UTAH at Merge: Evidence from multiple applicatives[*]

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It is argued that UTAH is a property of Merge, not a condition on representations. It is argued that both upward and downward Merge is needed to capture the word order and A-movement properties of Bantu applicatives, along with their selectional properties. The different A-movement properties of applicatives are attributed largely to their phasal / nonphasal status and to cross-linguistic variation in the distribution of EPP features.
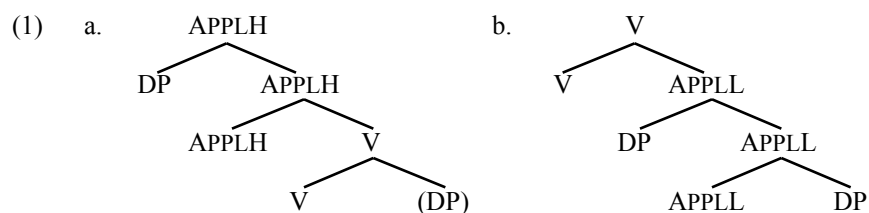
1. Introduction

In the generative linguistic tradition, the language faculty is regarded as a biological system. Like any other biological system, it is subject to resource limitations. For example, it has been recently argued that derivations are computed in phases, which constitute small, manageable domains for syntactic operations (Chomsky 2000, 2001). There has also been an attempt to eliminate global conditions on representations in favour of local conditions on operations. For example, what was previously formulated as a condition on D-structure, the Uniformity of Theta Assignment Hypothesis (UTAH; Baker 1988), is most straightforwardly recast as a property of the operation Merge. This approach makes new empirical predictions which have not yet been explored in great detail. I argue here that these predictions are confirmed by a set of observations about Bantu applicatives (APPLs).

Bantu APPLs can be classified into two types, which Pylkkänen (2002) calls High and Low APPLs. High APPLs establish a semantic relation between an individual and an event; for example, a benefactive argument can benefit from an event, or a locative argument can specify where it takes place. Low APPLs instead establish a semantic relation between two individuals, such as a recipient and a theme, or a source and a theme. Compositionality, then, implies that a High APPL has a structure like that in (1a), with an individual-denoting specifier and an event-denoting complement; and that a Low APPL has a structure like (1b), with an individual-denoting specifier and an individual-denoting complement.

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(1) a. APPLH   b.   V

         DP   APPLH   V   APPLL

                APPLH   V   DP   APPLL

                        V   (DP)   APPLL   DP

       As a result of their selectional properties, Low APPLs can appear only with verbs that take an internal argument, while High APPLs can appear with both transitive and intransitive (including unergative) verbs.[1] For example, English has a Low recipient APPL which establishes a direct semantic relation between two DPs, such as *Mary* and *a letter* in (2a). As predicted, the Low APPL is incompatible with an unergative verb.

(2) a. John sent Mary a letter.
     b. * John ran Mary. ('John ran for Mary.')

On the other hand, the Kichaga benefactive is a High APPL, which relates a DP individual to a verb phrase event. In this case, an internal argument is not required:

(3) N-ǎ-í-zrìc-í-à   mbùyà.
     FOC-he-PR-run-APPL-FV   friend
     'He is running for a friend.'   *Bresnan and Moshi 1990:149*

       This analysis predicts certain restrictions on the possible combinations of APPLs. A High APPL head could, of course, merge with a VP containing a Low APPL, as with any other VP. Likewise, a High APPL head could merge with a High APPLP, which also denotes an event. However, a Low APPL head should not be able to merge with a High APPLP, both because the High APPLP does not denote an individual, and because the High APPL would then have no event-denoting argument.[2]
       A review of the Bantu literature reveals that the expected combinatorial restrictions do not apply (McGinnis and Gerdts 2003). For example, in Haya, a Low dative APPL can take a High instrumental APPLP as its complement (4).

(4) Kat' á-ka-siig-is'   ómwáán' ámajút' ékitambâla.
     Kato he-PST-smear-INST child   oil   handkerchief
     'Kato smeared oil on the child with the handkerchief.'   *DB:63*

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[1] Pylkkänen (2002) also argues that a depictive secondary predicate can modify a High applied argument, but not a Low one, except in languages where other internal arguments can be so modified. I have not yet been able to test this prediction for the cases discussed here.

[2] Not discussed here, but also of interest, are combinations of Low   APPLs. For example, Kinyarwanda allows the combination of dative and alienable possessor APPLs (Kimenyi 1980:101–105). See Legate (2003:184) for discussion of a similar case in Choctaw.

I will argue that such apparent violations of compositionality are predicted if semantic composition obtains at the moment of Merge, rather than at a subsequent level of representation. I will argue that in the cases described above, relations established by Merge are subsequently altered, yielding a structure that no longer directly reflects the compositional interpretation of the derivation.

2. UTAH as a condition on external Merge

Baker (1988:46) formulates UTAH as follows, within the framework of Government and Binding Theory:

(5)   Identical thematic relationships between items are represented by identical structural relationships between those items at the level of D-structure.

Minimalist theory seeks to eliminate such global conditions on representations. Within this framework, UTAH can be most straightforwardly recast as a condition on external Merge — that is, Merge of an item not already merged into the derivation. For example, it could be postulated that identical thematic relationships between items are represented by identical Merge operations applying to them. The condition may be more clearly stated as follows:[3]

(6)   Thematic relationships are established by external Merge.

The two formulations in (5) and (6) have different empirical consequences. For example, (5) in principle allows non-local thematic relationships, while (6) allows such relationships only between two elements that merge. There is some support for the more local version. On the basis of an asymmetry between subject and object interpretations, Marantz (1984) argues that the external argument of a transitive clause must receive its theta-role compositionally from the verb phrase, not directly from the main verb. This requirement must be stipulated under (5), but it follows naturally from the formulation in (6), on the conventional assumption that the external argument merges with the verb phrase after the direct object has merged.

The formulation in (6) also opens up the possibility of non-compositional structures, since it is the derivation that is compositionally interpreted, not the resulting structure. Under standard assumptions, each Merge operation is reflected in a structural relation of sisterhood, which persists throughout the derivation; thus, structures will always be compositional. However, if the sisterhood relation created by Merge could be subsequently altered, or if two elements could merge without becoming sisters, then (6), but not (5), would allow the derivation to be interpreted compositionally, even if this interpretation is not accessible from the resulting syntactic structure.

There is indeed evidence that a sisterhood relation created by Merge can be subsequently altered (Phillips 1996, 2003; see also Richards 2002). Constituency conflicts suggest that the standard assumptions about constituency

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[3] Hornstein (2001) argues that internal Merge can also establish thematic relationships.

are incorrect (Ernst 1994, Pesetsky 1995). For example, in (7), *[visit them]* appears to be a constituent, since it undergoes movement. On the other hand, *[them [on each other's birthdays]]* also appears to be a constituent, since the pronoun c-commands the anaphor. On the traditional view, the two constituent structures are incompatible: the PP either is, or is not, part of the VP constituent. Nevertheless, both seem to co-exist in a single derivation.

(7)   Bill said he would visit them$_i$, and [visit them$_i$]$_j$ he did [t$_j$ [on each other's$_i$ birthdays]].

       Phillips argues that the apparent conflict arises because a constituent created by Merge is destroyed by a subsequent application of Merge. First the object DP merges with V, as in (8a); then P merges, as in (8b), followed by its complement DP.[4] When P merges, the object DP is reanalyzed as its specifier.

(8)   a.   b.
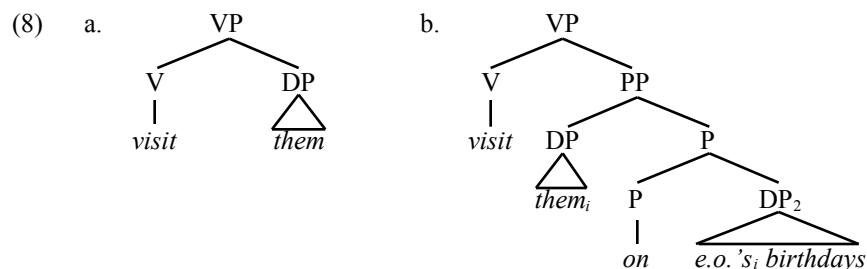
Under this view, the moved VP constituent in (7) is interpretable because it establishes a dependency with a copy VP like the one in (8a), even though this copy is subsequently altered. After the complement of P merges, the "cascade" structure in (8b) allows the pronoun to c-command and bind the anaphor. This procedure results in a representational opacity: when P merges, the sisterhood relation between V and DP$_1$ in (8a) ceases to exist. Nevertheless, this DP is still interpreted as the object of V.

       Phillips argues that the entire syntactic derivation proceeds from the top down — or, more accurately, from left to right. However, if the formulation of UTAH in (6) is to be preserved, it is not clear that a purely left-to-right derivation can be maintained. As noted above, there is evidence that the external argument receives a compositional theta-role from the verb phrase. If this thematic relationship is established by external Merge, then the verb phrase must be constructed before the external argument is merged with it, even though (in most languages) the subject precedes the verb phrase. I propose that the derivation actually proceeds outwards from the verb — either upwards or downwards, depending on what undergoes Merge.

       If the structural reflection of a thematic relationship can be eliminated before all Merge operations are complete, then UTAH must be treated as a condition on Merge, not as a condition on representations. I will also argue that two elements can merge without becoming sisters. The resulting structure

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[4] For simplicity, I will assume that DPs are completed in a parallel set of Merge operations before merging with other constituents.

therefore does not provide sufficient information to identify the thematic relationships involved.

Consider, for example, the portion of a derivation shown in (9). In (9b), it seems clear that *v* has merged with VP: VP is completed just prior to merging *v*, and VP becomes the sister of *v*.

(9) a.
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          VP
         /  \
        V    DP
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b.
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          vP
         /  \
        v    VP
            /  \
           V    DP
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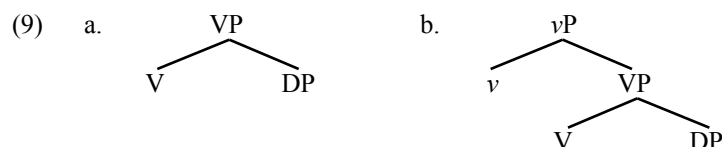
On the other hand, in (8b), it is not clear what P has merged with: VP is completed just prior to merging P, but DP_1 becomes the sister of P. In the next section I argue that a structural configuration like (8b) can arise from merging a head with a constituent just completed. Thus, a head selecting an event-denoting argument, like a High APPL, can merge downward with VP.

In such a case, the thematic relationship created by Merge is not reflected structurally by a sisterhood relation. However, this thematic relationship can arguably be identical to one that is reflected by sisterhood. For example, a passive *by*-phrase has a compositional thematic role identical to that of the external argument in the corresponding active clause (Marantz 1984:129). Nevertheless, an external argument is merged upward, where it can bind internal arguments (10a), while a *by*-phrase is merged downward, where it can be bound by internal arguments (10b).

(10) a. Each professor$_i$ taught her$_i$ students her$_i$ favourite subject.
      b. The students were taught every subject$_i$ by its$_i$ foremost expert.

This alternation is something of a puzzle under the representational version of UTAH. Under the Merge version, however, the external argument and the *by*-phrase can have the same thematic relation to *v*P if they both merge with *v*P — one upwards, the other downwards. The resulting structural relationships are distinct, but the Merge relation is identical.

3. Upward and downward Merge in Bantu applicatives

In this section I present a more extended argument that UTAH is a condition on Merge. In 3.1, I present cases expected under either formulation of UTAH, in which a High APPL merges above a theme, a Low APPL, or another High APPL. In 3.2, I argue that event-selecting APPL heads can also merge downward (see also McGinnis and Gerdts 2003). As a result, the thematic relationship created by Merge is not reflected structurally by sisterhood.

Some remarks are in order regarding the syntactic analysis I will assume for applicatives. As noted above, it has been argued that syntactic derivations proceed in phases (Chomsky 2000, 2001). According to this view, merging certain functional heads (for example, *v* or C) results in the completion of a phase. The *domain* of the phase (the complement of the phase head) is then

sent off for phonological and semantic interpretation. This results in the Phase Impenetrability Condition: elements in the domain of a phase are inaccessible to further sy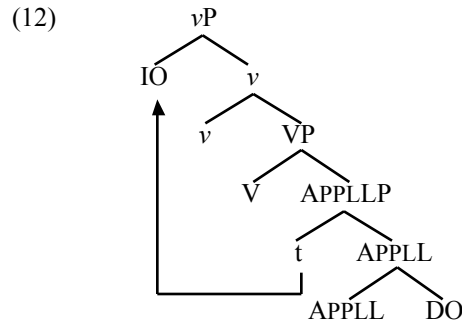ntactic operations. However, the head and *edge* of the phase (specifiers and adjuncts of the phase head) remain accessible. Thus, for a constituent in the domain to escape the phase, it must first move to the edge. Chomsky proposes that a phase head can trigger movement to the edge of the phase by means of a EPP feature. For example, wh-subjects can escape an embedded clause by first moving to the edge of the embedded CP.

There is some debate in the literature regarding which functional categories constitute phase heads. McGinnis (2001, 2002, 2004) argues that High APPLs are phases, while Low APPLs are not. Under this view, an EPP feature on the High APPL head allows the direct object to leapfrog over the applied argument to spec-APPL in a passive (11a). From there, it can move again to spec-*v*, and on to the subject position. If no EPP feature is added to the High APPL head, the applied argument can move to spec-*v* instead (11b), and thence to the subject position. Thus, the typical High APPL is symmetrical, allowing either object to move to subject position in a passive.

(11)   a.
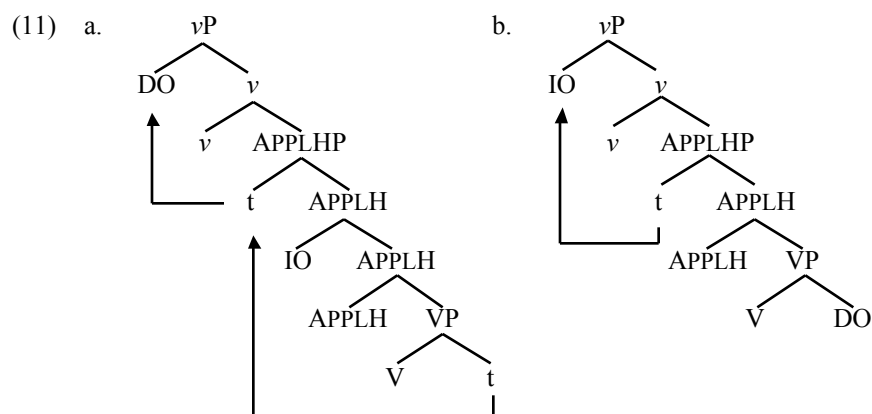
If a Low APPL is not a phase head, it has no EPP feature to allow movement of the lower argument. Moreover, only the closest eligible constituent can be attracted to the edge of the *v*P phase (12). As a result, the typical Low APPL is asymmetrical, allowing only one object to move to subject position in a passive.[5]

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[5] McGinnis (2004) argues that in some Low APPLs, the applied argument has inherent Case, which makes it ineligible for A-movement. The result is also asymmetrical, but in this case only the theme can raise to subject position.

(12)

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            vP
         ╱      ╲
       IO         v
        ↑      ╱    ╲
        │     v       VP
        │          ╱     ╲
        │         V      APPLLP
        │              ╱      ╲
        │             t       APPLL
        │                   ╱     ╲
        └──────────── APPLL    DO
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However, the High/Low distinction alone does not fully account for the symmetrical/asymmetrical distinction (Doggett 2004). This is partly because the availability of EPP features is subject to cross-linguistic variation. Thus, some High APPLs allow only the applied argument to raise to subject position, because the APPL head has no EPP feature to allow the lower object to move.

Doggett also argues that both objects can move out of a Low APPL if *v* has two available EPP features. This argument is based on an intriguing set of facts from Haya, a Bantu language spoken in Tanzania (Duranti and Byarushengo 1977). Haya has a Low dative APPL, expressing a direct semantic relation between the theme and the indirect object (13).

(13) Kat' á-k-óólek'   ómwáán' épîca.
      Kato he-PST-show child   picture
      'Kato showed the child a picture.'   *DB:58*

The Haya "passive" is more like an inverse derivation: the thematic role of the external argument is expressed, not by a prepositional phrase, but by an optional DP. In a double-object passive, the dative argument can raise to subject position (14a). More interestingly, the theme also can raise to subject under certain circumstances. For example, it can raise if the external argument is not expressed (14b).

(14) a.   Omwáán$_i$ a-k-óólek-w-a   kat'   t$_i$ épîca.
            child   he-PST-show-PASS-FV   Kato   picture
            'The child was shown the picture by Kato.'   *DB:59*

      b.   Epíc' é-k-óólek-w-a   (*kat') ómwáana.
            picture he-PST-show-PASS-FV   Kato   child
            'The picture was shown to the child by Kato.'   *DB:59–60*

Doggett proposes that in a Haya passive, *v* has two EPP features. One can be checked by merging an external argument in spec-*v*, while the other is checked by an internal argument that raises first to spec-*v*, then to the subject position. However, if the external argument is not merged, then both EPP features of *v* can be checked by internal arguments (15). Thus, the theme can move over the dative argument, and onwards to the subject position.

(15)
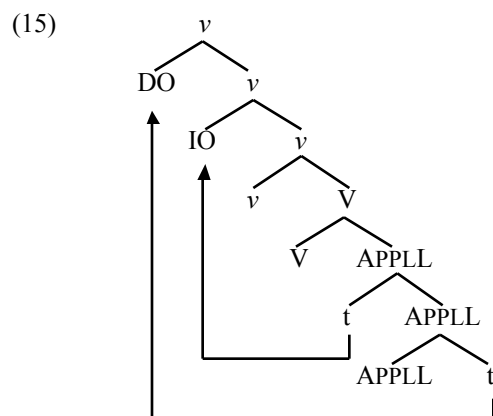
If the external argument is merged, the theme can still raise to subject if the dative argument incorporates into the verb (16). Doggett argues that in this case, the dative argument is a clitic that undergoes head-movement to *v*. The dative clitic does not check the second EPP feature of *v*, so the theme can do so instead.

(16) Bá-ka-mw-óólek-w-a   káto.
        they-PST-him-show-PASS-FV   Kato
        'They were shown to him by Kato.'   *DB:60*

Since the DO can also incorporate into the verb, (16) can also mean 'He was shown to them by Kato.'

4.1 Merging High applicatives upwards

Both the representational and Merge versions of UTAH predict that High APPLs can merge with either a VP or another High APPLP. Such derivations can be illustrated with Kinyarwanda, a Bantu language spoken mainly in Rwanda (Kimenyi 1980). Benefactive (17a) and locative APPLs (17b) are High APPLs, as demonstrated by their ability to merge with unergative VPs:[6]

(17) a.   Umugóre a-rá-kor-er-a   umugabo.
              woman   she-PR-work-BEN-ASP man
              'The woman is working for the man.'   *K:32*

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[6] In Kinyarwanda it is important to distinguish between unergative verbs, which cannot combine with a Low APPL, and transitive verbs with a null thematic object, which can (i). Object suppression as in (i) is possible for most arguments with object properties (see footnote 8), though not for datives or benefactives (Kimenyi 1980:61).

(i)   Úmwáalimu y-eerets-e   abányéeshuûri.
        teacher   he -show -ASP students
        'The teacher showed the students.'   *K:61*

b.　Ábáana　b-iica-yé-ho　　　ámééza.
　　children　they-sit-ASP-LOC　table
　　'The children are sitting on the table.'　　　　*K:92*

Both benefactive and locative APPLs can also combine with a verb phrase containing a Low APPL. For example, Kinyarwanda has a Low dative APPL. A VP containing a dative APPL can merge with a benefactive (18a) or locative APPL (18b).

(18)　a.　Umugóre　a-rá-hé-er-á　　　　<u>umugabo</u>　ímbwa　ibíryo.
　　　　　woman　　she-PR-give-APPL-ASP　man　　　dog　　food
　　　　　'The woman is giving food to the dog for the man.'　　*K:65*

　　　b.　Umugóre　a-rá-hé-er-á-mo[7]　　　<u>ishuûri</u>　umuhuûngu ibitabo.
　　　　　woman　　she-PR-give-APPL-ASP-LOC school　boy　　　books
　　　　　'The woman is giving the books to the boy in the school.'　*K:96*

The neutral word order suggests that the (underlined) benefactive and locative arguments c-command the dative and theme arguments, as is expected if a High APPL merges with VP, while a Low APPLP merges with V.

As noted above, High APPLs are typically symmetrical, allowing either the applied argument or the next lowest argument to move to the subject position of the passive. This type of alternation can be seen with benefactive+dative APPLs, where the benefactive (19a) or the dative (19b) argument can move to the subject position of a passive.[8]

(19)　a.　Umugabo$_i$　a-rá-hé-er-w-a　　　　　t$_i$ ímbwa ibíryo n'ûmugóre.
　　　　　man　　　he-PR-give-BEN-PASS-ASP　dog　　food　by-woman
　　　　　'For the man is given food to the dog by the woman.'　　*K:66*

　　　b.　Ímbwa$_i$ i-rá-hé-er-w-a　　　　　umugabo t$_i$ ibíryo n'ûmugóre.
　　　　　dog　　it-PR-give-BEN-PASS-ASP man　　　food　by woman
　　　　　'The dog is given food for the man by the woman.'　　*K:65*

The Low dative APPL is also symmetrical, as it is in Haya: both the dative (19b) and the theme (20) can move to subject position in a passive.

(20)　Ibíryo$_i$　bi-rá-hé-er-w-a　　　　　umugabo　ímbwa t$_i$ n'ûmugóre.
　　　food　　it-PR-give-BEN-PASS-ASP　man　　　dog　　by woman
　　　'The food is given to the dog for the man by the woman.'　　*K:65*

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[7] Many, though not all, locative applicatives in Kimenyi (1980) also have the applicative suffix *-ir/-er*. This suggests that the locative suffixes *-ho* and *-mo* are not themselves APPL heads, but clitics doubling the locative argument.

[8] In addition to movement to subject, Kimenyi (1980) also discusses other object properties: pronominalization, reflexivization, object-subject reversal, and extraction in relative clauses, clefts and *wh*-questions. I have corrected an apparent error in the translation of (19a) to reflect Kimenyi's description of the facts; the verbatim version is 'The man is given food for the dog by the woman.'

Following Doggett's analysis of Haya, we might propose that the head of the High benefactive APPL has EPP features that attract both the theme and the dative. However, the word order of postverbal arguments appears to be the same in the active (18a) and the passive in (20). This is not expected if movement of the theme is contingent on prior movement of the dative to spec-APPL.

Another possibility, which Doggett proposes for symmetrical Low APPLs in British English, is that the theme can merge either above or below the dative argument. She notes that variable ordering of themes and datives is observed in a number of languages, including Croatian, Greek, French, and Italian. In British English, however, a dative argument always c-commands a (non-pronominal) theme in an active clause. Nevertheless, Doggett proposes that the theme can be generated above the dative argument here as well, provided that it raises to the subject position. Cases of this sort have been observed elsewhere; for example, Rackowski (2002) discusses a High instrumental in Tagalog that must move to the subject position, as indicated by *ang* (21a); another argument cannot move to subject instead (21b). Marantz (1984:245–246) notes a similar case in Chicheŵa.

(21) a. I-pinang-lakad   ng lalaki <u>ang   tungkod</u>.
         OBL-ASP-walk   CS man   ANG stick
         'The man walked with a stick.'

   b. * Nag-lakad   ng tungkod <u>ang   lalaki</u>.
         NOM.ASP-walk CS stick   ANG man
         'The man walked with a stick.'   *Rackowski 2002:52*

I will assume that arguments that must move to subject position are generated with an uninterpretable Tense feature. Another plausible case of this kind is PRO:[9]

(22) a. * Mary believed [him to have fired PRO].
    b.   We forced him [PRO to fire Mary].
    c.   We forced Mary [PRO$_i$ to be fired t$_i$ by him].

The example in (20) is open to a similar analysis: the theme can be generated above the dative argument as long as it is generated with an uninterpretable Tense feature. An EPP feature on the High benefactive APPL head will then allow the highest argument of the Low APPL — dative or theme — to move over the benefactive argument, then continue on to the subject position. In short, it is reasonable to conclude that a benefactive APPL merges above VP. Such a result is expected under both representational and Merge versions of UTAH, given that the High benefactive APPL head selects an event argument.

In the High locative APPL, the locative argument can move to subject position in a passive (23a), but lower arguments, such as the theme, cannot (23b). These observations can be captured if the locative APPL head lacks an

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[9] A similar case is observed in Italian, where one type of impersonal *si* is obligatorily nominative — that is, it must agree with finite T (Cinque 1988). PRO must instead agree with non-finite T.

EPP feature to attract a lower argument, so that the theme is trapped within the domain of the APPLHP phase.

(23) a.   Ishuûri$_i$ ry-oohere-j-w-é-ho   t$_i$ igitabo n'úúmwáalímu.
             school   it-send-ASP-PASS-ASP-LOC   book   by-teacher
             'The school was sent the book by the teacher.'   *K:94*

     b. * Igitabo$_i$ cy-oohere-j-w-é-ho   ishuûri t$_i$ n'úúmwáalímu.
             book   it-send-ASP-PASS-ASP-LOC school   by-teacher
             'The book was sent to the school by the teacher.'   *K:95*

Likewise, when a locative APPL merges with a VP containing a dative APPL, neither the dative (24a) nor the theme (24b) can become the subject of the passive:

(24) a. * Umuhuûngu$_i$ a-rá-hé-er-w-á-mo   ishuûri t$_i$
             boy   he-PR-give-APPL-PASS-ASP-LOC   school

             ibitabo   n'ûmugóre.
             books   by-woman

             'The boy is given the books in the school by the woman.'   *K:96*

     b. * Ibitabo$_i$ bi-rá-hé-er-w-á-mo   ishuûri
             books   they-PR-give-APPL-PASS-ASP-LOC school

             umuhuûngu t$_i$ n'ûmugóre.
             boy   by-woman

             'The books are given to the boy in the school by the woman.' *K:96*

       Since datives and themes can normally raise to subject, the locative evidently blocks them from doing so in (23b) and (24). However, the locative argument itself can raise to subject position, as shown in (23a). This supports the view that the locative c-commands both arguments: as the closest argument, it is attracted to spec-T in a passive. Again, this result is expected under both a representational version and a Merge version of UTAH, on the assumption that the High Locative APPL merges with VP, while the Low dative APPL phrase merges with V.
       Locative and benefactive High APPLs can also combine, as shown in (25). This is also predicted by both versions of UTAH. Like VPs, High APPLPs denote events. Thus an event-selecting High APPL can merge with a High APPLP.

(25) Úmwáana y-iicar-i-yé-ho   íntebe umugabo.
       child   he-sit-APPL-ASP-LOC chair   man
       'The child is sitting on the chair for the man.'   *K:113*

Which APPL head merges with which APPLP in (25) is not entirely clear. Locality considerations suggest that the benefactive merges above the locative. As noted above, the locative generally blocks lower arguments from moving to subject position in a passive. However, the locative does not block movement of the benefactive, as shown in (26a). The benefactive generally does not block movement of a lower argument, and indeed the locative argument can also move to the subject position (26b).

(26) a. Umugabo y-iicar-i-w-é-ho   íntebe n'úúmwáana.
          man   he-sit-BEN-PASS-ASP-LOC chair   by-child
          'For the man was sat on the chair by the child.'   *K:114*

      b. Íntebe y-iicar-i-w-é-ho   umugabo n'úúmwáana.
          chair   it-sit-BEN-PASS-ASP-LOC man   by-child
          'The chair was sat on for the man by the child.'   *K:114*

On the other hand, the neutral word order in (25) has the locative preceding the benefactive. If left-to-right word order mirrors c-command, as has been reported for other Bantu languages (Marantz 1993, Ngonyani 1996), then this suggests that the locative c-commands the benefactive. Kimenyi (1980:114) reports that it is possible to reverse the linear order of the two arguments, but then the animate argument is interpreted as a possessor ('The child is sitting on the man's chair.'). McGinnis and Gerdts (2003) suggest that the order in (25) is derived by stylistic movement to avoid ambiguity. Another possibility is that the Benefactive can merge above the locative only if it is generated with an uninterpretable Tense feature, and thus must move to subject position.

Although a number of details remain unresolved, the cases described above are broadly compatible with either a representational version or a Merge version of UTAH. High APPLs merge with VPs or with other High APPLPs, and High applied arguments c-commands themes and Low applied arguments. In the following section, however, I will present cases in which a High APPL is c-commanded by a theme or by a Low applied argument. Such cases support a cascade analysis along the lines of Phillips (1996, 2003), with downward Merge. This analysis is compatible with the Merge version of UTAH, but not with the representational version.

4.2 Merging High applicatives low

We have already seen that benefactive and locative APPLs in Kinyarwanda are High. Instrumental APPLs also appear to be High, since they can combine with unergatives:

(27) Umuhíinzi a-kor-eesh-a   isúka.
      farmer   he-work-INST-ASP hoe
      'The farmer is working with the hoe.'   *Overdulve 1975:209*

They can also combine with transitive VPs (28a). Instrumental passives are symmetrical: either the instrument (28b) or the theme (28c) can raise to subject position.

(28) a. Umugabo a-ra-andik-iish-a íbárúwa íkárámu.
man he-PR-write-INST-ASP letter pen
'The man is writing a letter with the pen.' *K:81*

b. Íkárámu$_i$ i-ra-andik-iish-w-a íbárúwa t$_i$ n'ûmugabo.
pen he-PR-write-INST-ASP letter by-man
'The pen is used to write a letter by the man.' *K:81*

c. Íbárúwa$_i$ i-ra-andik-iish-w-a t$_i$ íkárámu n'ûmugabo.
letter he-PR-write-INST-ASP pen by-man
'The letter is being written with a pen by the man.' *K:83*

However, unlike benefactive and locative arguments, instrumental arguments in a transitive clause follow the theme, suggesting that the theme c-commands the instrument. Quantifier-pronoun binding supports this view: (29a) shows that a quantificational theme can bind the instrument, while (29b) shows that a quantificational instrument cannot bind the theme (McGinnis and Gerdts 2003).[10]

(29) a. N-a-fúngul-ish-ije buri muryango úrufunguzo rwáwo.
I-PST-open-INST-ASP each door key its
'I opened each door$_i$ with its$_i$ key.' *A. Rutayoberana, p.c.*

b. N-a-fúngul-ish-ije umuryango wáyo buri rufunguzo.
I-PST-open-INST-ASP door its each key
'I opened its$_i$ door with each key$_{j/*i}$.' *A. Rutayoberana, p.c.*

On a bottom-up approach to Merge, an instrumental APPL that merges with VP should c-command an object contained in VP. However, this does not seem to be the case in (29). Although the instrumental APPL has the semantics of a High APPL, it seems to merge below the theme.

Like benefactives, instrumental APPLs can combine with locative APPLs:

(30) Úmwáalímu y-a-andik-iish-ijé-ho ikíbáho imibáre íngwa.
teacher he-PST-write-INST-ASP-LOC board math chalk
'The teacher wrote math on the blackboard with chalk.' *K:107*

As noted above, the locative APPL blocks lower arguments from raising to subject position in a passive. If the instrumental argument merges below the theme, a locative should block it from raising to subject. This prediction is confirmed. In a passive locative+instrumental APPL, the locative argument can raise to the subject position (31a). The theme cannot, as usual in locative APPLs (31b). The instrumental also cannot move to subject position (31c). This observation crucially distinguishes High instrumentals from High benefactives,

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[10] The data in (29) should not be used without confirmation, as the tones have not been checked. Alexandre Rutayoberana describes these applicatives as "old-fashioned" Kinyarwanda. Many speakers prefer a non-applicative construction with a PP instrument instead.

whose movement is not blocked by the locative, as shown above (Kimenyi 1980, Gerdts and Whaley 1993, McGinnis and Gerdts 2003).

(31) a. Ikíbáho$_i$ cy-a-andik-iish-ij-w-é-ho   t$_i$ imibáre íngwa.[11]
         blackboard it-PST-write-INST-ASP-PASS-ASP-LOC   math   chalk
         'On the blackboard was written math with chalk.'   *K:107*

     b. * Imibáre$_i$ y-a-andik-iish-ij-w-é-ho   ikíbáho t$_i$ íngwa.
         math   it-PST-write-INST-ASP-PASS-ASP-LOC blackboard chalk
         'Math was written on the blackboard with chalk.'   *K:108*

     c. * Íngwa$_i$ y-a-andik-iish-ij-w-é-ho   ikíbáho   imibáre t$_i$.
         chalk   it-PST-write-INST-ASP-PASS-ASP-LOC blackboard math
         'Chalk was used to write math on the blackboard.'   *K:108*

The differences between instrumental and benefactive APPLs can be captured if the benefactive merges upward, while the instrumental merges downward.

Further evidence that a High APPL can merge downward comes from Haya.[12] As seen above (in (14)), a passive with a syntactically expressed external argument allows the next lowest argument to move to subject position, but blocks movement of an argument merged lower. On the other hand, if the external argument is not syntactically expressed, either of the two next lowest arguments can raise to subject position.

Haya also has an instrumental APPL, which appears to be High. According to Trithart (1977), it can occur with intransitive verbs, including inherent reflexives (32), which are usually unergative (Takehisa 2003).

(32) Kat' á-k-óóg-es'   ébyombo.
      Kato he-PST-clean-INST soap
      'Kato washed (himself) with soap.'   *Trithart 1977:78*

The instrumental APPL can also combine with transitive verb phrases (33a). As in Kinyarwanda, instrumental APPLs are symmetrical: in the passive, either the instrument (33b) or the theme (33c) can raise to subject position, even when the external argument is syntactically expressed.

(33) a. Kat' á-ka-tééz'   ómwáán' ékíti.
         Kato he-PST-hit.INST child   wood
         'Kato hit the child with a piece of wood.'   *DB:61*

     b. Ekíti$_i$ kí-ka-tééz-i-bw-a   kat' ómwáana t$_i$.
         wood   it-PST-hit-INST-PASS-FV Kato child
         'The piece of wood was used by Kato to hit the child'   *DB:67*

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[11] I have omitted the phrase *n'úúwáalímu* 'by the teacher' from these examples.

[12] Many thanks to Teal Bissell Doggett for bringing these facts to my attention.

    c.   Omwáán'$_i$ a-ka-tééz-i-bw-a   kat' t$_i$ ékíti.
               child   he-PST-hit-INST-PASS-FV Kato   wood
               'The child was hit with a piece of wood by Kato.'   *DB p61*

       Word order in (33a) suggests that the theme c-commands the instrumental argument, as in Kinyarwanda. This conclusion is supported by the observation that when the instrumental APPL combines with a Low dative APPL (34), the dative appears to c-command the instrumental.

(34) Kat' á-ka-siig-is'   ómwáán' ámajút' ékitambâla.
      Kato he-PST-smear-INST child   oil   handkerchief
      'Kato smeared oil on the child with the handkerchief.'   *DB:63*

Again, the word order in (34) suggests that the dative is the highest argument. Stronger evidence comes from locality effects. In a passive, the dative argument can raise to subject position even if the external argument is syntactically expressed (35a). As usual in a dative APPL, the theme can raise to subject only if the external argument is not syntactically expressed (35b). Intriguingly, the same is true of the instrument (35c).

(35) a.   Omwáán'$_i$ a-ka-siig-is-i-bw-a^{13} kat' t$_i$ ámajút' ékitambâla.
               child   he-PST-smear-INST-PASS-FV Kato oil   hanky
               'The child was smeared with oil with the handkerchief by Kato.'
                                                  DB:63

      b.   Amajúta$_i$ gá-ka-siig-is-i-bw-a   (*kat') ómwáán' t$_i$ ékitambâla.
               oil   it-PST-smear-INST-PASS-FV Kato child   hanky
               'The oil was smeared on the child with the handkerchief (*by
               Kato).'   *DB:63*

      c.   Ekitambála$_i$ kí-ka-siig-is-i-bw-a   (*kat') ómwáán' ámajûta t$_i$.
               hanky   it-PST-smear-INST-PASS-FV Kato child   oil
               'The handkerchief was used to smear oil on the child (*by Kato).'
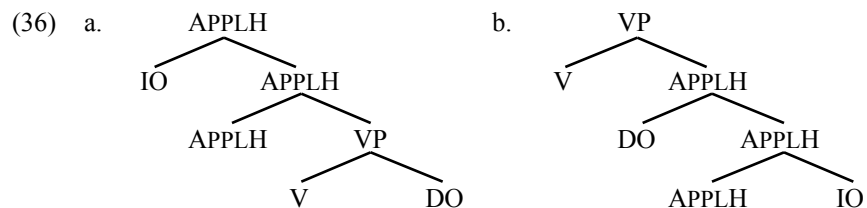   *DB:63*

The contrast between (35a) and (35c) suggests that the High instrumental APPL merges below the Low dative APPL.
       In both Haya and Kinyarwanda, then, there is evidence that a High APPL merges low, even though it selects an event argument. The apparent contradiction can be resolved if constituents can merge downward. Suppose that once the VP is completed, a High APPL can merge either above it (36a) or below it (36b). The Merge operation will establish a thematic relationship between the High APPL and VP in both cases. A High applied argument will c-command a Low applied argument and the theme if merged upwards, and will
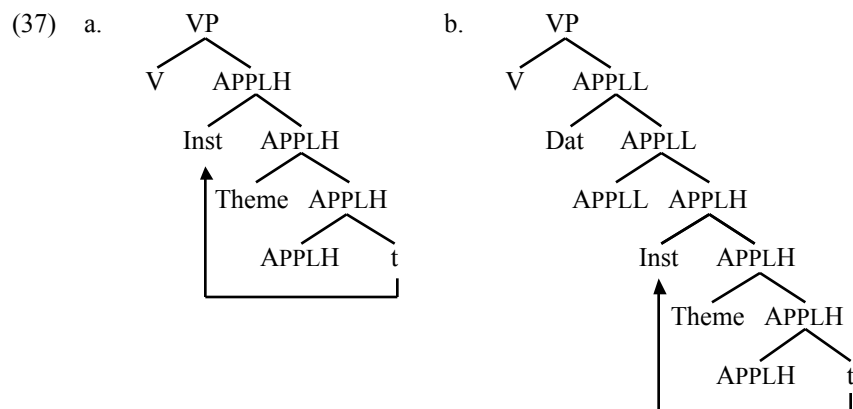
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[13] Trithart (1977) argues that the instrumental APPL involves two morphemes, *-s* (*-is*) and *-i*. The *-i* is generally not seen in surface forms, but conditions the insertion of the *-bw* allomorph of the passive suffix, which occurs only post-vocalically.

be c-commanded by a Low applied argument and the theme if merged downwards.

(36) a.
```
              APPLH
             /     \
           IO      APPLH
                  /     \
              APPLH      VP
                        /   \
                       V     DO
```
b.
```
              VP
             /   \
            V     APPLH
                 /     \
               DO      APPLH
                      /     \
                  APPLH      IO
```

Note that instrumental APPLs in both languages are symmetrical, even when they merge downwards. This suggests, intriguingly, that the EPP feature on the instrumental APPL head can attract its own complement into its specifier, as shown in (37a) for an APPLP merged below VP, and in (37b) for an APPLP merged below a Low dative APPL.

(37) a.
```
              VP
             /   \
            V     APPLH
                 /     \
              Inst     APPLH
                      /     \
                  Theme     APPLH
                           /     \
                       APPLH       t
```
b.
```
              VP
             /   \
            V     APPLL
                 /     \
              Dat      APPLL
                      /     \
                 APPLL       APPLH
                            /     \
                        Inst       APPLH
                                  /     \
                              Theme      APPLH
                                        /     \
                                    APPLH       t
```

Kinyarwanda and Haya applicatives provide evidence that UTAH is a constraint on Merge, not on representations. If a High APPL merges downward, as in (36b), the thematic relationship between the High APPL head and VP is not expressed by a sisterhood relation. After the APPL head merges, the thematic relationship between V and the theme is also no longer expressed by a sisterhood relation, since the theme is reanalyzed as a specifier of APPLH. Thus, there is no transparent mapping from representations to thematic relationships. On the other hand, if UTAH is a property of Merge, then each thematic relationship is determined at the particular point in the derivation when the two items in question merge. Under this view, UTAH determines thematic relationships even when two elements do not merge as sisters (downward Merge), or when their sisterhood relation is destroyed by a subsequent application of Merge.

The argument for downward Merge sketched here is somewhat preliminary, and many properties of Bantu applicatives remain elusive. Nevertheless, there is convincing evidence of a conflict between selectional requirements and structural positions. The downward Merge analysis constitutes

a promising step towards resolving these conflicts. This analysis provides support for the Minimalist program of reformulating conditions on representations, such as UTAH, as conditions on operations. If successful, this program will illuminate the ways in which resource limitations shape and constrain the language faculty.

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