8 THE SOURCE OF THE BIGRADE CONJUGATION AND STEM SHAPE IN PRE-OLD JAPANESE

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1. Introduction

One of the first things that a learner of Japanese notices is the contrast between the verb forms in (1):

(1) a. *Tenpu   ga   tuku   to   50Kbyte gurai ni   naru.*
        attachment NOM attach when 50kbyte about LOC   becomes
        'When an attachment attaches, it (the message) becomes about 50K
        bytes.'

   b. *Tenpu   o   tukeru to   50Kbyte gurai ni   naru.*
        attachment ACC attach when 50kbyte about LOC   becomes
        'When (one) attaches an attachment, it (the message) becomes about
        50K bytes.'

She notices the formal similarity between the stem *tuk-* 'attach_INTRANS' in (1a) and *tuke-* 'attach_TRANS' in (1b). These two represent the two main verb conjugations in Japanese: *tuk-* represents the consonant stem or godan conjugation, while *tuke-* represents the vowel stem or ichidan conjugation. The learner also notices the grammatical relationship between the two stems: *tuk-* is the intransitive and *tuke-* the transitive form of 'attach'. Soon she comes upon another remarkable fact: pairs like (1) are quite common, but it is not possible to predict which conjugation has which valence. In some cases, the relationship between conjugation class and transitivity is reversed:

(2) a. *Hifu ga   sakeru to   kizu ga   hukaku naru.*
        skin NOM split   when wound NOM deep   becomes
        'When the skin splits, the wound gets deeper.'

b. *Hifu   o   saku to kizu   ga   hukaku naru.*
skin   ACC   split when   wound NOM   deep   becomes
'When one splits the skin, the wound gets deeper.'

In (2), the vowel-stem verb is transitive, and the consonant-stem verb is transitive. This is the opposite of the situation in (1). This basic state of affairs – the existence of two main conjugation classes, the presence of formally similar stems in both conjugations, related by transitivity, and the unpredictability of the transitivity relation – has a very old history in Japanese. It obtains in the oldest attested variety, Old Japanese, as shown in (3) and (4):

(3) a. *ta=kwomura ni   amu   kak-i   tuk-i*
hand=wrist on   horsefly hang-RY attach-RY
'a horsefly bit (him) on the forearm and...'
(*Kojiki* Yûryaku, 712)

 b. *yo no naka ni   kokoro   tuk-e-zu-te*
world GEN midst in heart   put-MZ-not-ing
'without paying heed to the affairs of the world'
(MYS 4162, 746-757)

(4) a. *ipa   sak-u*
rock split-SS/RT
'splits rock.'
(*Nihon shoki* Jindai 2, 720, phonetic note explaining name of god)

 b. *(tume) sak-e-te*
nail   split-RY-ing
'the nail splits and...'
(*Nihon ryôiki* 2.26, 822)

Intransitive *tuk-* 'attach' and transitive *sak-* 'split' belong to the quadrigrade (yodan) conjugation in OJ, while transitive 'attach' and intransitive 'split' belong to the bigrade (nidan) class. The descendants of these four verbs belong to the corresponding conjugation classes in modern Tokyo and Kyoto Japanese and in varieties whose divergence from the ancestors of modern Tokyo and Kyoto antedates the 8th century, such as Shuri (Okinawa; National Language Research Institute 1963). The conjugation classes have undergone important mergers and other changes, but the basic opposition between these two main conjugations remains in the standard language and other varieties.

2. Previous reconstructions

For the past half century, linguists have attempted to explain how the main conjugation classes came into being in Japanese. Let us first examine how these classes are situated within the eight conjugation classes of OJ.

(5) The conjugation classes of Old Japanese:

Conjugation Imperative	Conclusive	Irrealis	Continuative	Adnominal	Conditional
Quadrigrade *okye*	*oku* (A) 'put'	*oka*	*oki*	*oku*	*oke*
Upper Bigrade *okwiyo*	*oku* (B) 'arise'	*okwi*	*okwi*	*okuru*	*okure*
Lower Bigrade *akeyo*	*aku* (B) 'dawn'	*ake*	*ake*	*akuru*	*akure*
Monograde *miyo*	*miru* (B) 'see'	*mi*	*mi*	*miru*	*mire*
k-irregular *koyo*	*ku* (B) 'come'	*ko*	*ki*	*kuru*	*kure*
s-irregular *seyo*	*su* (A) 'do'	*se*	*si*	*suru*	*sure*
n-irregular *ine*	*inu* (A) 'go'	*ina*	*ini*	*inuru*	*inure*
r-irregular *are*	*ari* (B) 'be'	*ara*	*ari*	*aru*	*are*

The OJ conjugations suggest that the irrealis (mizenkei) base, which appears with a functionally heterogeneous group of suffixes such as the negative and passive, may reveal the original shape of certain stems, in particular the irregular monosyllabic stems *ko-* 'come' and *se-* 'do', because the vowels in the irrealis base of these verbs are quite unpredictable. A second striking fact about the OJ conjugations is the distinctiveness of the bigrade continuative endings, *-wi* and *-e*. This last is the central motivation of Ohno's (1953) reconstruction of the proto-Japanese verbal system.

(6) Ohno's (1953) reconstruction of the proto-Japanese verbal system:

Conjugation Imperative	Conclusive	Irrealis	Continuative	Adnominal	Conditional
Quadrigrade *okye*	*oku* 'puts'	*oka*	*oki*	*oku*	*oke*
Pre-OJ **oki-a*	**oki-u*	**ok-a*	**ok-i*	**ok-ru*	**ok-ai*
Upper Bigrade *okiyo*	*oku* 'arise'	*okwi*	*okwi*	*okuru*	*okure*

Pre-OJ *oki-yo	*oki-u	*oko-i	*oko-i	*oko-uru	*oko-urai
Lower Bigrade akeyo	aku 'dawn'	ake	ake	akuru	akure
Pre-OJ *ake-y	*ake-u	*aka-i	*aka-i	*aka-uru	*aka-urai
Monograde miyo	miru 'sees'	mi	mi	miru	mire
Pre-OJ *mi-yo	*mi-ru	*mi-i	*mi-i	*mi-ru	*mi-rai

Ohno reconstructed an opposition in stem shape parallel to the opposition between the modern conjugations. He reconstructed the OJ quadrigrade conjugation, ancestor of modern consonant stems, with consonant stems for proto-Japanese; he reconstructed OJ bigrade verbs, ancestors of modern vowel stems, with vowel stems. Ohno did not simply project the modern opposition back into the past, however. Hashimoto (1931/1949:174) had noticed that while the quadrigrade continuative ending is –i, the bigrade ending is –wi (in the upper bigrade or kami nidan conjugation) or –e (in the lower bigrade or shimo nidan conjugation). Ohno exploited the parallel between the bigrade continuative endings and other cases where the nucleii /wi/, /e/ are derived from contractions of *u, o + i and *a + i respectively (1955:308) to reconstruct the bigrade stems as ending in -u, -o, or -a.

Further support for these reconstructions comes from what Arisaka (1931/1975:50) called 'embedded root forms' (hifukukei): cases where the original root in -u, -o, or -a is embedded in a derived form. (7) gives examples of this for the two verbs in (4), upper bigrade oku/okwi 'arise' and lower bigrade aku/ake 'dawn'.

(7) Embedded root forms:

    a. *okosu* 'raise, cause' < *oko-s-u*
        okoru 'arise, occur' < *oko-r-u*

    b. *akasu* 'make dawn, make clear'   < *aka-s-u*
        akasi 'red' (cf. uninflected adjective *aka* 'red')   < *aka-si*

A final comment is order here about Ohno's reconstruction of the irrealis forms. The table in (6) shows an irrealis (mizenkei) suffix of variable shape: *-a in the quadrigrade conjugation, *-i elsewhere. But Ohno's actual proposal is that the irrealis is a secondary category, made up of vowel-initial suffixes (traceable to auxiliaries) that are suffixed directly to the original stem. On this view, for example, negative

adnominal *yukanu* 'don't go (ADNOMINAL)' derives from *yuk+an-u*, where *yuk-* is the stem of 'go' and *an-u* is the adnominal form of the negative auxiliary. Speakers later reanalyze such forms as *yuk-a-n-u*, taking the initial vowel of the auxiliary to be the irrealis ending. There is good evidence that this reanalysis is still in progress in the eighth century, as subsequently productive endings that select the irrealis base, such as causative *-su/-se*, are just beginning to emerge at this time. A unified reconstruction of the irrealis as resulting from stem+aCV(CV)- is made explicit in Unger's reconstruction, discussed in the next section. The irrealis category thus derives from affixation of longer vowel-initial endings directly to the stem.

Ohno's reconstruction explains the shape of the bigrade continuative endings and relationship between bigrade verbs and embedded root forms as in (5). But it fails to explain the relationship between the bigrade pattern and the transitivity alternations we saw in (1-4). We might note also that Ohno's hypothesis that all bigrade verbs descend from vowel stems forces us to reconstruct proto-Japanese stems such as **tuka-* for 'attach$_{TRANS}$' and **saka-* for 'split$_{INTRANS}$'; but there are no hidden root forms that provide independent support for such reconstructions in the case of these verbs.

Yoshida (1973) and Unger (1977, 1993) are responsible for the next important advance in the reconstruction of the bigrade classes, in my opinion. These linguists share the insight that the bigrade conjugations are derived, or secondary (see Frellesvig, this volume, for another version of this view). Unger provides a comprehensive reconstruction for all of the conjugations of proto-Japanese. (8) shows his reconstruction for the quadrigrade and bigrade conjugations.

(8) Unger's (1977, 1993) reconstruction of quadrigrade and lower bigrade stems:

		Quadrigrade 'it opens'			Bigrade 'open it'		
		Pre-OJ	>	OJ	Pre-OJ	>	OJ
a.	Conclusive	*aka-u*	>	*aku*	*aka-gi-u* > *akagu* > *aku*		
b.	Irrealis	*aka-aX*	>	*akaX*	*aka-gi-aX* > *akagiX*		
				>*ake$_2$X*			
c.	Continuative	*aka-i$_1$*	>	*aki*	*aka-gi-i* > *akagi* > *ake$_2$*		

    d. <u>Adnominal</u>   *aku-re-u > akuru > aku   *aka-gu-re-u >
akaguru

                                              >

akuru

    e. <u>Conditional</u>   *aku-re > akure   *aka-gu-re > akure

    f. <u>Imperative</u>   *aka-Ø > ake_1 *aka-gi-Ø > ake_2
$Ø(yo_2)$

Unger proposes that the derivational source is an "enlarging clitic" *gi, "cognate with the passive/causative marker of Korean (Martin 1972), or a monosyllable of the shape *Ce" (1993:70). As we see below, the second of these proposals is quite close to Yoshida's and the view that I advance in this paper. Note that the final vowel in quadrigrade roots plays a rather minor role in Unger's reconstruction. This vowel is always lost before the conclusive, irrealis, and continuative suffixes in (8a-c). Here Unger follows Yamaguchi's (1971, 1985) proposal that in an early stage of pre-OJ derived V_1-V_2 sequences, V_1 is lost, if the root is longer than the suffix. This ensures that the hypothesized root-final vowel is lost in, e.g. 'doesn't open' (*aka-azu > akazu 開かず), but retained in 'doesn't come' (*ko+azu > kozu 来ず). In a later stage of pre-OJ, (i) *g is lost and (ii) V-V sequences diphthongize. This is the stage where the bigrade continuatives are formed, as shown in (9):

(9) Unger's (1977, 1993) derivation of bigrade continuatives

$\qquad$*Hiatus Loss of *g

Diphthongization
(a) Upper bigrade *oko-gi-i >   *okogi   >   *oko-i >   okwi

(b) Lower bigrade *aka-gi-i >   *akagi   >   *aka-i >   akey

In more recent work, Unger (2001) relaxes the claim that all quadrigrade roots were originally vowel-final. He continues to hypothesize an original vowel after roots with a final coronal consonant, to block the effects of the 'strong palatalization' process hypothesized by Whitman (1985). In other quadrigrade roots, a final vowel may or may not be present. However the other features of Unger's earlier reconstruction are retained.

Unger's reconstruction represents a major step forward in that it accounts for the derived nature of the bigrade conjugations. But Unger's derivations still fail to account for a number of facts. Firstly, the transitivity patterns of lower and upper bigrade stems are different. The lower bigrade conjugation includes both transitives and intransitives, as we saw in (1-4); the former are somewhat more numerous. As observed by Kida (1988:83), however, upper bigrade verbs include only intransitives (1988:88). Thus *oku/okwi* 'arise,' *tuku/tukwi* 'get used up,' *sugu/sugwi* 'pass, exceed,' and *amu/amwi* 'bathe' are all intransitive. Kida notes two possible exceptions: *todomu/todomwi* 'bring to a stop' and *komu/komwi* 'enfold.'[1] But as Kida points out (ibid), both of these verbs have lower bigrade alternants: *todomu/todome* and *komu/kome*. It is the latter that survive in later Japanese, and have the wider distribution in OJ.

The second problem with Unger's reconstruction concerns the specific proposal that the 'enlarging clitic' is cognate with the Korean passive/causative marker, MK *-Gi-* < *-ki-*. The Korean morpheme appears to have originally been a causative suffix, subsequently extended to a passive function, although both functions already exist in the first hangŭl texts of the 15th century. It derives true causatives, with agent causees (10a), and passives with (animate) experiencer surface subjects (b).

(10) a. *Emeni ka   ay hanthey   pap ul   mek-i-ess-ta.*
       mother NOM   child to   food ACC   eat-CAUS-PAST-DEC
       'The mother fed the child.'

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[1] A third possible exception, *todu/todi* 'shut (door)' lacks a clear OJ phonographic attestation.

b. *So ka   holangi eykey   mek-hi-ess-ta.*
cow NOM   tiger by   eat-pass-pasT-DEC
'The cow was eaten by the tiger.'

Neither of these patterns is attested with Japanese bigrade stems. Japanese bigrade intransitives are unaccusatives, not passives; therefore they disallow expression of an agent, overt or implicit. Thus (11) disallows expression of an agent:

(11)*Hifu ga   geka i ni sakeru to   kizu   ga   hukaku naru.*
skin   NOM surgeon by split   when   wound NOL   deep becomes
'When the skin is split by the surgeon, the wound gets deeper.'

Likewise, bigrade transitives do not occur with agent causees; that is, they do not entail a true causative structure involving two agents and two events. OJ did have lower bigrade stems which are superficially causative-like in that they appear to add an additional argument, such as *paku/pake* '(cause to) strap on:'

(12) *usi ni   koso   pana napa pak-ure*
cow-DAT   EMPH nose rope   strap.on-IZ
'On the cow strap on the bridle'
(MYS 3886)

Even in a case like (12), however, the bigrade transitive does not result in a causative with a volitional (i.e. agentive) causee. Thus (12) means "put the bridle on the cow," not "make the cow put on her bridle."
    A third problem for the comparison with the Korean passive/causative maker is that in many cases, the root selected by the ancestor of the Japanese bigrade endings was an adjective; in these instances, the meaning of the derived Japanese bigrade verb is never causative (as is the case in Korean), but rather inchoative. Examples of this type include *aku/ake* 'dawns,' from *aka-* 'red' in (5-7), *asu/ase* 'gets shallow,' from *asa-* 'shallow'; *opu/opwi* 'grows,' from *opo-* 'big,' *sabu/sabwi* 'behave quietly' from *sabu-* 'lonely,' and many others. Adjectives are generally taken to have been uninflecting in pre-OJ. The formative involved in the derivation of the bigrade stems must have been able to select adjectival roots as complements, and turn them into inchoative verbs. Typological parallels become relevant here: while passives derived from inchoatives and causatives derived from passives are robustly attested across languages, inchoatives derived from passives or causatives are not. This suggests that the base meaning of the

formative involved in the derivation of the bigrade conjugations was inchoative.

A fourth problem that must be explained by any reconstruction of the bigrade stems is the major statistical imbalance between upper and lower bigrade classes. Lower bigrade stems are much more numerous: Frellesvig (this volume) states that they make up 20% of all OJ verbs; quadrigrade stems make up 75%, but Frellesvig counts only approximately 30 upper bigrade stems. In terms of absolute numbers, Kida counts 1,295 quadrigrade stems, 452 lower bigrade stems, and 83 upper bigrade stems in OJ (1988:78-9).[2] Note that the much lower frequency of upper bigrade verbs does not help us explain the absence of transitives among them, because a very high proportion of upper bigrade verbs are transparently derived (see problem three above); nevertheless, the derivation never produces a transitive. Ideally, we would like to find a reconstruction that explains both the low frequency of this conjugation and its restriction to intransitives.

The facts summarized above indicate that whatever morpheme was involved in the derivational relationship linking quadrigrade and bigrade stems, it was not a simple "transitivity flipper," nor was it a causative/passive morpheme like Korean *-hi/ki/li/i-*. Upper bigrade stems do not participate in the transitivity alternation at all. And for many bigrade verbs, the derived interpretation was inchoative, not transitive or intransitive.

3. A "new" old proposal

Yoshida Kanehiko's (1973:85-6) proposes that the verb *u/e* 'gets, obtains, be able to' is the source of the bigrade conjugation. He refers to an earlier hint along these lines by Takeda Yûkichi (1957:201). *U/e* is rather rare in OJ texts in phonogramatic attestations, except in its continuative form *e*. It occurs as a potential auxiliary, less frequently in its base lexical meaning 'get.' It is classified as a lower bigrade verb; in fact its shape consists exactly of the lower bigrade endings:

(13) The conjugation of *e/u* 'get' (lower bigrade)

Conclusive	*u* (?B) 'receive'
Irrealis	*e*
Continuative	*e*

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[2] Kida's larger numbers (based on a tally of entries in Omodaka et. al, 1967) results from counting separately verbs involving the same derivational element: thus deadjectival verbs in upper bigrade *-mu/-mwi* are each counted separately. The point is the same, however: upper bigrade stems are much less frequent than the other classes.

Adnominal	*uru*
Conditional	*ure*
Imperative	*eyo*

Yoshida and Takeda both remark on the absence of OJ phonogrammatic attestations of conclusive *u*. Continuative and irrealis *e* and adnominal *uru* are attested, the latter only in the function of potential auxiliary. Takeda's speculation about the relation between *u/e* and the bigrade conjugation is brief: "There are cases where it would appear that verbs in the lower bigrade conjugation with other finals may include this word" (1957:201). Yoshida is more explicit: "*U* exists as an independent (word), but from a phonological and semantic standpoint it may be supposed that this element is incorporated in the remainder of the lower bigrade conjugation. It is the original morpheme of the lower bigrade formation" (1973:87-8). Neither Takeda nor Yoshida spell out how this verb, grammaticalized as a suffix, might derive the functions and forms associated with the bigrade endings.

Let us consider form first. Martin (1987:681 and 1996:13) proposes that *u/e* 'get' is built on the same root *a-* that occurs in *ar-* 'exist,' with the latter derived by an original suffix in *-r-*. On this view, continuative (and irrealis) *e* is derived by affixation of the continuative suffix *-i*: *a+i > e*, as per Ohno's (or Unger's) analyses. Frellesvig (this volume) makes an alternative proposal, which I will adopt in this paper. Frellesvig proposes that the stem of *u/e*, like the other OJ monosyllabic stems in (5), 'come' and 'do,' was identical to its irrealis form, that is *e-*. Let us examine the proposal concretely, contrasting *u/e* and *ku* 'come.'

(14)   *e/u* 'get'   *ku* 'come'
  a. <u>Conclusive</u>   *e-u* >   *u*   *ko-u* > *ku*

  b. <u>Irrealis</u>   *e-aX* >   *eX*   *ko-aX* > *koX*

  c. <u>Continuative</u> *e-i* >   *e [ey]*   *ko-i* > *ki*

In the conclusive and irrealis (a-b), the outcome is the same for both verbs. In the continuative (c), *ku* deletes the stem vowel, while *e* appears to delete the suffix. Relevant here is a crucial difference between the two stems: onset /k/ remains after deletion of the stem vowel with *ku*, but the stem would be completely obliterated by the same strategy with *e*, as indeed occurs in the conclusive. We can explain this pattern with a modification of Yamaguchi's (1973, 1985) generalizations about stem and affix contraction, mentioned in §2. This is presented informally in terms of the ranked constraints in (15):

(15) a. *Hiatus (Stem faithfulness) (C)V - VCVX: suffix-initial vowel drops.

    b. *Hiatus (Diphthongization) V - i: -> Vy

    c. *Hiatus (elsewhere):   stem-final vowel drops

(15a) applies to any suffix of more than one syllable, as originally proposed by Yamaguchi. This derives the irrealis forms of all stems. The diphthongization strategy in (15b) applies only to the monomoraic suffix *-i* and stems made up only of a vowel. The only other instance of a suffix of shape -V in OJ is conclusive *-u*; here the suffix vowel wins, as this belongs to case (13c) discussed above.

    (15a) is a restatement of Yamaguchi's (1973, 1985) constraint, also adopted by Unger. It shares a crosslinguistic insight widely adopted in Optimality Theory, expressed in McCarthy & Prince's (1995) Stem(Root)-Affix Faithfulness Metaconstraint, [3] which states that faithfulness to stems (or roots) outranks faithfulness to affixes. We can understand (15a) to stipulate that in cases of stem+affix hiatus, the initial vowel of the affix is deleted unless the consequence would be complete obliteration of all material in the affix.[4]

    (15b) applies when the suffix is a single vowel. There are two candidate cases here: continuative *-i* and conclusive *-u*. Of these two segments, *i was available for diphthongization in pre-Old Japanese (see Frellesvig & Whitman, this volume, and the references cited there for a discussion of the outcomes of diphthongization in *V+i). Most of the examples of pre-OJ diphthongization involve compounds of the form (CV)CV+iCV. There are no clear examples of this type involving *(CV)Ce+ iCV, probably because the pre-OJ raising rule discussed by Frellesvig and Whitman raised *e to *i in positions other than final syllables. But verb stem + *-i* provides a final syllable context where we should expect *e to be retained; it is then reasonable to suppose that the outcome of diphthongization is *e-i > *ey > OJ *e*. On this view, diphthongization is a sort of 'last resort' strategy for maintaining

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[3] I am grateful to my colleague Abigail Cohn for clarifying the ramifications of a constraint-based analysis of these facts for me. I have not attempted to implement a full OT-style analysis here, however.

[4] The adnominal forms of 'come' and 'do' in (5) may at first seem to require a modification of (15a); taking 'come' as an example, the stem vowel in *ko+uru* appears to be deleted despite the fact that the suffix *-uru* is two syllables. In Whitman (2004), however, I argue that the pre-OJ shape of the adnominal suffix was *-ur* or *-or*; given this monosyllabic shape, (15a) does not apply. I then suggest that assimilation of the stem vowel *ki+ur > *kuur* followed by metathesis > *kuru* is the strategy that circumvents hiatus in the adnominal form.

material from stem and suffix. The same strategy is not available for conclusive -*u* because pre-OJ did not have labial off-glides in Vw.

Finally, (15c) mandates loss of the stem final vowel when the alternative is complete obliteration of the suffix. In cases of CV (or longer) stems such as 'come' and 'do,' some stem material (the onset consonant) is retained. In the case of the sole single vowel verb stem, *e-* 'get,' the stem vowel is completely obliterated, but only in the conclusive and adnominal (see note 3) parts of the paradigm. It seems possible that the non-attestation of conclusive *u* (and rarity of adnominal *uru*) in OJ noted by Takeda and Yoshida may have been related to the opacity of these forms. *U* remerges in the reading tradition for early Heian kundoku material, but it seems possible that this is a learned restoration.[5]

In the preceding discussion I have proposed that **e-* 'get' belonged to the pre-OJ class of monomoraic stems. Like other members of this class, 'come' and 'do', 'get' lost its root vowel in the conclusive and adnominal (14a), but retained it in the irrealis (14b). Unlike other members of the class, due to its unique status as a stem composed of a single vowel, **e-* used a diphthongization strategy to retain elements of stem and affix in the continuative.

Let us now proceed to apply Takeda and Yoshida's proposal that the lower bigrade endings originate from **e-* 'get' attached to other stems. Note that this proposal already captures the same insight as Unger's reconstruction: that the (lower) bigrade conjugation is derived. There are two cases that we should consider: vowel stems such as adjectival *aka-* 'red' in (5-6), and cases where we might posit an original consonant stem, such as when no evidence from embedded root forms (hifukukei) exists to support reconstruction of a stem-final vowel. Actually, Unger's example 'open' in (8) is such a case: no related embedded root form exists to support reconstruction of **aka-* 'open,' and Unger's revised (1993) reconstruction does not require that we posit one. Of course we must be cautious in such cases; absence of a related embedded root form in any given case may be just an historical accident. Nevertheless I will assume (like Ohno) that original consonant stems did exist; for perspicuity I will use **sak-* 'split' (cf. 2, 4), where the nonexistence of a related embedded root forms of the shape *saka-* is consistent with reconstruction of a consonant stem.

(16)   **aka-* 'red' + *e* 'get'   *sak-* 'split' + *e* 'get'
   a. <u>Conclusive</u>   **aka + e-u*   > *aku*   **sak + e-u* > *saku*

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[5] For example, conclusive *u* occurs 26 times (3 times in combination with the modal adjective *besi*) in the reading tradition for the character 'get, can' in the early Heian kunten annotated text Konkômyô saishôô kyô (Asuka 1985).

    b. <u>Irrealis</u>   *aka + e-aX > akeX   * sak + e-aX > sakeX

    c. <u>Continuative</u> * aka + e-i > ake   * sak + e-i > sake

In (16), the lower bigrade verbs are derived by combination with *e- 'get' as an auxiliary. The main phonological question raised by this scenario is the relative timing of the various strategies to avoid hiatus in the inflected forms of *e- and avoidance of hiatus when *e- is combined with the lexical stem. Let us assume that the diachronic scenario in (16) involves a reanalysis of auxiliary *e- as the stem final vowel of the derived bigrade stems 'get red' and 'get split;' the inflectional endings -u (conclusive), -aX (irrealis), and -i (continuative) were then attached to *ake- 'get red' and *sake- 'get split' as part of the synchronic grammar of pre-OJ.

Also assuming the constraints in (15) as part of the synchronic grammar of this period, the affixes combine with *ake-/*sake- to produce aku/saku in the conclusive (under 15c), ake/sake in the irrealis (under 15a), and *akey/sakey > ake/sake in the continuative (under (15b). What is slightly less clear is how (or whether) the *hiatus constraints in (15) applied to the original reanalysis. In the case of *aka+e-, there are two possible outcomes: /e/ could replace the original stem final vowel under (15c), or we could imagine that *e, like *i could contribute to the creation of a falling diphthong *ey > OJ e. These two possibilities are impossible to distinguish in the case of stems in *-a, but I return to the issue in the discussion of upper bigrade stems below.

Yoshida comments only briefly that the meaning of *e- plausibly contributes to the semantics of the lower bigrade stems. His insight is correct; the semantics of 'get' are perfect for explaining the three lexical subtypes instantiated by lower bigrade verbs. 'Get' > inchoative (change of state) as in *aka- + e- > ake- 'get red' is widely attested in the grammaticalization literature (Heine & Kuteva 2003:144-145, Anderson 1975). Heine & Kuteva observe that "this process appears to be associated primarily with contexts where 'get' has adjectives and related words as complements" (2003:145). As we observed in §2, this is exactly what occurs in Japanese: inchoative bigrades result when the original complement of *e- 'get' was an adjectival stem. Heine and Kuteva also present crosslinguistic evidence for the developments 'get' > passive (2003:144-147) and 'get' > permissive causative (145-6). The examples of both types cited by Heine & Kuteva involve analytic formations where 'get' remains an independent word, and most appear to be true passives and causatives, with expressible agents and causees. A case more directly comparable to the Japanese situation may be the Proto-Indo-European affix *-ne-, which reanalyzed in Germanic as a

suffix *-nā/-nə*, derives inchoative verbs from adjectives and inchoative intransitives (unaccusatives) from transitive verbs (description and examples from Prokosch 1939:156-7; see also Suzuki 1989):

(17) a. Gothic *wakan*, Old Norse *vaka* 'wake' : Go. *-wak-na-n*, ON *vak-na* 'wake up'

b. Go. *fulls* 'full' : *full-na-n* 'fill up (intransitive)

Although an independent lexical source for **-ne-* is unclear, Anderson (1975:24) suggests a relationship with PIE **neud-* 'obtain something desired, use.' The point is that an analytic grammaticalization (such as with English *get*) may produce fully realized passives or causatives, while more complete grammaticalization to affixal status might be expected to result in more lexicalized inchoatives or unaccusatives.

Let us now consider the question of upper bigrade stems. Takeda and Yoshida do not propose to derive upper bigrades from **e-*. The reason is obvious: while the lower bigrade endings are identical to the conjugation of OJ *u/e*, as we have seen, the upper bigrade continuative forms differ in the continuative and irrealis. On the other hand, the rest of the endings are identical in the two conjugations, and the upper bigrade functions are subset of the three lower bigrade functions. As we saw in §2, transitive bigrades appear to be exceptional; other than the exceptions noted in §2, upper bigrades are intransitive, and most are inchoative.[6] I will suggest, then, that upper bigrade verbs are derived from the combination of non-inflecting, primarily adjectival stems with **e-* 'get.' (18) presents a diachronic derivation of the upper bigrades modeled on one of the scenarios we entertained for lower bigrades from the same source.

(18)   **opo-* 'big' + *e* 'get'   > *opu/opwi* 'it grows'
   a. <u>Conclusive</u>   *opo + *e-u*   > *opoy-u   > *opwi-u* -> *opu* (15c)

   b. <u>Irrealis</u>   *opo + *e-aX* > *opoy-aX > *opwiX* (15a)

   c. <u>Continuative</u> * *opo* + *e-i* > *opoy-i   > *opwi*

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[6] Some upper bigrade intransitives are not transparently inchoative in meaning, such as *amu/amwi* 'bathe.' But even this verb does not stand in a derivational relationship with a quadrigrade transitive as lower bigrade *sake-* 'it splits' does with quadrigrade *sak-* 'split it.'

I suggested that in the diachronic derivation of stems in *(CV)CV + *e-* we could posit a scenario where *e-* combines with the stem final vowel to form a diphthong. This scenario is adopted in (18): *e-* first combines with the lexical stem, forming a diphthong in *-oy (*-uy in the case of roots like *amu-* 'bathe'). These diphthongs are reduced to /wi/ in OJ. The diphthongs (and later -wi) combine with conclusive -u under (15c), and irrealis -aX under (15a); I assume that Vy or /wi/ + continuative -i results simply in -Vy or wi.

Support for the hypothesis that *e-* combined with stem-final vowels to form a diphthong is provided by the paradigms of the passive/middle auxiliaries in OJ. OJ has two passive auxiliaries, both belonging to the lower bigrade conjugation: *-ru-/re* and *-yu/-ye*. The latter is more widespread in the OJ period. Following the basic hypothesis in this paper, we should expect these bigrade auxiliaries to be derived from the combination of *e-* 'get' with a lexical stem. In the case of *-ru-/re* the stem is the existential verb *-ar-*. **Ar-* + *e-* follows the derivation for consonant stems in (16) to derive the passive auxiliary *-aru/-are*; later, the initial -a- of this auxiliary is reanalyzed as the final of the irrealis base. **-Yu/-ye* can be explained in a parallel fashion if we adopt Martin's (1987, 1996) view that existential *ar-* is derived from an original root *a-* 'to be' plus the stative suffix *-r*. Combining *a-* directly with *e-* under the diphthongization scenario in (18) results in a conclusive of the form *ay-u* and continuative *ayuru*. The expected continuative under this scenario is *a+e-* > *ay* > *e*, but it is easy to image that the model of stem-final /y/ for the rest of the paradigm resulting from diphthongization of *e-* provided an analogical basis for establishing the stem *ay-* in the continuative (that is, blocking monophthongization). Reanalysis of *ayu/aye* as irrealis + auxiliary results in the OJ paradigm *a-yu/-ye*. On this view, both *-ru-/re* and *-yu/-ye-* both originate as passives formed from 'become' ('be'+ 'get') plus lexical verb. This account crucially depends on the idea that *e-* combined with a stem vowel to produce a diphthong -Vy in pre-OJ.

I have presented above an account of how both the lower and upper bigrade conjugations result from the combination of lexical stems with *e-* 'get,' essentially an application (and extension) of Takeda and Yoshida's original proposal. Lower bigrade verbs consist of inchoatives formed from adjectival substantives ending in a vowel and intransitives ('it gets split') or transitives ('get it attached') derived from verbal roots. Upper bigrade roots have only the first of these sources: they result from adjectival substantives in *-o or *-u, their meaning is thus inchoative.

In considering the implications of this account, one important question remains. This is the problem of whether proto-Japanese had both open and closed syllable verb roots of more than one syllable. As we saw in §2, Ohno assumed that all quadrigrade verbs had closed

syllable roots, while Unger (1977) argued that all verb roots originally ended in open syllables. The account presented here is consistent with either view. Ohno's is the simplest to implement: on this approach, all verb roots longer than *CV- end in consonants; attachment of *e- to these results in a lower bigrade pattern. Adjective roots end in a vowel: attachment of *e- to these results in upper or lower bigrade, depending on the identity of the vowel. But Unger's approach can also be adopted: we could hypothesize that the stem final vowel is retained in combination with *e- only with non-bound roots - that is, substantivals.

There is some evidence that suggests that latter approach is correct, that is, that pre-OJ had verbal roots of shape CVC- and CVCV- (in additional to the uncontroversial CV- roots). Take, for example the root *kap- 'exchange. ' In addition to the quadrigrade stem kap- 'mingle, exhange, buy' in OJ, this root displays embedded root forms of shape kapa- in transitive kapas- 'exchange (actions), do reciprocally' and transitive kapar- 'change, take the place of.' But it also has a lower bigrade transitive kapu/kape '(ex)change with, replace with.' Taken together, these forms suggest a CVCV- root *kapa-; the original root final vowel is lost in the quadrigrade, as in Unger's reconstruction (8). The derived transitive in -s (*kapa-s-) and the derived bigrade transitive kapu/kape < *kapa+e both "increase" the transitivity of the original root, in the sense of Jacobsen (1988), but in different ways. While kap- entails merely a transaction, kapas- implies an exchange or pairing of actions by multiple agents, while kapu/kape entails a change of location on the part of the patient. It is difficult to specify that the transitive derivation in -s and the transitive derivation with *e- 'get' show any difference in degree of transitivity between themselves. Instead, the difference between them may involve a degree of lexicalization. Kapas- typically appears in verb-verb compounds (mi+kapas- 'exchange looks,' yobi+kapas 'call one another'), while kapu/kape functions as an independent verb, suggesting that it may be the later formation.

Verb roots with both a transitive in -s and a bigrade transitive are rare however.[7] Transitives in -s are the regular pattern for adjectival roots (aka-s- 'pass the dawn' < aka- 'red; opo-s- 'grow, raise' < opo- 'big). One possibility is that transitive -s was extended from adjectives to verb roots ending in a vowel, but not to verb roots in general until the reanalysis resulting in the irrealis base paved the way for the productive post-OJ causative formation in irrealis + -su/-se. On this view, the lower bigrade transitives may be regarded as suppletive strategy for consonant-final verb roots that were unable to host transitive -s. If this view is correct, presence of a lower bigrade transitive may be a general diagnostic for primary *CVC- root, except for a small number of cases

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[7] Others include nagas- 'let flow, drain' and nagu/nage 'throw' from naga- 'elongated.'

where the bigrade transitive was extended to *CVCV- roots such as *kapa-, to represent a semantic distinction with the original transitive in -s.

This view may also provide an explanation for the exceptional intransitives mentioned in §2, *todomu/todomwi* 'bring to a stop' and *komu/komwi* 'enfold.' The first of these verbs occurs only in two songs by Yamanoue no Okura (MYS 605 and 657); elsewhere only the lower bigrade variant *todomu/todome* occurs. The second occurs only in the first song of the *Kojiki*; in the corresponding song in the *Nihon shoki*, lower bigrade *komu/kome* occurs in its place. We have good evidence for an original CVCV root *komo- (viz. *komor-* 'be hidden, snuggled). As the pattern of transitives derived with *e- was extended to CVCV roots, some varieties may have followed the earlier pattern for CVCV + e- for adjectival roots in (18), while most varieties followed the established pattern for attaching *-e to CVC- roots.

4. *Conclusion*

In this paper I have addressed the longstanding problem of the historical source for the two main conjugations in Japanese. The basic hypothesis that I develop in this paper dates back to Takeda (1957). It holds that the source for the nidan endings is the verb *e- 'get', which fused with verbal and adjectival roots to derive transitives, anticausatives and inchoatives. I have argued that this source accords well with the lexical patterning of bigrade verbs (inchoatives from adjectives, unaccusatives from transitives, transitives from intransitives). I have shown how it can be understood to derive not only lower bigrade stems in -e but upper bigrade stems in -i < wi, and suggested why the latter derivation is largely limited to inchoatives (because it derives from adjectives) and smaller in number (because this is its only source). Finally, I have suggested that the opposition between transitives in -s and lower bigrade transitives may indicate a difference in original root shape.