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The “bundling” hypothesis and the disparate functions of little *v*

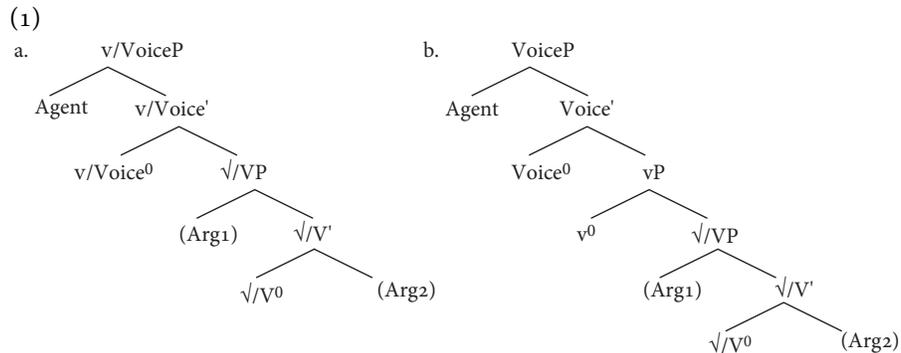
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1.1 Introduction

The split-verb phrase hypothesis first appeared in Larson (1988), and was taken up in various guises by Hale and Keyser (1993), Kratzer (1994, 1996), Chomsky (1995), and Marantz (1997). Each ascribed a different subset of properties to the new external argument-introducing projection. The new projection also had a variety of names—verb phrase (VP), *v*P, or VoiceP. Some considered it functional (especially Kratzer 1996); others treated it as lexical, or left its functional or lexical status unaddressed.

However, all these proposals had in common the assumption that the external argument was introduced in the new phrase’s specifier, and the projection of the lexical verb or its root was the new phrase’s complement. That is, the overall picture was as illustrated in (1a). The new projection also variously (i) checked accusative case, (ii) served as a verbalizer for the head of its complement, (iii) introduced agentive or causative semantics and/or (iv) an initiating subevent, and (v) delimited a cyclic domain.

Later proposals further subdivided the VP, including, among many others, Borer (1994, 2005b), Travis (2000), Pylkkänen (2002, 2008), and Ramchand (2008). In Pylkkänen (2002, 2008), the single *v*P/VoiceP projection became VoiceP and *v*P, as in (1b). The VoiceP introduced an external argument, checked accusative case, and delimited a cyclic domain; the *v*P introduced agentive or causative semantics and verbalized the head of its complement.



Unlike other subdivision proposals, Pylkkänen also introduced a “Voice-bundling” parameter, allowing both (1a) and (1b) to occur in a language, depending on the setting of its Voice-bundling parameter. A Voice-bundling language would have the structure in (1a), unifying the functions of Voice and *v* in a single projection, and a Voice-splitting language would have the structure in (1b), with each functional head independently performing their different functions. The central idea is similar to the “Split-IP” parameter (Thráinsson 1996; Bobaljik and Thráinsson 1998), where rich agreement paradigms were argued to motivate learners to posit separate projections for agreement and tense marking, with consequences for the syntax of subjects (Rohrbacher 1994, 1998; Vikner 1995, 1997; Bobaljik and Jonas 1996; Thráinsson 1996; Bobaljik and Thráinsson 1998; Conradie 2007). In the case of the Voice-bundling parameter, the Language Acquisition Device (LAD) looks for morphological evidence that *v* and Voice are independently realized, and for morphosyntactic and semantic evidence that they function independently. Absent such evidence, the LAD posits a single *v/Voice* head consisting of a “bundle” of all the relevant features and serving the relevant functions. Given such evidence, the LAD projects separate *v* and Voice heads, with the former bearing certain features and the latter others. (Alternative technical formulations of the bundling parameter are possible, e.g., a Spanning view (Svenonius 2012; Merchant 2015) or a selection-based/Adjacency-requirement view (Marantz p.c.). In a Spanning treatment, a nanosyntactic series of projections—one for each feature—might be expected to arise. We will use Pylkkänen’s original metaphor throughout—feature-bundling—and comment occasionally when the data might differentiate alternative technical implementations.)

We first consider several case studies that suggest that Pylkkänen’s Voice-bundling parameter is on the right track. There are bundling languages where it appears that both *v* and Voice functions are tightly correlated, appearing and disappearing together; and there are splitting languages where the functions are distributed across two distinct projections and can be manipulated independently. The bundling languages we will consider in section 1.2 are Chol and Persian, while for splitting

languages we look at Hiaki and Chemehuevi in section 1.3. We apply the predictions of the splitting/bundling parameter to the interaction of passive and light verb constructions in Italian, suggesting that it is Voice-bundling.

We then focus narrowly on *v* (section 1.4), reviewing arguments from Key (2013) and Jung (2014) about productive causatives, applicatives, and passive, looking at Key’s treatment of Turkish causatives and Jung’s discussion of Korean and Hiaki applicatives and causatives. These patterns indicate that productive causatives are not a recursive *v*, as assumed in Harley (1995, 2013), but instead realize a pure “Caus” category. The verbalizing *v* and the causativizing Caus are categorically and morphosyntactically distinct. Finally, a sketchy, possibly cartographic picture of the hierarchy of derivational verbal projections begins to emerge (section 1.5).

1.2 The case for bundling: all functions in one head

What if accusative assignment, external argument introduction, and verbalization were all accomplished by a single head? There would certainly be a tight connection between case assignment and the presence of an external argument, as per Burzio’s Generalization (Burzio 1986: 178). Such a language should also show a tight connection between an external argument and the category of the main predicate: lack of external argument would entail lack of verbalizing projection, so the main predicate would be non-verbal. Coon and Preminger (2013) argue that Chol, a Mayan language, exhibits this constellation of properties, and constitutes robust evidence for the *v*P as originally conceived.

1.2.1 Chol (Coon and Preminger 2013)

Coon and Preminger propose that the following biconditional holds in Chol (Coon and Preminger 2013: 11):

- (2) a. All internal arguments must be assigned case (absolutive) by a v^0 head.
b. All v^0 heads must assign absolutive case to an internal argument.

That is, v^0 is the locus of absolutive case. If a v^0 with absolutive case is present in the derivation, it must discharge it. If this is true, and if v^0 when present also introduces an Agent and verbalizes the lexical projection below, then the biconditional makes clear predictions:

- (3) *Predictions:*
 - a. Clauses without a case-marked internal argument will be headed by non-verbal predicates (since no internal case means no v^0 , and hence no verbalizing projection).

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- b. Only structures *with* case-marked internal arguments will include an Agent (since no absolutive case means no v^0 , and no v^0 means no external argument).

Coon and Preminger show that both predications are true of Chol. Consider an optionally transitive root like *dance*. The unergative version is a nominal that cannot inflect as a verb, while the transitive version with an absolutive determiner phrase (DP) complement is a verb, with an overt verbalizing morpheme on the non-verbal stem (Coon and Preminger 2010: 11):

- (4) a. Choñkol-oñ tyi soñ
 PROG-ABS.1P PREP dance
 'I am dancing.'
- b. Choñkol k-soñ-iñ bals
 PROG ERG.1P-dance- v_{tr} waltz_N
 'I am dancing a waltz.'

In (4b), although the 3p absolutive case borne by *bals* 'waltz' is null on both noun and verb, its morphosyntactic presence can be detected by the fact that the first person marker on the transitive verb comes from the ergative A-series, while in the intransitive version in (4a), the first person marker comes from the absolutive B-series. In (4b), the null absolutive case on *bals* 'waltz' conditions the ergative marking of the subject. The presence of absolutive case assigned to an internal argument thus correlates with whether the verb root *soñ-* is verbal or not, as predicted by the bundling hypothesis.

The second prediction concerns the relationship between case assignment and the introduction of an Agent argument. Only roots with a case-marking complement should introduce an Agent. To express the agent of an unergative intransitive root, or a root with a caseless incorporated object, a light verb structure is required; the lexical stem cannot behave as a verb. The light verb takes a nominal version of the lexical stem as its complement. In consequence, the light verb (not the main verb) is able to introduce an Agent argument, since it case-marks that nominalized main predicate.

- (5) a. Tyi a-cha'l-e k'ay unergative verb with agent
 PRF A.2P-DO- v_{tr} song_N
 'You sang.' (Lit. You did song)
- b. Tyi a-cha'l-e wuts'-pisil incorporated caseless object noun
 PRF A.2P-DO- v_{tr} wash-clothes_N with agent
 'You washed clothes.' (Lit. You did clothes-washing)

In Chol, then, only verbalized things take case-marked complements, and only verbalized things have Agent arguments, and only case-marked complement-takers are verbal. The three properties—verbalizing, case-licensing a complement, and Agent-introducing—go together. This pattern is nicely accounted for if v^0 is associated with all three properties.

- (6) a. v^0 verbalizes
b. v^0 carries a case feature that *must* be checked (a property of Chol)
c. v^0 makes possible the introduction of an Agent

Coon and Preminger show that this constellation of effects leads to a neat explanation for a puzzle in the progressive, which is headed by a non-agentive auxiliary (exemplified in (4a) above). Since this auxiliary is non-agentive, the only case available in progressive clauses comes from Infl^0 . This follows from the bundling hypothesis, according to which non-agentive elements, lacking v^0 , cannot assign case to an internal argument. Consequently, the progressive auxiliary behaves differently when combined with transitive verbs than when combined with intransitive verbs. With intransitive verbs, as in (4a), Infl^0 is able to directly case-mark the single argument of the lexical verb, and a preposition case-marks the nominalized lexical verb itself. In progressives of transitive verbs, in contrast, the auxiliary instead selects a nominalized clause whose two arguments are internally licensed. For a full discussion, see Coon and Preminger (2013).

We next turn to another bundling case study, of Persian, considering the predictions of the bundling hypothesis for the passive.

1.2.2 Persian (Folli, Harley, and Karimi 2005)

The argumentation below depends on the assumption, common in syntactocentric views of morphology, that one terminal node corresponds to one morpheme. If the functions of Voice^0 and v^0 are subsumed by a single head, there should only be a single morpheme that accommodates all functions.

This has implications for languages like Persian, where virtually all verbal expressions consist of a light verb, realizing v^0 , and a separate non-verbal predicate supplying lexical content. If the v^0 head in Persian bundles both Voice and *v* functions together, then the only way to demote the Agent is to change the light verb, i.e., if there is a single v^0 head, then the agent-introducing version should be in complementary distribution with the non-agent-introducing version. In fact, that is what we see (Folli et al. 2005). In (7a), there is an agentive light verb, *dâdan* ‘to give,’ and the clause contains an agent argument. In (7b), the best translation of an English passive is provided. Rather than passivize the light verb *dâdan*, an entirely different, non-agentive light verb is substituted, *xordan* ‘collide.’ In short, if there is no separate Voice^0 in a language, that language will lack a true passive, instead implementing passive-like meanings via argument structure alternations that require distinct light verbs.

- (7) a. tim-e mâ unâ-ro shekast *dâd*
team-EZ we they-râ defeat gave
‘Our team defeated them.’

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b. tim-e mâ az unâ shekast *xord*
team-EZ we of they defeat collided
'Our team was defeated by them.'
(Lit-ish: 'Our team encountered defeat from them.')

(8) a. Minu bachcha-ro kotak *zad*
Minu child-râ beating hit
'Minu hit the child.'

b. Bachche kotak *xord*
child beating collided
'The child got hit.'

This kind of light verb alternation is indistinguishable from causative/inchoative alternations in Persian, which also involve substituting a non-agentive for an agentive light verb:

(9) a. âb be jush âmad
water to boil came
'The water boiled.'

b. Nimâ âb-ro be jush âvard
Nima water-râ to boil brought
'Nima boiled the water.'

That is, the same head, as diagnosed by complementary distribution, is responsible for passive-like structures, inchoative structures, causative structures, and agentive structures. Passive-like structures aren't built on top of agentive structures,¹ rather, passive-like structures and agentive structures are in an equipollent relationship.² Further, the light verb head that is substituted to eliminate an Agent argument is the only verb in the clause. The main predicate in all Persian complex predicates is non-verbal. The two properties of Agent-introduction and verbalization, then, are united in a single head in Persian.

¹ See section 1.4 for discussion of Bruening's (2013) view of passive, which does build passive structures on top of agentive structures.

² Likely the most accurate way to characterize the Persian situation is to say that there is no passive whatever, no productive construction that does what we normally think of a passive as doing. Negin Ilkhanipour (p.c.) has pointed out a couple of counterexamples, including the following, where the light verb *keshidan* 'pull,' appears in a participial form in construction with *shodan* 'become' apparently functioning as a passive auxiliary.

(i) ?in xune be ?âtash keshide shod
this house to fire pull.prt beome.pst.3sg
'This house was burned.'

Such constructions are rare in the language, however; whatever status they have, Persian does not have a *productive* passive in the same way that English, German, or Hiaki do.

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In many accounts (see, e.g., Borer 2005b, among others) a further connection between verbalization and interpretation is posited: only verbalized elements can have event structure. If the verbalizing head introduces events, then we might expect Persian to reflect the dynamic/stative distinction in its light verbs. That is, stative predicates should involve a stative *v*, while eventive predicates involve an eventive *v*, in complementary distribution with each other. This expectation is also borne out (Folli et al. 2005). Consider the translation of the ambiguous eventive/stative verb *remember* in Persian, in (10a) and (10c). A sentence like *Kimea remembers her name* can be translated in two ways, both using the same non-verbal predicate, *be yâd* ‘in memory.’ If the stative light verb *dâshtan* ‘have,’ appears, the construction is necessarily stative, as shown by its incompatibility with progressive, (10b). If the eventive light verb *âvardan* ‘bring,’ is used instead, the present tense implies habitual aspect, as typical for eventive verbs, (10c), and the progressive construction is possible, also typical for eventive verbs (10d).

- (10) a. Kimea esm-e un-o be yâd dâr-e
 K. name-Ez her-râ to memory have-3s
 ‘Kimea remembers her name’ (stative)
 (Lit. Kimea_i has her_k name in her_i memory)
- b. **Progressive*
 *Kimea esm-e un-o dâr-e be yâd dâr-e
 K. name-Ez her-râ have-3SG to memory have-3SG
 (Lit. *Kimea is having her name in her memory)
- c. Kimea esm-e un-o be yâd mi-yar-e
 K. name-Ez her-râ to memory hab-bring-3SG
 ‘Kimea is remembering her name.’
 (Lit. Kimea is bringing her name to memory)
- d. ✓*Progressive*
 Kimea esm-e un-o dâr-e be yâd mi-yâr-e
 Kimea name-Ez her-râ have-3SG to memory hab-bring-3SG
 ‘Kimea is remembering her name.’

Thus another property of verbalization, eventiveness, is associated with the v^0 position in Persian. Persian thus appears to be a bundling language, where verbalization, Agent-introduction and eventiveness are all controlled in a single v^0 head.

1.3 The case for splitting: Voice⁰ functions and v^0 functions on independent heads

Pylkkänen shows that Finnish and Japanese exhibit properties suggesting that v^0 and Voice⁰ are separate projections in those languages. Harley (2013) provides a further

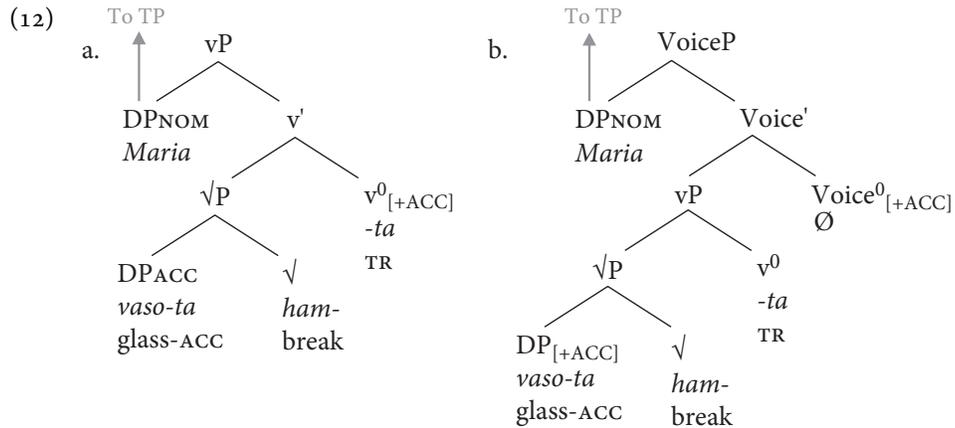
illustration of Voice-splitting in the Uto-Aztec language Hiaki. Serratos (2008) also argues that Chemehuevi is a Voice-splitting language, adducing evidence from Causer-less causatives. Let us briefly review these accounts.

1.3.1 *Hiaki passives and Causee-less causatives*

Hiaki³ is agglutinating. The frequently realized causative/inchoative alternation is equipollent; the alternation changes the verbalizer on a non-categorized $\sqrt{\quad}$, which cannot stand alone. Verbalization and causative or inchoative semantics are thus simultaneously encoded by a single morpheme, a clear realization of v^0 :

- (11) a. Maria vaso-ta ham-ta-k
 Maria glass-ACC break-TR-PRF
 ‘Maria broke the glass.’
 b. Uu vaaso ham-te-k
 The.NOM glass break-INTR-PRF
 ‘The glass broke.’

If Hiaki is a Voice-bundling language, the transitive sentence in (11a) should have the structure in (12a). On the other hand, if Hiaki is a Voice-splitting language, the structure of (11a) should be (12b), in which *-ta* accomplishes only verbalization and causativization, and a null Voice head introduces the external argument and checks accusative case.



³ Hiaki is spoken in northern Mexico and southern Arizona. Everything I know about the language is thanks to the generosity, patience, and interest of our consultants, Maria Florez Leyva and Santos Leyva.

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Recall the key assumption that a single terminal node is realized by a single morpheme. If (12a) were correct, we would expect that eliminating the external argument would involve changing the properties of *-ta* itself. A passive might involve a third morpheme, neither *-ta* nor *-te*. If (12b) is correct, on the other hand, we could affect the external argument by adjusting Voice⁰, leaving *-ta* unaffected; we might see a passive morpheme “stack” outside of the *-ta* morpheme. The latter is what happens: to get a passive of (11a), instead of substituting a third morpheme for *-ta/-te*, the passive suffix *-wa* is stacked outside *-ta*:

- (13) Uu vaaso ham-ta-wa-k.
The.NOM glass break-TR-PASS-PRF
‘The glass was broken/Someone broke the glass.’

Given the one-morpheme one-terminal hypothesis, the discrete v⁰ and Voice⁰ morphemes in Hiaki suggest separate heads for v⁰ and Voice⁰, i.e., that Hiaki is a Voice-splitting language.

Hiaki’s patterns of productive causativization also point in this direction. Hiaki has a “direct” causative *-tua*, where the Causee appears marked as a direct object (14a), and an “indirect” one, *-tevo*, where the Causee cannot appear (14b):

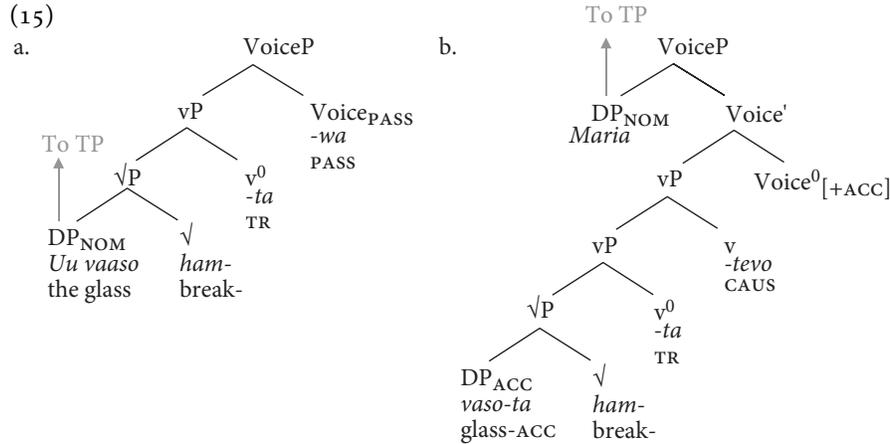
- (14) a. Juan Maria-ta vaso-ta ham-ta-tua-k.
Juan Maria-ACC glass-ACC break-TR-CAUS.DIR-PRF
‘Juan made Maria break the glass.’
b. Juan vaso-ta ham-ta-tevo-k
Juan glass-ACC break-TR-CAUS.IND-PRF
‘Juan had the glass broken/had someone break the glass.’

In the *-tevo* causative of *ham-ta* ‘break-TR,’ the embedded Agent is absent from the structure without affecting the causative *-ta* morpheme in *hamta*. That is, *-tevo* embeds an external-argument-less structure without affecting the morphology associated with the external argument in (11).

In a syntacticocentric morphology, we would not expect *-tevo* or *-wa* to be able to “subtract” or “delete” a structural Agent from structure in its complement (i.e., a syntacticocentric morphology must obey the Monotonicity Hypothesis; Koontz-Garboden 2007). Instead, both *-wa* and *-tevo* select a structure that semantically includes an unsaturated Agent argument, but which does not include a syntactic DP argument to saturate that position.

That is, passive *-wa* selects for a vP whose head introduces an external argument in its semantic denotation. Because Hiaki is a Voice-splitting language, the external argument position is not saturated at the vP level. An active Voice head would introduce a syntactic DP argument to saturate that open position, but the passive Voice head does not; instead the open position is existentially bound.

Similarly, *-tevo* selects for a vP complement. The semantic external argument is introduced by the *v* in the complement of *-tevo*, but that argument is not saturated by any DP, since *-tevo*'s complement lacks a VoiceP. It ends up existentially bound.



In addition to this morphosemantic argument, Harley (2013) introduces syntactic evidence from the Hiaki high applicative to show that the position in which the external argument is introduced is distinct from the projection headed by the morpheme bearing agentive or causative semantic content; that is, there are separate projections that bring in agentive semantics and the external DP. The Hiaki applicative introduces an internal argument to any agentive predicate (transitive or intransitive). In (16), the applied argument and the applicative morpheme are both in bold. Neither can appear without the other, i.e., the presence of one entails the presence of the other.

- (16) a. Maria **uusi-ta** aa ham-ta-**ria**-k
 Maria child-ACC 3sg.ACC break-TR-APPL-PRF
 'Maria broke it for the child.'
- b. Aapo **uusi-ta** yi'i-**ria**-k
 3sg.NOM child-ACC dance-APPL-PRF
 'He danced for the child.'

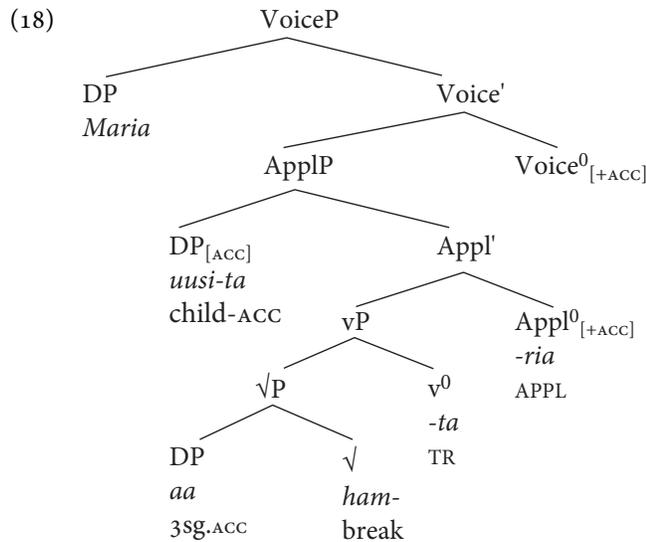
Syntactically, the applied argument is the highest internal argument of the clause, c-commanded by the subject and c-commanding any other internal argument. This accounts for why the applied argument, but not the internal Theme argument, is promoted in a passive of an applicative, as shown in (17). This demonstrates that the applied argument is more local to spec-TP and nominative case than other internal arguments.⁴

⁴ Note the Hiaki applicative head forms part of the array of structural case-checkers of the clause, since the applied argument participates like any other object in A-movement operations.

- (17) Uusi aa ham-ta-ria-wa-k
 Child.NOM 3sg.ACC break-TR-APPL-PASS-PRF
 ‘It was broken for the child/Someone broke it for the child.’
 (Lit. The child was broken it)

Now, the applicative suffix *follows* the v^0 morphology, so by the Mirror principle (Baker 1985), the applicative suffix must occur higher in the structure than v^0 . However, the argument introduced by the applicative head is *lower* than the external Agent argument. This is shown by the fact that the Agent *Maria* receives nominative in (16a) above, while the applied argument *uusi-ta* ‘the child-ACC,’ is accusative. The applied argument, then, must be lower than the Agent.

As McGinnis (1998, 2001) and Pykkänen (2002) show, this configuration of morphological and syntactic elements is predicted if vP and VoiceP are separate projections. The Appl head selects for vP and introduces the applied argument above vP but below VoiceP. The ApplP is in turn the complement of Voice, which introduces the Agent, above the applied argument:



For a fully detailed exposition see Harley (2103); however, the above should establish some motivation for the split-vP picture.

1.3.2 Chemehuevi: Causer-less causative (Serratos 2008)

One final piece of evidence for the independence of the causative projection and the Causer argument comes from Serratos’ (2008) analysis of Chemehuevi, another Uto-Aztecan language. In Chemehuevi, we see a similar pattern as in other non-Voice-bundling languages, where causative morphology appears without a Causer argument being introduced (see also Wood and Marantz (this volume) for

discussion of the Japanese adversity causative). Serratos gives (19) and (20) to illustrate:

- (19) Iva asi-huvi-tu-wa.
here salt song-caus-pres
'Salt song is going on.'
- (20) Sünawa-vi kani-gai-mi-yü yunakaimü-wa'i-vü,
coyote-NPN.nom house-have-usit-past company-with-3sg/poss
'Coyote was dwelling with his company
tüvi-pü-a tügü-tu'i-kwa'i-k^ya.
earth-NPN-obl hungry-caus-away-perf
when it was hungry times on earth.'

Both are truly subjectless constructions: neither causative form has an overt subject, nor has a thematic object been promoted. Nonetheless, both are clearly morphologically and semantically causative. In particular, (20) uses the Chemehuevi causative *-tu'i*, whose regular behavior and biclausal status is conclusively independently established by Serratos. A more literal translation would be 'when hunger was being caused on earth,' though even this passive translation does not capture the subjectless structure of the original (maybe, 'when there was hunger-causing happening on earth' would be closer). The unexpressed Causer argument in this construction is not human, nor another (perhaps supernatural) intentional agent, which would be expected if this were an impersonal construction with a null impersonal subject (see e.g., Maling and Sigurjónsdóttir 2002, among others). Rather, the hunger is understood to be caused by recurring natural processes, implicit from the context. We thus have a clearly causative structure lacking a syntactic Causer argument. This possibility is predicted, as Serratos argues, if Chemehuevi is a Voice-splitting language, in which external arguments are introduced by VoiceP independently of agentive verbal semantics.

1.3.3 Diagnosing bundling of Voice+v: participial passives and light verb constructions

If the "bundling" parameter accounts for crosslinguistic variation, what other kinds of diagnostics might be sensitive to it? If a language lacks a high applicative (as in Pyłkkänen 2002), or a stacking passive, or Causee-less causatives, can we be sure that it is a bundling language? Might it be a splitting language that just happens to lack these morphemes? How can we decide whether its Voice and v are bundled or independent?

The interaction of passivization with the light vs. heavy verb distinction may be telling in this regard. When Voice and v are bundled in a given language (as for Persian) we predict that light verbs in that language should fail to passivize, since

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adjusting Voice will necessarily involve adjusting *v*. Passivization of light verb constructions, then, may provide a bundling diagnostic for Voice and *v*.

Folli and Harley (2007, 2013) argue that Italian participial passives can only be built from main verbs, and that light verbs—*v*⁰ heads—resist passivization. We can see this with *fare* ‘make, do,’ whose main verb and light verb uses can be easily distinguished. Main verb *fare* passivizes felicitously, as in (21):

- (21) a. Gianni ha fatto una torta.
Gianni has made a cake
‘Gianni made a cake.’
b. Una torta è stata fatta da Gianni.
A cake is been made by Gianni
‘A cake was made by Gianni.’

Folli and Harley (2007) show, however, that light causative *fare* does not:

- (22) a. Gianni ha fatto ridere Mario.
Gianni has made to.laugh Mario
‘Gianni made Mario laugh.’
b. *Mario è stato fatto ridere da Gianni.
Mario was made to.laugh by Gianni
‘Mario was made to laugh by Gianni.’

Similarly, the light verbs in Italian *V-ata* complex predicates (Folli and Harley 2013) resist passivization:

- (23) a. *?Una risata è stata fatta da Giulia. (active: Giulia ha fatto una risata)
A laughing is been made by Giulia (Giulia has made a laughing)
b. *Una letta è stata data a Kant da Gaia. (active: Gaia ha dato una letta a Kant)
A reading is been given to Kant by Gaia. (Gaia has given a reading to Kant)
c. *?Una sgridata è stata presa da Gianni. (active: Gianni ha preso una sgridata.)
A scolding is been taken by Gianni (Gianni has taken a scolding)

Folli and Harley (2007, 2013), working in a framework without an independent VoiceP, argue that participial morphology selects a Root-containing constituent below *v*⁰ to attach to, and this is why Italian light verbs cannot passivize. However, in that work they did not differentiate between VoiceP and *v*P; effectively, they presumed that Italian was a bundling language.

If Voice and *v* are not bundled, and if light verbs reside in *v*, then we expect Voice morphology to be able to select light verbs as well as main verbs. If light verbs are

instead in complementary distribution with passive voice, as observed in (23) in Italian we can conclude that Voice+v are bundled in that language.⁵ This possibility predicts the failure of passivization with Italian light verb constructions.⁶

1.3.4 Summary so far

We have seen that Pykkänen’s typology distinguishing Voice-bundling from Voice-splitting languages may be supported by evidence from Chol, Persian, Hiaki, and Chemehuevi. The evidence we have used to classify a given language are listed below:

- (24) a. *Voice-bundling language*:
- (i) has relationship between verbalizing morphology and Agent introduction
 - (ii) can have relationship between internal case checking and Agent introduction
 - (iii) has a single position of exponence for verbalizing, causativizing, inchoative, and “passivizing” morphology.
- b. *Voice-splitting language*:
- (i) has agglutinating (“stacking”) passive morphology
 - (ii) can have high applicatives
 - (iii) can show causative morphology in the absence of a syntactic Causer argument.

⁵ A counterargument to this idea for both English and Italian, however, might be made from the observation that verbalizing morphology is *not* in complementary distribution with passive voice in English (Borer 2003; Harley 2009) or Italian:

- (i) The solution was clar-ifi-ed
- (ii) The verb was nominal-ize-ed.

The same is true for event nominalizations, which have been argued to lack VoiceP (see, e.g., Marantz 1997; Harley and Noyer 1998). On this basis, Borer (2003), and subsequently Harley (2009), argue that English is *not* a Voice-bundling language, since verbalizing morphology can appear without requiring the introduction of an external argument. Marantz (p.c.) suggests that the bundling restriction could be relativized to context, so it might apply only when T is adjacent to Voice, thus explaining why v can receive independent exponence in passives and nominalizations. Such relativization might predict a more fine-grained range of bundling patterns than the context-independent view presented here.

⁶ Here is a point where variations in the technical implementation of the bundling parameter would matter. If one adopted Bruening’s (2013) approach to passive, according to which a Pass⁰ head selects for an unsaturated (but “active”) Voice head, the conclusions drawn here about the relationship between passive and bundling would be unjustified, since Passive and (active but unsaturated) Voice could and would always co-occur. The facts from Italian and Persian concerning the difficulty of passivizing an agentive light verb construction would then go without an explanation, as would certain Hiaki affixal raising predicates. I suggest, preliminarily, that Bruening’s proposal is simply the vP-VoiceP splitting hypothesis in a novel guise: his tests for “active” voice are actually tests for agentive v, which introduces an agentive argument but does not saturate it. This is what passive Voice does in this framework as well, without requiring the Voice recursion (passive and active co-occurring) that Bruening advocates.

Taking separate Voice and *v* nodes to be established, we next consider *v* itself. In previous work, building on Miyagawa (1994, 1998), I argued that productive causatives are a subtype of *v*.⁷ However, work by Key (2013) and Jung (2014) calls this into question. Productive causatives may not be *v* after all, and we may need an even finer grained subdivision: verbalizing *v*P, subject-introducing VoiceP, and productive causative CausP.

1.4 Morphological causatives: recursion of *v*P? Or a dedicated projection in the hierarchy? (Key 2013)

Having looked at the motivation for separating Voice and *v* in at least some languages, we now turn to little *v* itself, and its interactions with causatives and applicatives.

Harley (1995, 2008), following Miyagawa (1994, 1998), suggested that productive causatives and lexical causatives are both *v*⁰. A productive causative of a lexical causative is possible in languages like Hiaki and Japanese, the latter exemplified in (25). If causatives are *v*, then a productive causative of a lexical causative is an example of *v*P embedding *v*P:

- | | | | |
|------|--------------------------------|-------------------------------|---------------|
| (25) | kow-as-ase | ugok-as-ase | (Kuroda 1993) |
| | break-CAUS-CAUS | move-CAUS-CAUS | |
| | ‘make someone break something’ | ‘make someone move something’ | |

The *v*P-recursion approach predicts arbitrarily long chains of causatives, the way independent causative verbs like *make* do (*John made Bill make Joe make Sam do his homework*). Such a structure would surface as a verb with multiple causative suffixes, *V-caus-caus-caus*.

However, such recursive structures are impossible in both Japanese and Hiaki, and, in a wide-ranging survey, Svenonius 2005 showed that there seems to be a cross-linguistic prohibition against multiple productive causatives. A theory like that of Miyagawa (1994, 1998) or Harley (1995, 2008) must capture this independently: if productive causatives are *v*Ps headed by *v*_{CAUS}, and lexical causatives are also, then the impossibility of recursion of productive causatives is difficult to model; one expects the property of self-embedding to iterate. Elimination of causative recursion has usually been stipulated away by some specific morphological constraint, for example a dispreference for adjacent identical morphemes (Kuroda 1993 suggests such an account for Japanese). The more languages exhibit the constraint, however, the more we are motivated to search for a general, rather than specific, explanation for it.

⁷ This is presupposed in the discussion of Voice-splitting in Chemehuevi in (20) above, since (20) is a productive causative. The independence of Voice and *v* in Chemehuevi is also established by (19), a lexical causative, which Serratos (2008) shows is indubitably a verbalizer.

Key (2013) argues for a syntactic characterization of this prohibition. He suggests that lexical causatives, formed by the verbalizer v_{CAUS} , are distinct from productive causatives, which are a purely causative element in the extended projection above vP : CausP. For Key, the ban on recursion of productive causatives is cartographic in character, rather than morphological. In his account, productive causatives do not verbalize, and verbalizers are not productive causatives: vP and CausP are distinct.⁸

Somewhat ironically, the language that provides the evidence for Key's hypothesis is Turkish, which, on the surface, appears to be an exception to Svenonius's 2005 generalization; Turkish appears to *allow* causative recursion. Key shows, however, that Turkish "causative recursion" is not in fact causative recursion at all; rather, apparent causative recursion is actually focal reduplication. We next will see how Key's proposal accounts for the ban on recursion of productive causatives and informs our understanding of the nature of v .

1.4.1 Turkish productive causatives in comparison to Japanese

Given the Voice-splitting hypothesis, we can ask whether the embedded constituent in a causative construction is VoiceP, or smaller. Japanese productive causatives (like Hiaki *-tua* causatives) seem to embed a VoiceP, with exceptional case marking (ECM) of the embedded Agent argument, patterning biclausally according to several tests. Both matrix Causer and embedded Agent can control a subject-oriented adverbial, (26); binding condition B is satisfied when an embedded object is coindexed with the matrix Causer, so the embedded and matrix clauses count as independent binding domains, (27); and the embedded clause can conjoin with another clause, within the scope of the matrix causative, (28).

(26) Adverbial control: two subjects

Taroo-wa arui-te Hanako-o ik-ase-ta
Taroo-Top walk-te Hanako-acc go-sase-pst
Readings: 'Taro made Hanako go, walking.'
'Taro, walking, made Hanako go.' (Harley 2008: 30)

(27) Binding condition B: two domains

a. Toru_i -wa Kitahara_j-ni kare^{*_i/*_j} -o syookai si-ta.
Toru-TOP Kitahara-DAT he-ACC introduction do-PST
'Toru introduced him to Kitahara.'

⁸ See Wood and Marantz (this volume) for a proposal that could derive this difference between v and Caus, rather than stipulate it; the relevant information may be deducible from the categorial property of the head's sister at Merge, supplemented with a projection constraint.

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b. Toru_i -wa [Kitahara_j-ni kare_i/*_j]-o syookai s]-ase-ta.
Toru-TOP Kitahara-D_{AT} he-ACC introduction do-CAUS-PAST
‘Toru made Kitahara introduce him.’ (Horvath and Siloni 2011b)

(28) Coordination of embedded clause:
Hanako-ga [[Masao-ni uti-o soozisuru]-ka
Hanako-NOM Masao-DAT house-ACC clean-or
[heya-dai-o haraw]]-ase-ru kotoni si-ta
room-rent-ACC pay- CAUS-INF that to.do-PAST
‘Hanako decided to make Masao clean the house or pay room rent.’
Reading: -(s)ase scopes over ‘or’; Masao has a choice. (Kuroda 2003: 455)

These tests distinguish clearly between productive and lexical causatives in Japanese, since the latter do not pass any of them.⁹

Turkish also exhibits an important distinction between lexical and productive causatives: lexical causatives exhibit root-conditioned allomorphy, while productive causatives never do, just as in Japanese. However, Key (2013) shows that even Turkish *productive* causatives pass none of the tests for biclausality (following Horvath and Siloni 2011b, who show the same for Hungarian). The embedded subject is not a potential controller for a subject-oriented adverbial, (29); a pronominal embedded object cannot be bound by the matrix Causer, (30); and no coordination or disjunction of the embedded event is possible, (31).

(29) Adverbial control: one subject
Tarkan_i Hakan-a_j Mehmet-i bil-erek_i/*_j döv-dür-dü.
Tarkan Hakan-DAT Mehmet-ACC know-PART beat-CAUS-PAST
‘Tarkan made Hakan beat Mehmet on purpose.’
(*bil-erek* ‘knowingly,’ only controlled by Tarkan, not Hakan)

(30) Binding condition B: one domain
a. Hakan_i on-u*_i döv-dü
Hakan 3SG.ACC beat-PST
‘Hakan beat him.’
b. Tarkan_i Hakan-a_j on-u *_i/*_j döv-dür-dü
Tarkan Hakan-DAT 3SG beat-CAUS-PST
‘Tarkan made Hakan beat him.’

⁹ See Key (2013) for discussion of the embedded scope of negation.

(31) No coordination of caused events

*Hakan Mahmut-a ev-i temiz-le veya kira
Hakan Mahmut-DAT house-ACC clean-v- or rent
öde-t-me-ye karar ver-di.
pay-CAUS-NOM-DAT decision give-PAST

Intended: 'Hakan decided to make Mahmut clean the house or pay rent.'

Key concludes that Turkish causatives are Pykkänen's vP-embedding type, in contrast to Japanese causatives, which are Voice-embedding. If these tests diagnose the presence of an embedded VoiceP in Japanese, they are telling us that the Turkish productive causative does not embed a VoiceP.

Without a VoiceP projection, however, it is puzzling how the Causee argument in Turkish productive causatives, for example *Hakan* in (29), is introduced. Key argues that Turkish Causees are adjuncts to vP.¹⁰ This explains two important differences between Turkish and Japanese Causees. In Turkish, the Causee may be omitted (32), while in Japanese, it may not:

(32) Hasan kutu-yu aç-tır-di.
Hasan box-ACC open-CAUS-PAST

'Hasan made the box be opened/Hasan made (someone) open the box.'

Further, in Turkish, the Causee is immune to passivization, which instead targets the embedded object. In Japanese the Causee is promoted in a passive and the embedded object cannot be.¹¹ (See Key 2013 for examples.)

The Causee-less sentence in (32) is not a case of *pro*-drop, which requires discourse licensing and yields a definite (pronominal) interpretation. Key gives example (33) below to illustrate the interpretation of a *pro*-dropped Turkish subject; it requires an established discourse topic with which the dropped argument co-refers:

(33) Kapı-yı anahtar-la aç-ti.
door-acc key-with open-past
'(He) opened the door with a key.' ←requires established topic
#(Someone) opened the door with a key/#The door was opened with a key.

In contrast, the omission of the Causee in (324) does not require contextual support and receives an existential interpretation, like the unexpressed Agent of a passive. It cannot receive a pronominal interpretation, as in (34):

¹⁰ It might also be introduced by a null Applicative head, as Jung (in prep) proposes for Korean.

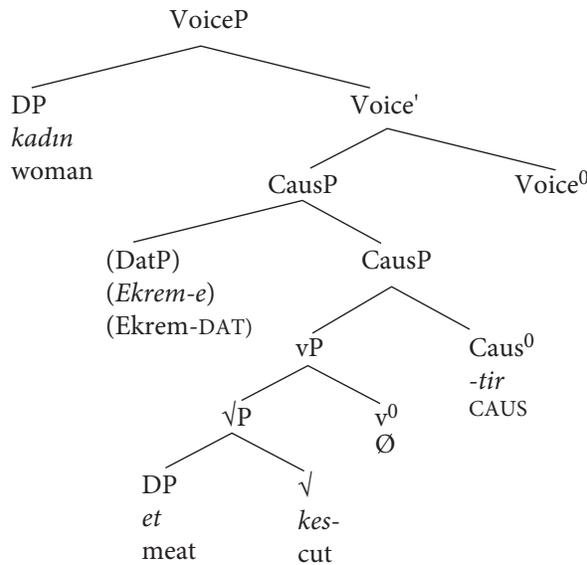
¹¹ Hiaki *-tua* causatives pattern with Japanese *-sase* causatives. See Tubino Blanco (2010). Hiaki *-tevo* causatives resemble Turkish causatives.

(34) Existential interpretation for missing Causee

- a. Hasan kutu-yu aç-tır-di.
 Hasan box-ACC open-CAUS-PAST
 ‘Hasan had the box opened./Hasan had (someone) open the box.’
 #Hasan had (him) open the box.
- b. Kadın et-i kes-tir-di. (Özkaragöz 1986)
 woman meat-ACC cut-CAUS-PAST
 ‘The woman had the meat cut./The woman had (someone) cut the meat.’
 #The woman had (him) cut the meat.

Key proposes that Turkish productive causatives are headed by a dedicated CausP projection embedding a vP. They lack an embedded VoiceP that would introduce a Causee, as illustrated in (35).

(35) Turkish productive causatives



‘The woman had Ekrem cut the meat/had the meat cut.’

Key’s analysis accounts for a puzzling paradox about allomorphy in the Turkish verb. We have seen that Turkish lexical causatives exhibit root-conditioned allomorphy, while productive causatives never do, even when intervening heads are null and the causative is adjacent to the root. One might think that this is because the causative is merged outside the first vP, as Miyagawa (1994, 1998) and Harley (1995, 2008) argue, proposing that allomorphy can only be conditioned within the same phase, and the productive causative head is too far away to be conditioned by the root. That predicts, however, that root-conditioned allomorphy should be impossible outside the vP in

general. Unfortunately, Turkish (like English) shows allomorphy of Tense⁰ when the heads between Tense⁰ and the root are null. How can allomorphy on Tense be conditioned across vP and VoiceP, when allomorphy on causative heads apparently cannot be? The Miyagawa/Harley view cannot be maintained in its most straightforward form. (See Embick 2010 and Merchant 2015 for alternative approaches to Tense/Asp allomorphy.)

Key's explanation depends on his proposal that productive causatives are CausP, not vP. Productive causatives select already verbal complements; no verbalizing properties are needed in the productive causative head (cf. Wood and Marantz on *i*^{*}, this volume). Productive causatives, then, are *pure* causatives, expressing nothing else. In contrast, Key proposes that lexical causatives bundle verbalizing [+v] with [+CAUS].

Crucially, claims Key, the lexical causative allomorphs of Turkish are specified for [+v, +CAUS]. The elsewhere causative morpheme (36), however, is a realization simply of the [+CAUS] feature; it is underspecified for [+v]:

(36) *-Dir* ↔ +CAUS

Consequently, the elsewhere causative morpheme is eligible for insertion into both the causative verbalizing head—the lexical causative head—and the 'pure' causative head, CausP, of productive causatives. When no specific allomorph for lexical causative v exists, the elsewhere causative realizes the lexical causative head due to being underspecified for v.¹²

The Caus⁰ head of a productive causative, in contrast, lacks the verbalizing function, the [+v] feature. Consequently the only Turkish vocabulary item that can be inserted in a Caus⁰ head is elsewhere *-Dir*, not any of the lexical causative allomorphs.¹³ It is the fact that the allomorphs are specified for both [+v] and [+CAUS] that blocks root-conditioned allomorphy in the productive causative, not an intervening phase boundary.¹⁴

Besides explaining the monoclausal character of Turkish causatives, and the optionality of the Causee argument, Key accounts for the puzzle we began this subsection with: the failure of recursion in productive causatives. If productive causatives are the exponent of a pure CausP in the extended functional projection,

¹² Wood and Marantz (this volume) offer a different take on the lexical-causative allomorphs of Japanese, according to which the 'causative' realization of v in Japanese instead indexes transitivity via conditioned allomorphy from Voice.

¹³ The productive causative also has a partially phonologically conditioned allomorph *-t-*; see Key (2013).

¹⁴ A reviewer rightly notes that other constraints on the theory of allomorphy are needed to rule out the possibility of conditioned allomorphs of Caus⁰ itself. Although no morpheme realizing a [+v] feature could be inserted, the existence of *other* conditioned allomorphs of Caus are not in principle ruled out. Since cross-linguistic surveys (Svenonius 2005) suggest that such conditioned allomorphy of Caus⁰ does not occur, an explanation of that is still needed. Key's theory, however, does rule out lexical causative allomorphs in the head of CausP.

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we expect the ban on recursion. Just as there cannot be more than one TP or more than one AspP, there cannot be multiple CausPs.

1.4.2 *Turkish causative iteration is not causative recursion*

Before turning to consider the implications of a dedicated CausP, we briefly review Key’s explanation of why examples like (37) below are not, after all, cases of causative recursion, since such recursion, if instantiated, would undermine the extended projection view of CausP. As noted above, Turkish is often presented as an exception to the claim that productive causatives block recursion on the basis of such examples.

- (37) Mektub-u müdür-e kâtip vasita-si-yile imzala-t-tır-dı-m.
letter-ACC director-DAT secretary means-3SG-INST sign-CAUS-CAUS-PST-1SG
‘With the help of the secretary, I got the director to sign the letter.’ (Aissen 1979)
(often presented as “I made the secretary make the director sign the letter.”)

Key shows that many languages that have “causative recursion” of this kind independently allow vacuous causative iteration. This is the case for Turkish, Kashmiri, Tsez, and Hungarian. The sentence in (38b), despite containing multiple causative morphemes, is not interpreted as instance of recursive causation; rather, it describes a single causative event:

- (38) a. Saç-ım-ı kes-tir-di-m
hair-1SG-ACC CUT-CAUS-PST-1SG
‘I had my hair cut.’
b. Saç-ım-ı kes-tir-t-ti-m
hair-1SG-ACC cut-CAUS-CAUS-PST-1SG
‘I had my hair cut.’ (Göksel and Kerslake 2005)

Key shows that iteration of causative morphemes introduces focal emphasis, akin to Ghomeshi et al.’s (2004) “Contrastive Reduplication” in English: “It’s not a *SALAD*-salad, it’s a chicken salad.” In cases like (40b), multiple causative morphemes do not reflect embedding of causative events.

What about the possibility of extra Causees? First, extra Causees need not correspond one-to-one with extra causative suffixes. An instrumental-marked Causee can appear even if the extra causative suffix does not, as Key demonstrates in (39a) and (b):

- (39) a. Müdür, yardımcı-sı aracılığıyla işçi-ler temsilci-si-ne
director assistant-3SG by.means.of worker-PL rep.-3sg-DAT
yeni bir yönetmelik yaz-dır-t-tı.
new a by-laws write-caus-caus-PST
‘The director, via his assistant, had the workers’ representative write new by-laws.’

- b. Müdür, yardımcı-sı aracılığıyla işçi-ler temsilci-si-ne
director assistant-3SG by.means.of worker-PL rep.-3SG-DAT
yeni bir yönetmelik yaz-dır-dı.
new a by-laws write-CAUS-PST
'The director, via his assistant, had the workers' representative write new
by-laws.'

Key notes that the semantics of causation allows for multiple causal links in any causal chain, which can be introduced by adjuncts even in a language like English:

- (40) a. I had the letter signed by the director by means of a courier.
b. I had my car repaired by Jim through Tom's mediation.

Such adjuncts can introduce intermediate causal links in Turkish, even in verbs not marked causative at all:

- (41) Şükran kayıp çantasını karakol-da çalış-an bir tanıdık
Şükran lost purse-3SG-ACC police.station-LOC work-PRT a acquaintance
aracılığıyla/vasıtasıyla bul-du.
by.means.of find-PST
'Şükran found her lost purse by means of an acquaintance who
works at the police station.'

Since additional causal links can be specified via adjuncts without causative iteration, and since causative affixes can vacuously iterate without specifying additional causal links, Key concludes that the "iterated causation" construction is simply the expected intersection of the independently possible causative focus construction with additional causal adjuncts. That is, in the putative Turkish causative recursion cases, vacuous causative iteration and additional causal links happen to co-occur.

1.4.3 Non-bundling v+Voice, bundling Caus+Voice (Jung 2014)

Another case that suggests a distinct categorical status for productive causatives in contrast to lexical causatives comes from Jung (2014), who demonstrates that Korean productive causatives interact with passives differently than lexical causatives, and that Hiaki applicatives interact with lexical causatives differently than productive causatives. Jung argues that Korean, like Hiaki, is a non-Voice-bundling language at the "first phase" level. The lexical causative morpheme and a stacking overt passive morpheme can co-occur, as illustrated for Hiaki in (42) and for Korean in (43). The v_{CAUS} projection and the Voice projection are therefore distinct.

- (42) Bwa'am on-tua-wa-k.
food salt-LEX.CAUS-PASS-Perf
'The food was salted.' [Hiaki]

- (43) Lamyen-i ta kkul-i-eci-ess-ta.
noodle-NOM all boil_{vi}-LEX.CAUS-PASS-Past-Comp.
(Lit. The noodle was all boiled. (The noodle is ready.)) [Korean]

In Korean, as in Hiaki, an applicative can appear following a lexical causative, introducing an argument below the Agent in Voice, confirming Korean's non-bundling status:

- (44) Mary-ka tongsayng-eykey lamyen-ul kkul-i-ecwu-ess-ta.
Mary-Nom brother-Dat noodle-Acc boil_{vi}-LEX.CAUS-APPL-Past-Comp
'Mary cooked noodles for brother.'

In Korean, like Japanese and Hiaki, the Causee of a productive causative behaves as an independent subject. The structures are biclausal, so the productive causative embeds a VoiceP, not a vP.

Interestingly, however, Jung shows that Korean and Hiaki differ in whether or not a passive can stack on top of a *productive* causative, one which embeds an agentive verb. In Hiaki this is fine (45), but in Korean, the equivalent is surprisingly impossible. Korean productive causatives cannot be passivized (46):

- (45) Empo Huan-ta chochon-tua-wa-k
you John-Acc punch-SYN.CAUS-PASS-Perf
'You were made to punch John.' (Escalante 1990: 86) [Hiaki]

- (46) *Mary-ka ppang-ul kwup-keyha-eci-ess-ta.
Mary-Nom bread-Acc bake-SYN.CAUS-PASS-Past-Comp
'Mary was made to bake bread.' [Korean]

Jung therefore proposes that the *productive* causative in Korean is bundled with its matrix Voice features, while in Hiaki everything projects independently. In Korean, lexical causatives are independent of Voice, heading their own vP projection, but productive causatives are bundled with Voice and are thus not passivizable, since Voice cannot be adjusted without eliminating the productive causative bundled with it.

The different behavior of the Korean lexical and productive causatives is consistent with Key's conclusion that productive causatives are featurally simpler than lexical causatives, and constitute a distinct category. We can state Jung's results in Key's terms, then, by saying that although *v* is not bundled with Voice in Korean, the purely causative head Caus is.

In another line of argument perhaps suggesting a categorial difference between Caus and v_{CAUS} , Jung shows that in Hiaki the applicative head can only attach outside lexical causatives, not outside productive causatives. She shows that unaccusative roots with causative suffixes can be applicativized, as in (47), while causativized unergative roots cannot, as in (48):

- (47) Causative unaccusatives + applicative: ok
- a. Mario Alle-ta uka karo-ta wee-tua-ria-k.
Mario Alex-Acc that car-Acc go-caus-appl-Perf
(‘Mario drove that car for Alex.’)
(Lit. Mario made that car go for Alex)
- b. Mario usi-ta uka vakot-ta sim-tua-ria-k.
Mario child-Acc the snake-Acc leave-caus-appl-Perf
(‘Mario made the snake leave for the child.’)
- (48) Causative unergatives + applicative: bad
- a. *Jose Maria-ta uka kawai-ta chepti-tua-ria-k.
Jose Maria-Acc that horse-Acc jump-caus-appl-Perf
(‘Jose made that horse jump for Maria.’)
- b. *Nee mala-ta Mario-ta yi’i-tua-ria-k.
I mother-Acc Mario-Acc dance-caus-appl-Perf
(‘I made Mario dance for mother.’)
- c. *Jose yoemia-ta uka hamut-ta nok-tua-ria-k.
Jose people-Acc the woman-Acc speak-caus-appl-Perf
(‘Jose made the woman speak for the people.’)

Since unergative verbs require an external argument introduced in Spec-VoiceP, causatives of unergatives must be productive, rather than lexical. Cases like (48), then, show us that productive causatives cannot applicativize in Hiaki.

Again, interpreting Jung’s result in light of Key’s conclusion, this pattern can be explained in selectional terms if the Hiaki high applicative selects for vP, not CausP.¹⁵ Applicatives of lexical causatives (and of other agentive verbs) are hence possible, but not applicatives of productive causatives.

Summarizing, we have seen two further pieces of evidence, from Jung 2014, that lexical and productive causatives behave like different syntactic categories. Korean v_{CAUS} and Caus interact differently with passive, which Jung accounts for by hypothesizing that Caus is bundled with Voice in Korean but v_{CAUS} is not. Similarly, Hiaki applicatives combine with v_{CAUS} but not Caus. Differentiating v_{CAUS} and Caus

¹⁵ A reviewer asked whether such a selectional mechanism could account for the impossibility of high applicatives in Voice-bundling languages, thus obviating the need for the technical notion of bundling in favor of selectional or adjacency requirements. One way to implement this might be to suggest that Voice in bundling languages is subject to an adjacency or selectional constraint between Voice and v that would rule out an intruding ApplP. However, it’s not clear that such an approach would be consistent with the need for an intruding ApplP in a high-applicative language to be selected for by the same Voice⁰ as its transitive counterpart; presumably the ApplP in such a language would need to have the same category as its complement to get the selection facts right, so selection might not be able to differentiate between vP and ApplP. See Wood and Marantz (this volume) for discussion of how a featurally unspecified argument-introducing head could allow such selectional “transparency.”

categorically could allow an account of this pattern in terms of the particular selectional properties of the applicative head.

1.5 Some puzzles and conclusions

To conclude this whirlwind overview of some recent developments in our understanding of Voice and *v*, we have seen that Pylkkänen’s bundling parameter can provide insight into the behavior of Chol (section 1.2.1) and Persian (section 1.2.2) on the one hand and Hiaki (section 1.3.1), Chemehuevi (section 1.3.2) and Korean (section 1.4.3) on the other. The complementary distribution of passivization and light verb constructions in Italian provides further evidence of the patterns predicted by Pylkkänen’s taxonomy (section 1.3.3).

However, it appears that further distinctions must be made within the first-phase domain. Key’s study of Turkish suggests that the verbalizing and causativizing functions of v_{CAUSE} are only bundled in lexical causatives. Productive causatives are pure projections of a CAUS feature, CausP, devoid of *v*’s categorial signature (sections 1.4.1 and 1.4.2).

The idea that productive causatives are a distinct projection from *v*P might help us understand Jung’s observation that productive causatives are bundled with Voice in Korean, while lexical causatives are not, and that Hiaki applicatives can attach to lexical but not productive causatives (section 1.4.3).

Key’s proposal, and Jung’s results, may suggest that verbal derivational morphology, while apparently scopally interactive, recursive, and subject to the whims of speakers’ expressive intentions, may instead reflect a Cinque-style hierarchy of categorial selection (Cinque 1999), with cross-linguistic variation in the bundling (or perhaps ‘spanning,’ Svenonius 2012) of these features. Assuming that the verb root sits at the bottom of the tree, we would have, minimally, the potential for a fully expanded hierarchy within VoiceP as outlined in (49) with the various patterns of bundling and independence in the different languages.

- (49) $vP > \text{ApplP} > \text{CausP}_1 > \text{VoiceP} > \text{CausP}_2$
- Turkish: *v*P, CausP₁, VoiceP distinct. No ApplP, no CausP₂
 - Hiaki: *v*P, ApplP, CausP₁ (-*tevo*), VoiceP and CausP₂ (-*tua*) distinct.
 - Korean: *v*P and ApplP distinct. No CausP₁. CausP₂+VoiceP bundled.
 - Italian: *v*P and VoiceP bundled. No ApplP,¹⁶ no CausP₁. (*Faire Infinitif* may exemplify CausP₂.)¹⁷

¹⁶ Or perhaps Italian has an ApplP, but one whose morphological exponent is zero. Folli and Harley (2006, 2007) make use of an ApplP to account for the distribution of certain affected dative arguments, including the Italian equivalent of the *Faire Par* causative construction.

¹⁷ I assume that *Faire Par* causatives involve main verb *fare* embedding a nominalized *v*P (Folli and Harley 2007).

Like other projections in a Cinque-type hierarchy, certain projections would have to be either optional or typically morphologically unexpressed in a given language. The hierarchy expresses Jung's result that applicatives cannot occur outside CausP₁ (or CausP₂, for that matter).

We have seen three positions in which a causative feature can be expressed. The head *v* can bear a [+CAUS] feature that conditions the insertion of the same elsewhere causative element as in either CausP, so long as no root-conditioned allomorph is specified; we see this in Japanese, Hiaki, and Turkish. The Caus heads, whether in a VoiceP-internal or external position, lack the [+v] feature, and so cannot be realized by root-conditioned allomorphs of *v*⁰, even causative ones. Both VoiceP-internal and Voice-P external CausPs would be necessary to capture the differences between VoiceP-embedding causatives, like Japanese *-sase* and Hiaki *-tua*, and *v*P-embedding causatives like Turkish *-Dir* or Hiaki *-tevo*.

The overall picture faces many potentially fatal problems, however. If languages can have two distinct kinds of CausP heads—Caus₁ below Voice (like Hiaki *-tevo* or Turkish *-Dir*) and Caus₂ above Voice (like Korean *-keyha* and Hiaki *-tua*)—then the account of the failure of causative recursion evaporates. Some language could use both CausP₁ and CausP₂ and realize each in a single structure with the same elsewhere causative. There would only be a single Causee (associated with the Voice-embedding CausP₂) but two causative events would be entailed. Hiaki *-tevo* and *-tua* can co-occur in some verbs; we have *ni'i-tua-tevo* 'fly-CAUS.DIR-CAUS.INDIR' and *hitto-tevo-tua* 'heal-CAUS.INDIR-CAUS.DIR,' which is predicted by the theory, but their exponence is not identical. If a language can have both Caus₁ and Caus₂, and if both can be realized by an elsewhere causative exponent, then we predict that we might even see *three* nonvacuous iterated instances of causative: lexical, Caus₁, and Caus₂. Since our starting point was the observation that such causative profligacy has not been documented, work remains.

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