

**Morpholexical Transparency  
and the argument structure of verbs of cutting and breaking**

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*Abstract*

*Guerssel et al.'s 1985 generalizations regarding the argument structure of verbs of cutting and breaking (C&B) are reanalyzed based on the principles of Morpholexical Transparency and Complete Linking. A working hypothesis according to which the C&B domain is universally exhaustively partitioned into argument structure classes of "cut" and "break" verbs is proposed and tested against a corpus of data from 17 languages. Counterevidence to the hypothesis includes "bipolar" verbs that are semantically specific both on the state change and its cause and a language that lacks "cut" verbs, framing severance as state change. The survey suggests that universals of argument structure include the principles of Morpholexical Transparency and Complete Linking, but not specific verb classes.*

*Keywords: argument structure, lexical semantics, lexicon-syntax interface, typology.*

## 1. Setting the stage: terms and issues

A key question in research on the interface between syntax and lexical semantics is to what extent, and by what principles, the argument structure properties of a verb are predictable from its meaning. Particular emphasis has been placed on *cross-linguistic* predictability – for example, on the extent to which children can predict the argument structure of a verb they are learning on the basis of its semantics and *vice versa* (e.g., Bowerman and Brown to appear; Grimshaw 1994; Landau and Gleitman 1985; Pinker 1984, 1989). Argument structure – henceforth A-structure – may be conceived broadly as comprising information on the following issues (e.g., Grimshaw 1990):

- *thematic structure*: the types of thematic relations the verb assigns to arguments and obliques
- *subcategorization*: the types of arguments and obliques the verb may or must co-occur with
- *linking*: the mapping between thematic relations and arguments/obliques
- *variability*: privileges of participating in alternations or undergoing operations that change any or all of the above

My concern here is with variability in a particular semantic domain: separation in material integrity (Hale and Keyser 1987) – henceforth, C&B (for “cutting and breaking”). Since 2001, the members of the Event Representation Project at the Max Planck Institute for Psycholinguistics have been conducting a cross-linguistic survey of lexicalization and A-structure in the C&B domain. This research has been based on elicitation with the *Cut and Break Clips* (Bohnenmeyer, Bowerman, and Brown 2001). Researchers collected descriptions of the videoclips, followed by focused elicitation to elucidate the semantics and A-structure properties of the verbs produced. The present

article provides an analysis of the findings regarding the A-structure properties of C&B verbs in 17 languages.

Our research on the syntax of C&B verbs has been directed, among other things, at testing a number of hypotheses derived from Guerssel *et al.* 1985. Guerssel *et al.* argued for the existence of two cross-linguistically recurrent classes of C&B verbs. These classes – named after their most prominent representatives in English, “cut”-type verbs and “break”-type verbs – are said to have distinct privileges of participating in A-structure alternations and undergoing A-structure-changing operations.

A-structure alternations in a narrow sense are occurrences of verbs as multiple polysemous lexemes which differ in their thematic structure and subcategorization, but are transparently related in both respects. An example is the English causative-inchoative alternation (e.g., *break<sub>tr</sub>* – *break<sub>intr</sub>*). A-structure-changing operations are morpholexical operations (Ackerman 1992; Sadler and Spencer 1998) that transparently change a verb’s thematic structure and subcategorization. Of particular interest to me here are anticausative derivations, which produce inchoative stems from causative roots. An example is the Spanish reflexive clitic in its anticausative function (e.g., *romper-se* break-REFL ‘break<sub>intr</sub>’), as opposed to its reflexive (‘to break oneself’), passive (‘to be broken’), and middle (‘to break (easily/with difficulty/...)’) uses. Morpholexical operations that change a verb’s A-structure also include complex predicate formations (Ackerman and Webelhuth 1998) such as verb-particle constructions in Germanic and Slavic languages and verb compounding in Japanese, Mandarin (Chen, this issue), and Yukatek Maya. Following established practice (e.g., Haspelmath 1993), “A-structure alternations” in a broad sense is henceforth used as a cover term for A-structure alternations in a narrow sense (polysemous verbs) and A-

structure-changing operations. For the purposes of this article, it is crucial to distinguish operations that change a verb's A-structure from voice operations. Voices are morphosyntactic operations that alter a verb form's subcategorization and linking properties to adapt it to a particular information perspective in discourse, while leaving thematic structure intact. Examples of voice operations include the English passive and the passive and middle voice functions of the Spanish reflexive clitic, as opposed to the reflexive and anticausative functions of the same marker (Maldonado 1992).

Guerssel *et al.* argue that membership in the “cut” and “break” classes is semantically determined. My interest in this proposal derives from its combination with the hypothesis that the “cut” and “break” classes are universal. Guerssel *et al.* do not make this claim; but they claim to have found “cut” and “break” classes in the four unrelated and typologically vastly different languages they studied – Berber, English, Hocāk, and Warlpiri. In the present article, I test the hypothesis of a universal bipartition of the C&B domain into “cut” and “break” classes against a corpus of data from 17 mostly unrelated languages. The general question addressed by this study is whether universals of A-structure include specific A-structure classes divided along subtle semantic differences in an otherwise homogenous conceptual domain. This would suggest strong cross-linguistic agreement in both semantic categorization and form-to-meaning mapping. It is the extent of this agreement that is validated here.

In Section 2, I summarize Guerssel *et al.*'s analysis of the A-structure of C&B verbs and argue that it can be derived from the principles of Morpholexical Transparency and Complete Linking. Section 3 gives an overview of the data this article draws on. I then present evidence suggesting that while the principles of Morpholexical Transparency and Complete Linking may be universal, the A-structure

classes of "cut" and "break" verbs are not. The evidence includes semantically "bipolar" C&B verbs (section 4), polysemous constructions that encompass anticausative interpretations with "break" verbs and quasi-inchoative voice interpretations with "cut" verbs (section 5), and verbs that lexicalize severance as state change with unspecific causes (section 6).

## 2. The predictions

Guerssel *et al.* 1985 studied C&B verbs in English, Berber, Warlpiri, and Hocãk (or Winnebago, a Siouan language of Nebraska and Wisconsin). English C&B verbs fall into two broad classes (as first suggested by Fillmore 1967). An important characteristic of the "break" class is that its members participate in the causative-inchoative alternation (1). In contrast, the members of the "cut" class do not (2). Instead, they undergo the so-called "conative" alternation ((3); but see below), which is not available to the members of the "break" class (4):

- (1) a. Floyd broke/cracked/shattered the vase.
  - b. The vase broke/cracked/shattered.
- (2) a. Floyd cut/cubed/sliced the bread.
  - b. \*The bread cut/cubed/sliced.
- (3) Floyd cut (\*cubed \*/sliced) at the bread.
- (4) \*Floyd broke/cracked/shattered at the vase.

The relevant facts of Berber resemble those of English, except that all C&B verbs can occur in intransitive clauses with the Theme (the affected object) linked to the sole argument. But only clauses projected from "break"-type verbs have an inchoative (i.e., non-causative state change) interpretation in such clauses; "cut"-type verbs admit only middle-voice readings. The English middle construction is illustrated in (5). It is "characterized by a lack of specific time reference and by an understood but

unexpressed agent” (Levin 1993: 26). Guerssel *et al.* appear to assume the same semantics for the Berber middle.

(5) a. The vase breaks/cracks/shatters easily.

b. The bread cuts/cubes/slices easily.

As shown in (5), both “cut” verbs and “break” verbs participate in the middle. The difference between inchoative and middle forms is that inchoatives, unlike middles, may refer to individual events under specific time reference, and do not introduce a Cause or Agent of these events into the discourse representation. The inchoative-middle distinction is discussed in detail in section 5.

In Hocāk, “break”-type verbs have an inchoative and a causative stem both of which are morphologically marked (an “equipollent” system in Haspelmath’s (1993) typological survey). “Cut”-type verbs do not form inchoative stems. In Warlpiri, only “break”-type roots combine with different light verbs under an inchoative (*yani* ‘come’) and a causative (*pinyi* ‘hit’) reading. It may be possible to analyze the *yani-pinyi* pattern either as an A-structure alternation in the narrow sense or as an instance of complex predicate formation; either way, the pattern confirms that these processes do not extend to “cut” verbs. Warlpiri has a conative alternation, which is restricted to “cut”-type verbs, whereas Berber and Hocāk lack such an alternation.

Guerssel *et al.* (see also Hale and Keyser 1987) argue that the syntactic differences between “break”-type and “cut”-type verbs derive from their semantic representations (their “lexical conceptual structure” – LCS), as illustrated for *break* and *cut* in (6)-(7):

(6) *break* LCS: y comes to be BROKEN

(7) *cut* LCS: x produce “cut” on y,

by sharp edge coming into contact with y

“Break” verbs are semantically monadic, encoding a state change event without attributing a cause to it. On this account, the inchoative reading is basic; the causative reading is the result of a “productive rule“ that introduces a (generic) causal event whose participant is linked to subject. “Cut” verbs, in contrast, are semantically dyadic – they lexicalize causal impact on a Theme as the result of contact between the Theme and some Instrument or body part. This type of LCS blocks inchoative readings, but licenses conative alternations. On Guerssel *et al.*’s account, the conative reading comes about when the “cut” component is removed from the main clause of the LCS and inserted into a purposive clause; the main clause is replaced by a motion description. The result is (7’):

- (7’) *cut* Conative LCS: x causes sharp edge to move along path toward y,  
in order to produce “cut” on y,  
by sharp edge coming into contact with y

Guerssel *et al.*’s account of the syntactic properties of “cut” and “break” verbs hinges critically on the assumption that “break” verbs, unlike “cut” verbs, are semantically monadic. But this assumption is far from uncontroversial. Levin and Rappaport-Hovav (1995) assume that the causative form of “break” verbs is the basic form in English; the inchoative form is derived by an A-structure operation. If A-structure alternations in the narrow sense are viewed as polysemy patterns, as in the present article (in line with, e.g., Cruse 1986: 74-76 and Jackendoff 2002: 339-342), it is not obvious that either direction of derivation is privileged. Either sense may arise as a metonymic extension of the other. And Haspelmath (1993) shows that both directions are found in A-structure derivations in the languages of the world: some languages have unaccusative “break” verbs that causativize; others have base-transitive “break” verbs that anticausativize. Once it is acknowledged that “break”



verbs may be just as dyadic as “cut” verbs, Guerssel *et al.*’s explanation for why the former, but not the latter, produce inchoative forms can no longer be maintained.

I would like to propose an alternative account of the A-structure properties of C&B verbs, which rests on two basic principles of the lexicon-syntax interface, stated in (8)-(9):

(8) *Morpholexical Transparency*: Productive A-structure alternations that relate two lexemes in a semantically transparent fashion can add or delete generic, but not specific, subevent representations from the event structure of the verb.

(9) *Complete Linking*: A well-formed syntactic projection from a verb lexeme requires all thematic relations spelled out in the verb’s semantics to be linked to arguments or obliques specified in the verb’s A-structure, unless they are blocked from linking by voice operations.

Principle (8) echoes proposals by Ackerman (1992) and Doron and Rappaport-Hovav (1991). The formulation of the principle rests on the assumption that thematic structure is grounded in a subevent decomposition as proposed in Grimshaw (1990), Jackendoff (1976), Levin and Rappaport-Hovav (1995), Van Valin and LaPolla (1997), and elsewhere. Assume that two lexemes stand in a semantically transparent morphological relation if the meaning of one is predictable given the meaning of the other and knowledge of the alternation that relates the two. Principle (8) addresses predictability in terms of the notion of “specificity” of information, echoing earlier proposals by Levin and Rappaport-Hovav (1995) and Pinker (1989). Semantically transparent alternations (in the broad sense: either polysemy or productive morphology) can add or delete “generic”, but not “specific”, information about a subevent. “Generic” here refers to the *presence* of a subevent in the semantic

representation and to its *role* in the representation. The relevant options in the C&B domain are cause and state change. “Specific” information further classifies the subevents in terms of details of the nature of the cause or change; e.g., the manner in which the change was brought about, the involvement of a particular kind of Instrument, the way in which the change affects the Theme, or the degree to which the Theme is affected. Such specific information is inherently lexical and therefore cannot be added or erased by transparent morpholexical processes or alternations. In other words, two lexemes that differ in that one includes specific information about a subevent that the other lacks cannot be related by a productive morphological process or polysemy pattern.<sup>1</sup>

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<sup>1</sup> The formulation in (8) restricts this principle to productive processes, and productivity in morphology is often a matter of degree. Consider, for instance, the “induced action alternation” (Levin 1993: 31), which is arguably an analogical extension of the causative-inchoative alternation to verbs such as *run*, *walk*, and *jump*. As these verbs are agentive, their causativization describes indirect causation by some participant inducing the agent to perform the event. These causatives are thus semantically more complex than the causatives of non-agentive verbs. An independent principle that limits the complexity of causal chains expressed in simple lexical items requires these causatives to be expressed by light verb constructions (e.g., *make run*; cf. Smith 1978; Levin and Rappaport-Hovav 1995). Nevertheless, these verbs have transitive stems that appear to be modeled on the causative-inchoative alternation in a nonce-fashion. Since the semantic relation between the intransitive and transitive stems of these verbs cannot be described merely in terms of addition or extraction of a generic causal subevent, principle (8) predicts that there is no general rule that entirely accounts for their meanings – they presumably have to be

Principle (8) constrains the possibility space for altering verb meanings through productive alternations. Principle (9), in contrast, deals with the effect that changes in meaning licensed by principle (8) have on a verb's A-structure, and, conversely, that A-structure changes have on meaning. This constraint, modeled on Van Valin and LaPolla's (1997: 325) Completeness Constraint, is critical to understanding the difference between A-structure alternations on the one hand and voice operations on the other. Middle voice and passive operations, which change the verb's linking properties but leave its lexical meaning and A-structure unaffected, occur with both "cut" and "break" verbs.

Principles (8)-(9) predict the possibility of A-structure alternations that relate a lexeme meaning 'cause to become broken' to one meaning 'become broken' (while barring a lexeme with the meaning, say, 'cause to become rich' from being transparently related to a lexeme meaning 'cause to become broken'). The causal subevent of "break" verbs can be removed by A-structure alternations because it is semantically generic (similarly Levin and Rappaport-Hovav 1995: 107, 242; Pinker 1989: 106, 198). There is any number of conceivable ways in which one can *break*, *shatter*, *tear*, or *split* something – no particular manner of action and no use of a particular kind of Instrument, or indeed any Instrument at all, is entailed.

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learned one-by-one. Indeed, for instance, *walk*<sub>TR</sub> is restricted mostly to dogs in the theme role, and it is the human agent, rather than the dog, who necessarily instantiates *walk*<sub>ITR</sub> during an event of the relevant kind, while *jump*<sub>TR</sub> requires a horse in the theme role, and the agent is expected to ride the horse during the jump, rather than to cause it to jump by, say, giving it a start with a car horn. Yet, as there is an entire class of such exceptions (Levin 1993 lists 12 verbs), all extending the causative-inchoative alternation in a parallel fashion, there still is a pattern here.

“Cut” verbs, however, are not mirror images of “break” verbs (cf. Levin and Rappaport-Hovav 1995: 295, fn. 13). “Cut” verbs, too, are rather flexible about the action performed and the Instrument used (I can *cut* an orange using anything from a knife or axe to a metal string or laser beam, and I can do it by bringing the blade to bear on the fruit or by dropping the fruit onto the blade from sufficient height). And at least *some* “cut” verbs clearly entail some form of change (if you *chop*, *slice*, or *cube* something, there is no denying that it winds up *chopped*, *sliced*, or *cubed*). What sets “cut” verbs apart is the notion of contact between the Theme and some kind of *Instrument* (including an Agent’s body part). “Cut” verbs specify some *property* of the Instrument or of the way it is used (cf. Koenig *et al.* ms.; e.g., *cut*, *slice*, *hack*, and *saw* entail use of some blade-like object, whereas *bore*, *puncture*, and *prick* entail use of a pointy object). A particular result state may or may not be specified as well; this seems to motivate the distinction between “cut” verbs (*sensu stricto*), which undergo the conative alternation in English, and “carve” verbs (e.g., *carve*, *slice*, *cube*, *grind*), which do not (Levin 1993: 156-158) – the latter are the ones with specific result states. The fact that “carve” verbs, which specify clear result states, do not appear in conative clauses, whereas “cut” verbs *sensu stricto* do, strongly suggests that the latter are not semantically specific on the change the Theme undergoes. As Levin and Rappaport-Hovav (1995: 103) argue, what blocks “cut” verbs from producing transparently related inchoative lexemes is the impossibility of referring, however implicitly, to an Instrument without referring to a cause (Keyser and Roeper 1984). **It is this same impossibility that prevents inchoative forms of “break” verbs from combining with Instrument phrases (though not with causal adjuncts):**

- (10) The cup cracked/broke/shattered (\*with a hammer/stone/kick).

Since “cut” verbs entail the involvement of an Instrument in the event, reference to the cause of the event cannot be suppressed, and thus the verb is blocked from producing transparently related inchoative forms.

“Cut” verbs (*sensu stricto*, i.e., not “carve” verbs) cannot appear in conative constructions because they specify only a generic result. For instance, a *cut* can vary from mere incision in the Theme’s surface all the way to separation of the Theme into two parts.<sup>2</sup> In line with (8), this lack of specificity licenses deletion of the state change event and Theme from the semantic representation. The Theme is then reintroduced as a Goal, since its presence is still required by the contact component. The result is the conative construction. “Break” verbs, of course, are barred by (8) from producing conative variants, since they cannot be transparently related to lexical items that do not encode a specific state change.

The remainder of this article is dedicated to a study of universals and cross-linguistic variation in the A-structure of C&B verbs. At the outset, candidates for universals are the principles in (8)-(9) and the A-structure classes of “cut” and “break” verbs that Guerssel *et al.* found in four unrelated and typologically drastically different languages. Specifically, the predictions in (11) are tested:

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<sup>2</sup> One “break” verb of English – namely, *break* itself – can be used in reference to any loss of structural integrity. In this sense, *break* is a generic “break” verb. There are two circumstances that nevertheless prevent *break* from entering conative clauses: first, its lack of Instrument/manner-specificity (it is unclear what one would have to *do* in order to “break at” something); and secondly, the impossibility of removing the entailment of *some* result state of loss of structural integrity without the verb becoming semantically completely vacuous.

- (11)i. Across languages, C&B verbs fall into two semantic classes: those that specify use of a particular kind of Instrument and a generic state change (“cut” verbs) and those that specify a particular kind of change or a particular type of Theme argument, but are nonspecific regarding Instruments involved (“break” verbs).<sup>3</sup>
- ii. Across languages, “break” verbs may (but need not) occur in transparently related causative and inchoative lexemes, whereas “cut” verbs never produce transparently related inchoatives. “Cut” verbs, in turn, may (but need not) occur in transparently related causative and conative lexemes, while “break” verbs do not produce transparently related conatives.

The following sections present the results of the cross-linguistic survey. Section 3 gives an overview of the language sample and previews the central findings of the study. Section 4 discusses a phenomenon that corroborates the principle of Morpholexical Transparency, but contradicts the bipartition into “cut” and “break” verbs predicted in (11): the existence of “bipolar” C&B verbs, which encode both a specific state change and a specific cause. Section 5 examines the problem of polysemous constructions with both anticausative and voice readings. In some languages, such voice functions are hard to distinguish from the inchoative semantics

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<sup>3</sup> Every state change representation entails a Theme role (Jackendoff 1976).

“Break” verbs thus may be semantically specific on the type of change, the kind of object undergoing it – i.e., the theme – or both. In fact, objects are conceptualized with affordances for the kinds of change they undergo – e.g., wood *splinters*, fabric *tears*, glass and ceramics *breaks* into shards, etc. Folk physics assumptions about the structure of objects of different material seem to play a powerful role in the semantics of “break” verbs.

of the anticausative function. This makes it difficult to test the prediction that anticausatives are restricted to “break” verbs. Section 6 addresses the phenomenon of verbs that lexicalize severance (i.e., “cutting” events) in terms of state change without a specific cause.

### 3. Overview of the sample and synopsis of findings

The summary presented in the following sections covers the languages listed in Table 1 overleaf. *Prediction (11i)* – Although all of the languages have C&B verbs in multiple A-structure classes, not all of them have a binary distinction between “cut” and “break” verbs. Four of the languages – Biak, German, Mandarin, and Yukatek – have complex predicates that are semantically specific on both the properties of an Instrument used in the action (or the manner in which it is used) and the state change inflicted on the Theme. These “bipolar” verbs represent a third type, distinct from both the “cut” and the “break” type; cf. section 4. And in Mandarin and Biak, this third type is in fact the dominant type of C&B verb. Mandarin has transitive roots that describe “cutting” events without entailing state change and intransitive state change verbs of “breaking” that do not encode a cause; all causative state change verbs in the C&B domain are “bipolar” compounds (cf. Chen, this issue). Mandarin has thus neither “cut”- nor “break”-type verbs. The same is true of Biak, with only a single exception: *kor* ‘slash’, a “cut”-type verb. Furthermore, a number of languages in the sample have “break”-type verbs that describe severance events as state changes (cf. section 6). In Yéli Dnye, all severance verbs appear to be of this kind – there are “break” verbs, but no “cut” verbs, in this language (Levinson, this issue).

*Prediction (11ii)* – Except for German, no languages in the sample are reported to have conative alternations. The analysis presented in the following sections therefore focuses on the prediction that “break” verbs, but not “cut” verbs, occur in

transparently related causative and inchoative lexemes. Again with the exception of German, the two patterns that are relevant to this prediction – causative-inchoative polysemy patterns and anticausative derivations – are distributed complementarily across the languages of the sample that have “break” verbs: causative-inchoative

Table 1 *The language sample.*

Language	Affiliation	Collectors
Biak	Austronesian	van den Heuvel
Oaxaca Chontal	isolate	O'Connor
Ewe	Kwa	Ameka and Essegbey
German	Germanic	Bohnmeyer
Hindi	Indo-Iranian	Narasimhan
Jalonke	Mande	Lüpke
Kinyarwanda	Bantu	Bohnmeyer
Kuuk Thaayorre	Pama-Nyungan	Gaby
Mandarin	Sino-Tibetan	Chen
Otomi	Oto-Manguean	Palancar
Spanish	Romance	Bowerman and Palancar
Sranan	Atlantic Creole	Essegbey
Tamil	Dravidian	Narasimhan
Tidore	West Papuan	van Staden
Tzeltal	Mayan	Brown
Yélf Dnye	East Papuan	Levinson
Yukatek	Mayan	Bohnmeyer



polysemy patterns are found in Ewe, Jalonke, Sranan, and Tidore, while anticausative forms occur in Chontal, Kinyarwanda, Spanish, Tzeltal, and Yukatek; German, as noted, has both. One language – Biak – has a causative-inchoative alternation, but no C&B verbs participate in it, since all causative verbs used in reference to “breaking” scenes are “bipolar” compounds; cf. section 4. Otomi and Yéî Dnye are special in that they have “break” verbs with pairs of causative and inchoative stems which are phonologically similar, but morphologically unrelated in synchronic terms. Hindi and Tamil distinguish transitive and intransitive forms of C&B verbs on the basis of suppletion in tense and voice morphology. I treat the intransitive partners of these alternations as suppletive anticausative or voice forms; see section 5. A number of languages have intransitive state change roots that causativize in order to produce “break” verb stems. In Kuuk Thaayorre (Gaby, this issue), all “break” verbs appear to be of this type.

No direct counterevidence to prediction (11ii) has emerged, with the possible exception of apparent “cut” verbs of Tidore, which, according to van Staden (this issue), participate in the causative-inchoative alternation; but see section 6. However, it has been difficult or impossible to validate (11ii) in a number of languages: Hindi, Mandarin, Tzeltal, and Yukatek. These languages use polysemous constructions to express anticausativization of “break” verbs and voice operations on “cut” verbs.

Unlike the English middle and passive constructions, these voice forms are not easily distinguished semantically from inchoatives. Hence, the appearance of anticausatives from “cut” verbs arises in these languages. This problem is discussed in section 5.

#### 4. Beyond “cut” and “break”: Bipolar C&B verbs

Four typologically diverse languages in the sample – Biak, German, Mandarin, and Yukatek – make prominent use of complex predicates (Ackerman and Webelhuth 1998) in the C&B domain. These complex verbs are semantically specific regarding *both* the change effected on the Theme *and* the cause of that change – i.e., they are semantically “bipolar”, and thus conform to neither the “cut” type nor the “break” type, but constitute a third class. In line with the principles of Morpholexical Transparency (8) and Complete Linking (9), bipolar verbs are inert regarding A-structure alternations: since both the causal and the resulting subevent representations are specific, neither can be removed from the meaning of a transparently related stem. This inertness can be illustrated with the English “carve” verbs, which are simplex bipolar verbs. “Carve” verbs undergo neither the conative (12b) nor the causative-inchoative alternation (12c):

- (12) a. Carole carved the stone.  
 b. \*Carole carved at the stone.  
 c. \*The stone carved. (Levin 1993: 158)

Among complex bipolar predicates, the only transparently related lexemes that lack one of the subevent specifications are their component roots or stems. German uses preverbs (pre-verbal particles) to add a state change component to activity verbs or further specify the result state of state change verbs. Consider *zer-schmettern* ‘smash to pieces’. The base *schmettern* ‘smash’ expresses motion of a Theme caused by hitting it in a particular manner:

- (13) German
- |       |             |          |                           |
|-------|-------------|----------|---------------------------|
| Floyd | schmetterte | den Ball | ins gegnerische Feld.     |
| Floyd | smashed     | the ball | into the opponents’ field |

‘Floyd smashed the ball into the opponents’ field.’

*Zer-schmettern* ‘smash to pieces’ preserves the specific activity component of the base and adds to that the specific state change component (“apart”, “to pieces”) introduced by the particle. As a result, *zer-schmettern* undergoes neither the causative-inchoative alternation (14b) nor the conative alternation (14c). For comparison, (15) illustrates the conative alternation with *kratzen* ‘scratch’.

(14) German

a. Floyd zer-schmetterte das Glas.

Floyd apart-smashed the glass

‘Floyd smashed the glass to pieces.’

b. \*Das Glas zer-schmetterte.

the glass apart-smashed

‘\*The glass smashed to pieces.’

c. \*Floyd zer-schmetterte an das Glas.

Floyd apart-smashed on the glass

‘\*Floyd smashed to pieces at the glass.’

(15) German

a. Floyd kratzte Sally.

Floyd scratched Sally

‘Floyd scratched Sally.’

b. Floyd zer-kratzte das Glas.

Floyd apart-scratched the glass

‘Floyd scratched the glass.’<sup>4</sup>

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<sup>4</sup> German “cut” verbs usually *require* prefixation (or some other form of result state specification) with affected Themes (i.e., outside the conative construction).

c. Floyd kratzte an dem Glass.

Floyd scratched at the glass

‘Floyd scratched at the glass.’

It might be thought that the inchoative use as in (14b) is blocked for all prefixed verbs, not just “bipolar” ones (i.e., prefixed “cut” verbs); but this is not so. Example (16) illustrates *zer-brechen*, which undergoes the causative-inchoative alternation, in line with the fact that *brechen* ‘break’ encodes state change with a generic cause.

(16) German

a. Floyd zer-brach das Glas.

Floyd apart-broke the glass

‘Floyd broke the glass.’

b. Das Glas zer-brach.

the glass apart-broke

‘The glass broke.’

Biak, Mandarin, and Yukatek use compound verb stems in the C&B domain (e.g., Mandarin *bai-duan* ‘bend-broken’; Yukatek *xíik-ch’àak* ‘burst-cut’). In Biak and Mandarin, compound verbs are by far the predominant lexical expression of caused C&B events. In these compounds, one component stem specifies the state change and the other its cause. This explains why no Biak C&B verbs participate in this language’s causative-inchoative alternation: with the exception of the “cut” verb *kor* ‘slash’, all causative C&B verbs are compounds (van den Heuvel, pc). Mandarin and Yukatek lack causative-inchoative polysemy patterns. Yukatek has an anticausative derivation which also expresses voice functions. This construction is acceptable with

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Exceptions involve animate Themes as in (15a). (15b) would be mildly odd without the prefix.

compound verbs under its middle voice and “anaphoric passive” (see section 5) readings, but not under its anticausative interpretation. In Mandarin, compound verbs can occur in intransitive clauses whose sole argument refers to the Theme; again, this construction has a voice character (cf. (24) below). The anticausative-middle/passive distinction is taken up in the next section.

Bipolar verbs make a bipartition of the C&B domain in “cut” and “break” A-structure classes impossible in those languages in which they occur, refuting prediction (11ii). At the same time, their failure to participate in A-structure alternations offers another source of support for the validity of the crosslinguistic generalizations (8)-(9).

## 5. Anticausatives with polysemous voice functions

Many languages have polysemous constructions that encompass both anticausative and middle-voice or passive-like interpretations. Since the latter interpretations occur with both “cut”- and “break”-type verbs, such constructions can make it difficult to test the hypothesis (11ii) that only “break” verbs have transparently related inchoative lexemes.

In Berber, “break” verbs occur in intransitive clauses with the Theme linked to the sole argument and an inchoative interpretation: a state change of the Theme is expressed without attribution of a cause. “Cut” verbs appear in this type of clause only under “middle” interpretations: a property relating to the event type denoted by the verb is ascribed to the Theme (Guerssel et al. 1985: 49; compare the English examples in (1b) above for the inchoative and (5) for the middle). A similar contrast is found in Kinyarwanda, one of the languages of our sample: the anticausative/middle form in

–*ik* licenses inchoative interpretations with “break” verbs such as *gusatura* ‘split’ in (17), but merely middle readings with “cut” verbs such as *kugema* ‘incise’ in (18):<sup>5</sup>

(17) Kinyarwanda

Iki karooti ya-satu-tse ité?  
 this carrot CL.3-split-MIDDLE:PRV why  
 ‘Why did this carrot split?’ (*tse* < *ik-ye*)

(18) Kinyarwanda

Kiri ku-gem-ik-a.  
 CL.3:COP INF-incise-MIDDLE-IMPF  
 ‘It (melon) is cuttable.’

Let us assume that anticausative derivations produce inchoative stems from causative bases by removing the causal subevent from the base’s meaning, whereas middle voices merely block linking of the causal subevent’s participant (Keyser and Roeper 1984; Ackema and Schorlemmer 1994). Recall that the principle of Complete Linking, formulated in (9) above, requires all thematic relations spelled out in a verb’s semantics to be linked to arguments or obliques specified in the verb’s A-structure,

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<sup>5</sup> Abbreviations in interlinear glosses include: A – cross-reference “set-A” (“ergative”/possessor); ACC – accusative; APP – applicative; B – cross-reference “set-B” (“absolutive”); CL – noun class; CON – connective; COP – copula; DEM – demonstrative; DET – determiner; D1 – proximate deixis; D2 – distal deixis/anaphoric reference; ERG – ergative; GEN – genitive; IMPF – imperfective; INC – incomplete; INF – infinitive; INST- instrumental; MIDDLE – middle voice; PASS – passive; PROG – progressive; PRSV – presentative; PRV – perfective; REFL – reflexive; SG – singular; 3 – 3<sup>rd</sup> person.

unless they are blocked from linking by voice operations. Anticausative derivations and middle voice operations satisfy this requirement in different ways:

- Anticausative derivations satisfy (9) by removing the causal subevent from the semantics of the verb. The result is a derived inchoative stem that encodes the state change lexicalized in the base without expressing the cause of this event. The principle of Morpholexical Transparency (8) restricts this process to “break” verbs: “break” verbs encode a semantically *generic* causal subevent that can be removed by a semantically transparent A-structure-changing derivation, whereas “cut” verbs encode a semantically *specific* causal subevent that cannot be deleted without loss of Morpholexical Transparency.
- Middle voice operations satisfy (9) by blocking the linking of the Agent role. The result is a verb form that presents the event as caused, but leaves the Agent unspecified. Since voice operations do not change the semantics or A-structure of the verb, they are not restricted to “break” verbs.

Like Kinyarwanda and Berber, Spanish has a form – the “pseudo-reflexive” – that has both anticausative and middle-voice functions. This form also has a passive function. As the predictions of (11) specify, the anticausative interpretation of the pseudo-reflexive is restricted to “break” verbs such as *romper* ‘break’ (19). The pseudo-reflexives of “cut” verbs like *serrar* ‘saw’ cannot receive an anticausative interpretation; instead, they require a middle (20a) or a passive (20b) reading (cf. Maldonado 1992):

(19) Spanish

La taza se rompió.

the cup REFL broke

‘The cup broke/was broken.’ (anticausative or passive)

## (20) Spanish

a. Las ramas de éste árbol se sierran fácilmente.

the branches of this tree REFL saw easily

‘The branches of this tree saw (off) easily.’ (middle)

b. La rama se serró.

the branch REFL sawed

‘The branch was sawed.’ (passive)

The availability of passive interpretations for Spanish pseudo-reflexives, in addition to anticausative and middle readings, makes for a critical difference between the Spanish pseudo-reflexive and the Kinyarwanda anticausative/middle form *-ik*. This is because passive uses are not as easily distinguished from anticausative readings as middle voice operations are, since passives, unlike middles but like anticausatives, may refer to specific events. This makes it harder to test the prediction that only “break” verbs produce anticausative forms. There are, nevertheless, semantic differences between the anticausative and passive readings in Spanish.

Consider the contrasts among the pseudo-reflexive forms shown in (21). Under an anticausative/inchoative interpretation the pseudo-reflexive does not encode a causal subevent, so it is entirely natural to combine it with an adverbial clause that encodes the immediate cause of the state change, as shown for the “break” verb *romper* in (21a). Under a passive interpretation, in contrast, the pseudo-reflexive *does* introduce a causal subevent to the discourse representation (cf. Koenig and Mauner 2000 on the English short passive); the Agent role it entails merely remains unlinked. (A pseudo-reflexive interpreted as a passive is incompatible with Agent phrases and so behaves like an Agent-less or “short” passive in English.) This renders (21b) odd: since the pseudo-reflexive of *serrar* ‘saw’, a “cut” verb, must receive a passive (or middle)



interpretation, combining it with the “cause“-type adverbial *porque Miguel...* ‘because Miguel...’, forces the inference that Miguel, despite his use of the saw, was not the Agent of the sawing event. This conflict does not arise in (21c), where the adverbial clause is readily understood to encode an indirect cause.

(21) Spanish

- a. La taza se rompió porque Miguel la dio un golpe con el martillo.  
 the cup REFL broke because Miguel it gave a hit with the hammer  
 ‘The cup broke because Miguel hit it with the hammer.’
- b. ?La rama se serró  
 the branch REFL sawed  
 porque Miguel estuvo dándole con el serrucho.  
 because Miguel was giving it with the handsaw  
 ‘The branch was sawed off because Miguel was acting/working on it with the handsaw.’
- c. La rama se serró porque Miguel lo ordenó.  
 the branch REFL sawed because Miguel it ordered  
 ‘The branch was sawed off because Miguel ordered it.’

Example (21) shows that in Spanish, the anticausative and passive functions of the pseudo-reflexive can be discriminated by introducing a subevent referring to an immediate cause into the discourse representation: in an anticausative this is acceptable, but in a passive it is pragmatically anomalous.

However, this test does not work for a number of other languages that have a construction that is or might be ambiguous between anticausative and voice interpretations. Yukatek Maya has a construction that is a case in point. This construction is traditionally called a middle voice by Mayanists, both to distinguish it

from the passive voice and because it can also be used in contexts in which the English middle is used (cf. (5) above). The anticausative function of the Yukatek middle form is described in Bohnemeyer (2004). Example (22) illustrates the middle voice interpretation with the “cut” verb *xot* ‘cut’ (the middle form is marked by vowel lengthening and a rising pitch contour):

(22) Yukatek

Le=che’ he’l=a’, uts

DET=wood PRSV=D1 good(B.3.SG)

u=xóot-ol y=éetel motosyèera.

A.3=cut\MIDDLE-INC A.3=with chain saw

‘This tree here, it cuts easily (lit. it’s easy to cut) with a chain saw.’

Like the Spanish pseudo-reflexive in (19)-(21), the Yukatek middle construction is polysemous between an anticausative interpretation under which it applies only to “break” verbs and various voice functions under which it applies to both “break” and “cut” verbs. But under one of its voice functions, the Yukatek middle form is entirely natural in contexts in which the Spanish pseudo-reflexive under its passive interpretation is anomalous. As (23a) illustrates, the Yukatek passive (marked by infixation of a glottal stop into the CVC root *lom* ‘stab’) is pragmatically odd at the tail end of a sequence of clauses that encodes a causal chain. The anomaly reflects the fact that the Yukatek passive, like its English and Spanish counterparts, introduces a causal subevent with an implicit Agent to the discourse representation. Accordingly, (23a) implicates that the implicit Agent is somebody other than the child. In contrast, the middle in (23b) is acceptable in this context. It does not give rise to the implicature, but is interpreted to the same effect as the reflexive in (23c) (which,

unlike its Spanish counterpart, has no interpretations other than reflexive and reciprocal): that the child inadvertently stabbed herself/himself.

(23) Yukatek

Le=pàal=o', túun báax-t-ik le=kuchìiy=o',...

DET=child=D2 PROG:A.3play-APP-INC(B.3.SG) DET=knife=D2

'The child, (s)he was playing with the knife, ...'

a. ?...káa=h-lo'm-ih.

CON=PRV-stab\PASS-B.3.SG

'...(when/and then) (s)he was stabbed.'

b. ...káa=h-lóom-ih.

CON=PRV-stab\MIDDLE-B.3.SG

'...(when/and then) (s)he (was) stabbed.'

c. ...káa=t-u=lom u=báah.

CON=PRV-A.3=stab(B.3.SG) A.3=self

'...(when/and then) (s)he stabbed himself/herself.'

Example (23b) illustrates the canonical use of the Yukatek middle in narratives: a causal chain is distributed across a sequence of clauses, and the middle-voice form is used in reference to the final result of the chain. My hypothesis is that the middle has a kind of “anaphoric passive” function in this type of context: it anaphorically tracks causes and Agents introduced in preceding discourse.

Semantic tests unambiguously identify *lom* ‘stab’ as a “cut” verb: one cannot *lom* something without using a pointy Instrument (which may be a body part). The predictions in (11) entail that anticausatives do not apply to “cut” verbs such as *lom*. But even discourse-pragmatic evidence does not permit a distinction between the “anaphoric passive” and anticausative functions of the Yukatek middle. Since there is

no independent evidence that the Yukatek middle in (23b) has a voice interpretation, rather than an anticausative one, the hypothesis that “cut” verbs do not form anticausatives is untestable in this case. The “mediopassive” form of Tzeltal Maya has a similar range of uses to that of the Yukatek anticausative; this motivates Brown (this issue) to question whether Tzeltal has distinct A-structure classes of “cut” and “break” verbs.

A similar problem is presented by the suppletive intransitive form *kaT* of *kaaT* ‘cut’ in Hindi. Like Yukatek *lom* ‘stab’ above, *kaaT* is a bona fide “cut” verb (Narasimhan, this issue), so according to (11ii) it ought not to produce anticausative forms. Example (24) may then be a counterexample to prediction (11ii):

(24) Hindi

Ye        rasii    kaT    gaii    kyOkii    Floyd=ne  
 DEM    rope    cut    went    because    Floyd=ERG  
 use    caakuu=se    maar-ne=kii    koshish    kii.  
 it:ACC knife=INST hit-INF=GEN attempt    did

‘This rope got cut because Floyd tried to hit it with a knife.’

However, *kaaT* may have an “anaphoric passive” function just like Yukatek *lóom* in (23b). It occurs in the same kind of context as the Yukatek middle in its anaphoric passive function (hence the translation *got cut*). Future research will have to evaluate the anaphoric-passive analysis in Hindi.

A similar situation seems to obtain in Mandarin. Consider (25) (Jidong Chen, pc):

(25) Mandarin

John qie<sup>1</sup> le    ping<sup>2</sup>guo<sup>3</sup>, ping<sup>2</sup>guo<sup>3</sup> qie<sup>1</sup>-kai<sup>1</sup> le.  
 John cut PRV apple        apple        cut-open PRV  
 ‘John cut (on) the apple, (and) the apple cut open.’

The occurrence of transitive compound verbs in intransitive clauses with the Theme as the only realized argument has been described as a middle voice construction (Cheng and Huang 1994). As (25) shows, this construction is quite acceptable in an “anaphoric passive” context (i.e., tracking a causal subevent introduced in preceding context, parallel to (23b)). Yukatek compound C&B verbs are acceptable with the middle in contexts suggestive of anaphoric passive interpretations as well. Like “cut” verbs, compound C&B verbs encode specific causal subevents and thus are predicted by (9)-(10) to be excluded from anticausative formation. But voice constructions with anaphoric passive readings are for all practical purposes indistinguishable from inchoative interpretations. Thus, when “cut” verbs and compound C&B verbs occur with verb forms that encompass both anticausative and anaphoric passive readings, the predictions in (11) are for these verbs untestable.

## 6. “Break” verbs of severance

Yélf Dnye has severance (“cutting”) verbs which show the syntactic behavior of “break” verbs. The semantic extensions of these verbs overlap with those of “cut” verbs in other languages, but they produce inchoative forms in apparent violation of (11). My hypothesis is that these are actually “break” verbs, in the sense that they represent an alternative way of conceptualizing severance events – as state changes of various kinds, rather than as actions involving Instruments with certain properties.

Levinson (this issue) argues that Yélf Dnye lacks “cut” verbs altogether. Instead, the most common and semantically general C&B verbs divide the domain according to a distinction of separation “along the grain” (*chaa*) vs. “across the grain” (*châpwo*) vs. “incoherently” (*pwââ*), where the notion of grain appears to have been extended to all materials available to traditional Yélf culture. How the separation is effected is irrelevant for the use of these verbs, according to Levinson. *Chaa* ‘sever along the

grain’ and *pwââ* ‘divide incoherently’ have an intransitive inchoative counterpart, as could be expected if they are actually “break”-type verbs, but *châpwo* ‘sever across the grain’ does not. One might take this as evidence that *châpwo*, at least, is a “cut” verb, but Levinson argues against this view.

The Ewe severance verb *lã* occurs across a range of scenes broadly similar to the extension of Yéî *châpwo*. Unlike the more clearly “cut”-type verbs of the language (e.g., *dza* ‘slash’, *si* ‘cut’, and *kpa* ‘carve’), it participates in the causative-inchoative alternation. Further candidate severance verbs with state-change semantics include Spanish *cortar* and Sranan *koti* (cf. also Bowerman 2005). As Essegbey (this issue) points out, *koti* may be “used to describe changes that are caused without sharp-edged Instruments but whose result look as though they were caused by such Instruments”.

(26) illustrates Spanish *cortar* in the pseudo-reflexive construction:

(26) Spanish

La sogá se cortó porque Miguel la dio un golpe con un martillo.  
 the rope REFL cut because Miguel it gave a hit with a hammer  
 ‘The rope broke (lit. cut) because Miguel hit it with a hammer.’

As discussed in the previous section, the presence of a causal clause suggests an anticausative (i.e., inchoative) interpretation of the pseudo-reflexive form. The breaking of the rope was effected with a hammer, not with a bladed Instrument; so an interpretation of *cortar* in (26) with “cut” semantics seems out of the question. It remains to be seen whether *koti* and *cortar* are indeed “break”-type verbs of severance or whether these verbs instead represent a sort of crossover combining traits of “cut” and “break”-type semantics.<sup>6</sup> More research is also needed to establish whether

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<sup>6</sup> What I have in mind here is a crossover between domains not unlike the one found in the extensions of *eat* and *drink*. *Eat* denotes the ingestion of solid foods and

Tidore *tola* ‘cut’ is amenable to either type of analysis. Van Staden (this issue) argues that *tola* and other Tidore verbs have “cut”-type Instrument-specific (or manner-of-instrument-use-specific) semantics, but nevertheless produce inchoative forms, in violation of (11).

The possibility of severance verbs with state change (i.e., “break”-type) semantics is an intriguing discovery that deserves further study. The critical test is whether verbs such as Yélf Dnye *châpwo* or Tidore *tola* entail Instrument properties (or properties of the use of an Instrument). If they do, they are “cut” verbs, in which case their occurrence in inchoative forms patently falsifies the predictions in (11). If they do not, they are “break” verbs. In this case, the predictions under (11) are supported. But this latter outcome would raise new questions about the implications of (11) for learnability, since it would suggest that children need extensive extensional evidence before they can decide whether a verb has “cut” or “break” semantics, or that they might in fact have to rely to some extent on syntactic evidence to make this call.

## 7. Conclusions

Guerssel *et al.* 1985 found A-structure classes of “cut” and “break” verbs in Berber, English, Hocāk, and Warlpiri. They argued that the differences in syntactic properties between these classes derive from a difference in semantic adicity: base forms of

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*drink* the ingestion of liquid foods, except for soup when consumed with a spoon.

This is not a case of polysemy and it cannot be analyzed in terms of an alternative manner or Instrument semantics (use of a spoon does not per se trigger *eat*: when the soup in the spoon scenario is replaced by water or soda, native speaker intuitions break down). Such phenomena are perhaps best dealt with in terms of “preference rule systems” as sketched in Jackendoff 1983.

“break” verbs are monadic, whereas base forms of “cut” verbs are dyadic. I have proposed an alternative analysis based on two hypothesized principles of the syntax-semantics interface, Morpholexical Transparency and Complete Linking. On this account, “cut” verbs co-lexicalize a property of an Instrument (or its use), but are nonspecific regarding the change effected by it. In contrast, “break” verbs describe a particular kind of state change, but are semantically nonspecific on the cause of this change. This explains why the latter, but not the former, produce transparently related inchoative forms, while the former, but not the latter, may participate in conative alternations.

I have then tested the hypothesis that verbs of separation in material integrity – C&B verbs – universally fall into the two classes of “cut” and “break” verbs, and only those. A survey of the semantic and syntactic properties of C&B verbs in 17 genetically and typologically diverse languages shows that this prediction is not borne out. The bipartition into “cut” and “break” verbs must be replaced by a tripartite classification that includes “bipolar” verbs, which are semantically specific about both the state change and its cause. These include complex C&B verbs such as Germanic verb-particle constructions and compound verb stems as in Biak, Mandarin, and Yukatek. Bipolar verbs show the syntactic variability of neither “break” verbs nor “cut” verbs, and thus provide an unexpected confirmation of the principle of Morpholexical Transparency.

Nor do all languages have both “cut” and “break” verbs. In Mandarin, all simplex verbs in the C&B domain encode either the use of an Instrument, but no state change, or describe a state change without reference to a cause. All causative state change verbs are “bipolar” compounds. So Mandarin has neither “cut” nor “break” verbs. The same is true in Biak, with the exception of one apparent true “cut” verb. Other



languages lack “cut” verbs because, instead of categorizing “cutting” events in terms of actions with Instruments, as other languages do, they categorize them in terms of state changes. Such verbs are found in Ewe, Spanish, Sranan, and Yélf Dnye. In Yélf, such “break” verbs appear to be the only expression of severance events; this language thus lacks “cut” verbs altogether (Levinson, this issue).

Finally, it is often difficult to validate the prediction that causative-inchoative alternations and anticausative derivations are restricted to “break” verbs. This is because many languages have an anticausative construction that is polysemous, and also encompasses a voice reading (middle or passive). In some cases, as in English, the voice reading of the polysemous form can be distinguished from the anticausative reading because it cannot refer to individual events. In other cases, e.g., the Spanish pseudo-reflexive construction, discourse-pragmatic evidence can help disambiguate between the two interpretations. But in the case of the putative “anaphoric passive” function of the so-called middle voices of Mandarin and Yukatek, the prediction cannot be tested even with use of discourse-pragmatic evidence.

Taken together, the findings of this study suggest that what is shared across languages in the C&B domain is not, in first approximation, lexical classes with predictable morphosyntactic properties. The true universals of the syntax-semantics interface in this domain appear to be the abstract principles that govern the mapping between form and meaning, such as Morpholexical Transparency and Complete Linking.

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