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Case Marking and Event Structure: One Conlanger's Investigations

Matt Pearson

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Abstract

This paper explores how arguments are distinguished using case marking in different languages, with particular reference to the ways in which case marking is affected by factors such as animacy, definiteness and specificity, the aspect of the clause (perfective versus imperfective), and the event-type of the predicate (including whether it is stative or dynamic, telic or atelic, durative or punctual). The paper includes both a typological and an autobiographical component. I begin by briefly illustrating how case marking interacts with argument and event structure in various natural languages. I then show how my own efforts at language construction have been informed by these phenomena, and how my attempts to invent a unique yet naturalistic case system have broadened my understanding of argument and event structure in natural languages.

1 Introduction: Encoding Grammatical Roles

One important function of morpho-syntax is to encode, in an explicit yet economical fashion, how the participants in a given event are associated to particular grammatical roles (e.g., subject versus object), thereby enabling language users to distinguish them and determine ‘who’s doing what to whom’ in a given clause. Some languages do this primarily by means of WORD ORDER. In Malay, for example, subjects and objects are distinguished by their position relative to the verb: subjects precede the verb while objects follow.¹

- (1) Malay
- a. Saya membantu ibu
1s ACT.help mother
‘I am helping mother’

¹The following abbreviations are used in the examples: 1du = first person dual, 1p = first person plural, 1s = first person singular, 3 = third person, 3s = third person singular, ACC = accusative, ACT = active voice, ALL = allative, DAT = dative, DET = determiner, ERG = ergative, FEM = feminine, IMP = imperative, INF = infinitive, INTR = intransitive, IPF = imperfective, LOC = locative, MASC = masculine, NOM = nominative, OBJ = object (agreement), OBL = oblique case marker, PART = partitive, PF = perfective, PL = plural, PRG = progressive, PST = past, RPST = remote past, SUBJ = subject (agreement), TNS = tense marker, TR = transitive.

- b. Ibu membantu saya
 mother ACT.help 1s
 ‘Mother is helping me’

Other languages add morphology to the verb (or some other element associated with the verb, such as an auxiliary) which encodes the person/number and gender features of one or more of the verb’s arguments, with the presence or type of morphology being determined by the grammatical role of that argument. This kind of morphology is called AGREEMENT or CONCORD. One example of a language which makes heavy use of agreement to distinguish arguments is Yimas, a Papuan language spoken in New Guinea (Foley 1991). Nouns in Yimas are divided into to various classes, where each noun class triggers a different set of agreement prefixes on the verb. In simple transitive clauses a verb will take two such prefixes, where the first prefix agrees with the object and the second prefix with the subject. Consider the example below, where the arguments are *narmanj* ‘woman’, which belongs to class II, and *krayj* ‘frog’, which belongs to class VI.

- (2) Yimas
 Krayj narmanj **k-n-tay**
 frog.VI woman.II VI:OBJ-II:SUBJ-see
 ‘The woman saw the frog’

That *narmanj* functions as the subject while *krayj* functions as the object is determined by the form of the verb: the class II agreement prefix follows the class VI prefix. Note that Yimas, unlike Malay, has very free word order. The words in (2) can be placed in any order without affecting the meaning, at least with regard to which noun is interpreted as the subject and which as the object. (In order to express ‘The frog saw the woman’, the agreement morphology on the verb must be changed.)

Besides word order and agreement, a third strategy which languages use to distinguish grammatical roles is CASE marking, whereby morphology is added directly to the noun phrase to mark its syntactic function. An example of this is Quechua, where direct objects of transitive verbs carry the ACCUSATIVE case suffix *-ta*, while subjects of transitive and intransitive verbs occur in the NOMINATIVE (marked by the absence of a case suffix):

- (3) Quechua
 a. Juan aywa-n
 Juan:NOM go-3
 ‘Juan goes’
 b. Juan Pedro-ta maqa-n
 Juan:NOM Pedro-ACC hit-3
 ‘Juan hits Pedro’

Most languages use some combination of word order, agreement, and case for distinguishing grammatical functions—though there is usually a tendency to favor one of these strategies over the others. For example, although Quechua is primarily a case-marking language, verbs also agree with their subjects (and in certain cases their objects): note the suffix *-n* on the verb in (3), which marks the subject as third person. Likewise, English relies primarily on

word order, but also makes limited use of subject agreement (e.g., *you sing* versus *she sings*), and makes case distinctions on pronouns (e.g., *he* versus *him*). In this paper, I will focus my attention on case marking systems, although many of my observations—e.g., with regard to the kinds of alignment patterns found in languages—also apply to agreement systems.

The structure of this paper is as follows: In section 2 I present a basic typology of case systems, focusing on how ‘core arguments’ (subjects and objects) are distinguished from one another. In section 3 I show that case marking can be sensitive to other factors besides the need to distinguish core arguments. For example, the choice of case marking can be determined by the semantic properties of the noun phrase being marked (such as animacy and definiteness), or by the semantic properties of the clause as a whole (e.g., whether or not it denotes an event with an inherent endpoint). Finally, in section 4 I turn to my own conlang, Okuna. In designing the system of core case marking in Okuna, I have been inspired by many of the phenomena discussed in section 3, with the goal of trying to carry an event-based case marking schema to its logical limit. In presenting the results of this work, I try to show how my attempts to devise a unique yet naturalistic case system have broadened my understanding of argument and event structure, yielding predictions about the kinds of case patterns we might expect to find in natural languages.

2 Basic Case Alignment

2.1 Accusative and Ergative

The examples in (3) above show that in Quechua, subjects of transitive and intransitive verbs take the same form (i.e., they appear without a case suffix) whereas objects of transitive verbs are marked differently, using the suffix *-ta*. Languages which treat intransitive subjects and transitive subjects the same way, with a distinct marking for transitive objects, are said to have an ACCUSATIVE alignment. Another language which works like Quechua is Japanese. In Japanese, however, both the nominative and the accusative are marked by overt suffixes:

- (4) Japanese
- a. Taroo-**ga** kita
Taro-NOM come.PST
‘Taro came’
 - b. Taroo-**ga** mikan-**o** tabeta
Taro-NOM orange-ACC eat.PST
‘Taro ate the orange’

Most languages with case systems exhibit this type of alignment. However, other strategies for distinguishing core arguments are also found. One of these is illustrated in (5) below for the Australian language Guugu Yimidhirr (Haviland 1979). In this language, direct objects and subjects of intransitive verbs are both unmarked, while subjects of transitive verbs take the case ending *-ngun*. This is known as an ERGATIVE case marker, and languages which use the same case marking for intransitive subjects and transitive objects, while marking transitive subjects in a different way, are said to have an ERGATIVE alignment.

- (5) Guugu Yimidhirr
- a. Yarrga buli
boy:NOM fell
'The boy fell down'
 - b. Yarrga-**ngun** dyaarba dudaaymani
boy-ERG snake:NOM chased
'The boy chased the snake'

In languages of the ergative type, the case used for intransitive subjects and transitive objects is typically referred to as the ABSOLUTIVE. However, some authors (e.g., Bittner and Hale 1996) refer to it as the NOMINATIVE, using this term to denote whatever case is canonically associated with intransitive subjects (regardless of whether this case is also used for transitive subjects, transitive objects, both, or neither). I adopt the latter convention in this paper.

A number of languages exhibit both ergative and accusative alignments in different contexts, suggesting that case alignment patterns are best thought of as features of particular syntactic domains (argument types, constructions, etc.) rather than as properties of entire languages. Languages which include both accusative and ergative alignments are said to be SPLIT-ERGATIVE, or to exhibit ERGATIVITY SPLITS. A common kind of ergativity split is based on tense or aspect: past or perfective clauses show an ergative alignment while non-past or imperfective clauses show an accusative alignment. This is illustrated below for the Caucasian language Georgian (Comrie 1978):²

- (6) Georgian
- a. Ṡtudent-**i** midis
student-NOM goes
'The student goes'
 - b. Ṡtudent-**i** mivida
student-NOM went
'The student went'
 - c. Ṡtudent-**i** çeril-**s** çers
student-NOM letter-DAT writes
'The student writes the letter'
 - d. Ṡtudent-**ma** çeril-**i** daçera
student-ERG letter-NOM wrote
'The student wrote the letter'

Another well-known type of split is illustrated in (7) for the Australian language Wargamay (Lynch 1998). In languages of this type, pronouns inflect for case according to an accusative alignment, while common noun phrases inflect according to an ergative alignment. Notice that this split results in transitive clauses where nominative marking appears on both the subject and the object (7c), or on neither (7e).

²Somewhat confusingly, Georgian uses the DATIVE case instead of the accusative to mark transitive objects in present tense clauses. Crucially, direct objects are marked differently from both transitive and intransitive subjects, showing that present tense clauses have an accusative alignment.

- (7) Wargamay
- a. Ngali gagay
 Idu:NOM go
 ‘We two are going’
 - b. Maal gagay
 man:NOM go
 ‘The man is going’
 - c. Ngali ganal ngunday
 Idu:NOM frog:NOM see
 ‘We two are looking at the frog’
 - d. Maal-**ndu** ganal ngunday
 man-ERG frog:NOM see
 ‘The man is looking at the frog’
 - e. Maal-**ndu** ngali-**nya** ngunday
 man-ERG Idu-ACC see
 ‘The man is looking at us two’

Interestingly, the mirror images of the ergativity splits in (6) and (7) never seem to occur. That is, we do not find natural languages in which past (or perfective) clauses show an accusative alignment while non-past (or imperfective) clauses show an ergative alignment. Likewise, there do not seem to be any natural languages in which pronouns inflect according to an ergative alignment while common noun phrases inflect according to an accusative alignment. For some discussion of these asymmetries, see Delancey (1981).

2.2 Object Marking in Ditransitives

Just as subject and object marking shows different alignments (accusative versus ergative), both across languages and within the same language, so we find differences in how the two objects in a ditransitive clause are marked. A DITRANSITIVE clause is one which includes two objects (e.g., *Daniel gave the woman a present*), while a clause with only a single object (e.g., *Daniel read the book*) is said to be MONOTRANSITIVE. Ditransitive clauses generally denote events of transmission, involving a change in location or ownership. To distinguish the two objects in a ditransitive clause, I will use the term THEME to refer to the object denoting the participant that undergoes the change of location or ownership (e.g., *a present* in the example above), while the object denoting the endpoint or recipient (e.g., *the woman* above) is referred to as the GOAL.

A common pattern for distinguishing themes from goals is found in Japanese, illustrated in (8). Here the theme is marked the same way as the object of a monotransitive clause, namely with accusative case. By contrast, the goal is marked with a different case, usually referred to as the DATIVE. Languages like Japanese are said to mark objects according to a DIRECT-INDIRECT alignment: objects in monotransitive clauses and themes in ditransitive clauses are grouped together as DIRECT OBJECTS, while goals in ditransitive clauses are treated separately and referred to as INDIRECT OBJECTS.

- (8) Japanese
- a. Taroo-**ga** mikan-**o** tabeta
Taro-NOM orange-ACC eat.PST
'Taro ate the orange'
 - b. Taroo-**ga** Hanako-**ni** hon-**o** yatta
Taro-NOM Hanako-DAT book-ACC give.PST
'Taro gave the book to Hanako'

A different pattern for marking objects in ditransitive clauses is found in Kokborok (spoken in Assam, India). In this language, it is the goal which receives the same marking as the object of a monotransitive clause, namely the dative suffix *-no*. The theme, by contrast, is marked by the absence of a suffix. Languages with this pattern are said to have a PRIMARY-SECONDARY object alignment: goals and objects of monotransitives are grouped together and referred to as PRIMARY OBJECTS, while themes are treated separately and referred to as SECONDARY OBJECTS (Dryer 1986).

- (9) Kokborok
- a. Buruy-čhikla-rəg-**no** rəhər-di
girl-young-many-DAT send-IMP
'Send the young girls!'
 - b. Buphaŋ-**no** tuy ru-di
tree-DAT water give-IMP
'Give the tree water!'

Note that the classification of languages into direct-indirect and primary-secondary types cuts across their classification into accusative, ergative, and split-ergative types. All possible combinations appear to be attested. For example, Basque is like Japanese in exhibiting a direct-indirect alignment in ditransitives, but whereas Japanese is an accusative language, Basque is ergative. Likewise, the Bantu languages of Africa tend to show a primary-secondary alignment in ditransitives, and are exclusively accusative; while the Salish languages of the Pacific Northwest also show a primary-secondary alignment, but are ergative.

2.3 The Function of Case Marking

Comrie (1978) and others have suggested that the primary role of case marking is to differentiate the core arguments of transitive predicates—that is, to provide a formal means for distinguish subjects from objects, and goals from themes. Moreover, languages tend towards economy in the number of formal distinctions they make. For example, Comrie notes the comparative scarcity of languages in which intransitive subjects are consistently marked differently from both transitive subjects and transitive objects. Likewise, languages in which monotransitive objects are consistently marked differently from both theme and goal objects do not seem to be attested.

However, a number of authors, beginning with Hopper and Thompson (1980), have shown that case marking can serve other syntactic and semantic functions besides simply disambiguating subjects from objects, and goals from themes. For example, case marking can

convey information about the nature of the event or its participants. An example of this was already given in (6) above, which shows that case alignment in Georgian is sensitive to the tense/aspect of the clause. Other factors which influence the case marking of core arguments are illustrated in the following sections. After reviewing examples from natural languages, I show how a consideration of event structure has informed the development of the case system in my conlang, Okuna.

3 Some Factors Influencing Core Case Marking

3.1 Animacy, Agentivity, and Individuation

Languages often associate prototypical transitive subject marking with events where the subject is AGENTIVE—i.e., acting consciously and volitionally, and initiating or controlling the event rather than being affected by it. For example, in many ergative languages, ergative case appears not just on transitive subjects, but also on the subjects of certain intransitive verbs denoting highly agentive actions. On the other hand, in both ergative and accusative languages, transitive subjects often fail to take canonical case marking when the clause contains a non-volitional or non-dynamic predicate—e.g., a predicate denoting a psychological state or event of perception, over which the subject participant exerts little or no conscious control.

Both of these phenomena are illustrated by Guaymí, a Chibchan language spoken in Costa Rica and Panama (Payne 1997). In Guaymí, canonical transitive subjects take ergative marking (in the past tense only; cf. the Georgian examples in (6) above). This is illustrated in (10a). Ergative case also marks the subject of certain intransitive verbs denoting volitional actions, as in (10b). However, intransitive subjects expressing the undergoer of an action are unmarked (10c), while transitive subjects denoting the experiencer of an emotion or sensation appear in an oblique case, such as the dative or locative (10d)–(10e):³

- (10) Guaymí
- a. Toma-**gwe** Dori dəma-ini
Tom-ERG Doris greet-PST
‘Tom greeted Doris’
 - b. Dori-**gwe** blit-ani
Doris-ERG speak-PST
‘Doris spoke’
 - c. Nu ŋat-ani
dog die-PST
‘The dog died’
 - d. Toma-**e** Dori hatu-aba
Tom-DAT Doris see-PST
‘Tom saw Doris’

³The term OBLIQUE refers to case roles other than those prototypically associated with subjects and objects. Oblique cases typically denote more peripheral participants in an event—e.g., location, beneficiary, reason, manner, and so on.

- e. Davi-**bötö** Dori hurö rib-aba
 David-LOC Doris fear feel-PST
 ‘David was afraid of Doris’

Agency is tied to ANIMACY, since the more ‘animate’ a participant is, the more likely it is to play the role of agent in discourse. Hence, animacy is sometimes an important factor in how subjects are case-marked. In general, the less animate the subject noun phrase is—either in absolute terms, or relative to the animacy of the object noun phrase—the more likely it is to receive (special) case marking. A striking example of this comes from Dani, a Papuan language of New Guinea (Foley 1986). Like Yimas, discussed above, Dani makes extensive use of verb agreement, but has little core case morphology: transitive subjects and objects are prototypically unmarked for case. However, the subject does take a special ergative suffix just in case it is less animate than the direct object. This is illustrated by the minimal pair below. Note that in Dani, as in most languages with animacy hierarchies, nouns denoting humans are considered more ‘animate’ than nouns denoting animals.

- (11) Dani
- a. Ap palu na-sikh-e
 man python 3SOBJ:eat-RPST-3SSUBJ
 ‘The man ate the python’
- b. Ap palu-**nen** na-sikh-e
 man python-ERG 3SOBJ:eat-RPST-3SSUBJ
 ‘The python ate the man’

Like subjects, direct objects can also vary in their case marking depending on their semantic properties. In many languages, only certain types of noun phrases take special direct object marking. For example, in Malagasy (an Austronesian language spoken on Madagascar), subjects and objects are distinguished primarily through word order, with the subject following the object (12a)–(12b). In addition, however, proper names take accusative case marking when they function as direct objects: compare (12c) with (12d) (pronouns also have distinct nominative and accusative forms, as in English).

- (12) Malagasy
- a. Mahita ny lehilahy ny vehivavy
 see DET man DET woman
 ‘The woman sees the man’
- b. Mahita ny vehivavy ny lehilahy
 see DET woman DET man
 ‘The man sees the woman’
- c. Mahita ny lehilahy Rabe
 see DET man Rabe
 ‘Rabe sees the man’
- d. Mahita **an-d**Rabe ny lehilahy
 see ACC-Rabe DET man
 ‘The man sees Rabe’

This may be a special case of a general pattern found in many languages with an accusative alignment, whereby objects are marked differently from subjects only when they are highly INDIVIDUATED—that is, definite, referential, and/or denoting a particular individual or quantity. Turkish (13) and Hebrew (14) are languages in which accusative case marking is reserved for objects that have specific or definite referents. Indefinite or non-specific objects are unmarked, making them non-distinct from nominatives (Enç 1991, Hopper and Thompson 1980):

- (13) Turkish
- a. Ali bir piyano kirala-mak ist-iyor
 Ali one piano rent-INF want-IPF
 ‘Ali wants to rent a piano’ (any piano will do)
 - b. Ali bir piyano-**yu** kirala-mak ist-iyor
 Ali one piano-ACC rent-INF want-IPF
 ‘Ali wants to rent a (specific) piano’

- (14) Hebrew
- a. David natan matana lə-Rina
 David gave present to-Rina
 ‘David gave a present to Rina’
 - b. David natan **’et** ha-matana lə-Rina
 David gave ACC DET-present to-Rina
 ‘David gave the present to Rina’

Note that in such languages, unmarked direct objects tend to form a tighter unit with the predicate than marked objects do. In Turkish, for example, unmarked objects must immediately precede the verb, whereas accusative-marked objects can be separated from the verb by intervening material. Note the position of the object relative to the adverb *hemen* in (15a) versus (15b).

- (15) Turkish
- a. Ali hemen bir piyano kirala-mak ist-iyor
 Ali immediately one piano rent-INF want-IPF
 ‘Ali wants to rent a piano immediately’ (any piano will do)
 - b. Ali bir piyano-**yu** hemen kirala-mak ist-iyor
 Ali one piano-ACC immediately rent-INF want-IPF
 ‘Ali wants to rent a (specific) piano immediately’

This tendency for non-individuated objects to associate to the verb is taken to its extreme in languages that have productive NOUN INCORPORATION, like the Siberian language Chukchee (Hopper and Thompson 1980). In Chukchee, the less individuated the direct object is, the more likely it is to lose its object status altogether and combine with the verb into a single morphological unit, as shown in (16). Note that Chukchee is an ergative language: the fact that the subject in (16) is marked nominative instead of ergative shows that the clause is

formally intransitive, which in turn suggests that the incorporated noun *kopra-* is not being treated as a separate argument, but rather as part of the verb.⁴

(16) Chukchee

- a. Tung-**e** nantəwatən kupre-**n**
 friends-ERG set.3sOBJ.3pTR:SUBJ net-NOM
 ‘The friends set the net’
- b. Tung-**ət** kopra-ntəwatg’at
 friends-NOM net-set.3pINTR:SUBJ
 ‘The friends set nets’ (lit. ‘The friends net-set’)

As a final example of differential object marking, consider Hindi (17) (Hopper and Thompson 1980). In Hindi, direct object marking depends on both individuation and animacy: the more individuated the direct object is, and the higher its referent is on the animacy hierarchy, the more likely it is to take case marking. For instance, definite noun phrases with human referents are almost always case-marked, while non-referential noun phrases denoting inanimate entities almost never are.⁵

(17) Hindi

- a. Machuee-nee machlii pakṛii
 fisherman-ERG fish(FEM):NOM caught:FEM
 ‘The fisherman caught a fish’
- b. Machuee-nee machlii-**ko** pakṛaa
 fisherman-ERG fish(FEM)-DAT caught:MASC
 ‘The fisherman caught the fish’

Notice that marked objects in Hindi take the dative case (cf. the Georgian example in (6c)). This is not an uncommon pattern. Generally speaking, it seems that the more animate and individuated the direct object of a monotransitive is, the more likely it is to be marked like the goal argument in a ditransitive; and the less animate and individuated it is, the more likely it is to be marked like a theme argument.

3.2 Aspect and Aktionsart

In addition to the features of the event participants (such as animacy and agentivity), case marking can be affected by the properties of the event itself, or by the temporal and aspectual viewpoint from which the event is regarded.

We already saw an example of the latter type in Georgian, where core arguments can be marked according to an ergative alignment or an accusative alignment, depending on the tense/aspect of the clause. Another example of the interaction between case and aspect is illustrated below for Finnish. Direct objects in Finnish generally take one of two cases, accusative or partitive. One of the factors determining the choice of case is the aspect of

⁴Note also that *kupre-* ‘net’ becomes *kopra-* in (16b) due to vowel harmony: roughly speaking, the vowels in the noun stem undergo lowering to match the height of the low vowel /a/ in the verb stem.

⁵Past tense verbs in Hindi agree in gender and number with their nominative argument. If no nominative argument is present, the verb takes ‘default’ masculine singular agreement.

the clause: partitive case is preferred when the clause expresses a generic or ongoing event (IMPERFECTIVE aspect), as in (18a), while accusative case is preferred when the clause expresses a specific event which is viewed as complete(d) (PERFECTIVE aspect), as in (18b). Notice that the form of the verb is the same in these two examples: whether the clause has a perfective interpretation (‘wrote’) or an imperfective interpretation (‘was writing’) is indicated solely by the case marking on the object.⁶

(18) Finnish

- a. Liikemies kirjoitti kirjet-**tä** valiokunna-**lle**
 businessman:NOM wrote letter-PART committee-ALL
 ‘The businessman was writing a letter to the committee’
- b. Liikemies kirjoitti kirjee-**n** valiokunna-**lle**
 businessman:NOM wrote letter-ACC committee-ALL
 ‘The businessman wrote a letter to the committee’

Other properties which may be relevant to case marking include DYNAMICITY, TELICITY, and PUNCTUALITY. These properties relate not to the tense/aspect of the clause, but to the kind of event or state of affairs denoted by the predicate (sometimes called AKTIONART, literally ‘type of action’). I discuss these properties in turn.

Dynamicity relates to whether the predicate denotes a situation involving change over time. Non-dynamic predicates, also called STATIVE predicates, are those which express states, properties, locations, or relations. Dynamic predicates, also called EVENTIVE predicates, are those which express ‘true’ events—that is, situations involving a change in the state or location of an entity, or a change in the relationship between two or more entities. Examples of sentences with non-dynamic predicates include those in (19), while (20) gives sentences with dynamic predicates:

- (19) a. That dog is happy
 b. That dog has three legs
 c. That dog resembles its master
- (20) a. That dog ran away
 b. That dog was eating a bone
 c. That dog died

Eventive predicates can be further classified according to telicity. TELIC predicates denote events which have a natural endpoint—that is, events which (if they are not interrupted first) will necessarily reach a moment of completion or culmination, beyond which they cannot continue. An example of a sentence with a telic predicate is *The girl ate the apple*. Here the event reaches its endpoint once the apple has been completely consumed. Additional examples of telic predicates are given in (21). An ATELIC predicate is one which does not have a natural endpoint, and can (in principle) continue indefinitely. An example of a sentence with an atelic predicate is *The girl carried the cat*. Here there is no necessary stopping point,

⁶Other factors which affect the choice between partitive and accusative include the definiteness of the direct object, and whether the predicate is stative or eventive (cf. the Estonian examples in (28) and (29) below).

no point at which the girl can be said to have ‘completed’ the action of carrying the cat; rather, the endpoint of the event is arbitrary. Other examples of atelic predicates are given in (22).

- (21) a. Daniel fell down
 b. Daniel built a house
 c. Daniel reached the summit
- (22) a. Daniel danced
 b. Daniel wore a red shirt
 c. Daniel is walking the dog

Finally, telic predicates can be classified according to their degree of punctuality. PUNCTUAL predicates denote changes of state or location which are (conceived of as being) virtually instantaneous. By contrast, NON-PUNCTUAL (or DURATIVE) predicates denote events which take time to reach their culmination point. Examples of punctual predicates are given in (23), while (24) includes examples of non-punctual predicates:

- (23) a. The bomb exploded
 b. Daniel entered the house
 c. Daniel passed out
- (24) a. Daniel recovered from the illness
 b. Daniel drank a glass of milk
 c. Daniel wrote the letter

An example of how telicity and punctuality can influence case marking comes from the Polynesian language Samoan, which shows a generally ergative alignment (Hopper and Thompson 1980). The verb *manatu* ‘think’ can denote either an atelic event (‘think about’) or a telic and punctual event (‘think of, remember’). In the former case, the verb is formally intransitive, and takes a nominative (unmarked) subject denoting the experiencer and an oblique argument denoting the subject matter (25a). In the latter case, the verb is formally transitive (suffixed with the transitive marker *-a*), and takes an ergative subject denoting the experiencer and a nominative object denoting the subject matter (25b).

- (25) Samoan
- a. Sā manatu le tama i le teine
 TNS think DET boy OBL DET girl
 ‘The boy thought about the girl’
- b. Sā manatu-a le teine e le tama
 TNS think-TR DET girl ERG DET boy
 ‘The boy remembered the girl’

A second pair of examples illustrating the same contrast is given below, featuring the verb *va’ai*. The sentence in (26a) receives a durative interpretation, while (26b) receives a punctual interpretation:

(26) Samoan

- a. Na va'ai le tama i le i'a
TNS look:at DET boy OBL DET fish
'The boy was looking at the fish'
- b. Na va'ai-a e le tama le i'a
TNS look:at-TR ERG DET boy DET fish
'The boy spotted the fish'

For certain types of transitive predicates, telicity is connected to how individuated the direct object is. Compare the following:

- (27) a. Daniel ate *the apple*
b. Daniel ate *apples*

In the first sentence, the verb takes a definite singular object and the predicate is construed as telic: the eating event culminates once the apple in question has been completely consumed. In the second sentence, where the verb takes a bare plural object, the predicate is construed as atelic: since no definite quantity of apples is specified, the eating event can go on indefinitely. Since case marking can be affected by how individuated the direct object is, it should come as no surprise that case marking can also be influenced by aktionsart.

As a final example showing how these various factors combine to determine case marking, consider Estonian (Hopper and Thompson 1980). In this language direct objects typically take either the accusative case or the partitive case. Broadly speaking, the more individuated the object is, and the more affected by the action, the more likely it is to appear in the accusative case; the less individuated and affected the object is, the more likely it is to take partitive case marking. For example, the partitive case is used when the direct object is indefinite or non-specific (28a); when the event is ongoing (imperfective), and hence the direct object is not (viewed as having been) completely affected by the action (28b); or when the predicate is stative or otherwise non-agentive, and denotes an event where the direct object does not undergo any change of state (28c)–(28d):

(28) Estonian

- a. Me peame kohe bensii*n-i* võtma
we must.1p right:away petrol-PART take
'We'll have to get some petrol right away'
- b. Mu sõber pakkis oma asj*-u*
my friend packed his thing-PART:PL
'My friend was packing his things'
- c. Ma nägin oma sõpr*-a* kohvik*-s*
I saw my friend-PART coffehouse-in
'I saw my friend in the coffehouse'
- d. Ma armastan park*-i* väga
I like park-PART much
'I like the park very much'

On the other hand, partitive case is dispreferred when the event has an endpoint which has been successfully reached. Note the following pair: Adding the directional particle *ära* to the clause renders the predicate telic and punctual, in which case it denotes a change of state rather than a state or property (cf. the Samoan examples in (25)). When *ära* is present, the direct object appears in the accusative rather than the partitive, even though it need not be understood as affected by the action.

- (29) Estonian
- a. Ta tundis seda nais-t
 he knew this:PART woman-PART
 ‘He knew this woman’
- b. Ta tundis selle nais-e ära
 he knew this:ACC woman-ACC away
 ‘He recognized this woman’

4 Conlang Applications: An Okuna Case Study

Okuna (formerly called Tokana) is a conlang I have been working on for the last eighteen years or so. Over that time it has gradually evolved into a relatively free word order language, with SOV being the unmarked order, where the syntactic functions of core arguments are encoded by a combination of case marking on noun phrases and plural agreement on verbs. (I abstract away from plural agreement in the following discussion.)

Okuna started out as a garden-variety accusative language, but gradually evolved towards a more ergative-like alignment. Eventually I settled on a system involving three core case roles, NOMINATIVE, ERGATIVE, and DATIVE, marked by affixes which attach to the final word of the noun phrase. In the current incarnation of the language, ergative case is marked by the suffix *-ma*, while dative case is marked by the suffix/infix *-i* (which generally attaches after the final vowel in the stem: e.g., *iha* ‘woman’ + *-i* > *ihai*; *mikal* ‘boy’ + *-i* > *mikail*). The nominative case is marked by the suffix *-e*, or by a shift in stress to the final syllable of a vowel-final stem (with lowering of a final high vowel: e.g., *kytu* ‘gift’ > *kytò*). Examples of these three cases are given in (30):

- (30) a. Ihama akote totsait teunyi
 woman.ERG box.NOM table.DAT put.PF
 ‘The woman put the box on the table’
- b. Sakialma mikail kytò uktiyl
 Sakial.ERG boy.DAT present.NOM give.PF
 ‘Sakial gave the present to the boy’

Originally the case system worked much like in a ‘normal’ ergative language, with ergative case used for transitive subjects, and nominative case for intransitive subjects and transitive objects. Ditransitive clauses had a direct-indirect object alignment, with dative case used to mark goals and nominative case used to mark themes. But as the language evolved, I began to take note of how case marking often interacts with aspect, definiteness, volitionality, etc., in natural languages. I then conceived the idea of building a case system for Okuna from

the ground up, based on (certain pre-selected features of) event structure. What would such a language look like? How naturalistic would it be?

Taking sentences like those in (30) as my model, I noted that they define an event in which a **THEME** (marked with nominative case) is transmitted from an **AGENT** (marked with ergative case) to a **GOAL** (marked with dative case). Moreover, the event is both volitional and telic: it is initiated and sustained by the action of the agent, and ends once the theme has reached the goal. Generalizing this under the inspiration of languages like those discussed in the previous sections, I hit upon the following schema for mapping case roles onto event participants:

- (31) a. **Ergative** – Marks a noun phrase as denoting an event participant (typically animate and volitional) which is the source of an action, or initiates a change of state in some other participant.
- b. **Dative** – Marks a noun phrase as denoting a participant which specifies the goal or endpoint of a telic event.
- c. **Nominative** – The ‘elsewhere’ case: Typically marks a noun phrase as denoting a participant which occupies (or comes to occupy) a location, which is transmitted from an agent or source to a goal, or which mediates in some way between an agent or source and a goal.

The experiment was then to see how far I could extend the schema in (31) without creating a system that seemed artificial or incoherent to me. How would the mapping scheme outlined above dictate the assignment of cases to core arguments, and how would the results compare with what is attested in natural languages?

4.1 Change of Motion, Change of State

Consider again ditransitive clauses such as (30) above. These denote events of directed motion—that is, events where one participant manipulates another, causing the latter to end up in a new location. Of course, motion events can also be undirected (or self-directed), in which case an object moves to a new location of its own accord, without that action having any external controller or initiator. Since an undirected motion event has a theme and a goal, but no separate causer, a clause denoting such an event will include a nominative argument and a dative argument, but lack an ergative argument. An example is given in (32a). Another example of a clause denoting a self-directed motion event is given in (32b); here the goal of the event is implicit, and the verb takes just a nominative argument.

- (32) a. Sakiale kotoi etyi
Sakial.NOM house.DAT go.PF
‘Sakial went to the house’
- b. Sakiale uihtyi
Sakial.NOM sit:down.PF
‘Sakial sat down’

How to mark participants in non-motion events? One strategy is to metaphorically extend the change of location of a theme to other, more abstract kinds of change, such as change in possession (where the dative-marked goal denoting the possessor):

- (33) Mikail kytò moityi
 boy.DAT present.NOM get.PF
 ‘The boy received a present’

Extending the motion metaphor in a different direction results in examples like (34). These clauses denote non-agentive, telic, often punctual events whereby one entity (the experiencer) acquires the perception or knowledge of another entity or idea. Here, following a pattern commonly found in natural languages, the experiencer is treated as a kind of goal, into whose awareness the second participant (treated as a theme) figuratively moves. The experiencer is thus marked with dative case (cf. the Guaymí example in (10d) above), while the object being perceived is marked with nominative case.

- (34) a. Sakiail mikale kilyi
 Sakial.DAT boy.NOM see.PF
 ‘Sakial saw the boy’
 b. Sakiail kihune tlelhyi
 Sakial.DAT letter.NOM find.PF
 ‘Sakial found the letter’

Note that, since dative case marks noun phrases associated with the endpoint of a telic event, it will only mark the experiencer when the predicate denotes acquisition of a mental state, like those in (34). To remain consistent with the schema in (31), predicates denoting the mental state itself must take experiencers in one of the other cases. I opted to use oblique cases, such as the LOCATIVE, for this function (cf. the Guaymí example in (10e)). Locative case in Okuna is marked with the suffix *-na*. Compare:

- (35) a. Sakiail mikale tsokuyi
 Sakial.DAT boy.NOM meet.PF
 ‘Sakial met the boy’
 b. Sakialna mikale koipa
 Sakial.LOC boy.NOM know.IPF
 ‘Sakial knows the boy’

Compare also the following examples, where the verbs *kil-* and *kul-* are contrasted. Both of these verbs correspond to English ‘see’. However, *kil-* is dynamic and telic, referring to an event whereby an object enters the visual field of the perceiver; whereas *kul-* (derived from *kil-* through a change in the stem vowel) is non-dynamic and atelic, referring to the state whereby an object is located in the visual field of the perceiver. By the logic of the system, only *kil-* will mark take an experiencer argument in the dative case. The experiencer argument of *kul-* appears in an oblique case, here the ALLATIVE (marked by the suffix *-a*):

- (36) a. Sakiail mikale kilyi
 Sakial.DAT boy.NOM see.PF
 ‘Sakial saw (i.e., noticed, caught sight of) the boy’
 b. Sakiala mikale ikulanka
 Sakial.ALL boy.NOM PRG.see.IPF:PST
 ‘Sakial saw (i.e., was able to see, had a view of) the boy’

Yet another way to metaphorically extend the schema in (31) would be to associate events where an object arrives at a location with events where an object enters into a state. This gives us a way to deal with clauses expressing spontaneous transformation: the noun phrase denoting the participant undergoing the transformation is marked with nominative case, while the noun phrase denoting the final state (if overtly expressed) is marked with dative case. Compare (32a) above with the example in (37b): just as the moving event ends once Sakial reaches the house, so the changing event ends once the caterpillar reaches ‘butterfly-hood’.

- (37) a. Sakiale tiokyi
 Sakial.NOM die.PF
 ‘Sakial died’
 b. Lyihpyilà sileip milhtyi
 caterpillar.NOM butterfly.DAT turn.PF
 ‘The caterpillar turned into a butterfly’

In treating terminal states as a type of goal, Okuna is again following a pattern commonly found in natural languages (compare (37b) with its English translation, where the terminal state is marked using the goal preposition *into*). The treatment of other types of change-of-state events is discussed in the next section.

Consider also the examples below. As (38a) shows, noun phrases in the nominative case not only denote participants undergoing a change of location (when the clause is dynamic), but also participants occupying a particular location (when the clause is non-dynamic). Given the metaphorical extension whereby arrival at a location is equated with entry into a state, we might likewise equate being in a location with being in a state. Therefore nominative case will also be used for arguments which occupy a state of being, or possess a particular property, as in (38b):

- (38) a. Pyie keulna itoilha
 child.NOM chair.LOC PRG.stand.IPF
 ‘The child is standing on the chair’
 b. Pyie fiha
 child.NOM young.IPF
 ‘The child is young’

4.2 Agentivity and Affectedness

Notice that the examples in the previous section all lack ergative noun phrases. In accordance with (31), ergative case in Okuna is associated only with event participants that act as the external agent or source of a dynamic event. Hence a clause which describes a non-dynamic state of affairs, or an event which lacks an external agent—such as those in the previous section—will not include an ergative argument.

Conversely, whenever an event is understood to be initiated or controlled by an agent, that agent will be represented by an ergative argument. Compare the examples below, which show that when a noun phrase in the ergative case is added to a sentence denoting a

spontaneous change of state or location, the resulting sentence denotes a change of state or location caused by an external agent.

- (39) a. Hitole mukyi
 door.NOM close.PF
 ‘The door closed’
 b. Elimma hitole mukyi
 Elim.ERG door.NOM close.PF
 ‘Elim closed the door’
- (40) a. Sakiail mikale kilyi
 Sakial.DAT boy.NOM see.PF
 ‘Sakial saw the boy’
 b. Elimma Sakiail mikale kilyi
 Elim.ERG Sakial.DAT boy.NOM see.PF
 ‘Elim showed Sakial the boy’ (lit., caused Sakial to see the boy)

Much as in Guaymí, the connection between ergative case and agency is extended even to intransitive clauses in Okuna. When a single-argument verb denotes a (potentially) volitional event, involving a participant who exhibits conscious control over the activity in question, the noun phrase denoting that participant will generally appear in the ergative case, even though the clause is intransitive (41a). Intransitive clauses denoting non-volitional events, by contrast, normally have nominative subjects (41b).

- (41) a. Pyima hakatlyi
 child.ERG laugh.PF
 ‘The child laughed’
 b. Pyie mouhtyi
 child.NOM get:sick.PF
 ‘The child got sick’

How to mark objects of monotransitives in Okuna? A large number of monotransitive verbs describe situations whereby an agent acts so as to bring about a change of state in the patient. Based on the schema in (31), I opted to encode the patient as a dative-marked goal. Consider the examples in (42). In these sentences the direct object is marked with dative case because the event necessarily ends once the patient has been completely affected by the action: the eating event ends once the fish is entirely consumed, the smashing event ends once the pot is in pieces, and the building event ends when the fence is complete. There is thus a real sense in which the patient identifies or defines an endpoint for the event, much as the goal of a motion event does.

- (42) a. Ounama kahoi iasyi
 bear.ERG fish.DAT eat.PF
 ‘The bear ate the fish’
 b. Mikalma kopoi tsitspyi
 boy.ERG pot.DAT smash.PF
 ‘The boy smashed the pot’

- c. Sukakama mutoi tiespyi
 worker.ERG fence.DAT build.PF
 ‘The worker built a fence’

Comparing the sentences in (42) with those in (30), Okuna seems to be exhibiting a primary-secondary object alignment (cf. Kokborok (9), as well as Hindi (17)). However, this is an artifact of the examples chosen. If the monotransitive clause denotes an atelic event, one which lacks a predetermined endpoint, it follows from the schema in (31) that the direct object will not be marked with dative case. The verbs in (43) define open-ended events with arbitrary endpoints; therefore their direct objects will take (default) nominative marking instead of dative marking.

- (43) a. Ihama kopò ekpyi
 woman.ERG pot.NOM carry.PF
 ‘The woman carried the pot’
 b. Sakialma napehe tsulyi
 Sakial.ERG sister.NOM visit.PF
 ‘Sakial visited (his) sister’

Since telicity is a property of entire *predicates* rather than *verbs*, it also follows that a given verb in Okuna might take a dative object in some cases but not others, depending on telicity. Consider the examples in (44), which differ in how individuated the direct object *kahu* ‘fish’ is. In (44a), where the direct object takes dative case, a particular fish is being referred to, such that the event of eating that fish necessarily ends once the fish is completely consumed. In (44b), by contrast, *kahu* is not individuated, but instead picks out a general class of entities, with the predicate as a whole denoting an open-ended activity (fish-eating). By the logic of the system in (31), *kahu* cannot take dative case here, since, although it expresses the patient of the action, that patient does not identify the endpoint of a telic event. Instead, the direct object appears in its unmarked form, without any case ending at all. Likewise for the generic sentence in (44c), where the predicate denotes a property of bears in general, rather than a particular event or activity.

- (44) a. Ounama kahoi iasyi
 bear.ERG fish.DAT eat.PF
 ‘The bear ate the fish’
 b. Ounama kahu iasyi
 bear.ERG fish eat.PF
 ‘The bear ate fish’ (i.e., did some fish-eating)
 c. Ounama kahu iasa
 bear.ERG fish eat.IPF
 ‘Bears eat fish’

4.3 Further Consequences

Consider the following sentences:

- (45) a. The boy pushed the canoe
 b. The boy pushed the canoe *into the river*

Example (45a) is atelic, while the addition of the prepositional phrase in (45b) renders the predicate telic by adding an explicit endpoint. The event of pushing a canoe can (in principle) go on indefinitely, but the event of pushing a canoe into a river necessarily ends once the canoe is in the river. (Even if the boy continues to push the canoe after this point, he can no longer be described as pushing it into the river.) If dative case is associated with endpoints in Okuna, it follows that in the Okuna equivalent of (45b), *into the river* will be expressed using a phrase in the dative:

- (46) a. Mikalma puole tlynkyi
 boy.ERG canoe.NOM push.PF
 ‘The boy pushed the canoe’
 b. Mikalma puole sihkunoi tlynkyi
 boy.ERG canoe.NOM river.DAT push.PF
 ‘The boy pushed the canoe into the river’

Likewise, compare the following:

- (47) a. The boy pushed the canoe
 b. The boy pushed the canoe *seven feet*
 c. The boy pushed the canoe *for two hours*
 d. The boy pushed the canoe *until he got tired*

Like (45b), (47b)–(47d) are arguably telic. Here, though, the sentence does not include a goal phrase, but rather a phrase which indicates a particular spatio-temporal limit. The phrases *seven feet* and *for two hours* can be thought of as measuring the distance (in space or time) from the beginning of the pushing event to the end.⁷ The adjunct clause *until he got tired* fulfills a similar function, associating the endpoint of the pushing event with a particular change of state. Put another way, the event of pushing the canoe ends as soon as it reaches the point in space/time indicated by *seven feet*, *two hours*, or *he got tired*. Inasmuch as measure phrases and *until* clauses function to delimit (or provide an endpoint for) an otherwise atelic event, I decided that, by the logic of the system in (31), measure phrases and *until* clauses in Okuna should appear in the dative case:

- (48) a. Mikalma puole katlam kiain tlynkyi
 boy.ERG canoe.NOM cubit five.DAT push.PF
 ‘The boy pushed the canoe five cubits’
 b. Mikalma puole luom hein tlynkyi
 boy.ERG canoe.NOM hour two.DAT push.PF
 ‘The boy pushed the canoe for two hours’

⁷Compare (44a) above, where the fish can be thought of as ‘measuring the distance’ from the beginning of the eating event to the end: as the event progresses, more and more of the fish is consumed, with the endpoint of the event corresponding to the moment where fish is gone.

- c. Mikalma puole haktetai tlynkyi
 boy.ERG canoe.NOM getting:tired.DAT push.PF
 ‘The boy pushed the canoe until (he) got tired’

Metaphorically speaking, the boy is transmitting the canoe to an abstract endpoint, whose relationship to the starting point is defined by the spatial measure *katlam kian* ‘five cubits’, the temporal measure *luom hen* ‘two hours’, or the change event *hakteta* ‘getting tired’.

I know of no natural language which consistently treats measure phrases and *until* clauses in this way: rather than basing my use of dative case on a natural language model, I allowed it to arise from the logic of the system. Nevertheless, the result strikes me as entirely naturalistic, and I would therefore predict this feature to occur in some natural language. Interestingly, Finnish appears to provide some initial support for this prediction. Only after I decided to mark temporal measure phrases with dative case in Okuna did I discover that Finnish often uses the accusative case for this function (rather than, say, one of the oblique cases). This is illustrated in (49) (Mitchell 1991). The accusative in Finnish shares other functions with the dative in Okuna—for instance, both are used to mark the patients of telic predicates (cf. (18) and (42)).

- (49) Finnish
 Hän asui siellä yhde-**n** vuode-**n**
 3sNOM lived there one-ACC year-ACC
 ‘S/he lived there for one year’

As with the dative case, the schema in (31) similarly suggests various extensions to the uses of the nominative in Okuna. If transitive verbs denoting telic events assign dative case to their objects, this ‘frees up’ the nominative case to express other semantic roles. Recall that the ‘prototypical’ function of nominative case in Okuna is to mark entities which undergo movement from a source to a goal. Given my approach to event structure, whereby spatial relations are metaphorically extended to other kinds of relations, there are a number of roles that an extra nominative argument could conceivably play.

The nominative argument may be thought of as ‘mediating between’, or ‘bridging’, a source and a goal. Hence, in cases where the source is an agent initiating a change of state, and the goal is a patient undergoing a change of state, nominative case could be used to mark the instrument manipulated by the agent to bring about the change of state. Consider these examples:

- (50) a. Ihama kahoi tikò tahyi
 woman.ERG fish.DAT harpoon.NOM kill.PF
 ‘The woman killed the fish with the harpoon’
 b. Elimma totsait mule patlyi
 Elim.ERG table.DAT cloth.NOM cover.PF
 ‘Elim covered the table with the cloth’

In (50a), the harpoon can be thought of as transferring force from the woman to the fish, thereby acting as a kind of intermediary between the agent and the patient. Likewise in (50b), the covering event involves the movement or transference of the cloth from Elim to

the table. Notice that in languages with SERIAL VERB CONSTRUCTIONS, the instrument in a change-of-state event is often treated much like the theme of a directed motion event, while the patient is treated like the goal. For example, in the West African language Fon, both themes and instruments occur as the direct object of the light verb *só* ‘take’ (Lefebvre 1991):

- (51) Fon
- a. Kòkú só àsón dọ távò-ǰí
Koku take crab put table-on
‘Koku put the crab on the table’
 - b. Kòkú só àsón ná Àsíbá
Koku take crab give Asiba
‘Koku gave the crab to Asiba’
 - c. Kòkú só àtín hò Àsíbá
Koku take stick hit Asiba
‘Koku hit Asiba with the stick’

Likewise, with verbs of creation or transformation, the nominative argument could express the material being transformed, while the dative argument represents the object or substance being created/transformed. In (52) below, for example, the woman metaphorically transmits the clay into (the form of) a pot, and the corn into (the substance of) flour:

- (52) a. Ihama sutè kopoi uostyi
woman.ERG clay.NOM pot.DAT shape.PF
‘The woman shaped the clay into a pot’
or ‘The woman shaped the pot out of the clay’
- b. Ihama ahotsine sofoi tlulyi
woman.ERG corn.NOM flour.DAT pound.PF
‘The woman ground the corn into flour’

Finally, consider examples like the following:

- (53) a. The workers built the house
b. The workers built the house *in a month*

In (53b), as in (47c) above, a temporal measure phrase has been added to the sentence. Here, however, the measure phrase does not convert an atelic predicate into a telic one, since the predicate *build the house* is already telic. Rather than picking out the endpoint of the event, the measure phrase in (53b) specifies the span of time that separates the endpoint from the point at which the event began. Inasmuch as *in a month* can be thought of as tracing the distance from the source (or initiation) of the building event to its goal (or result), I chose to express the Okuna equivalent using the nominative:

- (54) a. Sukakama kotoi tiespyit
worker.ERG house.DAT build.PF.PL
‘The workers built the house’

- b. Sukakama kotoi es ilmè tiespyit
 worker.ERG house.DAT one month.NOM build.PF.PL
 ‘The workers built the house in one month’
 or ‘The workers took one month to build the house’

As with the dative measure phrase construction in (48), I don’t know of any natural language that works quite this way. But I think that the construction in (54) follows as a reasonable extension of the prototypical functions of nominative case in Okuna. It would be interesting to see if there are any natural languages which express measure phrases of this type in (the equivalent of) nominative case.

5 Conclusion

The primary function of core case marking systems is to discriminate the arguments of multi-argument verbs, thereby helping the listener keep track of ‘who’s doing what to whom’. However, in many if not most languages, case marking also shows sensitivity to grammatical features of the arguments (such as definiteness, specificity, referentiality, animacy, and volitionality), as well as features of the predicate (eventivity, telicity, punctuality) or the clause as a whole (tense, aspect). Case systems thus reflect not merely the number of arguments in the clause and their respective grammatical functions (subject, object, etc.), but also how the event denoted by the clause is conceived.

Inspired by phenomena in a number of natural languages, I have used my conlang Okuna as a laboratory for exploring the relationship between case and event structure. I have attempted not only to incorporate features such as volitionality and individuation into the case system, but to extend event-sensitive case marking as far as it will go to see what would happen. The results are sufficiently bizarre to satisfy my taste for the exotic, while still (I think) retaining the feel of a natural human language. Interestingly, my attempts to make my system as coherent and consistent as possible have led me to posit various patterns and syncretisms which don’t exist in any natural languages that I know of, but which *should* exist in some language if my theories about event structure are on the right track. This illustrates just one of the ways in which experimenting with conlangs can inform ones understanding and exploration of ‘natural’ language phenomena.

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