Where Do Verb Classes Come From?

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Verb classes are sets of semantically-related verbs sharing a range of linguistic properties, such as:
    — possible realizations of arguments
    — interpretation associated with each possible argument realization

The big question: What is behind verb classes that on the one hand makes them so appealing as a research tool and on the other hand explains their limitations?

Overview:
Part I: The appeal and limitations of verb classes
Part II: The underpinnings of verb classes

Part I. The appeal and limitations of verb classes

1   Introduction: The appeal of verb classes

Fillmore's "The Grammar of *Hitting* and *Breaking*" (1970) shows the importance of verb classes as:
— devices for capturing patterns of shared verb behavior
— a means of investigating the organization of the verb lexicon
— a means of identifying grammatically relevant elements of meaning

Fillmore's study focuses on the verbs *break* and *hit* as representatives of two larger classes of verbs
        (1970: 125, (15)–(16)), whose members share patterns of behavior.

(1)   a.   *Break* VERBS: bend, break, crack, fold, shatter, split, snap, ...

         b.   *Hit* VERBS: bash, bump, hit, kick, pound, slap, strike, stroke, tap, whack, ...

The *break* verbs and *hit* verbs show considerable divergences in their argument realization options.

(2)   Availability of transitive use and instrumental *with* phrase:

         a.   The boy broke the window (with a ball).

         b.   The boy hit the window (with a ball).

(3)   Availability of the causative alternation (V-transitive = 'cause to V-intransitive'):

         a.   The boy broke the window./The window broke.

         b.   The boy hit the window./*The window hit.

(4)   Availability of body-part possessor ascension (Fillmore 1970: 126, (23)–(26)) :

         a.   I broke his leg./*I broke him on the leg.

         b.   I hit his leg./I hit him on the leg.

(5)   Availability of the *with/against* alternation (Fillmore 1977: 74–78):

      a.   Perry broke the fence with the stick. = Perry broke the stick against the fence.
      b.   Perry hit the fence with the stick. ≠ Perry hit the stick against the fence.

Concomitantly, the members of these sets of verbs share the same broad semantic characterizations:

(6)   a.   *Break* Verbs: verbs of change of state: involve a change of state in an entity.
      b.   *Hit* Verbs: verbs of surface contact: involve (often forceful) contact with an entity, without entailing a change in its state.

(7)   a.   # The rocks broke the windshield, but luckily it wasn't damaged.
      b.   The rocks hit the windshield, but luckily it wasn't damaged.

Further support: comparable semantic classes of verbs, again with distinct behavioral patterns, can be identified in other languages, such as Lhasa Tibetan (DeLancey 1995, 2000), Berber, Warlpiri, and Winnebago (Guerssel et al. 1985).

2   Moving beyond Fillmore's "The Grammar of *Hitting* and *Breaking*"

• The fact that classes of verbs with similar meanings show characteristic argument realization patterns suggests the patterns can be attributed to facets of meaning common to class members.

• Many subsequent studies—both large- and small-scale—have confirmed and extended Fillmore's findings (e.g., Dixon 1991, Faber & Mairal Usón 1999, Green 1974, Gruber 1967, Jackendoff 1990, Koenig et al. 2008, L&RH 1991, Viberg 2001, Willems 1981, Zwicky 1971).

AN EXAMPLE: My book *English Verb Classes and Alternations* (1993) classifies verbs in two ways:

• according to their SEMANTIC CONTENT: manner of motion verbs, directed motion verbs, sound verbs, change of state verbs, perception verbs, verbs of gestures and sign, weather verbs, . . .

⇒ yields a fairly fine-grained semantic classification: 48 broad classes or 192 smaller classes.

• according to their PARTICIPATION IN ARGUMENT ALTERNATIONS: causative alternation, conative alternation, dative alternation, locative alternation, *with/against* alternation, . . .

⇒ yields a coarser-grained semantic classification, which appears to have more grammatical relevance than the other (e.g., Fillmore's *hitting* and *breaking* study): 79 alternations.

3   Problems for efforts to identify verb classes

Assuming that limitations of coverage in existing work can be addressed, perhaps in part by using computational tools (Kipper et al. 2008, Korhonen & Briscoe 2004), there are larger issues facing efforts to identify and exploit verb classes.

— Choosing among various ways of defining verb classes:
    – Determining the phenomena to be used in their definition.
    – Determining the best grain-size for verb classes.
— Dealing with the many instances of apparent multiple verb class membership.

3.1 Relating verb classes defined by argument alternations to Fillmorean verb classes

An argument alternation by its very nature defines a verb class: The verbs showing the alternation.

QUESTION: How do such verb classes relate to the "Fillmorean" verb classes, which are defined
by members with shared meaning and shared behavior?

ANSWER: Generally, classes of alternating verbs include several Fillmorean classes.

AN EXAMPLE: The English dative alternation

(8)   a.   Terry gave Sam an apple. (double object construction)

        b.   Terry gave an apple to Sam. (*to* construction)

(9)   Verbs found in the double object construction (based on Gropen et al. 1989: 243–244):

        a.   *give* VERBS: give, pass, hand, sell, pay, trade, lend, loan

        b.   VERBS OF FUTURE HAVING: advance, allocate, allot, allow, assign, award, bequeath, forward, grant, guarantee, leave, offer, promise

        c.   *send* VERBS: mail, send, ship

        d.   *throw* VERBS: fling, flip, kick, lob, shoot, slap, throw, toss

        e.   VERBS OF CONTINUOUS CAUSATION OF ACCOMPANIED MOTION IN A DEICTICALLY SPECIFIED DIRECTION: bring, take

        ("benefactive" and manner of speaking/communication verbs omitted for simplicity.)

• There is an intuition that the subclasses of alternating verbs do not have the same status,
in that one subclass may be felt to represent the "core" alternating verbs.

EXAMPLE: For the dative alternation, the *give* verbs are taken to be the core verbs.

What is behind the intuition of a set of "core" alternating verbs?

— In the construction grammar literature, the "core" verbs include those whose own meaning
is said to mirror the meaning of the construction (Goldberg 1995).

— Crosslinguistically, members of the "core" class display the alternation across languages,
while members of other classes need not (Croft et al. in press, RH&L 2008 on the dative
alternation; Hirschbühler 2003, Kim 1999 on the locative alternation).

Based on an examination of English, Icelandic, German, Dutch, Croft et al. (2001) propose a
ditransitivity hierarchy involving three verbs chosen from major dative alternation subclasses.

(10)   Ditransitivity Hierarchy: 'give' < 'send' < 'throw'

• Certain verb properties, e.g., participation in argument alternations, crosscut Fillmorean classes.

The observation that the "dative alternation verbs" and comparable classes are not coextensive with
a Fillmorean class means that there are generalizations which cannot be stated in terms of notions
such as "change of state verb" or "manner of motion verb" as they may crosscut such classes.

This observation suggests that Fillmorean verb classes are not themselves primitives and that verb
class effects are in some sense derived.

THE LESSON: The two dimensions of lexical organization—verb classes and argument alternations—
    lead to distinct and different-sized verb classes.

3.2 Determining the appropriate grain-size for semantic verb classes

Different studies support positing verb classes of varying grain-sizes.

AN EXAMPLE: Three options for the class membership of English *run*; these correspond roughly
to the superordinate, basic, and subordinate levels of the categorization literature (Rosch 1978).

● COARSE-GRAINED CLASSIFICATION (superordinate level:) *run* is a manner verb (and not a result
    verb like *go*) (RH&L (in press) propose this distinction is rooted in the notion "scalar change").

(11) a. MANNER VERBS: specify a manner of carrying out an action.
          cry, hit, pound, jump, walk, shout, whisper, shovel, sweep, wipe, smear, spray . . .
      b. RESULT VERBS: specify the result of an event.
          arrive, break, clean, come, cover, crack, die, empty, fill, open, put, remove, . . .

WHY THIS DISTINCTION MATTERS: It influences a verb's argument realization options:
    Manner verbs show considerably more and different options than result verbs (RH&L 1998).

(12) Pat ran. (activity)
      Pat ran to the beach. (directed motion)
      Pat ran herself ragged. (change of state)
      Pat ran her shoes to shreds. (change of state)
      Pat ran clear of the falling rocks. (directed motion)
      The coach ran the athletes around the track. (causation)
              (likewise many manner of motion verbs)

(13) The students went.
      The students went to the beach.
    ∗ The jetsetters went themselves ragged.
    ∗ The runner went his shoes to shreds.
    ∗ The pedestrian went clear of the oncoming car.
    ∗ The coach went the athletes around the track.
              (likewise many directed motion verbs)

● MEDIUM-GRAINED CLASSIFICATION (Fillmorean; basic level): *run* is a manner of motion verb
    (contrast membership in another manner verb subclass, e.g., verbs of manner of speaking);
    Fillmore (1970) also contrasts such classes: *hit* verbs vs. *break* verbs.

(14) a. MANNER OF MOTION VERBS: amble, crawl, fly, hop, jog, jump, gallop, limp, run,
          scamper, skip, swim, trudge, walk, wander, . . .
      b. VERBS OF MANNER OF SPEAKING: holler, mumble, murmur, mutter, scream,
          shout, stammer, whisper, yell, . . . (Urban & Ruppenhofer 2001, Zwicky 1971)
      c. *Hit* VERBS: beat, hit, kick, pound, rap, tap, whack, . . .

WHY THIS DISTINCTION MATTERS: It determines finer-grained argument realization options among
manner verbs, such as transitivity, preposition choices, and participation in object alternations.

(15)   Directional phrases (specify path of the subject):

    a.   Tracy ran into the room/over the hill/up the stairs.

    b.   ∗ Tracy shouted into the room/over the hill/up the stairs.

(16)   Addressee *to/at* phrases (specify path of the understood content of communication):

    a.   Tracy shouted to/at Sandy. (the sound—a shout—moves)

    b.   ∗ Tracy ran to/at Sandy.

• FINE-GRAINED CLASSIFICATION (subordinate level): among manner of motion verbs, *run* lexicalizes a manner of motion that causes directed displacement towards a goal (as opposed to one that does not) (Allen et al. 2007, Alonge 1997, Biberauer & Folli 2004, Folli & Ramchand 2005).

(17)   a.   DISPLACEMENT-IMPLYING MANNER VERBS: fly, jump, roll, run, slide, walk, . . .

    b.   OTHER MANNER VERBS: amble, dance, float, meander, scamper, stroll, wander, . . .

The verbs in (17a) involve manners characteristic of animates, which are typically used with the intent of reaching a goal; thus, they may at least implicate a path (Beavers, Levin & Tham 2009).

WHY THIS DISTINCTION MATTERS: These are the manner of motion verbs most likely to allow directional interpretations of locative PPs (Gehrke 2008, Nikitina 2008, Thomas 2004).

(18)   a.   John walked in the room.

    b.   # John danced in the room. (on the goal interpretation)

Occasionally, exceptions are cited to Talmy's (1975, 1985) claim that manner verbs cannot show directed motion interpretations in verb-framed (i.e. path) languages (Alonge 1997, Fábregas 2007, Folli & Ramchand 2005, Kopecka 2007, Martínez Vázquez 2001); these involve the same verbs.

(19)   a.   Allez,   courons   dans   la   maison!
               go-2PL,   run-1PL   in   the   house
               'Come on, let's run in the house!' (French; Stringer 2006: 63)

    b.   . . .   volaron   a   Mar de Plata . . .
                   flew   to   Mar de Plata
               '. . . they flew to Mar de Plata . . .' (Spanish; Martínez Vázquez 2001: 52, (112))

THE LESSON: No one grain-size seems appropriate for all relevant generalizations.

3.3   Multiple verb class membership and its consequences

• If the level of classification represented by Fillmorean classes is privileged, as existing work seems to take it to be, then verbs with membership in more than one such class might be expected to be the exception, as considerable overlap among such classes would diminish their value.

• Yet, a considerable number of verbs have complex patterns of behavior which are best understood if multiple verb class membership is posited.

A CASE STUDY: Cooking verbs (Atkins, Kegl & Levin 1988)

• Cooking verbs show an unexpected set of properties if a verb's meaning determines its behavior.

(20)   COOKING VERBS: boil, cook, fry, poach, roast, steam, stew, toast, . . .

        a.   Causative alternation:
                 Sam baked the apples at 375F./The apples baked at 375F.

        b.   Unspecified object alternation:
                 Sam bakes bread on Tuesdays./Sam bakes on Tuesdays.

        c.   Benefactive alternation:
                 Sam baked a birthday cake for Chris./Sam baked Chris a birthday cake.

• The problem in a nutshell:

	bake	*carve*	*break*
Causative alternation:	yes	no	yes
Unspecified object alternation:	yes	yes	no
Benefactive alternation:	yes	yes	no

(21)   CHANGE OF STATE VERBS (i.e. *break* verbs): break, close, darken, dry, freeze, lengthen, melt, open, redden, ripen, shorten, split, . . .

        a.   Causative alternation:
                 Sam broke the glass./The glass broke.

        b.   Unspecified object alternation:
                 Sam broke the glass./*Sam breaks on Thursdays.

        c.   Benefactive alternation:
                 Sam broke the glass for me./*Sam broke me the glass.

(22)   CREATION-DIRECTED ACTIVITY VERBS: carve, crochet, embroider, knit, sculpt, sew, spin, weave, whittle, . . .

        a.   Unspecified object alternation:
                 Sam carved the doll./Sam carves in the evenings.

        b.   Benefactive alternation:
                 Sam carved a doll for me./Sam carved me a doll.

        c.   Causative alternation:
                 Sam carved a doll./*The doll carved.

• Towards a solution: Two senses of *bake*

(23)   a.   CHANGE OF STATE *bake*: to change the state of something by dry heat in an oven: *Sam baked the potatoes for an hour at 375F.*

        b.   CREATION *bake*: to create by means of changing the state of something by dry heat in an oven: *Sam baked a birthday cake for Chris.*

	break	*carve*	*bake* (change)	*bake* (activity)
Causative alternation:	yes	no	yes	no
Unspecified object alternation:	no	yes	no	yes
Benefactive alternation:	no	yes	no	yes

The problematic constellations of properties arises from a failure to recognize that
     a verb may show multiple senses and, hence, have multiple class membership.

• Due to such observations, Levin posits multiple class membership for 784 of 3024 verbs (26%), according to Lapata & Brew (2004).

• What determines whether a given verb will show properties of more than one verb class?

(24)   The listing of a verb in more than one class ... is left open to interpretation in Levin. Does it indicate that more than one sense of the verb is involved, or is one sense primary, and the alternations for that class should take precedence over the alternations for the other classes in which the verb is listed? (Dang et al. 1998)

• Wheeler (1996) argues verbs with multiple class membership are actually "basically" members of one class. She exemplifies this point with search verbs, but it applies more generally: most likely, cooking verbs are basically creation-directed activity verbs. Moreover, the intuition that *throw* verbs are not core dative verbs may reflect a basic membership outside the *give* verb class (RH&L 2008).

3.4   Summary

Work on verb classes must confront issues of class grain-size, multiple class membership, properties crosscutting verb classes, and classes of alternating verbs vs. Fillmorean verb classes.

Part II. The underpinnings of verb classes

4   Delving beneath the Fillmorean verb classes

Organization of the verb lexicon into Fillmorean verb classes suggests a verb's meaning consists of:
— A part shared by all members of the same verb class: an event type or SCHEMA.
— A part that distinguishes among the members of a class: the ROOT.
This division could also be conceptualized in terms of "constructions" and "verbs".

Concomitantly, many phenomena that come under the "verb class" rubric can be understood
in the context of two levels of linguistic description and the relation between them:
— the meaning lexicalized—or entailed— by the verb itself (its "root")
— the set of event types (or "schemas")
Each provides a way of forming verb classes useful to language-specific and crosslinguistic studies.

5   Sources of verb class effects: Roots and event schemas

5.1   The representation of verb meaning

5.1.1   The key components of verb meaning: Roots and event schemas (RH&L 1998)

A verb meaning may be represented as a predicate decomposition consisting of two components (e.g., Borer 2005, Goldberg 1995, Grimshaw 2005, Hale & Keyser 2002, Jackendoff 1990, Marantz 1997, Mohanan & Mohanan 1999, Pesetsky 1995, Pinker 1989, RH&L 1998).

- *Event schema:* structural component of meaning, representing an event type;
  it is drawn from a limited inventory encompassing the event types encodable in language;
  it is often defined in terms of primitive predicates, forming a predicate decomposition.

Most important distinction is whether an event schema is simple, consisting of a single subevent,
  or complex, consisting of two subevents—a causing subevent and a result subevent.
(See Dowty 1979, Levin 1999, L&RH 1999, McCawley 1971, Morgan 1969, RH&L 1998).

(25) a. Simple event schema: single subevent
          e.g., [x ACT$_{<MANNER>}$]

      b. Complex event schema: causing subevent CAUSE result subevent
          e.g., [[x ACT$_{<MANNER>}$] CAUSE [BECOME [y $<RES\text{-}STATE>$]]]

- *Root:* a sound/meaning pairing, representing a verb's core lexicalized meaning;
  characterized by an ontological type, chosen from a fixed set of options, including
  result state (*dry*), thing (*saddle*), stuff (*butter*), container/location (*bottle*), manner (*wipe*);
  the set of roots is in principle open-ended.

Support for the proposal that a root has a single ontological type: there are manner verbs and result verbs, but not verbs simultaneously lexicalizing both meaning components.

(26) MANNER/RESULT COMPLEMENTARITY
      Manner and result meaning components are in complementary distribution:
      a verb may lexicalize only ONE. (RH&L in press; cf. L&RH 1991, 1995)

5.1.2   The association of roots with event schemas

- The basic event schema associated with a verb is determined by its root's ontological type;
  this association could be viewed in lexical, syntactic, or constructional terms.

- The possible associations are schematized via *canonical realization rules* (RH&L 1998: 109).

(27) a. manner → [x ACT$_{<MANNER>}$]
              (e.g., *jog, run, creak, whistle, ...*)

      b. result, i.e. externally caused, state →
              [[x ACT] CAUSE [BECOME [y $<RES\text{-}STATE>$]]]
              (e.g., *break, dry, harden, melt, open, ...*)

- Roots are integrated into schemas as ARGUMENTS, (27b), or MODIFIERS, (27a),
  of predicates; roots are italicized and in angle brackets; notated via subscripts when modifiers.

5.2   The place of roots in defining verb classes

Certain verb classes can be tied to the ontological types of their members' roots.

5.2.1 Roots of a single ontological type

• Classes of verbs will emerge simply because they share roots of the same ontological type;
   such verb classes will necessarily be quite coarse-grained.

AN EXAMPLE: The manner vs. result verb distinction.

This distinction, which crosscuts the transitive/intransitive distinction, is important in the
   organization of the English verb lexicon and in the characterization of English verb behavior
   (Fillmore 1970, Levin 1999, RH&L 1998, 2005, in press).

	Manner Verbs	vs.	Result Verbs
— Verbs of Damaging:	*hit*	vs.	*break*
— Verbs of Putting — 2-dim:	*smear*	vs.	*cover*
— Verbs of Putting — 3-dim:	*pour*	vs.	*fill*
— Verbs of Removal:	*shovel*	vs.	*empty*
— Verbs of Combining:	*shake*	vs.	*combine*
— Verbs of Killing:	*stab*	vs.	*kill*

These notions are also applicable to verbs that may not be easily put into larger lexical "domains"
spanning manner and result verb classes.

(28) a. MANNER VERBS: cry, eat, exercise, mutter, scribble, shout, squeak, waltz, . . .

   b. RESULT VERBS: arrive, dry, come, destroy, gladden, melt, widen, . . .

Manner verbs and result verbs differ systematically in meaning and behavior.
— Within a language the manner vs. result verb dichotomy figures in:
   — characterizing behavioral patterns, as in (29) (Fillmore 1970, L&RH 1991, RH&L 1998)
   — characterizing language acquisition patterns (Behrend 1990, Gentner 1978)
— Across languages the dichotomy figures in crosslinguistic similarities and divergences.

(29) a. UNSPECIFIED OBJECTS: Kim swept/*broke.

   b. NON-SUBCATEGORIZED OBJECTS: Kim scrubbed/*broke her fingers raw.

   c. CAUSATIVE ALTERNATION: Kim broke/wiped the window; The window broke/*wiped.

• Verb classes arising from ontological types of roots will likely be found across languages.
   (The exception: languages with small verb inventories; Schultze-Berndt 2006.)

• However, languages may vary in two respects in their verb classes:

— The number of verbs with roots of a particular ontological type available.

Studies of the lexicalization patterns of motion events note that verb-framed languages tend to have
reduced inventories of manner of motion verbs (and most likely manner verbs in general) when
compared to satellite-framed languages (Slobin 2000, 2006, Wienold 1995, Shi 2008).

Within the manner of motion domain, verbs specifying major gaits (e.g., the equivalents of English
walk, *run*) tend to be lexicalized across languages, while their hyponyms are not (e.g., *jog, lope* or
amble, creep, prance, strut), particularly in verb-framed languages (Malt et al. 2008 on English,
Dutch, Spanish, Japanese; see also Slobin 2000, Wienold 1995).

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Some verb-framed languages can nevertheless differentiate manners of motion—and manners more generally—using ideophones or adverbials: e.g., Japanese (Wienold 1995: 320, Table 7).

Ideophone	Verb	Gloss
yochiyochi	*aruku* 'walk'	'toddle, totter'
sutasuta	*aruku*	'walk briskly'
burabura	*aruku*	'stroll'
tobotobo	*aruku*	'trudge along, tread on'
shanarishanari	*aruku*	'walk daintily'

— The precise set of verbs with roots of a particular ontological type available.

Even languages with comparable number of verbs may lexicalize distinct manners (see Snell-Hornby's 1983 contrastive German/English study, including sound and manner of motion).

5.2.2 Subclasses of roots of a single ontological type

• Classes of verbs will emerge due to sharing roots of identifiable subtypes of one ontological type; such verb classes may be medium- or fine-grained.

• The existence of such subclasses is evident in the existence of distinct subclasses of manner verbs, such as sound verbs, manner of motion verbs, *hit* verbs.

How best to characterize these classes will depend on how best to represent a root's "meaning": e.g., Jackendoff's (1990) notion of "3-D models" to encode "action patterns".

• Not every facet of a root's meaning is relevant to the formation of subclasses.

AN EXAMPLE: Verbs of sound (Levin, Song & Atkins 1997, Song 1996)

(30)   VERBS OF SOUND: beep, buzz, clatter, creak, gurgle, hiss, honk, jingle, rattle, ring, rumble, rustle, squeak, thud, whir, . . .

The most obvious way to characterize verbs of sound is in acoustic terms (Snell-Hornby 1983):
   — volume: rumbles are typically loud, whirs are not
   — pitch: squeaks are usually high, rumbles low
   — resonance: rattles as compared with thuds
   — duration: gurgles or rumbles must have some duration, honks or beeps may take an instant

Verbs of sound also differ in the manner in which the sound is produced:
   — internal to the sound emitter: *babble*, *gurgle*, *rumble*
   — external to the sound emitter: *clatter*, *jingle*, *rattle*
   — in either way: *squeak*, *whistle*

Of these, only manner of sound production is relevant to describing the behavior of these verbs:
   Verbs of sound with causative uses describe externally produced sounds;
   they may also take nonsubcategorized objects and be used as verbs of directed motion.

(31)   a.   Cold icy winds swept under the gaps of cottage doors rattling them fiercely.

       b.   The cart rattled its way down the rutted streets.

       c.   The old jalopy rattled into the driveway.

What makes manner of sound production special? It involves how the event comes about:
cf. a causal chain approach to event conceptualization as a basis for argument realization
(Croft 1991, DeLancey 1984, Talmy 1976).

5.3   The place of event schemas in defining verb classes

Verb classes may emerge because sets of verbs are associated with the same event schema.
There are two reasons verbs may share an event schema:
— They have roots of the same ontological type.
— They are associated with the same "augmented" event schema.

5.3.1   Shared "basic" event schemas

• Classes of verbs will emerge simply because their members share the same "basic" event schema,
that is, the event schema associated with a verb by virtue of the canonical realization rules.

• As these rules associate an event schema with a root based on its ontological type, the ensuing
verb classes will largely mirror those that emerge by virtue of a root's ontological type.

• However, there is a major dichotomy based on having simple vs. complex event schema,
and roots of several ontological types might map onto each of these major event schema types,
giving rise to coarse-grained classes.

This dichotomy is important as verbs with simple vs. complex event schema show significantly
different argument realization options, as well as other properties.

• Verbs with complex event schemas fall into subclasses as there are different types of caused events,
depending on the type of result involved: a result state (lexicalized by the root; *dry*), a created
object (*create*), a result location (which may or may not be lexicalized by the root; *put*, *bottle*).

(32) a. *dry*: [[x ACT] CAUSE [BECOME [y <*DRY*>]]]
      b. *bottle*: [[x ACT] CAUSE [BECOME [y BE AT <*BOTTLE*>]]]

5.3.2   Shared event schemas due to "template augmentation"

• Classes of verbs will emerge because their members share the same "derived" event schema,
that is, an event schema built on an existing one via the process of "template augmentation"
posited by RH&L (1998). (See L&RH 1999 on a second process of "event coidentification".)

(33) TEMPLATE AUGMENTATION: Event schemas may be freely augmented up to other possible
schemas in the basic inventory of event schemas. (RH&L 1998)

• Template augmentation builds complex event schemas consisting of two simple event schemas:
a causing subevent—containing the verb's root—and a newly introduced result subevent.

(Could be seen as putting verbs in new constructions, licensed by criteria in Goldberg 1995, 1997)

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• PROPERTIES OF TEMPLATE AUGMENTATION: An illustration via a case study of the verb *wipe*.

— *wipe* has a manner root: it describes a form of contact with a surface. Although wiping is used
      to remove stuff from a surface, the action need not entail a particular result.

— Due to its manner root, *wipe* has a simple event schema, so is eligible for template augmentation:
      wipe's simple event schema can be augmented to give a "derived" removal event.

(34)   a.   Kelly wiped the table.
              [x ACT$_{<WIPE>}$ $\underline{y}$]
      b.   Kelly wiped the crumbs off the table.
              [[x ACT$_{<WIPE>}$ $\underline{y}$] CAUSE [BECOME [z NOT AT $<PLACE>$]]]

— The augmented event schema is associated with the same "name"—*wipe*—as the root associated
      with the basic event schema, which is now subsumed into the augmented event schema.

— In this instance, template augmentation is possible since wiping is a conventional means of
      effecting removal of stuff from a surface, even if the verb *wipe* does not entail it (Talmy 2000).

More generally, template augmentation is allowed when the action denoted by the verb root is a
      conventional way of bringing about the added result subevent.

— *wipe*'s own root is basically associated with an actor and a surface.
      In the augmented event schema an added predicate (*off*) licenses a "stuff removed" argument,
      and the "normal" (location) object appears in the newly introduced result subevent.

• Thus, template augmentation gives rise to a large class of verbs with a "derived" complex
      event schema—a coarse-grained class.

• More interesting are the medium-grained classes that also emerge: verbs with a "derived" complex
      event schema sharing the same type of result subevent: e.g., removal, addition, creation.

These classes emerge because template augmentation can introduce various types of result subevents,
      but as each type of result subevent is typically brought about by a particular kind of action,
      each type can only be paired with certain verbs—those verbs with roots designating actions
      conventionally used to bring about that type of result.

In fact, these verbs classes include those associated with many object alternations in English,
      because their members have a root paired with a basic and an augmented event schema.

(35)   Locative alternation — "removal" subtype: Removal result subevent

      a.   Jack wiped the counter.
      b.   Jack wiped crumbs off the counter.

      wipe VERBS: rake, rub, scrub, shovel, sweep, wipe, . . .

(36)   Locative alternation — "putting" subtype: Addition result subevent

      a.   Jill sprayed the wall with paint.
      b.   Jill sprayed paint on the wall.

      smear VERBS: dab, smear, splash, spray, sprinkle, stuff, . . .

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(37)   Material/product alternation: Creation result subevent

    a.   Martha carved a toy out of the piece of wood.

    b.   Martha carved the piece of wood into a toy.

    CREATION-DIRECTED ACTIVITY VERBS: carve, knit, sew, weave, whittle, . . .

• The intuition that there are "core" and "non-core" alternating verbs may arise because some have a "derived" event schema.

6   Sources of multiple verb class membership

6.1   Roots with multiple ontological classifications

• Roots are complex enough semantic entities—perhaps, even having a prototype-like nature— that some may have multiple ontological classifications.

• Such roots will naturally be associated with multiple verb class membership.

EXAMPLES: "Polysemous" English denominal verbs

(38)   *string*:
    'put on a string' (e.g., beads)
    'provide with strings' (e.g., a violin)
    'remove strings from' (e.g., green beans)

(39)   *powder*:
    'put powder on' (e.g., a cake)
    'make into a powder' (e.g., aspirin)

• Such instances of multiple verb class membership would most likely be sporadically attested, although there may be instances that involve sets of related roots.

6.2   Roots associated with multiple event schemas due to template augmentation

• Roots that have a basic association with one event schema and an association with a second one due to template augmentation will show multiple class membership.

• Since sets of related verbs may show the same form of template augmentation, whole classes of verbs with multiple class membership may arise.

• Some verbs showing multiple class membership for this reason may belong to several verb classes, when their roots describe manners used to obtain several types of results.

In such instances, several complex event schemas are built on the same simple event schema, with each characterized by a distinct type of result.

— The verb *sew* has such a root, since sewing can be used to create an object, cover a surface, attach things, or even "impress" an image.

(40) a.   Dale sewed the piece of silk into a ball gown.
               Dale sewed a ball gown out of the piece of silk.

        b.   Dale sewed bows on the costume.
               Dale sewed the costume with bows.

        c.   Dale sewed the lining to the skirt.
               Dale sewed the lining and the skirt together.

— A verb whose root describes a manner used only to obtain a very specific result,
    such as *vacuum*, will show more limited class membership.

(41) a.   Avery vacuumed the dust off the rug.
               Avery vacuumed the rug.

        b.   ∗ Avery vacuumed the dust onto the rug.

        c.   ∗ Avery vacuumed the dust into a pile.

6.2.1 A caveat on multiple class membership

Being found in several syntactic frames may not suffice for positing multiple class membership.

THE REASON: Members of some verb classes may have two distinct argument realizations.

RH&L (2008) argue that for *give* verbs the dative alternation arises for this reason:
    give x to y and *give y x* do not involve the caused possession and caused motion event schemas,
    respectively (Goldberg 1995, Harley 2003), but rather simply the caused possession schema.

The *with/against* alternation characteristic of *hit* verbs may also reflect alternate argument realizations for the same event type (cf. Nichols (1984:188) on such verbs in Caucasian languages).

(42)   *With/against* alternation: Sam hit the fence with a stick./Sam hit a stick against the fence.

7 Conclusion

The various conceptions and granularities of verb classes, as well as issues of multiple class membership, can be understood in the context of the key components of verb meanings.

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