Distinguishing referential from grammatical function in morphological typology

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0. Introduction. This paper argues that the contrast between derivation and inflection, which continues to inform most typological approaches to word formation, is useful for describing only a few of the most basic cross-linguistic differences in morphology. In the discussion that follows, I first review the concepts "analytic, synthetic, and polysynthetic" as they are traditionally applied to entire languages, pointing out gaps and inconsistencies in this system of classification. Next I propose replacing (or at least augmenting) the morphology-specific categories of derivation and inflection with a system of functions based on a combination of two well-accepted linguistic contrasts that apply beyond morphology as well. The first involves the distinction between the three types of linguistic expression: referential (denotative, or real-world semantic) meaning, on the one hand, and two grammatical subsystems, on the other: discourse functions and phrase structure rules. The second contrast is the structural difference between head and modifier, which has been applied semantically and in phrase structure, but here is also applied to the discourse layer of language. The resultant model – which I call 'Holistic Grammar' – permits a more fine-grained approach to morphological typology, and also better integrates morphology with the syntactic and lexical components of language by avoiding primary dependence on notions unique to word formation. I then demonstrate how Holistic Grammar is useful for comparing languages with rich affixal morphologies, the so-called polysynthetic languages, and propose a new way to compare verb agreement strategies across languages. Finally, I apply this scheme to the verb morphology of Ket, an endangered isolate spoken in Central Siberia that has hitherto defied typological characterization, to compare Ket subject/object agreement with that of better-known polypersonal languages.

1. Some gaps and inconsistencies in the traditional system. Linguists became keenly interested in typology long before they developed sophisticated theories of morphology. Ever since the days of Wilhelm von Humboldt, morphologists have categorized languages into isolating, analytic, synthetic and polysynthetic types. Subsequent advances in linguistic theory, including those offered by Edward Sapir (1921), have contributed surprisingly little toward

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1 The discourse component of the proposed model includes all functions that mechanically align the message to the speech act or its participants. In other words, it subsumes speech style marking and functional sentence perspective, as well as deictic grammatical features such as person, tense, mood, evidentiality, and spatial viewpoint. The phrasal component subsumes grammatical features that are not speech-act dependent, such as agreement. The referential component includes all aspects of semantic content not tied mechanically to the speech act.

2 However, Sapir's typology was particularly innovative in treating multiple exponence as a key morphological feature, an idea I develop further in the scheme presented below.
providing a more rigorous application of these traditional categorizations. In section 2, I will argue that this impasse developed because the functional dichotomy between derivation and inflection which informs this system is too imprecise to be of real value in understanding many key differences across languages in how lexemes or their grammatical forms are constructed. Even the few generalizations that can be elucidated by using these notions as morphological primitives – for instance the seeming continuum "isolating-analytical-synthetic-polysynthetic" – prove upon closer inspection to contain notable gaps and inconsistencies. To give the traditional typology its due, inflection is useful from both a descriptive and explanatory viewpoint in that languages with little or no word-internal morphosyntax (analytic languages) tend to use word order to express phrasal head/modifier relationships, while synthetic languages are free to use word order for pragmatic purposes. Also, languages weak in both derivation and inflection (isolating languages) tend to be correspondingly richer in productive patterns of conversion or root compounding. But the traditional typology is incomplete even by its own internal measure in lacking a designation for a language that is rich in inflection but poor in derivation. I propose the term 'conglomerating' for such languages, which rounds out the old derivation/inflection-based morphology as follows:

(1) A basic morphological typology using derivation and inflection as functional primitives
   ISOLATING – poor in both derivational and inflection affixes (Chinese)
   ANALYTIC – rich in derivation, poor in inflection (English)
   CONGLOMERATING – poor in derivational affixes but rich in inflection (Ket)
   SYNTHETIC – rich in both derivation and inflection (Latin, Russian)

As indicated in Table 1, one example of a conglomerating language is Ket, an isolate spoken by about 300 people near the Yenisei River in Central Siberia. I will return to Ket morphology in section 4.

What, then, is a polysynthetic language? On the face of it, this term would appear to be available to describe any particularly rich florescence of affixal morphology. However, there are two problems with how the word is actually used which limit its efficacy. First, a language is normally called "polysynthetic" only if it is richly synthetic in a way that differs fundamentally from the type of synthesis found in Indo-European languages. As is known, most Indo-European languages use suffixes to express grammatical categories, with a propensity for multiple exponence in a single suffix. Observe, for instance, the following Lithuanian words:

(2) Lithuanian nouns
    rank-a
    hand-INSTR.SG
    'with the hand'

    rank-omis
    hand-INSTR.PL
    'with the hands'

Lithuanian verbs (Ambrazas 1997)

    dirb-si-me
    work-FUT-1P.PL
    'we will work'

    dirb-davo-me
    work-PAST.FREQ-1P.PL
    'we had been working'
Lithuanian nouns allow only one desinence, which normally expresses two distinct functions (case and number); verbs sometimes allow two desinences, but one of these likewise shows multiple exponence (person + number agreement). Now consider some examples from Hungarian (3) and Qazaq (4) – two richly synthetic languages that, perhaps unfairly, are not generally regarded as polysynthetic:

(3) Hungarian noun suffixation (Törkenczy 1997:62)
kez-ek-vel 'with hands'
hand-PLURAL-INSTRUMENTAL.CASE

kalap-jai-m-é-i-t 'the ones that belong to my hats (used as a direct object)'
hat-PLURAL-1SG.POSSESSOR-EXTERNAL.POSSSESSUM-PLURAL-ACCUSATIVE

(4) Qazaq (Turkic) verb suffixation (Kozhakhmetova 1989)
žas-ba-baq-siñ-dar 'you all will not write'
write-NEGATIVE-FUTURE-2SJ-PLURAL

Hungarian and Qazaq are clearly richer in grammatical categories than even the most synthetic of Indo-European languages. Yet they tend to express many of the same morphosyntactic categories. In fact, Hungarian and Turkic affixal grammar differs from Indo-European mainly in the general absence of multiple exponence. Linguists usually avoid calling Turkic and Uralic languages 'polysynthetic', apparently because their type of synthesis – aside from the lack of multiple exponence and a concomitant penchant for agglutination – is little more than an elaboration of the same type of synthesis common to Indo-European.

Bantu and Athabaskan languages, by contrast, are considered polysynthetic, at least by virtue of their complicated verb morphologies. Functionally, verb forms in these families differ most obviously from Indo-European in that they cross-reference the object as well as the subject. Even more striking, however, is the fact that they intersperse their grammatical morphemes among the verb's referential morphemes, rather than keeping them together in a single, segregated morphosyntactic zone:

(5) Navajo (Faltz 1998:324)
ch’í-ná-náá-nish-d-zid 'I woke up again'
out-revert-again-PAST.1SG.SJ-INTRANSITIVE-wake

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3 Languages with polypersonal verbs (i.e., verbs that internally cross-reference one or more syntactic terms or semantic roles in addition to the subject or agent) are normally regarded as polysynthetic on this basis alone.
The verb in these languages differs radically from the other parts of speech, which do tend to have discrete, word-like stems onto which grammatical affixes are concatenated. Rather than a word-like form, a verb stem in Swahili or Navajo involves a positional formula that often contains grammatical affixes interspersed between two or more disjunct referential morphemes. This formula, as well as the disjunct positioning of the referential morphemes, is probably residue left from a time when at least some of the verb's referential components were expressed as separate words sporting their own grammatical affixes. Ultimately, the verb stem itself inherited this phrase-like morpheme formula when the process of univerbation stranded referential morphemes among their own grammatical affixes. This sort of lexicalized position class is entirely lacking in concatenative languages such as Turkic or Hungarian, whose stems resemble Indo-European. Not surprisingly, languages that use such formulaic stems in at least one part of speech (most commonly the verb) are typically regarded as polysynthetic.

"Indo-Eurocentrism" is by far the lesser of the two problems affecting the typological label 'polysynthetic', however. More serious is the fact that richly synthetic languages that do get labeled 'polysynthetic' differ among themselves in ways that elude clear characterization in any typological scheme using derivation and inflection as descriptive primitives.

For example, Eskimoan and Wakashan languages are routinely (and, by any measure, justifiably) regarded as polysynthetic, yet both differ radically from Bantu and Athabaskan. These families are characterized by concatenations of suffixes expressing a rich array of referential functions. Neither contains anything resembling the position-class based stems of Athabaskan or Bantu. Instead, polysynthesis in Eskimoan and Wakashan involves long agglutinations of affixes expressing meanings that tends to coincide with free content words in other languages:

(7) Central Siberian Yupik polysynthesis (de Reuse 1992:164)
\textit{vughagh-vig-ghllag-nge-yug-tugh-t} \quad 'they want to acquire a big church'
\textit{pray-place to do (preceding verb)-big (preceding noun)-acquire (preceding noun)-want.to (do preceding verb)-INDICATIVE-3PL.SJ}

(8) Nootka polysynthesis (Sapir 1921:133-4)
\textit{inikw-ihl'-minih-'is-ita-a} \quad 'several small fires were burning in the house'
\textit{fire-in.house-several-small-former-VERB}

Some Eskimoan affixes can even be mildly recursive (de Reuse 1992), another morphological feature that is wholly alien to the Bantu/Athabaskan type of polysynthesis.
Observe that a key difference exists between the otherwise similar Yupik (Eskimoan) and Nootka (Wakashan) types of polysynthesis illustrated by examples (7) and (8) – a difference that cannot be captured by the traditional derivation/inflection dichotomy. Each of the Yupik base suffixes specifies a particular form class category (noun-creating or verb-creating) together with its specific referential content. For instance, the suffix -vig- not only conveys the semantic-head notion of 'place,' it also converts a verb base into a noun meaning 'place to do the event specified by the preceding stem'. This fusion of real-world referential content with form-class specification is typical of base affixes in all Eskimoan languages. In Nootka, by contrast, form class is specified by a separate suffix that is otherwise functionally vacant, while the semantically rich affixes preceding it are intrinsically neither verbal nor nominal. A hallmark of Wakashan polysynthesis, in contrast to Eskimoan, is the form-class neutral status of most referential affixes.

These and other key typological differences cannot receive an adequate assessment using the traditional morphological notion of derivation – a category that conflates form-class creation together with referential aspects of the stem. The following sections argue that derivation and inflection are in fact epiphenomena of two more basic, non-morphology specific features of language. These features do permit typological differences such as those evident among Eskimoan, Wakashan, and other richly synthetic languages to be described clearly and elegantly.

2. The problem with derivation and inflection, and a new system of typological primitives.
Functionalist studies of morphology (for example, Bybee 1985) accurately point out that derivation and inflection represent a continuum rather than a discrete functional dichotomy. But this truth has never been squared with the sharp dichotomy that does exist between syntactic patterns (defined as rules capable of expressing meaning when combined with lexemes but lacking intrinsic referential meaning of their own) and content words (minimal free forms with their own referential meanings). It is common to regard derivational affixes as helping to form new lexemes and thus approximating content words in function, while inflections approximate function words or syntactic rules. If inflection is the syntactic portion of morphology, and derivation the referential portion (ignoring for the moment the issue of form-class marking discussed above), then why is the distinction between them so fuzzy? Why does it fail to reflect the sharp difference between phrase structure and referential meaning prevalent in the syntactic component of language? To elaborate upon a well-known Chomskyan metaphor, why do "colorless green ideas" behave one way in syntax, but quite another in the morphology as it is conceived of in terms of a contrast between "lexical derivation" and "syntactic inflection"?

A solution to this conundrum accrues from two observations. One problem, already discussed above, is that the notion of lexeme creation, or derivation, confounds two profoundly different linguistic functions. The first is the expression of referential meaning; the second is form-class (part-of-speech) marking, which clearly belongs to the grammatical rather than referential layer of language even though it is routinely subsumed under "lexical derivation." For
example, the English words: dark (adjective) vs. darkness, and darken vs. darkening (noun) are synonymous referentially, but differ sharply in form class. Recall that in Nootka, referential expression and form-class marking are kept morphologically discrete, while in Yupik, as in English and many other languages, they are often fused in a single affix. Subsuming both functions together under "derivation" obscures this typological distinction.

The second observation that sheds light on the inadequacy of the traditional system is that it never takes into account the structural difference between head and modifier. This distinction can be applied to each of three long-recognized functional layers of linguistic expression to establish a new system of typological primitives. These three functions are: 1) referential (denotative meaning, or semantic content that exists independent of the speech act itself), 2) discourse (connotative, stylistic, pragmatic, or any grammatical feature that mechanically references the speech situation or its participants), and 3) phrasal (grammatical features unrelated to the speech situation itself). Note that the application of the head/modifier distinction to the discourse layer of language is innovative in this analysis.

A typology that replaces the fuzzy notions of derivation and inflection with the clear-cut dichotomies between referential, discourse, and phrasal function – subdivided into their possible head vs. modifier roles – yields the scheme shown in (9). It is important to note that the resultant categories represent abstract functions rather than morphemes or other concrete units of linguistic expression. A given lexeme, morphological operation, or syntactic pattern may express only one of these categories; or it may express two or more of them simultaneously:

(9) The Holistic Grammar Model

<table>
<thead>
<tr>
<th>lexicon (L)</th>
<th>morphology (M)</th>
<th>syntax (S)</th>
</tr>
</thead>
<tbody>
<tr>
<td>head-creating (h)</td>
<td>head-modifying (m)</td>
<td></td>
</tr>
<tr>
<td>Referential</td>
<td>content words, idiomatic phrases</td>
<td>Mdh discourse creation^5</td>
</tr>
<tr>
<td>Function (r)</td>
<td>modifying function words</td>
<td>Mdh discourse creation^5</td>
</tr>
<tr>
<td>Discourse</td>
<td>Ld exclamations</td>
<td>Mdh discourse creation^5</td>
</tr>
<tr>
<td>Function (d)</td>
<td>shifter words, discourse particles</td>
<td>Mdh discourse creation^5</td>
</tr>
<tr>
<td></td>
<td>(deixis, style, pragmatics)</td>
<td>Mdh discourse creation^5</td>
</tr>
<tr>
<td></td>
<td>sentential adverbs</td>
<td>Mdh discourse creation^5</td>
</tr>
</tbody>
</table>

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4 In the scheme proposed, combinations involving two or more roots are either free syntactic phrases (created by the phrase structure rules, an Sp function) or new lexemes (idiomatic phrasal compounds, an Mrh function).
5 Stylistic (connotative) differences in meaning are regarded as head properties in the discourse layer of the model. Just as every word capable of expressing phrase-related functions must belong to a particular form class and every content word must express a basic referent, every morpholexical process must belong to a particular stylistic subsystem of the language (be it the so-called "neutral style" or some more narrowly defined discourse sphere).
This model of language is "holistic" in the sense that it employs a unified set of functional parameters to describe morphological operations and their relation both to lexemes as well as to syntactic rules. Yet morphology remains a distinct component in Holistic Grammar that cannot be reduced to the mere interaction of lexicon and syntax. The (partial) autonomy of morphology accrues from the process-oriented association between item and arrangement in morphological operations. Both syntactic rules and morphological operations represent processes; but the patterns of phrase structure have no meaning apart from the lexemes or morphological categories that provide their input. A morphological operation, on the other hand, is intrinsically bound up with a specific meaning (either denotative, connotative or phrasal), even when it involves no unit of form apart from the process of change being applied to its base input. One example of a morpheme-less morphological operation would be the rule of subtraction that formally differentiates masculine and feminine adjectives in French by deleting the word-final consonant of the former. Another would be reduplication, which produces a meaningful change in the base via a rule that adds no independently existing morpheme form as part of the process. Morphology might best be defined as the set of all processes in language that are limited to a particular meaning or set of meanings. Syntactic rules, on the other hand, help express meaning yet any lack any specific semantic content of their own. And phonological rules neither have meaning nor create meaning (apart from contributing to stylistic contrast), yet still form part of the functional system of language. Finally, the lexicon deals with meaningful units apart from the processes that create them.

As shown in (9), Holistic Grammar makes the claim that six distinct functions are fundamental to all morphological expression: 1) referent creation (abbreviated Mrh), 2) referent modification (Mrm), 3) discourse creation, or style marking (Mdh); 4) discourse (deictic) modification (Mdm); 5) form-class creation (Mph); and 6) phrasal modification (Mpm). All

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6 Word-order patterns are bound up with specific meanings only insofar as lexemes subcategorize for specific phrasal orderings, examples being the relative order of adjective vs. noun in Romance languages. Subcategorization rules (Sr in the scheme above) could be defined as lexeme-specific constraints on phrase structure patterns.

7 This scheme can accommodate both morpheme-based and word-based approaches to morphology, depending on what is viewed as the output and what as the input. A word-based approach takes two or more lexemes as the input and compares them to produce an output in the form of some characterization of morphological similarity/dissimilarity). A morpheme-based approach takes a base or stem as the input and subjects it to some operation (perhaps involving a discrete morpheme such as an affix, perhaps not) to produce an output (a complete word-form). Also, in a morpheme-based approach the six functions of Holistic Morphology can in theory serve as either a trigger or a constraint on the application of a morphological operation.
morphological processes (affixation, compounding, etc.) fulfill at least one of these functions by definition, and may express two or more of them simultaneously. Which among these six functions tend to get expressed through multiple exponence by a single morpheme or morphological operation is in itself an important typological parameter. Languages can thus be categorized both in terms of: 1) which functions tend to be expressed affixally (or by compounding, transfixation, subtraction, or another formal type of morphological operation), as well as in terms of 2) which functions share a fused morphological expression. Finally, some morphological patterns follow universal tendencies; others are more language-specific; and still others are linked to one another by various types of structural implicature.

How do the traditional categories of derivation and inflection actually pair up with the six morphological functions of the new model? Holistic Grammar redefines most derivational affixes as expressing either referent creation (Mrh) or form class creation (Mph) or both. It redefines most inflectional affixes as expressing either phrasal modifying (Mpm) or discourse modifying (Mdm) function or both. Referential modifying (Mrm) and style creating (Mdhs) affixes are the least easily characterized in terms of derivation and inflection. Style creating features may attach to the lexeme, the phrase, the entire sentence, or be separate from lexical and phrasal systems altogether. Consequently, sometimes they seem inflectional, sometimes derivational. And sometimes they seem unlike either process (as, for example, in "un-friggin-believable").

The affixes that cause the most ambiguity for the old derivation/inflection split are those that express a referent modifying (Mrm) function. From the perspective of their intrinsic semantic content, these morphemes comprise a single, clear-cut functional category. But they differ with regard to the factor of their additional involvement in the grammar (defined here as the set of structural patterns that involve lexemes but extend beyond the individual lexeme). The morphemes used for deictic and phrasal modification are grammatical by definition, since their presence follows mechanically from the use of lexemes in specific discourse contexts or phrase structures. But referential categories such as number, gender, size, shape, animacy, intensity, and so forth, are real-world semantic features that need not, in and of themselves, play an extra-lexical role in the language system. Which referent modifying categories play an additional, grammatical role is an important typological parameter that depends on the language in question. Here, the notions of 'inflection' and 'derivation' are useful only up to a point. For example, the English plural suffix -s, like the category of noun plural in all languages, is referent modifying (Mrm), but it is also involved in subject/verb agreement; and its regularity and productivity make it especially "inflection-like." The Mandarin Chinese plural suffix -men plays no such role (in this way, it more resembles English referent modifying suffixes such as -let in 'cloudlet').

Plurality is expressed in formal fusion with grammatical categories such as case or agreement only in select families, such as Indo-European, whereas number and case are usually kept separate in families such as Turkic or Uralic. Diminutive and augmentative affixes in Indo-European languages do not interact with grammatical categories such as declension and gender.
In Bantu, however, these categories are bound up with grammatical agreement. Other richly synthetic languages implicate none of their referent modifying categories in their grammatical system. Nootka provides an excellent example in having an unusually large array of referent modifying morphemes (plurality, size, shape, and various spatial details, such as being located on an island, near a river, etc.). All of these semantic categories remain aloof from the language's non-referential layers of function, yet appear very "inflection-esque" in terms of their productivity and regularity. Finally, Russian verb aspects play an obvious grammatical (discourse-related) role, yet their morphological expression is not generally predictable from a formal point of view. It is therefore practically meaningless to assign the term "derivational" or "inflectional" to affixes such as those that mark aspect in Russian, since their "derivation-like" formal irregularity stands at odds with the "inflection-like" regularity of their grammatical functions. The six categories of Holistic Morphology offer the typologist a more precise descriptive apparatus to differentiate between the inherent meaning of referent modifying morphemes, on the one hand, and their involvement (or lack of involvement) in expressing various non-referential functions, on the other.

To give a very preliminary example of how Holistic Grammar can be mustered to characterize a single language's overall morphological type, let us take a cursory look at affixation in English:

(10) A holistic description of English morphology with emphasis on affixation

**Mrh. Referent creation** is defined as the expression of basic denotative, real-world meaning, regardless of the mechanics of the speech situation, and separated from metagrammatical categories such as form class. In English, this basic, content-word function is frequently expressed by a bare root or idiomatic root compound. However, referent creating (Mrh) affixes are also fairly well represented and tend to be Stratum I affixes (in other words, they are integrated with their base in a single phonological word): *alcohol-ic, in-just-ice, re-ceive, com-pare, de-fy, in-ept*, etc. (Prosodic features often serve to help distinguish morphological functions, but they need not be completely isomorphous with any particular function.) Like Eskimoan, English is rather rich in Mrh affixes that simultaneously mark form class (Mph function): *damn-ation, teach-er, green-ness, work-able*, etc. Referent creating affixes in English tend not to agglutinate unless they also alter the stem's form class: *act-iv(e)-ity*.

**Mrm. Referent modification** is defined as the explication of some aspect of denotative meaning intrinsically associated with the basic referent (inalienable or inherent notions such as size, shape, plurality, intensity, repetition), without the creation of any idiomatic or metaphorical meaning (affixes that create such meanings belong to the previous category, Mrh, since they express new referents). Referent modification in English is often achieved simply by adding lexical modifiers during phrase creation rather than by a morphological operation. Referent
modifying (Mrm) prefixes in English usually belong to Stratum II (in other words, the do not form a single phonological word with their base): re-write, de-louse, co-author, non-compliance. Some Mrm affixes are mildly recursive: re-re-write, anti-anti-war, great-great-grandmother. This type of morphological recursion (where the same affixal form is repeated without intervening morphemes) appears to be unique to this functional category across languages, though most Mrm affixes are not recursive. English Mrm suffixes belong to Stratum I: poet-ess, green-ish, cloud-let, gos-ling. English is somewhat poorer in the affixal expression of referent modifying categories, and affixes expressing them tend not to agglutinate (unlike Nootka) except in the cases of prefixal recursion mentioned above, though plural suffixes may follow another Mrm suffix: tigr-ess-es, cloud-let-s. (The traditional category of 'inflection' is useful when applied to English plural suffixes, about which more below.)

**Mdh. Style creation** is a head-creating rather than a modifying aspect of the discourse layer of morphology, since it marks the basic sociolinguistic type of speech situation by specifying the identity, gender, or status of one or more participants in some way or another. Style creation subsumes all connotative meaning as well as other stylistic features of the morphology. English has few purely style-marking affixes, though certain morphological processes such as clippings and partial reduplications of the type helter-skelter, wishy-washy tend to express Mdh function by their very nature. Ideophonic affixes in other languages likewise belong here. So do hypochoristic affixes such as the somewhat old-fashioned -kins in Bobbykins, in contrast to true diminutive suffixes such as -ette in kitchenette, which fulfill a referent modifying (Mrm) function. The mildly productive suffix -let is functionally more diverse. In cloudlet this suffix is Mrm (a cloud specified as being referentially small) and Mdh (poetic style marking), whereas in eyelet it expresses Mrm together with Mrh functions (but lacks any special stylistic, or Mdh, function), since it helps create the basic referent: e.g., eyelet means "a small snap" rather than "a small eye". The propensity for various types of multiple exponence in the suffix -let may explain its weak productivity, since several specific factors must all be fulfilled simultaneously for any one of its lexical sub-patterns to apply. As might be expected, multiple exponence involving two or more Holistic functions seems in general to constrain a morpheme's productivity.

**Mdm. Discourse modification (deixis)** is defined as any function that mechanically (rather than referentially) signals the particular details inherent to the speech situation, minus the stylistic marking of the speech act or its participants (Mdh). Mdm functions include all of the traditional deictic categories, such as tense (work-ed), as well as person marking or viewpoint specification. The English verb agreement suffix -s (he work-s) fulfills two deictic functions (tense and person), as well as one phrasal modifying function (Mpm) – subject/verb agreement. Comparative and superlative suffixes also belong here: old-er, old-est because they express a modification of one part of the message in relation to another part. Recall that deictic affixes are normally regarded as inflections in the old typology.
**Mph. Form class creation** is defined as the form-class status (i.e., part of speech) of the word itself, minus the word's referential meaning. Unless they also express a new referent (Mrh function), form-class marking affixes in English tend to be Stratum II suffixes and are always added outside of affixes that express Mrh or Mrm functions: *quick-ly, think-ing* (deverbal noun). Such pure Mph affixes behave in a very "inflection-like" way, but could never be called inflections since form-class specification is supposed to be a "derivational" feature. Mph affixes can agglutinate in English, with each new affix canceling the previous one out: *anti-dis-establish-ment-ari-an-ism*. Recall also that many affixes in English simultaneously fulfill both Mrh and Mph functions. English is moderately rich in Mph affixes, though conversion is also a common means of form class change. This functional component also subsumes participial and gerundive affixes, such as English *-ing* ⁸, (as well as infinitival affixes in languages that contain them)

**Mpm. Phrasal modification** is defined as any function relevant to the phrasal syntax other than form-class specification itself. Mpm affixes include phrase-dependent features of morphology such as agreement, case, and subordination. This is by far the poorest affixal category in English, which is why English is considered an analytic language. Only a few Mpm suffixes have survived from the language's more synthetic Indo-European heritage and they never agglutinate. They also occur in morphological word-final position: *who-m*, he *see-s*. The possessive *'-s* in *John's* or *students'* has even become a phrasal enclitic (e.g., the *student who dropped by your office's book is here*).

Other analytic or synthetic languages could be analyzed in similar fashion to reveal interesting features that cannot be described so clearly based on the old derivation/inflection dichotomy. Section 3 will illustrate how the six functional categories of Holistic Morphology can help define the differences between various types of polysynthetic languages. Section 4 will show how this new system provides a natural cross-linguistic typology for verb-internal subject-object agreement.

### 3. Polysynthesis revisited

Languages with rich morphologies differ even more strongly among themselves in how their affixes express the six morphological functions discussed above. Some of these differences have already been touched upon. Turkic and Uralic (cf. examples 3 and 4 above) tend to express phrasal and discourse modifications (Mpm and Mdm) separately from referent modifications such as plurality (Mrm) as well as from form-class marking (Mph).

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⁸ English gerunds and participles formed with the Mph suffix *-ing* do not concatenate with verb-modifying (Mpm, Mdm) affixes: thus, *(his) working* would be the gerundive formation from either *he works* and *he worked* (rather than *work-ings* or *work-eding*). Languages differ typologically in the degree to which they tolerate the retention of grammatical affixes during a change in form class (Mph). In Ket, for example, finite verb converted into attributive adjectives or temporal adverbs do retain their agreement and tense/mood affixes (cf. Vajda, in press).
Wakashan languages (ex. 8) are extremely rich in affixes of referent modification (Mrm), and these affixes play no role in form-class marking (Mph). Eskimoan (ex. 7) is rich in affixes that simultaneously create a new referential head (Mrh) as well as specify the form class (Mph). Bantu languages (ex. 6) mix referent-modifying (Mrm) functions such as animate/inanimate with the phrase-modifying (Mpm) feature of noun-class agreement. The complex array of postpositions and semantically vivid spatial case suffixes in languages like Hungarian also fall within the function of referent modification (Mrm). In languages such as Navajo (ex. 5), where verbs display complex interdigitations of grammatical (Mpm or Mdm) and referential (Mrh or Mrm) morphemes, the positional selection of the grammatical morphemes itself fulfills a special form-class defining (Mpm) function, since the feature of position-class distinguishes verb stems from stems belonging to other parts of speech. The same will prove true of Ket verb stems (cf. section 4 below). In languages where all referential stems are concatenative, the juxtaposition of grammatical affixes in relation to referential morphemes fulfills a purely phrasal- or discourse-modifying function and has no role in distinguishing one form class from another. The use of position class as a morphological head-creating category (i.e., a form-class defining category) does not even enter into the old typology, which is based on morpheme form alone. For this reason, notions such as derivation and inflection are of little value in explaining one of the key traits of languages with non-concatenative morphological stems.

Holistic morphology, in particular, offers a better way to compare differing strategies of subject/object agreement in polysynthetic (as well as less richly synthetic) languages. As is known, languages with morphological noun/verb agreement can differ in several ways, in addition to the basic fact of whether agreement is expressed on the subject/object NPs, verb-internally, or both. The basic semantic and syntactic traits of verb agreement cross-linguistically have been surveyed in Dixon (1999). A language's overall agreement strategy can be accusative (sometimes called 'nominative'), where all subjects trigger the same marking. Or it can be ergative (sometimes called 'absolutive'), where any intransitive subject triggers the same marking as the direct object of a transitive verb. The final possibility is found in the so called active/agentive or active/inactive systems surveyed by Mithun (1991). These are of two types. Most active/agentive languages are split-S, whereby some intransitive verbs always cross-reference their subjects as active participants, and others always cross-reference their subjects as inactive participants (usually with the same marking as is triggered by an object patient); Lakhota (discussed in Mithun 1991) provides a clear example of such a language, where active vs. inactive subject agreement is lexically conditioned for each verb. A few active/inactive are fluid-S, where at least some intransitive verbs allow either active or inactive cross-referencing of the subject depending on the real-life situation being referenced; Tsova-Tush (Holisky 1987), a North Caucasian language related to Chechen, is an example of this rare type. Next, a language may use more than one of these agreement strategies based on the expression of some discourse-related function, such as using accusative marking for present and future tenses but ergative or split-S in past-tense verb forms; Georgian (Harris 1981) provides a classic example of such a
language. Third, subject and object markers might be concatenated onto a discrete morphological stem, as in most familiar languages of Europe and Asia, so that finite verb stems do not differ radically from stems of other parts of speech; or they may be interdigitated between the referential morphemes, so that the finite verb as a part of speech involves a morpheme position formula that radically distinguishes it from nouns and other parts of speech (this occurs in Athabaskan and Bantu, for example). Finally, it is possible that a language could vary its agreement strategy for purposes other than grammatical agreement (i.e., Mpm or Mdm function), per se. For example, different speech styles could require different agreement strategies; this would constitute a stylistic, or Mdh, split in agreement. Or, even more unexpected, a verb's individual agreement strategy could represent an idiosyncrasy not dictated by any overarching discourse or phrase-related considerations at all; in other words, the choice of agreement strategy could serve as a basic component of referential expression (an Mrh feature). The next section examines the only documented case of a language (Ket) that uses verb-internal actant agreement in this way.

The chart below illustrates how all of these differences in subject/verb agreement strategies can be described in terms of the Holistic Model:

(11) A Holistic comparison of possible functions expressed by actant agreement

<table>
<thead>
<tr>
<th>Referential function</th>
<th>Head-creating function</th>
<th>Head-modifying function</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mrh</td>
<td>Choice of actant marking strategy depends idiosyncratically upon the stem's basic referential meaning (documented for Ket)</td>
<td>Actant marking is split more or less predictably based on the semantic roles of event participants (in any language with active/agentive marking; examples include Lakhota, Tsova-Tush)</td>
</tr>
<tr>
<td>Mdh</td>
<td>Actant marking is split based on speech style (reported for at least one Tibeto-Burman language)</td>
<td>Actant marking strategy is split to reflect tense, mood, person, or functional sentence perspective. Different person markers (or person-marking strategies or positions) also belong to this function. (documented in Georgian and some other languages)</td>
</tr>
<tr>
<td>Mph</td>
<td>Actant position selection in any language with non-concatenative finite verb stems (where it helps distinguish finite verbs</td>
<td>Actant position selection in any language with concatenative verb forms (no form-class split in stem type). Transitivity-based actant marking</td>
</tr>
</tbody>
</table>

9 In languages such as Georgian, where case markers also help coordinate the subject and object with the verb, the tense- or mood-based grammatical split in agreement strategy means that the case markers likewise fulfill both phrasal (Mpm) as well as discourse (Mdm) functions, since the type of agreement strategy used on the nouns helps signal tense or mood as well as noun/verb agreement on the phrasal level.
Note that the model in (11) categorizes the possible functional roles played by verb agreement in the language overall. All languages with verb-internal agreement markers use them in verb-phrase creation; in other words, verb agreement is a phrase-modifying (Mpm) feature of every language that contains it. But languages with verb agreement differ in terms of what additional features their agreement system expresses. Language such as Indo-European, Turkic, and many others, use verb agreement for no other function other than to link the subject with its verb as part of a finite verb phrase. In other languages, verb agreement is involved in expressing other types of linguistic function, as well. For example, it appears that at least one Himalayic language\(^\text{10}\) additionally uses the choice of agreement as a stylistic marker (an Mdh function). Georgian (1981) requires different agreement strategies for different tense and mood forms, so that the choice of agreement strategy expresses a discourse modification (Mdm) function. And in languages that use an active/agentive agreement strategy, agreement plays a role both in phrasal modification and referent modification (Mrm). Finally, in languages with so-called templatic verb stems (Bantu, Athabaskan, for example), the morpheme positions involved in verb agreement help distinguish the verb from other form classes in the language, so that agreement additionally plays a role in form-class creation (Mph).

Perhaps the most striking detail in (11) is the assertion that there exists a language that uses agreement morpheme positions as a part of its system of basic referent creation (Mrh), in addition to several of the other purposes discussed so far. Only one such language has been documented. This language is Ket, an isolate spoken by a few hundred people in central Siberia. Section 4 examines Ket morphological typology in greater detail. It turns out that the scheme of Holistic Morphology is extremely useful for comparing Ket morphology with that of other polypersonal languages.

4. Ket finite verb morphology. Most of this section is devoted to explaining the basic features of Ket actant (i.e., subject/object) agreement, which are discussed exhaustively in Vajda (2003) and Vajda (in press). First of all, Ket morphology is noteworthy for its overall paucity of referential affixes. New referential stems are created mostly through conversion or root compounding rather than affixation. Conversion is also the favored means of changing form class, though a handful of purely form-class changing affixes do exist (for example, the suffix -s, which nominalizes most other parts of speech: nánbê’t ‘to bake bread’ -> nánbê’ts ‘baker’; úgdê ‘long’ -> úgdê’s ‘length’, etc.). Because Ket is rich in grammatical (Mdm, Mpm) affixes, it would not be appropriate to call it ‘isolating.’ In section 1 above, I offered the term ‘conglomerating’ as

\(^{10}\) I am grateful to Claude Hagège for pointing this out to me. Unfortunately, I do not have a published source for the language in question.
a typological designation for a language that is rich in grammatical affixes (i.e., phrasal and/or discourse modifying) affixes yet poor in referential (i.e., Mrh or Mrm) affixes.

The most unusual feature of Ket morphology, however, appears in the language's polypersonal finite verb forms. A finite verb conveys the deictic categories (Mdm) of tense (preterite vs. non-preterite) and modality (indicative vs. imperative), as well as the phrasal category (Mpm) person/number/class agreement with the subject and direct object (which I have called "actant agreement"). The Ket verb's complexity derives mostly from how the process of referent creation (Mrh) interacts with the grammatical feature of subject/object (=actant) agreement. In what appears to be a morphological quality unique to Ket and its extinct Yeniseic relatives, the positions that express subject/object agreement are selected as part of the verb's lexical entry rather than by a general grammatical rule, even though the morphs that occupy them are chosen by regular agreement rules during verb phrase formation. This technique divides the verbal lexicon into five productive conjugations, alongside about a dozen moribund patterns. Vajda (2003) argued that Ket has no typological alignment grammatically speaking, since every stem chooses its agreement strategy idiosyncratically. The lexical entry of each Ket finite verb consists of, in addition to one or more purely referential morpheme shapes, a positional formula that predetermines the positional configuration of its agreement markers. Every permissible configuration must conform to the position-class formula given in (12). But which particular configuration will be used in any given stem cannot be predicted in the grammar based on syntactic functions, semantic roles, or any other stem feature. In other words, the actant marker configuration is itself an important feature of what allows each individual verb stem to convey its individual referential meaning. It thus contributes to referent creation (Mrh function) in the same way that declensional classes and more conventional types of conjugation classes do in many other languages. All Ket finite verb-stem formulas follow a model consisting of the following ten position classes:

(12) Universal position-class formula used for all Ket finite verb forms (P = position class)

<table>
<thead>
<tr>
<th>P8</th>
<th>P7</th>
<th>P6</th>
<th>P5</th>
<th>P4</th>
<th>P3</th>
<th>P2</th>
<th>P1</th>
<th>P0</th>
<th>P-1</th>
</tr>
</thead>
<tbody>
<tr>
<td>valence</td>
<td>incor-</td>
<td>valence</td>
<td>adposition</td>
<td>durative /a/</td>
<td>valence</td>
<td>past tense</td>
<td>valence</td>
<td>base</td>
<td>valence</td>
</tr>
<tr>
<td>porate</td>
<td>or</td>
<td>valence</td>
<td>or imperative</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Darkened captions indicate possible subject-object (=actant) agreement positions, which are chosen referentially and idiosyncratically yet filled with grammatically determined morpheme shapes. Italics mark the tense/mood slot; the other slots (P7, P5, P0) are completely referential.

Vajda (2001; in press) argues that the position-class model, or template, shown in (12) represents an amalgam of five lexically competing allo-templates, each of which licenses a productive subject-object marker configuration called an "actant conjugation." These conjugations – labeled Active, Possessive, Absolutive, Coreferential Absolutive, and
Coreferential Inactive – are shown in (13) below. Conjugation membership is lexically specified for each finite verb stem and can only be explained as deriving from (generally opaque) diachronic processes of stem creation, even though all five are grammatically equivalent in that each expresses subject/object agreement. In terms of its overall agreement system, modern Ket is neither accusative, nor ergative, nor active/stative (neither split-S nor fluid-S); nor is there any kind of grammatical or stylistic split in actant agreement. The use of actant agreement as a component of referent creation insures that Ket has no basic grammatical alignment typologically speaking.

The charts in (13) show how the various actant positions function in different conjugations. A hyphen marks slots never filled by any form belonging to the given conjugation; labels identify slots that may or may not be filled depending on the stem in question, though P0 is always filled. In Modern Ket, P7 is also filled in all productive stem patterns, making most finite verb stems discontinuous binomial constructs with their grammatical markers interdigitated between the purely referential morphemes. The relative positions of grammatical markers in the verb largely obey the scopal rules for morpheme ordering laid out in Rice (2000). However, the choice of actant conjugation, as well as the position of the grammatical affixes in relation to the purely referential portions of the verb (P7, P5, P0) cannot be predicted by any rules of universal syntax and therefore must be regarded as idiosyncratic features of individual stems). Table (13) illustrates these conjugations schematically as well as in terms of example verbs.

(13) Five lexico-grammatical sub-formulas (each stem specifies one as part of its lexical entry)

<table>
<thead>
<tr>
<th>Active Conjugation (a basic active/inactive marking strategy)</th>
</tr>
</thead>
<tbody>
<tr>
<td>P8</td>
</tr>
<tr>
<td>----</td>
</tr>
<tr>
<td>active incorporate - adposition durative marker 3neuter past tense 1, 2 patient base active</td>
</tr>
<tr>
<td>animate or 3animate patient or imperative animate</td>
</tr>
<tr>
<td>agent (person/class) patient (plural)</td>
</tr>
</tbody>
</table>

Examples:
déqsàq 'I hear' [di8-eq7-(s)-aq0 1sj8-L7-L0]  
dábbàk 'she drags it (once)' [d38-b3-bak0 3f.sj8-3n.o3-drag8]  
dígdàksaq 'I go to the river for a few days and return' [di8-igda7-k5-(s)-aq0 1sj8-igda7-ADE5-go0]  
dítsàl 'I get cold' [di8-t3sk0 1sj8-freeze8]  
i daétsàwut 'the sun rises' [da8-es7-a4-qu7 3f.sj8-up7-D4-one.moves8]  
daqáyàwán 'she grows big' [da8-qa7-a4-qan0 3f.sj8-big7-D4-INCEPT8]  
dítàrānim 'we are lying prone' [di8-t4-damin0 1sj8-SU5-D4-PL.sj9]  
datòqìbjèt 'she keeps stepping' [da8-toq7-n7-be7 3f.sj8-footstep/s7-make8]

11 A key to the abbreviations used in the glosses accompanying these examples can be found at the end of this article.
Possessive Conjugation  (incorporated possessive proclitics cross-reference the subject)

<table>
<thead>
<tr>
<th>P8</th>
<th>P7</th>
<th>P6</th>
<th>P5</th>
<th>P4</th>
<th>P3</th>
<th>P2</th>
<th>P1</th>
<th>P0</th>
<th>P-1</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>-</td>
<td>-</td>
<td>non-</td>
<td>past tense</td>
<td>non-</td>
<td>base</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>+</td>
<td>possessive subject agreement</td>
<td>marker</td>
<td>agreement</td>
<td>or imperative</td>
<td>agreement</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Examples:
dkūţléjbhata 'she whistles' [d/kutolej7-b3-a'ta0 her/whistling7-IC3-R1-extend.INTR0].
ablakèjbatà 'I am clapping' [ab/lakej7-b3-a'ta0 my/clap7-IC3-R1-extend0]

Absolutive Conjugation  (ergative/absolutive marking strategy)

<table>
<thead>
<tr>
<th>P8</th>
<th>P7</th>
<th>P6</th>
<th>P5</th>
<th>P4</th>
<th>P3</th>
<th>P2</th>
<th>P1</th>
<th>P0</th>
<th>P-1</th>
</tr>
</thead>
<tbody>
<tr>
<td>transitive</td>
<td>incorporate</td>
<td>intransitive</td>
<td>adposition</td>
<td>durative</td>
<td>non-</td>
<td>base</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>subject</td>
<td>or</td>
<td>marker</td>
<td>agreement</td>
<td>or imperative</td>
<td>subject</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>direct object</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Examples:
bàyàavra 'I hear' [ba6-k-3-a4-b4-da0 1S.SJ6-ADes5-D1-IC3-sound.extends0],
dabágèiyàvèt 'she often drags it' [da3-bakde0-u7-k2-a4-bel0 3F.SJ6-drag3-3N.O6-ABL3-D4-ITER0]
ábàtaran 'I sweat' [a7-ba2-k5-d/a4-qan0 heat7-1S.SJ6-ADes5-ITT/D4-INCEPT0]
úgbùn 'she slips' [u6-k5-a4-b3-un0 3F.SJ6-ABL3-IC3-slip.MOM0]
èjìlàyìapòl 'I freeze to death' [ej7-ba6-k5-a4-b3-téél0 kill7-1S.SJ6-ADes5-D4-IC3-freeze0]
úyàtn 'she goes' [u6-k5-a4-in0 3F.SJ6-ABL5-D4-go0]

Coreferential Absolutive Conjugation  (ergative/absolutive with double subject marking)

<table>
<thead>
<tr>
<th>P8</th>
<th>P7</th>
<th>P6</th>
<th>P5</th>
<th>P4</th>
<th>P3</th>
<th>P2</th>
<th>P1</th>
<th>P0</th>
<th>P-1</th>
</tr>
</thead>
<tbody>
<tr>
<td>subject</td>
<td>incorporate</td>
<td>redundant</td>
<td>adposition</td>
<td>durative</td>
<td>/a/</td>
<td>3 neuter</td>
<td>past tense</td>
<td>1, 2</td>
<td>base</td>
</tr>
<tr>
<td>subject marker</td>
<td>or</td>
<td>3 anim.obj</td>
<td>object</td>
<td>or imperative</td>
<td>object</td>
<td>(animate.class pl)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Examples:
dakúttòlejêbkusa 'she whistles' [da8-kutolej7-bu6-k7-(s)-a0 3F.SJ6-whistling7-3RS6-ABL5-event.extends0]
dìgàvatsaq 'I go to the river for a few hours and come back'
[di8-igda7-ba6-f-5-(s)-aq0 1Sf8-igda7-1S.RS6-SU5-go0]
dabùtòlok 'she shuddered' [da8-bu6-f-3-i/t2-ak0 3F.SJ6-3RS6-head3-D3-PT2-move0]
sùgbàyônden 'I returned' [di8-suk7-ba6-k5-o4-in2-den0 1Sf6-back7-1S.RS6-ABL5-D4-PT2-go0]

Coreferential Inactive Conjugation
(a mixture of accusative and active marking traits, with double subject marking as well)

<table>
<thead>
<tr>
<th>P8</th>
<th>P7</th>
<th>P6</th>
<th>P5</th>
<th>P4</th>
<th>P3</th>
<th>P2</th>
<th>P1</th>
<th>P0</th>
<th>P-1</th>
</tr>
</thead>
<tbody>
<tr>
<td>active</td>
<td>incorporate</td>
<td>direct</td>
<td>adposition</td>
<td>durative</td>
<td>inactive</td>
<td>past tense</td>
<td>redundant</td>
<td>base</td>
<td></td>
</tr>
<tr>
<td>or transitive</td>
<td>object</td>
<td>marker</td>
<td>inanimate-</td>
<td>or</td>
<td>subject marker</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>subject (person/class)</td>
<td>class subject</td>
<td>imperative</td>
<td>(person/number)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Examples:

dígḍādaq 'I go to the river (and remain there)' \[dī-igdaʔ-tS-dʔi-daq\] 1SJ-igdaʔ-D⁴-1S.RS⁻-go⁰
sitōna 'he woke up' \[sit-ʔ-o⁴-\qquad-in²-a⁰ \quad \text{wake}⁳-M.SJ⁴-PT²-state⁰\]
dahúnàjarij 'she slips' \[da⁸-hunʔ-tS-(j)-aS-dj\] 3F-SJ-\quad-slip\quad-D⁴-3S.RS⁻-ITER⁰

daŋāji 'she grows' \[da⁸-a'-(j)-aS-tj\] 3F-SJ-D⁴-3S.RS⁻-grow⁰

dīndiruk 'I moved aside' \[dī⁻-in²-dʔi-duk\] 1SJ-PT²-1S.RS⁻-move.away⁰

It is the presence of multiple, idiosyncratically contrasting agreement patterns such as these that render Ket noun/verb agreement a referential feature of the verb stem. In other words, it is the multiplicity of roles played by each agreement position across the verb system as a whole that render them referential components of each particular verb form. The examples below, which are adapted from Vajda (in press), illustrate why the various Ket subject/object agreement strategies cannot be regarded as being governed by any overarching grammatical principle. They demonstrate that every referential class of Ket verbs – whether based on event individuation (aspect) or participant individuation (semantic or valence) – contain verbs belonging to more than one conjugation. Consequently, there are many synonyms or near synonyms across the various conjugations, as demonstrated when the examples in (13) are juxtaposed semantically (14-18) rather than grouped according to conjugation membership:

(14) Conjugational synonyms or near synonyms in Ket

Active: déqsāq 'I hear' \[dī⁻-eq⁷-tS-aq\] 1SJ-L⁷-L⁰
Absollutive: bāyū'ra 'I hear' \[ba⁶-k⁵-a'\quad-bS-da⁰ \quad 1S.SJ⁶-AMES⁵-D⁴-IC³-sound.extends⁰\],
Active: dābbāk 'she drags it (once)' \[dbS-bS-bak⁰ \quad 3F-SJ-3N.O⁻-drag⁰\]
Absollutive: dābbādējūvāt 'she drags it (often)' \[dbS-bak⁰-k⁵-bS-da⁰ \quad 3F-SJ-3N.O⁻-ABL⁵-D⁴-ITER⁰\]
Possessive: dākūṭīlebjāta 'she whistles' \[dku⁻-bS-tS-da-aS-dkB\] 3F-SJ-whistling IC⁵-R⁴-extend.INTR⁰.
Coreferential Absollutive: dākūṭīlejōka 'her whistles' \[dkg⁻-bS-tS-da-aS-dkB\] 3F-SJ-whistling IC⁵-R⁴-extend.INTR⁰.

(15) Verbs meaning "make a trip down to the riverbank (igda = to the riverbank)

<table>
<thead>
<tr>
<th>Coreferential Absollutive</th>
<th>Active Conjugation</th>
<th>Coreferential Inactive Conjugation</th>
</tr>
</thead>
<tbody>
<tr>
<td>single short round trip</td>
<td>single longer round trip</td>
<td>single trip without return</td>
</tr>
<tr>
<td>dī⁻⁸-igdaʔ-baS⁻⁰-tS-aq⁰</td>
<td>dī⁻⁸-igdaʔ-k⁵-tS-aq⁰</td>
<td>dī⁻⁸-igdaʔ-a'⁻⁴-dʔi-daq⁰</td>
</tr>
<tr>
<td>1SJ⁻⁸-igdaʔ-1S.RS⁶-SU⁵-go⁰</td>
<td>1SJ⁻⁸-igdaʔ-AMES⁵-go⁰</td>
<td>1SJ⁻⁸-igdaʔ-D⁴-1S.RS⁻-go⁰</td>
</tr>
<tr>
<td>dīgdāva saq 'quick trip'</td>
<td>dīgdāksaq 'medium trip'</td>
<td>dīgdādaq 'long trip'</td>
</tr>
</tbody>
</table>
(16) Derivational patterns that build involuntary causatives
Active subject marking: *dìātÉål* 'I get cold' [$di^8-tōl^0$ 1SJ^8-freeze^0]
Inactive subject marking: *sìto* 'he woke up' [$si^8-o^-in^2-a^0$ wake^7-3M.SJ^4-PT^2-state^0]
Absolutive subject: *ābātāwan* 'I sweat' [$ā^7-ba^5-kā^4-d/a^4-qan^0$ heat^7-1S.SJ^5-ADES^5-ITT/D^4-IMP^0]
Coref. Absolutive: *dabuútoålok* 'she shuddered' [$da^8-bu^6-t^3-o^-il^2-0k^0$ 3F.SJ^8-3RS^6-head^5-D^4-PT^2-move^0]
Coref. Inactive: *dahuúnaåjaRij* 'she slips' [$da^8-hun^7-a^3-j^-a^1-dij^0$ 3F.SJ^8-slip^7-D^4-3RS^1-ITER^0]
Absolutive + P3: *ubuån* 'she slips' [$u^6-k^5-b^3-un^0$ 3F.SJ^6-ABL^5-IC^3-slip.MOM^0]
Coref. Absolutive: *eújbaåÄaptÉl* 'I freeze to death' [$ej^7-ba^6-k^5-a^4-b^3-tÉÉl^0$ kill^7-1S.SJ^6-ADES^5-D^4-IC^3-freeze^0]

(17) Subject marking in anti-causatives
Absolutive: *uúÄa* 'she goes' [$u^6-k^5-a^4-tn^0$ 3F.SJ^6-ABL^5-D^4-go^0]
Active: *ìÅ daeúsaåQut* 'the sun rises' [$da^8-es^7-a^4-qu^0$ 3F.SJ^8-up^7-D^4-one.moves^0]
        *daqāyāwan* 'she grows big' [$da^8-qa^7-a^4-qan^0$ 3F.SJ^8-big^7-D^4-ADES^0]
Coreferential Inactive: *da.aúja* 'she grows' [$da^8-a^4-(j)^-a^1-tij^0$ 3F.SJ^8-D^4-3RS^1-grow^0]
        *dǐndì ruk* 'I moved aside' [$dί^8-in^2-dį^1-duk^0$ 1SJ^6-PT^2-1RS^1-move.away^0]
Coref.Absolutive: *súgbāyonden* 'I returned' [$dί^8-suk^2-ba^5-k^5-o^4-in^2-den^0$ 1SJ^6-back^7-1RS^6-ABL^5-D^4-PT^2-go^0]

(18) Derivational patterns that build iteratives or distributives
Special P0 morpheme: *diùtāramin* 'we are lying prone' [$di^8-t^5-a^4-damin^0$ 1SJ^8-ADIT/D^4-PL.SJ^0]
Special P7 morpheme: *datōŋjibėt* 'she keeps stepping' [$da^8-toq/ŋj^-bēt^0$ 3F.SJ^8-footstep/s^7-make^0]
Non-agreement P3-1: *ablākėjbatā* 'I am clapping' [$abl/lake^7-b^3-a^1-ta^0$ my/clap^7-IC^3-r^1-extend^0]

A fuller analysis of Ket finite verb stem patterns (Vajda 2003) reveals that although the choice of actant agreement is often completely unpredictable, it sometimes is partly predictable based on notions of event or participant individuation. For example, Coreferential Absolutive stems sometimes convey certain types of quicker than usual events (cf. example 15 above). And Coreferential Inactive stems sometimes express "auto-instrumental" actions (where the subject's own body (hand, eye, foot, etc) fulfills the instrument role and specifically excludes the possibility that an alienably-possessed tool was used). However, these very same meanings are often expressed by stems belonging to other conjugations, so that the role of agreement strategy (i.e., actant conjugation) in conveying such specific Mrm (referent modifying) functions is too sporadic to be used as a global predictor of agreement marking. More evidence of the unpredictable, referent-marking function of Ket actant agreement could be provided, but the data presented should suffice to demonstrate that, although Ket has a rich system of verb-internal actant agreement, it has no typological alignment grammatically speaking due to the idiosyncratic role that agreement plays in basic referential expression.

In concluding this section it would be germane to ask how such an unusual and seemingly cumbersome morphological technique could ever have arisen in Yeniseic. Vajda (2003) suggest
that the proto-Yeniseic linguistic forerunner of Ket originally contained a series of base-initial valence prefixes that contributed idiosyncratically to basic referential meaning (Mrh) in some stems; in other stems they helped express transitivity and semantic valence according to predictable patterns (Mrm). These prefixes appear to have been *d- for valence decrease, and a voiceless fricative (possibly */l/) for valence increase of various sorts, and they operated much like the analogous "classifiers" found in Athabaskan languages today. The Athabaskan valence-decrease d- and valence-increase l- likewise play an idiosyncratic and unpredictable lexical role (Mrh function) in some stems, and a predictable referential modifying (Mrm) role in other stems. In time, the Yeniseic consonantal prefixes underwent phonological attrition due to the influence of the surrounding Turkic and Samoyedic languages, which did not tolerate anlaut consonant clusters. This led to their retention only before vowel-initial base (P0) morphemes and their elision elsewhere (though they left traces even here in the form of tonal and consonant ablaut in the following syllable). Because proto-Yeniseic morphology appears to have been, like Modern Ket, 'conglomerating' (i.e., poor in any type of referential affixation), no other referential affixes were available to replace the eroded valence prefixes. Instead, the grammatical agreement marker series themselves were co-opted for use in novel combinations to help signal differences in referential meaning. Note that Modern Ket actant conjugations – just like the valence-changing consonants reconstructible for proto-Yeniseic (and the valence-modifying "classifier" consonants of modern Athabaskan) – may contribute either to the basic referential meaning (Mrh) or help individuate the semantic roles of the event participants (Mrm). And so it turns out that a morphological feature of Yeniseic not even represented in the traditional isolating-analytic-synthetic-polysynthetic continuum (i.e., the language's age-old conglomerating morphological bent) seems to have been responsible for the rise of actant conjugations in Modern Ket.

5. Conclusion. The Holistic Model identifies the functional niche into which Ket actant agreement fits, so that the language's unique typological features can be meaningfully compared with the more familiar ones documented for other polypersonal languages. As it turns out, Ket is unusual only insofar as it uses the choice between several competing verb agreement strategies as a referential feature of each individual stem. By contrast, in other polypersonal languages with verb-internal subject/object markers, the agreement strategy represents a uniform grammatical feature of the verb system in general and plays no idiosyncratic role in the expression of referential categories of meaning. Because of historical changes that eroded certain valence prefixes, verb agreement in Ket has simply taken on a referential function in addition to its original phrase-building function. It also becomes clear that the Ket verb, among polysynthetic structures, bears more similarity to verbs in other "non-concatenative" languages such as Bantu and Athabaskan, where position class likewise fulfills a special function in form-class creation by radically distinguishing finite verbs from other word types. Thus, Ket verb agreement is involved, in one way or another, in expressing three distinct functions in addition to noun/verb
agreement, per se: 1) referent creation, or Mrh, since the choice of agreement strategy is a component of the basic stem rather than dictated by an overall rule, 2) referent modification, or Mrm, in Active Conjugation and Coreferential Inactive Conjugation, where it marks the class of the subject and object; and 3) form-class creation, or Mph, for formally distinguishing verbs from other parts of speech. Simply calling Ket subject/object agreement markers 'inflections' completely misses the referential function expressed by the positional configuration of these morphemes within the verb complex.

Instead of merely replacing 'inflection' and 'derivation' with alternate labels, or dividing them into subcategories that fail to address the ambiguity between form and function inherent in these notions themselves, the Holistic Model demonstrates them to be epiphenomena of two clear-cut functional oppositions that operate beyond morphology: head vs. modifier structure, and referential vs. grammatical (i.e., discourse and phrasal) function. This short paper has barely introduced the system's descriptive potential. If applied rigorously, Holistic Grammar offers the promise of achieving a more fine-grained and all-inclusive set of typological designations than has hitherto been available to morphologists.

References


**Van Valin**

**Morpheme glosses used in the Ket examples in Section 4**

ABL – ablative adposition (usually denotes motion away or an external change of state)

ADES – adessive adposition (usually denotes motion towards or an internal change of state)

AC – animacy classifier

AN – animate class

AL – applicative affix (adds an extra theme- or instrument-role argument to the stem)

AP – animate-class plural subject

AT – atelic (appears in some verbs lacking a built-in completion point)

D – durative marker (appears in many verbs denoting states or temporally complex events)

F – feminine class of referent

IC – involuntary causative (marker found in many stems denoting accidental action or natural process)

IIT – marker that appears in inchoatives with an incorporated theme-role argument

IMP – imperative affix

INCEPT – inceptive or inchoative

INTR – intransitive

ITER – iterative (multiple actions or events, or a single event progressing in increments)

L – any lexical element that defies clear semantic definition apart from the rest of the stem

M – masculine class of referent

MOM – punctual, momentaneous (specifically a single event rather than repeated events)

MT – classifier of mental states and attitudes

N – inanimate class of referent, either singular or plural

O – direct object agreement affix

PL – plural referent
PT – past tense (preterite) affix
R – resultative infix (derives stative intransitives from telic transitives)
RS – redundant subject agreement
S – singular animate-class referent
SEMEL – semelfactive (instantaneous or quicker-than-usual event)
SJ – subject agreement
SU – superessive adposition (marks verbs involving superficial contact with a surface)
TR – transitive

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