performed by the syntax, and argues that a closer look reveals that the derivational processes in question cannot in fact be analyzed as syntactic. In the

[1] The founding paper of the DM framework, Halle & Marantz (1993), presents DM as a theory of inflection and makes no explicit claims about derivation, but the adoption of root-based syntax and the rejection of the inflection/derivation distinction are clear at least by Marantz (1997; 2001). See below for further references.

Brent de Chene. 2017. Root-based syntax and Japanese derivational morphology. In Claire Bowern, Laurence Horn & Raffaella Zanuttini (eds.), *On looking into words (and beyond)*, 135–155. Berlin: Language Science Press. DOI:10.5281/zenodo.495442

end, then, the Japanese data is consistent with Anderson's view that there is a fundamental distinction between inflection and derivation and that the criterion of syntactic relevance picks out just that morphology traditionally classified as inflectional.[2]

In recent years, the derivational morphology of the Japanese verb has become a standard example (as in Harley 2012) illustrating the DM claim that syntax is root-based – the claim, that is, that along with functional morphemes, the atoms of syntactic computation are roots rather than (inflectable) stems or (inflected) words (Embick & Marantz 2008: 5). In particular, it has become widely accepted (Marantz 2013: 106) that the Japanese suffixes that create transitive and intransitive verb stems are instances of little v, causative and inchoative, that attach to roots and thus that the verb stems themselves are syntactic constructions – much like, say, the combination of a verb stem with a tense element or a main verb with an auxiliary. Here, I note first that these claims about the constituency of Japanese verb stems rest on a restricted database that masks the fact that a significant number of stems involve sequences of two transitivity-determining suffixes. I then present the failure of two nested suffixes to interact in the way expected of syntactic elements – in particular, the fact that an inner suffix must be taken as invisible for purposes of semantic interpretation and argument structure – as the first of several related arguments casting doubt on the proposal to generate Japanese verb stems syntactically.

The data on which DM theorists base their claim that the verbal derivational suffixes of Japanese are instances of little v attaching to roots is the appendix of Jacobsen (1992), which represents a light revision of the appendix of Jacobsen (1982), and in turn appears lightly revised as Appendix I in Volpe (2005). That appendix consists of roughly 350 pairs of isoradical intransitive and transitive verbs presented in their citation forms (Imperfect/Nonpast Conclusive) and sorted into sixteen classes depending on the derivational suffixes that appear at the right edge of their stems. The fact that the Jacobsen/Volpe appendix is limited to verb stems presented pairwise means that using it as a basis for the identification of root requires assuming for each transitivity pair that there are neither stems of other lexical categories nor verb stems outside the transitivity pair that provide information about the relevant root. §2 below, in the context of presenting background information on Japanese derivation, introduces a number of cases in which this assumption is unjustified. The following three sections, building on the observations of §2, present reasons for doubting that verb stems are syntactically derived. While for concreteness I refer throughout to the DM literature cited above and related work, the argumentation is intended to apply to any proposal to generate Japanese verb stems syntactically.

§3, first, shows that a substantial minority of verb stems involve two transitivizing (T) or intransitivizing (I) suffixes (with the four orders TT, TI, IT, II all attested), but that an outer suffix must be taken to render an inner one null and void for purposes of argument structure and semantic interpretation. §4 shows that the same is true for the suffix

[2] On a personal note, while I have taken the idea that inflection is precisely the syntactically relevant morphology as a guiding principle for many years, it was anything but obvious to me at the time Steve proposed it. It ranks high in my personal inventory of the many things I have learned from Steve, and I am happy to have this opportunity to reaffirm it in a volume dedicated to him.

pair *-m-* (verbal) and *-si-* (adjectival), with the additional complication that the order in which those two suffixes appear relative to a root R is an idiosyncratic function of R. §5, finally, argues against a syntactic account of stem formation on the basis of semantic change, claiming, for lexical causatives in particular, that the diachronic instability of the putatively compositional causative interpretation (much as if a phrase like *kick the bucket* were to lose its compositional interpretation, retaining only the idiosyncratic one) shows that that interpretation cannot have been based on a syntactic derivation in the first place. In all of these cases, the behavior of the derivational suffixes under consideration is contrasted with that of inflectional and uncontroversially syntactic elements. §6, a brief conclusion, sketches two possible non-syntactic approaches to derivational morphology and speaker knowledge thereof and suggests that the choice between them for cases like the one considered here remains a topic for further research.

2 Background

In considering the shortcomings of Jacobsen's (1982; 1992) appendix as a database for Japanese verbal derivation, the first thing to note is that the pairwise presentation of the data does not always adequately represent the relations of isoradicality that hold among verb stems. This is because a number of roots underlie three or (in at least one case) four verb stems rather than two; in such cases, Jacobsen either lists two pairs in separate places or, as we will see below, omits one of the stems. In several cases involving three stems on a single root, there are two pairs of stems differentiated at least roughly by root alloseme, with a formal contrast for either transitives or intransitives but not both. For example, the difference between the allosemes 'solve' and 'dissolve, melt' of the root *tok-* corresponds to a formal distinction for transitives but not for intransitives, as shown in (1) and (2).[3]

(1) a. *tok-e-* 'be solved'
    b. *tok-* 'solve'

(2) a. *tok-e-* 'melt (i)'
    b. *tok-as-* 'melt (t)'

In other cases, as in (3) and (4), there is no alloseme-dependent pairing, simply a triplet of isoradical stems.

(3) a. *tunag-ar-* 'be connected'
    b. *tunag-e-* 'connect (t)'
    c. *tunag-* 'connect (t)'

[3] Below, taking the distinction between inflection and derivation in Japanese to be uncontroversial, I use *stem* in the traditional meaning "morpheme (sequence) subject to inflection" and cite bare stems rather than inflected forms; "(i)" and "(t)" in glosses indicate intransitive and transitive meanings, respectively.

(4) a. *uk-* 'float (i)'
b. *uk-ab-* 'float (i)'
c. *uk-ab-e-* 'float (t)'

In these last two cases, the policy of pairwise listing results in one stem of each isoradical set (specifically, 3b and 4a) being left out of the database.

In fairness to Jacobsen, it must be noted that morphological analysis was not his aim in compiling his appendix. Most crucially for our purposes, he nowhere refers to the notion "root", and it is only with Volpe's (2005) DM treatment that the root becomes a central concept in the interpretation of the appendix data. Volpe's (2005: 121 (note 27)) procedure for root extraction, however, amounts to simply peeling off the outermost derivational suffix and labeling the residue a root, and he has been followed implicitly in this practice by other DM theorists.

We should observe before proceeding that there are many cases, illustrated by (5) below, in which Volpe's procedure does in fact yield a root.

(5) a. *nao-r-* 'get better (illness, injury); get repaired'
b. *nao-s-* 'cure; repair'

(5) is clearly the kind of case Marantz (2013: 106) has in mind when he says about Japanese that "there seems overwhelming support for analyzing the suffixes signaling either the lexical causative as opposed to the inchoative or the inchoative as opposed to the lexical causative as realizations of a little *v* head attaching to the root." As we will now see, however, there are a number of respects in which the properties of (5) do not generalize to the Japanese derivational system as a whole. Most crucially, there is reliable evidence for a number of Volpe's "roots" that they are actually morphologically complex, with the result that many verb stems contain two derivational suffixes rather than one. Given that, as we have already noted, Volpe's procedure for root extraction involves no attempt to compare verb stems with stems of other lexical classes or with verb stems outside the transitivity pair under consideration, this result is unsurprising. Let us examine a few representative cases.

Consider the sequence *tunag-* of (3) above. Comparison of that sequence, roughly meaning 'connect', with the noun *tuna* 'rope' suggests that the former is undersegmented, and in particular that the transitive stem *tunag-* consists of the noun stem *tuna* (or the root that underlies it) suffixed with *-g-*. This suggestion is confirmed when we observe that *-g-* is suffixal in a number of other stems as well, with a core subset ((6–7 below and the three of note 3) displaying a very specific semantics: *-g-* takes as input a noun stem denoting a tool T and returns a verb stem with the meaning "to make typical use of T". Three examples that occasion resegmentation of entries of the Jacobsen/Volpe appendix are given in (6) through (8), with both a transitive and an intransitive stem noted in each case.[4]

[4] Three further examples whose status in the contemporary language might be thought questionable are *tumu-g-* 'spin (thread)' (*tumu* 'spindle'), *ha-g-* 'fletch (arrow)' (*ha* 'feather'), and, with an irregular alternation of *t* with *s, husa-g-* 'cover, stop up' (*huta* 'cover').

(6) a. *tuna* 'rope'
b. *tuna-g-* 'tie together, tie up'
c. *tuna-g-ar-* 'get connected'[5]

(7) a. *to(-isi)* 'whetstone'
b. *to-g-* 'whet'
c. *to-g-ar-* 'become pointed'

(8) a. *mata* 'crotch, fork'
b. *mata-g-* 'step over, straddle (t)'
c. *mata-g-ar-* 'straddle (i)'

The derivational relationships postulated in (6–8) appear unimpeachable in both formal and semantic terms: the roots are nonalternating, and the semantic relationship between nominal and verbal meanings is unmistakable.

More common as a stem-forming suffix than *-g-* is *-m-*, which can be shown to be a stem formant in several dozen verbs. (9–11) display three cases in which recognition of suffixal *-m-* forces resegmentation of strings that Volpe takes to be roots (the (a) items of (9) and (10) are adjective stems, and that of (11) is an adjectival noun, a stem with adjectival meaning but essentially nominal inflection).

(9) a. *ita-* 'painful'
b. *ita-m-* 'be painful, get injured'
c. *ita-m-e-* 'injure'

(10) a. *yuru-* 'slack'
b. *yuru-m-* 'slacken (i)'
c. *yuru-m-e-* 'slacken (t)'

(11) a. *hiso-ka* 'stealthy, secret'
b. *hiso-m-* 'be hidden, lurk'
c. *hiso-m-e-* 'conceal, mask'

We have seen that in addition to verb stems formed with the common suffixes *-r-* and *-s-*, illustrated in (5), there are verb stems formed with *-g-* and *-m-*. In fact, of the nine occurring stem-final consonants, all but *n* can be shown to be suffixal in some stems. Suffixal *-b-* has been illustrated in (4b) above; (12) through (14) display one example each for *-k-*, *-t-*, and *-w-* (*w* deletes in the phrasal phonology before nonlow vowels; here and below, I take reference to a suffix -C(V)- to subsume reference to its post-consonantal allomorph -aC(V)-).

[5] Kunio Nishiyama (personal communication) suggests the possibility that *-g-* in (6) is a (transitivity-neutral) verbalizer, with the transitivity of (6b) resulting from a null transitivizer parallel to the intransitive *-ar-* of (6c). A fully general form of this proposal will require the postulation of a very large number of morphological zeros.

(12) a. *na-k-* 'make characteristic sound' (animal); 'weep' (human)
b. *na-r-* 'sound (i)' (inanimate subject)
c. *na-r-as-* 'sound (t)'

(13) a. *hana-re-* 'move (i) away (from); be released'
b. *hana-s-* 'move (t) away (from); release'
c. *hana-t-* 'release forcefully, discharge'

(14) a. *muk-* 'face, look (in a direction)'
b. *muk-e-* 'cause to face, turn (t) (in a direction)'
c. *muk-aw-* 'face, proceed toward'
d. *muk-aw-e-* '(go to) meet, receive (a visitor)'

We see, then, that the inventory of suffixes that create verb stems of determinate transitivity is a good deal larger than envisioned in the Jacobsen/Volpe appendix, where, apart from idiosyncratic formations, the relevant set is essentially limited to *-r-*, *-s-*, *-re-*, *-se-*, *-e-*, *-i-*, and zero. In closing this introductory section, let us consider two semantic issues that arise with respect to the Jacobsen/Volpe appendix data. The first involves the interpretation of roots, the second the interpretation of suffixes.

Quite apart from the question of whether or not roots are taken to be elements that are manipulated by the syntax, no attempt to segment stems into roots and suffixes synchronically is a fully grounded project in the absence of a criterion for isoradicality – a criterion, that is, for determining when two given stems share a root and when they do not. The semantic lability of individual stems over time that will be illustrated in §5 makes this by no means an idle question. It is, however, a question that neither Jacobsen nor Volpe engage with seriously; Jacobsen (1982: 38)[6] says only that the members of a transitivity pair must exhibit "a certain degree of semantic affinity", and Volpe (2005: 32) confines himself to observing that "Root semantics is a wide-open area for further research". The question of isoradicality is essentially coextensive with the traditional problem of distinguishing homophony from polysemy, a problem that may ultimately be illuminated by psycholinguistic and neurolinguistic research (see Marantz 2013: 103). It is worth keeping in mind, however, that any program involving the synchronic identification of roots requires innumerable provisional decisions on this matter.

Turning now to the interpretation of the stem-forming suffixes of which we have seen a number of examples, let us note first that while Volpe (2005) follows Jacobsen (1982; 1992) in referring to the two members of a transitivity pair as "intransitive" and "transitive", more recent literature such as Harley (2008; 2012) and Marantz (2013) use the more specific "inchoative" and "causative". In fact, cases like *ka-r-* (Western Japan; cf. Eastern *ka-ri-*) 'borrow' versus *ka-s-* 'lend' and *azuk-ar-* 'take on deposit' versus *azuk-e-* 'deposit' show that even the former pair of terms is too specific to be accurate in general. This is because the first member of each of those pairs shows "intransitive" morphology in spite of displaying what, under Burzio's generalization, are the twin hallmarks of causative little

[6] See also note 5, p.34 and the corresponding note 30 of Jacobsen 1992 (pp. 248–249).

v, namely an agentive external argument and accusative case-marking. Cross-linguistic parallels[7] suggest that the treatment of 'borrow' as the intransitive counterpart of 'lend' is by no means accidental or exceptional. The phenomenon of a stem with causative meaning but "intransitive" morphology appears to show that if the semantics of the two morphological types are specified separately, they will have to overlap. Let us briefly note another type of example that suggests the same conclusion.

The stems *too-r-* 'pass through' and *mata-g-* 'step over, pass over, straddle' (8b above) are closely parallel in both their semantics and their case-marking. When the subject is animate, as in (15) (where stem-internal segmentation is suppressed), that subject (marked nominative but omitted in the examples) is both an agent and a theme moving along a path, and the accusative object is an intermediate point on that path.

(15) a. Syootengai o toot-te eki ni modot-ta.
shopping.district ACC pass.through-CJ station DAT return-PF
'I passed through the shopping district and returned to the station.'

b. Saku o matai-de hodoo ni hait-ta.
barrier ACC step.over-CJ sidewalk DAT enter-PF
'I stepped over the barrier and onto the sidewalk.'

In other uses, the agent of examples (15) may be replaced by an inanimate theme, with *matag-* in the meaning 'pass over', or by a path argument, as in *The road passes through the tunnel/over the train tracks.*

In spite of the close semantic parallelism between *too-r-* and *mata-g-*, however, the two stems differ in their transitivity status: *too-r-* is the intransitive corresponding to transitive *too-s-* 'pass though (t)', while *mata-g-* is the transitive corresponding to intransitive *mata-g-ar-* 'straddle' (8c above), the latter differing from *mata-g-* in taking a dative rather than an accusative object. Unless *too-r-* and *mata-g-* are semantically distinct in a way we have failed to identify, this fact shows that the transitivity status of a stem cannot be a function of that stem's semantics alone, and a fortiori cannot be a function of the semantics of that stem's suffix. An alternative possibility, which considerations of space preclude developing here, is that there is a continuum of degrees of transitivity, as suggested by Hopper & Thompson (1980) and subsequent work, and that what transitivity pairs have in common is that the "transitive" member has a higher degree of transitivity than the "intransitive" member.[8] In any case, however, the evidence we have seen here is sufficient to establish that there is no simple, general account of the semantics of the suffixes that create transitivity-specific Japanese verb stems, and that, as was the case regarding the question of a criterion for isoradicality, much work remains to be done in this area.

Above, we have seen that the data of the Jacobsen/Volpe appendix is a good deal more complex and irregular, both formally and semantically, than consideration of examples

[7] See Kuo (2015: 59, 84–85, 107) for the Taiwanese languages Amis, Puyama, and Seediq, respectively; other languages for which the relationship can be easily verified include Tagalog and Swahili.

[8] Jacobsen (1992: 73–74) develops a scalar concept of transitivity but does not suggest that the common point of transitivity pairs is a transitivity differential in favor of the morphologically transitive member.

like (5) might suggest. Nothing in the present section, however, is intended as an argument for or against any particular treatment of that data. Taking our discussion of the Jacobsen/Volpe appendix as a starting point, we now turn, in Sections 3 through 5, to arguments against proposals to generate Japanese verb stems syntactically.

3 Sequences of verbal suffixes

As we have already noted, one consequence of the resegmentations that are entailed by comparing the stems that participate in transitivity pairs with stems of other lexical categories (as well as with other verb stems) is that many stems can be seen to display a sequence of two suffixes attached successively to a root rather than a single transitivity-determining suffix. For example, the (c) examples of (6) through (8) above all involve the sequence *-g-ar-*, where the first suffix creates a transitive stem and the second an intransitive. Similarly, the (c) examples of (9) through (11) all involve *-m-e-*, where the first suffix creates an intransitive stem and the second a transitive. Suffix sequences are also observed in (12c) and (14d).

Sequences of two transitivizing suffixes and two intransitivizing suffixes are observed as well. For example, (16d) below, where (16) is an expansion of (6), involves the sequence *-g-e-*, where both suffixes create transitive stems, and (17c) involves the sequence *-m-ar-*, where both suffixes create intransitive stems.

(16) a. *tuna* 'rope'
b. *tuna-g-* 'tie together, tie up'
c. *tuna-g-ar-* 'get connected'
d. *tuna-g-e-* 'tie together, connect'

(17) a. *yasu-raka* 'peaceful, calm'
b. *yasu-m-* 'rest (i)'
c. *yasu-m-ar-* 'become rested, at ease'
d. *yasu-m-e-* 'rest (t)'

Recall now the DM claim that Japanese transitivity-determining suffixes are instances of little v, with at least an inchoative and a causative "flavor" (Marantz 2013: 107) to be distinguished. Abstracting away from the fact that (at a minimum) both types of little v will have to be polysemous, and writing the inchoative version as "v_i" and the causative version as "v_c", the structure of the two stems of (5), for example, will be as shown in (18) (simplified glosses given) .

(18) a. *nao-r-* [[R]v_i] 'get better'
b. *nao-s-* [[R]v_c] 'make better'

In the same way, the structure of the stems (16c–16d) will be as in (19), and that of the stems (17c–17d) will be as in (20). (Here and below, I take the fact that *-g-* and *-m-* (and also *-b-, -k-, -t-, -w-*) in isolation are entirely parallel in function to the suffixes the DM

literature treats as little v (notably *-r-*, *-s-*, and *-e-* (see e.g. Marantz 2013: 108) to license a parallel treatment for them in the DM framework we are taking as representative of syntactic treatments of derivation.)

(19) a. *tuna-g-ar-* [[[R]v_c]v_i] 'connect (i)'
b. *tuna-g-e-* [[[R]v_c]v_c] 'connect (t)'

(20) a. *yasu-m-ar-* [[[R]v_i]v_i] 'get rested'
b. *yasu-m-e-* [[[R]v_i]v_c] 'rest (t)'

If the representations of (19–20) are constructed in the syntax, in line with the proposal that roots and functional morphemes are the primitives of syntactic derivation, we will expect them to be interpreted compositionally, with the meaning of the outer little v combining with the result of composing the meaning of the inner little v with that of the root. In fact, no verb stem has an interpretation that involves two units of "little v meaning", either two instances of "inchoative" or two instances of "causative" or one of each; for interpretive purposes, the only little v that matters in representations like those of (19–20) is the outer one.[9] This is as if, when the Perfect auxiliary occurs outside of the Progressive in English or the Passive outside of the (productive) Causative in Japanese, as illustrated in (21), the outer auxiliary were to nullify the interpretation of the inner one rather than composing with it semantically.

(21) a. have been eating [PERF[PROG[V]]]
b. *tabe-sase-rare-* [[[V]CAUS]PASS] 'be made to eat'

It would seem that in uncontroversially syntactic constructions like those of (21), this kind of nullification never occurs, and thus that we can assume that the syntactic computational system includes no mechanism for opting out of compositional interpretation in this way. The structures of (19–20) therefore pose a major problem for the idea that the suffixes deriving Japanese verb stems are syntactic elements.

We have seen that the syntactic status of constructions like (19–20) is called into question by their interpretive properties. The representations of (19) pose a second problem as well, namely that the internal v_c will introduce an external argument that must ultimately remain unrealized.[10] In the remainder of this section, I concentrate on documenting further instances of the construction (19a), verb stems that introduce no external argument in spite of containing a transitivizing suffix.

[9] While the v_i of (20b) could be taken to be semantically active, the meaning of such causatives would have to coincide with that of causatives derived from roots, as in (18b). The semantic inertness of the inner little v thus follows for this case as for the others. (In DM, identification of category-determining elements with phase heads requires that lexical causatives, being monophasal, be root-based (Marantz 2007).)

[10] The causative interpretation and the external argument may in fact be introduced by separate heads (Pylkkänen 2008: chapter 3); what is important for our purposes is that in the data at hand they are both present when a transitivizing suffix appears alone but absent when it appears inside another transitivity-determining suffix.

Consider first the isoradical sets (22–25), all of which illustrate the suffix sequence *-r-e-*.[11]

(22) a. *mak-* 'roll up, wind around'
b. *maku-r-* 'roll up, tuck up'
c. *maku-r-e-* 'get turned up, ride up'

(23) a. *nezi* 'screw'
b. *nezi-r-* 'twist'
c. *nezi-r-e-* 'get twisted'

(24) a. *yabu-k-* 'rip (t)'
b. *yabu-r-* 'rip (t)'
c. *yabu-r-e-* 'rip (i)'

(25) a. *kasu-ka* 'faint, at the limits of perception'
b. *kasu-m-* 'become hazy, dim'
c. *kasu-m-e-* 'cloud (the vision of), deceive; graze, skim over; skim off, steal'
d. *kasu-r-* 'graze (touch lightly in passing)'
e. *kasu-r-e-* 'become faint or discontinuous (printing, writing); become hoarse (voice)'

The stems of (22–25) are all in common use in contemporary Japanese; a final parallel set that is particularly transparent semantically but for which the verb stems are obsolete is *kubi* 'neck', *kubi-r-* 'strangle', *kubi-r-e-* 'die by hanging oneself'.

Examples of the construction (19a) involving the suffix sequence *-m-ar-* can also be cited, as in (26–28). (26a) reflects the fact, not previously exemplified, that bare roots not infrequently occur reduplicated as adverbial items of the mimetic vocabulary.

(26) a. *kurukuru* 'round and round (rotation, winding)'
b. *kur-* 'reel in, wind'
c. *kuru-m-* 'wrap by rolling'
d. *kuru-m-ar-* 'be rolled up, wrapped up'
e. *kuru-m-e-* 'lump together'

(27) a. *tuka* 'hilt, handle'
b. *tuka-m-* 'grasp' (accusative object)
c. *tuka-m-ar-* 'be caught, captured'; 'hold on to' (dative object)
d. *tuka-m-aw-e-* 'catch, capture'

[11] Taking the root to be *maku-* in (22) obviates postulating a new suffix allomorph for the (b) and (c) examples but requires a rule deleting a root-final vowel in a zero-derived verb stem for (22a). Given also a rule *a + i > e,* mirroring the presumed historical development (see Ono 1953 and subsequent literature), many apparently consonant-final roots could be reanalyzed along parallel lines; for example, the stems of (1–2) above could be *tok-, toka-i-, toka-s-* (√toka) rather than *tok-, tok-e-, tok-as-* (√tok).

(28) a. *haza-ma* 'gap, interstice' (< *hasa-ma* (*ma* 'interval'))
b. *hasa-m-* 'insert between'
c. *hasa-m-ar-* 'get caught between'

In (6–8) and (22–28), then, we have seen examples in which intransitivizing suffixes appear outside transitivizing suffixes, resulting in stems of the shape (19a). These are structures for which, as a result of the internal v_c, both a causative interpretation and an external argument are predicted, but do not materialize. We have already argued that the syntactic status of all four constructions (19–20) is called into question by the fact that the inner little v of those constructions is never interpreted. Regarding the unrealized external argument of stems of the shape (19a), similarly, it is clear that there is no way, in a system of syntactic derivation based on selectional features and the Merge operation and restricted by a "no tampering" condition (Chomsky 2008: 138), for a specifier introduced by one head to be deleted or ignored as a consequence of merger of a higher head. The conclusion seems inescapable, then, that a system of stem-formation that allows stems of the form (19a), and stems of the form (19–20) more generally, cannot be the result of the syntactic computational system.

4 Verbal *-m-* and adjectival *-si-*

In (19–20) above, we saw that transitivizing and intransitivizing suffixes, characterized as v_c and v_i respectively, can occur in any of the four logically possible orders following a root. We have not seen any examples, however, in which the members of an individual pair of suffixes appear in a given order after one set of roots but in the opposite order after another set. For example, the suffixes of the sequence *-g-e-* always occur in that order regardless of their status as transitivizing or intransitivizing. In fact, there are three possibilities in that regard: both suffixes can be transitivizing, as in (16d), the first can be intransitivizing and the second transitivizing, as in *yawa-ra-g-e-* 'soften (t)' (cf. *yawa-ra-g-* 'soften (i)'), or the first can be transitivizing and the second intransitivizing, as in *hisya-g-e-* ~ *hisi-g-e-* 'be crushed' (cf. *hisya-g-* ~ *hisi-g-* 'crush'). In this section we will observe two suffixes,one deriving verb stems and the other adjective stems, for which there are four modes of attachment to a root: direct affixation of each suffix, verbal suffix preceding adjectival, adjectival suffix preceding verbal, and both orders with the same root. It will be argued that both the fact that only the outer suffix is interpreted, parallel with what we saw in §3, and the fact that the relative position of the suffixes is an idiosyncratic function of the individual root militate against treating the suffixes as syntactic elements.

Many Japanese roots support both a verb stem in *-m-,* exemplified in §3, and an adjective stem formed with the suffix *-si-*. While adjective stems in *-si-* are not treated in the DM literature on Japanese derivation, that suffix has a natural DM analysis as a category-determining little a, where the latter is a stative counterpart of inchoative v_i and causative v_c (Marantz 2013: 103). In the examples of (29–30), both suffixes attach directly to a root, making those examples parallel, as the displayed structure shows, to

the verb stems *nao-r-* and *nao-s-* that we saw in (5) and (18) (the root of 30 also supports a stem *kuy-i-* that is a close synonym of (30b); *y* deletes before a front vowel in the phrasal phonology).

(29) a. *suzu-si-* [[R]a] 'cool, refreshing'
b. *suzu-m-* [[R]v_i] 'cool off, refresh oneself'

(30) a. *kuy-asi-* [[R]a] 'causing chagrin, regret'
b. *kuy-am-* [[R]v_c] 'rue, regret'

There are a number of roots supporting both types of stem seen in (29–30), however, for which the verb stem in *-m-* is derived from the adjective stem in *-si-*. This is illustrated in (31–32) (I take *-si-* to be suffixal in an otherwise unsegmentable CVCV*si-* adjective stem).

(31) a. *kuru-si-* [[R]a] 'painful, uncomfortable, difficult'
b. *kuru-si-m-* [[[R]a]v_i] 'suffer'

(32) a. *kana-si-* [[R]a] 'sad'
b. *kana-si-m-* [[[R]a]v_i] 'grieve, sorrow'

And there are roots for which, in contrast, the verb stem in *-m-*, whether transitive (as in 33b) or intransitive (as in 34b) serves as the base for derivation of the adjective stem in *-si-*:[12]

(33) a. *uto-* [[R]a] 'distant, ill-informed'
b. *uto-m-* [[R]v_c] 'shun, ostracize'
c. *uto-m-asi-* [[[R]v_c]a] 'unpleasant, repugnant'

(34) a. *ita-* [[R]a] 'painful'
b. *ita-m-* [[R]v_i] 'be painful; get damaged'
c. *ita-m-asi-* [[[R]v_i]a] 'pitiable, pathetic'

Finally, there is at least one root for which both the verb stem in *-m-* and the adjective stem in *-si-* contain both suffixes, in the opposite order in the two cases:

(35) a. *tutu-m-asi-* [[[R]v_c]a] 'modest, unpretentious'
b. *tutu-si-m-* [[[R]a]v_c] 'be cautious regarding; abstain from'

What conclusions can we draw from the data of (29–35)? First of all, with regard to interpretation, those examples support the same observation that was made in §3 for stems of the four types in (19–20), namely that when a stem contains two derivational suffixes, the inner one is interpretively inert.[13] The semantic relations of the two stems

[12] For an English parallel to the three types (29–30), (31–32), (33–34), consider *ambigu-ous/ity, duplic-it-ous, monstr-os-ity.*

[13] While one might imagine for some of the doubly suffixed stems of (31–35) that the interpretation of the whole depends in some way on that of the inner suffix, there is evidence against this idea in some cases. With respect to (34), for example, the root-reduplicated adjective *itaita-si-* 'pitiable, pathetic' shows that the occurrence of that meaning for the stem *ita-m-asi-* has nothing to do with the inner suffix *-m-*.

to each other and to the root in (35), for example, are roughly the same as in (29–30), even though the stems of (35) each contain two suffixes and the stems of (29–30) only one. This observation, as we have seen, casts doubt on the proposal that the suffixes in question are syntactic elements.

A parallel argument can be made regarding the relative position of suffixes. (19–20) have already shown, of course, that if suffixes are divided into transitivizing ("causative") and intransitivizing ("inchoative") types, there are no constraints on their relative order when two of them occur in the same stem, so that their actual order in particular cases becomes a function of the individual root. As suggested by the discussion of the suffix sequence *-g-e-* at the beginning of this section, though, if we classify suffixes on strictly distributional grounds, without reference to transitivity value, it is possible to set up two position classes that will obviate conditioning of suffix order by roots in the great majority of cases: roughly speaking, the suffixes recognized by the Jacobsen/Volpe segmentation of stems will belong to the outer layer, with the inner layer being composed of suffixes such as *-g-*, *-m-*, *-w-*, and (transitivity-neutral) *-r-*.

For the data of (29–35), however, conditioning of suffix order by individual roots is inescapable. This, then, constitutes a second way, independent of the interpretive inertness of the inner suffix, in which the behavior of *-m-* and *-si-* fails to conform to what we would expect of syntactic elements. Returning to the analogy with auxiliary verbs that we appealed to in §3 (see 21 above), the positional relations of those two suffixes are as if the Perfect and the Progressive auxiliaries (say) both appeared adjacent to the stem for one class of verbs, but the Perfect was formed by placing the Perfect auxiliary outside the Progressive for a second class of verbs, and the Progressive was formed by placing the Progressive auxiliary outside the Perfect for a third class. The reason, of course, that this is difficult to imagine is that we expect unambiguously syntactic elements to appear in a fixed order with respect to a verbal or nominal stem. Indeed, since the 1990s, a great deal of work in cartographic syntax (notably Cinque 1999) has developed the idea that the (hierarchical) ordering of syntactic functional heads is fixed not only internally to a single language, but universally. From that perspective, the radical failure of Japanese verbal *-m-* and adjectival *-si-* to display a consistent ordering makes it extremely difficult to view them as syntactic heads.

5 Compositional meanings and semantic change

We have claimed that the syntactic computational system includes no mechanism for opting out of compositional interpretation, in particular by allowing a higher head to nullify the interpretation of a lower one. More generally, it seems reasonable to assume that the compositional interpretation of structures generated by the syntax is automatic, so that there is no way to block the compositional interpretation of a syntactic constituent.[14] We expect it to be true, in other words, that no instance of a syntactically generated structure or construction can idiosyncratically fail to display the compositional

[14] I will assume that this principle is not compromised by the delayed transfer to the interfaces characteristic of phase-based derivation (Chomsky 2001).

semantic interpretation associated with that structure or construction.[15] As a result, a phrase like *kick the bucket* that is demonstrably generated by the syntax will automatically have the compositional interpretation predicted by its lexical items and its syntactic structure, independently of whether it has one or more listed interpretations as well. As a diachronic corollary, we can infer that loss of the compositional interpretation of a syntactically generated constituent is not a possible change, assuming that the grammar and the lexicon have remained stable in the relevant respects. Thus, it would not be possible for *kick the bucket* to lose its compositional interpretation over time, retaining only the idiomatic one. When a phrase that was once generated by the syntax does have only a listed interpretation, it is either because the component words have dropped out of the lexicon, as is probably the case for the phrase *to plight one's troth* for most contemporary English speakers, or because the grammar no longer generates phrases of the type in question, as is the case for the phrase *till death do us part.*

What is true for manifestly phrasal constituents is true for inflected forms as well. Lexicalization (i.e. idiomatization) of *guts* in the meaning 'courage' and *balls* in the meaning 'audacity' has no effect on the status of those forms as regular plurals as long as the relevant stems and the rules for forming and interpreting plurals are diachronically stable. In Japanese, many verbal Gerund forms in *-te* are lexicalized as adverbs: *sitagatte, yotte* 'consequently' (*sitagaw-* 'obey', *yor-* 'be due to'), *kiwamete, itatte* 'extremely' (*kiwame-* 'reach, carry to extremity', *itar-* 'reach'). As long as the relevant verb stems remain in the lexicon and *-te* remains an inflectional suffix, however, there is no way that these idiomatic meanings can replace the compositional meanings that the forms have by virtue of their inflectional (ultimately, syntactic) status. The same is true of verbal Conjunctive forms that have been lexicalized as nouns: *nagasi* 'sink' (*naga-s-* 'make flow'), *nagare* 'flow, course of events' (*naga-re-* 'flow').[16]

If loss of a compositional interpretation is not a possible semantic change, assuming stability of grammar and lexicon, then demonstrating that the predicted compositional meaning of a putatively syntactic construction is subject to loss over time will support the conclusion that the construction in question is not syntactic after all, since if it were, its compositional meaning should be diachronically stable. In the present section, I will make this argument with respect to the Japanese lexical causative in *-s-*, exemplified by stems like *nao-s-* 'cure, repair', seen in (5b) and (18b) above. Specifically, I will document a number of cases in which the construction [R[*s*]] can be shown to have had the predicted interpretation CAUS(‖R‖) (‖R‖ the interpretation of R) originally but later to have lost that interpretation in spite of the fact that ‖R‖ itself has remained constant.

[15] Correspondingly, establishing that some phrase P is a counterexample to this principle will require (a) displaying P's syntactic structure; (b) displaying the rule of interpretation associated with that structure; and (c) showing that P idiosyncratically lacks the predicted interpretation.

[16] The semantics of these nouns has been treated in the DM literature since Volpe (2005) as involving selection of root allosemes by a noun-forming suffix ("special meanings of the root triggered across the little *v* head" (Marantz 2013: 107). The extreme semantic distance that separates many of the nouns from their corresponding roots (abundantly documented by Volpe), however, makes idiom-formation a more plausible basis for the nominal meanings than alloseme choice (for the distinction between the two mechanisms, see Marantz 2013: 105).

As a first example, consider the stem *yurus-* 'allow, forgive'. In Old Japanese (see Omodaka et al. 1967), the primary meaning of this stem is 'slacken (t)', with secondary meanings 'let go of'; 'allow, comply with, tolerate'; and 'forgive, exempt'. *Yurus-,* in other words, is historically the causative in *-s-* on √yuru 'slack' (see 30) above), a root that in modern Japanese underlies the adjective stem *yuru-* 'slack', the nominal adjective *yuru-yaka* 'slack, gradual', and the verb stems *yuru-m-* 'slacken (i)' and *yuru-m-e-* 'slacken (t)'. As is clear from these four stems, the root has been completely stable semantically over thirteen centuries, and the same can be assumed for causative *-s-*. There is no trace in the modern meaning of *yurus-,* however, of the original concrete primary meaning 'slacken'. That meaning, in other words, has been completely replaced by the originally secondary or extended meanings 'allow' and 'forgive'. If *yuru-s-* had been a syntactic construction, with the meaning 'slacken (t)' the compositional result of a semantic rule of interpretation, this replacement should have been impossible, just as we have suggested that it would be impossible for *kick the bucket* to lose its compositional meaning and retain only the idiomatic one.

The history of the stem *itas-* 'do (humble)' is broadly parallel. In Old Japanese, it is the causative corresponding to *itar-* 'reach a limit', as explicitly noted in Omodaka et al. (1967), and thus means 'bring to a limit'. In the modern language, while intransitive *itar-* has retained its original meaning, *itas-* is for the most part, bleached of concrete content, simply a suppletive humble variant of *suru* 'do'. A third case in which a *s*-stem has lost a putatively compositional causative meaning involves *konas-* 'deal with, take care of; be skilled at', whose primary meaning was originally 'break up, pulverize' and which is based historically on *ko* 'powder' (Ono, Satake & Maeda 1974). Like many other original monosyllables, *ko* has been replaced as a freestanding noun by a bisyllabic form, in this case *kona,* which is attested starting around 1700. The only serious proposal for the origin of *kona* (see NKD) appears to be that it is a backformation based on *konas-*. If the backformation theory is correct, *kona* and *konas-* were unquestionably isoradical at the relevant point in time, so that *konas-* consisted of √kona 'powder' plus causative *-s-*. Today, however, while the root noun remains in the language, the meaning 'break up, pulverize' for the verb is extinct.[17]

Two further stems in *-s-* for which the predicted causative meaning appears to have been lost over time are *hatas-* 'carry out, perform, accomplish' and *kuras-* 'make a living; live, spend (time)'. The roots appear in the zero-derived noun *hata* 'edge, perimeter; outside' and the zero-derived adjective stem *kura-* 'dark', respectively, and are semantically identifiable in the intransitives *hate-* 'end (i)' and *kure-* 'darken (day), end (i)' (for the *a* ~ *e* alternation, see note 11 above). The expected primary meaning 'end (t)' of *hatas-* appears in the gloss 'bring to a conclusion' in Omodaka et al. (1967); for *kuras-,* similarly, Omodaka et al. record the expected primary meaning 'spend the time until evening' (i.e. 'let the day darken'). In both cases, however, this compositional meaning is absent from the modern stems, neither of which stands in a purely causative relation to the corresponding intransitive or to the root. The meaning of *hatas-,* as the above

[17] While dictionaries retain examples like *tuti o konasu* 'break up dirt (clods)', the speakers I have consulted deny knowledge of such a usage.

definition indicates, inherently includes an element of purposive activity (carrying out a command, achieving a goal, fulfilling an obligation) that is absent from that of *hate-*. While the semantic difference between *kuras-* and *kure-* is more subtle, the basic fact preventing the former from functioning as the causative of the latter is that, unlike *kure-* ('come to an end'), *kuras-* ('spend (time)') is atelic. Both *hatas-* and *kuras-*, then, like *yurus-, itas-, and konas-,* are cases in which the predicted interpretation CAUS(‖R‖) of the construction [R[*s*]] has been lost over time.

In this section, we have seen an argument against the syntactic derivation of Japanese verb stems based on semantic change, using causatives in *-s-* as a representative stem-type. It goes without saying, we should emphasize, that perhaps the most common type of semantic change, the addition of idiomatic or extended meanings, does not count against the hypothesis of syntactic generation: as is well known, linguistic units of any size can be idiomatized, with the tendency to undergo idiomatization inversely proportional, roughly speaking, to size (Di Sciullo & Williams 1987: 14). But loss of a putatively compositional meaning, we have claimed, does count against syntactic generation, because there is no reason to take the compositional interpretation of syntactic structure to be anything but automatic and exceptionless. In order for a compositional meaning M to be lost, the syntactic structure underlying it would first have to be exempted from compositional interpretation, with M being lexicalized at the same time; M could then be lost from the lexicon. If this sequence of events is impossible because exemptions of the required type are never granted, however, a putatively compositional meaning that is in fact subject to loss cannot have been based on a syntactic derivation in the first place.

6 Conclusion

Above, I have attempted to evaluate the proposal that the derivational suffixes that create transitive and intransitive verb stems in Japanese are syntactic heads, in particular varieties of little v. Crucial evidence in this regard has come from identifying an inner layer of derivational suffixation (*-g-, -m-,* etc.) in addition to the well-known outer layer whose main members are *-r-*, *-s-*, *-re-*, *-se-*, *-e-*, *-i-*, and zero, since this has allowed us to raise the question of how two derivational suffixes interact when they occur together in the same stem. We saw in §3 that in such a case, the inner suffix is always inert for purposes of argument structure and semantic interpretation, casting doubt on the position that the suffixes are syntactic elements. In §4, we saw that the same is true for combinations of the verbal suffix *-m-* and the adjectival suffix *-si-,* with the added complication that the order in which those two suffixes occur is an idiosyncratic function of the root. Finally, in §5, we argued, without reference to suffix sequences, that the combination of a root and a transitivity-determining suffix, taking causative *-s-* as a representative example, cannot be a syntactic construction because its putatively compositional interpretation is unstable over time. All the evidence we have seen, then, points toward the conclusion that the derivational suffixes under consideration are not syntactic elements. Equivalently, if one wishes in the face of this evidence to generate Japanese verb and ad-

jective stems syntactically, one will require relaxation of otherwise well-motivated constraints on structure-building and interpretation precisely for the domain of the stem. As suggested at the outset, our conclusions in this regard support Anderson's (1982: 594) position on the place of morphology in the grammar: derivation is pre-syntactic, and the units of lexical storage are inflectable stems; inflection, in contrast, is the post-syntactic spellout of morphological elements and morphosyntactic properties that are treated by syntactic operations.

The conclusion that Japanese derivational suffixes, in contrast with suffixes like the Passive and the productive Causative, are not syntactic elements is supported at a more impressionistic level by the fact that, as is easily confirmed, the two sets of suffixes differ sharply in their degree of regularity, both formal and semantic. Formally, while variation in the shape of the Passive suffix *-(r)are-* is limited to phonologically conditioned alternation of *r* with zero at the left edge, and variation in the shape of the Causative suffix *-(s)as(e)-* is limited to phonologically conditioned alternation of *s* with zero at the left edge and non-phonological alternation of *e* with zero at the right, variation in the realization of what under a DM analysis will be v_i and v_c is highly unconstrained, with multiple unrelated allomorphs for each of the suffixes and almost complete overlap between the two allomorph sets. Semantically, while the meaning of Passivepassive stems in *-(r)are-* and (apart from occasional idioms) Causative stems in *-(s)as(e)-* is both regular and relatively straightforward to characterize, the meaning of stems in v_i and v_c is in most cases multiply polysemous and highly idiosyncratic; the glosses we have given above, while aiming at a marginal increase in accuracy over the labels in Jacobsen (1992) and Volpe (2005), in many cases only scratch the surface of the problem of specifying stem meaning. With regard to semantics, it should also be remembered that, as we noted in §2, morphological analysis internal to the stem proceeds on the basis of an unredeemed promissory note regarding the criterion for isoradicality and that equally serious questions arise about how the meaning of transitivity suffixes is to be specified, given the apparent semantic overlap between transitivizing and intransitivizing morphology.

If Japanese verb and adjective stems are not, then, created by the syntactic computational system, how should we conceive of their structure and, crucially, the knowledge that speakers have about that structure? Broadly speaking, there are two types of answer that could be given to this question. On one of them, derivational morphology of the type we have seen here would be the result of a combinatory system roughly parallel to syntax but less regular both in terms of the hierarchical relationships holding among grammatical elements and the semantic interpretation of complex structures. From the standpoint of theoretical parsimony, of course, this would seem like an unattractive proposal; surely, if possible, we would prefer to maintain that the language faculty involves a "single generative engine" (Marantz 2001; 2005). Viewing language as a biological object, however, there would appear to be no grounds for excluding a priori the possibility that our linguistic capacities include a combinatory stem-formation module of the sort in question. In evolutionary terms, such a module might have provided a vastly expanded repertory of named concepts in advance of the emergence of a fully regular and productive syntax, representing a sort of half-way house on the road to discrete infinity.

The second type of answer that could be given to the question of the form taken by speaker knowledge of the relations among isoradical stems, assuming that those relations are not mediated by the syntactic computational system, is that that knowledge is frankly non-generative – that is, non-combinatory. In this case, all stems will be lexically listed, with relations among them captured by redundancy rules, for example, those of the type pioneered by Jackendoff (1975) (see also Jackendoff 2002: 53). What is unsatisfying about this type of answer is that it provides no insight into why derivational morphology should exist at all – why, that is, stems (setting aside compounds) are not all atomic. While we have seen evidence that at least some derivational morphology cannot be syntactic, then, there is no unambiguously attractive alternative account of the structure of speaker knowledge in this area. As a result, the place of derivational morphology in our linguistic competence remains very much an open question.

Acknowledgments

I would like to express my appreciation to Takayuki Ikezawa, in conversations with whom the idea for this paper emerged. I am also grateful to Kunio Nishiyama and Yoko Sugioka for comments on a presentation of some of this material at the 152nd meeting of the Linguistic Society of Japan (Tokyo, June 2016). Finally, I am indebted to several reviewers for comments that have resulted in a number of clarifications and improvements. Remaining errors of fact or interpretation are my responsibility.

Abbreviations

CJ (second or perfective) conjunctive
PF perfective

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