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More on the typology of inchoative/causative verb alternations*

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1. Formal and semantic basic-derived relationships

In the morphological systems of human languages, we find abundant cases of asymmetric relationships between words, where one word is basic and another word is formally derived from it (cf. Bybee 1985: 50-58). For example, the Russian Genitive form *Vladimira* 'Vladimir's' is formally derived from the Nominative form *Vladimir*. Or, to take an example from derivational morphology, the lexeme *resultative* is derived from the lexeme *result*. It is well-known that such formal basic-derived relationships typically correlate with similar semantic relationships: The formally derived (or marked) words are generally also semantically derived in that they have some additional meaning element that is lacking in the formally basic (or unmarked) word. This correlation between the formal and the semantic basic-derived (or markedness) relationships has been identified as an instance of diagrammatic iconicity, an interesting case of external motivation for linguistic structures (e.g. Haiman 1980; Mayerthaler 1981).

If the general principle of iconicity is responsible for the direction of formal basic-derived relationships, we would expect such relationships to be universal. And this is what we typically find: For instance, plurals are universally formally derived and singulars are basic,[1] diminutives are univer-

* This paper looks at the ways different languages express inchoative/causative verb alternations. The original idea and the methodology are due to Nedjalkov (1969; 1990), by whom I have been greatly inspired.

sally formally derived and non-diminutives are basic, comparative forms of adjectives are universally derived and positive forms are basic, etc. There may be some unclear cases and a few exceptions to these generalizations, but the fundamental pattern is quite uniform across languages.

However, the direction of formal basic-derived relationships is not always universal. There are quite a few cases, especially in derivational morphology, where the direction of derivation differs within a language or across languages. As an example of language-internal variation, take the morphological relationship between names of scientific disciplines and their practitioners in English. The discipline may be derived from the scientist, as in (1a), but the scientist may also be derived from the discipline, as in (1b).

(1) a. discipline derived from scientist
linguist-ics ← *linguist*
chemist-ry ← *chemist*
b. scientist derived from discipline
physics → *physic-ist*
statistics → *statistic-ian*

As an example of cross-linguistic variation, take adjectives and abstract nouns. In European languages, abstract nouns are generally derived from adjectives (*heavy* → *heaviness*, *broad* → *breadth*, etc.), but in some languages elsewhere in the world abstract nouns are basic and adjectives (or rather, expressions used like adjectives) are derived from them, e.g. in Tamil (cf. Lehmann 1990, with some further discussion).

Such variation in the direction of the formal basic-derived relationships puts us in a dilemma. On the one hand, one could simply conclude from such variation that there is no necessary connection between the directions of semantic and formal derivation (e.g. Mel'čuk 1967). Mel'čuk claims that abstract nouns are semantically basic and that adjectives are semantically derived from them (e.g. *broad* = 'having much breadth'), and that the direction of formal derivation is the reverse in European languages (he calls this "reverse word-formation", 1967: 355-56). But if such a divergence of the directions of semantic and formal derivation is possible, we are left without an account of the uniformity that we do find in many cases (plural, diminutive, comparative, etc.).

If, on the other hand, we refuse to give up the principle of diagrammatic iconicity, then the cases of variation and of apparent reverse formal derivation present a puzzle.

In this paper I will look at another area of grammar where the direction of formal derivation shows variation and we seem to be faced with reverse word-formation: **inchoative/causative verb alternations** like those in (2). (The notions "inchoative" and "causative" will be explained in detail in section 2.)

(2) a. Russian: inchoative derived from causative
causative: *rasplavit'* 'melt (tr.)' →
inchoative: *rasplavit'-sja* 'melt (intr.)'
b. (Khalkha) Mongolian: causative derived from inchoative
causative: *xajl-uul-ax* 'melt (tr.)' ←
inchoative: *xajl-ax* 'melt (intr.)'

In Russian, the inchoative member of the pair is marked and derived from the causative member, while in Mongolian the causative member is marked and derived from the inchoative member. With respect to the semantic side, this case is quite analogous to the case of abstract nouns and adjectives above. There are independent semantic reasons to think that the causative member of an inchoative/causative alternation is semantically derived, while the inchoative member is semantically basic. Intuitively, it seems clear that *A melts (tr.) B* means 'A causes B to melt (intr.)', but that *B melts (intr.)* does not mean 'B undergoes the action of X melting (tr.) B', because there is no external agent implied in inchoative verbs like *melt (intr.)*. Thus, on purely semantic grounds we seem to be forced to conclude that causative verbs are derived from inchoatives, and that cases like (2a) are instances of reverse word-formation (Mel'čuk 1967: 352-353).

The typological survey in this paper shows that this hypothesized direction of semantic derivation is not matched by a uniform direction of formal derivation. Languages differ greatly in their ways of expressing the relationship between inchoative and causative verbs with a common lexical meaning. However, the variation that we find is not random, whereas we would expect it to be random if there were no principle of diagrammatic iconicity. The data presented in section 7 suggest a solution to the puzzle of apparent reverse word-formation in cases like (2a). The central claim of this solution is that the kind of meaning that is relevant for diagrammatic iconicity is conceptual meaning, not objective meaning. Objectively, the meaning 'melt (tr.)' may be more complex than and derived from the meaning 'melt (intr.)', but conceptually, the relation between the two meanings could be quite different (cf. Lakoff (1987) for the distinction between objective and conceptual meaning).

Variation in the direction of formal derivation can generally be seen as the manifestation of indeterminacy of the conceptual-semantic relation. This is intuitively very plausible in the case of disciplines and scientists (cf. (1)). Linguistics may be defined as the activity linguists are engaged in, or a linguist may be defined as someone who does linguistics. Neither of these possibilities is obviously wrong, and it seems that the variation in the direction of formal derivation can be attributed to this semantic indeterminacy. I will assume that this is also the best explanation for cross-linguistic variation, as in the case of abstract nouns and adjectives, and in the case of the inchoative/causative alternation, the main topic of this paper, to which we now turn.

2. Formal types of inchoative/causative verb pairs

An **inchoative/causative verb pair** is defined semantically: it is a pair of verbs which express the same basic situation (generally a change of state, more rarely a going-on)[2] and differ only in that the **causative** verb meaning includes an agent participant who causes the situation, whereas the **inchoative**[3] verb meaning excludes a causing agent and presents the situation as occurring spontaneously. A typical example is shown in (3).

(3) a. (inchoative) *The stick broke.*
b. (causative) *The girl broke the stick.*

Inchoative verbs are generally intransitive and causative verbs are transitive, but the inchoative/causative opposition is more restricted than the intransitive/transitive opposition. For example, the German verb pair *weinen* (intr.) 'weep' / *beweinen* (tr.) 'weep for' is not inchoative/causative.

The inchoative member of an inchoative/causative verb pair is semantically similar to the passive of the causative (*the stick was broken*), but it crucially differs from it in that the agent is not just unexpressed; rather, the situation is conceived of as occurring without an agent, spontaneously. This does not mean that there cannot be an agent in the objective situation. In (4a), the melting process is presumably caused by the same factors as in (4b), but only in (4a) is it conceptualized as occurring spontaneously.

(4) a. (inchoative) *The snowwoman melted.*
b. (causative) *The sun melted the snowwoman.*

An example where the basic situation is not a telic change of state, but an atelic going-on is (5).

(5) a. (inchoative) *The top is spinning.*
b. (causative) *The child is spinning the top.*

Turning to the formal side of inchoative/causative verb pairs, I distinguish three main types: Causative, anticausative, and non-directed alternations (or oppositions). Non-directed alternations are further subdivided into labile, equipollent, and suppletive alternations. (These main subtypes are identified in Nedjalkov (1969).)[4]

In the **causative** alternation, the inchoative verb is basic and the causative verb is derived. The causative verb may be marked by an affix (6a), by a causative auxiliary (6b), or by stem modification (6c).

(6)	a.	Georgian	*duγ-s*	'cook (intr.)'
			a-duγ-ebs	'cook (tr.)'
	b.	French	*fondre*	'melt (intr.)'
			faire fondre	'melt (tr.)'
	c.	Arabic	*darasa*	'learn'
			darrasa	'teach'

In the **anticausative** alternation, the causative verb is basic and the inchoative verb is derived (hence the term *anticausative*,[5] which was coined in Nedjalkov and Sil'nickij 1969). Again, the anticausative may be marked by an affix (7a), by an anticausative auxiliary (7b), or by stem modification (7c). (In the case of stem modification, the direction of derivation is not always obvious. See below, section 5 for some discussion.)

(7)	a.	Russian	*katat'-sja*	'roll (intr.)'
			katat'	'roll (tr.)'
	b.	Lezgian	*xkaž xun*	'rise'
			xkažun	'raise'
	c.	Hindi-Urdu	*khul-naa*	'open (intr.)'
			khol-naa	'open (tr.)'

In **non-directed** alternations, neither the inchoative nor the causative verb is derived from the other. In **equipollent** alternations, both are derived from the same stem which expresses the basic situation, by means of different affixes (8a), different auxiliary verbs (8b), or different stem modifications (8c).

(8)	a.	Japanese	*atum-aru*	'gather (intr.)'
			atum-eru	'gather (tr.)'

b.	Hindi-Urdu	*šuruu honaa*	'begin (intr.)'
		šuruu karnaa	'begin (tr.)'
c.	Lithuanian[6]	*lūžti*	'break (intr.)'
		laužti	'break (tr.)'

In **suppletive** alternations, different verb roots are used, e.g.

(9)	Russian	*goret'*	'burn (intr.)'
		žeč'	'burn (tr.)'

Finally, in **labile** alternations,[7] the same verb is used both in the inchoative and in the causative sense, e.g.

(10)	Modern Greek	*svíno*	1. 'go out'
			2. 'extinguish'

Note that this classification does not take into account the status of the deriving elements as inflectional, derivational, or syntactic. All I am interested in here are markedness relations, and these apply to inflection, derivation, and syntax alike.

The reason why inchoative/causative verb alternations are so interesting for linguistic typology is that they are expressed in such different ways across languages, which we can take to indicate that the semantic relation between the inchoative and the causative member is indeterminate in the sense explained in section 1. But one of the five expression types, the causative alternation, is also used to express semantic relations other than the inchoative/causative relation. In many languages, causatives can be formed from a wide range of verbs, including transitive verbs. For example, in Turkish, there are noncausative/causative pairs like *işle-mek* 'work' / *işle-t-mek* 'make work', *yaz-mak* 'write' / *yaz-dır-mak* 'make write'. Such pairs are never expressed as anticausatives or as non-derived alternations. Since they show no cross-linguistic variation, they are not taken into account here and are not considered to be inchoative/causative pairs.

3. Semantic restrictions on inchoative/causative verb pairs

Not every situation can occur as the basic situation in an inchoative/causative alternation. Verbs like 'break', 'burn', 'melt', 'roll', 'open', typically occur in such alternations (cf. examples (2)-(11)), but verbs like 'work', 'dance', 'cut', 'build', 'criticize', 'sleep', never do.

We have already begun to characterize the semantic conditions on inchoative/causative pairs above. The basic situation must be a change of

state or a going-on. This excludes three large classes of situations. First, a state cannot be the inchoative member of an inchoative/causative alternation. Second, an action that does not express a change of state (e.g. 'help', 'invite', 'cite', 'criticize', 'read') cannot be the causative member of such an alternation. Third, agentive intransitive verbs like 'talk', 'dance', 'work', etc. cannot be the inchoative member of an inchoative/causative pair because they are not conceived of as occurring spontaneously. This still leaves us with a large class of transitive verbs such as 'wash', 'build', 'cut', 'dig', 'paint', etc., which do express a change of state.

The most important specific semantic condition on inchoative/causative verb pairs is the absence of **agent-oriented meaning components**. The reason for this is clear: Since the inchoative member implies the absence of an agent, it cannot contain agent-oriented semantic elements. This may be illustrated with the verb 'cut', which minimally differs from 'tear (tr.)' in that it has the agent-oriented meaning component 'by means of a sharp instrument'. Thus, while 'tear (tr.)' has a corresponding inchoative verb ('tear (intr.)'), 'cut' lacks it (cf. also Guerssel at al. 1985):

(11) a. *The girl tore her pants.*
b. *The pants tore.*

(12) a. *The tailor cut the cloth.*
b. **The cloth cut.*[8]

Similar minimal pairs are given in (13)-(15).

(13) a. 'wash': agent-oriented meaning element 'by means of soap and/or washing instruments'
no inchoative alternant possible
b. 'clean (tr.)': no agent-oriented meaning element
alternation: e.g. Russian *očiščat'* 'clean (tr.)' anticausative *očiščat'-sja* 'become clean'

(14) a. 'execute': agent-oriented meaning element 'sanctioned by the regime'
no inchoative alternant possible
b. 'kill': no agent-oriented meaning element
alternation: e.g. Lezgian (labile verb) *q'in* 'kill'/'die'

(15) a. 'tie': agent-oriented meaning element 'by wrapping with strings, etc.'
no inchoative alternant possible (Gothic *bindan* 'tie' / anticausative **bund-nan*)

b. 'untie': no agent-oriented meaning element
alternation: e.g. Gothic *andbindan* 'untie' / anticausative *andbund-nan* 'become loose'

This condition should probably be generalized. Take the example of the verb 'decapitate'. An inchoative alternant is clearly impossible, but there do not seem to be any agent-oriented meaning components. The specific meaning component 'by severing the head from the body' is clearly patient-oriented. Thus, if we stretch our imagination we can think of a situation where a decapitation takes place spontaneously. But such situations are very unlikely and extremely rare in our experience. In its generalized form, the condition is then:

(16) A verb meaning that refers to a change of state or a going-on may appear in an inchoative/causative alternation unless the verb contains agent-oriented meaning components or other highly specific meaning components that make the spontaneous occurrence of the event extremely unlikely.

Thus, the semantic conditions on inchoative/causative alternations are quite strong. The large majority of simple, non-derived verbs cannot appear in this alternation in most languages. Given these heavy restrictions, it is not surprising that anticausatives and causatives are generally derivational rather than inflectional categories (inflectional expression requires high lexical generality, cf. Bybee (1985: 16-17)).

However, it would be a gross exaggeration to say, as Marantz (1984: 181-82) does, that "unlike passivization, for example, the anticausative alternation is limited cross-linguistically to a restricted class of verbs with some semantic coherence". While it is true that anticausative verb pairs show some semantic coherence along the lines of (16), the rich diversity of verb meanings as represented in (2)-(11) and Table 2 below argue against Marantz's claim that they are not created by a productive lexical rule, but "by analogy from a few core examples".

This alternation is particularly regular in verbs that are derived from adjectives. For example, every German factitive derivation can form an anticausative with the particle *sich*, and every Russian factitive derivation can form an anticausative in *-sja*.

(17) German adjectives, factitives, and anticausatives

flüssig	'liquid':	*verflüssigen*	'make liquid'
		sich verflüssigen	'become liquid'
anders	'different':	*verändern*	'change (tr.)'
		sich verändern	'change (intr.)'
voll	'full':	*füllen*	'fill (tr.)'
		sich füllen	'fill (intr.)'
stark	'strong':	*verstärken*	'reinforce'
		sich verstärken	'become strong'

(18)

lučšij	'better':	*ulučšit'*	'improve (tr.)'
		ulučšit'-sja	'improve (intr.)'
vysokij	'high':	*povysit'*	'raise'
		povysit'-sja	'rise'
širokij	'wide':	*rasširit'*	'widen (tr.)'
		rasširit'-sja	'widen (intr.)'

Similarly, many English derivations in *-ize* are labile, i.e. can be used both as inchoatives and as causatives, e.g. *we generalized the solution/the solution generalized*, etc. (cf. Keyser & Roeper 1984: 389). The reason why deadjectival factitives systematically appear in the inchoative/causative alternation is that they generally contain only the meaning component 'cause to become' in addition to the adjectival meaning, and this meaning component is neither agent-oriented nor otherwise too specific or unlikely.

The semantic characterization of verbs in inchoative/causative alternations given in (16) seems to be a good candidate for a universal. However, occasionally one finds examples where different languages behave differently with respect to inchoative/causative alternations. Consider the examples in (19)-(20).[9]

(19) Russian anticausative
Kamni mojut-sja v reke.
stones wash:3PL-ANTIC in river
'The stones are washed in the river.'

(20) Slave (Athabaskan) inchoative and causative (Rice 1989: 454)
a. *bé whet'e.*
meat be.cooked
'The meat is cooked.'
b. *bé whe-h-t'e.*
meat be.cooked-CAUS
'She cooked the meat.'

The Russian anticausative in (19) and the Slave basic verb in (20) can only

be translated by an English passive, i.e. there is no corresponding inchoative/causative pair in English. Such differences between languages can be interpreted in two ways: (i) the characterization in (16) is not universal but differs slightly for different languages, or (ii) the individual verb meanings differ across languages, such that e.g. Russian *myt'* does not mean exactly the same as English *wash*, and Slave *whet'e* does not mean exactly the same as English *be cooked*. Since there can be no doubt that verb meanings coincide only imperfectly across languages, it may well be that such individual differences account for contrasts as in (19)-(20) and that the semantic characterization in (16) still has universal status. I must leave this question unresolved here.

4. The sample

Let us now turn to the cross-linguistic data that will tell us more about the typological distribution of the various formal types of expressing the inchoative/causative alternation.

Nedjalkov (1969) gathered data for four alternations ('laugh/make laugh', 'boil (intr.)/(tr.)', 'burn (intr.)/(tr.)', 'break (intr.)/(tr.)') from sixty languages (i.e. 240 verb pairs). I will discuss his results below. In this paper I will present data from 21 languages for 31 alternations (ca. 600 verb pairs). Although the number of languages is smaller and my language sample is more biased, the greater number of verb pairs in this study leads to interesting further insights into the role of verb meaning in inchoative/causative alternations (cf. sections 7-8), resulting in a proposal for resolving the puzzle presented in section 1. Furthermore, they allow a typological characterization of the languages (cf. section 6).

The 21 languages were chosen mainly because I could get the relevant data for them. They are hardly representative of the world's languages (not a single Australian or New World language is represented), but neither are all of them Indo-European or European. The 21 languages are listed in Table 1.

The 31 verb pairs are all verbs with a rather basic meaning that can be easily identified by means of a dictionary. It is hoped that they are reasonably representative of inchoative/causative alternations in general. Since it is unclear how the notion of a representative sample of verbs can be made more precise, I had to rely on impressionistic observations. Most of the data (listed in the appendix) were gathered from dictionaries.

Table 1. The 21 languages of the sample

(Indo-European)	Russian, Lithuanian, German, English, French, Rumanian, Greek, Armenian, Hindi-Urdu
(Finno-Ugric)	Hungarian, Finnish, Udmurt
(Afro-Asiatic)	Arabic, Hebrew
(Turkic)	Turkish
(Mongolian)	Khalkha Mongolian
(Nakho-Daghestanian)	Lezgian
(Kartvelian)	Georgian
(Niger-Congo)	Swahili
(Austronesian)	Indonesian
(unclassified)	Japanese

Table 2. The 31 inchoative/causative verb pairs

1. 'wake up (intr.)/(tr.)'	12. 'change (intr.)/(tr.)'	22. 'finish (intr.)/(tr.)'
2. 'break (intr./(tr.)'	13. 'melt (intr.)/(tr.)'	23. 'turn (intr.)/(tr.)'
3. 'burn (intr.)/(tr.)'	14. 'be destroyed/destroy'	24. 'roll (intr.)/(tr.)'
4. 'die/kill'	15. 'get lost/lose'	25. 'freeze (intr.)/(tr.)'
5. 'open (intr.)/(tr.)'	16. 'develop (intr.)/(tr.)'	26. 'dissolve (intr.)/(tr.)'
6. 'close (intr.)/(tr.)'	17. 'connect (intr.)/(tr.)'	27. 'fill (intr.)/(tr.)'
7. 'begin (intr.)/(tr.)'	18. 'boil (intr.)/(tr.)'	28. 'improve (intr.)/(tr.)'
8. 'learn/teach'	19. 'rock (intr.)/(tr.)'	29. 'dry (intr.)/(tr.)'
9. 'gather (intr.)/(tr.)'	20. 'go out/put out'	30. 'split (intr.)/(tr.)'
10. 'spread (intr.)/(tr.)'	21. 'rise/raise'	31. 'stop (intr.)/(tr.)'
11. 'sink (intr.)/(tr.)'		

5. Difficulties with the formal classification of inchoative/causative verb pairs

The classification of the 31 verb pairs in 21 languages into the five formal categories identified in section 2 is not always without problems. A difficulty that has already been alluded to concerns the direction of derivation in verb alternations expressed by stem modification. The direction of derivation is easy to establish when one of the verbs contains a segmental string (an affix, a particle, or an auxiliary verb) that is absent in the other one (cf. examples (6-7)(a-b)). But with stem modification (examples (6-7)(c)), it is not always easy to distinguish the basic stem and the modified stem. The main criteria for identifying the basic stem are (i) phonological markedness,

(ii) direction of neutralization, and (iii) productivity.

The criterion of phonological markedness can be illustrated by the Arabic alternation *darasa* 'learn' / *darrasa* 'teach'. Here *darrasa* is taken as derived because the geminate *rr* is phonologically more marked than simple *r*.

The direction of neutralization is criterial in Hindi-Urdu pairs like *phir-naa/pher-naa* 'turn (intr.)/(tr.)', *pit-naa* 'take a licking' / *piit-naa* 'beat up' (cf. example (7c)). In such alternations, the inchoative verb generally has a high vowel (*i, u*), whereas the causative may have a high vowel (*ii, uu*) or a mid vowel (*e, o*). That is, the neutralization is in the direction of the inchoative and hence the causative is basic/less marked.[10] This criterion also applies in the case of the Arabic causative of the type *darrasa*: the pattern here is always *CaCCaCa*, whereas the corresponding non-causatives can have the patterns *CaCaCa* (e.g. *darasa*), *CaCiCa* (e.g. *rakiba* 'ride' / *rakkaba* 'make ride'), and *CaCuCa* (e.g. *sarufa* 'be noble' / *sarrafa* 'ennoble').

According to the criterion of productivity, if new verbs can be derived by means of stem modification only in one direction, this is the direction of derivation of the whole pattern. For example, an Arabic *CaCCaCa* causative can productively be derived from any *CaCVCa* verb, whereas new *CaCCaCa* do not give rise to derived *CaCVCa* verbs. Similarly, in Hindi-Urdu only the derivation of inchoatives from causatives is productive, not the reverse direction (Saksena 1982: 18-19).

Another difficulty concerns verb pairs that differ not in their stem but in their inflection. For example, in Basque (not represented in my sample) tense and person/number are generally expressed on an auxiliary which is different for transitive and intransitive verbs, e.g. intransitive *joan da* 's/he went', transitive *ikusi du* 's/he saw it'. Inchoative/causative alternations are sometimes expressed solely by means of different auxiliaries, e.g. *hil da* 's/he died', *hil du* 's/he killed her/him'. It is not clear whether such pairs should be classified as equipollent or labile. Some German verbs behave similarly, cf. (21).

(21) a. *Der Krug ist zerbrochen.*
'The jug has broken.'
b. *Wer hat den Krug zerbrochen?*
'Who has broken the jug?'

The German verbs of this type (also *verbrennen* 'burn', *schmelzen* 'melt', *(er)löschen* 'go out/put out', *rollen* 'roll', *einfrieren* 'freeze', *trocknen* 'dry') have been classified as labile here because the inflection is different only in certain forms and one would not say that the verbs are derived from the stem by means of the auxiliary (in contrast to Basque, where one might well adopt this view).

Another case of different inflection is the Greek Active/Middle opposition, e.g. *sikóno* 'raise' vs. *sikónome* 'rise'. Such pairs have been classified as anticausative here on the basis of the criteria of morphological markedness (corresponding to phonological markedness, as discussed above) and productivity. The Greek Middle forms are morphologically marked in that they are all more complex (consist of more segments) than the corresponding Active forms, cf. the paradigms in (22).

(22)

Greek		Active	Middle
SG	1	*sikón-o*	*sikón-ome*
	2	*sikón-is*	*sikón-ese*
	3	*sikón-i*	*sikón-ete*
PL	1	*sikón-ume*	*sikon-ómaste*
	2	*sikón-ete*	*sikon-ósaste*
	3	*sikón-un*	*sikón-onde*

The criterion of productivity exhibits the same asymmetry. While Middle forms in *-ome* (etc.) can freely be formed from new Active verbs, new Middle forms do not give rise to derived Active forms (e.g. the deponent *érxome* 'come' does not allow the formation of a corresponding causative **érxo* 'make come').

Another possible case of different inflection are Japanese alternations like *yak-e-ru/yak-u* 'burn (intr.)/(tr.)'.[11] It could be that Japanese *-e-* in verbs like *yak-e-ru* is not a verb-deriving suffix, but just an affix associated with a different conjugation class. However, I have classified such pairs as asymmetric because Japanese *-e-* is consistently preserved across the verbal paradigm (*yak-e-masu*, *yak-e-nai*, *yak-e-ta*, contrasting with *yaki-masu*, *yak-anai*, *yai-ta*) and thus fulfills the criterion of morphological markedness.[12]

Not all of my classificatory decisions will meet with unanimous agreement, but I hope to avoid some misunderstandings by making explicit these criteria, which I think best serve the overall purpose of this paper, the establishment of a correlation between semantic and formal markedness.

Another problem with the methodology used here should briefly be mentioned. This methodology would work optimally if the likelihood of a

verb pair being expressed in a particular way depended only on the verb meaning and on the language type. But in several languages it is clear that it also depends on formal properties of the verb stem. For example, in Armenian the causative expression type is clearly favored if the verb is derived by means of the suffix *-an-*, e.g. *artn-an-al* 'wake up (intr.)', causative *artn-a-cn-el* 'wake up (tr.)'. Of the nine Armenian causatives in the sample, six are derived from *-an*-verbs. In Hindi-Urdu, all borrowed verbs are of the equipollent type, because the only way to borrow a verb is by compounding a borrowed event noun with the auxiliary *kar-naa* 'do' or *ho-naa* 'become'. In Modern Greek, verbs borrowed from Ancient Greek (or Katharevousa) are of the anticausative type because this is the most common expression type in Ancient Greek (in contrast to vernacular Modern Greek, where labile verbs are very common). In German, equipollent pairs like *aufwachen/aufwecken* 'wake up', *lernen/lehren* 'learn/teach', *versinken/versenken* 'sink' belong to an old Indo-European formation type that has long since become unproductive.

Thus, there are several cases where the origin or age of a verb seems to determine its expression type. This is probably one of the major factors accounting for the "noise" in the statistical data presented below. There does not seem to be an obvious way around it, but fortunately it does not destroy the correlations completely.

6. Typological characterization of the languages

Before discussing our main question (the basic-derived relationship in the light of the typological data), let us look at the ways in which the languages of the sample differ from each other in the expression of the 31 inchoative/causative pairs.

Table 3 gives the numbers of verb pairs in each language that belong to each of the five formal types distinguished in section 2. In addition, the ratio of the numbers of anticausative pairs and causative pairs and the percentage of non-directed pairs were calculated. The total number of verbs is not always 31 because I lacked some of the data for several languages. When there are two synonymous verb pairs that show different expression types, each of them was counted as 0.5.

Table 3 shows that languages differ considerably in their preferences for different types in expressing the inchoative/causative alternation. Some languages have a directed alternation (anticausative or causative) in almost

Table 3. Expression types by language

	total	A	C	E	L	S	A/C	% non-dir.
Russian	31	23	0	5	0	3	46.00	26
German	31	14.5	0	4	11.5	1	29.00	53
Greek	31	13.5	0	0	16.5	1	27.00	56
Rumanian	30	24	1	0	3	2	24.00	17
French	31	20.50	2	0	7.5	1	10.25	27
Lithuanian	31	17.5	6	6	0.5	1	2.92	24
Hebrew	31	20.5	7.5	2	1	0	2.73	10
Arabic	31	17	8.5	3	1	1.5	2.00	18
Georgian	31	9	4.5	15.5	0	2	2.00	56
Armenian	31	16	8.5	5.5	0	1	1.88	21
Swahili	31	11	11	8	0	1	1.00	29
Finnish	28	12	13.5	0.5	0.5	1.5	0.88	9
Udmurt	31	10.5	12.5	4.5	2.5	1	0.84	26
Hungarian	31	7	9	12	0	3	0.78	48
Lezgian	31	8	12	6	5	0	0.66	35
Hindi-Urdu	31	7.5	14	7.5	2	0	0.54	31
Turkish	30	9	17.5	2.5	0	1	0.51	12
Mongolian	31	6	22	2	0	1	0.27	10
Indonesian	31	0	14	17	0	0	0.04	55
English	31	2	0	1	25	3		94
Japanese	31	3.5	5.5	20.5	0.5	1		71
total	636	243	164.5	128.5	69	310		

Abbreviations:
A = anticausative alternation
C = causative alternation
E = equipollent alternation
L = labile alternation
S = suppletive alternation
A/C = ratio of anticausative to causative pairs
% non-dir. = percentage of non-directed pairs

all cases, e.g. Finnish, Turkish, Mongolian, and Hebrew. Other languages exhibit a significant proportion of non-directed alternations, e.g. English, Japanese, Indonesian, Georgian, German, and Greek. It should be noted that English is unique in the sample in showing as strong a preference for non-directed alternations as Finnish and Turkish show for directed alternations.

But also within languages with many non-directed alternations, there are significant typological divergences. Japanese, Indonesian, and Geor-

gian prefer equipollent marking of both members, whereas English, German, and Greek prefer labile verbs.[13] The overwhelming preference for labile verbs in English is quite unique, and one suspects that it is connected with the fact that English shows little morphology in general (cf. Nichols 1986: 157). However, a larger sample including some isolating languages would be required to test this hypothesis.

The typological diversity of the ratio of anticausative to causative alternations is also substantial. Except for English and Japanese, all languages of the sample have a sufficiently large number of directed alternations to enter into the comparison. The languages in Table 3 are arranged in the order from the greatest preference for anticausative derivations to the greatest preference for causative derivations.

For this typological parameter, both extremes are well-represented in the sample. On the one hand, there are languages like Russian, Rumanian, Greek, French, and German with a strong preference for anticausatives and very few causatives. On the other hand, there are languages like Indonesian which have almost no anticausatives and rely heavily on causatives.

One might wonder whether the typological parameter of anticausative vs. causative preference is connected with any other facts of the languages. The only correlation that comes to mind immediately is a geographical one: Languages that prefer anticausatives are spoken in Europe, and languages that prefer causatives are spoken elsewhere. The absence of causative morphology and the importance of anticausative derivations seems to be a European areal feature.

Against this interpretation one might object that the anticausative-preferring European languages are not only geographically adjacent, but also genetically related. Indeed, the anticausative marker is etymologically identical in four of the European languages (Russian *-sja*, German *sich*, French and Rumanian *se*, going back to the Proto-Indo-European reflexive pronoun **s(w)e-*). However, this cannot be the whole story, as the non-European Indo-European language Hindi-Urdu shows. The Indic languages inherited the same reflexive pronoun **s(w)e-* from the proto-language, and the European languages also inherited the same causative marker (Proto-Indo-European **-eye/o-*) which is still very productive today in Hindi-Urdu, but is now restricted to a few lexical items in Germanic and Slavic languages (e.g. German *senken* 'sink (tr.)' vs. *sinken* 'sink (intr.)', Russian *utopit'* 'sink (tr.)' vs. *utonut'* 'sink (intr.)'), and was lost completely in Greek and Romance.

Two further points lend some support to the European areal hypothesis: First, Modern Greek also strongly prefers anticausatives to causatives, although its genetic relationship to Slavic and Germanic is not closer than to Hindi-Urdu or Armenian, and although it uses a totally different device for deriving anticausatives (special subject person/number suffixes). Second, among the Uralic and Altaic languages of the sample, those that are spoken in Europe (Hungarian, Finnish, Udmurt) show a higher proportion of anticausatives than those that are spoken outside of Europe (Turkish, Mongolian).[14]

7. Different preferences for the direction of derivation in different verbs

After having looked at the way languages differ with respect to their preferences for different expression types, we now turn to the preferences of individual verbs for different expression types. Table 4 gives for each verb the number of languages in which it is expressed in each of the five expression types.

The figures in Table 4 can immediately be compared to the results obtained by Nedjalkov (1969), shown in Table 5. The figures from my investigation fully confirm Nedjalkov's results.[15] While my data are from fewer languages and are more areally and genetically biased, they are from a much larger number of verbs and therefore allow us to test the explanatory hypothesis advanced in Haspelmath (1987:19-21) and Nedjalkov (1990).[16]

In Haspelmath (1987) I argued, following a study on Japanese by Jacobsen (1985), that a factor favoring the anticausative expression type is the probability of an outside force bringing about the event. Conversely, the causative expression type is favored if the event is quite likely to happen even if no outside force is present (similarly Nedjalkov 1990). A very similar account is given by Croft (1990: 60): "the more typically the change of state requires an external agent, the more likely the causative type will be unmarked". This hypothesis seems to be borne out by the data. Events such as freezing, drying, sinking, going out, and melting occur commonly in nature around us and do not need an agentive instigator.[17] On the other hand, events such as splitting, breaking, closing, opening, gathering and connecting are typical of the kinds of things that human beings do. In both cases, the correlation is only typical, not necessary: Human agents may sink, extinguish, dry, melt, and even freeze things, and things may split,

Table 4. Expression types by verb pairs

	total	A	C	E	L	S	A/C
18. 'boil'	21	0.5	11.5	3	6	0	0.04
25. 'freeze'	21	2	12	3	4	0	0.17
29. 'dry'	20	3	10	4	3	0	0.30
1. 'wake up'	21	3	9	6	2	1	0.33
20. 'go out/put out'	21	3	7.5	5.5	3	2	0.41
11. 'sink'	21	4	9.5	5.5	1.5	0.5	0.42
8. 'learn/teach'	21	3.5	7.5	6	2	3	0.47
13. 'melt'	21	5	10.5	3	2.5	0	0.48
31. 'stop'	21	5.5	9	3.5	3	0	0.61
23. 'turn'	21	8	7.5	4	1.5	0	1.07
26. 'dissolve'	21	10.5	7.5	2	1	0	1.40
3. 'burn'	21	7	5	2	5	2	1.40
14. 'destroy'	20	8.5	5.5	5	1	0	1.55
27. 'fill'	21	8	5	5	3	0	1.60
22. 'finish'	21	7.5	4.5	5	4	0	1.67
7. 'begin'	19	5	3	3	8	0	1.67
10. 'spread'	21	11	6	3	1	0	1.83
24. 'roll'	21	8.5	4.5	5	3	0	1.89
16. 'develop'	21	10	5	5	1	0	2.00
15. 'get lost/lose'	21	11.5	4.5	4.5	0	0.5	2.56
21. 'rise/raise'	21	12	4.5	3.5	0	1	2.67
28. 'improve'	21	8.5	3	8	1.5	0	2.67
19. 'rock'	21	12	40	3.5	1.5	0	3.00
17. 'connect'	21	15	2.5	1.5	1	1	6.00
12. 'change'	21	11	1.5	4.5	4	0	7.33
9. 'gather'	21	15	2	3	1	0	7.50
5. 'open'	21	13	1.5	4	2.5	0	8.67
2. 'break'	21	12.5	1	4	3.5	0	12.50
6. 'close'	21	15.5	1	2.5	2	0	15.50
30. 'split'	20	11.5	0.5	5	3	0	23.00
4. 'die/kill'	21	0	3	1	1	16	—
total	636	243	164.5	128.5	69	31	

Table 5. Expression types by verb pairs (Nedjalkov 1969)

	total	A	C	E	L	S	others	A/C
'laugh/make laugh'	60	0	54	6	0	0	0	0
'boil'	60	2	36	5	9	7	1	0.05
'burn'	60	8	19	5	14	14	0	0.42
'break'	60	22	9	8	19	0	2	2.44
total	240	32	118	17	42	21	3	0.27

break, close, gather, and even connect spontaneously, but this is much less likely and less typical.

While learning does not happen spontaneously in nature, it does commonly happen without an external teaching agent. Indeed, learning may be regarded as an agentive event itself, and in many languages the verb 'learn' is even transitive.[18] An extreme case is 'laugh', which is so typically spontaneous that it is hardly ever expressed as an anticausative.[19]

It is more difficult to say anything in general about the verbs that are intermediate between the two extremes, but on the whole the hypothesis of the relevance of the likelihood of spontaneous vs. caused events is strongly supported by the new cross-linguistic data of Table 4.

I should add that the semantic factor of probability of external causation is closely related to the semantic condition formulated in (16) above. In section 3, I asked the question, what makes inchoative/causative alternations (i.e. alternations that can be expressed by anticausative or non-directed alternations) **possible**? In this section I ask, what makes anticausative alternations **likely**? It turns out that these two questions receive basically the same answer. In section 3, I formulated a restriction that makes an inchoative/causative alternation so unlikely that it is for practical purposes impossible. Recall the example of the verb 'decapitate'. Above I pointed out that spontaneous decapitations are so unlikely that an inchoative version of 'decapitate' is excluded. But this is not in principle different from saying that spontaneous splitting and closing are so unlikely that few languages have a non-derived verb for the events of splitting (intr.) and closing (intr.).

We can think of various verb meanings as being located on a scale of increasing likelihood of spontaneous occurrence, as in (23).

(23) scale of increasing likelihood of spontaneous occurrence

'wash' 'close' 'melt' 'laugh'

inchoative/causative alternations

Verb meanings on the left of this scale (e.g. 'wash', 'decapitate') are so unlikely to occur spontaneously that they can never or almost never occur in an inchoative/causative alternation. The closest approximation to an inchoative version is a passive ('is washed'). The next category of verbs (e.g. 'close') is somewhat more likely to occur spontaneously, but still normally caused externally. Such verbs show a preference for anticausative

expression. Verb meanings further to the right are increasingly more likely to occur spontaneously. In verbs like 'melt' there is a preference for causative expression, while anticausative expression is still possible. Finally, in verbs on the right of the scale only causative derivations are possible.

In the next section I will attempt to show how the hypothesis of this section explains the different preferences for the direction of derivation and how iconicity can be "saved".

To conclude this section, I would like to make one final comment on non-directed expression types. In contrast to the anticausative/causative types, verbs do not differ significantly as to the frequency with which they occur in non-directed alternations. There is only one exception: 'die/kill' is expressed by different roots (i.e. by suppletion) in 16 of the 21 languages. This would be hard to understand if only the physical meaning of 'die/kill' were considered. Physically, dying/killing is not much different from going out/putting out or other verb pairs that behave similarly. It seems that the enormous social and moral significance of the difference between spontaneous dying and agentive killing has to be taken into account in order to understand why so many languages allow themselves the luxury of different roots for these two events.[20]

8. Conceptual simplicity as the basis of semantic basic-derived relationships

In the preceding section I identified the likelihood of spontaneous vs. caused events as the main factor determining the direction of derivation in inchoative/causative verb pairs. We can explain this correlation between formal and semantic properties if we assume a broader view of the nature of the 'semantic' properties. If the semantic properties of a word are only the objective semantic features discovered by semantic decomposition (as, for instance, in Mel'čuk 1967), then causatives are always semantically more complex than inchoatives and the existence of or even preference for anticausatives is a mystery. But iconicity in language is based on conceptual meaning, and the correlation between formal and semantic basic-derived (or markedness) relationships should be understood in cognitive terms, as in Givón's (1991:106) principle:

(24) Categories that are **cognitively** marked tend also to be **structurally** marked.

From this perspective the correlation of section 7 begins to make sense. Events that are more likely to occur spontaneously will be associated with a conceptual stereotype (or prototype) of a spontaneous event, and this will be expressed in a structurally unmarked way. On the other hand, events that are more likely to occur through causation by an external agent will be associated with a stereotype of a caused event, so the caused event will be expressed in a structurally unmarked way. Essentially the same conclusion is reached in Croft (1990): "frequently experienced correlations of semantic (and pragmatic) features determine linguistic patterns" (p. 62); "What matters for the prototype is that frequently enough in ordinary experience, no obvious external agent is present." (p. 61)

It must be kept in mind that this form-meaning correlation is only a tendency that was discovered through a large-scale cross-linguistic study. This tendency is not nearly so strong as the universal preference for unmarked singulars and derived plurals, or other universal markedness patterns. The tendency described here is so weak that it is almost impossible to detect it in a single language due to interfering factors such as the type of the language (cf. section 6). However, the cross-linguistic study shows that the distribution of expression types over verb meanings is by no means random, as one would predict if "reverse word-formation" were a normal option.

An interesting parallel to the inchoative/causative alternation is provided by the derivation of person (or animal) nouns by means of motion affixes. For example, in German the word *Pfarrer* refers to a minister generically or to a male minister; from this the noun *Pfarrerin* 'female minister' can be derived by means of the female motion suffix *-in*. However, the formal basic-derived relationship corresponds to no basic-derived relationship in the real world: a *Pfarrerin* is not a *Pfarrer* who has some additional property. It is only the conceptualization in a male-dominated world that makes a *Pfarrer* conceptually simpler than a *Pfarrerin* (because a minister is more likely to be male, and male ministers are much more frequent than female ministers). Conversely, the male motion suffix *-erich* is used where a female is the more likely case, especially with animal nouns such as *Ente* '(female) duck', *Enterich* 'male duck' (cf., for example, Doleschal (1992) on markedness in German gender derivations). The different directions of derivation in male/female alternations are quite parallel to the inchoative/causative alternation (the main difference being that conceptualizations seem to differ less across languages in the male/female case).

The main question that had to be left open in this paper is the question of why the languages are distributed across the different types in just this way. Only some areal connections could be suggested here (cf. section 6). But a solution has been proposed for the serious problem that was posed at the beginning of this paper: The challenge to iconicity coming from cases of apparent reverse word-formation could be answered at least for inchoative/causative alternations. The existence of anticausatives is not a problem because the semantic markedness relationship which iconically corresponds to the formal basic-derived relationship cannot be equated with a basic-derived relationship in the real world. Semantics is conceptual, and our conceptualization of the world reflects it in a way that is profoundly influenced by our conceptual capacities. Only extensive typological comparison has made this conclusion possible.

NOTES

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1. This is Greenberg's (1963: 94) Universal 35.
2. The term *going-on* (i.e. a non-agentive activity in the Vendlerian sense) is borrowed from Quirk et al. (1985: 201).
3. The term *inchoative* is not very felicitous because it is often (and originally) used in the sense 'inceptive, beginning'. The reason for this terminological confusion is that inceptive verbs that are formed from stative expressions are inchoative verbs in the above sense, e.g. Latin verbs in *-escere* (*rubescere* 'begin to be red, become red' from *rubere* 'be red'). I use the terms inchoative/causative for want of a better alternative and because they have recently come to be used in this way (e.g. Marantz 1984; Guerssel et al. 1985; Croft 1991). A possible alternative would be the term pair *endoactive/exoactive* used in Japanese linguistics (e.g. Lewin 1959: 118-122; based on the 18th-century Japanese terminological distinction *jidooshi/tadooshi*).
4. Nedjalkov calls the labile opposition *conversive* (I avoid this term because conversion is often regarded as directed zero derivation), and the equipollent opposition *correlative* (I avoid this term because it has too many other uses).
5. Thus, an anticausative verb is an inchoative verb derived from a causative verb. Unfortunately, there is only one term, *causative*, both for the semantic verb type (corresponding to inchoative) and for the morphological type (corresponding to anticausative). It would be nice to have a different term, e.g. *aetiative* (Greek *aitía* 'cause'), for semantic verb types. Then one could say that a causative verb is a derived aetiative verb.

6. Again, the case of stem modification is less obvious than the other cases. Strictly speaking, pairs like Lithuanian *lūžti/laužti* can be regarded as equipollent only if an abstract root (e.g. {lwž}) is assumed from which both alternants are derived. In any event, it is clear that such pairs are quite different from suppletive pairs as in (9).
7. The term *labile* was borrowed from Caucasian linguistics, where it is in general use (cf., for instance, Nichols 1986: 156-161).
8. The sentence *The cloth cut (easily, etc.)* is possible with a potential passive interpretation (sometimes called "middle"), but not with an inchoative interpretation. See Haspelmath (1987: 31), Geniušienė (1987) on the relation between potential passives and anticausatives.
9. These examples were pointed out to me by Andrej Kibrik.
10. Thanks to M.H. Klaiman for pointing this out to me.
11. This was pointed out to me by Hartmut Haberland.
12. Shibatani (1990: 235-236) also considers the suffix *-e-* as a verb-deriving suffix. Lewin (1959: 118-122), however, opts for the conjugation-class view.
13. Incidentally, German and Greek are counterexamples to Nichols' (1986: 156-161) hypothesis that lability is associated with ergative alignment and with the lack of detransitivizing word-formation and relation-changing syntactic rules.
14. Again, one might object that the distribution coincides with genetic relationships: Uralic languages show more anticausatives, Altaic languages show more causatives. The crucial test would come from the non-European Uralic languages (Samoyedic, Ob-Ugric), and perhaps from the Altaic languages that can be considered part of the European linguistic area (such as Karaim, Gagauz, Chuvash).
15. The major divergence between Table 4 and Table 5 concerns the relation between the total number of anticausative verb pairs and causative verb pairs. In Table 4, there are more anticausatives than causatives, whereas in Table 5 there are significantly more causatives than anticausatives. Since my sample is biased in favor of European languages, which prefer anticausatives (cf. section 6), Nedjalkov's numbers are probably more representative of the world's languages (although his sample is also biased in that it includes too few languages from the New World and Oceania). Another reason for the high number of causatives is that Nedjalkov included the alternation 'laugh/make laugh', which can only marginally be regarded as an inchoative/causative alternation.
16. Croft (1990) also carried out a cross-linguistic study of basic-derived relationships in verbs. His study represents the other extreme: he considers only four languages (English, French, Japanese, Korean), but a much larger range of verb meanings. Since he does not quantify his results, they are not compared directly here. However, his results are very similar to those obtained by Nedjalkov and myself.
17. Boiling, which leads the list of anticausative-preferring verbs, is somewhat special. It occurs in nature mainly as a result of volcanic activities. But human agents may boil liquids only very indirectly, by using the natural force of fire, which may account for the behavior of 'boil'. Nedjalkov (1990) observes that the boiling patient is seen as more active than the burning or breaking patient because it is in movement and creates bubbles.

18. 'Learn' is one of the few exceptions to the generalization made in section 2 that "inchoative verbs are generally intransitive".

19. Nedjalkov (1990) cites Macedonian as the only case (from 120 languages) where 'laugh' (*smee se*) is the anticausative of 'make laugh' (*smee*).

20. As Maria Polinsky points out (p.c.), there might also be an areal/cultural connection here: All languages that have non-suppletive pairs for 'die/kill' are non-European (Hebrew, Hindi-Urdu, Indonesian, Lezgian, Turkish). However, there are six other non-European languages that have suppletion (like all the European languages), and the European language Basque (not in the sample, but mentioned in section 5) has the non-suppletive pair *hil da* 'dies' / *hil du* 'kills'.

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APPENDIX

The 31 inchoative/causative verb pairs in 21 languages
(Abbreviations as in Table 3)

Arabic

1. ist-ayqaẓa/ʔ-ayqaẓa (A); ṣaħaa/ṣaħħaa (C)
2. in-kasara/kasara (A)
3. iħ-t-araqa/ʔ-aħraqa (E)
4. maata/qatala (S)
5. in-fataħa/fataħa (A)
6. in-qafala/qafala (A)
7. badaʔa (L)
8. darasa/darrasa (C); ta-ʕallama/ʕallama (A)
9. il-t-amma/lamma (A)
10. in-t-ašara/našara (A)
11. ġariqa/ʔ-aġraqa (C)
12. ta-baddala/baddala (A)
13. in-ṣahara/ṣahara (A); saaħa/sayyaħa (C)
14. damara/dammara (C)
15. daaʕa/xasira (S); fuqida/faqada (A)
16. ta-ṭawwara/ṭawwara (A)
17. ir-t-abaṭa/rabaṭa (A)
18. ġalaa/ʔ-aġlaa (C)
19. ta-ʔarjaħa/ʔarjaħa (A)
20. in-ṭafaʔa/ʔ-aṭfaʔa (E)
21. ir-t-afaʕa/rafaʕa (A)
22. in-t-ahaa/ʔ-anhaa (E)
23. daara/ʔ-adaara (C)
24. ta-daħraja/daħraja (A)
25. ta-jammada/jammada (A)
26. ðaaba/ʔ-aðaaba (C)
27. im-t-alaʔa/malaʔa (A)
28. ta-ħassana/ħassana (A)
29. jaffa/jaffafa (C)
30. in-šaqqa/šaqqa (A)
31. waqafa/waqqafa (C)

Armenian (citation form suffix *-al/-el*)

1. artna-n-al/artna-cn-el (C)
2. ǯard-v-el/ǯard-el (A)
3. ayr-v-el/ayr-el (A)
4. spa-n-el/meɾ-n-el (S)
5. bac-v-el/bac-an-al (E)
6. pak'-v-el/pak'-el (A)
7. sks-v-el/sks-el (A)
8. sovor-el/sovor-ecn-el (C)
9. havak-v-el/havak-el (A)
10. əndarc'ak'-v-el/əndarc'ak'-el (A)
11. xegol-v-el/xegol-el (A)
12. pox-v-el/pox-el (A)
13. hal-v-el/hal-el (A)
14. kand-v-el/kand-el (A)
15. k'or-č-el/k'or-cn-el (E)
16. zarga-n-al/zarga-cn-el (C)
17. k'ap'-v-el/k'ap'-el (A)
18. eɾ-al/eɾa-cn-el (C)
19. č'oč'-v-el/č'oč'-el (A)
20. hang-č-el/hang-cn-el (E)
21. barʒra-n-al/barʒra-cn-el (C)
22. verša-n-al/verša-cn-el (C)
23. ptt-v-el/ptt-el, ptt-ecn-el (A, E)
24. glor-v-el/glor-el (A)
25. saɾ-č-el/saɾ-ecn-el (E)
26. luc'-v-el/luc'-el (A)
27. lc-v-el/lc-n-el (E)
28. lava-n-al/lava-cn-el (C); barelav-v-el/barelav-el (A)
29. čora-n-al/čora-cn-el (C)
30. č'eɣk-v-el/č'eɣk-el (A)
31. k'angn-el/k'angn-ecn-el (C)

English

see above Table 2.

Finnish

1. herätä/herä-ttää (C)
2. murt-ua/murtaa (A)
3. palaa/pol-ttaa (C)
4. kuolla/tappaa (S)
5. ava-utua/avata (A)
6. sulke-utua/sulkea (A)
7. alkaa (?)/aloittaa, alkaa
8. oppia/ope-ttaa (C)
9. kok-oontua/koota (A)
10. levitä/levi-ttää (C)
11. vaipua, laskea/laskea (S, L)
12. muutt-ua/muuttaa (A)
13. sulaa/sula-ttaa (C)
14. tuho-utua/tuhota (A)
15. hukk-ua, hukk-aantua/hukata
16. kehitt-yä/kehittää (A)
17. yht-yä/yhdistää
18. kiehua/kiehu-ttaa (C)
19. kiikkua/kiiku-ttaa (C)
20. sammua/sammu-ttaa (C)
21. kohota/koho-ttaa (C)
22. lopp-ua/lope-ttaa (E); päätt-yä/päättää (A)
23. pyöriä/pyöri-ttää (C); vääntyä/vääntää (A)
24. vieriä/vieri-ttää (C)
25. jäätyä/jäädy-ttää (C)
26. liueta/liuo-ttaa (C)
27. täytt-yä/täyttää (A)
28. parant-ua/parantaa (A)
29. kuivaa/kuivata
30. haljeta/halkaista
31. pysähtyä/pysähd-yttää (C)

French

1. se réveiller/réveiller (A)
2. se briser/briser (A)
3. brûler (L)
4. mourir/tuer (S)
5. s'ouvrir/ouvrir (A)
6. se fermer/fermer (A)
7. commencer (L)
8. apprendre (L)
9. s'assembler/assembler (A)
10. s'étendre/étendre (A)
11. s'enfoncer/enfoncer (A)
12. changer (L)
13. fondre/faire fondre (C)
14. être détruit/détruir (A)
15. se perdre/perdre (A)
16. se développer/développer (A)
17. se lier/lier (A)
18. bouillir/faire bouillir (C)
19. se balancer/balancer (A)
20. s'éteindre/éteindre (A)
21. se lever/lever (A)
22. finir (L)
23. se tourner/tourner (A)
24. rouler (L)
25. geler (L)
26. se dissoudre/dissoudre (A)
27. se remplir/remplir (A)
28. s'améliorer/améliorer (A)
29. sécher (L); se dessécher/dessécher (A)
30. se fendre/fendre (A)
31. s'arrêter/arrêter (A)

Georgian

1. ga-i-ɣviʒ-ebs/ga-a-ɣviʒ-ebs (E)
2. i-mt'vreva/a-mt'vrevs (E)
3. i-c'v-is/c'v-av-s (A)
4. mo-k'vdeba/mo-k'lavs (S)
5. ga-i-ɣ-eba/ga-a-ɣ-ebs (E)
6. da-i-xur-eba/da-xur-avs (A)
7. da-i-c'q-eba/da-i-c'q-ebs (E)
8. i-sc'avl-is/a-sc'avl-is (E)
9. še-i-k'rib-eba/še-k'reb-s (A)
10. ga-vrcel-deba/ga-a-vrcel-ebs (E)
11. da-i-xrč-oba/a-xrč-obs (E)
12. še-i-cvl-eba/še-cvl-is (A)
13. ga-dn-eba/ga-a-dn-obs (C)
14. da-i-ngr-eva/da-a-ngr-evs (E)
15. i-k'arg-eba/k'arg-avs (A)
16. da-i-šl-eba/da-šl-is (A)
17. še-e-xam-eba/še-u-xam-ebs (A)
18. duɣ-s/a-duɣ-ebs (C)

19. i-rxeva/a-rxevs (E)
20. kr-eba/a-kr-obs (E)
21. a-dg-eba/a-i-γ-ebs (S)
22. ga-tav-deba/ga-a-tav-ebs (E)
23. brun-avs, mo-brun-deba/a-brun-ebs (C, E)
24. mi-gor-av-s/mi-a-gor-ebs (C)
25. ga-i-qin-eba/ga-qin-avs (A)
26. ga-i-xsn-eba/ga-xsn-is (A)
27. a-i-vs-eba/a-a-vs-ebs (E)
28. ga-umǯobes-deba/ga-a-umǯobes-ebs (E)
29. šr-eba/a-šr-obs (C)
30. ga-i-p'-oba/ga-a-p'-obs (E)
31. ga-čer-deba/ga-a-čer-ebs (E)

German

1. aufwachen/aufwecken (E)
2. zerbrechen (L)
3. verbrennen (L)
4. sterben/töten (S)
5. sich öffnen/öffnen (A)
6. sich schliessen/schliessen (A)
7. anfangen (L)
8. lernen/lehren (E)
9. sich sammeln/sammeln (A)
10. sich ausbreiten/ausbreiten (A)
11. versinken/versenken (E)
12. sich verändern/verändern (A)
13. schmelzen (L)
14. kaputt gehen/machen (E)
15. verloren gehen/verlieren (A)
16. sich entwickeln/entwickeln (A)
17. sich verbinden/verbinden (A)
18. kochen (L)
19. (sich) schaukeln/schaukeln (L, A)
20. erlöschen/löschen (L)
21. sich heben/heben (A)
22. enden/beenden (L)
23. sich umdrehen/umdrehen (A)
24. rollen (L)
25. einfrieren (L)
26. sich auflösen/auflösen (A)
27. sich füllen/füllen (A)
28. sich verbessern/verbessern (A)
29. trocknen (L)
30. sich spalten/spalten (A)
31. anhalten (L)

(Modern) Greek

1. ksipnó (L)
2. spázo (L); tsakízome/tsakízo (A)
3. kéome/kéo (A)
4. pethéno/skotóno (S)
5. anígho (L)
6. klíno (L)
7. arxízo (L)
8. mathéno (L)
9. singendrónome/singendróno (A)
10. dhiadhídhome/dhiadhídho; aplónome/aplóno (A)
11. vithízome/vithízo (A)
12. alázo (L)
13. lyóno (L); tíkome/tíko (A)
14. xalnó (L)
15. xánome/xáno (A)
16. anaptísome/anaptíso (A)
17. sindhéome/sindhéo (A)
18. vrázo (L)
19. liknízome/liknízo (A)
20. svíno (L)
21. sikónome/sikóno (A)
22. telióno (L)
23. jirízo (L); stréfome/stréfo (A)
24. kiliéme/kilió (A)
25. paghóno (L)
26. dhialíome/dhialío (A)
27. jemízo (L)
28. veltiónome/veltióno (A); kaliterévo (L)
29. steghnóno (L); apoksirénome/apoksiréno (A)
30. xorízo (L)
31. stamatáo (L)

Hebrew

1. hit-ʕorer/he-ʕir, ʕorer (E, A)
2. ni-šbar/šavar (A)
3. ni-sraf/saraf (A)
4. mat/he-mit (C)
5. ni-ftah/patah (A)
6. ni-sgar/sagar (A)
7. hitħil, heħil (L)
8. lamad/limed (C)
9. hit-ʔasef, ne-ʔesaf/ʔasaf (A)
10. hit-pares/paras (A)
11. tavaʕ/tibaʕ, hi-tbiaʕ (C)
12. hi-štana/šina (A)
13. na-mas/he-mes (E)
14. harav/he-heriv (C)
15. ʔavad, neʔevad/ʔibed (C, E)
16. hit-pataħ/pataħ (A)
17. hit-kašer/kišer (A)
18. rataħ/hi-rtiaħ (C)
19. hit-nadned/nidned (A)
20. kava/kiba (C)
21. hit-romem/romem (A)
22. ni-gmar/gamar (A)
23. hi-stovev/sovev (A)
24. na-gol/galal (A)
25. kafa/hi-kfi (C)
26. hit-porer/porer (A)
27. hit-male/mile (A)
28. hi-štaper/šiper (A)
29. hit-yabeš/yibeš (A)
30. hit-pacel/picel (A)
31. ne-ʕecar/ʕacar (A)

Hindi-Urdu (citation form suffix *-naa*)

1. jaag-naa/jag-aa-naa (C)
2. ṭuuṭ-naa/toṛ-naa (E)
3. jal-naa/jal-aa-naa (C)
4. mar-naa/maar-naa (A)
5. khul-naa/khol-naa (A)
6. band honaa/band karnaa (E)
7. šuruu honaa/šuruu karnaa (E)
8. paṛh-naa/paṛh-aa-naa (C)
9. ikaṭṭhaa honaa/ikaṭṭhaa karnaa (E)
10. phail-naa/phail-aa-naa (C)
11. ḍuub-naa/ḍub-o-naa (C)
12. badal-naa (L)
13. pighal-naa/pighl-aa-naa (C)
14. ujar-naa/ujaar-naa (A)
15. kho jaa-naa/kho-naa (A)
16. vikaas honaa/vikaas karnaa (E)
17. bandh-naa/baandh-naa (A) lag-naa/lag-aa-naa (C)
18. ubal-naa/ubaal-naa, ubal-aa-naa (A, C)
19. hil-naa/hil-aa-naa (C)
20. bujh-naa/bujh-aa-naa (C) gul honaa/gul karnaa (E)
21. uṭh-naa/uṭh-aa-naa (C)
22. xatm honaa/xatm karnaa (E)
23. phir-naa/pher-naa, phir-aa-naa (A, C)
24. luṛhak-naa/luṛhk-aa-naa (C)
25. jamnaa/jam-aa-naa (C)
26. ghul-naa/ghul-aa-naa (C)
27. bhar-naa (L)
28. behtar honaa/behtar banaanaa (E)
29. suukh-naa/sukh-aa-naa (C)
30. phaṭ-naa/phaaṛ-naa (A)
31. ruk-naa/rok-naa (A)

Hungarian

1. fel-ébred/fel-ébresz-t (C)
2. össze-tör-ik/össze-tör (A)
3. elég/elég-et (C)
4. meg-hal/meg-öl (S)
5. kinyíl-ik/kinyi-t (E)
6. zár-ódik, zár-ul/zár (A)
7. el-kezd-ödik/el-kezd (A)
8. tan-ul/tanít (E)
9. össze-gyűl-ik/össze-gyűj-t (E)
10. terjed/terjesz-t (C)
11. el-mer-ül/el-mer-ít (E); el-süllyed/el-süllyesz-t (C)
12. meg-változ-ik/meg-változ-tat (E)
13. olvad/olvasz-t (C)
14. el-puszt-ul/el-puszt-ít (E)
15. el-vész/el-vesz-(í)t (C)
16. fejl-ődik/fejl-eszt (E)

17. szövetkezik/össze-köt (S)
18. fő/fő-z (C)
19. hintáz-ik/hintáz-tat (E); ringat-ódik/ringat (A)
20. ki-alszik/ki-olt (S)
21. emel-kedik/emel (A)
22. be-fejez-ődik/be-fejez (A)
23. forog/forg-at (C); yford-ul/ford-ít (E)
24. csavar-odik/csavar (A); gur-ul/gur-ít (E)
25. meg-fagy/meg-fagy-aszt (C)
26. old-ódik/old (A)
27. meg-tel-ik, telít-ődik/töl-t (E)
28. jav-ul/jav-ít (E)
29. szár-ad/szár-ít (E)
30. széthas-ad/szétheas-ít (E)
31. meg-áll/meg-áll-ít (C)

Indonesian

1. (ter)bangun/mem-bangun-kan (E, C)
2. patah/me-matah-kan (C)
3. ter-bakar/mem-bakar (E)
4. mati/me-mati-kan (C)
5. ter-buka/mem-buka (E)
6. tutup/me-nutup (C)
7. mulai/me-mulai (C)
8. bel-ajar/meng-ajar (E)
9. mengumpul/mengumpul-kan (C)
10. ter-sebar/me-nyebar-kan (E)
11. tenggelam/me-nenggelam-kan (C)
12. ber-ubah/meng-ubah (E)
13. men-cair/men-cair-kan (C)
14. binasa/mem-binasa-kan (C)
15. meng-hilang/ke-hilang-an (E)
16. ber-kembang/me-ngembang-kan (E)
17. ber-gabung/meng-gabung-kan (E)
18. di-rebus/me-rebus (E)
19. ber-ayun/meng-ayun (E)
20. padam/me-madam-kan (C)
21. ke-naik-an/me-naik-kan (E)
22. selesai/me-nyelesai-kan (C)
23. ber-balik/mem-balik-kan (E)
24. ber-guling/meng-guling-kan (E); menggelinding/menggelinding-kan (C)
25. membeku/membeku-kan (C)
26. larut/me-larut-kan (C)
27. ter-isi/meng-isi (E)
28. bertambah baik/mem-per-baik-i (E)
29. kering/me-ngering-kan (C)
30. ter-belah/mem-belah (E)
31. ber-henti/meng-henti-kan (E)

Japanese (citation form suffix *-u/-ru*)

1. ok-i-ru/ok-os-u (E)
2. or-e-ru/or-u; war-e-ru/war-u (A)
3. yak-e-ru/yak-u (A)
4. sin-u/koros-u (S)
5. ak-u/ak-e-ru (C); hirak-u (L)
6. toz-i-ru/toz-as-u; sim-ar-u/sim-e-ru (E)
7. hazim-ar-u/hazim-e-ru (E)
8. osow-ar-u/osi-e-ru (E)
9. atum-ar-u/atum-e-ru (E)
10. hirog-ar-u/hirog-e-ru (E)
11. sizum-u/sizum-e-ru (C)
12. kaw-ar-u/ka-e-ru (E)
13. tok-e-ru/tok-as-u (E)
14. kowa-re-ru/kowa-s-u (E)
15. naku-nar-u/naku-s-u (E)
16. hattatu su-ru/hattatu s-ase-ru (C)
17. tunag-ar-u/tunag-u, tunag-e-ru (A, E)
18. wak-u/wak-as-u (C)
19. yur-e-ru/yur-as-u (E)
20. ki-e-ru/ke-s-u (E)
21. ag-ar-u/ag-e-ru (E)
22. ow-ar-u/o-e-ru (E)
23. maw-ar-u/maw-as-u (E)
24. korog-ar-u/korog-as-u (E)
25. koor-u/koor-ase-ru (C)
26. tok-e-ru/tok-as-u (E)
27. mit-i-ru/mit-as-u (E)
28. nao-r-u/nao-s-u (E)
29. kawak-u/kawak-as-u (C)
30. sak-e-ru/sak-u (A)
31. tom-ar-u/tom-e-ru (E)

Lezgian (citation form suffix *-un/-n*)

1. axwaraj awatun/axwaraj awudun (E)
2. xu-n (L)
3. ku-n (L)
4. q'i-n (L)
5. aq^{h}a x̂un/aq^{h}aj-un (A)
6. k'ew x̂un/k'ew-un (A)
7. bašlamiš x̂un/bašlamiš-un (A)
8. čir x̂un/čir-un (A)
9. k'wat' x̂un/k'wat'-un (A)
10. čuk'-un/čuk'u-r-un (C)
11. batmiš x̂un/batmiš-ar-un (E)
12. degiš x̂un/degiš-ar-un (E)
13. c'ur-un/c'uru-r-un (C)
14. čuk'u-n/čuk'u-r-un (C)
15. kwax̂-un/kwad-ar-un (C)
16. wilik fin/wilik raqurun (E)
17. sad-sadaw q'u-nšad-sadaw q'u-r-un (C)
18. rugu-n (L)
19. eč'ä x̂un/eč'äğ-un (A)
20. tüxü-n/tüxü-r-un (C)
21. xkaž x̂un/xkaž-un (A)
22. kütäh x̂un/kütäh-un (A)
23. elqü-n/elqü-r-un (C)
24. awax̂iz-awax̂iz fin/awax̂iz-awax̂iz raqurun (E)
25. č'agu-n/č'agu-r-un (C)
26. c'uru-n/c'uru-r-un (C)
27. ac'u-n/ac'u-r-un (C)
28. q^{h}san x̂un/q^{h}san-ar-un (E)
29. q'uru-n/q'uru-r-un (C)
30. xu-n (L)
31. aqwaz-un/aqwaz-ar-un (C)

Lithuanian (citation form suffix *-ti*)

1. pabus-ti/pabud-in-ti (C)
2. lūž-ti/lauž-ti (E)
3. deg-ti/deg-in-ti (C)
4. užmuš-ti/mir-ti (S)
5. at-si-dary-ti/ati-dary-ti (A)
6. klosty-ti-s/klosty-ti (A)
7. pra-si-dė-ti/pra-dė-ti (A)
8. moky-ti-s/moky-ti (A)
9. rink-ti-s/rink-ti (A)
10. iš-si-plės-ti/iš-plės-ti (A)
11. skend-e-ti/skand-in-ti (E)
12. pa-si-keis-ti/pa-keis-ti (A)
13. iš-si-lydy-ti/iš-lydy-ti (A)
14. su-griū-ti/su-griau-ti (E)
15. pa-si-mes-ti/pa-mes-ti (A)
16. plėto-ti-s/plėto-ti (A)
17. jung-ti-s/jung-ti (A)
18. vir-ti/vir-ti, vir-in-ti (L, C)
19. sup-ti-s/sup-ti (A)
20. ges-ti/ges-in-ti (C)
21. pa-si-kel-ti, pa-kil-ti/pa-kel-ti (A, E)
22. pa-si-baig-ti/pa-baig-ti (A)
23. suk-ti-s/suk-ti (A)
24. ris-ti-s/ris-ti (A)
25. už-šal-ti/už-šal-dy-ti (C)
26. iš-tirp-ti/iš-tirp-in-ti (C); at-si-skies-ti/at-skies-ti (A)
27. pri-si-pildy-ti/pri-pildy-ti (A)
28. ger-ė-ti/ger-in-ti (E)
29. saus-ti/saus-in-ti (C)
30. per-skil-ti/per-skel-ti (E)
31. nu-trūk-ti/nu-trauk-ti (E); su-si-laiky-ti/su-laiky-ti (A)

(Khalkha) Mongolian (citation from suffix *-(V)x)*

1. ser-ex/ser-e-ex (C)
2. xuga-r-ax/xuga-l-ax; xemx-r-ex/xemx-l-ex (E)
3. šat-ax/šat-a-ax (C)
4. üx-ex/al-ax (S)
5. ongoj-x/ongoj-lg-ox (C)
6. xaa-gd-ax/xaa-x (A)
7. üüs-ex/üüs-g-ex (C)
8. sur-ax/sur-g-ax (C)
9. cugl-ax/cugl-uul-ax (C)
10. delge-r-ex/delg-ex (A)
11. živ-ex/živ-uul-ex (C)
12. öörčlö-gd-öx/öörčl-öx (A); xuvir-ax/xuvir-g-ax (C)
13. xajl-ax/xajl-uul-ax (C)
14. evd-r-ex/evd-ex (A); süjr-ex/süjt-g-ex (C)

15. xaja-gd-ax/xaj-ax (A)
16. xögž-ix/xögž-üül-ex (C)
17. xolbo-gd-ox/xolb-ox (A)
18. bucl-ax/bucal-g-ax (C)
19. dajvalz-ax/dajvalz-uul-ax (C)
20. untr-ax/untr-a-ax (C)
21. örgö-gd-öx/örg-öx (A)
22. duus-ax/duus-g-ax (C)
23. erg-ex/erg-üül-ex (C)
24. önxr-öx/önxr-üül-ex (C)
25. xöld-öx/xöld-ö-öx (C)
26. uus-ax/uus-g-ax (C)
27. düür-ex/düür-g-ex (C)
28. sajžr-ax/sajžr-uul-ax (C)
29. xat-ax/xat-a-ax (C)
30. xaga-r-ax/xaga-l-ax (E)
31. zogs-ox/zogs-o-ox (C)

Rumanian

1. se trezi/trezi (A)
2. se rupe/rupe (A)
3. arde (L)
4. muri/ucide (S)
5. se deschide/deschide (A)
6. se închide/închide (A)
7. începe (L)
8. învăța/preda (S)
9. se aduna /aduna (A)
10. se răspîndi/răspîndi (A)
11. se scufunda/scufunda (A)
12. se schimba/schimba (A)
13. se topi/topi (A)
14. ?/distruge
15. se pierde/pierde (A)
16. se dezvolta/dezvolta (A)
17. se uni/uni (A)
18. fierne (L)
19. se legăna/legăna (A)
20. se stinge/stinge (A)
21. se ridica/ridica (A)
22. se sfîrși/sfîrși (A)
23. se învîrti/învîrti (A)
24. se rostogoli/rostogoli (A)
25. înghețа/face să înghețe (C)
26. se dizolva/dizolva (A)
27. se umple/umple (A)
28. se îndrepta/îndrepta (A)
29. se usca/usca (A)
30. se crăpa/crăpa (A)
31. se opri/opri (A)

Russian (citation form *-t'/-ti*)

1. prosnut'-sja/budit' (S)
2. lomat'-sja/lomat' (A)
3. goret'/žeč' (S)
4. umeret'/ubit' (S)
5. otkryt'-sja/otkryt' (A)
6. zakryt'-sja/zakryt' (A)
7. načat'-sja/načat' (A)
8. učit'-sja/učit' (A)
9. sobrat'-sja/sobrat' (A)
10. rasprostranit'-sja/rasprostranit' (A)
11. uto-nut'/utop-it' (E)
12. izmenit'-sja/izmenit' (A)
13. rasplavit'-sja/rasplavit' (A)
14. razrušit'-sja/razrušit' (A)
15. terjat'-sja/terjat' (A)
16. razvit'-sja/razvit' (A)
17. sočetat'-sja/sočetat' (A)
18. kipet'/kipjatit' (E)
19. kačat'-sja/kačat' (A)
20. gas-nut'/gas-it' (E)
21. podnjat'-sja/podnjat' (A)
22. končit'-sja/končit' (A)
23. povernut'-sja/povernut' (A)
24. katit'-sja/katit' (A)
25. zamerz-nut'/zamoroz-it' (E)
26. rastvorit'-sja/rastvorit' (A)
27. napolnit'-sja/napolnit' (A)
28. ulučšit'-sja/ulučšit' (A)
29. sox-nut'/suš-it' (E)
30. raskolot'-sja/raskolot' (A)
31. ostanovit'-sja/ostanovit' (A)

Swahili (citation form suffix *-a*)

1. am-k-a/am-sh-a (E)
2. vunj-ik-a/vunj-a (A)

3. ungu-k-a/ungu-a (A)
4. fa/ua (S)
5. fungu-k-a/fungu-a (A)
6. fung-w-a/fung-a (A)
7. anz-a/anz-ish-a (C)
8. fund-a/fund-ish-a (C)
9. kusany-ik-a/kusany-a (A)
10. ene-a/ene-z-a (C)
11. zam-a/zam-ish-a (C)
12. geu-k-a/geu-a, geu-z-a (A, E)
13. yeyu-k-a/yeyu-sh-a (E)
14. harib-ik-a/haribu (A)
15. pote-a/pote-z-a (C)
16. sitawi/sitawi-sh-a (C)
17. ung-w-a/ung-a (A)
18. chem-k-a/chem-sh-a (E)
19. yong-a/yong-esh-a (C)
20. zim-ik-a/zim-a (A)
21. iku-k-a/inu-a (A); pand-a/pand-ish-a (C)
22. maliz-ik-a/maliz-a (A)
23. zungu-a, zungu-k-a/zungu-sh-a (C, E)
24. fingir-ik-a/fingir-ish-a (E)
25. gand-a/gand-ish-a (C)
26. yeyu-k-a/yeyu-sh-a (E)
27. ja-a/ja-z-a (C)
28. fanya ujambo/pata ujambo (E)
29. kau-k-a/kau-sh-a (E)
30. pasu-k-a/pasu-a (A)
31. simam-a/simam-ish-a (C)

Turkish (citation from suffix *-mek/-mak*)

1. uyan-mak/uyan-dır-mak (C)
2. kır-ıl-mak/kır-mak (A)
3. yan-mak/yak-mak (S)
4. öl-mek/öl-dür-mek (C)
5. aç-ıl-mak/aç-mak (A)
6. kapa-n-mak/kapa-mak, kapa-t-mak (A, E)
7. ?/başla-mak
8. öğre-n-mek/öğre-t-mek (E)
9. topla-n-mak/topla-mak (A)
10. yay-ıl-mak/yay-mak (A)
11. bat-mak/bat-ır-mak (C)
12. degiş-mek/degiş-tir-mek (C)
13. eri-mek/eri-t-mek (C)
14. boz-ul-mak/boz-mak (A)
15. kayb-ol-mak/kayb-et-mek (E)
16. inkişaf et-mek/inkişaf et-tir-mek (C)
17. birleş-mek/birleş-tir-mek (C)
18. piş-mek/piş-ir-mek (C)
19. salla-n-mak/salla-mak (A)
20. sön-mek/sön-dür-mek (C)
21. kalk-mak/kal-dır-mak (C)
22. bit-mek/bit-ir-mek (C)
23. dön-mek/dön-dür-mek (C)
24. yuvarla-n-mak/yuvarla-mak (A)
25. don-mak/don-dur-mak (C)
26. çöz-ül-mek/çöz-mek (A)
27. dol-mak/dol-dur-mak (C)
28. düzel-mek/düzel-t-mek (C)
29. kuru-mak/kuru-t-mak (C)
30. yar-ıl-mak/yar-mak (A); çatla-mak/çatla-t-mak (C)
31. dur-mak/dur-dur-mak (C)

Udmurt (citation form suffix *-ny*)

1. sajka-ny/sajka-ty-ny (C)
2. tija-śky-ny/tija-ny (A)
3. sut-sky-ny/suty-ny (A)
4. kuly-ny/viy-ny (S)
5. ust-iśky-ny/usty-ny (A)
6. pytsa-śky-ny/pytsa-ny (A)
7. kutsky-ny (L)
8. dyšy-ny/dyš-ety-ny (C)
9. l'uka-śky-ny/l'uka-ny (A)
10. vōlmy-ny/vōlmy-ty-ny (C)
11. vyjy-ny/vyjy-ty-ny (C)
12. vošt-iśky-ny/vošty-ny (A)
13. ćyža-ny/ćyža-ty-ny (C)
14. kuaška-ny/kuaška-ty-ny (C)
15. ysy-ny/ys-ty-ny (C)
16. azin-sky-ny/azin-ty-ny (E)
17. gerʒa-sky-ny/gerʒa-ny (A)
18. byrekty-ny (L); pōzy-ny/pōz-ty-ny (C)
19. vetta-śky-ny/vetta-ny (A)

20. kysy-ny (L)
21. ʒut-sky-ny/ʒuty-ny (A)
22. byry-ny/byd-ty-ny (C); bydes-my-ny/bydes-ty-ny (E)
23. berga-ny/berga-ty-ny (C)
24. pityr-sky-ny/pityr-ty-ny (E)
25. kyn-my-ny/kyn-ty-ny (E)
26. sylmy-ny/sylmy-ty-ny (C)
27. tyrmy-ny/tyrmy-ty-ny (C)
28. umoja-ny, umoja-t-sky-ny/umoja-ty-ny (C, A)
29. kuas-my-ny/kuas-ty-ny (E)
30. pil'-iśky-ny/pil'y-ny (A)
31. dugdy-ny/dugdy-ty-ny (C)