

1. Verb Classes and Alternations

This chapter will give a general overview over argument structures of verbs, and phenomena that are used to argue for particular argument structures and verb classes. The discussion follows in large parts [Levin, 1993 #6701], which gives a broad overview of English verb classes and verb alternations. Subsequent chapter will then be concerned with various theories that have been developed to deal with argument structure.

1.1. Evidence for Argument Structure Differences

1.1.1. Number of Arguments

Verbs are certainly the most complex words, from a semantic viewpoint. They don't only incorporate semantic features such as tense, aspect, mood, agreement, but also govern arguments of any number, from zero to at least four or even five:

- (1) a. (Latin) Pluit. 'It is raining.'
- b. Mary arrived.
- c. Mary saw John.
- d. Mary showed John a picture.
- e. Mary sold John a picture for one hundred dollars.
- f. Mary moved the compost from the oak tree through the yard to the fence.

The number of arguments of a verb is clearly a lexical property; the following examples are ungrammatical, because the verbs do not support the indicated number of arguments:

- (2) a. *Mary arrived John.
- b. *Mary saw John a picture.
- c. *Mary showed.

This holds even though not every argument of a verb need to be realized, and we find cases in which verbs seem to acquire additional arguments:

- (3) a. Mary showed a picture.
 - b. Mar sold a picture.
 - c. Mary moved the compost.
- (4) a. Mary showed John a picture for hundred dollars.
 - b. Mary sneezed the napkin off the table.

1.1.1. Type of Argument Realization

In addition to the number of arguments, the type of arguments varies for predicates. In English we have to distinguish between regular objects and prepositional objects:

- (5) a. Mary saw John.
- b. Mary talked about John.

Quite often verbs can subcategorize for different types of objects, but then we find clear meaning differences:

- (6) a. Mary believed John.
 - b. Mary believed in John.
- (7) a. Mary knew John.
 - b. Mary knew about John.

In languages with a richer case system, we find even more variations of this type. For example, a number of verbs in German have subjects in the dative or accusative case.

- (8) a. Mir scheint, daß es regnet.
 me.DAT appears that it rains
 'It appears to me that it is raining'
 - b. Mir ist angst.
 me.DAT is afraid
 'I'm afraid.'
- (9) a. Mich friert.
 me.ACC freezes
 'I'm cold.'
 - b. Mich dürstet.
 me.ACC thirsts
 'I am thirsty.'

In German there are only very few verbs that require a subject in a case other than the nominative. In other languages we find substantially larger classes of verbs with non-nominative subjects, e.g. in Icelandic (data from [Kress, 1982 #6817] p. 215):

- (10) a. Stúlkuna vantar peninga.
 girl.ACC lack money.ACC
 'The girl doesn't have money.'
- b. Mannin dreymdi jar eld.
 mann.ACC dreamt vulcano eruption
 'The man dreamt of a vulcano eruption.'

Both in German and in Icelandic, non-nominative subjects occur only if the subject role is not agentive. Hence the choice of subject is indicative for semantic properties of the verb.

This influence of the semantic role of an argument on the realization of that argument can be observed in many other cases. For example, in Georgian verbs that express psychological states or sensory experience (like 'love', 'hate', 'want', 'wish', 'hear' etc.) have a dative subject (and not a nominative/ergative subject).

But it is equally remarkable that the syntactic type of an argument may be the same, even though the semantic contribution of the argument can differ widely. Cf. the following list of cases of different semantic roles of the object NP (due to Levin):

- | | |
|-------------------------------------|---------------------------|
| (11) The engineer built the bridge. | effected object |
| The engineer destroyed the bridge. | consumend object, patient |
| The engineer widened the bridge. | patient |
| The engineer moved the bridge. | theme |
| The engineer washed the bridge. | location/surface |
| The engineer crossed the bridge. | location |
| The engineer reached the bridge. | goal |
| The engineer left the bridge. | source |
| The engineer saw the bridge. | object of perception |
| The engineer hated the bridge. | stimulus |
| The engineer avoided the bridge | |
| The engineer studied the bridge | |

1.1.1. Auxiliary Selection

Another source of evidence for verb classification is the selection of auxiliaries, which has been discussed especially with respect to the perfect auxiliary in Romance languages like Italian and for Germanic languages like Dutch and German (English has lost this distinction; all verbs require the perfect auxiliary *have*, it used to have a *be/have* distinction as well). For example, German has contrasts like the following:

- (12) a. Hans ist gekommen. ‘Hans has arrived.’
- b. Hans ist gestorben. ‘Hans has died.’
- c. Hans ist rot geworden. ‘Hans became red.’

- (13) a. Hans hat gearbeitet. ‘Hans has worked.’
- b. Hans hat gesungen. ‘Hans sang.’
- c. Hans hat getanzt. ‘Hans danced.’

While the verbs are all intransitive, and the arguments are realized in the same way, the auxiliary selection points to an important semantic difference. Roughly, verbs that are selected by *ist* ‘is’ do not have an agentive subject role, whereas verbs that are selected by *hat* ‘has’ are agentive. Notice that there is some variation; in particular, verbs like *dance* can be seen as movement verbs and then select for *ist*, just like ‘arrive’:

- (14) Hans ist durch die Halle getanzt. ‘Hans has danced through the hall.’

We will argue later (in the section on unaccusatives) that this shows that Hans also has the non-agentive role of a moved object in such cases.

1.1.1. Nominalizations

Another type of evidence for verb classes are nominalizations. Consider the verbs *cut* and *hit*. Both are transitive verbs:

- (15) a. Mary cut the salami.
- b. Mary hit the ball.

But notice that only *cut* has a zero nominalization that refers to the result of the action (e.g., *the cut was smooth, deep etc.*).

1.1.1. Verb Alternations

Perhaps the most important linguistic instrument to argue for various verb classes is to investigate in which verbal patterns verbs occur. Take an example by Levin (1993: p. 6ff.). Consider the four transitive verbs *cut*, *break*, *touch*, *hit* that prima facie belong to the same class as they are all transitive. Furthermore, the object appears to have, roughly, the patient role in all cases.

- (16) a. Margaret cut the bread.
- b. Janet broke the vase.
- c. Terry touched the cat.
- d. Carla hit the door.

But they behave differently with respect to the so-called **middle** alternation:

- (17) a. The bread cuts easily.
- b. Glass vases break easily.
- c. *Cats touch easily.
- d. *Doors hit easily.

We find a different pattern when we try out the **conative** alternation:

- (18) a. Margaret cut at the bread.
- b. *Janet broke at the vase.
- c. *Terry touched at the cat.
- d. Carla hit at the door.

We find yet another pattern for the **body-part possessor ascension** alternation:

- (19) a. Margaret cut Bill on the arm. (cf. Margaret cut Bill’s arm.)
- b. *Janet broke Bill at the finger. (cf. Janet broke Bill’s finger.)
- c. Terry touched Bill on the shoulder. (cf. Terry touched Bill’s shoulder.)
- d. Carla hit Bill on the back. (cf. Carla hit Bill’s back.)

Each of the four verbs can be characterized by a distinct class of alternations that it can undergo. But this is not an idiosyncratic property of the verbs; there are many more verbs that show the same patterns:

- (20) a. *break* verbs: crack, rip, shatter, snap...
- b. *cut* verbs: cut, hack, saw, scratch, slash, ...
- c. *touch* verbs: pat, stroke, tickle, ...
- d. *hit* verbs: bash, kick, pound, tap, whack, ...

It is intuitively obvious that these verb classes share certain elements of meaning. For example, both *break* and *cut* express that the referent of the object undergoes some change of state, a meaning component absent from *touch* and *hit*. But the verbs differ insofar *cut* describes the manner in which the state change came about (by cutting, hacking, sawing etc.), a meaning component that is absent for *break* verbs.

1.1. A Survey of Verb Alternations in English

1.1.1. Introduction

Verb alternations are a particularly interesting research tool for lexical semantics, as they allow to identify rather fine-grained classes of verbs with the help of tests that are not semantic in their nature, but involve grammaticality judgements. These tests, however, tell us something about the semantic properties that are relevant for grammar. This is, of course, under the hypothesis that the reasons why certain verbs undergo certain alternations is not just determined by non-semantic reasons.

Not all dimensions in which the meaning of verbs can differ influence verb alternations. For example, verbs of sound emission and manners of speaking can differ along the dimension of loudness (e.g. *whisper, say, shout*), but this variation never determines whether a particular alternation is possible or not.

In this section I will go through the major alternations listed in Levin (1993). This survey is especially useful because it is not guided by any specific theoretic interest; it investigates the verb alternations that we find in English. See Levin’s book for many more examples and references; I have used the same numbering, for ease of reference.

1. Transitivity Alternations

1.1 Alterations between transitive and intransitive uses (NP V NP — NP V, or NP V PP)

Object of Transitive and the subject of Intransitive have the same role.

(21) Middle alternation:

The butcher cuts the meat. / The meat cuts easily.

Generic interpretation, understood but unexpressed agent.

(22) Causative/Inchoative alternations:

Janet broke the cup. / The cup broke.

Tim dropped the ball. / The ball dropped.

Also known as anti-causative, ergative. Affects verbs of change of state or change of position.

(23) Induced Action alternations:

The horse jumped (over the fence) / Sylvia jumped the horse over the fence.

With some movement verbs, directional verb is necessary.

(24) Other causative alternations:

The baby burped. / The father burped the baby.

Basically intransitive verbs, limited range of objects (**burp the doctor*).

(25) Substance/Source alternation

Heat radiates from the sun. / The sun radiates heat.

Verbs of substance emission

1.2 Unexpressed Object Alternations

Subject of the transitive and subject of the intransitive have the same role:

(26) Unspecified Object alternation.

Mike ate the cake. / Mike ate.

Wide range of activity verbs, object is understood as something that qualifies as a typical object of the verb.

(27) Understood Body-Part Object Alternation

I waved my hands. / I waved.

Verbs describing conventionalized gestures made with a particular part of the body; the term referring to the body part can be omitted.

(28) Understood Reflexive Object Alternation

Jill dressed herself / Jill dressed.

Intransitive is understood reflexively.

(29) Understood Reciprocal Object Alternation

Anne met Cathy. / Anne and Cathy met.

Intransitive is used with a reciprocal interpretation.

(30) PRO-arb Object Alternation

That movie always shocks people. / That movie always shocks.

The unexpressed object receives an “arbitrary” or “PRO-arb” interpretation.

(31) Characteristic Property Alternation (for agents, instruments):

That dog bites people. / That dog bites.

This knife cuts bread. / This knife cuts.

Generic (habitual) interpretation; ability of an agent or suitability of an instrument

(32) Way Object Alternation

They pushed their way through the crowd. / They pushed through the crowd.

(33) Instructional Imperative.

Bake the cake for 30 minutes. / Bake for 30 minutes.

Contextual interpretation of the object. In cookbooks, manuals, etc.

1.3 Conative Alternations

(34) *Paula hit the fence. / Paula hit at the fence.*

Terry pushed the table. / Terry pushed at the table.

1.4 Preposition Drop Alternations

(35) Locative Preposition Drop

Martha climbed up the mountain. / Martha climbed the mountain.

Verbs with a directional interpretation, “holistic” interpretation.

(36) ‘With’ Presposition Drop

John met Sarah. / John met with Sarah.

Few verbs of social action that are also reciprocal.

2. Alterations Involving Arguments within the VP

2.1 Dative Alternation

(37) *Bill sold a car to Tom. / Bill sold Tom a car.*

No intransitive counterpart. There is a substantive literature on this alternation that we will review in greater detail. The verbs denote, in general, change of possession, and the recipient argument must be animate.

2.2 Benefactive Alternation

(38) *Martha carved a toy for the baby. / Marha carved the baby a toy.*

Resembles dative alternation but requires preposition *for*, applies to verbs of obtaining or creation.

2.3 Locative Alternations

(39) ‘Spray/Load’ Alternation

Jack sprayed paint on the wall. / Jack sprayed the wall with paint.

Verbs related to putting and covering. The ‘with’ variant has a holistic effect. The locative variant is not possible with verbs that have a holistic meaning, e.g. **Jack covered the blanket over the baby*.

(40) ‘Clear’ Alternation

Henry cleared dishes from the table. / Hencry cleared the table of the dishes.

Applies to verbs that appear antonyms of spray/load verbs. The PP is headed by *of*. It has an intransitive variant: *Clouds cleared from the sky / ?The sky cleared of clouds*.

(41) ‘Wipe’ Alternation

*Helen wiped the fingerprints off the wall. / Helen wiped the wall (*of the fingerprints)*

Similar to ‘clear’ alternation, but no *of*-phrase allowed.

- (42) ‘Swarm’ Alternation:
Bees are swarming in the garden. / The garden is swarming with bees.
 Holistic effect similar to ‘spray/load’ alternation, with the difference that the subject, not the object, is affected. (Cf. the itransitive form of ‘clear’ alternations).

2.4 Creation and Transformation Alternations

- (43) Material/Product Alternations
Martha carved a toy out of the piece of wood. / Martha carved the piece of wood into a toy.
 Agentive verbs with arguments expressing a raw material and an artefact.
 Intransitive version: *That acorn will grow into an oak tree. / An oak tree will grow from that acorn.*
- (44) Total Transformation Alternation
The witch turned him into a frog. / The witch turned him from a prince into a frog.
 Involves three internal arguments (in addition to Material/Product, a ‘source’ argument).
 Intransitive version: *He turned (from a prince) into a frog.*

2.5 Reciprocal Alternations

No change of transitivity involved.

- (45) Simple Reciprocal Alternation
I separated the yolk from the white. / I separated the yolk and the white.
I confused Mary with Anna. / I confused Mary and Anna.
- (46) ‘Together’ Reciprocal Alternation
I blended the sugar into the butter. / I blended the sugar and the butter together.
 Intransitive variant: *The eggs mixed with the cream. / The eggs and the cream mixed together.*
- (47) ‘Apart’ Reciprocal Alternation
I broke the twig off the branch. / I broke the twig and the branch apart.
 Intransitive variant: *Brenda agreed with Molly. / Brenda and Molly agreed.*

2.6 Fulfilling Alternation

- (48) *The judge presented a prize to the winner. / The judge presented the winner with a prize.*

2.7 Image Impression Alternation

- (49) *The jeweller inscribed the name on the ring. / The jeweller inscribed the ring with the name.*
 Similar to ‘spray/load’ verbs, but no holistic effect associated with the ‘with’ form.

2.8 ‘With’/ ‘Against’ Alternation

- (50) *Brian hit the fence with the stick. / Brian hit the stick against the fence.*
 Contact verbs.

2.9 ‘Through’/ ‘With’ Alternation

- (51) *Alison pierced the needle through the cloth. / Alison pierced the cloth with a needle.*
 Holistic effect?

2.10 ‘Blame’ Alternation

- (52) *Mira blamed the accident on Terry. / Mira blamed Terry for the accident.*
 No other verbs known for this alternation.

2.11 ‘Search’ Alternation

- (53) *Ida hunted the woods for deer. / Ida hunted for deer in the woods. / Ida hunted deer in the woods.*
 Arguments: entity being sought + location of the search

2.12 Body-Part Possessor Ascension Alternation

- (54) *Selina touched the horse on the back. / Selina touched the horse’s back.*
 Verbs of contact.

2.13 Possessor-Attribute Factoring Alternation

- (55) Possessor Object
I admire his courage. / I admire him for his courage.
- (56) Attribute Object
I admire his honesty. / I admire the honesty in him.
- (57) Possessor and Attribute Alternation
I admire him for his honesty. / I admire the honesty in him.
- (58) Possessor Subject
The clown amused the children with his antics. / The clown’s antics amused the children.
 With a type of psych-verbs.
 Intransitive: *Meat fell in price. / The price of meat fell.*

- (59) ‘As’ Alternation
The president appointed Smith press secretary. / The presididunt appointed Smith.

3. ‘Oblique’ Subject Alternations

Alternations between a non-object (a PP) and a subject.

3.1 Time Subject Alternation

- (60) *The world saw the beginning of a new era in 1492. / 1492 saw the beginning of a new era.*

3.2 Natural Force Subject Alternation

- (61) *I dried the clothes in the sun. / The sun dried the clothes.*

3.3 Instrumental Subject Alternation

- (62) *David broke the window with a hammer. / The hammer broke the window.*
 (Verbs of change; cf. **The spoon ate the ice cream.*)

3.4 Abstract Cause Subject Alternation

- (63) *He established his innocence with the letter. / The letter established his innocence.*

3.5 Locatum Subject Alternation

- (64) *I filled the bucket with water. / Water filled the bucket.*

3.6 Location Subject Alternation

- (65) *We sleep five people in this room. / This room sleeps five people.*

3.7 Container Subject Alternation

- (66) *I incorporated the new results into the paper. / The paper incorporated the new results.*

3.8 Raw Materia Subject Alternation

- (67) *She baked wonderful bread from that whole wheat flour. / That whole wheat flour baked wonderful bread.*

3.9 Sum of Money Subject Alternation

- (68) *I bought (you) a ticket for five dollars. / Five dollars will buy (you) a ticket.*

3.10 Source Subject Alternation

- (69) *The middle class will benefit from the new tax laws. / The new tax laws will benefit the middle class.*

4. Reflexive Diathesis Alternations

4.1 Virtual Reflexive Alternation

- (70) *The boy opened the window. / This window just opens itself.*
Similar to middle.

4.2 Reflexive of Appearance

- (71) *I presented a solution to the problem. / A solution to the problem presented itself.*

5. Passive

5.1 Verbal Passive

- (72) *The cook sliced the mushroom. / The mushroom were sliced by the cook.*

5.2 Prepositional Passive

- (73) *George Washington slept in this bed. / This bed was slept in by George Washington.*

5.3 Adjectival Passives

- (74) *The feathers remained stuffed in the pillow. / The pillow remained stuffed with feathers.*

5.4 Adjectival Perfect Participles

- (75) *recently arrived guest, elapsed time etc. (but *walked man, *slept children)*
Unclear whether these are verbal participles or deverbal adjectives.

6. Alternations involving Postverbal “Subjects”

6.1 ‘There’ Insertion

- (76) With the verb *be*:

A flowering plant is on the window sill. / There is a flowering plant on the window sill.

With verbs of existence, spatial configuration (e.g., *dangle*), verbs of appearance and disappearance, inherently directed motion (*arrive*), manner of motion (*dart*); other verbs that can be coerced into verbs of existence, passive transitive verbs, transitive verbs like *enter*, but not with change of state verbs (like *melt*). Definiteness effect: the NP is typically indefinite or at least hearer-new.

6.2 Locative Inversion

- (77) *A flowering plant is on the windowsill. / On the windowsill is a flowering plant.*
Verbs similar to the class that allow for ‘there’ insertion.

7. Other Constructions

7.1 Cognate Object Construction

- (78) *Sarah smiled. / Sarah smiled a charming smile.*
With verbs of nonverbal expressions and dance verbs, also *dream, fight, live, sing, sleep, think* etc.

7.2 Cognate Prepositional Phrase Construction

- (79) *Kelly buttered the bread. / *Kelly buttered the bread with butter. / Kelly buttered the bread with unsalted butter.*

7.3 Reaction Object Construction

- (80) *Pauline smiled. / Pauline smiled her thanks.*
Verbs of manner of speaking, gestures, signs.

7.4 X’s Way Constructions

- (81) *He worked his way through the book.*
The PP must express the result or location.

7.5 Resultative Constructions

- (82) *Bill pushed the door open.*

Secondary predicate *open* must be predicated of the object, or the subject of an intransitive change of state verb (e.g., *The river froze solid*); with other transitive verbs fake reflexives have to be used (*He cried himself hoarse*). The verb denotes an event that leads to the indicated result. It can be applied to non-subcategorized objects, cf. *John burned the stove black*.

7.6 Unintentional Interpretation of Object

- (83) With reflexive object:

Pauline cut herself.

Specific meaning: unintentionally. The sentence is ambiguous to the normal reflexive interpretation.

- (84) With body-part object:

Silvia cut her finger (on the knife).

The sentence *Silvia cut her finger* is ambiguous (cf. only two meanings for *Silvia cut her finger, and so did Martha*). With Cut-verbs, Break-verbs, Hit-verbs, and Hurt-verbs (e.g. *bruise*).

7.7 Bound Nonreflexive Anaphor as Prepositional Object

- (85) *This list includes my name on it / *itself.*

The PP argument must refer to the subject, no variation pronoun/reflexive.

7.8 Directional Phrases with Nondirectional Motion Verbs

- (86) *The truck rumbled. / The truck rumbled into the driveway.*

Audrey tiptoed. / Audrey tiptoed to the door.

Verbs that are not directional movement verbs can acquire the properties of such verbs with a PP indicating movement from a source, through a path, or to a goal. E.g., verbs of sound emission and non-directional motion verbs.

8. Verbs Requiring Special Diatheses

8.1 Obligatory Passives

(87) *It is rumored that he left town.* (also for *reincarnate, repute*).

8.2 Obligatorily Reflexive Object

(88) *The politician absented himself.*

Also for *assert, avail, behave* etc. (several dozen verbs)

8.3 Inalienably Possessed Body-Part Object

(89) *Jennifer arched her back / *John's back*

8.4 Expletive 'it' Object

(90) *Let's call it a day. / You've really lived it up.*

8.5 Obligatory Adverb

(91) *The teacher meant well. / *The teacher meant.*

8.6 Obligatory Negative Polarity Context

(92) *The horse wouldn't budge.*

1.1. A Survey of Verb Classes in English

The second part of Levin (1993) is a discussion of verb classes that can be identified using verb alternations, all in all about 200 distinct classes.

Take as an example the **verbs of creation** (p. 172). There are six subtypes:

b. 'Build' verbs (*bake, carve, compile, grow, make...*)

Material/Product: *Martha carved a toy out of the piece of wood / Martha carved the piece of wood into a toy.*

*Total transformation: *Martha carved the piece of wood from a branch into a toy.*

*Causative: **A toy carved out of the piece of wood.*

Benefactive: *Martha carved me a toy.*

c. 'Grow' verbs (*develop, evolve, grow, hatch, mature*)

Material/Product (intransitive): *That acorn will grow into an oak tree. / An oak tree will grow from that acorn.*

*Total transformation: **That acorn will grow from a seed into an oak tree.*

Causative: *The gardener will grow that acorn into an oak tree.*

d. Verbs of preparing (*bake, blend, boil, brew, ...*)

*Material/Product: *Donna fixed last night's leftovers into a sandwich.*

*Causative Alternation: *A sandwich fixed.*

Benefactive Alternation: *Donna fixed me a sandwich.*

e. 'Create' verbs (*coin, compose, construct, design, fabricate, manufacture, ...*)

*Material/Product: *David constructed the bricks into a house.*

*Benefactive: **David constructed me a house.*

*Causative: **The huse constructed.*

f. 'Knead' verbs (*beat, bend, coil, collect, compress, fold, freeze, melt, ...*)
*Material/Product: *I kneaded the dough into a loaf / *I kneaded a loaf (from the dough)*

Causative/Inchoative with some verbs: *The dough twirled into a pretzel.*

g. 'Turn' verbs (*alter, change, convert, transform...*)

*Material/Product: *The witch turned him into a frog / *from a prince.*

Total transformation: *The witch turned him from a prince into a frog.*

Causative Alternation: *The prince turned into a frog.*

There are basic semantic differences between those verbs:

b. 'Build' verbs: Creation of a product through the transformation of raw materials.
Benefactive o.k. if the action is on someone's behalf.

c. 'Grow' verbs: Transformation of an entity from one form to another.

d. Verbs of preparing: Creation of a product, usually through the transformation of raw materials. Typically for verbs that denote food preparation.

e. 'Create' verbs: Creation verbs with an effected object; the raw material cannot be expressed by a direct object.

f. 'Knead' verbs: The bringing about of a change of shape in an entity.

g. 'Turn' verbs: Describe a complete transformation.