Dimensions of Morphological Structure

- Sapir’s typology (< Boas):
  - Concepts expressed in a word (4 types)
  - Grammatical processes expressing these concepts (several types, including affixation as one)
  - Degree of internal complexity (analytic/isolating < synthetic < polysynthetic)

Concepts: 1. ‘write’ 2. ‘on top of’ 3. ‘Past Participle’

overwritten

Processes: 1. composition 2. vowel change 3. suffix -en
"A polysynthetic language is one in which words are very complex. That is, they have more than one meaning element combined into a single word. For instance, English *cat's*"
What is “Complex” about morphology?

“A complex system is a system composed of interconnected parts that as a whole exhibit one or more properties (behavior among the possible properties) not obvious from the properties of the individual parts.”

– Wikipedia
What are the “Obvious” Aspects of Language?

- Languages need to have syntax
  - Recursive, hierarchical combination of meaningful elements is what gives human language its expressive power
- Languages need to have phonology
  - The conflict between Faithfulness and Markedness is inherent in the need to express meaning through physical systems with their own properties.
- These things follow from the nature of language.
Why Have Any Morphology?

- Morphological material has its own principles for arranging meaningful material within larger units (‘morphotactics’).
  - To the extent this is distinct from the way the syntax organizes meaningful elements into larger units, morphotactics ought not to be unnecessary.
- The ‘same’ morphological element can have a variety of overt realizations (‘allomorphy’).
  - To the extent this is distinct from the modifications required by the phonology, allomorphy lacks independent motivation.
Morphotactics ≠ Syntax

Kwakw’ala: Word order is rather rigid: V-S-Ox-Os-PP*
Adjectives precede Nouns, etc.

But:

(a) When “V” and “O” are part of the same word, they typically appear in the order O-V instead of V-O:
e.g. ň’ena-gila ‘oil-make’, *gila-ň’ena.

(b) If “O” is part of the same word with “V”, it can precede the subject:
e.g., na’w-əm’y-ida bəgʷanəm ‘cover-cheek-the man’, *na’w-ida bəgʷanəm-əm’ya

c) Exactly when they form a single word, an Adjective and its modified Noun can occur in the order N-Adj:
e.g., ň’aqʷa-dzi ‘copper-large’, *dzi- ň’aqʷa

Virtually every systematic property of the syntax of the language plays out quite differently in the morphotactics
Morphotactics ≠ Syntax

Morphological composition:

\[ k^w ak^w'ala-exsd-ən \]

speak.Kwakw’ala-want-1SG
‘I want to speak Kwakw’ala’

Syntactic composition:

ax-exsd-ən q-ən k^w ak^w’ala
Ø-want-1SG that-1SG speak.Kwakw’ala
‘I want to speak Kwakw’ala’
Allomorphy ≠ Phonology

- In Kwakw’ala (and other Wakashan languages) suffixes are of three types, not predictable from their phonological shape, in terms of their effect on the final consonant of a preceding stem:
  - Hardening (glottalizing), e.g. /qap+alud/ → [qap’alud] ‘to upset on rock’
  - Softening (roughly, voicing), e.g. /qap+is/ → [qabis] ‘to upset on the beach’
  - Neutral (no change), e.g. /qap+a/ → [qəpa] ‘(hollow thing is) upside down’
Allomorphy ≠ Phonology

- Similar to, e.g., Celtic mutations, these changes no doubt have their origin in segmental accommodations, but in synchronic terms, they are arbitrary morphology.

- A common approach to such phenomena: posit segmental content corresponding to the difference among mutation classes, and attribute the changes to the phonology.

- Changes are not phonologically coherent (e.g., /x, s/ ‘harden’ to [’n, ’y or ts’], ‘soften’ to [n, y or dz])

- No precedent for these changes in the independent phonology

- No good candidate for triggering content: e.g., both neutral and softening suffixes can, but need not, begin with ?. In general, no consistent differences in phonological shape.
Morphology is Inherently ‘Complex’

- The properties of morphological structure (morphotactic organization and non-phonologically induced allomorphy) do not follow from the nature of language.
- Nonetheless, virtually all languages have at least some morphology that is not reducible to syntax and/or phonology.
- As such, any morphology is ‘complex’ from the point of view of the language faculty.
- But of course, some systems are more complex than others...
Some Systems are More Complex than Others

Kwakw’ala:

hu̱xʷ- sanola-gil-eł
vomit-some-continuous-in.house
’some of them vomit in the house’

Mohawk:

Wa’koniatahron’kha’tsherohktáhkwen.
wa’-koni-at-ahronkha’-tsher-o’kt-ahkw-en
FACTUAL-1SG/2SG-MIDDLE-speech-NMZ- run.out.of-CAUS-STATIVE
‘I stumped you.’ (left you speechless)

Central Alaskan Yupik:

Piyugngayaaqelrianga-wa.
pi-yugng-a- yaaqe-lria- nga=wa
do-able-probably-INTR.PARTICIPIAL-1SG-suppose
‘I suppose I could probably do that.’
Dimensions of Complexity

- **System Complexity:**
  - Number of distinct affixes (non-root meaningful elements) in the system
  - Number of meaningful components of the form of a single word
  - Predictability of ordering relations among elements

- **Complexity of exponence:**
  - Deviation from the classical morpheme
  - Number of word forms corresponding to a single lexeme
  - Complexity of allomorphy
Number of Affixes in the System

- ‘Eskimo’-Aleut languages: ca. 500 derivational affixes (not counting at least as many more inflectional suffixes)
- Kwakw’ala: ca. 250 derivational affixes (Boas 1947)
- English: ca. 150 prefixes and suffixes (Marchand 196)
- Standard Mandarin: 7 prefixes and 8 suffixes (Packard 2000)
Number of Affixes in a Word

“[Central Siberian Yupik] postbases are most often productive and semantically transparent, and can be added one after another in sequences of usually two or three, the maximum encountered being seven. These sequences are relatively short in comparison to other Eskimo languages, such as CAY, where one can find more than six postbases in a work, and where it is possible to have more than a dozen.” (deReuse, 1994)

Kwakw’ala is similar to CSY in the degree of observed complexity.
Element Order

Compositional (scope-based) order in Kwakw’ala:

a. cause to want

ne’nakʷ’-exsda-mas-uxʷ John gax-ən
go.home-want-cause-3SG John to-1SG
‘John made me want to go home’

b. want to cause

q’aq’oχa-madz-exsd-uxʷ John gax-ən q-ən gukʷile
learn-cause-want-3SG John to-1SG that-1SG build.house
‘John wants to teach me to build a house’

Here the order follows from the content properties of the elements involved (by the “Mirror Principle”), and so does not contribute complexity.
Element Order

- In some languages, the order of certain affixes is fixed in some way that does not derive from scope.

- Hyman 2002: Chichewa has a fixed order CAUS-APP regardless of their relative scope.

a. Applicativized causative: -lil-its-ιl- [with [cause cry]]
   alenjé a-ku-lil-its-il-a mwaná ndodo
   hunters 3pl-prog-cry-CAUS-APP-fv child sticks
   ‘the hunters are making the child cry with sticks’

b. Causativized applicative: -takas-its-ιl- [cause [stir with]]
   alenjé a-ku-takás-its-il-a mkází mthîko
   hunters 3pl-prog-stir-CAUS-APP-fv woman spoon
   ‘the hunters are making the woman stir with a spoon’

In such a case, the order of affixes contributes complexity because it does not follow from properties of their content.
Element Order

  - Preverb + iterative + multiple + negative + incorporate + inceptive + distributive # pronominal + qualifier + conjugation/negative + tense + subject + classifier + stem

- The ordering of these element classes is partly based on semantics, partly on phonology (prosodically weaker elements closer to the stem) and partly arbitrary.

- Because the template does not follow from the properties of the elements, it adds complexity.

- Such templates tend to be very stable over long periods.
What factors are ‘natural’ predictors of element order?

- Semantic scope
- Grammatical function (e.g. derivation is ‘inside of’ inflection)
  - Perhaps more detailed “Bybee effects” (mood inside of tense inside of agreement, etc.)
- Are some instances of this theorems rather than just tendencies?
- Phonological shape (element size and prosodic status; high vowel before low, V-initial before C-initial as in Sanskrit 2P clitics)
Complexity of Exponence

- The ‘ideal’ morphological element, corresponding to the classical structuralist morpheme, is a discrete, indivisible unit of form linked to exactly one discrete unit of content.

- Real morphology is not like that, as we shall see.
  - The correspondence between elements of form and elements of content is in general many-to-many (and not ‘onto’ in either direction), not one-to-one.

- Some aspects of content are signaled not by a discrete, overt piece of form but rather by the manipulation of the form relative to some opposed category.
Complexity of Exponence

- Complexity of paradigms (mapping from lexemes to word forms)
- Relations between morphosyntactic words (pairings of a lexeme and a morphosyntactic representation) and overt word forms that are not one-to-one
  - Syncretisms (e.g. [hɪt] as both present and past of {HIT})
  - Variation (e.g. either [dajvd] or [dowv] as past of {DIVE})
Complexity of Allomorphy

- A range of degrees to which the behavior of an element does not follow from its other properties:
  - Phonological variation under phonological conditions
  - Lexically specified variation (“allomorphy”) under phonologically specified conditions (e.g. Warlpiri ergative -rlu/-ngku; Surmiran stems)
  - Allomorphy conditioned by specific morphological categories or semantically/grammatically coherent sets of categories
  - Allomorphy conditioned by semantically/grammatically arbitrary sets of categories (“morphomes”)
Complexity of Allomorphy

- Diverse behavior of formally parallel elements
  - Distinct conjugation classes of phonologically and grammatically similar stems
  - Distinct effects of phonologically similar affixes on stems (e.g. three types of Kwakw’ala suffix)
- Boundary type effects: distinct phonological behavior of clitics, Level I vs. Level II affixes, etc.
Where does Morphological Complexity Come From?

- Overwhelmingly, from historical change
- “Grammaticalization”
  - words > clitics > affixes
  - phonological conditioning is reinterpreted as conditioning by an associated morphological category (e.g. Germanic Umlaut)
- Lexicalization: Material learned and stored as chunks loses its analysis
- Change often results in greater complexity, but complexity results in change
Where does Morphological Complexity Come From?

- Not all structure can be explained by “grammaticalization”: not all of today’s morphology is yesterday’s syntax.
- Al Sayyid Bedouin Sign Language: new sign language with emerging grammatical structure.
- 3rd generation speakers have developed conventionalized compounds.
- Endocentric compounds have modifier-head order (e.g. PRAY^HOUSE ‘mosque’) – the opposite of the head-modifier order found in syntactic constructions (Meir et al. 2010).
Is complexity symmetric between speakers and hearers?

How can we determine the extent to which what seems complex to linguists is also complex for language users?

Language learners seem to acquire remarkably complex systems (from the linguist’s point of view) with little special effort.

Although morphological structure of any sort would seem to be a serious challenge to the notion that human languages are ‘optimal’ solutions to the problem of mapping content to form, morphology seems to be a fact of life – and a part of the human language faculty.