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Resultatives, Derived Statives, and Lexical Semantic Structure

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in Linguistics

by

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LIST OF ABBREVIATIONS

1 (1s, 1p)	first person (first person singular, first person plural)
¬1	not first person
2 (2s, 2p)	second person (second person singular, second person plural)
3 (3s, 3p)	third person (third person singular, third person plural)
ACC	accusative case
AGR	agreement morpheme
ALN	alienable possession
AUX	filler vowel occurring in some auxiliaries
COP	copula
CPM	complementizer
DET	determiner
DXF	deictic particle meaning ‘far, facing away’
DXS	deictic particle meaning ‘near, off to the side; oriented normal to the <i>f</i> direction in a spherical-polar coordinate system’
f	feminine gender
FOC	focus
IMP	imperfective aspect
INCEP	inceptive
INF	informal
IRR	irrealis
NEG	negative marker
NM	nominative case
NOM	nominalizer
PASR	passive resultative
PASS	passive
PAST	past tense
PDUR	past durative
PFV	perfective aspect
PL	plural marker
POS	possessive marker
POSR	possessive resultative
PPRT	past/passive participle
REF	reflexive
S	affirmative form of a class of verbs (marked with <i>s-</i> in Pima)
ST	stative
SUB	subject agreement
VB	verbalizer (used only in Pima on some predicate adjectives)

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ABSTRACT OF THE DISSERTATION

Resultatives, Derived Statives, and Lexical Semantic Structure

by

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The hypothesis that the meanings of words in natural language have structure has been debated among linguists for over three decades. This dissertation examines two resultative suffixes in Pima (Tepiman, Southern Uto-Aztecan), referred to as the passive resultative and the possessive resultative, whose properties are relevant for this debate. The interpretations which these two resultatives receive support one type of structure within the meanings of certain verbs.

The passive resultative suffix *-s* is canonically interpreted as a resultative proper; verbs with this suffix typically express the condition which results from an event of the type denoted by the unsuffixed verb. Certain verbs with this suffix, however, receive a derived stative interpretation, where the condition which they express need not be the result of any event at all. Other verbs with this suffix receive a perfect interpretation;

their meaning is solely that an event of some type has occurred. Resultative-suffixed verbs with these interpretations all lack as an argument the agent which occurs as subject of the base verb. Where the base does not take an agent, however, the suffixed form receives one of three other interpretations and the argument structure of base and resultative appears identical. The possessive resultative suffix *-kc*, in contrast, has a more restricted distribution; verbs with this suffix receive either a resultative or derived stative interpretation, where the subject of the suffixed verb is responsible for maintaining this condition.

While several analyses of the Pima resultatives are considered here, the most economical analysis of the distribution of interpretations which Pima resultatives receive involves monotonically adding semantic components in order to build the meaning of both eventive verbs and resultatives. This analysis is presented within the framework of Distributed Morphology, where the semantic components of these verbs are associated with a number of abstract syntactic elements. Since these resultatives are temporally stative, an introductory chapter explores what temporal stativity is and what it indicates about a predicate; another introductory chapter discusses published analyses of resultatives in Chichewa and German, which show several quite different ways that a morphologically and semantically derived predicate may be given this property.

1. Introduction

What is meaning? How is it best represented? Is there structure to the meaning of words, or is the meaning of a word simply unanalyzable? These are broad questions whose answers are still debated among semanticists (for example, the criticisms of Fodor and Lepore 1998, 1999, and the responses of Pustejovsky 1998 and Hale and Keyser 1999). While fully satisfactory answers to these questions may require years of further research in linguistics, this dissertation provides a detailed examination of phenomena in a small number of languages that are relevant for this broader discussion.

The primary phenomenon to be investigated here involves what Nedjalkov and Jaxontov (1988:7) refer to as a RESULTATIVE: a linguistic object which denotes a state – a property, quality, or characteristic – and which is morphologically related to (often derived from) a linguistic object whose meaning involves an event or process which results in that characteristic.¹ Resultatives therefore contrast with better-studied phenomena like causatives in that while the meaning of a causative focuses on an event which causes some other event or state, the meaning of a resultative focuses on a state which results from some other event. While the relationship between the cause and result is similar in both causatives and resultatives, they differ in the choice of eventuality which is foregrounded; they often differ in the direction of morphological derivation, as well.² Resultatives, therefore, provide an interesting and relatively under-studied domain

¹ Although Nedjalkov and Jaxontov limit their comments to verbs, I use the term “linguistic object” here to include cases where resultatives may be phrasal as well as single words.

² There is unfortunately another use of this term in modern linguistic research – probably a more frequent use, in fact. RESULTATIVE may also refer to a type of complex predicate

in which to explore questions of structure within the meaning of lexical items and more complex linguistic units. Even independent of the broader questions of meaning structure, the semantic relationship between resultatives and their bases deserves a thorough understanding.

The culmination of this dissertation will include a detailed examination of two resultative suffixes in the Southern Uto-Aztecan language Pima (or Akimel O'odham, as speakers of the language refer to it), a dialect of O'odham.³ These suffixes, when present on certain verbs, produce a verb which is a RESULTATIVE in what Nedjalkov and Jaxontov (1988) call the narrow sense: it denotes a state that necessarily results from an event of the type that is denoted by the base verb. On other verbs, however, the same suffixes produce what these authors refer to as a DERIVED STATIVE: such a verb form denotes a state that is not required to result from some event. (Nedjalkov and Jaxontov also use the term “resultative” in a broad sense to refer to both resultatives proper – those that are necessarily the result of an event – and derived statives.) The properties of resultatives in Pima appear best explained by positing a degree of structure within the meaning of certain words, a structure which is manipulable within the syntax of the language, and it is this structure which is responsible for the different interpretations of resultatives.

consisting of a main predicate, typically a verb specifying an activity or process, and a secondary predicate, typically an adjectival or prepositional phrase, which specifies the result of that activity (this type of expression is discussed, for example, in Goldberg and Jackendoff 2004). Resultatives in this sense are like causatives in that they focus on the activity rather than the resulting state (*i.e.*, they are eventive and not temporally stative, in the sense that will be made clear in chapter two), and are therefore different from resultatives in the sense of Nedjalkov and Jaxontov (1988) – though whether a predicate specifies a result is relevant for the formation of resultatives in the latter sense.

³ Ethnologue (Gordon 2005) and ISO/DIS 639-3 language code: ood

Before presenting the details of this analysis, however, it is important to set out the assumptions within which the analysis will be formulated and delineate the concepts that will be relevant. Since resultatives often pattern like what have been referred to as “stative” predicates, the following chapter will survey recent approaches to stativity, with the goal of making clear what properties of a predicate make it stative. A special concern of this discussion will also be differences among types of stative predicates, particularly whether the properties that make a predicate stative are inherent to that predicate or are the result of aspectual modification of a more basic predicate – the difference between stative predicates and predicates of states, in a neo-Davidsonian sense. Chapter three will then survey several proposals in the literature which involve morphologically and semantically deriving predicates that are stative from those that are not; these proposals relate eventive and stative predicates in resultative-like constructions – that is, in a derivational relationship which is the opposite of a causative one. The difficulties in extending these proposals to the Pima resultatives will be the primary motivation in chapter four for breaking the meaning of Pima verbs into component parts – a component expressing an action and a component expressing a state which results from it.

2. What does “stative” mean?

Terms like “state”, “stative”, and “stativity” have long been used by linguists to describe in an intuitive way the properties of certain words or classes of words in language. These terms are also often used in a more formal way by theoretical linguists when discussing certain agreement systems, verb classes, or lexical aspect (the latter also referred to as event type or *Aktionsart*). In fact, the idea that a category of “static” verbs (which “stand for states”) could be distinguished goes back, by the citation of Kenny (1963), to the writings of Aristotle. When the term “stative” is used descriptively, writers often do not bother to define it, assuming the meaning to be obvious to the reader. The intended sense is frequently that a word or larger predicate which is stative does not involve anything “happening” – it does not involve any action, activity (in a non-technical use of these terms), or change over time. Although formal definitions for stativity have been proposed, such definitions sometimes do not coincide with the intuitive use of these terms by other linguists, and in some cases different linguists appear to use these terms to describe sets of linguistic objects with different properties.

It is therefore important to review the definition (or definitions) of stativity as it has been presented in the literature, and to specify how this and other terms will be used in the present work. It is also crucial to understand what it means for a predicate to be stative before it will be possible to determine how stative predicates may be derived from eventive predicates (*i.e.*, the case of resultatives). The first section of this chapter will therefore discuss the use of the terms “stative” and “stativity” by a number of linguists in the tradition of lexical aspect or *Aktionsart*, and consider what their tests for stativity are

truly sensitive to and what they tell us about the linguistic objects under study, concluding by clarifying the difference between a temporally stative predicate and a predicate that takes a state as an argument (in a Davidsonian sense). The subsequent section of this chapter will consider the views of a number of linguists on subcategories within the set of stative predicates and representational differences that correspond to these subcategories; this subcategorization will be relevant for predicting the possible interpretations of resultatives.

Before beginning this review, however, it is important to point out a distinction which was implicit in the reference to Aristotle above: a distinction between language and linguistic objects on the one hand, and real-world objects and their (not-necessarily-linguistic) cognitive representation on the other. This distinction can become rather blurred when a Davidsonian semantic framework is adopted, as in this paper, and therefore warrants discussion at the outset.

Semantic analysis in the tradition of Davidson (1967) claims that eventive verbs take at least one argument in addition to those which are expressed as noun phrases in a clause. This argument, which typically is not expressed by phonological features at all, corresponds to the event that the verb is meant to communicate. In this kind of framework, the verb *read* in a sentence like (1)a is represented semantically as a predicate with three arguments, as in (1)b.

- (1) a. Evan read a book.
b. $\llbracket \text{read} \rrbracket = \lambda x \lambda y \lambda e \text{ read}'(x)(y)(e)$

Here, the verb *read* denotes a predicate which takes three arguments: one for the entity which is doing the reading, one for the entity which gets read, and one for the event of

reading itself. Another way to view this representation of the meaning of the verb *read* is as a relationship between individuals and events. In this example, the individuals denoted by the name *Evan* and the noun phrase *a book* stand in a particular relationship to an event of a certain type, namely, an event of reading.

This represents the general idea of Davidsonian semantics (or event semantics), and although many linguists have adopted a number of changes to Davidson's initial theory, theories of event semantics share at least one strong motivation: introducing events as arguments of predicates makes adverbial modification much simpler. For example, a sentence like (2)a can be represented something like what is given in (2)b, and not as in (2)c.

- (2) a. Isabel baked a cake in the kitchen with a convection oven.
 b. **bake'(a-cake)(Isabel)(e) \wedge in-the-kitchen'(e) \wedge with-a-convection-oven'(e)**
 c. **with-a-convection-oven'(in-the-kitchen'(bake'(a-cake)(Isabel)))**

The representation shown in (2)b captures the entailment relations between sentences with and without such modifiers more easily than does the representation in (2)c. For instance, if the sentence *Isabel baked a cake in the kitchen with a convection oven* is true, then the sentence *Isabel baked a cake with a convection oven* is also true, and the sentence *Isabel baked a cake* is also true. These entailment relations follow from the semantics of conjunction seen in a representation as in (2)b, but are not easy to guarantee for a representation like (2)c. Other entailment patterns involving modifiers are likewise more easily explained by positing an event variable.

The motivation for choosing a Davidsonian framework, including entailment patterns like this one, is discussed in more detail in a number of other works such as

Parsons (1990) and Landman (2000), and my intent is not to repeat all of their arguments here. Having explained the basic Davidsonian proposal, what I wish to point out here is that most formal accounts in the Davidsonian tradition do not satisfyingly define what an event is.⁴ Further, a distinction is seldom made between events “in the real world” (that is, changes in configurations of the external world over time, a concept which becomes particularly troubling for “events” which have no associated observable physical processes, such as psychological events of remembering or hearing) and events as linguistic and cognitive objects – *i.e.*, as the elements which fill these event argument positions. This is not a critical flaw, since for the purpose of studying language, the most important relationship is that between linguistic objects and a speaker or hearer’s cognitive model of the world; the question of what configurations and changes in the real world do and do not correspond to events in a cognitive or linguistic sense is more properly the domain of psychology or philosophy rather than linguistics.⁵

⁴ This is not to say that they say nothing about what an event is, but that what they do say is not completely satisfying. Parsons (1990), for instance, assumes that an event is simply what the gerund of an English verb denotes, whatever that referent may be. This predicts that (other complexities aside) what a gerund may express and what the simple past tense of a verb may express should be equivalent. In any context where a speaker may truthfully say *John ran*, the speaker should also be able to say *What happened was running*, and vice versa; problematically, some speakers may feel that sentences like these are not necessarily true in all of the same contexts. Other authors (Landman 2000, for example) have taken up the very sticky issues of distinguishing events from each other, especially distinct events which necessarily occur together, such as *buying* events and *selling* events; this distinction appears to involve more than keeping track of the time and location that an event occurs at.

⁵ It is not beyond imagination, however, that linguistic data is relevant for determinations within other disciplines of cognitive science that, strictly speaking, fall outside the domain of linguistics. An example of linguistic data being used to support conclusions about psychology can be seen in Wolff (2003), who notes a correlation between the directness or indirectness of real-world causation (presented in a representation of a real-

Some authors do, however, address this point. For at least some authors, the events which fill these argument positions are taken to be real-world objects, not linguistic or cognitive ones (*e.g.*, Maienborn 2004a); for others, the events which serve as arguments of linguistic objects are identical to the events which serve as elements of a cognitive model of the world. If there turn out to be distinct types of events in this linguistic or cognitive sense, then it is appropriate for linguistics to explore the properties and behavior of verbs (*i.e.*, linguistic objects) as a function of the type of events (*i.e.*, cognitive objects) they take as arguments.

In fact, the neo-Davidsonian tradition (*e.g.*, Parsons 1990) assumes an ontology of event types – or eventuality types, to introduce a term which is not limited just to events – extending the idea of an event variable beyond what are non-technically considered to be events; within this framework, eventuality arguments may be filled by events or states (where “event” and “state” formally refer to objects with specific properties). The neo-Davidsonian position is not universally accepted, however, and a number of opposing perspectives will be discussed later in this chapter. If the neo-Davidsonians are correct, and stative verbs are to be given a treatment similar to Davidson’s treatment of eventive verbs – that is, if stative verbs are to be analyzed as having a state argument in addition to their nominal arguments – then problems similar to those associated with events proper need to be addressed for states: are the states that fill the state argument positions linguistic objects, cognitive objects, or real-world objects? How is one state distinguished from another? What distinguishes states from events, if both are

world causal interaction) and linguistic structures intended to communicate information about that causation (specifically, lexical causatives versus periphrastic causatives).

considered possible types of eventualities?⁶

For the purpose of this dissertation, I will use the terms “event” and “state” to refer to components of a cognitive model of the world, which I will assume are identical to the objects that fill the argument positions of linguistic items.⁷ I will discuss some of the proposed answers to the above questions, but will leave the difficult questions concerning their precise nature to future work. These events and states are by hypothesis independent of the language used to communicate things about them, though their properties – in particular their temporal properties, as we will see – may affect the properties of the linguistic objects they interact with.

These cognitive objects are distinct from the linguistic objects that take them as arguments, however. Terms like “eventive verb” and “stative verb” (or sometimes “static verb”) may be understood in a narrow sense to refer to the linguistic objects which take these cognitive objects as arguments – “eventive verb” = a verbal predicate which has an event argument, like **bake'**, and “stative verb” = a verbal predicate which has a state argument, like **know'** (states in this sense are most frequently atemporal relations, including spatial relations, or property concepts in the sense of Dixon 1982 –

⁶ I am following Bach (1986) in using the term “eventuality” in a formal sense as a cover term for both events and states in a Davidsonian framework.

⁷ Here I differ from Maienborn (2004b), who claims that the consensus of semanticists is that eventualities are particular spatiotemporal entities in the real world, and it appears that she intends to contrast this with the position that eventualities are elements of a cognitive model of the real world. Her motivation for saying that eventualities are real world objects, rather than elements of a cognitive model, appears to be that she believes eventualities must be perceptible – a position which prohibits a number of verbs like *know* and *resemble* from having eventuality arguments. I believe that taking eventualities as cognitive objects is not incompatible with perception of them, but I will not pursue this issue further here.

characteristics such as texture, color, age, dimension, and so on). The term “stative” is also sometimes applied to any linguistic object (*i.e.*, a word or phrase) which has particular temporal properties, not necessarily one that takes a cognitive object of a certain type as an argument – for example, the progressive form of any verb is sometimes considered to be stative in this latter temporal sense. The difference between these two uses of the term “stative” – one referring to a predicate whose argument is of a certain type, and the other referring to a predicate with certain temporal properties – is difficult to make for all linguistic items that it has been applied to, however, since the perfect definition of a state has not yet been given. If there is no way to say what can and cannot be a state, then it is difficult to prove that any predicate that is temporally stative does not in fact take a state as argument; if progressives are temporally stative, how can we determine if this is because they take a state as an argument?⁸

We will see in the following section that there are diagnostics which can be used to distinguish these two senses of “stative”, though frequently the entire set of diagnostics is taken as being diagnostic of stativity without consideration of these two senses. The question of the structure of meaning which this dissertation aims to address involves the relation between events and states as cognitive objects (as mediated by linguistic objects like verbs), so relations between linguistic objects which do not refer to states – that is,

⁸ Another example of a problematic case involves the resultant state participles of Kratzer (2000), which have traditionally been called perfects. Although such forms have certain properties typically associated with predicates of states (*e.g.*, the Subinterval Property, introduced below in (8)), Kratzer analyzes such forms as being stative because of the way they relate an event and a time, not because they refer to a state. Other authors, such as Parsons (1990), do analyze perfects as predicates of states (*i.e.*, real world or cognitive objects), states which are defined in terms of an event and a time. Kratzer’s views will be discussed further in section 3.2.

relations between predicates of events which are not temporally stative and predicates of events which happen to be temporally stative – need to be considered separately. It is therefore important to make clear which diagnostics are sensitive to the presence of a predicate of states and which diagnostics are sensitive to stative temporal properties of a predicate, whether or not that predicate involves any actual state.

2.1 “Stative” as lexical aspect: temporal property or type of eventuality?

The idea that verbs can be divided into a stative and a non-stative class based on meaning has been adopted by many linguists. This distinction has also been argued to have a number of morphosyntactic reflexes, from controlling the occurrence of predicates in particular syntactic structures (such as the progressive in English) to differences in the set of morphemes used to express person and number in verb agreement (as discussed, for example, in Mithun 1991) to what O’Herin (2002) claims is a pervasive split in the syntactic architecture of the clause (at least in Caucasian languages). These morphosyntactic reflexes may therefore be taken as diagnostic of the stativity or non-stativity of any predicate.

One early proposal which sought to explain the morphosyntactic behavior of verbs and adjectives in English by appealing to stativity or non-stativity was made by Lakoff (1966). He proposed that verbs and adjectives were specified by a grammatical feature as *STATIVE* or *NONSTATIVE* (the determination of the value of this feature will be discussed shortly), and that this featural specification was relevant for a number of grammatical constructions in English: occurrence in “true” (or “command”) imperatives;⁹

⁹ True imperatives have the illocutionary force of a command. This differs from the first

occurrence in true progressives (*i.e.*, not merely nominals or gerunds involving *-ing*); occurrence in pseudoclefts with the verb *do* or replaced in elliptical contexts by *do so*; occurrence in an infinitival complement of the verbs *persuade* and *remind*; occurrence with subject-oriented adverbials like *enthusiastically*, with a purposive adverbial like *for someone's sake*, and in a clause with *instead of*. Examples of most of these tests will be discussed in the following subsections.

Lakoff's motivation for proposing this binary featural difference was that many verbs and adjectives pattern the same way in all of these constructions; this uniformity is predicted if a single feature is responsible for the acceptability of a verb or adjective in all of these contexts. While it is true that verbs and adjectives strongly tend to pattern uniformly with respect to these tests, later authors have determined that the behavior of a verb or adjective with respect to these tests is not always uniform; other syntactic and semantic factors were proposed to explain the patterns in each construction, and Lakoff's claim that a single featural specification was involved in all of them was called into question. Lakoff was careful, however, to formulate his proposal in terms of a grammatical feature rather than a semantic one; that is, the grammatical property of being *STATIVE* or *NONSTATIVE* is distinct from (and need not coincide with) the semantic property of activity or inactivity possessed by meanings of these verbs and adjectives. The syntactic tendencies associated with this semantic property are empirical facts, rather than necessities.

clause of English sentences like *Give someone an inch, and they'll take a mile*; the first clause is morphologically identical to an imperative, but does not have the force of a command. Such forms instead have the meaning of an implication, as in *if p then q*.

Unfortunately, Lakoff did not define exactly what the relevant semantic property (*i.e.*, activity or inactivity) is. He noted that “overwhelmingly”, verbs and adjectives that have the featural specification *STATIVE* (as determined by behavior in the constructions he discusses) also have the semantic property of inactivity (which is assumed to be intuitively understood), and that verbs and adjectives which are *NONSTATIVE* tend to have the semantic property of activity. He acknowledged at least two classes of verbs which were exceptions to this generalization – one which appears to be composed of positional verbs like *sit*, *stand*, and *huddle*, and another which includes verbs like *remain*, *stay*, and *keep* – all of which are semantically inactive yet grammatically *NONSTATIVE*. He explicitly noted an absence of forms that are semantically active yet grammatically *STATIVE*. Since Lakoff’s tests were all phrased strictly in terms of the grammatical properties of words in English constructions, however (*i.e.*, with other English words or in specific English grammatical contexts, like the progressive or the present tense), it is difficult to determine whether languages besides English share precisely the same generalization with regard to activity or inactivity that Lakoff proposed for English. Nevertheless, cross-linguistic comparison may be loosely made with at least some of these constructions (for example, with the language-specific equivalent of English *do* or *do so*, and with other tests to be discussed in the following subsections), and although Lakoff did not observe semantically active but grammatically stative forms in English, Guaraní is a language which may contain examples of this type; see Mithun (1991) for discussion. Their absence in English may thus be an accident.

Many of the constructions that Lakoff argued display sensitivity to the

STATIVE/NONSTATIVE feature are also discussed within a tradition of more articulated categories of clausal predicates, where it has become clear that the same factor is not relevant for acceptability in all of them. This is the tradition involving what has been called lexical aspect, event type, or *Aktionsart*, and variants of this categorization have been presented by Ryle (1949), Kenny (1963), Vendler (1967), Bach (1986), and many others. Rather than analyze this syntactic behavior as a strictly grammatical phenomenon as Lakoff did, many of these authors analyze this behavior as a semantic phenomenon – the result of temporal properties of the meaning of these predicates (or the eventualities that the predicates denote). These semantic properties are reflected indirectly in the way that the linguistic objects which refer to them interact with other linguistic objects, especially morphemes related to tense and grammatical aspect.

Vendler (1967) begins a presentation of his lexical aspectual classification with the observation that because tense (*i.e.*, temporal relationship) is one of the things that verbs are morphologically marked for, time or temporal relationships must be relevant for the interpretation of verbs. Using facts of co-occurrence with temporal adverbials and acceptability in grammatical constructions similar to those observed by Lakoff, he distinguishes four time schemata which are associated with verbs, which he terms *states*, *activities*, *accomplishments*, and *achievements*.¹⁰ Like Lakoff, Vendler distinguishes between the linguistic objects and the conceptual objects that he is discussing when he says that these time schemata are “constituents of the *concepts* that prompt us to use

¹⁰ Kenny (1963) discusses just three categories of verbs: static verbs, activity verbs, and performance verbs, the latter of which appears to be the sum of Vendler’s categories of accomplishment and achievement verbs.

those *terms* the way we consistently do” (1967: 98, emphasis added); the linguistic objects under study behave in the way that they do because of the temporal properties of the concepts they express – *i.e.*, their meaning. He describes a total of four schemata:

- (3) “...the concept of activities calls for periods of time that are not unique or definite. Accomplishments, on the other hand, imply the notion of unique and definite time periods. In an analogous way, while achievements involve unique and definite time instants, states involve time instants in an indefinite and non-unique sense.” (Vendler 1967: 106-7)¹¹

Accomplishments extend over an interval of time, ending with a climax or specific endpoint (or *TELOS*), while activities extend over an interval of time without such an endpoint. The eventuality described by a sentence like *John ran* is therefore an activity, since the eventuality that is involved does not necessarily have a natural, required endpoint; in contrast, the eventuality described by the sentence *John ran a mile*, does have a natural and required endpoint – the point at which John finishes moving himself over the distance conventionally defined as 5280 feet – and is therefore an accomplishment.

Achievements can be thought of as consisting solely of an instantaneous climax, as described by a sentence like *John realized his error*; states can be thought of as holding (*i.e.*, as being true) at a single point of time or an interval of time without a climax or natural endpoint, as described by a sentence like *John is quiet*.¹²

¹¹ Vendler does not provide a formal structure in which to model time and temporal relations. His use here of the terms *period of time* and *instant* is consistent with the common assumption that time is homomorphic to the set of real numbers (*e.g.*, Katz 1995); an instant would therefore correspond to a single point of time, while a period of time would correspond to an interval (*i.e.*, a set including all times bounded by an initial point and a final point). This formalization will be discussed further below, though it does not matter whether time is taken to be homomorphic to the set of real numbers or the set of integers, for instance.

¹² The formalization of these categories in Dowty (1979) includes a formalization of their

The tests proposed by Vendler, Kenny, and a number of others since their time as being indicative of states (and by extension indicative of stative predicates) are discussed in the following subsections, along with other grammatical and interpretive properties which are taken to be characteristic of states or stative predicates. Note that although adjectives (and presumably also nominals and adpositional phrases) may be classified as stative or non-stative by some of these tests, most of the tests are applicable only when the words or phrases in question occur in clausal contexts.¹³ In the time since many of these tests were proposed, other authors have determined that many of the linguistic properties put forth as characteristic of states and stative predicates are actually not sensitive to merely the temporal properties of the predicate or its referent. As was noted with regard to the proposal of Lakoff (1966), many other semantic properties are often shared by predicates that have stative temporal properties, and it is these other semantic properties that the proposed tests for stativity are actually sensitive to. The tests are therefore grouped accordingly.¹⁴

temporal properties; in his system, states are the only type of eventuality whose temporal extent can correspond to a single instant of time; all other categories require a minimal interval of at least two instants (a minimal non-momentary interval). While states may also hold over an interval, they are the only category for which it must also be the case that they are true at every subinterval (and therefore every instant) within that interval; see the discussion of the Subinterval Property on page 30.

¹³ Authors differ over their interpretation of these tests as applying to entire clauses or just to verb phrases; the latter would require the clausal subject to occur within a verb phrase, since subjects can be relevant for determination of lexical aspect. The question becomes irrelevant if the four-way categorization is understood as applying to the eventualities that fill the Davidsonian argument position, rather than to the linguistic objects that take those eventualities as arguments.

¹⁴ There are also a number of proposed tests which are not listed here, mainly because later authors have concluded that they rest on incorrect generalizations or are not useful (as demonstrated by a lack of further discussion). For example, Lakoff (1966) claimed

2.1.1 Diagnostics sensitive to volition or agency

The first set of diagnostics appears to indicate the degree of volition or control that the referent of a nominal argument – typically the subject – has in the eventuality that the predicate expresses. Since many stative predicates express properties that are open to neither volition nor control, the incompatibility of *do* with many stative predicates in these constructions can be ascribed to a conflict in selectional restrictions, rather than a conflict in the temporal properties of the predicates (*i.e.*, the verb *do* places selectional restrictions on arguments that conflict with the restrictions placed on those arguments by most stative predicates).

that verbs and adjectives marked STATIVE could not be used in either clause surrounding *instead of* (as in ✓ *John wrote a paper instead of building a house*, **John wrote a paper instead of knowing all the facts*, **John heard the music instead of looking at the painting*); to the extent that this seems to give correct results, it may involve volitionality of one or both verb phrases: **John wrote a paper instead of sinking to the bottom of the ocean*. Another test is found in Kenny (1963), who claimed that only static verbs allow the inference from *X has verb-ed* to *X verb-s* (as in *John has seen the car* to *John sees the car*); this inference does not appear to hold for all stative verbs, however, and it is not clear that this is a correct claim. Vendler (1967) argues that *could* and *would* are often interchangeable for state terms (and certain achievements), though this is only the case for certain involuntary processes (Vendler's example involves the verb *see*) where no other logically necessary conditions are present. Lastly, Katz (1995) has argued that although eventive sentences support eventive anaphora, stative sentences do not support state anaphora (as in ✓ *Smith stabbed Jones. It happened at noon*, but **Kim loved Sandy. It was last year.*); Mittwoch (2003), however, argues forcefully that there do exist cases of state anaphora that are not re-analyzable in terms of fact or proposition anaphora.

- (4) *Tests which are sensitive to volition or agency:*
- a. Stative predicates may not occur in pseudoclefts replaced by *do* (Lakoff 1966, Dowty 1979)¹⁵
 - b. Stative predicates may not be replaced by *do so* (Lakoff 1966, Dowty 1979)
 - c. Stative predicates may not occur in “true” or “command” imperatives (Kenny 1963, Lakoff 1966, Dowty 1979)
 - d. Stative predicates may not occur in the infinitival complement of the verbs *persuade, remind, force* (Lakoff 1966, Dowty 1979)
 - e. Stative predicates may not occur with subject-oriented adverbials like *enthusiastically, deliberately, or carefully* (Lakoff 1966, Dowty 1979)
 - f. Stative predicates may not occur with a purposive adverbial like *for someone’s sake* or *intentionally* (Kenny 1963, Lakoff 1966, Dowty 1979)

The first two of these tests involve substitution by *do* or *do so*. Eventive predicates like *read a book* are fine in such contexts, as in *What John did was read a book* and *John read a book, and Mary did so, too*. Stative predicates like *know the answer*, however, are generally bad in these contexts, as in **What John did was know the answer* and **John knew the answer, and Mary did so, too*. Unfortunately, these diagnostics are as difficult to interpret as the verb *do* is to analyze. As a main verb, Ross (1972) has claimed that *do* requires that its subject generally be volitional (thus generally animate) and agentive. Since many stative predicates require subjects that are neither of these, the incompatibility of *do* with many stative predicates in these constructions is predicted. Other predicates which are non-volitional or non-agentive are also predicted to be bad; an example of such a predicate is *fall off the chair* – though since volitionality or agency may be a pragmatically-determined factor where potential agents are involved, there may be agentive readings of such predicates that are acceptable: *?What John did was fall off the chair* and *?John fell off the chair, and Mary did so, too*.

¹⁵ Belvin (1996) concludes that the use of *do* in pseudoclefts requires that the predicate it is replacing be both agentive and non-stative.

There do exist contexts where *do* may be used without a requirement of volition or agency, however, both in pseudoclefts (as in *What the machine did was make a lot of noise*) and in other contexts (such as *What was the machine doing?*), though *do so* is generally not as acceptable with such predicates (volitionality is generally still required for *do so*, as in *?The washer made a lot of noise, and the dryer did so, too*). The non-volitional predicates that occur in these contexts express situations or activities (in a non-technical sense) that require a non-momentary interval of time to unfold, either as an intrinsic property or because they involve external or internal change (which by definition requires distinct situations at multiple moments of time); note the contrast between *What the machine did was make noise* (requiring a non-momentary interval) and **What the flower did was stink* (which can be true at a moment of time, as will be discussed below).¹⁶

One proposal discussed in Dowty (1979) is that an abstract predicate DO distinguishes stative predicates from many activities (which are semantically most similar

¹⁶ Either of these conditions is sufficient for acceptability with *do*, though motion and change themselves require an interval of time. Many verb phrases which may be replaced by *do* yet which appear to lack motion, change, or volition, do turn out to require a non-momentary interval of time for evaluation. Consider an exchange like *What was the machine doing? Nothing. All it did was just sit there*, where *sit there* is presumably a predicate that requires neither volition nor change. It will be seen below that positional verbs like *sit* require an interval of time for their evaluation, even though position on the face of it seems to be evaluable for truth at a single instant of time. Another example of a non-volitional predicate being replaced by *do* is the verb phrase *break the window* in the sentence *What the rock did was break the window*. In the formalization of Dowty (1979), the change of state which is required for the event denoted by *break* requires a minimum of two moments of time – one at which the window is intact, and an immediately following moment at which the window is fractured – thus constituting a non-momentary interval. As the criteria are worded here, however, the mere fact that *break* involves a change is sufficient to make it acceptable with *do*.

to statives in that they are atelic and can have significant duration), though he concludes that the semantic contribution of DO can at most be something like “unmediated controllability” rather than volitionality.¹⁷ Interestingly, Dowty (1975) also observes that when adjectives pattern like non-stative predicates by such tests, they are always associated with a volitional (or more precisely, “controllable”) reading rather than a non-volitional activity interpretation (compare ✓ *What the student did was be noisy* with **What the machine did was be noisy*), which may be analyzed as an instance of this abstract predicate DO which is expressed as the copula. Whatever the proper analysis actually is for adjectives like *noisy* and *brave* that can be used in a situation where their argument exercises volitionality or control, these adjectives may involve a separation of the volitional and stative components in some way that is not possible with verbs.¹⁸ Moreover, while the behavior of many predicates with regard to the diagnostics in (4)a and (4)b may be explained in terms of the selectional restrictions of the verb *do*, this explanation will not account for all cases, and a complete explanation will not be found until the properties of *do* (whether there is only one *do* or whether *do* represents several homophonous morphemes) are better understood.

Tests (4)c through (4)f also involve constructions or lexical items that require

¹⁷ Rothstein (1999:360), however, suggests that even this characterization is too strong.

¹⁸ Suppose, for instance, that there is a null morpheme which contributes the idea of volition in the second verb phrase of *What the student did was be noisy*, and that *be noisy* itself contributes just the intended resulting state. If the null volitional morpheme is what licenses the use of *do* in the pseudocleft, then the absence of the possibility of volition (as in **What the machine did was be noisy*) is predicted to correlate with the unacceptability of the pseudocleft with *do*. This is similar to the abstract DO proposal of Dowty (1979). The contribution of volitionality cannot be associated only with an overt copula, however, since there are contexts where volitionality is present without an overt copula, as in the prenominal use of the adjective: *The intentionally noisy students were detained*.

volitionality, controllability, or agency – for example, it makes no sense to command someone to have a property that they have no control over; thus, *?Know the answer!* is odd, as are *?John intentionally knew the answer*, *?Mary persuaded John to know the answer*, and *?John knew the answer for his teacher’s sake*. Dowty (1979) cites Lee (1971) for these tests being sensitive to agency; non-volitional readings of a predicate like *fall off the chair* are similarly unavailable, as in *Mary persuaded John to fall off the chair* (this predicate in this context can only have a volitional reading), and predicates whose arguments are inanimate (and thus cannot be volitional) are likewise unacceptable, as in *Mary persuaded the machine to be noisy* and *The machine was noisy for the engineer’s sake*. These tests originally appeared to be sensitive to stativity, however, since many stative predicates are involuntary.¹⁹

The latter tests in this section do not involve the verb *do*, so an explanation for the observed patterns in terms of an abstract operator DO is less plausible here. It might be presumed that causation, as well (as indicated in Dowty’s system by a CAUSE operator), also implies non-stativity, and so the presence of causation, whether morphological or lexical, is sufficient to make a predicate agentive (thus patterning like a non-stative by these tests). While this might agree with the intuition that stative predicates don’t involve anything “happening” and that causation does involve this kind of “happening”, causative

¹⁹ While these tests have been demonstrated not to indicate stativity, there remains the question of why there is so much of an overlap between stativity and non-volitionality, non-controllability, and non-agency, that is, why statistically so few predicates, whether adjectives or verbs, are both volitional and stative in their temporal properties (as determined by other tests for stativity). While this is an intriguing issue, I will have no more to say about it than that volitional predicates – those requiring the input of mental energy, in some sense that needs to be refined – require a non-momentary interval of time to hold.

predicates can, in at least some cases, pattern like stative predicates by some tests.

Pykkänen (2000) discusses Finnish experiencer-object psychological predicates that overtly occur with a causative morpheme, but which nevertheless pattern as stative by a number of the tests to be seen in (6) (which are directly sensitive to the temporal properties of predicates); she cites English experiencer-object psychological predicates like *concern*, *perplex*, and *bother* as parallels. All verbs which are overtly causative (in Finnish) and which pattern like statives, however, are also shown by a number of standard tests to be non-transitory or individual level (in the sense of Carlson 1977). While it is not clear that the restriction to individual level holds for stative causatives cross-linguistically, the relationship between individual level predicates and stativity will be discussed further in section 2.2.

2.1.2 Diagnostics sensitive to duration and telicity

The other diagnostics which have been proposed for stativity are directly sensitive to certain temporal properties of predicates. Certain of these diagnostics, however, are sensitive to properties that are not unique to stative predicates; rather, they distinguish states and other eventualities with certain temporal properties from those eventualities that lack them. The tests in (5) (phrased for English) distinguish predicates which express eventualities that are durative (that can last for more than a minimal interval of time) and atelic – properties that stative and activity predicates share.

- (5) *Tests which are sensitive to duration and telicity:*
- a. Stative predicates may occur with durational adverbials like *for an hour* or *until I was seven*; in such cases, it is entailed that the predicate was true at all times during that interval (Vendler 1967, Dowty 1979)
 - b. Stative predicates may not occur with telic time adverbials like *in an hour* (Dowty 1979)

These tests distinguish predicates that express states or activities from those that express accomplishments or achievements. Test (5)a distinguishes stative and activity predicates from achievement predicates because the latter may not generally be predicated over an arbitrarily long interval of time; it is fine to combine a *for*-PP with a stative predicate, as in *The door was open for five minutes*, or with an activity predicate, as in *John ran for five minutes*, but not with an achievement predicate, as in *The vase shattered for five minutes*.²⁰ Test (5)b distinguishes stative and activity predicates from both accomplishment predicates because the latter are telic (*i.e.*, they have a specific climax or end-point); compare the stative predicate in *?The door was open in five minutes* and the activity predicate in *?John ran in five minutes* with the accomplishment predicate in *John drew a picture in five minutes*.^{21,22}

Interestingly, it is possible for what are sometimes accomplishment predicates (corresponding to durative, telic events) to occur with durative, atelic temporal adverbials. The sentence *John read the book for an hour* is grammatical if John's reading of the book went on for an hour and probably did not culminate in John finishing the

²⁰ Accomplishment predicates are also odd with a *for*-PP, but not because they cannot have duration. Accomplishment predicates with a *for*-PP appear to sound odd because the adverb is atelic; telic durative adverbs like *in five minutes* express the same duration along with the fact that the event reached its natural climax. Compare *?John drew a picture for five minutes* with *✓John drew a picture in five minutes*. Predicates which allow either a telic or atelic reading, like *read a book*, are fine with either adverbial.

²¹ Apparent counterexamples to this diagnostic such as *The child was better in five minutes* involve a change of state interpretation of the otherwise stative predicate – *the child became better* – and are therefore telic and non-stative.

²² Achievement predicates are generally odd with an *in*-PP because they cannot have an indefinite duration, not because they are not telic; they are marginally acceptable with something like an accomplishment reading, where the duration specifies the length of time that elapsed before the achievement took place: *?The vase shattered in five minutes*.

book; this contrasts with a sentence like *John read the book in an hour*, which entails that at the end of the hour John had finished the book, that is, that the event of reading the book had reached its natural end-point. Facts like these show that, as Vendler (1967) indicated, more than one time schema can frequently be used with the same verb – or rather, with the same verb phrase or sentence (Dowty 1986) – and that other material in the verb phrase or sentence may be consistent with only certain time schemata; in this case, the phrase *read the book* can be interpreted either as an accomplishment or an activity, but only one of these interpretations is consistent with each temporal adverbial. In this case, the activity of reading (less than the complete) book is a subpart of the accomplishment of reading the (complete) book. It is also possible for a phrase like this to receive an activity reading which consists of a series of (complete) book-reading events which comprise a larger atelic “meta-event” or plurality of events: although the event denoted by *John read a book* can be an accomplishment, as indicated by the grammaticality of *John read a book in an hour*, a series of accomplishments (*i.e.*, complete book-readings) lacks a natural climax, thus constituting an activity. An atelic temporal adverbial may be predicated of this plurality of events even while a telic temporal adverbial is predicated of each sub-event, as in *John read a book in an hour for twenty hours straight*.²³

²³ In languages besides English, the constituent *read the book* in the telic and atelic uses may be marked in other ways such that the time schema is not ambiguous between an activity or an accomplishment, for instance by the case marked on the object *the book*. In the English example with both telic and atelic adverbials, there is no overt marking of the repetition of telic events of book-reading that comprise the overall atelic meta-event of reading multiple books, though other languages may also choose to mark this overtly.

2.1.3 Diagnostics sensitive to the time interval required for evaluation

The other proposed diagnostics for stativity which are directly sensitive to the temporal properties of predicates involve the interaction of predicates with tense, aspect, modality, and discourse-level phenomena. It appears, however, that while the type of eventuality that a given verb expresses does affect a predicate's behavior with regard to tense and aspectual morphemes, other aspectual morphemes which combine with the base predicate interact with each other, as well; what has been argued about these diagnostics (as discussed, for example, in Katz 1995) is that they are all sensitive to the ability of a predicate to be evaluated for truth at a moment of time – a single instant or point of time – rather than over a non-momentary interval, which we will see is related to what is called the Subinterval Property.

- (6) *Tests which are sensitive to the ability to be predicated of a moment of time (rather than an interval of time):*
- a. Stative predicates may not occur in true progressives (*i.e.*, not merely nominals or gerunds with *-ing*) (Kenny 1963, Lakoff 1966, Vendler 1967, Dowty 1979, Katz 1995)
 - b. Only stative predicates may occur in the simple present without a habitual or frequentative interpretation. (Dowty 1979, Katz 1995)
 - c. In narrative discourse, stative, progressive, and perfect clauses (unlike eventive clauses) do not advance the narrative time (Katz 1995 and citations there)
 - d. Stative, progressive, and perfect clauses are taken to hold at the same time as the event in an eventive *when*-modifier, while an eventive predicate is taken to follow the event introduced in the *when*-clause (Katz 1995 and citations there)
 - e. Stative, progressive, and perfect clauses show a maximal interpretation with time span adverbials, such as *last week* or *Sunday*, while eventive clauses do not (Katz 1995 and citations there)
 - f. Past tense stative, progressive, and perfect clauses may refer to situations which hold through the present time, while past tense eventive clauses must only refer to events which are completely located in the past (Katz 1995)
 - g. A modal with a non-stative predicate must be interpreted deontically, while a modal with a stative, progressive, or perfect predicate is preferentially interpreted epistemically (Katz 1995)

The first two tests involve the acceptability of the progressive and the type of interpretations available for the simple present tense, perhaps the most well-known diagnostics for stativity. In the latter tests ((6)c through g), those predicates which are traditionally described as being stative and which are picked out by the first two tests – such as predicate adjectives and verbs like *know*, *love*, *exist*, *stink*, and so on (many of which are individual level predicates which describe psychological conditions) – pattern with aspectually-marked clauses of a number of types, including progressives, perfects, and habituais or generics. These latter tests should be sensitive to some property that statives and these other aspectually complex predicates share, and several authors have come to the conclusion that these tests are in fact sensitive to whether a predicates which can be true at a moment of time, rather than over an interval of time (see especially Katz 1995). Because the relationship between statives, progressives, and habituais crucially depends on one’s analysis of progressives and habituais, most of these tests ((6)c through g) will be discussed at greater length after considering just those tests which involve the progressive and habitual or generic interpretations themselves.

2.1.3.1 Dowty’s (1979) analysis of present tense and the progressive

Dowty (1979) proposes an account of tense, the progressive, and stative predicates in English which is intended to explain the observations in (6)a and b. To do this, he follows a number of authors (especially Bennett and Partee 1978) in evaluating basic propositions (*i.e.*, the semantic content of a sentence apart from tense) as true or false not with respect to moments or instants of time, but with respect to intervals of time. This is intended to capture the intuition that if John engaged in drawing a picture from

2pm to 4pm, a sentence like *John drew a picture* should only be said to be true over the complete interval from 2pm to 4pm, and not strictly true at a single point of time within that interval, such as 3pm (although any single moment of time between 2pm and 4pm could certainly be described as within a larger interval of picture-drawing).²⁴ Intervals may extend over long periods of time, such as two hours in this example, or may minimally consist of a single moment or instant of time. (Where I do not specify that intervals must be non-momentary, it should be assumed that any interval that is referred to can consist of many moments of time or just a single moment.)

Dowty also assumes that for present tense sentences, the interval of time at which the basic proposition is evaluated is the moment of utterance. In a framework where basic propositions are evaluated at an index rather than simply a time – where the index would include all the information relevant for making truth-conditional evaluations, such as the speaker, the context, or other factors relevant, for example, to possible-worlds semantics – a present tense sentence would be evaluated at the current world at the moment of utterance.²⁵ This default assignment of the moment of utterance for the

²⁴ The use of temporal intervals for the evaluation of basic propositions seems easily converted to a Davidsonian system in which basic propositions are predicates of eventualities, where the eventualities themselves occupy an interval of time.

²⁵ Dowty (1979) uses a theory of tense, aspect, and modality in which a predicate is evaluated for truth at an index which consists of an interval of time and a possible world. Intervals of time are defined by an initial moment and a final moment, and can minimally consist of a single moment if the initial and final moments are identical; the time line is isomorphic to the set of real numbers (*i.e.*, time is dense and is linearly ordered, though Dowty only arbitrarily makes the choice of dense over discrete moments of time). A possible world consists of the configurations of individuals over the set of all times such that they are consistent with all necessary truths, and is a theoretical mechanism that is frequently employed for modal semantics; the set of possible worlds includes every way that the world might actually be, and the determination of which of these possible worlds

interval of evaluation in simple present tense sentences results in an anomaly for sentences which cannot be assigned a truth value at a single moment. Dowty claims that, of the four Vendlerian time schemata, only stative predicates can be assigned truth values at a moment of time; all other predicates require a minimum interval of at least two distinct moments (such as for instantaneous changes of state, *i.e.*, achievements, or for ongoing activities), making them unable to occur in the simple present – thus explaining (in (6)b) why a sentence with a stative predicate is acceptable in the simple present, as in *John knows the answer*, and why sentences with other kinds of predicates are acceptable in the simple present only with additional aspectual or temporal modification, as in *John runs* (habitual reading only), *John draws a picture* (habitual reading only), and *The vase shatters* (habitual/generic reading only).

His explanation of the diagnostic in (6)a of course depends on his account of the progressive, which he assumes is an operator that combines with a basic proposition ϕ (which for Dowty is a complete but untensed sentence); his final semantic analysis of the progressive is shown in (7).

- (7) [PROG ϕ] is true at $\langle I, w \rangle$ if and only if for some interval I' such that $I \subset I'$ and I is not a final subinterval for I' , and for all w' such that $w' \in \text{Inr}(\langle I, w \rangle)$, ϕ is true at $\langle I', w' \rangle$. (Dowty 1979:149)

In words, this states that the progressive is an operator which applies to a basic proposition ϕ and which yields truth at a given index (an interval of time I in a given world w) just in case the proposition ϕ is true at another index $\langle I', w' \rangle$, which is defined as follows: I' is an interval of time of which I is a proper subpart and which does not end

actually corresponds to the real world is an empirical issue, not a logical one.

with I (*i.e.*, the condition that I is not a final subinterval of I' means simply that I does not include the last moment in I' ; this is required to capture the fact that the progressive of an accomplishment predicate – that is, a predicate which is telic – entails that the natural endpoint of the accomplishment has not yet occurred at I), and w' is a world which is in the set of “inertia worlds” of w at I . The set of inertia worlds, picked out by the function Inr , is the set of worlds that are identical to a given world up through a given interval of time, and for which “the future course of events after this time develops in ways most compatible with the past course of events” (Dowty 1979:148). All this is to say that a predicate may be truthfully uttered in the progressive if it appears consistent with the current situation that the predicate will be true of an interval of time which itself extends into the future, even if the predicate is not true of an interval which terminates at the present; thus, a progressive sentence like *John is drawing a circle* can be true at the moment of utterance even if the relevant circle does not yet exist at the moment of utterance, as long as the situation looks as if John actually will complete the task of drawing a circle – for instance, if he has drawn half of it already.²⁶

A sentence with the progressive operator of (7) may then be taken as an argument of a higher tense operator, such as PAST ϕ or FUTURE ϕ , which will set the interval of evaluation I relative to the utterance time. If neither of these tense operators is present, the default index at which the predicate is evaluated is the current world at the moment of

²⁶ Chapter 3 of Dowty (1979) discusses several types of future sentences in English, some of which involve only the progressive (such as *John is leaving for London tomorrow*), which differ from each other with respect to the degree of certainty that they express.

utterance.²⁷ Since the interval of evaluation of the progressive (I in (7)) is not required to be an interval at which the predicate itself actually holds (which is I' in (7)), no problem results if this interval I is now taken in the present tense to be a single moment. This is why non-stative predicates may occur in the present progressive, even when they may not occur in the simple present.

The progressive therefore converts a basic proposition of any of Vendler's four temporal schemata into a predicate which has the Subinterval Property. A paraphrase of Dowty's statement of the Subinterval Property is given in (8).²⁸

(8) A predicate α has the subinterval property if and only if the following is true: α is true at an interval I if and only if α is also true at any subinterval I' of I .

Some authors, in fact (e.g., Taylor 1977, Bennett and Partee 1978, Copley 2003), equate stativity with this very property; if a stative predicate is true over some interval I , it is also true at all subintervals of I , including the smallest subintervals of all, namely every moment of time within I ; if the basic proposition *the box be green* (i.e., a tenseless sentence) is true over an interval of one minute, it is necessarily the case that *the box be green* is also true at every point in time within that minute.²⁹ Activities, being atelic and durative, have the Subinterval Property down to some minimal interval length, which

²⁷ Once again, this is because Dowty assumes that the present tense does not require a tense operator. The analysis would be entirely compatible with a non-null present tense operator, as well.

²⁸ Dowty (1979:166) actually presents a definition from Taylor (1977) which is slightly different. Taylor, like Bennett and Partee (1978), uses statements of temporal properties like this to distinguish basic predicates with Vendler's four time schemata.

²⁹ Not all predicates which are traditionally considered to be stative have this property down to moments of time, however. Those which don't have it are the class which Dowty (1979:184) refers to as "interval" statives, generally consisting of positional verbal predicates like *sit*, *stand*, and *lie*. These will be discussed immediately below.

hypothetically corresponds to a “grain size” of the activity; if the basic proposition *John run* is true of an interval of one minute, it is necessarily the case that *John run* is true of a 30-second subinterval of that minute, and a 15-second subinterval of that minute, and so on, down to whatever the minimal interval is over which John can truthfully be said to run. Accomplishments and achievements, as telic predicates, might be said to have a kind of anti-Subinterval property, since if they are true at an interval I , they are necessarily not true at any interval that is smaller than I . The effect of the progressive, however, is to create a new type of predicate which allows that climax to exist in the future for a given interval of evaluation I – namely, in the interval I' , which extends some distance into the future in one of Dowty’s inertia worlds (though other mechanisms may also be used to express this modal-aspectual concept). The progressive therefore turns a predicate which does not have the Subinterval Property into one which does.

2.1.3.2 Activities as predicates which require a non-momentary interval

As noted above, the only basic propositions of which the Subinterval Property holds are those with the time schema of states, though something close to the Subinterval Property holds of activities, as well. We might wonder why, apart from stipulation, activities but not states should only be defined for truth over a non-momentary interval of time; this is the only temporal property which distinguishes activities from states. If activities but not states necessarily involve change (internal or external) or motion (which is change in position), then a restriction to some minimal interval of time is at least reasonable, since change is not defined without reference to multiple moments of time.³⁰

³⁰ More generally, this should be stated as “change is not (or cannot be) defined without

Dowty also points out that for some activities, such as those involving repeated sub-events or cycles like the activities associated with verbs like *waltz* and semelfactives like *knock*, the minimal interval over which such a predicate may be true – the “grain size”, referred to above – can be no smaller than the minimal sub-event, not just the minimal interval required to determine that some change is going on. Dowty discusses the verb *waltz* as an example; the activity expressed by the verb *waltz*, he argues, minimally involves at least three steps. If a dancer moves for only one step and stops, we cannot say truthfully *the dancer waltzed*, even if that step is identical to one that would be involved in a complete cycle of waltzing. This is not an epistemic question (*For what length of time must observation go on in order for speakers of a language to determine that an activity of a certain type is going on?*), but rather a cognitive one (*For what length of time must an activity go on in order for speakers of a language to comfortably refer to that as an activity of a certain type?*), and seems not to have a ready explanation other than that it seems to fit the intuitions that speakers (especially Dowty) have.

This line of reasoning seems to be fruitful also for explaining those cases of traditionally stative verbs which seem to require an interval for evaluation – what Dowty refers to as “interval statives”, consisting mostly of positional verbs. While the sentence *The book is on the table* (*i.e.*, a copular clause involving a locative prepositional phrase) can be assigned a truth value at a single moment and thus has the Subinterval Property

reference to multiple values of some parameter”, since change in its most general form can be with respect to time, space, or some other parameter, as well. In the examples being discussed here, the parameter in question is time, though in the discussion of Pima resultatives in chapter four we will see examples of predicates which involve change with respect to a spatial parameter, thus allowing them to be temporally stative.

down to moments of time, the truth of *The book is lying on the table* (i.e., a clause involving a positional verb) seems to require that the book's location not change over some minimal interval; thus, even though the type of relation that these verbs express explicitly involves no change, they seem to require a non-momentary interval at which to hold.³¹

Where it does not seem appealing that all activities require a non-momentary interval of time is with certain predicates like *smile* and *feign death*. These verbs or verb phrases pattern like activities according to Dowty's tests: they cannot occur in the simple present without a habitual or frequentative interpretation, and they can occur in the progressive. The situations which they express, however, at least intuitively seem to involve no change; there does not seem to be any reason why they should require a non-momentary interval to be evaluated as true or false: *John is smiling*, for example, or *John is feigning death*, would seem to equally well describe a non-momentary interval of time or a single instant. In order to salvage the explanation for these tests given above, one might claim that the non-momentariness of the eventualities associated with such predicates is simply an empirical fact about the meaning of these predicates in English: to count as smiling, the smile has to stay on one's face for more than a moment. This is stipulative at this point, however, and would not by itself constitute an explanation. If

³¹ Dowty also discusses the occurrence of positional verbs in the simple present as non-transitory predicates, as in *New Orleans lies at the mouth of the Mississippi River*. These, he claims, involve individual-level or object-level predication (in the sense of Carlson 1977), and as such entail the meaning that would be expressed by the (stage-level) progressive; since the object-level sentence makes a stronger claim, Gricean reasoning holds that the progressive form should only be used if the speaker has reason to believe that the object-level sentence is not true (e.g., if the city changes location periodically).

agenthood or control is necessarily involved in verbs like these, perhaps the explanation is to be found in what it means to be an agent or to exercise control – though it should be clear from the discussion of these topics in section 2.1.1 that much additional work is needed before agency and control are well understood.

This discussion of why activities require a non-momentary interval does not address another important issue regarding the progressive, however; namely, why stative predicates are unacceptable with the progressive. Although stative predicates can be true at a moment of time, they may certainly also be true over a non-momentary interval of time, as well, so there is no semantic reason why they should not occur in the progressive as defined in (7). If a stative predicate is true over a non-momentary interval, however, by the Subinterval Property of (8) it must necessarily be true at every moment within that interval, and since it is possible to use the simple present with stative predicates, the use of the progressive would not contribute additional information useful to a listener. By Gricean reasoning, therefore, the simple present should be preferred to the progressive for stative predicates – that is, for predicates which have the Subinterval Property down to moments of time.

This explanation, given by Dowty (1979), is a pragmatic explanation for the pattern in (6)a, rather than a strictly semantic or syntactic one. Dowty does not specifically address the status of aspectually complex predicates which are temporally stative, however, so it is not clear what explanation he would give for the properties noted in (6)c through g – that is, why all temporally stative predicates, whether aspectually simple or aspectually complex, pattern the same.

2.1.3.3 Katz's (1995) analysis of the progressive, present, and other tests

Dowty's explanation for the distribution of the progressive and the interpretation of the present tense contrasts somewhat with the account of Katz (1995), who presents an analysis of stative and non-stative predicates within a classical Davidsonian semantic framework, and who proposes an explanation for all the tests in (6).

Katz claims that the unacceptability of statives in the progressive does not have the sense of violating a conversational implicature, but is instead closer to simple ungrammaticality. Katz instead explains the distribution of the progressive and the interpretation of the simple present tense as a type clash between the semantic type of non-aspectually-modified eventive predicates (*i.e.*, basic propositions) and the predicate type that higher tense operators (including, unlike Dowty, the present tense) may apply to. In his dissertation and later papers, Katz proposes that while non-stative basic propositions have an event argument that ranges over events proper, stative predicates are strictly properties of moments of time, not mediated by an eventuality argument. Stative predicates under this analysis may still be interpreted over a non-momentary interval, but only as a consequence of the Subinterval Property in (8): evaluating a stative predicate over a non-momentary interval of time is equivalent to evaluating it at each moment of time within that interval. Basic predicates which have this property – those that are traditionally considered statives – need no further modification to combine with tense, for instance. For other predicates, aspectual operators like the progressive convert a predicate of events into a predicate of moments of time (which by the Subinterval Property may also be interpreted over a non-momentary interval).

This explains why certain aspectually-modified predicates – perfects, habituais, generics, and the progressive forms of eventive predicates – pattern with most traditional statives (*i.e.*, adjectives and stative verbs) in the tests in (6).³² Statives may not occur with the progressive because it takes as its argument a predicate of events, not moments of time. The restriction noted in (6)b, that only statives, progressives, and other aspectually-modified predicates may occur in the simple present tense, involves the same restriction which Dowty employed: utterances in the present tense are evaluated for truth at the moment of utterance, not over a non-momentary interval of time; predicates which cannot be given a truth value at a momentary interval are anomalous.

Katz's theory then explains (6)c through g as characteristic behavior of predicates of moments of time, rather than predicates of events (which by hypothesis take place over a non-momentary interval of time). Note that these other aspectually-modified predicates, like statives, cannot occur in the progressive – a result which is predicted if these aspects, too, create a predicate which is of the wrong semantic type to combine with the progressive.

- (9) *Generic*: Pool sharks smoke. ~ * Pool sharks are smoking.³³
Perfect: The picture has faded. ~ * The picture is having faded.
Progressive: The roof is collapsing. ~ * The roof is being collapsing.

Katz (1995) spends an entire chapter explaining why predicates of moments of time work as they do in the tests in (6)c through g, and I do not wish to reproduce the

³² To be fair, Dowty (1979) observes that stative predicates are the only underived predicates that can be true at a moment of time, though he does not use this characteristic in quite the same way that Katz does.

³³ Although this sentence does have an interpretation as a claim about an in-progress event involving an indefinite group of pool sharks, it cannot be interpreted as a generic statement about the kind picked out by the bare plural *pool sharks*.

details of his argumentation here; I will therefore outline his explanation for only one of these tests, the properties of *when*-clauses (6)d.³⁴

The explanation for the interpretation of *when*-clauses rests on the interpretation of temporal relations in discourse (related to test (6)c), for which Katz (1995) follows the analysis of Dowty (1986). Katz assumes, following Dowty, that the default assumption in interpreting a sequence of sentences is that the eventualities or situations that they express about each other sequentially, as well – that they do not overlap.³⁵ Thus, in a sequence of sentences as in (10), the default interpretation is that John's waking up preceded his shower, and his shower preceded his making breakfast and eating it.

(10) John got up at 9am. He took a long shower. He made himself a big breakfast and ate it.

Where the eventualities or situations necessarily occupy a non-momentary interval of time, this assumption of non-overlapping sequence results in moving the narrative time forward – in (10), by the length of time it takes John to shower, or the length of time it takes to make breakfast.

Where the events expressed by the main clause and the *when*-clause are not in a logical part-of relationship, the events appear to receive a similar non-overlapping, sequential interpretation, as in (11).

(11) Bill jumped back when the vase shattered.

Katz builds this interpretation into the representation for the *when* relation between

³⁴ This diagnostic was particularly helpful in determining stativity in Pima.

³⁵ Katz (1995) does, however, discuss quite interesting examples where this non-overlap of eventualities is violated.

clauses ϕ and ψ , paraphrased in (12).³⁶

- (12) [ψ *when* ϕ] is true if and only if there are intervals of time r' and r'' such that ϕ is true at r' , ψ is true at r'' , and r' abuts r'' (where *abuts* means that r' and r'' do not overlap, that r' is linearly before r'' , and where no intervals exist between r' and r''). (adapted from Katz 1995:72-73)

The representation in (12) encodes the fact that the eventuality expressed by the main clause immediately follows the eventuality expressed by the *when*-clause.

The temporal interpretation of a *when*-clause when the main clause is stative, however, does not appear to fit this representation, however. In (13), the stative predicate in the main clause – John being asleep – is most naturally interpreted to hold at the same time as the eventive predicate in the *when*-clause, and probably somewhat before and possibly after it, as well.

- (13) John was asleep when the vase shattered.

Katz proposes a pragmatic explanation for this phenomenon. The meaning of (13) as predicted by (12) should be that the moment of time r'' at which John is asleep immediately follows the interval r' on which the vase shatters. Even though in Katz's (1995) analysis stative predicates are predicates of single moments of time, our knowledge about the world tells us that many predicates are seldom true at just a single moment but instead may be true for at least a small interval of time. The pragmatic inference that John was asleep for at least some small interval before and after r'' is what is responsible for the sense that John's sleeping extended both before, and possibly after,

³⁶ Katz (1995) uses a Reichenbachian analysis of tense, where propositions are evaluated with respect to the speech time and a reference time. To avoid the lengthy explanation that would be required to use this tense system here, I have rephrased Katz's representation slightly.

the shattering of the vase.

Since this is a pragmatic inference, we might expect that it would be blocked by the right pragmatic factors in some contexts, and this is in fact the case. Where the event introduced in the *when*-clause is the cause of the state that is expressed by the main clause, it would not make sense for that state to hold before the causing event is complete; thus, the interpretation in such contexts should be that the temporal extent of the stative predicate of the main clause follows the temporal extent of the eventive predicate in the *when*-clause. This is in fact the temporal interpretation that is given to sentences like (14), where John's fear may be naturally understood as resulting from the shattering of the vase (a non-causal interpretation, where John's fear holds before the shattering event, is also possible).

(14) John was afraid when the vase shattered.

2.1.4 Why stativity as a temporal property isn't enough

If the ability to hold at a moment of time, rather than an interval, is what is meant for a predicate to be stative – which is the content of Katz's analysis, where stativity is equivalent to having the Subinterval Property – and if it is this property which is associated with the patterns noted in (6), then the patterning together of all temporally stative predicates is explained; the ability to be true at a moment of time is a property that both aspectually simple predicates (*i.e.*, traditional stative predicates) and aspectually derived ones (progressives, perfects, *etc.*) may possess.

For Dowty, however, treating all temporally stative predicates equally is inadequate. In Dowty's (1979) account of verb meaning, a small number of lexical

aspectual operators (abstract elements BECOME, CAUSE, and possibly DO) combine with a set of monomorphemic, basic predicates to produce all possible verb meanings. He restricted this set of basic predicates to only those predicates that are stative. An analysis of this type, however, requires some restriction on the type of meanings that these basic stative predicates can have, since if a basic predicate can have any meaning that a complex predicate can have (or even worse, any conceivable meaning at all), this decompositional system is not restrictive; it does not give any substantive restrictions on the set of possible verb meanings. If temporal stativity as defined here (*i.e.*, being true at a moment of time) is all that is required to be one of these basic predicates, however, then the meanings that are associated with generic, perfect, and progressive forms of predicates should have a status equivalent with traditional stative verbs and adjectives. Dowty's system would then predict that monomorphemic stative predicates should be able to have the meanings that are associated with generic, perfect, and progressive predicates; these predicates should then be available as the basis for more complex verb meanings constructed with BECOME, CAUSE, and DO.

Problematically, this situation does not seem to be the case. Dowty notes that meanings equivalent to having grammatical aspectual operators like the perfect and progressive take scope within lexical aspectual operators like BECOME and CAUSE are not observed for single verbs. An example of such a hypothetically impossible verb meaning (but one which may be expressed periphrastically) is something like *x causes y to have become blue*; this would be represented in Dowty's representational system by $[[DO(x)]CAUSE[BECOME[P(y)]]]$ (where $P(y)$ is a temporally stative basic predicate with a

meaning that would normally be associated with the perfect of a change of state); this states informally (and without making reference to tense in the matrix “clause”) that the individual that is represented by the variable x causes it to become the case that P is true of the individual that is represented by the variable y , where P is true of y at a time t if and only if at some time t' before t , the individual denoted by y was blue, and at some time t'' before t' , the individual denoted by y was not blue.

There needs to be some way to distinguish aspectually simple stative predicates like simply *blue* from the aspectually complex ones like *have become blue* by some property of their meaning, since it is aspectually simple statives, not aspectually complex ones, which form the basis for possible meanings of verbs. Distinguishing between these two types of statives is necessary in order to tighten the restrictions on what type of meaning can correspond to a (stative) basic predicate in a system like Dowty's. Although it is not as clear in the informal paraphrase of P given in the preceding paragraph, one thing which distinguishes a predicate like *have become blue* from simply *blue* is that the former makes reference to an event – an event of change of state – while the latter refers simply to a state. In a neo-Davidsonian analysis, the former meaning should only be representable by something which has an eventuality argument ranging over events, while the latter should have only an eventuality argument ranging over states. That is, there should be independent restrictions (imposed, perhaps, by whatever cognitive system deals with eventualities) on what meanings can be associated with the cognitive objects known as states, such that *have become blue* is not a meaning which can be associated with a simple predicate whose eventuality argument ranges over states. If this is what

distinguishes *have become blue* from *blue* such that the former is impossible as a basic predicate, then we may say that it is predicates of states, rather than simply any temporally stative predicate, which comprise the set of basic predicates.

Two options are in principle available to implement this in an analysis of possible and impossible word meanings applied to a particular language. First, it might be possible to explicitly state the restrictions on what sort of meanings can correspond to states, and then check the meaning of each hypothesized basic predicate to determine if it meets those definitional criteria. Formulating these criteria might be rather difficult however; an alternative would be to find an empirical or operational test which is sensitive to the presence of an event argument. This test could then be performed on a hypothetical basic predicate, and if an event argument is detected, we can conclude that the hypothetical basic predicate is not basic, after all.

2.1.4.1 Restricting the type of situations that states may denote

Dowty (1979) acknowledges the need for a restriction on the types of meanings that basic predicates may have, and also acknowledges that these restrictions are quite difficult to formulate. Is being temporally stative sufficient for a predicate to have a single eventuality argument that ranges over states? Obviously not, since otherwise the meaning of *have become blue* should be able to exist as the basis for more complex verb meanings. Dowty sketches the outlines of this kind of definitional approach, but he himself describes this attempt to delimit what can and cannot be a stative predicate for the purposes of decomposition as merely “tentative and programmatic” (Dowty 1979:126). The idea behind it, however, rests on the fact that most stative predicates

involve physical properties of location, size, weight, texture, color, composition, and so on. By adding specifications for these properties to the model-theoretic semantics, for example, it becomes possible to distinguish predicate types in terms of the way they make reference to these specifications. He posits a multi-dimensional logical space, with each dimension corresponding to a property from the list above. The model would also include a function that takes as arguments an individual and an index, and returns the location occupied by that individual at that index on each of the property dimensions.

The set of stative basic predicates could then be defined as below:

- (15) “...for each stative [basic] predicate there is a region of logical space such that at each index, an individual is in the extension of that predicate at the index if and only if the individual is assigned to a point within that region of space.” (Dowty 1979:127)

Since, as formulated in (15), the definition of a stative predicate cannot vary with the index (and so cannot vary with time), the fact that stative predicates can hold at a single moment of time follows. The meaning of *heavy* depends only on the position of an individual on the scale of weight, even if the precise region of the scale which qualifies as *heavy* also depends on a contextual variable.³⁷ A predicate which requires making reference to values on these scales at multiple times, however, like *have become blue*, does not fit this definition for what can be a basic stative predicate. Imaginary predicates like Goodman’s (1955) *grue* are also ruled out; *grue* is an imaginary color term to describe an object that is green up to a certain time, and blue after that time. It is

³⁷ The introduction of a contextual variable would require the definition of (15) to be reworded as “For each stative predicate P, for each value of a contextual variable C, there is a region of logical space...”, so that once the predicate and the context have been fixed, the region of space that is relevant does not vary with temporal changes in the index.

impossible to formulate such a meaning as a basic predicate in this kind of model.

This model-theoretic approach works well for certain predicates, but not for others. Determining the structure of the scale for adjectives like *beautiful* and *pleasant*, as well as the relevant region of the scale in which an individual must lie for the predicate to be true, seems to be a non-trivial task. It would also seem somewhat contrived to posit a scale with only two values for non-gradable adjectives like *alive* and *free*. Moreover, stative verbs like *love*, *know*, *resemble* (and other verbs that have stative as well as non-stative interpretations like *prove*, *show*, and *see*) do not seem amenable to this kind of treatment in terms of logical space at all. Dowty suggests that a way to address this issue may have something to do with Carlson's (1977) observation that the set of predicates for which physical criteria are suitable, whether stative or not, are stage-level, while the set of predicates for which physical criteria are inappropriate are individual level, though he does not present a clear solution.³⁸

2.1.4.2 Finding an operational distinction for basic predicates

Rather than seek a definitional solution to the question of what may and may not be a basic predicate (*i.e.*, a predicate of states), there is at least one diagnostic which is sensitive to the presence of an eventive Davidsonian argument and which can therefore distinguish aspectually complex stative predicates (*i.e.*, those built from predicates of events) from those which are not.

³⁸ In fact, it is not clear that this claim which Dowty attributes to Carlson is in fact correct. Adjectives like *tall* and *blonde* are easily definable in terms of measurable criteria, yet when referring to people they are most naturally individual level. Other adjectives like *available* are stage level, yet not amenable to a definition in terms of physical criteria.

- (16) *Test which distinguishes predicates of events from other predicates:*
 a. Only events (or predicates that take them) can be modified by rate adverbials like *quickly* or *slowly* (Kenny 1963, Katz 2003)³⁹

Superficially, it appears that adverbs like *quickly* and *slowly* may occur with predicates which are temporally stative, but not with aspectually simple statives. Consider the examples below (using examples comparable to (9)).

- (17) *Generic:* ✓ Pool sharks smoke quickly.
Perfect: ✓ The picture has slowly faded.
Progressive: ✓ The roof is slowly collapsing.
Traditional stative (verb): * The student knew the answer quickly.
Traditional stative (adj): * The child was tired quickly.

The results of this test must be interpreted with caution, however, since adverbs are known to receive different interpretations based on their linear location in a sentence, presumably corresponding to their precise syntactic hierarchical position (see, for example, Cinque 1999). The claim here is not that *quickly* or *slowly* may be predicated of a perfect, progressive, or generic/habitual directly, but that an eventive subcomponent of these predicates allows these adverbs; the rate adverbial would then be within the scope of the perfect, progressive, or generic/habitual. In fact, changing the position of the adverbs in these sentences to a position which might bring the perfect, progressive, or generic/habitual into the scope of the adverbial does change their acceptability; strangely, doing so appears to improve the stative sentences, as well.

³⁹ Kenny claims that this property holds only of activity verbs, though this appears not to be quite true; uses of such adverbs with achievements are possible, but the adverbs are typically given a different interpretation than they receive with activity or accomplishment predicates: *John quickly discovered the problem* has the meaning “It quickly came about that John discovered the problem”, rather than “John’s discovery of the problem occurred at a rapid rate”. This may be related to the phenomenon, observed by Dowty (1979) in his discussion of types of future sentences, that the planning stages of an event sometimes appear to constitute a part of that event.

- | | |
|------------------------------------|--|
| (18) <i>Generic:</i> | * Pool sharks quickly smoke. |
| <i>Perfect:</i> | * The picture slowly has faded. |
| <i>Progressive:</i> | * The roof slowly is collapsing. |
| <i>Traditional stative (verb):</i> | ✓ The student quickly knew the answer. |
| <i>Traditional stative (adj):</i> | ✓ The child quickly was tired. |

Changing the scope of the rate adverbial would seem to place the progressive, perfect, and generic/habitual sentences back on par with the traditional statives in (17), except that the acceptability of the traditional statives has also reversed. Their acceptability in (18), however, appears to be associated with a non-stative interpretation. As Vendler noted, quite a few predicates are consistent with multiple time schemata, and in their use in (18), the traditionally stative predicates have only an inchoative meaning: these two sentences may be paraphrased as “the student came to know the answer in a short period of time” and “the child became tired in a short period of time”. Inchoatives or inceptives are not themselves stative, and within a Davidsonian framework, such forms are typically analyzed as including an eventuality argument ranging over events, thus accounting for the acceptability with a rate adverbial.⁴⁰ The acceptability of *quickly* and *slowly* with a certain predicate is therefore an indication of an event argument somewhere within that predicate, and the scope of the rate adverbial should indicate the constituent within which that event argument is open for modification; the unacceptability of a rate adverbial with a certain scope indicates the lack of an event argument which is open for modification. By this diagnostic, even those traditionally stative predicates which pattern like non-

statives by some tests, such as those predicate adjectives and nouns like *noisy* and *a hero*

⁴⁰ Or, within a neo-Davidsonian framework such as that found in Parsons (1990), which is more directly comparable to Dowty’s (1979) analysis, they would involve both the original stative predicate whose eventuality argument ranges over states, as well as a BECOME predicate which introduces an eventuality argument ranging over events.

that may occur in the progressive and in pseudoclefts with *do*, are seen to lack an eventuality argument ranging over events (excluding a non-stative inchoative or inceptive interpretation): **John {was quickly/quickly was} noisy*, **John {was quickly/quickly was} a hero*.

2.1.4.3 Restricting the type of situations that states may denote: another try

Showing that a predicate is temporally stative, as determined by the diagnostics in (6), and that it does not involve an eventuality argument ranging over events, as determined by the rate adverbial diagnostic in (16), is not the same as showing that that predicate does have an eventuality argument ranging over states. Katz in fact concludes that there are no predicates of states, and that all stative predicates that are not derived from predicates of events are merely predicates of moments of time; their ability to be predicated of non-momentary intervals is a result, he says, of the Subinterval Property. Proving that all predicates do have an eventuality argument has been the goal of works like Parsons (1990), Landman (2000), and Mittwoch (2003), and the case of statives that are not derived from predicates of events will be discussed in the following section. What is worth considering at this point, however, is what it is that enables predicates of events to nevertheless be able to take a truth value at a single moment of time; this may help to refine the definitional approach to delimiting the meanings of aspectually simple stative predicates, that is, those that are stative because they are predicates of states, and can therefore form the basis for building verb meanings.

Those temporally stative predicates which contained within them an eventuality argument ranging over events proper, such as perfects, generics, and progressives, also

required some temporal, aspectual, or modal operator involving reference to other events, points in time, or possible worlds, in order to make them true at moments of time, rather than over intervals. Aspectually simple stative predicates, on the other hand, can be assigned a truth value at a single moment of time and require for their evaluation only information about that moment, not information about other moments or intervals. This seems to fit with Dowty's programmatic suggestion for delimiting the set of predicates which can form the basis for his decomposition, that they not involve reference to times or intervals of time, but to properties independent of time. The following definition therefore seems hold of aspectually simple stative predicates, *i.e.*, predicates of states:

- (19) A predicate of states is one that has the Subinterval Property down to moments of time and whose truth value can be determined without any information from any time besides the moment of evaluation

Having the Subinterval Property down to moments of time ensures that predicates of states are temporally stative in the sense of the diagnostics in (6), and the restriction to the moment of evaluation excludes any predicate which involves reference to an event proper. For instance, the meaning of the progressive as formulated by Dowty (given in (7)) would not by this definition be a possible meaning for a predicate of states since it requires knowledge about multiple moments of time. The evaluation of the progressive at interval I , which in the present tense is the moment of utterance, requires knowledge of the truth of the predicate at interval I' , which is necessarily a larger interval than I , and therefore includes moments of time apart from the moment that is included within the interval I .

Although the definition in (19) provides a basis for delimiting the kinds of

meanings that can serve as building blocks of more complex verb meanings, it does not fully answer the question brought up earlier of whether all temporally stative predicates that are not based on predicates of events are actually based on predicates of states. One question raised by this definition is the status of individual level predicates: all individual level predicates, including all of the traditionally stative verbs in English, in addition to habituais and generics, pattern like statives with regard to the tests in (6), but since an individual exists over an interval of time, not a single moment (*i.e.*, a stage of an individual occupies a single moment, while the individual itself exists over an interval), we would expect predicates of individuals to be assigned truth values over intervals of time. Can an individual level predicate have an eventuality argument that ranges over states, given this restriction on what can be a predicate of a state? The definition in (19) also excludes positional verbs like *sit*, *stand*, and *lie*, which have a non-active sense on which they do not have the Subinterval property, as indicated by their acceptability in the progressive (as in ✓*The hat rack was standing next to the door when John left*). The following section will therefore review a number of proposals regarding precisely which stative predicates have an eventuality argument, and what the nature of that argument is.

2.2 Stative predicates and predicates of states

Subclasses of temporally stative predicates certainly need not behave identically with regard to diagnostics which are not sensitive to the Subinterval Property. This has already been shown with regard to the rate adverbial diagnostic of (16), which was taken to indicate the presence or absence of an eventuality argument ranging over events proper. Other differences in behavior of classes of stative predicates have similarly been

attributed to different types of eventualities that those predicates take as arguments, or even the absence of an eventuality argument of any kind.

For instance, Bach (1986) cites L. Carlson (1981) as classifying stative eventualities into DYNAMIC states (Bach's examples are the positional senses of *sit*, *stand*, and *lie*) and STATIC states (his examples are *be drunk*, *be in New York*, *own x*, *love x*, and *resemble x*). This appears to correspond to Dowty's (1979) distinction between interval stative predicates (mainly positional verbs) and momentary stative predicates, which he notes include habituais from all other aspectual classes (similar to the position of Katz 1995). Dowty's syntactic test for interval predicates is the ability to occur in the progressive; of those predicates that do not involve predication over events,⁴¹ only interval stative predicates (denoting dynamic states) may occur in the progressive, as in *The book is sitting on the table*. No other differences are proposed by Bach or Dowty to correlate with this sortal difference in denotation, however.⁴²

⁴¹ Dowty, of course, does not take a Davidsonian approach, and so makes no reference to predication over events. His own classification of such predicates as statives is based on their behavior with respect to other diagnostics discussed in section 2.1, as well as potentially his own intuitions, though the rate adverbial diagnostic provides an even simpler way to classify all such verbs as stative-like in some sense.

⁴² Dowty also cross-classifies these two classes of states as non-agentive or agentive (as he does for the other three Vendlerian classes), as evidenced by their ability to occur in imperatives, with adverbials like *deliberately*, and several other tests from (4), resulting in four classes of stative predicates (1979:184). His semantic representation of these four classes of stative predicates does not reflect this subclassification directly, however; non-stative predicates are distinguished from statives by including one or both of the operators DO or BECOME, but the subcategories within stative predicates cannot be easily read from the elements of the semantic representation. Whether a predicate may hold at a momentary interval or not, that is, whether it denotes a static or dynamic state, is for Dowty an empirical semantic fact for each predicate (though, as discussed earlier, there are generalizations concerning which predicates require an interval), as is whether the subject is agentive or not.

Another proposal relevant to the question of the type of eventuality argument taken by statives is that of Kratzer (1995), who proposes a difference of type (among other differences) between stage level predicates and individual level predicates: namely, she proposes that only stage level predicates have a Davidsonian eventuality argument, and that the nominal arguments of individual level predicates are their only arguments. While this is first of all a claim about the stage level/individual level distinction, it is relevant for issues of stativity since all individual level predicates pattern as statives by the diagnostics in (6). In fact, all of the predicates in English that are categorically verbs and that Dowty classifies as momentary statives – the set which includes verbs like *know*, *love*, and *hate*, as well as *own* and *resemble* – are individual level. To state this another way, the only momentary stative predicates that are stage level in English are adjectives and other copular constructions.⁴³

Kratzer's account appears to explain the temporal properties of individual level predicates, and through a syntactic reflection of this semantic property, seems to explain other syntactic facts observed by Diesing (1988, 1990) in German, as well. Jäger (1999), however, points out in response to this that the adverbial modification facts that are a strong motivation for a Davidsonian analysis of stage level eventive verbs can also be observed with individual level predicates, both verbal and non-verbal, and concludes that

⁴³ This observation is made by Dowty (1979:179), though what is meant by stage level here cannot simply be the same as transitoriness, since there appear to be verbs that can be true at a moment (as evidenced by their acceptability in the simple present) and yet pattern like stage level predicates in that they are acceptable with temporal modifiers: *My leg hurts right now, but the pain will probably go away by this afternoon; The garbage disposal stinks right now, and it stank for hours last night before I rinsed it out, too.* In some but not all such cases, the progressive sounds at least marginally acceptable.

although they may not have the same type of eventuality argument as stage level eventualities, individual level predicates nevertheless have an eventuality argument of some kind. An example is given below.

- (20) a. John was a Catholic with great passion in his youth.
 b. John was a Catholic with great passion.
 c. John was a Catholic in his youth.
 d. John was a Catholic. (Jäger 1999: (50))

This behavior displayed by the sentences in (20), referred to as a “diamond” entailment pattern, is one that is often taken as a strong argument for a Davidsonian analysis of eventive sentences. We can note that sentence (20)a entails sentences (20)b, c, and d, that sentence (20)b entails (20)d, and that (20)c entails (20)d. The conjunction of sentences (20)b and (20)c, however, is not equivalent to (20)a, since (barring possible questions of theology) John may potentially be a Catholic at separate intervals of time – he may be a lukewarm Catholic in his youth, fall away, and become a passionate Catholic at a later age. This result is predicted if the semantic representation of the sentences in (20) is something like what is shown in (21) (the predicates shown are intended to be schematic; what is important is their relationship to each other between sentences).

- (21) a. $\exists s [\text{be-a-Catholic}'(s)(\text{John}) \wedge \text{with-great-passion}'(s) \wedge \text{in-youth}'(s)(\text{John})]$
 b. $\exists s [\text{be-a-Catholic}'(s)(\text{John}) \wedge \text{with-great-passion}'(s)]$
 c. $\exists s [\text{be-a-Catholic}'(s)(\text{John}) \wedge \text{in-youth}'(s)(\text{John})]$
 d. $\exists s [\text{be-a-Catholic}'(s)(\text{John})]$

The conjunction of the representations in (21)b and (21)c would include two instances of existential quantification over states, each with a distinct scope; this differs from the representation in (21)a, where both modifiers are predicated of the same state variable within the same scope of quantification. Thus, while two separate states occupying

distinct temporal intervals may satisfy the conjunction of (21)b and (21)c, only a single state occupying a single interval of time can satisfy (21)a. Jäger notes that the eventuality argument for non-verbal predicates like this also cannot simply be provided by the copula, since the adverbial behavior characteristic of an eventuality argument can be observed, he argues, even in constructions that do not require a copula (as in ✓ *A Catholic with great passion in his youth, John later became a Protestant.*).

Maienborn, in a number of recent papers (2004a, 2004b, among others), also examines differences among statives, focusing on issues related to the copula, and concludes that while all verbal and copular predicates have some kind of extra argument, there are at least three types of such arguments, as evidenced by three patterns of behavior of predicates with regard to eventuality-related tests. She draws a distinction between events proper, DAVIDSONIAN STATES (or D-states), and KIMIAN STATES (or K-states), arguing that while events and D-states have all the properties traditionally attributed to eventualities in the Davidsonian tradition, K-states are abstract objects (introduced by the copula in the case of non-verbal predicates, though Jäger's evidence may show differently) which are only available for cognitive processes and have only a temporal location.

Maienborn takes the consensus view concerning eventualities to be that they have certain ontological properties: they are concrete objects in the real world, which means that they are perceptible, they have a location in space and time, and they can vary in their realization. Maienborn argues that predicates that are traditionally considered to be eventive, presumably whether or not they are aspectually modified so as to have stative

temporal properties (*i.e.*, the perfects, progressives, and habituals/generics of the previous section), can be shown to take events proper as arguments; they are grammatical with rate adverbials (the diagnostic in (16)), and they may also occur as the subject of *happen*, as in the sentence below.⁴⁴

(22) a. ✓ The car made loud noises. This happened while it was accelerating.

Dowty's class of interval statives fail these specifically-eventive tests, however; they may not occur with rate adverbials, and they may not occur as the subject of *happen*. Other statives, such as copular constructions, also fail this test.

(22) b. * John stood at the window. This happened while... (*stood* = interval stative)
 c. * The student was busy. This happened while... (*be busy* = stage-level AP)

In many other ways, however, interval statives behave just like predicates of events are expected to behave, based on the ontological properties Maienborn assumes for eventualities. Predicates of events proper and interval statives may both occur as the non-finite complement of a perception verb, for instance, which is predicted if their arguments are observable, concrete objects. Copular predicates and momentary stative verbs are not acceptable in this context, which Maienborn takes to indicate that their referent is not a concrete, observable object like other eventualities.

(23) a. ✓ I saw the book spin on the table. *eventive*
 b. ✓ I saw the book lie on the table. *interval stative*
 c. * I saw the book be on the table. *copular (momentary) stative*
(cf. Maienborn 2004b: (14))

As another example, eventive predicates and interval statives allow an eventive reading

⁴⁴ Examples of the second test typically involve anaphoric binding of *this* in a sentence beginning with *This happened while...*. For further discussion, see Maienborn (2004b:8).

of the modifiers *ein bisschen* or *a little bit*, while copular statives, she claims, do not.⁴⁵

- (24) a. Max ran a little bit yesterday. ✓ *event reading* (also ✓ *degree reading*)
b. Max sat in the garden a little bit. ✓ *event reading* (also ?*degree reading*)
c. Max was in the garden a little bit. **event reading* (✓ *degree reading* only)

Some verbs, like *run* in (24)a, allow a degree interpretation with an adverbial like *a little bit*, meaning that the distance that was run was not great. All eventive verbs and interval statives, however, also allow an eventive reading of *a little bit*, on which the event (of running or sitting) goes on for a period that is not great. Copular predicates and all other momentary statives allow only a degree reading of such modifiers (on which, for example, Max might be on the edge of the garden, and only a little bit of him actually occupies space within the garden).⁴⁶ Interval statives, Maienborn says, therefore involve predication over an eventuality which in many ways resembles the eventuality that is present in eventive sentences, which she refers to as a D(avidsonian)-state. Copular predicates and all other momentary stative verbs, she says, do not take the same kind of eventuality argument.

Maienborn does not conclude that momentary statives lack any kind of hidden argument, however. She notes that eventive verbs, interval statives, and verbal and copular momentary statives all support temporal modification, as in (25).

- (25) a. The book spun on the table {yesterday/twice/for one minute}. *eventive verb*
b. The book lay on the table {yesterday/twice/for one minute}. *interval stative*
c. The book was on the table {yesterday/twice/for one minute}. *copular stative*

⁴⁵ Maienborn's arguments are based on German sentences; they have been replaced by English sentences for exposition here. The judgments, however, are retained from the German sentences.

⁴⁶ Maienborn notes that such predicates are all acceptable with the modifier *for a little bit*, which she argues should be given a distinct analysis as merely a time-span adverbial.

Furthermore, the denotations of momentary stative are available for processes of cognition, as demonstrated by their support of a kind of anaphora with *this*, as in (26).⁴⁷

- (26) a. Trash lay all over the room. This lasted for days until the janitor cleaned it up.
b. Carol is angry, but this will soon be over.

She therefore proposes that momentary stative take a “hidden” argument that ranges over entities that are similar to but ontologically distinct from eventualities (events and D-states), which she terms K(imian)-states.⁴⁸

Kimian states are named for Jaegwon Kim, who in a number of papers (1969, 1976) proposed an alternative to Davidson’s conception of events according to which events are merely “temporally-bound property exemplifications” (Maienborn 2004b:19). Maienborn synthesizes this concept with work by Asher (1993, 2000), who holds that abstract objects are mentally-constructed entities, to result in the concept of a Kimian state: K-states are “abstract objects [*i.e.*, cognitive objects – EJ] for the exemplification of a property *P* at a holder *x* and a time *t*” (Maienborn 2004b:20). K-states have different properties from D-states and events proper because they are distinct types of entities; because they are abstract mentally-constructed objects, they cannot be perceived and have no location in space, though they are accessible to cognition (recall the anaphora facts) and they may hold over an interval of time.

Most important for the purposes here, however, her conclusion that all clausal predicates have one of these three types of additional argument – and although

⁴⁷ Again, Maienborn’s judgments are given only for German sentences: ✓*Carol ist wütend. Das wird bald vorbei sein.* ✓*Der Schlüssel war weg und das seit dem Wochenende.*

⁴⁸ Predicates which take K-states as arguments include all copular constructions as well as momentary stative verbs, thus K-states coincide with Bach’s set of static states.

Maienborn herself does not extend this proposal to non-copular nouns, adjectives, and prepositions, if Jäger's arguments regarding non-copular contexts are correct (see the discussion following (21)), this additional argument position may be a property of the lexical vocabulary as a whole, not just verbs and the copula. Even without accepting all the details of her analysis, however, it seems safe to treat predicates in general as containing an eventuality (or eventuality-like) argument, and to assume that the variation within stative predicates is due to properties of this argument.

2.3 Summary: the uses of the term “stative”

This chapter has shown that the term “stative” has been used even within modern linguistics in a number of ways, with a number of specific meanings. As used by Lakoff (1966), STATIVE was one value of a syntactic feature which cross-classified both adjectives and verbs; the value of this feature for a given adjective or verb was to be inferred from the acceptability of the word in a number of syntactic constructions, and although most adjectives and verbs which were STATIVE shared the semantic property of inactivity (which was left undefined), this semantic property was not a sufficient condition for the grammatical feature value STATIVE. In the tradition of Aristotle, Ryle, Kenny, Vendler, and formalized by Dowty, a stative predicate was one which employed the time schema of a state – that is, a predicate which was able to be true at a non-specific moment of time, or over an interval of such moments; this was labeled within this chapter as temporal stativity. As has become clear, quite a few of the originally proposed tests are actually sensitive not to the ability to be true at a moment, but to properties which may be closely related to this, such as agency (volitionality or controllability), durativity,

or telicity. Moreover, although a number of tests do distinguish predicates which can be true at a moment, certain such predicates – generics or habituals, progressives, and perfects – may still require information beyond that moment in order to determine their truth or falsity. Generally, these predicates that are temporally stative yet require information about other moments can be distinguished from what are traditionally thought of as stative predicates – positional verbs, copular constructions, and individual level verbs – by the presence of an event argument somewhere within their meaning.

The last section addressed the question of whether these temporally stative predicates that did not include an event argument within their meaning nevertheless included a hidden temporal argument of some kind. Although there is as yet no consensus on the precise solution, Maienborn's arguments appear to show that at least all sentential predicates (verbs and copular constructions) include an argument position which can be used to specify temporal extent, and other authors (like Jäger) have concluded that this argument position is also available with the same predicates outside of the copular construction. In the following chapters, I will therefore assume that all predicates have some kind of hidden argument, with the caveat that not all such arguments may be created equal.

A related point is that although a number of different types of predicates involve no change at the moment of evaluation, not all such predicates appear to be available as bases for building up complex word meanings; that is, temporally stative predicates come in two types: predicates with an eventuality argument ranging over states and predicates which may have an eventuality argument which ranges over events but which (due to

other temporal operators) may have truth assigned at a moment, rather than over an interval. The set of predicates of states is taken to be the hypothetical basis, according to a theory like Dowty's (1979), for building more complex word meanings. It was concluded that the following definition (repeated from (19)) holds of predicates of states, and therefore restricts the types of situations (in terms of the real world or a cognitive model of it) that states could correspond to:

- (19) A predicate of states is one that has the Subinterval Property down to moments of time and whose truth value can be determined without any information from any time besides the moment of evaluation

This definition seems to agree with intuitions regarding what makes a stative predicate stative, and there seem to be readily available tests for the first clause (such as occurrence in the simple present tense). It is not clear, however, how an arbitrary predicate might be evaluated regarding the second clause without either reflecting on intuitions about the meaning of the predicate or examining a semantic representation for relations between multiple times. Although examining the semantic representation of a complex predicate is easily done by the linguist when such a representation is available, nothing so far formally prohibits a predicate ranging over states from including reference to some other time (though such predicates are felt not to exist, such as the famous example of *grue* as an impossible color term meaning 'green up to a certain time, and blue thereafter').

The discussion so far has established that it is possible to derive a predicate which is temporally stative from one that denotes an event; perfects, progressives, and habituais and generics are all examples of this. Stative predicates that are derived from events are expected to retain the semantic properties that are associated with those events, but as we

will see in the following chapters, this is not always the case.

For instance, we have seen that lack of agency (possibly also realized as lack of volition or lack of control) is a property frequently associated with temporally stative predicates that are also predicates of states. This correlation is so salient that the Vendlerian tradition initially believed that a number of tests which are now known to be sensitive to lack of agency instead indicated stativity. Currently there is no formal explanation for this tendency, nor for why it should be merely a tendency and not an absolute. In the following chapters, however, we will see that in a number of languages, there are morphemes which derive stative predicates from eventive ones, and in many cases these stative predicates lack the agentive component of meaning that at least appears to be part of the meaning of their morphological base.

While this might seem to fit with the general co-occurrence of stativity and lack of agency, it appears to involve non-compositional semantic derivation, and also runs against the sense of a slightly different cross-linguistic generalization. A number of authors (for example, Koontz-Garboden and Levin 2004, who refer back to Dixon 1982 and other work) note that languages in general tend to lexicalize different kinds of states in different ways. States that may be considered property concepts – “states related to speed, age, dimension, value, etc., and which presuppose no change” (Koontz-Garboden and Levin 2004:2) – are most often expressed in languages by morphologically simple expressions; those states which might be thought of as resulting from some other process or change are most often expressed in languages by morphologically complex expressions, these typically being derived from verbs denoting a change of state. In

chapter four, I will describe two resultative constructions in Pima that derive temporally stative predicates from eventive ones – which by this generalization should presuppose a change of state; nevertheless, one class of such forms at the very least presuppose no agency, and a subclass will be seen to presuppose no change of state, as well. The following chapter will therefore evaluate two different published analyses of resultatives and derived statives with these properties.

3. How to make a stative: Resultatives in Chichewa and German

Resultatives in the broad sense (*i.e.*, including both resultatives proper as well as derived statives) appear to be relatively common cross-linguistically; that is, in many languages there exist verb paradigms in which a verb form expressing an event of a certain type contrasts with a verb or verbal derivative that expresses the condition which results from an event of that type, though for some verbs in some languages, the condition expressed by the resultative need not result from an event of that type (in this case, the resultative is more precisely a derived stative). The typological survey of resultatives in Nedjalkov (1988) includes papers on 23 languages of Eurasia, Africa, and the Pacific, and though the details within each language vary, they all fit this general schema.⁴⁹ The resultatives themselves – the verbs or deverbal expressions that express a condition or state – may be descriptively referred to as “stative”, and in fact a number of the papers in Nedjalkov (1988) refer to all such resultative forms as denoting or expressing a state, though as we have seen in the previous chapter, it is important to be clear about what “stativity” means as applied to such forms, and whether they have stative temporal properties or are in fact predicates of states, as this term is used here.

One morphological opposition of this type which has been the focus of a large body of work is the adjectival passive in English, from an early stage of generative linguistic theory through the present (Siegel 1973; Wasow 1977; Lieber 1980; Bresnan 1982; Marantz 1984; Levin and Rappaport 1986; Dubinsky and Simango 1996; Kratzer

⁴⁹ The under-representation of certain areas or language families from this survey may reflect the political and geographic limitations of the authors more than any differences in the occurrence of resultatives, especially since the three languages that will be examined in this dissertation and that have similar oppositions are all from the Americas.

2000; Emonds 2002; Embick 2003, 2004; among others). While I will not attempt to review all of the literature which focuses on the English adjectival passive, this opposition will be referred to indirectly; this chapter will primarily examine the analyses of similar oppositions in other languages which have themselves been compared to the English adjectival passive: the stative suffix in Chichewa, a Bantu language, and the *Zustandpassiv* or state passive in German, which understandably bears a close historical relationship to the English adjectival passive. The discussion here will focus on those aspects of these analyses which will be of particular interest for Pima, namely, the status of agentive subjects (typically external arguments, or arguments which are syntactically external to the verb phrase) in the resultative and base forms, the nature and direction of the derivational relationship between the eventive and stative forms, and the apparent changes in components of meaning (in particular, the requirement that the condition expressed by a resultative is a result of some event, a requirement which is not present with derived statives).

3.1 The Chichewa stative suffix

Chichewa (also referred to as Chewa, Nyanja, or Chinyanja) is a Bantu language spoken primarily in Malawi and other areas of southern Africa.⁵⁰ This language, like Bantu languages in general, has a passive morpheme, which reduces the number of syntactic arguments of a verb by eliminating the argument that was the subject of the verb, though the demoted subject may be specified in a PP adjunct, as seen below.

⁵⁰ Ethnologue and ISO/DIS 639-3 language code: nya. The data on Chichewa which is referred to here comes from Mchombo (1993) and Dubinsky and Simango (1996).

- (27) a. Naphiri a-na-tsuka mbale
 Naphiri AGR-PAST-wash plates
 Naphiri washed the plates.
 b. Mbale zi-na-tsuk-idwa (ndi Naphiri)
 plates AGR-PAST-wash-PASS by Naphiri
 The plates were washed (by Naphiri). (Dubinsky and Simango 1996: (3a))

This language also has a contrasting verbal suffix which has been called the *STATIVE*.⁵¹ Like the passive, is associated with a reduction in the arity of the verb: the subject of the base verb is not an argument of the stative form. Unlike the passive, however, the subject of the base verb may not be specified in an oblique. Chichewa stative predicates in some ways resemble a derived stative, rather than a resultative: they have no entailments about the semantic involvement of an agent. The event or state denoted by the predicate can be spontaneous or brought about by an agent, but a stative predicate simply makes no claim about this. An example like (28) says that this was simply the way the plates were at the time.

- (28) Mbale zi-na-tsuk-ika (*ndi Naphiri)
 plates AGR-PAST-wash-ST by Naphiri
 The plates were washed (*by Naphiri). (Dubinsky and Simango 1996: (3b))

Dubinsky and Simango analyze this as not just the absence of an agent within the meaning of a stative verb, but as the absence of an eventuality which results in that state. Where such a foregoing eventuality would seem to be required, as with a verb like *wash*, they suggest that it is instead only pragmatically implicated (1996: fn.19).

The passive and the stative suffixes are distinguished by several other properties, as well. While a passivized verb is grammatical with a purpose clause (as in (29)), an

⁵¹ The use of this term as a traditional label for a verb form derived with a specific suffix should not be confused with the temporal use of this term as laid out in chapter 2. I shall attempt to make clear which of these senses I intend through context.

agent-oriented adverb (as in (30)), or an instrument (as in (31)), a stativized verb is not.

- (29) a. Chakudya chi-na-phik-idwa kuti anthu a-sa-fe ndi njala
 food AGR-PAST-cook-PASS that people AGR-NEG-die from hunger
 The food was cooked so that people should not die of starvation. (*ibid*: (4a))
 b. * Chakudya chi-na-phik-ika kuti anthu a-sa-fe ndi njala
 food AGR-PAST-cook-ST that people AGR-NEG-die from hunger
 The food was cooked so that people should not die of starvation. (*ibid*: (4b))
- (30) a. Chitseko chi-na-tsek-edwa mwadala.
 door AGR-PAST-close-PASS deliberately
 The door was closed deliberately. (*ibid*: (5a))
 b. * Chitseko chi-na-tsek-eka mwadala.
 door AGR-PAST-close-ST deliberately
 The door was closed deliberately. (*ibid*: (5a))
- (31) a. Kalata i-na-lemb-edwa (ndi pensulo).
 letter AGR-PAST-write-PASS with pencil
 The letter was written (with a pencil). (*ibid*: (7a))
 b. * Kalata i-na-lemb-edwa ndi pensulo.
 letter AGR-PAST-write-ST with pencil
 The letter was written with a pencil. (*ibid*: (7b))

Dubinsky and Simango (1996) take this as evidence for the presence of an agent in the passive, at least covertly, but not in the stative.

Dubinsky and Simango also point out several other types of evidence that quite different things are going on with the passive and stative suffixes in Chichewa. First, these two suffixes differ in their selectional restrictions regarding other affixes, and other affixes distinguish the passive and stative in terms of their selectional restrictions, as well. While the passive may attach to stems which have been derived by the causative or applicative affixes, the stative may not.⁵² In contrast, the benefactive applicative suffix may not attach to passivized stems, though it may freely attach to stems with the stative

⁵² This is contrary to a claim made by Mchombo (1993) that the stative suffix may attach to verbs derived by the causative suffix. Dubinsky and Simango argue that Mchombo's examples contain fossilized causative affixes, rather than true, synchronic examples of the causative affix.

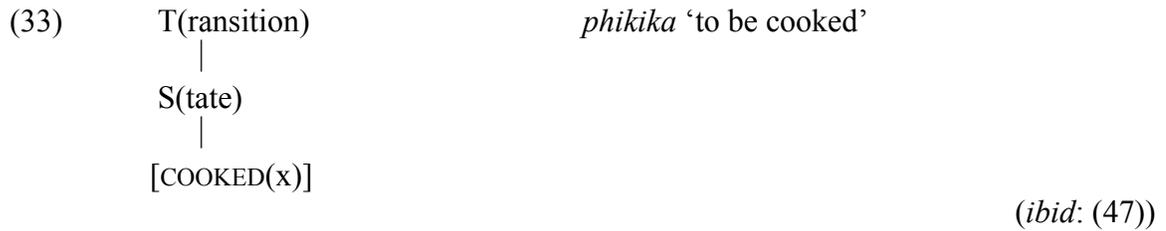
suffix.

Another difference between the stative and the passive suffixes concerns their phonological stability. The stative interacts phonologically with certain stems, while the passive, applicative, and causative affixes do not: the combination of stem plus stative suffix shows phonological reduction, as in *gulul-* ‘extract/remove’ + *-ika* ‘STATIVE’ → *guluka* ‘be removed’ (stative), compared to *gulul-idwa* → *gululidwa* ‘be removed’ (passive), *gulul-itsa* → *gululitsa* ‘make remove’ (causative), and *gulul-ira* → *gululira* ‘remove for’ (applicative).

Furthermore, there appear to be differences between the passive and stative in terms of semantic stability. While the semantic result of the passive suffix is always predictable, Dubinsky and Simango note that forms produced by the stative suffix are more susceptible to semantic drift: the passive of *tay* ‘throw away’ is the predictable *tay-idwa* ‘be thrown away’, but the stative *tay-ika* has a meaning closer to ‘be lost’.

Most critically for the discussion here, Dubinsky and Simango claim that the stative affix displays a sensitivity to the lexical aspect of a stem that the passive does not. While the passive may apply to almost any transitive verb, the stative suffix is restricted to accomplishments whose meaning includes an event or process which results in a change of state for the theme (where they suggest the definition of ‘change of state’ from Dowty 1991: coming into existence, going out of existence, and definite and indefinite changes of state, where “indefinite” here refers to indefinite changes in degree or in position). As examples, they point out that the change-of-state verbs *phika* ‘cook’, *swa* ‘break’, and *kumba* ‘dig’ may be suffixed either by the passive or by the stative affix,

of the original verb, as seen in (33).



Since the agent is associated only with the process portion of the lexical conceptual structure, the new verb would be anomalous with any linguistic expression whose meaning references such an agent, therefore predicting the observed incompatibility of stativized verbs with purpose clauses, agent-oriented adverbials, and instruments seen in (29)b, (30)b, and (31)b.

Although this is the lexical conceptual structure that Dubinsky and Simango list as the output of this operation, a number of considerations indicate that the proper representation for stative-suffixed verbs may only include the state node and below. First, it is taken as obvious why a verb with an LCS as in (33) would be considered stative; presumably such a representation is equivalent in the event semantics framework adopted in chapter 2 to a predicate with an eventuality variable that ranges over states (whether D-states or K-states), and is therefore temporally stative, as well. If only the process node is deleted and the transition node is left, however, the resulting verb should have a non-stative meaning, namely, the meaning of an inchoative or non-caused change of state (*i.e.*, a transition into a state). Even if this predicate necessarily combined with an aspectual morpheme such that it was temporally stative (according to the diagnostics of (6)), the presence of a transition node would also seem to contradict the claims regarding the meaning of the stative found in Dubinsky and Simango (1996) and Mchombo (1993),

that stative-suffixed verbs do not entail an event of the state's coming to hold – *i.e.*, that they are derived statives in the sense of Nedjalkov and Jaxontov (1988).

3.1.2 Consequences of this analysis

There are three important points of discussion concerning this proposed analysis. First of all is the issue of compositionality. This absence of a portion of the meaning of the base verb from the derived verb can be stated, as Dubinsky and Simango do, in terms of deletion (that the stative suffix copies the LCS of the base verb into a new lexical entry and subsequently deletes a portion of it) or equally well as selective copying (that when the stative suffix creates a new lexical entry, it copies only a portion of the meaning of the base), but in either case the semantic combination of the base and the stative suffix must involve an examination of the internal semantic structure of the base (in this case, the LCS); the meaning of the base verb cannot be treated as an unanalyzable unit. This runs contrary to one of the central properties that are presumed to hold of the operations that compute the meaning of complex expressions in natural language, the Principle of Compositionality: the meaning of a constituent is determined solely by the meaning of its parts and the rule used to combine them (Portner and Partee 2002). This is standardly taken to mean that semantic combination treats the elements that it combines as “black boxes”, without referring to their internal structure; this is an assumption, or at least an interpretation of this principle, that Dubinsky and Simango appear to reject.

The second issue deserving comment is the need for independent evidence of lexical conceptual structures of the type that Dubinsky and Simango propose. If limitations on the occurrence of the Chichewa stative suffix are to be explained in terms

of the type of LCS that a verb's lexical entry contains, then it is necessary to have evidence of a verb's LCS that is independent of the properties of this stative suffix. Dubinsky and Simango do propose such evidence, but as we will see in section 3.3, their evidence may not in fact show what they intend to conclude from it.

The third issue deserving comment is the concept of monotonicity of semantic derivation – or in other words, the fact that semantic operations are not assumed to result in the “loss” of meaning over a derivation. In a footnote (fn. 20, p. 772), Dubinsky and Simango acknowledge that it is odd for a morphologically more complex expression (the stative) to have a semantic representation that is less complex (*i.e.*, which lacks a part of the meaning present in the morphologically simpler form). Dubinsky and Simango explicitly reject a similar framework where monotonicity in event structure is taken to hold, namely in the event structure templates of Levin and Rappaport Hovav (1995, and later work by these authors), because that framework would allow only the existential quantification of an agent argument, rather than allowing deletion of the component of event structure that introduces that agent.

This is a more general problem, however, since the Chichewa stative is not the only example from natural language in which a morphologically derived form seems to lack portions of the meaning of the base from which it is derived. Haspelmath (1993) presents data from a number of languages in which inchoative verb forms (or at least a subset of them) look exactly like causative verb forms with the addition of reflexive morphology (typically a reflexive clitic). The meaning of these derived inchoatives does not simply involve existential quantification over a causer argument (which would

involve monotonically adding to the meaning of their morphological base), since inchoatives derived in this way may also be used to express internally-caused events or non-causative changes of state; an inchoative derived from a causative by reflexivization may be used in a context where the speaker wishes to make no assertions regarding any cause for the change of state. Rather, the assertion of an external cause that is part of the meaning of the causative form appears simply to be absent. If the apparent relative morphological complexity is a true indication of the direction of morphological and semantic derivation (*i.e.*, if the inchoatives are derived from causatives by the addition of a reflexive clitic), then these cases as well involve derived forms whose meaning fails to include part of the meaning of the base.

Pesetsky (1995) discusses cases like this, as well, however, and concludes that the causative cases are only “apparently” simpler morphologically. In his analysis, the causative forms include a phonologically null causative morpheme which is not present on the inchoative forms, and which obviates the need for a reflexive clitic (which is required for other reasons); thus, the causatives are in fact derived from the inchoatives, which are only apparently more complex morphologically. The notion of “morphological complexity” may therefore need to take into account the possibility of phonologically null morphemes, which would make the determination of the direction of derivation more difficult. To the extent that null morphemes are detectable primarily by their semantic contribution (Pesetsky discusses other ways, though meaning relations are a primary one), there does not seem to be a guaranteed way of determining morphological complexity and the direction of derivation independent of semantic complexity.

To summarize the proposal of Dubinsky and Simango, the stative suffix derives a stative verb from an eventive verb by filtering out (through deletion or selective copying) that portion of the meaning of the base verb that makes it eventive (*i.e.*, a predicate of events), leaving a component which is stative in the narrow sense (*i.e.*, a predicate of states) and thus also temporally stative; the stative component does not make reference to certain components of meaning of the base verb (an agent and an event which results in the state), and so these are not part of the meaning of the stative-suffixed verb. This formulation of the stative suffix is defined to operate only on verbs whose lexical conceptual structure fits a certain pattern – those that have both a process component and a resulting state component – and requires the ability to selectively manipulate subcomponents of the meaning of the base verb.

An alternative account which would produce very similar results in terms of the distribution and meaning of stative forms, but which would also allow compositionality and monotonicity to be maintained, can be formulated based on the type of analysis proposed by Pesetsky. If the process portion and the resulting state portion of the meaning of a transitive change-of-state verb are contributed by syntactically distinct elements, then the stative-suffixed form may involve the attachment of the stative suffix only to the element which contributes the state meaning, while the passive may involve the attachment of the passive suffix to a complex expression consisting of the process expression and the resulting state expression. This would explain the stativity of the stative-suffixed form, the absence of the eventive verb's external argument as an argument of the stative verb forms, and the lack of an entailment in the stative-suffixed

form that the state be the result of some process or action, though it would require the process expression to be expressed by a zero morpheme. Like Dubinsky and Simango's analysis, it would also require evidence for separating the meaning of what appears to be a single lexical item into subcomponents of meaning. This type of proposal will be elaborated on in the following chapter.

A somewhat different proposal for deriving a stative predicate from an eventive one has been made for the German state passive by Kratzer (2000), one which also involves the possibility of syntactic elements that are not expressed by phonological features, and which appeals to a decomposition of the meaning of verbs. This will be presented in the following section.

3.2 The German state passive

Although state or adjectival passives in English and German have been an active research topic for many years, recent work by Angelika Kratzer (2000) on the German state passive appears to be the first to make a distinction between two different interpretations that state passives can receive, based on a distinction made by Parsons between POST-STATES (or RESULTANT STATES, in his terminology) and TARGET STATES.

Parsons (1990), writing in the neo-Davidsonian tradition,⁵³ proposes that there is a state which holds forever after any given event culminates, or reaches its natural completion. Parsons labels this the RESULTANT STATE of the event. This state cannot

⁵³ The term "neo-Davidsonian" refers to a set of theoretical claims that extend the original proposal of Davidson (1967): predicates of all types (nouns and adjectives, as well as verbs) include an eventuality argument, and all of a verb's nominal arguments are introduced by predicates of this eventuality. A neo-Davidsonian representation of *John swept the floor* would be something like $\exists e [\text{**sweeping'**(e)} \wedge \text{**agent'**(e)}=\text{John} \wedge \text{**theme'**(e)}=\text{the-floor}]$.

cease to hold at some later time since it holds at a moment of time only by virtue of its associated event having reached its completion at a previous time; the resultant state of an event understandably figures into Parsons' analysis of the perfect. His use of this term, however, is not to be confused with the use of the term resultant state to refer to the state that the theme changes into in the previous discussion of Chichewa. Other authors use terms like after state or post-state to refer to a resultant state in Parsons' sense, and to avoid ambiguity I will use the term POST-STATE in subsequent discussion.

The state which an argument of a verb comes to be in at the conclusion or culmination of the event, referred to as a resulting state in the discussion of Chichewa, is what Parsons refers to as a TARGET STATE. Some, but not all, events have an associated target state. Unlike a post-state, it is a matter of contingent fact whether a target state holds or not at any given moment of time; that is, it is possible for a target state, unlike a post-state, to cease to hold at a later time. His examples of target states include the locative state of the ball in the sentence *I threw a ball on the roof* and the condition of the vase in the sentence *The fall cracked the vase*, prior to a possible change of state – for example, if the ball is retrieved or the vase is repaired. The verb *push*, on the other hand, does not entail that its object undergo a change of state, whether in its location or its condition, or that any particular state be true of its object, and so does not involve a target state.⁵⁴ Thus, a sentence where the plausible result of pushing (*i.e.*, a change in location) is denied, as in *I pushed the box, but the box didn't move*, is perfectly acceptable.

German, like English, has both a verbal (or eventive) passive and an adjectival (or

⁵⁴ Such a target state may be specified by other elements of the sentence, however, such as a directional prepositional phrase like *onto the truck*.

state) passive. German provides a better context for studying the state passive than English, however, since the two types of passive in German are clearly distinguished by the choice of auxiliary: verbal passives in German occur with the auxiliary verb *werden* ‘to become’, while state passives occur with the auxiliary *sein* ‘to be’. Kratzer’s novel observation regarding the state passive is that state passive participles in German can have one or both of the interpretations expressed by Parsons’ two state concepts just discussed. It appears that every state passive participle can receive a post-state reading, and a subset of participles can also receive a target state reading (which, when it is available, is typically the most salient interpretation).

One diagnostic which she uses to distinguish these two readings involves the adverbial *immer noch* ‘still’: since post-states are true at all times after their associated event, it is infelicitous to assert with *immer noch* that a post-state ‘still’ holds.

- (34) a. *Target state reading:*
 Die Geisslein sind (immer.noch) versteckt.
 DET:NM:p little.goats be:3p still hidden:PPRT
 The little goats are (still) hidden. (Kratzer 2000: (1a))
- b. *Post-state reading only:*
 Die Gäste sind (*immer.noch) begrüsst.
 DET:NM:p guests be:3p still greeted:PPRT
 The guests are (*still) greeted. (*ibid.*: (2d))

In interpreting these results, it is important to understand what unacceptability with *immer noch* really indicates. This is not a test for stativity, since tests like those in (6) can be used to show that all state passives are temporally stative; in English, *still* is acceptable with a wide variety of predicates, including habituais, progressives, negated sentences, and sentences based on predicates of states, and is acceptable with a possibly different meaning on generics and perfects, as well. What *still* in English seems to

contribute to meaning is that the truth value of the sentence it occurs in remains unchanged as some parameter is shifted (typically time, though other contextual factors are possible as parameters); it is therefore odd to use *still* to modify a sentence whose truth value could not possibly change in the first place, such as a sentence expressing a post-state. Acceptability with *still* (and presumably also with *immer noch*) indicates that a predicate is reversible.

Since this test is sensitive to reversibility, target states that happen to be irreversible based on real-world knowledge pattern just like post-states, so Kratzer advises caution in interpreting the results of this test. Examples of participles which fail this test, and which Kratzer proposes to analyze as irreversible target states, are the English participles *dead* and *cooked*. Although a sentence like #*The food is still cooked* is odd, she argues that it can be made to sound better in a context in which cooked food eventually returns to a raw state. That this type of context is not sufficient to save a sentence like **The program is still completed* she takes to indicate that *completed* has only a post-state interpretation.

The other diagnostic for distinguishing participles with a target state reading from those with solely a post-state reading is by the occurrence of the base verb with durative temporal prepositional phrases introduced by *für* ‘for’: verbs whose passive participles have a target state reading are just those that allow modification by such adverbial PPs.

(35) a. *Target state reading:*

Die Mutter hat die Geisslein für ein paar Stunden versteckt.
 DET:NM:f mother have:3s DET:ACC:p little.goats for one pair hours hidden
 The mother hid the little goats for a few hours. (ibid: (10a))

b. *Post-state reading only:*

* Du kann-st die Gäste für eine Stunde begrüßen.
2s:INF can-2s:INF DET:ACC:p guests for one hour greet
You can greet the guests for an hour. (ibid: (11a))

In the two German examples above, the temporal adverbial can only be interpreted as the length of time the target state held; in (35)a, a few hours is the length of time that the little goats were in a state of being hidden.⁵⁵ If *für* is limited to predication over state arguments, and if the verb in (35)b lacks a target state, then the occurrence of the *für*-PP is correctly predicted to be ungrammatical. This indicates that the target state which is asserted by the passive participle *versteckt* ‘hidden’ in (34)a is also present in the meaning of the eventive source verb in (35)a and is syntactically accessible, at least to the extent that the temporal adverbial may be predicated of it.

3.2.1 The mechanics of Kratzer’s analysis

Kratzer’s analysis of state passive participles must explain why they are stative, why there are distinct interpretations available to some but not all participles, and why they appear to be passive: the subject of the base verb (as in (35)) is not an argument of the state passive participle (as in (34)) – a property which was true of the Chichewa stative, as well.

Kratzer follows her earlier work (Kratzer 1996) in proposing that agentive subjects (*i.e.*, external arguments) are introduced not by the verb root itself but by a syntactically higher functional morpheme that combines with the verb root (she calls this

⁵⁵ This is in contrast to the English glosses, in which the temporal adverbial can be predicated of the length of time of the state or of the event. German uses the postposition *lang* to indicate duration of events, as in the acceptable form *Du kannst die Gäste eine Stunde lang begrüßen* ‘You can greet the guests for an hour’.

morpheme Voice); this morpheme is frequently not associated with any phonological features. The lack of the agent as an argument of the state passive participles is explained as a structural fact: it follows from her analysis, to be presented below, that the morpheme which introduces the agent is syntactically prohibited from combining with the morphemes that together constitute the state passive participle.

The temporal modification facts observed with regard to *für*-PPs appear to indicate that verbs that can form target state passive participles are composed of components that can be separately modified. Kratzer explicitly rejects the claim, however, found in Generative Semantics and several more recent proposals, that verbs may consist of stative and eventive components that are syntactically distinct. She instead proposes that participles which allow target state interpretations are formed from abstract roots that have two eventuality arguments: an argument for an event (as is typically proposed for predicates in the Davidsonian tradition),⁵⁶ as well as an argument for the target state. From this one root, both verbal (eventive) predicates and participial (stative) predicates are derived. Her example of the representation of the root *aufpump-* ‘pump up’, which combines by function application with its direct object (in (36)b), is shown below.

- (36) a. $\llbracket \text{aufpump-} \rrbracket = \lambda x \lambda s \lambda e [\text{event}(e) \wedge \text{pump}(e) \wedge \text{cause}(s)(e) \wedge \text{inflated}(x)(s)]$
 b. $\llbracket \text{das Boot aufpump-} \rrbracket = \lambda s \lambda e [\text{event}(e) \wedge \text{pump}(e) \wedge \text{cause}(s)(e) \wedge \text{inflated}(b)(s)]$
(ibid: (12),(13))

⁵⁶ According to Kratzer’s analysis, this argument is typically restricted to events proper (by the *event(e)* predicate in (36)a and b), though she argues later that this restriction does not hold for all verbs, since the corresponding argument of at least some verbs may be filled either by an event or a state. Such cases appear to always involve individual-level interpretations of the verbs.

The root in (36)a thus takes an individual, a state, and an eventuality as arguments, and asserts that the eventuality is an event proper which is an event of pumping and which causes a state, which is a state of being inflated and is true of some individual. Kratzer proposes that predicates based on abstract roots of this type, like the one in (36)b, must combine with a morpheme that both assign a syntactic category (since such roots, she proposes, are ambiguous between a verb and an adjective) and will leave only one eventuality argument open.⁵⁷ Examples of such morphemes are given in (37): an eventizer, which would existentially close the state argument to produce an eventive predicate, or a target stativizer, which would existentially close the event argument to produce a stative predicate (more specifically, a predicate of states). Predicates which have a single open eventuality argument (*i.e.*, those which lexically have only an event argument, or roots like *aufpump-* once they have had all their other argument positions filled) may also combine with a post-stativizer morpheme.⁵⁸

⁵⁷ Kratzer cites Lieber (1980) in treating state passives categorically as adjectives. A distinct proposal which shares this property can be found in Levin and Rappaport (1986), though Laczkó (2001) proposes that some “adjectival” (that is, state) passives be considered categorically verbs.

⁵⁸ Alternatively, if a rule of Function Composition is available for combination of zero-level heads, then the post-stativizer could attach to heads which have both an open event and an open state argument, as does *aufpump-* in (36). This would leave the state argument open, however, without any higher head to close it. Kratzer therefore proposes that the syntactic category label ‘V’, whose meaning may be that of the eventizer in (37), must occur below aspectual operators like the post-stativizer. She does not, however, explain why the target state and post-state participles both display the same participial morphology. She proposes that the participial morphology is required to justify the absence of richer verbal inflection, but she does not say why other non-finite verbal morphology, for example, could not also serve this purpose.

terminology had a target state reading – could attach only to verbs whose lexical conceptual structure included both an eventive component and a state; they took this to be the set of accomplishment verbs, as indicated by the lexical aspectual diagnostics of Dowty (1979) and the Vendlerian tradition, whose theme arguments undergo a change of state. A similar hypothesis for German might also be that all verbs which lexicalize a change of state of one of their arguments should have this second eventuality argument. A generalization like this, however, would both underapply and overapply. Kratzer notes that only a subset of accomplishment verbs allow target state passive formation, and that moreover, certain adverbials appear to allow verbs which do not lexicalize a change of state of one of their arguments to receive a target state interpretation. These two observations appear to receive at least partially satisfying answers within her analysis, but neither is without problems.

Regarding the latter observation, that certain verb phrases can receive a target state interpretation while the verb in isolation cannot, certain manner adverbials appear to introduce a state argument, thus creating a predicate with the proper form for the target stativizer to apply to. Kratzer’s example is shown below.

- (38) Die Haare waren immer.noch schlampig gekämmt.
 DET:NM:p hairs be:3p:PAST still sloppily comb:PPRT
 The hair was still combed sloppily. (Kratzer 2000: (16)a)

Kratzer concludes from this that target state participles must be derivable from larger phrasal constituents (*i.e.*, the phrase *die Haare schlampig gekämmt* ‘combed the hair sloppily’), since the verb and object by itself (*die Haare gekämmt* ‘combed the hair’),

parallel with (36)b) should not be able to form a target state participle.⁶⁰ Although Kratzer does not give a semantic representation of the sentence in (38), it is possible to infer its intended semantic form from a similar example (see Kratzer 2000:(22)).

- (39) a. $\llbracket \text{die Haare gekämmt} \rrbracket = \lambda e [\text{comb}(\text{the hair})(e)]$
 b. $\llbracket \text{schlampig} \rrbracket = \lambda e \lambda s [\text{action}(e) \wedge \text{cause}(s)(e) \wedge \text{indicate}(\text{sloppy}(e))(s)]$
 (combining by Event Identification)
 c. $\llbracket \text{die Haare schlampig gekämmt} \rrbracket =$
 $\lambda e \lambda s [\text{action}(e) \wedge \text{cause}(s)(e) \wedge \text{indicate}(\text{sloppy}(e))(s) \wedge \text{comb}(\text{the hair})(e)]$

The “manner” adverbial *schlampig* ‘sloppily’, therefore, is a function which takes both an eventuality and a state as arguments and whose meaning is that the eventuality is an action which caused the state, and that the state indicates that the event was performed in a sloppy way.⁶¹ This analysis therefore requires that an event cannot truthfully be called *schlampig* if it does not result in some current state which indicates the manner of the event that brought about that state (see Kratzer 2000:11 for discussion). After the adverbial combines with the verb + object constituent, the semantic form of (39)c is a relation between an event and a state, which is the proper type for the target stativizer of (37) to combine with – and importantly, this state has been introduced by the manner adverbial, rather than residing in the verb + object constituent seen in (39)a.

This leaves a number of open questions, however, about the proper analysis of the eventive equivalent of (38) with manner adverbials, as in *Jens hat die Haare schlampig gekämmt* ‘Jens combed his hair sloppily’. Problematically, there is no way to derive a

⁶⁰ This indicates that the derivation of at least some target state participial forms must occur in the syntax, even if Event Identification (as noted in fn. 58) is available to combine verb roots and the target stativizer in the lexicon, since the constituent that the target stativizer combines with in this case is itself built in the syntax.

⁶¹ Kratzer does not indicate the significance of the predicate *action(e)* in this paper.

strictly eventive predicate from the form in (39)c apart from having it combine with the eventizer in (37) because of the open state argument. Kratzer argued that the eventizer was the semantic contribution of a verbal category head, so either the entire phrase in (39)c must combine with a verbal head (problematic in that this constituent should already contain a verbal head and that the entire syntactic constituent in (39)c with the manner adverbial can be categorically marked as a complex verb), an unknown higher head must existentially bind the state, or the state variable must simply remain open.

Even this latter option, however, is not satisfying. If the state argument was allowed to remain open, this would remove the need for the verbal head to perform this quantification for any predicate, and therefore Kratzer's claim that a verbal category head is responsible for this quantification with verb roots like *aufpump-* is unnecessary. In addition, Kratzer elsewhere presents data which does support analyzing a light verbal head as closing off this state variable to further operations. This complicates the analysis of manner adverbials, however, if some but not all manner adverbials require a higher verbal head to close off a state introduced by that adverbial. In the hierarchy of clausal functional heads presented by Cinque (1999), for instance, manner adverbials are merged in the specifier of a Voice head, which, although low in Cinque's system, is still higher than the lowest verbal head. This would pose yet another problem for state passives, however: Kratzer's explanation for the lack of an external argument in state passives is that the state passive is derived from a constituent which is not large enough to include an external argument. For her, external arguments are introduced by the Voice head. Granting that Cinque's Voice head and Kratzer's Voice head may not be identical, this at

least requires Kratzer to claim that manner modifiers of an event (of the type seen in (39)b) are merged below the agent of that event.

The discussion in this section has so far only addressed the under-occurrence problem – that target state passive interpretations are available for verbs that are not just accomplishments in the Vendlerian sense whose theme argument changes state. There are also accomplishment verbs that seem to lexicalize a change of state of one of their arguments but do not allow modification by *für*-PPs and do not allow their state passive participle to receive a target state interpretation. These include verbs derived from adjectives, like *leeren* ‘to empty’ and *trocknen* ‘to dry’, resultative verbs like *leertrinken* ‘to drink empty’, as well as some verbs like *zumachen* ‘to make shut’ which are not derived from adjectives but where lexicalization of a target state seems plausible.

The pair of sentences in (40) indicate the general direction that Kratzer takes.

- (40) a. *Jens hat die Tür für zehn Minuten zugemacht.
have:3s DET:ACC:f door for ten minutes make.shut:PPRT
‘Jens made the door closed for ten minutes.’
b. Jens hat die Tür für zehn Minuten geschlossen.
have:3s: DET:ACC:f door for ten minutes close:PPRT
‘Jens closed the door for ten minutes.’

While both *schliessen* ‘to close’ and *zumachen* ‘to make shut’ are quite similar in meaning, they differ in the presence of an overt light verb (*machen* ‘to make or do’); recall also that Kratzer associated the eventizer morpheme in (37) with a light verbal head. Although she does not claim that the semantic content of *machen* is identical to the eventizer as given here, she does claim that any light verbal head, including the light verb *machen* in (40)a, will existentially bind any open state argument within its complement. The verb *zumachen*, as long as it contains a light verb, would therefore never have an

open or accessible state argument for the formation of a target state passive, even if a subcomponent like *zu-* were to have one.⁶² The verb *schliessen* ‘to close’, on the other hand, would require a null light verb to perform this quantification in the eventive case, which is consistent with there being an abstract root *schliess-* with both an event and a state argument, and this root could be the base for derivation of the target state passive.

Consider also de-adjectival verbs like *leeren* ‘to empty’ and *trocknen* ‘to dry’, which lack target state passive forms (evidenced by the ungrammatical **immer noch geleert* ‘still emptied’ and **immer noch getrocknet* ‘still dried’) and are transparently related to (presumably state-denoting) adjectives; as verbs, do they somehow lack target state arguments, or are such arguments merely inaccessible to temporal modifiers for some other reason? To claim that the adjectives themselves have an eventuality argument that ranges over states, but that the verbs lack this argument position altogether, would violate the monotonicity or compositionality property of semantic derivation that was discussed earlier. It therefore seems more consistent to assume that the internal structure of deadjectival causatives includes a position for a state argument, but that this position is for some reason not accessible for modification in the same way that the state argument for roots like *aufpump-* is.

The behavior observed for such forms is actually predicted under Kratzer’s analysis, however, if the null causative verbal head which attaches to these roots again involves existential closure of any open state variable, as with other light verbs like

⁶² It’s not clear that this explanation would predict the absence of temporal modification by *für*-PPs, which could conceivably merge below the light verb, without specifying that the target stativizer of (37) could not attach to prepositions – presumably what *zu* is.

machen and the eventizer of (37). Recall that participles with target state interpretations are formed when the target stativizer in (37) combines with an expression which has both an open event and an open state argument – a characteristic which Kratzer takes to indicate that the root is neutral with respect to category. In the case of a de-adjectival verb like *leeren* ‘to empty’, at no stage in its derivation will there be a constituent which has both an open event and an open state argument. The adjective itself may have an argument for a state but not for an event, and any verb which is derived from the adjective can only have an open event argument, since the verbal head itself must existentially close any open state arguments within its complement.

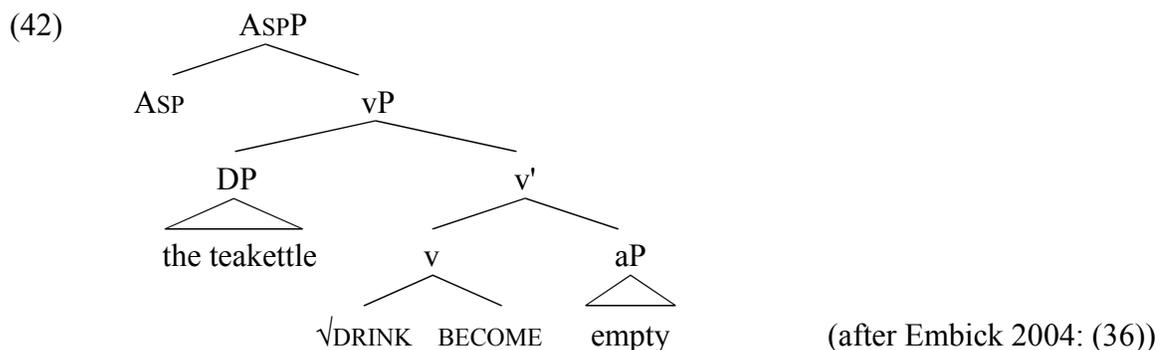
It is likewise puzzling at first that verbs with secondary predication of a resulting state like *leertrinken* ‘to drink empty’, which one might think would introduce a state argument similar to the manner-adverbial-modified verb *schlampig gekämmt* ‘sloppily combed’ in (38), cannot receive a target state interpretation.

- (41) Die Teekanne ist leer-getrunken.
 DET:NM:f teakettle be:3s empty-drunk:PPRT
 The teapot is drunk empty. (post-state reading only) Kratzer 2000: (8)b

The same explanation regarding the properties of verbal heads that predicted the behavior of causativized adjectives also predicts that target state interpretations should be unavailable for verbs with secondary predicates specifying resulting states; the difference between resultative secondary predicates and manner adverbial modification rests in the syntactic location of the state-denoting predicate in each case. Recall that the characteristic which allowed verbs with manner modification to form target state passives was that they contained both an open state and an open event argument at some level

within a verb phrase (*i.e.*, the manner adverbial attaches above the level of the verb itself). In contrast, if the resultative secondary predicate attaches at or below the level of the verb, then such verbs are straightforwardly predicted not to allow target state interpretations, since there will be no constituent of the proper semantic type for the target stativizer to attach to. In the most straightforward application of this, the resultative secondary predicate would attach directly to a verbal head.

This is in fact the structure that has been proposed in a number of analyses of resultative secondary predication, which treat the verb and secondary predicate (of some phrasal category like AP) as a kind of complex predicate. Embick (2004, citing Marantz 1989 and Larson 1988) proposes that resultative phrases are licensed as complements of a complex verb composed of a lexical root that has merged with a light verb BECOME. Embick's structure for resultatives (here for the phrase *the teakettle drunk empty*, which would combine with tense to form a complete sentence) is shown in (42).⁶³



Embick does not include event arguments in his semantic forms, so his analysis cannot be compared directly to Kratzer's. Nevertheless, the fact that the constituent which

⁶³ This representation differs from Embick's for ease of presentation. He distinguishes the resultative aspectual head ASP here from other ASP heads, and he gives the label FIENIT to his verbal head to distinguish it from formulations of a BECOME operator that are based on telicity (which he avoids; see Embick 2004:366 for further discussion).

introduces the state argument (the aP) is the complement of a light verbal head predicts, within Kratzer's system, that the smallest constituent which includes both the predicate of events and the predicate of states – namely the v' – will not be of the proper semantic type to combine with the target stativizer; it will have an open event argument, but not an open state argument. Kratzer's analysis therefore correctly predicts that verbs with overt verbal morphology, verbs with null verbal morphology, and those with resultative secondary predicates should lack target state interpretations.

Although Kratzer's analysis does appear to make correct predictions concerning the under-occurrence of target state interpretations to state passive participles (and possibly the cases of over-occurrence, as well), there is at least one point where her analysis appears to miss a generalization: the distribution of derived stative (*i.e.*, non-result resultative) interpretations.

3.2.3 Resultatives and derived statives in Kratzer's analysis

In Kratzer's analysis, state passive participles with post state interpretations are all predicted to be resultatives in the strict sense – as part of the meaning of the post-stativizer, they require some event to have completed before some reference time. State passive participles with target state interpretations are similarly predicted to be resultatives proper. All participles with target state interpretations are derived by the target stativizer in (37) (repeated as (43)a), which existentially quantifies over an event. Given the typical form of roots which combine with this target stativizer to produce semantic forms like that in (43)b (an extension of (36)b), this existentially quantified event is lexically specified to cause the relevant resulting state. Every state passive with

a target state interpretation should therefore entail that there was an event which caused this state to come into being; all target state passives are therefore resultatives in the strict sense, not derived statives.

- (43) a. Target stativizer: $\lambda R \lambda s \exists e R(s)(e)$ (Kratzer 2000: (14))
 b. $\llbracket \text{das Boot aufgepumpt} \rrbracket = \lambda s \exists e [\text{event}(e) \wedge \text{pump}(e) \wedge \text{cause}(s)(e) \wedge \text{inflated}(b)(s)]$
(ibid: (14))

The existential quantifier contributed by the target stativizer in the case of (43)b requires there to be some event of pumping which led to the boat's being in an inflated state, even though it is the state which is the focus (in a non-technical sense) of this form and which is responsible for the temporal stativity of the participle.

This is the opposite generalization than was claimed for Chichewa by Dubinsky and Simango, where all stative-suffixed verbs are predicted to be derived statives: the process portion of the lexical conceptual structure of a verb (corresponding to the causing event) is deleted in the formation of a stative-suffixed verb. Neither the prediction of Dubinsky and Simango's analysis nor the prediction of Kratzer's analysis is true for resultatives in Pima, however. Many Pima resultatives are resultatives proper, but there are at least some resultatives in the broad sense in Pima which lack an entailment of a past change of state, though the lack of such entailments appears to be sensitive to morphological environment in a way reminiscent of Kratzer's account of the under-occurrence of target state interpretations.

The prediction that all state passives in German are resultatives proper is actually not correct, either; Kratzer acknowledges that not all state passives with target state interpretations are results; some of them are derived statives. She proposes two ways to

can be inferred from her discussion. The relevant observation about *obstruct* is that the non-state-passive use in (44)b (as indicated by its transitivity, since both forms are marked with *-ed*) may still be stative, as the context for (44)b is intended to indicate. This is to be contrasted with the explicitly eventive reading of (44)c which is forced by the presence of a rate adverbial. A semantic representation of the root $\sqrt{\text{OBSTRUCT}}$ which is in the spirit of Kratzer's proposal is shown in (45).

- (45) a. $\llbracket \sqrt{\text{OBSTRUCT}} \rrbracket = \lambda x \lambda s \lambda e [\mathbf{cause}'(s)(e) \wedge \mathbf{obstructed}'(x)(s)]^{65}$
 b. $\llbracket [\text{VP the blood vessel obstructed}] \rrbracket = \lambda s \exists e [\mathbf{cause}'(s)(e) \wedge \mathbf{obstructed}'(v)(s)]$

This representation differs in two important ways from Kratzer's representation for *aufpump-* in (36)a: there is no predicate $\mathbf{event}'(e)$ which restricts the eventuality argument e to events proper, and there is no predicate analogous to $\mathbf{pump}'(e)$ which specifies the type of event which causes the obstructed state. Kratzer focuses on the former fact, though we will return to the significance of the latter fact below. If the eventuality which is chosen to fill the variable e is actually a state,⁶⁶ then this expression is still well-formed and should yield a meaning in which one state (uncharacterized by this representation) causes another state, namely the blockage of the blood vessel.⁶⁷

While the idea of a causative which is stative may sound odd at first, this idea was

⁶⁵ I will hereafter diverge from the notation which Kratzer uses, in order to follow what I take to be a more standard style. I am using the root notation of Pesetsky (1995) (the $\sqrt{\quad}$ symbol and block caps), and I distinguish semantic predicates from the linguistic objects of the same name by boldface and prime notation, such as $\mathbf{cause}'(s)(e)$.

⁶⁶ This assumes that there is no ontological difference between the eventualities that may occupy this position; this would be a problem if certain states (such as Maienborn's K-states from section 2.2) were not eventualities in the same sense that events are.

⁶⁷ It is for this reason that the semantics of causation for Kratzer should not involve an operator with a meaning like the BECOME operator of Dowty (1979), since the presence of such an operator would not result in stative causation in the present cases.

proposed by Pylkkänen (2000) on the basis of a subset of morphological causatives in Finnish. Taking Kratzer's and Pylkkänen's claims together, a sentence like the one in (44)b means informally that a state of the existence of tissue in a location causes a state of obstruction in the blood vessel. Finnish stative causatives are argued by Pylkkänen to be individual level predicates, though this example of stative causation in (44)b seems to indicate that this need not be a property that all stative causatives possess. Verbs like *obstruct* largely pattern like stage level predicates: they are acceptable with explicit temporal modification (46)a and in episodic contexts (46)b, properties characteristic of transitory or stage level predicates. In contrast, they do pattern like non-transitory or individual level predicates by apparently triggering a generic interpretation for a bare plural subject (46)c. This shows an interesting interaction with tense and modification, however; note that an existential interpretation, characteristic of stage level predicates, is favored when a locative modifier occurs (46)d or when the verb is in the past tense (46)e.

- (46)
- a. Tissue obstructed the baby's blood vessel for several hours after birth before it could be surgically removed.
 - b. Just as he was nearing his destination, John noticed a truck slowly turning around in the road in front of him. It completely obstructed the flow of traffic for several minutes while the driver inched backwards into a nearby driveway.
 - c. Stoplights obstruct the free flow of traffic.
 - d. Stoplights obstruct the free flow of traffic in Westwood.
 - e. Stoplights obstructed the free flow of traffic.

It is not clear if this unusual behavior is due to multiple senses that this verb may occur with, or if some other factor is responsible here. It appears to be the case, however, that causative predicates do not need to be non-transitory in order to be stative, and an analysis of such forms as involving stative causation may be appropriate.

While Kratzer's generalization appears to be correct that many compositional

derived statives are associated with verbs that have a stative causative sense, this may in fact be a distraction from the real issue. There appears to be evidence that the state passives produced from verbs with stative causative senses have more in common with eventive passives (apart from their stative temporal property) than do other state passives.

If passive participles like *obstructed* are truly state passives, they are unlike the state passives of other eventive verbs in that the argument which is realized as the subject of the base verb is licensed with the passive form in a *by*-phrase even when the verb receives a stative interpretation, as in (47)a. This contrasts with other state passives which do not allow the demoted subject (as in (47)b), and is also not characteristic of underived adjectives, which do not allow an agent or actor potentially responsible for the state (as in (47)c), or even an inanimate state causer (as in (47)d), in a *by*-phrase.

- (47) a. The blood vessel seemed congenitally obstructed (✓ by tissue).⁶⁸
b. The window seemed broken (# by the kids).⁶⁹
c. The door seemed open (# by the butler).
d. The door seemed open (# by the doorstep).

The primary difference between passives of stative causatives and passives of eventive verbs in general is that the passives of stative causatives are temporally stative, but this is expected if their primary eventuality (*i.e.*, the eventuality that tense and aspect morphemes modify) can range over states, as the non-passive cases demonstrate. In order to derive a stative form for such verbs, the “normal” passive morpheme may

⁶⁸ The verb *seem* takes a complement that is adjectival, not verbal; *seem* therefore forces an adjectival passive interpretation of its complement, rather than an eventive passive interpretation. This diagnostic is mentioned in other works on adjectival passives, such as Levin and Rappaport (1986).

⁶⁹ The last three sentences all allow a locational reading of the *by* phrase; this reading is irrelevant to the present analysis.

suffice; we do not need to use Kratzer's target stativizer to form stative passives from stative causatives.⁷⁰

If this is the case, we are left with only a single category of "true" state passives (*i.e.*, state passives formed with either the target stativizer or the resultant stativizer) which are derived statives rather than resultatives proper – that is, resultatives that lack the entailment of a causing event, an entailment which is predicted by Kratzer's analysis. Examples of such participles in English are *closed*, *broken* (in the sense of being non-functional), and *scattered* for some speakers. Kratzer's only explanation is that all such cases merely involve idioms.

There appears to be an argument, however, that the best analysis for exceptional cases like these at least in English and Pima does not involve listed, unpredictable meaning for all such forms. What is troubling about listing the meaning of all such forms is the high degree of regularity which the meanings of the stative forms and eventive forms have: the eventive forms appear to mean just that some state came about (or was caused), while the stative forms merely denote that very state. Words whose meanings are listed could in principle vary more in meaning than this, even though they would not be required to. Moreover, there appears to be a way to predict, based on the meaning of the base verb, whether its target state passive will have a derived stative meaning. These systematic relationships seem like they should be captured by the grammar.

One way to modify Kratzer's analysis to capture this generalization will be

⁷⁰ One fact that would be unexplained for passives of stative causatives, however, is why they pattern like other expressions that are categorically adjectives, rather than verbs – see footnote 68. Perhaps this diagnostic is not sensitive to syntactic category after all, and some "adjectival" passives are categorically verbs, as Laczko (2001) suggests.

discussed in detail in the following chapter. Before moving on to the details of Pima resultatives, however, it is worth examining an assumption that was crucial to both Dubinsky and Simango's analysis and Kratzer's, namely that the meaning of certain verbs can be decomposed in some way (like Dubinsky and Simango's lexical conceptual structures or Kratzer's second eventuality argument) into an eventive component and a target state component.

3.3 Evidence for decomposition of target states

Within the Davidsonian tradition, there are differing views on how to treat stative eventualities. Among those who acknowledge an ontological category of states as well as events, there is disagreement about the nature of the state argument in a number of types of stative predicates: individual level or non-transitory predicates have been argued by some not to involve predication over states at all, while others distinguish adjectival states from verbal states (and those predicates that involve a copula), or the states taken by interval statives (like *sit*, *stand*, and *lie*) from those taken by other stative predicates; such distinctions were discussed in section 2.2. Those who propose these distinctions among states do so on the basis of differences in the behavior of subsets of stative predicates, or differences in the behavior of stative predicates in different syntactic contexts. Tests that might be used to argue for the presence or absence of a state in the decomposition of a predicate should therefore take such facts into account, or run the risk of finding only states of a certain type (or rather, risk using a test which is sensitive only to certain types or instances of states).

For example, Kratzer's durative adverbial diagnostic involves specifying the

temporal duration of a state: *für zehn Minuten* ‘for ten minutes (applied to a state)’ versus *zehn Minuten lang* ‘for ten minutes (applied to an event)’. This diagnostic is therefore primarily sensitive to target states which saliently have a limited duration – transitory or stage level states. Even if individual level states exist as a type of individual distinct from stage level states, this test would not be sensitive to their presence. To illustrate, an individual level predicate like *be American* is predicted to sound anomalous with a durative temporal adverbial whether or not it involves predication over a state, because the type of state that is hypothetically present is not one that would felicitously occur with any specified duration; the awkwardness of *?Fred was American for five minutes* should not be taken as evidence that *be American* lacks an eventuality argument at all, but that it lacks an eventuality argument with certain temporal properties.

Moreover, in languages like English where the same adverbial may be used to specify the duration of an event or a state, an ambiguity between an event-duration and a state-duration reading of the temporal adverbial will only be detectable if the event and target state lexicalized by the verb are located at distinct intervals of time. To illustrate, the stative causatives just discussed involve the causation of one state by another, but this causative relationship holds at each moment of time. The causing state and the caused target state therefore have identical temporal extents; a sentence like *Tissue obstructed the blood vessel for ten minutes* is therefore predicted not to display the high/low ambiguity in temporal modification that is elsewhere evidence of a decomposed target state. This test will be discussed in more detail in the following sections.

3.3.1 What is not evidence: Vendlerian lexical aspect

Dowty (1979) attempts to provide an aspect calculus which equates Vendler's four lexical aspectual classes – states, activities, accomplishments, and achievements – with decompositional syntactic and semantic structures; in this analysis, accomplishment and achievement verbs are the categories which lexicalize changes of state and are associated with decomposed state predicates in their semantic structure. This is by now a popular belief, and is expressed even in works as recent as Dubinsky and Simango (1996), yet the tests that Vendler and Dowty propose to characterize accomplishment and achievement predicates are sensitive not to the presence of a target state, but merely to the durativity and telicity of a predicate. The work of Beth Levin and her co-authors (Rappaport Hovav and Levin 1998, Hay, Kennedy, and Levin 1999, among others) has demonstrated that although telicity and change of state may frequently be associated, verbs need not entail a change of state or include a decomposed target state in order to be telic, and verbs that do entail a change of state need not be telic. Determining the lexical aspect of a predicate is therefore not sufficient to determine whether it should be decomposed into an eventive (inchoative or causative) component and a target or resulting state component.

For example, the degree achievements discussed by Hay, Kennedy, and Levin (1999) pattern like activity predicates (*i.e.*, are durative and atelic, as shown by the acceptability of the temporal adverbial *for twenty minutes*) when they involve a change of state of an indefinite degree, as in (48)a. These predicates pattern like accomplishments (*i.e.*, are durative and telic, as shown by the acceptability of the telic temporal adverbial

in twenty minutes) when the change of state is understood to reach a contextually-defined point on the scale (*i.e.*, whatever temperature is considered *warm* in the context), as in (48)b, or when the change involves a specific interval along the scale, as in (48)c.

- (48) a. The chemist slowly warmed the solution for twenty minutes.⁷¹
b. The chemist warmed the solution in twenty minutes.
c. The chemist warmed the solution five degrees in twenty minutes.

Telicity is not an inherent and unchangeable property of causative change of state verbs like *warm*, even though it would plausibly be decomposed into an eventive (causative) component and a target state component; atelicity is therefore not a reliable indication of the absence of a decomposed state.

Likewise, telicity is not a reliable indication of the presence of a decomposed state. Certain verbs like *scrub* and *wash* may have primarily an activity (*i.e.*, durative and atelic) sense, as in (49)a, as indicated again by the durative, atelic temporal adverbial. They may also have an accomplishment sense (*i.e.*, durative and telic, as indicated by the adverbial), as in (49)b, if the direct object is taken to be an incremental theme (Krifka 1987, Dowty 1991): an argument of the verb for which a homomorphism exists between the progress of the event denoted by the verb and the extent to which some property holds of that argument. On this reading, the scrubbing event culminates when the scrubbing action has been completed over the entire surface of the tub; the physical extent of the tub's surface that has been scrubbed can be homomorphically mapped to the progress of the scrubbing event. Note that whether the direct object is *the stain* or *the tub*, it is merely an implicature and not an entailment that the stain itself or the surface of the tub

⁷¹ The rate adverbial *slowly* has been added to this sentence to eliminate a reading in which the temporal adverbial indicates the length of time the solution remained warm.

change in any way.

- (49) a. Marge scrubbed the stain for twenty minutes.
b. Marge scrubbed the tub in twenty minutes.
c. Marge scrubbed the tub clean in twenty minutes.

On an account of resultative secondary predication like that of Rappaport Hovav and Levin (1998), resultative secondary predicates can be added only to verbs which do not already lexicalize a change of state; the acceptability of the resultative secondary predicate *clean* in (49)c would therefore provide additional evidence that *scrub* by itself does not lexicalize a change of state, whether the direct object is *the stain* or *the tub*. If the lexicalization of a change of state is required in order for a target state to be decomposed for a given verb, *scrub* should not be decomposed in this way, despite the fact that it has a telic use in (49)b. Lexical aspect, as understood in the sense of Vendler and Dowty, is therefore not sufficient to determine whether a verb lexicalizes a change of state, and does not determine whether it should be decomposed into an eventive portion and a target state portion.

3.3.2 What is evidence: Ambiguity of temporal modification

Dowty (1979) devotes an entire chapter to evaluating the different types of evidence that have been used to argue for the decomposition of a target state component within eventive verbs. While he finds most of the types of data not to require a decompositional analysis, there are several types which he does feel are best explained by appealing to decomposition, and which may therefore provide the strongest diagnostics for the presence of a grammatically-accessible lexicalized target state for a given verb. This evidence in general involves scope ambiguities in which modifiers (both

morphological and syntactic) of certain predicates appear to have two different readings based on whether they modify the entire event denoted by the predicate or merely a target state which is the actual or intended result of this event.

The first class of examples involves durative temporal modification. The argument may be illustrated most clearly with a clause which uncontroversially contains two eventuality arguments, such as the periphrastic causative in (50). The temporal point or duration that is specified by an adverbial on the right edge of a periphrastic causative sentence may be interpreted as holding either of the eventuality denoted by the complement of the causative (a so-called “low” reading) or the eventuality denoted by the causative itself (a “high” reading).

- (50) a. The wicked witch made the princess sleep when the clock struck midnight.
b. The wicked witch made the princess sleep for a hundred years.

In the first sentence, the modifier *when the clock struck midnight* can be understood as giving either the time that some activity on the part of the wicked witch went on (the eventuality which resulted in the princess sleeping, denoted by the causative) or the time of the princess’s sleeping (the eventuality denoted by the complement of the causative). Similarly, the modifier *for a hundred years* can be understood as giving the length of time of the wicked witch’s action, or the length of time that the princess slept.⁷²

The use of the terms “high” and “low” to describe these readings reflects a

⁷² Since English does not mark repetitiveness on verbs, there are actually two high readings for this sentence, which easier to see in a non-causative example like *The wicked witch chanted the spell for a hundred years*. There is a repetitive reading on which for one hundred years the wicked witch repeatedly performs the action of chanting, and another on which the wicked witch’s single action of chanting lasts for one hundred years. The telic nature of the event in the single-event reading of *made the princess sleep* makes that reading somewhat degraded with the atelic temporal adverbial, however.

structural explanation of this ambiguity, where the structure of a periphrastic causative like the ones in (50) is assumed to be something like [make [the princess [sleep]]]; the high reading corresponds to the syntactic attachment of the modifier at the level of the verb *make*, while the low reading corresponds to the syntactic attachment of the modifier at the level of the verb *sleep*. If this ambiguity is to be given a structural explanation, then other structural properties of such sentences, such as pronominal binding possibilities (on an account of binding in terms of c-command), would be expected to correlate with the reading of the adverbial. Since making this argument most strongly would require first providing evidence for the syntactic analysis of the sentences in (50), I will not pursue it here, especially since the judgments of the binding possibilities for the two interpretations may be quite subtle, and because a syntactic explanation for the ambiguity is not required.⁷³ The minimum that these examples are intended to show is that there are two eventualities which the temporal modifiers may modify, corresponding to the single eventuality arguments that *make* and *sleep* have in other contexts.

This ambiguity is not limited to periphrastic causatives where positing two eventuality arguments is straightforward. A similar type of ambiguity can be observed with morphological causatives as in (51), though their properties are not exactly the same

⁷³ The argument would require judgments concerning a sentence like the one in (i).

(i) The wicked witch made every_i princess sleep when her_i clock struck midnight.

On a low reading of the adverbial, the pronoun *her* in the *when*-clause should be able to be bound by the quantifier *every princess*. (In this syntactic configuration, it may also be bound by *the wicked witch*.) What is predicted to be impossible on a syntactic explanation of this ambiguity is a high reading of the *when*-clause while the quantifier binds the pronoun – that is, in a context in which the action of the wicked witch takes place toward a given princess when that princess's clock strikes midnight. I am not even confident of my own judgments in this context.

as periphrastic causatives.

- (51) a. The presenter darkened the room when John came in.
b. The presenter darkened the room for three hours.

In (51)a, unlike for the periphrastic causative, the time provided by the adverbial may only be understood as the time that the presenter performed some action, and not the time that the room was in a certain state (as it would be in *The room was dark when John came in*). In (51)b, however, the duration of time given by the adverbial may be understood either as the length of time that the presenter was doing something (flipping switches, closing drapes, or sealing up light leaks) or the length of time that the room was in a certain state (as a result of what the presenter did).

This is exactly the same type of ambiguity that was seen with the periphrastic causatives, and so it is reasonable to ascribe a similar explanation to it in terms of the structural (*i.e.*, syntactic) placement of the modifier relative to the expressions that are associated with two eventuality arguments. With the causativized adjective *darken*, as with the periphrastic causative *make sleep*, the presence of two eventuality arguments is reasonable – one provided by the adjective which corresponds to the target state of the room, and one provided by the causative morpheme which corresponds to the causing event. Recall that the interpretation of temporal modifiers like this is one of the facts which prompted Kratzer (2000) to argue for two eventuality arguments in such forms.

Interestingly, the same behavior seen for morphological causatives can be seen with verbs which overtly bear no relation to an (underived) adjective.

- (52) a. Mary hid the present when John came in.
b. Mary hid the present for a few minutes.

In (52)a, the time provided by the adverbial can only be understood as the time that Mary performed the action. By contrast, in (52)b the adverbial may be understood as providing either the length of time that Mary's action went on or the length of time that the present remained in a certain condition.⁷⁴

Advocating a structural explanation of the ambiguity in sentences like those in (52) is controversial. A structural explanation for the ambiguity in (50) is not controversial, since the syntactic structure to accommodate a structural ambiguity is clearly present. Likewise, structurally accounting for cases like (51) is minimally more complicated, and requires interleaving morphological and syntactic structure to provide a structural account; certain theories of morphology, such as Distributed Morphology (Halle and Marantz 1993, 1994; Harley and Noyer 1999), make such a claim for independent reasons. There is no evidence for morphosyntactic structure within an apparently monomorphemic verb like *hide* apart from this ambiguity. The similarities between these and the previous cases make a uniform analysis attractive, but at the cost of proposing internal morphosyntactic structure where none is directly observed. Moreover, English appears not to contain a separate morphologically underived lexical item which expresses the decomposed target state of being hidden from which the verb

⁷⁴ The higher, event reading in this example may be slightly infelicitous for several reasons. This adverbial may involve a longer than normal time for such events, and as an atelic temporal adverbial may also conflict with the necessarily telic nature of a single event of hiding, unlike the degree achievement *darken*. When the hiding event is atelic, or rather, when an atelic sequence of multiple hiding events is involved, an event reading is more natural: *Mary hid the presents for a few minutes*. Alternatively, with a telic temporal adverbial and a slightly richer context (provided by *only*), the sentence is also better with an event reading, though the telic adverbial does not allow a low, state-duration reading: *May hid the present in only a few minutes*.

hide would be derived, comparable to the adjective *dark* from which the verb *darken* is derived. Nevertheless, Dowty and other linguists find this trade-off worthwhile.⁷⁵

While not ambiguous like the sentences in (52), the similar examples in (53) show that there are other verbs which appear to involve at least two separate targets (in a non-technical sense) for temporal modification, even where no morphosyntactic structure is observed (this example slightly modified from Dowty 1979:252).

- (53) a. John loaned his bicycle to Bill until tomorrow.
b. * John read a book until tomorrow.

The past tense marked on the verb in (53)a hints that the future adverbial must be modifying something else; the unacceptability of (53)b indicates that this is not a general property of verbs, but is unique to certain verbs. If temporal modification is always carried out semantically by means of eventuality variables, then positing multiple eventuality variables, whatever their source, receives additional support.

3.3.3 What is evidence: ambiguity with *again* and *re-*

Scope ambiguities similar to those in (50) through (52) can also be observed with other types of modifiers, the most well-known of which are *again* and the semantically similar prefix *re-*. Examples of these ambiguities with periphrastic causatives, morphological causatives, and apparently monomorphemic verbs are shown below.

⁷⁵ It is worth asking whether an adjective like *dark* is really as underived as it looks. Within Distributed Morphology, adjectives like this are assumed to be composed of a lexical root that has combined with a category-assigning head, and some authors (e.g. Embick 2003, 2004) propose that adjectives combine with aspectual morphemes, as well. On such an analysis, the state passive *hidden* is not significantly different from the adjective *dark*, and in fact *hidden* appears to be a state passive with a derived stative meaning – it does not require the state it denotes to result from an event, which is a meaning very similar to that of *dark*.

- (54) a. The wicked witch made the princess sleep again.
- (55) a. The presenter darkened the room again.
b. The presenter re-darkened the room.
- (56) a. Mary hid the present again.
b. Mary re-hid the present.

Sentences with *again* generally have both a “high” and “low” reading, similar to the temporal adverbials seen previously. If *again* is taken to modify the higher verb in (54)a, the wicked witch must have performed this action before, while if *again* modifies the lower verb, Aurora must have been asleep before, even if this is the first time that the witch has cast any spell on her. Similarly for the high readings of (55)a and (56)a, the presenter and Mary must have performed this action before, while on the low readings, all that is required is that the room have been dark or the present have been hidden before.

The ambiguity with *re-* (which is not acceptable on the causative *make*) is very similar. On the high readings of (55)b and (56)b, the presenter and Mary are claimed to perform an action that has been performed before (by them or potentially by someone else), and on the low readings, the room and the present are claimed to return to a condition that they were in before. These sentences, involving nearly identical morphological and syntactic ambiguities to those seen with atelic temporal adverbials like *for a few minutes*, also strongly motivate an account that interleaves morphological and syntactic structure, as in Distributed Morphology, and which posits morphosyntactic structure even for apparently monomorphemic verbs like *hide*.⁷⁶

⁷⁶ Evidence discussed by Dowty but which is not repeated here includes scope ambiguity

3.3.4 Other attempts to explain this evidence are unsatisfactory

Ambiguities in the interpretation of modifiers like the ones just discussed appear to provide the strongest argument for decomposing a target state in verbs like *hide*. Instead of a structural account of these ambiguities, however, it might be proposed that these facts can be explained semantically using meaning postulates or calculated entailments. For instance, it might be claimed that the lexical entry for *hide* specifies only the kind of event that takes place – in a Davidsonian framework, *hide* might have only a single eventuality argument that ranges over events proper – and that speakers know based on their knowledge about the world that an event of hiding something entails that the object be out of sight or difficult to find for some length of time. Temporal modifiers like *for a few minutes* and *again* might be predicated of this condition as a result of this calculated entailment.

While real-world knowledge probably does allow speakers to draw a number of conclusions from the occurrence of a verb, not all of these conclusions have this characteristic of being grammatically-accessible for modification in the way that the modifiable target states must be. An explanation for the modifier ambiguity facts that relies on calculated entailments therefore incorrectly predicts that all entailments should be temporally modifiable to the same extent. Dowty (1979:267) notes, for instance, that the verb *hospitalize*, at least in a modern Western context, entails among other things that the patient (in both senses of the term) come to be inside a building. This entailment does not, however, license a low reading of an adverbial like *again* in the sentence in (57) with

with reversative *un-* and the referential opacity of the direct object of verbs like *want*, *need*, and *seek*, a property which is typically associated with embedded clauses.

this particular interpretation, where the state which holds for a second time is the state of Mary residing in a building. If a low reading is present for (57), it must be that Mary is again in a hospital and not just any particular building.

(57) Dr. Windsor hospitalized Mary again.

To refine this proposal, it might be proposed that certain entailments (such as those for the target state of verbs like *hide*) may be made in the grammar, while other entailments (such as the entailment of *hospitalize* that the referent of the direct object come to be in a building) may be made based on encyclopedic knowledge – for instance, that all hospitals are buildings. This becomes almost indistinguishable, however, from an account which decomposes a verb into an eventive and a stative component within the grammar, and if a Davidsonian analysis of adverbial modification is motivated for the primary eventuality (*i.e.*, the eventuality that tense operates on), then the simplest overall account would treat adverbial modification of the secondary (target state) eventuality in the same way.⁷⁷

Yet another counterproposal is that the adverbs in question are simply vague about what they may modify, and that speakers choose an appropriate object for modification from the context. Similar reasoning to that used above shows that this is equally unworkable. As with the calculated entailment proposal, there must be some special listing of which objects are appropriate and which are not in any given context, since contexts which would otherwise appear to provide a suitable object (the *hospitalize*

⁷⁷ Stechow (2001) discusses further counterarguments to a recent paper arguing against decomposition of target states in the meaning of verbs, in the context of the German adverb *wieder* ‘again’.

example in (57)) do not allow multiple readings. Such a listing would be nearly equivalent to positing multiple eventuality arguments in just those cases, but not others.

3.3.5 How flexible is this decompositional structure?

While these adverbial scope ambiguities appear to provide support for a decompositional analysis of certain verbs and not others (and therefore may serve as diagnostics for the presence of at least those target states which are temporally limited and distinct in their temporal extent from the higher eventuality in the sentence), whether a verb is understood to include a lexically-specified target state may potentially change under certain conditions. When presented with an utterance which can be interpreted only by assuming a decomposed target state, listeners are sometimes willing to assume such a representation for verbs which would not normally be associated with a lexicalized target state. If this coercibility varies in different syntactic contexts, then this can skew a survey of the lexicon in favor of decomposed target states (if the diagnostics used to detect decomposed states themselves provide such coercion), or can lead to acceptance of forms in a context which depends on the presence of a decomposed state (such as target state passives, if that context provides coercion), even when other diagnostics show no evidence of a decomposed state. Thus, the generalization that the existence of a state passive with a target state interpretation correlates with the possibility of a low reading for temporal modifiers may appear to be inaccurate.

To illustrate, it was argued above that the verb *scrub* did not lexicalize a change of state and therefore should not be decomposed into components for an event and a target state, since a change of state of its direct object is an implicature but not an

entailment, and since a resultative secondary predicate like *clean* may be added to the verb. We can now add to this evidence the fact that *scrub* does not result in ambiguities with adverbials like *again* and *for ten minutes*, as in (58).

- (58) a. Marge scrubbed the tub again. (high reading only)
b. Marge scrubbed the tub for ten minutes. (high reading only)

We may note, however, that a resulting condition like that denoted by *clean* is often the intended result of a scrubbing action, and interestingly, this verb appears to marginally allow a target state reading of the adjectival passive (as determined by Kratzer's *still*-test) when the object is *the tub* – something which may naturally be described as *clean*.

Interestingly, the acceptability of a target state reading is reduced when the object is *the stain* – something which may not naturally be described as *clean*.⁷⁸

- (59) a. ? When I came back the next day, the tub was still scrubbed.
b. * When I came back the next day, the stain was still scrubbed.

To the extent that (59)a is acceptable, the condition which is taken to be holding upon the speaker's return is that the tub is clean as the result of a scrubbing process – that it is at least as clean as when the scrubbing event concluded. The marginality of this form, taken with the earlier evidence that this verb does not require a change of state, may indicate that the morphosyntactic context of a target state passive in (59) forces the listener to reanalyze the verb *scrub* as if it did lexicalize a target state that results from the scrubbing event. That is, if it is correct that state passives with a target state interpretation are derived from roots that include a lexicalized state (as proposed in different ways by both Kratzer and Dubinsky and Simango), then in order for *still* in

⁷⁸ The sentence *The tub is clean* is much more natural than *The stain is clean*,

(59)a to be acceptable, the verb *scrub* as used here must lexicalize a target state. The typically intended target state which is associated with a scrubbing event – namely that the object is clean – must be reinterpreted as a lexicalized change of state for the sentence in (59)a to be acceptable. In fact, the sentence in (59)a appears to have exactly the same meaning as the sentence in (59)c below, whose complex predicate explicitly lexicalizes this very target state.

(59) c. When I came back the next day, the tub was still scrubbed clean.

We can therefore conclude that, although a verb may lack a lexicalized target state, as indicated by the grammatical contexts which are intended to detect such states, the syntactic context of a target state passive may motivate a reinterpretation of the verb as if it did lexicalize a target state. We might therefore expect target state passives to occur (albeit marginally) with more verbs than the evidence for decomposition indicates. Since this is a matter of reinterpretation, this may be expected to vary with pragmatic factors in a given context, and possibly to vary on a language-specific, verb-specific, or speaker-specific basis. If this direction of coercion is common for similar alternations in other languages (*i.e.*, that resultatives with target state interpretations can coerce interpretations that temporal modifiers cannot), then we can at least conclude that, other things being equal, all verbs which have low readings of temporal modifiers should allow a resultative with a target state interpretation.

3.4 Summary

The analyses of resultatives presented in this chapter appealed to the idea that some verbs which express an event are somehow related to a state or property which

results from that event in such a way that that state is grammatically active or accessible to operations of the grammar. It is this target state which then forms the basis for at least a subset of resultative forms derived from these verbs. The issue of independently determining exactly which verbs lexicalize these target states was touched on in both of these analyses, and expanded upon here. Dubinsky and Simango described the set of verbs which occur with the Chichewa stative as accomplishment verbs whose themes undergo a change of state, but this use of Vendlerian lexical aspect was seen to be not viable. Kratzer's appeal to the availability of a low, state-modifying reading of temporal adverbials was seen to be one of two similar diagnostics which together provide the strongest evidence for decomposing target states in apparently underived lexical items.

Clearly, the proper analysis of resultatives and similar phenomena depends closely on the proper analysis of events and resulting or target states. As Kratzer showed for German, however, there are also resultative forms which are stative, but which nevertheless do not derive from predicates of states. In her analysis, it is apparently an accident that two morphemes as semantically different as the target stativizer and post stativizer of (37) have identical morphological expressions. While historical accident may be the explanation for certain properties of language, other explanations also need to be considered, at the risk of overlooking an opportunity to learn something about language. This is particularly true since resultatives with the same phonological expression in Pima will be seen in the following chapter to display the same two interpretations as the German state passives.

The following chapter will therefore examine in detail two kinds of resultatives in

Pima. Of particular interest will be the set of verbs which allow resultatives and the distribution of target state interpretations of those resultatives, including their grammatical category and their interaction with other derivational morphology. Other properties of the derived forms will also turn out to be relevant for their analysis, such as the apparent semantic inaccessibility of causers and agentive arguments and the status as a derived stative or as a resultative proper.

4. Pima resultatives and derived statives

It has already been noted that resultatives are not uncommon in natural language – that is, it is not uncommon that there exists a morphological relationship between an eventive predicate and a stative predicate which denotes, for example, a target state in the sense of Parsons (1990) rather than simply an aspectual form that is temporally stative.⁷⁹ The English adjectival passive and the German state passive are of this type, though because English and German are quite closely related, it may not be surprising that they share this type of alternation. Chichewa, however, which was the other focus of the previous chapter, is a Bantu language quite unrelated to English and German; the similarity in meaning of the Chichewa stative to the English and German state passive is therefore surprising if such alternations are at all rare. Other languages which appear to show similar morphological alternations include such typologically varied languages as Korean, Mandarin Chinese, Archi, Chukchee, Aleut, Uzbek, Ewe, Homeric Greek, Tongan, Indonesian, Arabic, Russian, Lithuanian, and Finnish (Geuder and Kim 2001 and Lee 2003 for Korean, all others from Nedjalkov 1988). This chapter will focus on a further example of such an alternation from Pima (or Akimel O’odham), a Southern Uto-Aztecan language of North America.

Pima is a language of the Tepiman branch of Southern Uto-Aztecan, spoken in several communities to the east and south of Phoenix, Arizona. Speakers of the language refer to themselves as Akimel O’odham (‘river people’), and the Pima language and the

⁷⁹ Here I use the term “relationship”, rather than “derivation”, since the exact nature of this relationship is not agreed upon – Dubinsky and Simango (1996) derive the stative form from the eventive form, while Kratzer (2000) derives both the stative and eventive forms from a common abstract form.

language of the Papago or Tohono O'odham ('desert people') are frequently considered to be dialects of a single O'odham language. Although the two dialects have grammatically significant (though sometimes subtle) differences, they each have two verb suffixes – which are pronounced *-s* and *-kc* (or just *-c* in certain contexts) – which appear to pattern the same and which derive resultatives; these two suffixes produce verbs which display different argument relations relative to their base verbs. Technical linguistic works written on the O'odham languages, however, say very little about them, and what little has been said focuses on Tohono O'odham.

Saxton (1982), writing about Tohono O'odham, describes these two suffixes as resultatives which form a passive-active pair, but gives little additional detail beyond a number of example sentences. One of these suffixes (the *-s*) patterns very much like the Chichewa stative and the English and German state passive: the suffixed verb takes a single argument which corresponds to the object of the unsuffixed verb. This suffix will be referred to here as the PASSIVE RESULTATIVE. The other suffix displays a different kind of behavior: the suffixed verb takes the same number of arguments as the unsuffixed verb, though with a stative meaning which typically involves control or possession on the part of the subject. Following the terminology of Nedjalkov and Jaxontov (1988), this will be referred to as the POSSESSIVE RESULTATIVE.⁸⁰ The properties of each of these suffixes will be discussed individually, and then several possible analyses will be considered. I will show in the subsequent sections that the type of analysis which best

⁸⁰ This differs from the terminology of Saxton (1982), who refers to these as ACTIVE RESULTATIVES. While possession is not universally required for possessive resultatives, I have chosen to use the term POSSESSIVE rather than ACTIVE to avoid the confusion that might be possible with the latter term, since the suffixed verbs are temporally stative.

resultative suffix: the subject of the unsuffixed form (*Jason* in (61)a) is not an argument of the suffixed form (as shown by (61)c), while the direct object of the unsuffixed form (*heg maagina* ‘the engine’ in (61)a) is the subject of the suffixed form (as in (61)b).

Based on data like this, the *-s* appears to involve very much the same kind of meaning as the target state interpretation of the German and English state passive and the Chichewa stative.

Like the German state passive, however, the Pima *-s* suffix can sometimes receive what appears to be a different interpretation. The definition in (60), which like any dictionary entry must necessarily be brief, does not convey the variety of interpretations that this suffix appears to receive, as well as the variety of bases that it attaches to in Pima.

For instance, it can attach to many intransitive verbs, where it does not always seem to receive the same kind of resultative target state interpretation as on transitive verbs like *matog*. Intransitive verbs that typically involve motion along a path appear to receive what Goldberg and Jackendoff (2004) refer to as an EXTENSION INTERPRETATION: the denotation of the theme argument, idealized as an extended line, occupies the entire path denoted by the verb. This also shifts the predicate from denoting a transitory event to being non-transitory and possibly individual level, a property which appears to be common to all occurrences of the *-s* suffix.⁸³ Although syntactic tests for an unaccusative/unergative distinction in Pima have not yet been well studied, the verbs in

⁸³ Equating non-transitory with individual level is not always warranted, however, as noted by Jäger (1999). It is not clear that individual level is the most appropriate label to apply to forms with the *-s* suffix; this point will be taken up at length below.

(62) are candidates for an unergative and an unaccusative, respectively, based on the semantic property of controlled vs. uncontrolled action (Levin and Rappaport Hovav 1995). Note that unlike the eventive transitive verb in (61), these verbs take the same number of arguments both with and without the *-s* suffix.

- (62) a. Muula 'a-t 'uug voog gahi hii.
 mule AUX-PFV high road across go:PFV
 The mule walked across the bridge.
- b. Hodai voog 'o 'am gahi him-s 'uug voog veco.
 rock road 3:SUB:IMP DXF across go-PASR high road under
 The paved road goes under the bridge.
- c. Juupin 'o heg kanaho.
 sink 3:SUB:IMP DET boat
 The boat is sinking.
- d. Jeved: 'o-m ge juupin-s.
 earth 3:SUB:IMP-DXF FOC sink-PASR
 The ground sinks (*i.e.*, the ground level drops into a depression).

Both the verbs in (62) may more properly be analyzed as unaccusative, however, since there exist other verbs which are also candidates for the class of unergative verbs, but for reasons of possible incorporation; the verb *vattot* ‘to build a ramada or brush arbor’ in (63) is derived from the noun *vatto* ‘ramada, brush arbor’.

- (63) a. Hemajkam 'o vatto-t.
 people 3:SUB:IMP ramada-MAKE
 The people are making a ramada.
- b. Kii veegaj 'o ge vatto-t-s.
 house behind 3:SUB:IMP FOC ramada-MAKE-PASR
 Behind the house there is built a ramada.

Verbs such as *vattot*, in contrast to verbs like *him* ‘to walk, to go’ and *juupin* ‘to sink’, do appear to take one fewer arguments when suffixed with the *-s* than without, as in (63)b; it is not clear what may be triggering subject agreement in such sentences.

A spatial, non-transitory interpretation with the *-s* suffix is not limited to

- (65) a. S-vegi 'Akimel 'o s-hottam med: kaacki wui.
 s-red river 3:SUB:IMP S-quickly run sea to
 The Colorado River is running quickly to the sea.
 b.* Svegi 'Akimel 'o s-hottam mels kaacki wui.

An example with the *-s* suffix on an intransitive path verb illustrates another possibility for the interpretation of a verb with this *-s* suffix, namely as a noun.

- (66) Kiihim 'o juupin-s c'ed:.
 village 3:SUB:IMP sink-PASR in
 The village is in a basin (*i.e.*, a sunken area of the ground).

A number of properties are indicative of nouns in Pima, including the ability to occur as the object of a postposition (as in (66)), occurrence with a determiner (frequently the default determiner *heg*, which is mandatory in certain syntactic contexts), and occurrence with a copula that is specific to predicate nouns (see (69)b). What is responsible for the nominal properties seen here may be an instance of a more general alternation involving property concepts and the objects picked out by those properties, similar to alternations in English described by Gorbet (2003). For reasons of space, I will continue to note where nominal interpretations are available, but will assume that the nominal cases follow naturally from whatever analysis is proposed to account for the verbal uses, as well; I will leave the precise nature of this phenomenon in Pima for future research.⁸⁵

With intransitive verbs that do not lexicalize a path of motion or a spatial position, suffixation with the *-s* results in a verb which denotes an object that is characterized by

⁸⁵ An alternation between property concepts and the objects that have those properties can be seen in English: “Give me your **tired**, your **poor**...”, meaning ‘people who are tired’ and ‘people who are poor’. One difference between English and Pima is that while this alternation in English appears to be restricted either to humans or to abstract nouns, there appears to be no restriction at all in Pima. Another difference is that in Pima, expressions which denote properties of objects but which are not derived by the *-s* apparently cannot be used in this way as nominal expressions to refer to those objects.

the action of the verb, typically involuntarily, again resulting in a non-transitory predicate. As with its occurrence on other intransitive verbs, there is no change in the number of arguments that the verb takes with and without the *-s*.

- (67) a. Haahag 'o 'iig.
 leaf 3:SUB:IMP fall
 The leaves are falling (and scattering).
 b. Haahag 'o veesko 'iig-s.
 leaf 3:SUB:IMP everywhere fall-PASR
 The leaves are fallen (and scattered) everywhere.
 c. John 'o gikujk.
 3:SUB:IMP whistle
 John is whistling.
 d. M-a-n-t o veem ñeo heg Gikujk-s
 CPM-AUX-1s:SUB-PFV IRR with talk:PFV DET whistle-PASR
 I will talk with Whistler.

This suffix is therefore not restricted to verbs that lexicalize a target state, though it is sometimes possible for the condition at the end of an event to be construed as a target state, as in (67)b. Where no target state is available, such derived forms are frequently used as nicknames, as in (67)d, where whistling-events characterize a particular person (the event here is necessarily involuntary, therefore the whistling must be an involuntary characteristic, like a speech impediment, and not merely a habit of the person).

As with the intransitive verbs seen earlier, the suffixed form is judged by speakers of Pima to involve a sense of permanence, thus appearing to be non-transitory or individual level. Verbs like those in (67)b as well as positional and path verbs with the *-s*, however, may be modified by a durative temporal adverbial, which is typically unacceptable with individual level predicates. The status of verbs suffixed with the *-s* as individual level predicates is therefore unclear.

Perhaps counter-intuitively, this suffix also appears on adjectives, though the

meaning contributed by the *-s* in such cases is not easy to discern. An adjective with the *-s* suffix is sometimes interpreted as asserting that its argument does not prototypically instantiate the property contributed by the adjective (like English adjectives with *-ish*), though this does not appear to be consistent across all forms. What appears to be more consistent is that adjectives suffixed with the *-s* give a sense of permanence (something like what is involved in individual level predication, as discussed above), even if the adjective was otherwise transitory. Moreover, adjectives with the *-s* pattern syntactically as verbs: as verbs, they may require an adjectivizing suffix to occur as a prenominal modifier of a noun, and they may also occur as the main predicate in a clause without a verbalizing suffix, even when the adjective would normally require such a suffix.

- (68) a. Cu'i vaaga 'o s-moik.
 flour dough 3:SUB:IMP S-soft
 The dough is soft.
 b. Cu'i vaaga 'o moik-s.
 flour dough 3:SUB:IMP soft-PASR
 The dough is soft (*i.e.*, is the soft kind).

Apart from the apparent change from transitory to non-transitory, however, the argument structure of the adjective does not appear altered; a single argument is taken either way.

This suffix also occurs on ditransitive verbs, where the argument structure is altered to include just two arguments, rather than three. Such forms appear to preferentially receive a nominal interpretation (as indicated by the choice of copula in (69)b), though a verbal interpretation is also available (as in (69)c).

- (69) a. Lulsi 'a-p-t 'am heñ-'aa'ad.
 candy AUX-2s:SUB-PFV DXF 1s:OBJ-promise
 You promised me candy.
- b. Lulsi maakig 'od: heñ-'aa'ad-s.
 candy give-NOM COP 1s:OBJ-promise-PASR
 A gift of candy is my promise (*i.e.*, the promise that is made to me).
- c. Lulsi 'o ki'ap heñ-'aa'ad-s.
 candy 3:SUB:IMP still 1s:OBJ-promise-PASR
 Candy is still promised to me.

When interpreted as verbs, forms with the *-s* suffix that are derived from ditransitive verbs take two nominal arguments which correspond to the direct and indirect objects of the base – a goal and a theme in (69). The presence of both arguments can be shown by the properties of subject and object agreement in Pima; verbs are marked for agreement with at most one object by a prefix or clitic on the verb itself, and when both a direct and an indirect object are present, the verb agrees with the indirect object, as in (69)a.⁸⁶ This pattern of agreement does not change when the *-s* suffix is attached, as can be seen in (69)b and c. When interpreted as a verb, the other argument (the direct object of the unsuffixed, ditransitive verb) surfaces as a subject, triggering third person subject agreement on the second position auxiliary.

When this suffix attaches to transitive psychological predicates, however, which are all individual level and therefore non-eventive, the argument structure appears to remain the same, as it did with adjectives and at least some intransitives.

⁸⁶ This is true as long as the indirect object is not introduced by an adpositional phrase; if so, the adposition agrees with the indirect object and the verb with the direct object.

- (70) a. S-heñ-kee'id⁸⁷ 'o heg 'Uupio.
 s-1s:OBJ-hate 3:SUB:IMP DET Skunk
 Skunk hates me.
- b. S-heñ-kee'id-s 'o heg 'Uupio.
 s-1s:OBJ-hate-PASR 3:SUB:IMP DET Skunk
 Skunk hates me.

Although it is not completely clear what difference in meaning there is between these two forms, speakers feel that such verbs with the *-s* suffix are compatible with situations in which the emotion is somewhat inconsistent across time, while such verbs without the *-s* give the impression that the emotion is more consistent.

Non-eventive verbs which are not psychological, such as *maas* 'look like', do not allow the *-s* suffix, which may indicate that some difference in semantics or argument structure between psychological predicates and other non-eventive predicates may interact with the morphosyntax or semantics of the *-s*. The presence of any stative verbs which allow the *-s*, however, whether psychological or not, is difficult to account for in a way parallel to Kratzer's analysis of the German state passive, since stative verbs on her analysis systematically lack a Davidsonian eventuality argument of any kind. No stative verbs, by Kratzer's claim, are able to form state passives in German (2000:12).

We can conclude, then, based at least on the eventive transitive and ditransitive verbs, as well as potentially unergative verbs like *vatto* 'to make a ramada', that the argument which is uniformly absent when the *-s* is present is the (typically) agentive external argument. If all of the other cases of attachment of the *-s* to intransitive verbs involve attachment to unaccusative roots, and if the difference between unergative and

⁸⁷ The *s-* prefix, seen in these and a number of foregoing examples, may have a less direct association with stativity. See Jackson (2002) for a discussion of this prefix.

unaccusative verbs rests in the semantic type of the subject (a difference which would be expressed syntactically in some theories of argument structure, such as that assumed by Kratzer 2000), then this generalization may be maintained.

4.1.2 Semantic properties of the *-s* suffix

The examples of the *-s* suffix seen so far show it attaching to several types of verbs, associated with several types of derived meanings. An important question at this point is whether all these instances of suffixes with the shape *-s* constitute a single suffix, or whether there are distinct *-s* suffixes that attach to potentially disjoint sets of words.

Although the apparent meanings that the *-s* suffix is associated with are on the face of it quite different, the difference in meaning when the *-s* combines with eventive transitive verbs, unaccusative and unergative verbs, ditransitive verbs, stative verbs, and adjectives, may be reducible to properties of the expressions that the *-s* attaches to. There are, however, a number of grammatical and interpretive properties that are shared by each of the occurrences of the *-s*.

Recall that the definition given for this suffix by Saxton, Saxton and Enos (1983) (quoted in (60)) claimed that the forms derived by this suffix were stative. It is possible to show by a number of the tests in (6) from chapter 2 that verbs with the *-s* suffix are temporally stative, and that in addition many are stative in the narrow sense: for example, they may hold at a single moment of time or over an interval, they are atelic, and they are unacceptable with rate adverbials like *s-hottam* ‘quickly’.⁸⁸ Additionally, for Saxton,

⁸⁸ Certain stative verbs in Pima do appear to be grammatical with *s-hottam* ‘quickly’, but in such a context they always receive an inchoative or inceptive interpretation in which what happens quickly is a change of state; moreover, other indicators for temporal

Saxton, and Enos, the assertion that such derived forms are stative includes a more specific claim about grammatical properties, since they explicitly categorize verbs in the O'odham languages based on their available aspectual forms: stative verbs are claimed to occur only in the imperfective aspect, not in the perfective.⁸⁹ This property holds of all expressions derived by the *-s* that are interpreted as verbs (that is, all the occurrences for which grammatical aspect can be determined). The sentences in (71) illustrate this property using a transitive eventive verbal base, but this behavior is typical of all forms suffixed with the *-s*.

- (71) a. Kuup-s 'o heg kuupad:ag.
 close-PASR 3:SUB:IMP DET door
 The door is closed.
 b.* Kuup-s 'a-t heg kuupad:ag.
 close-PASR AUX-PFV DET door
 (ungrammatical with any meaning)

Another property shared by all verbs derived by the *-s* suffix, as mentioned earlier, is that they give at least the impression of permanence, resembling what has been claimed for non-transitory or individual level predicates. This is the case also for sentence (71)a, which in the absence of any other context gives the impression that the door is permanently closed. As was also observed earlier, however, this sentence is compatible with an adverbial of temporal duration like *hetasp quinta 'ab* ‘for five

stativity also show these verbs to be not stative when given this interpretation.

⁸⁹ Compatibility or incompatibility with grammatical aspect has been used by some authors (*e.g.*, Smith 1991, Durst-Andersen 1993) to argue for particular values of lexical aspect; Dowty’s use of the progressive as a diagnostic for stativity is an example of this, as well. A proper presentation of the issues involved in taking the imperfective as a diagnostic for stativity is beyond the scope of this dissertation, so I will merely accept the categorization of Saxton, Saxton, and Enos (1983).

minutes', however, which makes a permanent interpretation impossible.⁹⁰

If expressions with the *-s* suffix were in fact interpreted as post-state passives, the permanence of the property that they express would be expected. Durative temporal modification should not be acceptable with expressions which denote a post-state, however, and it can be shown in other ways, as well, that most expressions with the *-s* suffix are interpreted as expressing target states rather than post states. Although sentence (71)a gives the impression that the condition of the door will hold indefinitely, it does not simply mean that a closing event has occurred in the past. This can be shown straightforwardly by the completely natural occurrence of the adverbial *ki'ap* 'still' with forms suffixed with the *-s* (note also *ki'ap* in (69)c, involving the verb *'aa'ads* 'to be promised'); thus, the verb *kuups*, at least, patterns like Kratzer's target state passives.

(72) Ki'ap 'o kuups.
 still 3:SUB:IMP close-PASR
 It is still closed.

In addition to the acceptability of durative temporal modification and the 'still' diagnostic, the interaction of the *-s* with another verbal affix indicates that the *-s* derives something with a target state interpretation, rather than a post-state interpretation or a perfect. There is a Pima verbal suffix *-kahim* whose meaning is that the property or activity denoted by the verb that it attaches to went on or was true in the past, but not at

⁹⁰ The acceptability of temporal and spatial modification are two diagnostics for stage-level predicates, though many stereotypically individual level predicates may sometimes occur with temporal or spatial modification: *John liked peanut butter sandwiches for many years, but then he just got sick of peanuts*. What this may indicate is that individual level predicates may sometimes be rather easily coerced into stage-level-hood.

the present, rather like English *used to*.⁹¹ If such a suffix were to attach to a perfect (that is, a form like a post-state passive that claimed merely that some event concluded before the reference time – typically the moment of utterance), it would result in conflicting truth conditions; the post-state predicate should have been true in the past, but false at the present, a temporal pattern which post-states cannot display. To give an English parallel, this is rather like saying **John used to have read 'The Hobbit'*; if it is true at a time *t* that John has read *The Hobbit*, then it must also be true at all times after *t*, which is inconsistent with the meaning of *used to*. Speakers of Pima, however, use the *-kahim* suffix quite naturally on many verbs already derived by the *-s* suffix, and do not find anything strange about their truth conditions.⁹²

- (73) Maagina 'o matog-s-kahim.
 engine 3:SUB:IMP take.apart-PASR-PDUR
 The engine was (*i.e.*, used to be) disassembled.

We may conclude from this that although the *-s* appears to derive non-transitory verbs, the verbs that it derives are still target state forms, and not post-state (or perfect) forms.

It is important to note, however, that certain occurrences of the *-s* suffix have a derived stative meaning; for example, although the eventive verb *kuup* ‘to close (transitive)’ denotes an event, the stative form *kuups* ‘be closed’ derived from it does not entail that an event of closing ever happened. It is entirely natural to describe something

⁹¹ Strictly speaking, it appears to assert that the property or activity held in the past, and is associated with an implicature that this property or activity does not hold at the present. Even if such implicatures may be cancelled, doing so should produce a notably different sense for speakers even if such forms are not contradictory; no such sense is observed by speakers of Pima.

⁹² Interestingly, however, there are certain Pima resultatives with the *-s* that do not allow the *-kahim* suffix.

as *kuups* which has never been open. This is also the case for the verb in (74)a, *'eestos* ‘to be hidden’. This sentence can be uttered if this particular gold never underwent a process of being hidden; for example, mineralogical processes could be responsible for the occurrence of the gold in locations that make it not easy to find, even though this process could never be described as ‘hiding the gold’.

- (74) a. 'Oola 'o 'am do'ag c'ed: 'eesto-s.
 gold 3:SUB:IMP DXF mountain in hide:PFV-PASR
 The gold is hidden in the mountains.
 b. 'Ali 'o 'atosha-d:ad-s.
 child 3:SUB:IMP diaper-put.on-PASR
 The baby is diapered.

This property does not hold for the verb in (74)b, *'atoshad:ads* ‘to be diapered’, however; this sentence can only be uttered truthfully if the baby has undergone a process of diapering, in addition to the real-world knowledge that a speaker may have that might say that having a diaper on always comes about from a specific change of state.

A structural correlate of the difference in interpretation between *'eestos* and *'atoshad:ads* appears to be the presence of overt verbalizing morphology. Where a verbalizing suffix occurs as part of the base that the *-s* suffix attaches to, a past event of the state coming to hold is always required; this is true whether the verbalizing suffix is a purely causativizing suffix like *-cud* or *-id*, or a suffix with a more complex meaning like *-d:ad* ‘put on’ in (74)b. This is interestingly reminiscent of Kratzer’s observations concerning the German state passive, where a target state reading of a state passive participle was unavailable if a verbal head was involved. Here in Pima, however, both forms may have a target state reading (that is, a reading on which it is asserted that some condition or property holds), but only the form that lacks an overt verbalizing suffix may

receive a derived stative meaning, without entailing a past event of the initiation or inception of that property or state. This implication goes in only one direction, however: it is not the case that every verbal base that lacks an overt verbalizing suffix is a derived stative, but only verbal bases that lack overt verbal morphology may also lack event entailments.

4.2 Possessive resultative: The Pima $-(k)c$ suffix

As mentioned earlier, the $-s$ suffix in Pima and Papago appears to be the passive member of a pair of resultative suffixes (Saxton 1982). The non-passive member of that pair, pronounced $[k\widehat{t}]$ (written $-kc$) after vowels and $[\widehat{t}]$ (written $-c$) after consonants, is defined by Saxton, Saxton, and Enos (1983) as follows:

- (75) “[a] suffix added to non-stative verbs to form stative verbs with the same transitivity [which mean] ‘have or ([when marked] reflexive) be (in a specified state or condition)’.” (31)

As with the $-s$ suffix, while this definition encapsulates the meaning and use of this suffix for many transitive eventive verbs, the details of its behavior are much more varied.

4.2.1 Syntactic properties of the $-(k)c$ suffix

This suffix attaches to transitive (76)a,b and ditransitive verbs (76)c,d, where the suffixed form appears to have the same argument structure as the unsuffixed form.

- (76) a. 'Amai 'a-n-t hiash heg heñ-'oola-ga.
 there AUX-1s:SUB-PFV bury:PFV DET 1s:POS-gold-ALN
 I buried my gold there.
- b. 'Amai 'a-ñ hiash-c heg heñ-'oola-ga.
 there AUX-1s:SUB bury:PFV-POSR DET 1s:POS-gold-ALN
 I keep my gold buried there.
- c. Marcus 'a-t maa heg Pam heg 'e-lial-ga.
 AUX-PFV give:PFV DET DET ¬1:POS-money-ALN
 Marcus gave his money to Pam.
- d. Marcus 'o maak-c heg Pam heg 'e-lial-ga.
 3:SUB:IMP give-POSR DET DET ¬1:POS-money-ALN
 Marcus has his money given (*e.g.*, bequeathed) to Pam.

Verbs with this suffix are translated alternately with English *have* and *keep*, both of which involve some degree of control on the part of the subject – loosely possession, or in clearer cases, the maintenance of a state or condition. In the case of English *have*, the degree of control can extend even to volitional, eventive causation (Belvin 1996), as in an example like *John had the choir sing a song*, though this is not the case with the $-(k)c$ suffix in Pima; the $-(k)c$ suffix cannot receive an eventive causative reading. For this reason, *keep* is sometimes used in the glosses to avoid the eventive causative senses that English *have* has. Control and maintenance of a state or condition appears to be central to the meaning of this suffix, however, and determining the semantic source of the relevant state or condition will prove to be important.

This suffix generally does not attach to intransitive verbs or adjectives, but it does attach to a few; below are examples of this suffix on an intransitive verb (77)b and an adjective (77)d. Where the $-(k)c$ suffix does attach, the suffixed forms are transitive and receive an interpretation involving stative causation or control, frequently involuntary.⁹³

⁹³ An empirical hazard of finding forms with the $-(k)c$ suffix in Pima is that the form of this suffix following a consonant is identical to the truncated form of the causative suffix

- (77) a. Juupin 'o heg kanaho.
 sink 3:SUB:IMP DET boat
 The boat is sinking. (repeated from (62)c)
- b. Kii damhod:ag 'o juupin-c heg Marcus.
 house ceiling 3:SUB:IMP sink-POSR DET
 The ceiling has Marcus hunched over.
- c. Jujul kui 'a-n-t ñei.
 crooked tree AUX-1s:SUB-PFV see:PFV
 I saw a crooked tree.
- d. Jujul-c 'a-ñ heg 'u'us.
 Crooked-POSR AUX-1s:SUB DET stick
 I'm keeping the stick crooked.

Note that in (77)b, an inherent property of the ceiling (such as its low height) is responsible for Marcus's condition of being "sunk", or hunched over.

4.2.2 Semantic properties of the *-(k)c* suffix

This suffix has a number of properties in common with the *-s* suffix, which may have been what led Saxton (1982) to propose that they formed an active/passive pair. For instance, the *-(k)c* suffix derives verbs that cannot occur with a perfective auxiliary.

Compare the sentence below in the perfective aspect to (76)a and b.

- (78) *'Amai 'a-n-t hiash-c heg heñ-'oola-ga.
 there AUX-1s:SUB-PFV bury:PFV-POSR DET 1s:POS-gold-ALN
 I kept my gold buried there.⁹⁴

-cud, and phonetically quite similar to the truncated form of another causative suffix *-jid*. The proper morphological analysis of a final suffix which sounds like *-c*, however, can be determined by examining the aspect of the sentence: truncation occurs only in the perfective aspect, and the *-(k)c* never occurs in the perfective. Therefore, a *-c* suffix in the imperfective should always be the *-(k)c* suffix, and a *-c* suffix in the perfective should always be either *-cud* or *-jid*. It is not known, however, if the similarity of meaning (*i.e.*, generally control) and form has led any speakers to reanalyze them as a single, more general causative suffix. For a detailed discussion of causation in Pima, see Smith (2005).

⁹⁴ This sentence is nearly identical to a sentence with a truncated causative suffix on the verb, *hiashpc* 'to bury for (PERFECTIVE)', and some speakers may allow the sentence in (78) with this interpretation.

As mentioned in the discussion of the passive resultative suffix *-s*, this property is taken by Saxton, Saxton, and Enos (1983) to be characteristic of stative verbs. Other tests can be used to show that such forms have other properties expected of temporally stative predicates: they may hold at a single moment of time or over an interval, they are atelic, and they are ungrammatical with rate adverbials like *s-hottam* ‘quickly’.

Also like verbs with the *-s* suffix, verbs with the *-(k)c* suffix give the impression of permanence and might potentially be analyzed as individual level predicates, but as with the *-s*, they are also compatible with durative temporal modification, something that Individual level predicates typically do not allow.

- (79) 'Amai 'a-ñ hiash-c-kahim heg heñ-'oola-ga hetasp 'ahidag 'ab.
 there AUX-1s:SUB bury:PFV-POSR-PDUR DET 1s:POS-gold-ALN five year for
 I kept my gold buried there for five years.

In sentence (79), the durative time adverbial is most saliently understood as the length of time that the gold remained buried, though it may more properly correspond to the duration of the control exerted by the subject.⁹⁵ This sentence also shows that the *-(k)c*, like the *-s*, is compatible with the past suffix *-kahim*, indicating that the state (or states?) denoted by the predicate is a target state, not a post-state. This is likewise shown by the acceptability of the suffixed forms with *ki'ap* ‘still’.

- (80) 'Amai 'a-ñ ki'ap hiash-c heg heñ-'oola-ga.
 there AUX-1s:SUB still bury:PFV-POSR DET 1s:POS-gold-ALN
 I still keep my gold buried there.

Despite these similarities, there are significant differences between the *-(k)c* and *-s* suffixes which may make a parallel analysis difficult. If these suffixes differed in

⁹⁵ These intervals may be distinguished if, for example, control of the gold changes while the gold remains buried – such as if the owner dies and the gold is inherited by another.

meaning only in whether they deleted or absorbed an argument, then they would be expected to attach to the same verbs. This is not the case.

- (81) a. 'Iida tapial 'o cikpan-s.
 this paper 3:SUB:IMP work.on-PASR
 This paper is worked-on.
- b.* Marcus 'o cikpan-c heg tapial.
 3:SUB:IMP work.on-POSR DET paper
 (bad with any meaning)
- c.* Marcus novi 'o mavgid-s.
 hand 3:SUB:IMP wave-PASR
 (bad with any meaning)
- d. Marcus 'o mavgid-c heg 'e-novi.
 3:SUB:IMP wave-POSR DET -1:POS-hand
 Marcus keeps his hand waved (*or* waving).

The verb in (81)a and b, *cikpan* ‘to work; to work on’, is a transitive eventive verb that allows the *-s* suffix but disallows the *-(k)c* suffix. The verb in (81)c and d, *mavgid* ‘to wave (tr.)’, is a transitive eventive verb that disallows the *-s* suffix but allows the *-(k)c* suffix. Neither verb shows a low reading of a durative temporal adverbial, which is characteristic of a lexicalized state. Although both the *-s* and *-(k)c* suffixes may require similar lexical properties of the verbs they attach to, it appears that they cannot easily be considered merely an active/passive pair without allowing them to idiomatically specify certain verbs that they may or may not attach to. Some more significant differences must separate these two affixes.

An observation that may be relevant for the analysis of the *-(k)c* suffix is that it shows a tendency to attach to verbs that lexicalize a target state, such as *'eestod*: ‘to hide (transitive)’, though this is not an inviolable requirement, as shown by the other sentences below with *cindat* ‘to kiss’ and *melcud* ‘to make run’.

- (82) a. Heriberto 'o 'eesto-kc heg 'e-gat.
 3:SUB:IMP hide-POSR DET ¬1:POS-gun
 Heriberto has his gun hidden.
- b. Jason 'o cindat-c heg Suzanne.
 3:SUB:IMP kiss-POSR DET
 Jason keeps Suzanne kissed.
- c. Marcus 'o mel-cud-c heg kalit.
 3:SUB:IMP run-CAUS-POSR DET car
 Marcus keeps the car running.

In its eventive use, the verb *'eestod*: ‘to hide’ may be understood as lexicalizing a state; when a durative temporal adverbial is present, the duration of time may refer to how long the object remained unseen, rather than how long the subject’s act of placing the object took, indicating that this target state is accessible for temporal modification. The verb *cindat* ‘to kiss’, on the other hand, is harder to think of in terms of a target state, and indeed a durative temporal adverbial occurring with this verb may only be understood as referring to the length of time that the kissing event went on. The third sentence, involving the causative verb *melcud* ‘to make run’, illustrates that even if the semantic accessibility of some sort of target state is what is relevant for the $-(k)c$ suffix, then the nature of that state is not necessarily as a property concept (that is, it need not be the kind of state that is relevant for building verb meanings; recall the discussion in chapter 2 of Dowty’s attempt to limit the type of meaning that a predicate of states may have). Here, the condition that Marcus maintains can either be a transitory condition of the car’s engine turning over (relevant, for example, if Marcus is the driver of a get-away car) or a non-transitory condition of the car being in working order (relevant, for example, if Marcus is a mechanic). The former “state” seems to correspond to an English progressive, which, while evaluable for truth at a moment, is semantically derived from a

predicate of events; the latter “state” seems to correspond to an individual level property, which may both be evaluated for truth at a moment of time and is at least intuitively construable as a property concept. Whatever is going on in the causative verb *melcud* ‘to make run’ such that the $-(k)c$ may occur there, the intransitive verb *med*: ‘to run’ from which *melcud* is built does not license the $-(k)c$ suffix.

Another prediction that would be made by saying that the $-(k)c$ and $-s$ suffixes were an active-passive pair is that presumably the $-(k)c$ suffix would not alter the argument structure of the verb it attaches to, but would merely alter the temporal properties of the verb to make it stative. This has already been shown to be incorrect for those intransitive verbs and adjectives which license the $-(k)c$, like those in (77), where the derived verb is transitive and takes an agent or causer which is not an argument of the base. Although more difficult to see in the case of transitive and ditransitive verbs, the argument structure of the suffixed form also appears to be different from the argument structure of the base form, not in terms of the number of arguments present, but in terms of entailments concerning the subject or external argument of the suffixed verb.

For instance, the subject of an eventive verb like *'eestod*: ‘to hide (tr)’ is directly in control of the change of state that the object undergoes; the subject of (83)a must be the individual who picked up the shovel and moved the dirt to hide the gold (using a very concrete example of a possible context for this utterance). In contrast, what the subject of the suffixed, stative form *'eestokc* ‘to have hidden (tr)’ is in control of in (83)b is not the change of state of the object, but the maintenance of that state. While the entity responsible for a change of state is frequently also responsible for maintaining that state,

this is not a necessary truth; this is illustrated by the pair of sentences below, which are quite natural in one and the same context.

- (83) a. Heñ-baabkeli 'a-t 'am 'eesto heg 'e-'oola-ga.
 1s:POS-grandfather AUX-PFV DXF hide:PFV DET -1:POS-gold-ALN
 My grandfather hid his gold.
 b. Ku-ñ vaikko.vestmaam 'ahidag 'ab 'am 'eesto-kc.
 CPK-1s:SUB thirty year for DXF hide:PFV-POSR
 I have kept it hidden for thirty years.

The second sentence in (83) therefore cannot require that the subject be the one to have hidden the gold, since the first sentence in (83) states that another individual was the one who did this; the subject in (83)b is merely responsible for maintaining the hiddenness of the gold, the state that the gold was in when this control was passed on from the grandfather to the speaker.

We would therefore expect that a verb with the $-(k)c$ suffix could be compatible with a situation in which there was never a change of state on the part of the object – *i.e.*, that verbs with the $-(k)c$ suffix may pattern like derived statives, rather than resultatives – and this is in fact the case. The second sentence above is equally natural in a slightly different context, as in (84), where no change of state of the gold is required at any time.

- (84) a. Heñ-baabkeli 'a-t 'am cee heg 'oola
 1s:POS-grandfather AUX-PFV DXF discover:PFV DET gold
 m-o 'eesto-s do'ag c'ed:.
 CPM-3:SUB:IMP hide:PFV-PASR mountain in
 My grandfather discovered gold that was hidden in the mountains.
 b. Ku-ñ vaikko.vestmaam 'ahidag 'ab 'am 'eesto-kc.
 CPK-1s:SUB thirty year for DXF hide:PFV-POSR
 I have kept it hidden for thirty years.

In the first sentence in this pair, the gold is described as being in a certain condition, in this case, using the passive resultative $-s$ suffix. There need not have been a change of

state that brought the gold into this condition; the gold may have been mineralogically deposited in the mountains in such a way that it was difficult to find, though this process cannot be thought of as “hiding” the gold. The second sentence, which is identical to (83)b, is just as natural in this context as in the previous one. All that is entailed concerning the subject is that the subject be responsible for maintaining the condition that the object is in, regardless of how it came to be in that condition.

As with the *-s* suffix, however, a derived stative interpretation is not available for every verb that the *-(k)c* suffix attaches to. Those verbs that do not involve a verbalizing morpheme (such as a causative suffix, like *-id* in (85)) may receive a derived stative interpretation, but verbs which include a verbalizing morpheme appear to require the target state to be a result. The paradigm below illustrates this.

- (85) a. Marcus kamish 'o s-vijin.
 shirt 3:SUB:IMP S-wrinkly
 Marcus's shirt is wrinkly.
- b. Pam miitol-ga 'o vijiñ-id heg Marcus kamish.
 cat-ALN 3:SUB:IMP wrinkly-CAUS DET shirt
 Pam's cat is wrinkling Marcus's shirt.
- c. Pam miitol-ga 'o vijiñ-id-c heg Marcus kamish.
 cat-ALN 3:SUB:IMP wrinkly-CAUS-ST DET shirt
 Pam's cat is keeping Marcus's shirt wrinkled.

The sentence in (85)c, where the *-(k)c* suffix attaches to the causativized adjective *vijiñid* ‘to make wrinkly’, can only mean that Pam’s cat is maintaining Marcus’s shirt in a wrinkled state, and that his shirt is not naturally in that state. The wrinkled state must have come about through some event.

If the possessive resultative *-(k)c* is to be analyzed as introducing some notion of control, this may represent another instance of stative causation, of the type proposed by

Pylkkänen (2000), discussed in section 3.2.3 in the context of Kratzer's (2000) analysis of the German state passive, where certain resultatives received derived stative interpretations; her characterization appears to apply to the Pima $-(k)c$ suffix, as well. Moreover, it will be seen in the discussion to follow that there is evidence that the possessive resultative $-(k)c$ always occurs outside a causative morpheme, whether lexical or morphological, and that the apparent derived stative interpretations in fact correspond to stative causation interpretations.

4.3 Categories of analysis

The data presented in the previous sections of this chapter display several properties that need to be addressed by any overall analysis of resultatives and their associated eventive predicates. Ideally, the analysis of these forms would allow in some way a prediction of whether a given verb in the language would license one or both of these resultative affixes (assuming that this property is predictable, rather than listed, and again remaining neutral on the specific direction of this derivation). The analysis should also explain why the passive resultative forms lack an argument that is observed in the eventive form – though only when this argument is an agentive subject, or external argument. To answer these questions requires understanding the type of stativity that the derived predicates show: whether they are stative because they are predicates of states, which I associate with a target state interpretation, or whether they are merely temporally stative, which is true of post-state interpretations that need not involve eventuality arguments ranging over states in order to be stative.

Along with these questions, a satisfying analysis of these resultatives should give

some explanation for the distribution of derived stative interpretations – interpretations where the target state expressed by the resultative need not have come about through a change of state. There appear to be three logically possible categories into which an analysis of the missing change of state entailments can be placed, based on the answers to the following two questions.

The first question to be answered is whether the derived statives like *'eestos* ‘be hidden’ and *'eestokc* ‘keep hidden (transitive)’ are related synchronically to the eventive forms like *'eestod*: ‘to hide (transitive)’ that do entail a change of state.⁹⁶ If the answer to this question is no, that the derived statives are not derivationally related to their eventive bases, then the potential analysis is simple, if not very satisfying: the meaning of the resultatives that have derived stative interpretations can simply be listed. If there is no synchronic derivational relationship between the two forms, then there is no problem that their meanings differ in idiomatic ways; this would unfortunately not explain why the difference in meaning between these two forms is generally so systematic.⁹⁷

If there is evidence that the eventive and derived stative forms in question are taken to have a synchronic derivational relationship, then independently listing their meanings would not be the best solution. The question to ask then is what the nature of that derivational relationship is. The overt morphological relationship between the

⁹⁶ Presumably, resultatives proper, like *vijiñidc* ‘keep wrinkled’, are easier to derive from their eventive base, since both the resultative *vijiñidc* and the eventive causative *vijiñid* share the entailment that an event of wrinkling went on.

⁹⁷ I am specifying here that the relationship must be both derivational and synchronic since it is possible to have a derivational relationship historically, but no derivational relationship synchronically. A historical derivational relationship is irrelevant to synchronic derivation.

eventive and resultative expressions imposes constraints on the possible direction of derivation, as does the semantic relationship. For example, is the stative form that does not entail a change of state derived from the eventive form that does entail a change, as the morphological marking appears to indicate, is the eventive form with the entailment derived from the stative form without it, or are both derived from a common source? Deriving the stative from the eventive would be a non-monotonic operation – it would involve deletion or loss from the derived stative form of a portion of the meaning of the eventive base form, which would also require the grammar to operate on part, but not all, of the meaning of a verb. Deriving the eventive from the stative would not require deletion as an operation of the grammar nor would it require decomposition of the meaning of words, though it would involve semantic derivation in the opposite direction from the apparent morphological derivation. Deriving both the eventive and the stative forms from a common source would not require deletion, but would require additional explanation of why the eventive forms appear to be underived.

The following sections will consider each of these three categories of analysis, and will show that the best account of the resultatives with derived stative interpretations does not involve listed meaning or deletion of components of meaning, but instead involves an extension of the proposals of Kratzer (1996, 2000), in which the external argument is not an argument of the “verb” at all, and even apparently monomorphemic verbs may be decomposed into multiple components within the morphosyntactic component of grammar.

4.3.1 Listing derived stative meanings

The resultatives whose derivation is the most problematic are those that receive a derived stative interpretation, where the stative predicate lacks an element of meaning that is present in the eventive predicate. Not all of the resultatives in Pima, however, have a derived stative interpretation. Verbs in which a verbalizing suffix (such as a causative suffix) intervenes between the passive resultative suffix and the verbal root never receive a derived stative interpretation. There are even resultatives without an overt verbalizing suffix in this position which cannot receive a derived stative interpretation; only a subset of resultatives without such verbalizing suffixes have a derived stative interpretation.

If the set of resultatives with derived stative interpretations is unpredictable, this would support an account in which the presence of a derived stative interpretation is idiomatically specified for each resultative. If this is the case, then the eventive predicates and the derived statives are not related derivationally, and there is no problem posed by any differences in meaning that they may have, since an expression with a listed meaning may in principle have any possible meaning.

Evidence in favor of listing the meanings of derived statives may also come from the absence of semantic transparency. A listed-meaning analysis is required, for instance, for those derived statives which exhibit semantic drift from their expected meaning, like the Chichewa stative *tay-ika*, which means something like ‘be lost’, but is derived from the verb *tay* ‘to throw away’. If one assumes that the meaning of an expression which is already listed is more susceptible to semantic drift than the meaning of an expression

which is computed by the grammar, the relatively high frequency of idiomatic meanings among Chichewa statives – which are claimed by Dubinsky and Simango (1996) to all have a derived stative interpretation – is explained if all such meanings are listed.⁹⁸ It is not clear, however, if this assumption concerning semantic drift is correct.

4.3.1.1 An example of this type: Kratzer (2000)

The analysis proposed by Kratzer (2000) is actually left with a listed-meaning analysis for state passives like *closed*, *broken*, and *scattered*, which have derived stative interpretations and which cannot be cases of stative causation, since her analysis predicts that all state passives which do not involve stative causation, whether with a post-state interpretation or a target state interpretation, should entail a past change of state. As discussed in section 3.2.3, the fact about derived statives in at least English and Pima that would be troubling on this account is the high degree of regularity which the meanings of the eventive forms and the derived statives have: the eventive forms appear to mean just that some state came about (or was caused), while the stative forms merely denote that very state. This systematic relationship seems like it should be captured by the grammar.

One way to explain this systematic relationship between eventive forms and derived statives, even though the meaning of the derived statives might be listed synchronically, is by a diachronic, rather than a synchronic, analysis. For instance, the derived statives in question might correspond historically to something more like a

⁹⁸ Dubinsky and Simango assume a grammar with a computational lexicon, so their claim is not that the meanings of all statives cannot be predicted. Instead, the meaning of a Chichewa stative in the default case is predictably derived and subsequently listed within the lexicon, and it is this lexically-listed status that makes them more susceptible to semantic drift.

perfect, whose meaning was just that some event had completed. At some point in the history of these forms, the meaning may have shifted from asserting that the event is complete, to asserting merely that the target state – which held at the completion of the event – holds. As noted in the previous sections, the Pima resultatives cannot be analyzed as perfect or post-state forms synchronically for a number of reasons. Although this might plausibly explain the current distribution, however, and might also explain the semantic drift facts observed for Chichewa, a diachronic explanation would require diachronic evidence in order to be supported, which is not available for Pima.

4.3.1.2 Problems with this type of analysis

While a listed-meaning analysis for derived statives is conceivable, there is reason in Pima, at least, to doubt its validity. On any account which says that the current meaning of Pima derived statives must be listed, it is troubling that the resultatives with derived stative interpretations appear to meet other well-defined criteria. Rather than being completely unpredictable, the availability of a derived stative interpretation is determinable based on details of the meaning of the eventive verb that appears to be the morphological base. Where the actual “name” of the verb specifies an event-type or an instrument which is involved in bringing the resulting target state to hold, a derived stative interpretation is unavailable. Derived stative interpretations are available (modulo the presence of a causative or other verbalizing morpheme) only where the “name” of the eventive verb specifies the type of target state that holds.

This can be illustrated with an example seen earlier. Kratzer’s semantic representation for the root *aufpump-*, repeated below from (36)a, includes a predicate

event(e), which restricts the primary eventuality argument to events proper, and a predicate *pump(e)*, which requires that the event filling the primary eventuality argument be of a certain type, namely, that it be a pumping event.⁹⁹

(36) a. $\llbracket \text{aufpump-} \rrbracket = \lambda x \lambda s \lambda e [\text{event}(e) \wedge \text{pump}(e) \wedge \text{cause}(s)(e) \wedge \text{inflated}(x)(s)]$
 (Kratzer 2000: (12))

Because of this, Kratzer's account predicts that both eventive verbs and target state passives derived from this root should (if compositional) entail an event of pumping that brought about the target state of being inflated.

The important point here, however, is that the root *aufpump-* specifies the type of event which brings the target state about – an event of pumping – in addition to the target state itself, and that this specification of event-type can easily be associated with part of the phonological label for this meaning: the *pump-* portion. Kratzer rejects a syntactic decomposition of verbs like *aufpumpen* into an eventive component and a target state component, however, in this case primarily because the target state component of the meaning, consisting of the predicate *inflated(x)(s)*, cannot always be associated one-to-one with the separable prefix *auf-*. If the prefix *auf-* can be underspecified, however, such that it could express a number of distinct target states in the context of different types of event components, as it could within Distributed Morphology, verbs like *aufpumpen* could easily be analyzed morphosyntactically, as well as semantically, into an eventive and a stative component. The presence of this eventive component – a component which specifies the type of event, or an instrument that is involved in such an

⁹⁹ The inclusion of the predicate *event(e)* is actually redundant here; it would be sufficient for this purpose merely for the predicate *pump(e)* to be present, since any eventuality that is a pumping event will necessarily be an event proper.

event, as with the English state passive *hammered* – would necessarily make a derived stative interpretation unavailable.

Although Kratzer does not give semantic representations for the roots that are the source of state passives like *closed*, *broken*, and *scattered*, note that all of these resultatives which can receive derived stative interpretations do not require a certain type of event to bring about the target state, but merely specify the type of target state that is brought about. This characteristic is also true of, for example, deadjectival causative verbs like *empty*, *clean*, and *dry*, whose resultatives *emptied*, *cleaned*, and *dried* do not have derived stative interpretations; these deadjectival resultatives, however, were seen to have only post-state passives, which necessarily require the target state to result from an event. In the case of *closed*, *broken*, and *hidden*, there is no morphologically simple adjective (like *empty*, *clean*, and *dry*) that denotes just the target state of closedness, brokenness, or hiddenness, and so there is no way apart from these derived statives to express the property concepts with a non-result interpretation.

The availability of a derived stative interpretation therefore appears to depend on precise properties of the meaning of a verb – or rather, the meaning of a verb may prevent a resultative which corresponds to that verb from having a derived stative interpretation. How can we be certain, however, apart from native-speaker intuition, whether a verb has a meaning of the relevant sort? Ideally, some syntactic diagnostic could be found to distinguish verbs with these components of meaning, in the same way that durative temporal modification was used to indicate the presence of a decomposed target state.

While I cannot point to a specific diagnostic which will serve this purpose, the

relevance of semantic properties for syntactic behavior in English is the focus of Levin (1993), and the framework developed there is refined in subsequent work (Levin and Rappaport Hovav 1995, Rappaport Hovav and Levin 1998, among others). Levin (1993) represents a catalog of syntactic properties and verb argument or diathesis alternations in English, and concludes that for a sample of about 3,000 verbs, the grammatical classes of verbs that pattern in identical ways syntactically are also distinguished by common “structural” aspects of meaning – such as the specification of a target state or of an event type or instrument. While Levin (1993) does not provide a structural representation for each class of verbs (what are referred to as EVENT STRUCTURE TEMPLATES in Levin and Rappaport Hovav 1995 and subsequent work), or list the semantic or structural properties (in the sense of properties of event structure templates) that are relevant for the alternations she discusses, it should be possible in principle to find a syntactic diagnostic which will indicate the presence of a specified event type or instrument.

This does not by itself constitute a complete explanation for the absence of event entailments in cases like *broken*, *hidden*, and *closed*. This generalization that the only resultatives that receive derived stative interpretations are those whose corresponding verbs do not specify an instrument or event type is a strong indication, however, that an analysis which claims that all derived statives are idioms is not desirable. The following sections will consider ways to derive the derived stative interpretations.

4.3.2 Decomposition with deletion

If the meaning of resultatives with a derived stative interpretation is to be computed rather than listed, the next question is to determine what it is to be computed

from, and whether this source for derivation includes as part of its meaning that some event occurs to bring about the state (as does the apparent morphological base) or not. Whether this derivational source includes an entailment of a past event or not is independent from whether the source is the surface eventive verb itself or an abstract root from which the eventive verb is also derived – since even the root in Kratzer’s analysis entailed an event which resulted in the target state. If the semantic derivation follows the apparent morphological derivation – that is, if the meaning of the base for derivation does include this past event – then some mechanism is required to remove this meaning from the meaning of the derived form, either deletion of this eventive meaning, or a selective copying operation that can exclude the eventive meaning.

4.3.2.1 An example of this type: Dubinsky and Simango (1996)

The analysis given by Dubinsky and Simango (1996) for the Chichewa stative morpheme falls into this “remove the event” category. Recall from section 3.1 that according to the Generative Lexicon theory of Pustejovsky (1995), information concerning causation, inchoation, or a target state is encoded in the lexical entry for each verb by means of a Lexical Conceptual Structure (LCS). The Chichewa stative suffix is claimed to attach only to verbs whose LCS includes a target state, and its effect is to create a new verb (*i.e.*, a new lexical entry) whose LCS includes only the state portion of the base verb’s LCS. This both derives a temporally stative predicate – since the new lexical entry involves predication over states, rather than events – and ensures that the external argument, which occurs in the LCS under the process node, is not an argument of the derived verb and is not semantically accessible in the same way that it is for a

passivized verb.

The details of Dubinsky and Simango's analysis depend on a number of properties of the architecture of the grammar that they use. The foremost of these is that the grammar includes a computational component both within the lexicon and within the syntax. Dubinsky and Simango find the divergent properties of the passive and the stative to be an argument in favor of placing them in distinct components, and thus an argument in favor of a grammar with this architecture. Their analysis also depends on the representation of event structure according to Pustejovsky (1995), in which the entire LCS of a verbal lexical entry can be manipulated by derivations that occur within the lexicon. Unlike the event structure templates of Levin and Rappaport Hovav, the LCS of a derived verb may differ from that of its base not just by augmentation but by reduction as well, whether the precise mechanism involves selective copying of the structure of the base or complete copying followed by partial deletion; thus, operations on LCSs do not need to be monotonic or meaning-preserving. If this type of representation or this type of operation on it were unavailable, Dubinsky and Simango's analysis would not be possible.

4.3.2.2 Problems with this type of analysis

An attempt to apply Dubinsky and Simango's theory to resultatives in Pima runs into a number of problems, some of which are not limited to Dubinsky and Simango's particular analysis, but which would be shared by any deletion-type analysis. First, if a derived stative interpretation (*i.e.*, one where the LCS of a verb is altered) is associated with morphological operations within the lexicon, and an interpretation as a resultative

proper (*i.e.*, one where the LCS of a verb is not altered) is associated with morphological operations within the syntax, then the Pima resultatives must occur in both the lexical and syntactic components, since they show both interpretations in different contexts. A single affix should occur in only one or the other component. This problem cannot be solved by claiming that interpretation as a resultative proper is triggered when the resultative suffixes attach outside other verbalizing suffixes (that is, that all resultatives that are outside other verbalizing affixes are necessarily in the syntax, rather than the lexical component), since interpretation as a resultative proper is not limited to such cases. There are verbs which retain an entailment of a past event but which do not involve a verbalizing affix – verbs like *aufpumpen* and *hammer* which lexicalize an event type or instrument.

This brings up another problem regarding target state passives: Dubinsky and Simango’s analysis is formulated to produce only target state passives with derived stative interpretations, and not target state passives whose target states are properly results. That these must be formed in the syntax is shown by Kratzer’s observation that the target state can be provided by a phrasal constituent, as in her *schlampig gekämmt* example in (38), repeated here.

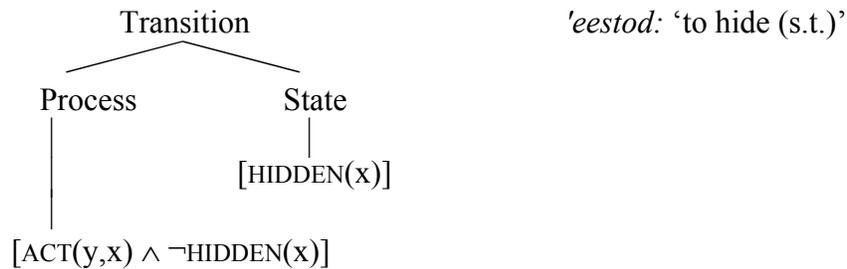
- (38) Die Haare waren immer.noch schlampig gekämmt.
 DET:NM:p hairs be:3p:PAST still sloppily comb:PPRT
 The hair was still combed sloppily. (Kratzer 2000: (16)a)

Presumably a treatment of post-state passives as aspectual morphemes in the syntax would fit easily with Dubinsky and Simango’s analysis of derived statives. Their analysis would need to be extended, however, to explain how target state passives which

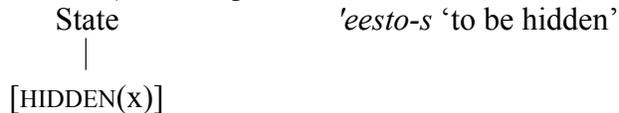
are interpreted as results, as in (38), can be derived in the syntax, as well, and why verbs with verbalizing suffixes and deadjectival verbs, like *zugemacht* ‘closed’ and *geleert* ‘emptied’, would not have target state interpretations.

These criticisms are associated with generating derived stative interpretations and interpretations as results in separate computational components; the possessive resultatives, however, pose problems independent of the computational components that are involved. Recall that for verbs suffixed with the Pima possessive resultative $-(k)c$, an “external” argument is present, but it does not receive the same entailments that are true of the external argument of the eventive form (which is the base for derivation, in this type of analysis). To accomplish this exchange of entailments in a system like Dubinsky and Simango’s would require replacing the Process and Transition nodes by another component to introduce the new external argument, following the steps in (86).

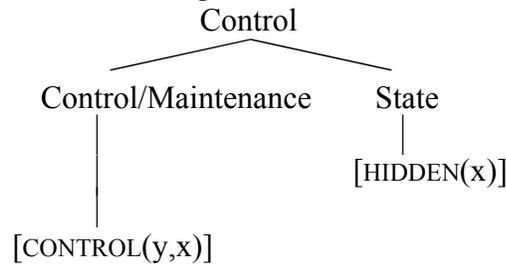
(86) a. *Base verb:*



b. *Process (and Transition) subcomponent deleted:*



c. *New subcomponent added.*¹⁰⁰



'*eestokc* 'to have (s.t.) hidden'

Here, the control that the external argument exerts is over the maintenance of the state, and an LCS like that in (86)c is consistent with a derived stative interpretation, where all reference to a past change of state has been removed. What operation should be involved, however, for those possessive resultatives that have target state interpretations but require the target state to result from a past event? If such an operation does not modify the LCS, how is the resulting predicate temporally stative?

One last objection to a deletion account is that it does not straightforwardly account for the extent interpretation of the Pima passive resultative *-s* (such as with path verbs and positional verbs) and the individual level interpretation that the *-s* appears to force on adjectives: what would be getting deleted, if the argument structure appears unchanged? There may be no way around positing at least a few distinct interpretations for the passive resultative, but reducing the number of interpretations that is required would be desirable, if possible.

To avoid these difficult questions raised by a deletion analysis of Pima

¹⁰⁰ Since this last step requires an extension of Pustejovsky's (1995) structure of LCSs and involves meanings that are not attested in Dubinsky and Simango's analysis of Chichewa, it is not clear what sort of new nodes would be appropriate (the *control/maintenance* and *control* nodes), or what sort of predicate should introduce the argument *y*. Plausibly, the control that *y* exerts should be over the state, rather than the object *x* that is in that state.

resultatives, it would be equally possible to represent the content of Pustejovsky's lexical conceptual structures or Levin and Rappaport Hovav's event structure templates not as a component of a lexical entry, but as a structure that is built in the syntax, as recent theories of syntax and morphology (such as Hale and Keyser 1998) have proposed for other reasons. The following section will discuss how to coordinate a semantically monotonic, purely structure-building account with the apparent morphological derivation.

4.3.3 The structure-building approach

4.3.3.1 Derived statives

If the eventive verbs and the resultatives with a derived stative interpretation are derivationally related semantically as well as morphologically, and if this semantic derivation is monotonic – that is, if operations like deletion are not to be used in the derivation of the derived stative forms – then the meaning that is shared by the derived statives and the eventive forms is all that can be contributed by a hypothetical common derivational source. The meaning of this base for derivation should not include an entailment of an event of the state coming to hold, since the derived statives lack this entailment. This first of all requires that the eventive forms, in spite of their overt appearance, are actually morphologically complex, since some other element must introduce the eventive components of meaning that are not supplied by this hypothetical base, such as this entailment of the an event of change of state. Moreover, if the meaning of the passive resultatives which receive a derived stative interpretation is merely that the target state of the verb holds of their single argument, then the meaning of these derived statives is entirely a part of the hypothetical base: the event that the eventive verb denotes

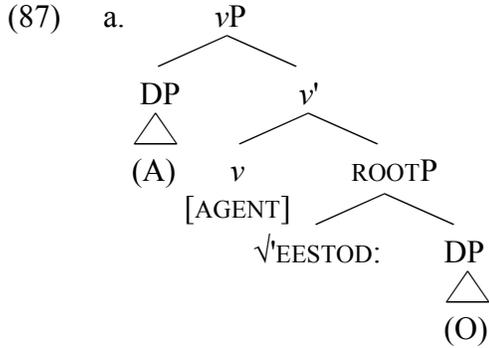
culminates in the coming to hold of this state. There is therefore a contrast between the eventive verbs, which are derived from this hypothetical source by a morpheme that adds meaning but not phonological features, and the derived statives, which are derived from this hypothetical source by a morpheme that adds phonological features but no meaning. This is at a minimum unexpected, and potentially undesirable.

Rather than adding no meaning at all, it is possible that the passive resultative morpheme on a structure-building account like this would introduce a slight change in meaning, such as a presupposition that the eventuality involved in this predication is a state. Moreover, some morpheme very much like Kratzer's target stativizer of (37) would be needed for the derivation of resultatives proper with a target state interpretation – resultatives that express a target state that is required to be a result. Resultatives with a post state interpretation would also require a morpheme like Kratzer's post stativizer. A structure-building account may therefore be viewed as merely an extension of Kratzer's (2000) proposal; one additional morpheme is needed for the derived statives, and the abstract roots which she proposes merely turn out not to correspond to syntactic atoms.

In the presentation here of a structure-building account, I will make a number of assumptions about general syntactic relations of arguments which are common to syntactic theories that would encode this kind of event structure information syntactically. Since the external argument is not something which is shared by the eventive and (passive-like) stative forms, it clearly cannot be present in their common derivational source. Following Kratzer (1996) and others, I will assume that the external argument is not an argument of the verb root, but is introduced by a dedicated voice head;

in English, this voice head need not have any phonological realization. A verbal extended projection which lacks this active voice head will also lack an external argument, just like an eventive passive. I will also assume (following Hale and Keyser 1998, for instance) that adjectives cannot syntactically combine with an argument directly, but require the mediation of some other element, such as a light verb or some element that occurs in nominal structure; the precise treatment of causativized adjectives will be discussed further after the basic analysis of lexical causative verbs has been sketched.

The principle behind an account of this type can be illustrated with a transitive change-of-state verb, which lexicalizes a target state but not an event type that brings about that state, like Pima *'eestod*: 'to hide'. Eventive occurrences of this verb, as in the sentence 'My grandfather hid his gold' in (83)a, would be built from a structure something like (87); the root for this verb, indicated as $\sqrt{\text{EESTOD}}$, has been given just the meaning that is shared by the eventive verb and the resultatives. The precise structure seen here, though commonly used (for example, Kratzer 1996), will be seen to require modification to account for other properties of the resultatives.



b. Constant expressions:

$$\begin{aligned} \llbracket \sqrt{\text{'EESTOD:}} \rrbracket &= \lambda x [\lambda s [\mathbf{hidden}'(x,s)]] \\ \llbracket v_{[\text{AGENT}]} \rrbracket &= \lambda P [\lambda y [\lambda e [\exists e' [P(e') \wedge \mathbf{cause}'(e,e') \wedge \mathbf{agent}'(e,y)]]]] \\ &\text{(to be revised)} \end{aligned}$$

c. Calculations:

$$\begin{aligned} \llbracket \text{ROOTP} \rrbracket &= \lambda s [\mathbf{hidden}'(O,s)] \\ \llbracket vP \rrbracket &= \lambda e [\exists e' [\mathbf{hidden}'(O,e') \wedge \mathbf{cause}'(e,e') \wedge \mathbf{agent}'(e,A)]] \end{aligned}$$

Here, O and A are constants that are used in place of the individuals denoted by the two DPs (assuming that they are denoting expressions). The variables s , e , and e' range over eventualities of any type, though their range may be restricted by the predicate they occur with (as mnemonically indicated by the choice of s or e for 'state' or 'event'). All semantic combination is by Function Application; the meaning of the non-terminal constituents, given the meaning of the constants in (87)b, is shown in (87)c.

This semantic model is technically incomplete without a specification of the truth conditions for the predicates it employs, namely **hidden'**, **cause'**, and **agent'**. Because the purpose of this discussion is merely to schematize one type of analysis and examine its algebraic form, and because the truth conditions for predicates of natural language like **cause'** and **agent'** are still a matter of debate among linguists, I will not discuss them in detail here. This analysis does assume, however, that such predicates can be defined, and

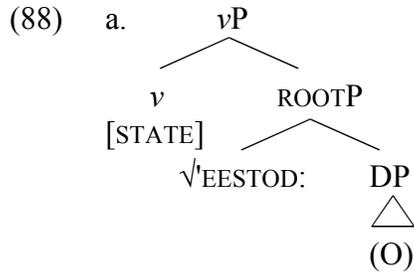
in fact depends crucially on it.¹⁰¹

It will be sufficient for discussion at this point to note that because the meaning of the root is identical (or nearly identical) to the desired meaning of the passive resultative, the proper meaning for this verb with the *-s* suffix can be produced merely by substituting a semantically vacuous head for the light verb in (87).

¹⁰¹ Dowty (1979), for instance, spends an entire section discussing the appropriate truth conditions for **cause'**. Although he does not resolve all the questions concerning causation in natural language, he concludes with the following truth conditions for causation (which he treats as a relation between two sentences represented by ϕ and ψ):

- (i) $[\phi \text{ CAUSE } \psi]$ is true if and only if (i) ϕ is a *causal factor* for ψ , and (ii) for all other ϕ' such that ϕ' is also a causal factor for ψ , some $\neg\phi$ -world is as similar or more similar to the actual world than any $\neg\phi'$ -world is. (Dowty 1979:109)
- (ii) ϕ is a *causal factor* for ψ if and only if there is a series of sentences $\phi, \phi_1, \dots, \phi_n, \psi$ (for $n \geq 0$) such that each member of the series *depends causally* on the previous member. (Dowty 1979:108)
- (iii) ψ *depends causally* on ϕ if and only if ϕ, ψ , and $\neg\phi \rightarrow \neg\psi$.

(In (iii), the implication \rightarrow is the natural language implication, for which Dowty cites Stalnaker (1968).) To be a complete analysis, therefore, similar truth conditions would need to be stated for all the other predicates used, like **agent'** and the more lexical predicates like **hidden'** – a task which is nontrivial.



b. Constant expressions:

$$\begin{aligned} \llbracket \sqrt{ʰEESTOD:} \rrbracket &= \lambda x [\lambda s [\mathbf{hidden}'(x,s)]] \\ \llbracket v_{[STATE]} \rrbracket &= \lambda P [\lambda e [P(e)]]^{102} \end{aligned}$$

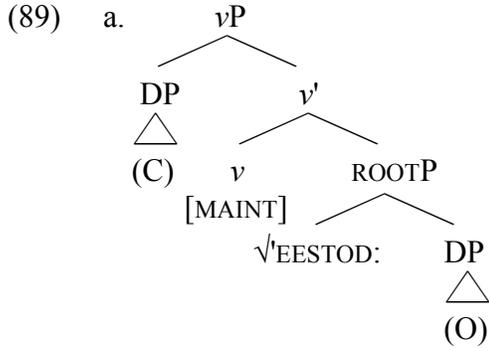
c. Calculations:

$$\begin{aligned} \llbracket \text{ROOTP} \rrbracket &= \lambda s [\mathbf{hidden}'(O,s)] \\ \llbracket vP \rrbracket &= \lambda e [\mathbf{hidden}'(O,e)] \end{aligned}$$

The structure in (88)a forms the basis for a sentence with *'eestos* 'be hidden', like (74)a.¹⁰³ The semantic form given here for $v_{[STATE]}$, which would be expressed by the *-s* suffix in Pima, should be taken only as an initial proposal; what is relevant is that this voice head adds no other participants in the eventuality, that the meaning of its complement is passed on with little or no change, and that its presence removes any necessity for the attachment of the agentive light verb $v_{[AGENT]}$, seen in (87). The *-(k)c* suffix would work in a similarly simple way, as illustrated in (89).

¹⁰² As mentioned above, this morpheme may not be completely devoid of meaning; it may introduce a restriction, perhaps via a presupposition, that the eventuality argument in question ranges over states: $\llbracket v_{[STATE]} \rrbracket = \lambda P [\lambda e [P(e)]]$; $\forall e [P(e) \rightarrow \mathbf{state}'(e)]$, where the presupposition follows the semicolon. This might result in incorrect predictions, however, where the *-s* attaches outside of a verbalizing morpheme like the causative.

¹⁰³ This also requires morphological merger of the root to left-adjoin to the light verb, in order for the *-s* which expresses the light verb $v_{[STATE]}$ to occur as a suffix on *'eesto*.



b. Constant expressions:

$$\begin{aligned} \llbracket \sqrt{\text{'EESTOD:}} \rrbracket &= \lambda x [\lambda s [\mathbf{hidden}'(x,s)]] \\ \llbracket v_{[\text{MAINT}]} \rrbracket &= \lambda P [\lambda y [\lambda e [P(e) \wedge \mathbf{maintain}'(e,y)]]]^{104} \quad (\text{to be revised}) \end{aligned}$$

c. Calculations:

$$\begin{aligned} \llbracket \text{ROOTP} \rrbracket &= \lambda s [\mathbf{hidden}'(O,s)] \\ \llbracket vP \rrbracket &= \lambda e [\mathbf{hidden}'(O,e) \wedge \mathbf{maintain}'(e,C)] \end{aligned}$$

This structure would form the basis for a sentence with *'eestokc* ‘keep hidden’, like (83)b.

The $v_{[\text{MAINT}]}$ head, which would be expressed by the $-(k)c$ suffix in Pima, removes any need for the presence of the light verb $v_{[\text{AGENT}]}$ that introduces an agentive external argument, just like the $v_{[\text{STATE}]}$ does. In place of $v_{[\text{AGENT}]}$, $v_{[\text{MAINT}]}$ would introduce an external argument of a different kind (as expressed by the predicate $\mathbf{maintain}'(e,y)$).

It should be clear from these examples that the meaning of a suffixed form is strongly dependent on the meaning of the root itself. The variation in interpretation that has been observed for verbs and adjectives with the $-s$ suffix in Pima can therefore be explained as variation in the types of meanings of the roots that this suffix attaches to. A number of quite distinct theories of lexical semantics accept that roots may differ significantly in their semantics, perhaps including such ontologically diverse items as

¹⁰⁴ Here, the truth conditions for $\mathbf{maintain}'$ are intended to capture whatever is asserted about the subject of verbs with the $-(k)c$ suffix – this individual is somehow responsible for maintaining the state that is predicated of the direct object.

properties (of individuals or events), relations, degrees, paths, and so on; Levin (2004) points out, however, that while many theories of lexical semantics put a large proportion of the burden of meaning on roots, there has not been much progress on what the meanings of the entire set of roots of a language actually are. The suggestions in (87) through (89), which involve properties of events and relations between eventualities and individuals, are merely suggestive, and it should not be inferred that all roots should have a similar form (like, for example, the roots involved in relational verbs like *cost* and *weigh*, those involved in unergative verbs like *sing* or *whistle*, or those involved in path verbs like *sink* and *zigzag*). Because the semantics of roots is not a well-developed field, I may not be able to base many firm conclusions on it for the purpose of investigating Pima resultatives. Nevertheless, several plausible proposals for the semantics of the *-s* and the semantics of certain classes of roots may be made.

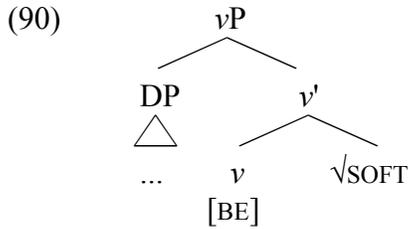
4.3.3.2 Path verbs and adjectives

One favorable prediction which this analysis makes concerns the individual level interpretation that is associated with adjectives and path verbs with the *-s* suffix, in conjunction with a syntactic account of the individual level/stage level distinction along the lines of that proposed by Diesing (1990). She proposes, based on extraction properties in German, that the subject of a stage level predicate is merged into syntactic structure quite low in a clause (*i.e.*, governed within the verb phrase), while the subject of an individual level predicate is merged quite high (*i.e.*, ungoverned in the specifier of IP). For the sake of comparison with the present analysis, we might suppose that stage level subjects are introduced by a voice head like that of (87), while individual level subjects

are introduced by some element higher in the structure, possibly as high as a Tense projection, but the precise structural position may remain unspecified – as long as this position is available in structure that dominates the $v_{[STATE]}$ light verb of (88).

If we adopt Diesing's proposal, there are then three positions where arguments may be introduced in a clause: as an internal argument (*i.e.*, an argument of the root), as an argument of a light verb like $v_{[AGENT]}$ or $v_{[MAINT]}$, or in the high position in which subjects of individual level predicates are merged. If the presence of this $v_{[STATE]}$ light verb corresponds to the absence of other light verbs like $v_{[AGENT]}$, then the only arguments that we expect to see on a verb with the *-s* suffix are internal arguments or arguments associated with this individual level interpretation. Verbs and adjectives with the *-s* suffix should not occur with stage level external arguments.

This provides a simple explanation for the individual level interpretation that adjectives with the *-s* in Pima receive. I will assume that the merge position of subjects of adjectives depends on the stage level or individual level status of the adjective, in just the same way as for verbs. If what distinguishes adjectives from verbs is that adjectives require some other element in order to be predicated of their argument (as proposed by Hale and Keyser 1998), it is natural to assume that for the low merge position for subjects corresponding to a stage-level interpretation of the adjective, there is an adjectival copular light verb $v_{[BE]}$, in addition to the light verbs introduced above, which mediates between an adjective with a stage level interpretation and its argument, as in (90).



If the light verb $v_{[STATE]}$ attaches to the root in place of the adjectival copular light verb (and moreover makes the subsequent attachment of the copular light verb impossible), then a stage level interpretation for this adjectival predicate is rendered impossible, as well. The only remaining position in which a subject may be introduced is the higher one, corresponding to an individual level interpretation of the adjective.¹⁰⁵

This analysis also appears to be correct for Pima verbs which receive extent readings with the $-s$ suffix, many of which involve spatial location or motion along a path and do not take an object or internal argument. Interpretations of this sort were discussed in section 4.1.1; an example of such a verb in Pima is *him* ‘to go (walking, on foot)’ (repeated from (62)).

- (62) a. Muula 'a-t 'uug voog gahi hii.
 mule AUX-PFV high road across go:PFV
 The mule went across the bridge.
 b. Hodai voog 'o 'am gahi him-s 'uug voog veco.
 rock road 3:SUB:IMP DXF across go-PASR high road under
 The paved road goes under the bridge.

The use of this verb without the $-s$ suffix in (62)a involves motion of the referent of the subject DP, and this motion may involve a particular manner (here, walking) and may instantiate a particular path (here, across the bridge). Because this predicate receives a stage level interpretation, Diesing’s theory predicts that the subject should occur within

¹⁰⁵ Adjectives and the Pima resultatives will be discussed further in the section on resultatives with target state interpretations.

the verb phrase, which I am assuming here corresponds to its introduction by a light verb like $v_{[AGENT]}$. The use of this verb with the $-s$ suffix, in contrast, involves an individual level interpretation, which in Diesing's theory corresponds to the subject DP being merged higher than the verb phrase; this position is still available to license an argument even if the only light verb present is $v_{[STATE]}$ (which is expressed by the $-s$ suffix). The occurrence of this verb with an extent reading in (62)b does not involve motion (and so cannot straightforwardly involve a manner of motion), but does involve a path of a particular type.¹⁰⁶ In this case, it is the referent of the subject DP itself – the paved road, not its motion – which instantiates this path, and as predicted, this is a property of an individual, not a stage. If the manner specification of the verb were completely irrelevant, then all verb roots that involve a similar path should be substitutable in all contexts when suffixed with the $-s$. Interestingly, this is not the case, since while *hims* is appropriate for extent readings of roads, trails, and the like, *mels* (from the verb *med*: 'to run (or to go in a wheeled vehicle)') is preferred for extent readings of rivers and streams.

Gawron (2005) examines verbs in English that have both a path of motion reading and an extent reading, and proposes the representation in (91)c as a general meaning for the verb *zigzag* with a motion reading (91)a and an extent reading (91)b. A parallel analysis for the Pima motion verb *him* is given in (92).

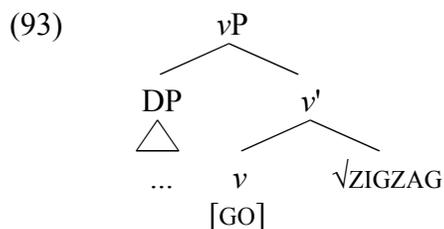
- (91) a. The mountain goat zigzagged from the valley floor to the ridge.
 b. The road zigzagged from the valley floor to the ridge.
 c. $\llbracket \text{zigzags}_s \rrbracket = \lambda e [\exists \pi [\text{path}'_s(e) = \pi \wedge \text{zigzag-shape}(\pi)]]$

- (92) $\llbracket \sqrt{\text{HIM}_s} \rrbracket = \lambda e [\exists \pi [\text{path}'_s(e) = \pi \wedge \text{walking}'(e)]]$

¹⁰⁶ Motion in a metaphorical sense or motion of a perspective point may appear to be involved, and may be why Talmy (1996) refers to cases of this type as 'fictive motion'.

Here, the variable e ranges over eventualities (including both events and states), while π ranges over spatiotemporal paths. The predicate **path'** is indexed to a particular axis S , which may be a spatial or temporal axis (provided by the context or by adjunct phrases). Informally, **path'** _{S} (e) = π is true just in case the spatiotemporal extent of the eventuality e , evaluated with reference to the axis S , is the path π .¹⁰⁷

Other aspects of Gawron's proposal would need further work to be applied to Pima, such as how manner might be evaluated for a stative eventuality in an extent reading such that the verb *him* 'to go (on foot)' is preferred for roads and *med*: 'to run, to drive' is preferred for rivers. For the present discussion, however, we can assume that since the verb root makes no reference to nominal arguments, any such argument must be added by some other element, such as a light verb. Sentence (93) shows a structure for stage level motion uses.



Here, a light verb GO is assumed to introduce the verb's argument.¹⁰⁸ If the $v_{[STATE]}$ light verb expressed by *-s* attaches to a root in place of $v_{[GO]}$ in (93), the stage-level external argument that it introduces would not be present, either. Interpreting Diesing (1992) to mean that subjects of individual level predicates are merged above the level of a light

¹⁰⁷ For Gawron's formal definition of the **path'** operator, see Gawron (2005).

¹⁰⁸ A light verb GO is used here, rather than the agentive light verb seen earlier. The semantic formulation of the agentive light verb in (87) is undesired both because it introduces causation and because agentive entailments are not desired for motion (since non-agents may move).

verb, predicates like *him-s* should only be able to occur with a subject if the predicate is interpreted as individual level, yielding the extent interpretation of sentences like (62)b.¹⁰⁹

4.3.3.3 Target state resultatives

The structure-building approach provides a nice explanation of the interpretation of the resultative suffixes on adjectives, path verbs, and verbs which specify only a change of state with no associated event type; all these classes of resultatives receive derived stative interpretations. The analysis becomes more complicated when resultatives with target state interpretations are considered, however; these are verbs similar to the German verb *aufpumpen* which was discussed in the context of Kratzer's analysis of the German state passive. Pima verbs which receive this interpretation include *dagkuan* 'to wipe clean', *mulin* 'to break by bending', *helig* 'to spread out (on a line)', *vakuan* 'to clean by bathing', and *viitkuan* 'to roll up (e.g., cloth)'.

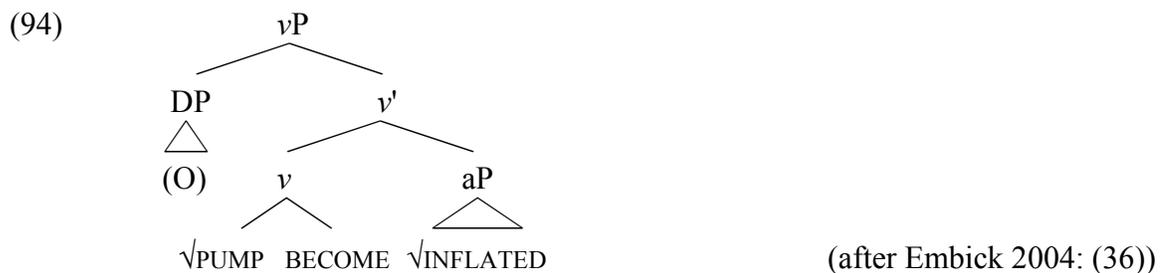
The comment which was made in the discussion of the verb *aufpumpen* in section 4.3.1 was that this verb specifies both the target state that results from some event as well as the type of event that results in that state. The representation of the root *aufpump-* was given in (36)a, repeated here

- (36) a. $\llbracket \text{aufpump-} \rrbracket = \lambda x \lambda s \lambda e [\text{event}(e) \wedge \text{pump}(e) \wedge \text{cause}(s)(e) \wedge \text{inflated}(x)(s)]$
 (Kratzer 2000: (12))

¹⁰⁹ To be complete, this analysis should also specify the semantic interpretation of subjects of individual level predicates. One possibility is that the spatiotemporal extent of the referent of the subject of an individual level predicate instantiates an eventuality which fills *e* in (91). Where the meaning of a verb root does not include a path, but instead only an event type, the referent of the subject must similarly instantiate an eventuality which is of that event type, thus leading to conclusions like the presence of a speech impediment in (67)d, for example, with the verb root *gikuj* 'to whistle'.

It was suggested earlier that portions of this representation could correspond to syntactically distinct elements: the predicate *pump(e)* could correspond to a syntactic element which is expressed with the phonological features *pump-*, and the predicate *inflated(x)(s)* could correspond to a syntactic element which is expressed in this context with the phonological features *auf-*. It was also mentioned earlier that the predicate *event(e)*, which is intended to force the eventuality which fills the variable *e* to be an event proper, is actually unnecessary, since *pump(e)* will have the same effect.

The general framework within which this structure-building analysis is being proposed assumes a syntactic decompositional analysis of event structure – that syntactic structure encodes the same information that Pustejovsky’s lexical conceptual structures (and other such theoretical constructs) do. Since verbs of the *aufpumpen* type have the same event structure as do verbs with resultative secondary predicates – a type of event which results in a state – these two verb types will be represented with the same syntactic structure. I will therefore adopt the analysis of resultative secondary predication given in Embick (2004). Embick’s proposal is shown in (94), extended to the verb *aufpumpen*.



The lexical root which specifies the type of event that results in the target state ($\sqrt{\text{PUMP}}$) combines with a light verb by what Embick calls DIRECT MERGE, an operation which merges two syntactic atoms into a single head, and which is interpreted semantically in a

different way than the interpretation normally associated with complement-taking (namely, function application). The interpretation which Embick associates with the syntactic structure of direct merge is given in (95)a. An alternative proposal utilizing eventuality arguments and a representation parallel to Kratzer's representation of *aufpump-* is given in (95)b.

- (95) a. $\lambda P [\lambda x [\text{BY}(\text{ROOT}, \text{BECOME}(P(x)))]]$ (modified from Embick 2004: (49b))¹¹⁰
 b. $\lambda P [\lambda x [\lambda s [\lambda e [\text{ROOT}(e) \wedge \text{cause}'(s)(e) \wedge P(x)(s)]]]]$

On Embick's analysis in (95)a, a root which is directly merged with a light verb BECOME (whose interpretation fills the position of ROOT in the representation) specifies a 'means' by which the property *P* (which is provided by the resultative secondary predicate through function application) comes to hold of the individual *x*; Embick uses the two-place relation BY to express this meaning, citing Dowty 1979 and Parsons 1990 for discussion of this relation. This meaning is entirely parallel to that of (95)b, however, with **cause'** in place of the BY relation, and where the root specifies an event type which results in the target state given by *P*. Assuming that the meaning of the root $\sqrt{\text{PUMP}}$ is an event type *pump(e)* and that the interpretation in (95)b is associated with direct merge of the root and the light verb, the representation in (94) will yield a meaning for *aufpump-* which is identical to Kratzer's proposed representation (36), with the absence of *event(e)*.

This analysis can be carried over directly for Pima verbs like *dagkuan* 'to wipe clean'. If the verb *dagkuan* specifies both a manner (wiping, movement along a surface)

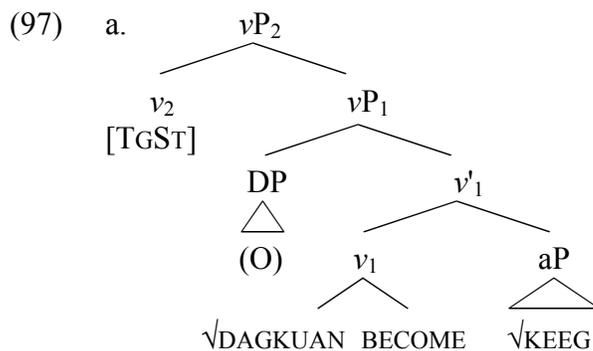
¹¹⁰ As mentioned in the discussion of Embick's proposal in section 3.2.2, he labels his light verb FIENF rather than BECOME because he does not wish to associate this predicate with a telic interpretation, as is typical for most formulations of a light verb BECOME. Since telicity is not the main issue here, and since the label FIENF is less easily understood, I am using the label BECOME for this light verb.

and a resulting state (that the surface become clean), it would also be given the structure in (94). This vP has a semantic representation with two open eventuality arguments, however. An agentive light verb therefore may not attach to the vP of (94), since this light verb requires its complement to have a single open eventuality argument; it is also reasonable to assume that tense morphemes may only operate on representations with a single open eventuality argument. I will therefore make use of Kratzer's (2000) proposal of an eventizer and a target stativizer to reduce the number of eventuality arguments to one. Her representations for these are repeated below from section 3.2.1.

- (37) Eventizer: $\lambda R \lambda e \exists s R(s)(e)$
 Target stativizer: $\lambda R \lambda s \exists e R(s)(e)$

The target stativizer will attach above the lowest vP , and is realized (when no other light verb occurs higher) by the $-s$ suffix. Sentence (96) is built from the structure in (97).

- (96) Gegosdakud: 'o dagkui-s.
 table 3:SUB:IMP wipe.clean-PASR
 The table is wiped clean.



b. Constant expressions:

$$\begin{aligned} \llbracket \sqrt{\text{DAGKUAN}} \rrbracket &= \lambda e [\mathbf{wipe}'(e)]] \\ \llbracket [\text{aP } \sqrt{\text{KEEG}}] \rrbracket &= \lambda x [\lambda s [\mathbf{clean}'(s) \wedge \mathbf{in}'(x,s)]]]^{111} \\ \llbracket v_{[\text{TGST}]} \rrbracket &= \lambda R [\lambda s [\exists e [R(s)(e)]]] \end{aligned}$$

c. Calculations:

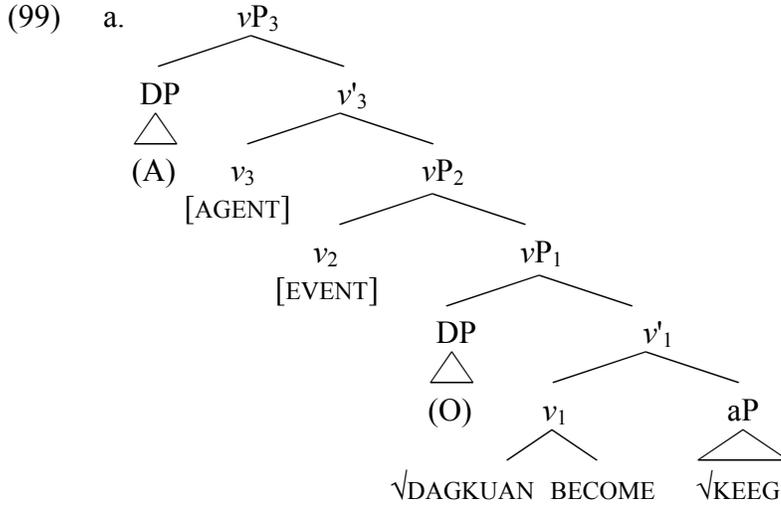
$$\begin{aligned} \llbracket v_1 \rrbracket &= \lambda P [\lambda x [\lambda s [\lambda e [\mathbf{wipe}'(e) \wedge \mathbf{cause}'(s)(e) \wedge P(x)(s)]]]] \text{ (from (95)b)} \\ \llbracket v'_1 \rrbracket &= \lambda x [\lambda s [\lambda e [\mathbf{wipe}'(e) \wedge \mathbf{cause}'(s)(e) \wedge \mathbf{clean}'(s) \wedge \mathbf{in}'(x,s)]]] \\ \llbracket vP_1 \rrbracket &= \lambda s [\lambda e [\mathbf{wipe}'(e) \wedge \mathbf{cause}'(s)(e) \wedge \mathbf{clean}'(s) \wedge \mathbf{in}'(O,s)]] \\ \llbracket vP_2 \rrbracket &= \lambda s [\exists e [\mathbf{wipe}'(e) \wedge \mathbf{cause}'(s)(e) \wedge \mathbf{clean}'(s) \wedge \mathbf{in}'(O,s)]] \end{aligned}$$

The representation of the vP_2 has the semantic properties that are observed for verbs like *dagkuis*: they are temporally stative (which is predicted, since the vP is a predicate of states) and receive a target state interpretation (thus, subsequent temporal modifiers will be predicated of the state, rather than the causing event), and require that the target state result from some event (here, an event of wiping).

When this verb occurs in an eventive use, as in (98), the agent-introducing light verb attaches after the eventizer has attached to (94), yielding the derivation seen in (99).

- (98) Marcus 'o dagkuan heg gegosdakud:
 3:SUB:IMP wipe.clean DET table
 Marcus is wiping the table clean.

¹¹¹ The aP involving the root $\sqrt{\text{KEEG}}$ is involved in the derivation of the adjective *keeg* ‘clean’, which expresses the intended target state of the verb *dagkuan* ‘to wipe (clean)’. This representation for adjectives will be discussed in the following section.



b. Constant expressions:

$$\begin{aligned}
 \llbracket \nu_{[\text{EVENT}]} \rrbracket &= \lambda R [\lambda e [\exists s [R(s)(e)]]] \\
 \llbracket \nu_{[\text{AGENT}]} \rrbracket &= \lambda P [\lambda y [\lambda e [\exists e' [P(e') \wedge \mathbf{cause}'(e,e') \wedge \mathbf{agent}'(e,y)]]]] \\
 &\hspace{15em} \text{(to be revised)}
 \end{aligned}$$

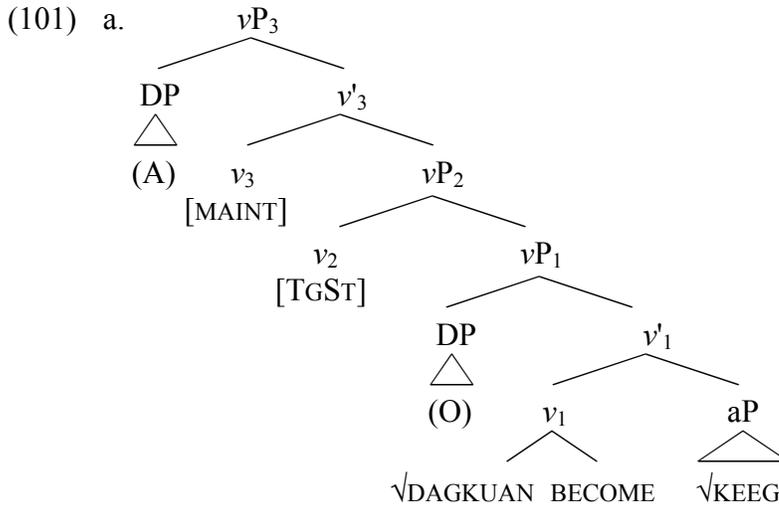
c. Calculations:

$$\begin{aligned}
 \llbracket \nu P_1 \rrbracket &= \lambda s [\lambda e [\mathbf{wipe}'(e) \wedge \mathbf{cause}'(s)(e) \wedge \mathbf{clean}'(s) \wedge \mathbf{in}'(O,s)]] \text{ (from (97)c)} \\
 \llbracket \nu P_2 \rrbracket &= \lambda e [\exists s [\mathbf{wipe}'(e) \wedge \mathbf{cause}'(s)(e) \wedge \mathbf{clean}'(s) \wedge \mathbf{in}'(O,s)]] \\
 \llbracket \nu'_3 \rrbracket &= \lambda y [\lambda e [\exists e' [[\exists s [\mathbf{wipe}'(e') \wedge \mathbf{cause}'(s)(e') \wedge \mathbf{clean}'(s) \wedge \mathbf{in}'(O,s)]] \\
 &\quad \wedge \mathbf{cause}'(e,e') \wedge \mathbf{agent}'(e,y)]]] \\
 \llbracket \nu P_3 \rrbracket &= \lambda e [\exists e' [[\exists s [\mathbf{wipe}'(e') \wedge \mathbf{cause}'(s)(e') \wedge \mathbf{clean}'(s) \wedge \mathbf{in}'(O,s)]] \\
 &\quad \wedge \mathbf{cause}'(e,e') \wedge \mathbf{agent}'(e,A)]]
 \end{aligned}$$

As with the passive resultative in (97), the eventizer is required to enable higher structure to attach. This also produces a predicate with the desired temporal properties: it is eventive by virtue of being a predicate of an event (since the highest eventuality involves an agent). It should be apparent, however, that the representation of the light verb $\nu_{[\text{AGENT}]}$ is still problematic: there are two **cause'** predicates when there should be only one. This problem will be resolved when $\nu_{[\text{AGENT}]}$ is reformulated in the following section.

The possessive resultative *dagkuakc* ‘keep wiped clean’ is derived parallel to (98), though the target stativizer is required rather than the eventizer.

- (100) Marcus 'o dagkua-kc heg gegosdakud:
 3:SUB:IMP wipe.clean-POSR DET table
 Marcus keeps the table wiped clean.



b. Constant expressions:

$$\llbracket v_{[MAINT]} \rrbracket = \lambda P [\lambda y [\lambda e [P(e) \wedge \mathbf{maintain}'(e,y)]]] \quad (\text{to be revised})$$

c. Calculations:

$$\llbracket vP_2 \rrbracket = \lambda s [\exists e [\mathbf{wipe}'(e) \wedge \mathbf{cause}'(s)(e) \wedge \mathbf{clean}'(s) \wedge \mathbf{in}'(O,s)]] \quad (\text{from (97)c})$$

$$\llbracket v'_3 \rrbracket = \lambda y [\lambda e [[\exists e' [\mathbf{wipe}'(e') \wedge \mathbf{cause}'(e)(e') \wedge \mathbf{clean}'(e) \wedge \mathbf{in}'(O,e)]] \wedge \mathbf{maintain}'(e,y)]]$$

$$\llbracket vP_3 \rrbracket = \lambda e [[\exists e' [\mathbf{wipe}'(e') \wedge \mathbf{cause}'(e)(e') \wedge \mathbf{clean}'(e) \wedge \mathbf{in}'(O,e)]] \wedge \mathbf{maintain}'(e,A)]$$

The representation in vP_3 has the properties that are observed for possessive resultative verbs like *dagkua* ‘keep wiped clean’: it is temporally stative (since its open eventuality argument e ranges over states, as required by the predicates **clean'**, **in'**, and **maintain'**), and the target state results from an event of wiping. The target stativizer is required here in order for the light verb $v_{[MAINT]}$ to attach, though since there is no $-s$ suffix present overtly, I assume that this suffix is not realized when other light verbs attach above it.¹¹²

¹¹² It must be the target stativizer which attaches here, and not the eventizer (which is apparently null everywhere), since the eventizer would cause **wipe'** and **maintain'** to be

Before concluding the discussion of this verb type, it should be noted that some verbs which pattern this way, including *dagkuan* ‘to wipe (clean), may in other contexts appear not to lexicalize a target state, but only a manner, in contrast to the German verb *aufpumpen*. It is useful at this point to reconsider the example of *scrubbed* mentioned in section 3.3.5, in which the participle of a verb which apparently specifies only the event type (without a target state) can nevertheless be interpreted as if it did lexicalize a target state – thus with a meaning identical to *scrub clean* – if doing so is the only way to interpret an expression involving the verb. The example context is as a target state passive resultative, repeated below.

(59) a.? When I came back the next day, the tub was still scrubbed.

Since the interpretation which *scrubbed* receives in such cases is identical to the interpretation of *scrubbed clean*, the participle *scrubbed* must also include a resultative secondary predicate with the meaning of *clean*, but which is not realized by any overt phonological material; the same may be true for some verbs in Pima. The derivation would then proceed exactly as in (97).

If this target state interpretation is available for verbs like *scrub*, however, it goes against a generalization made by Rappaport Hovav and Levin (1998) that each subevent in the event structure of a clause must be associated with overt phonological material. An explanation for this generalization might also explain why instances where *scrubbed* receives a target state interpretation are only marginally acceptable, or require a rich context in order to sound acceptable. Similarly, a number of Pima verbs which pattern as

predicated of the same eventuality argument, resulting in inconsistency since **wipe'** requires an event and **maintain'** requires a state.

target state resultatives also do not have phonological material that clearly names an event and phonological material that names a target state; this includes even *dagkuis* ‘wiped (clean)’, for which a structure was shown in (97).¹¹³ Many of these apparent target state passives in Pima may therefore involve coercion to make a verb which should only allow a post-state interpretation interpretable in a context which should only allow a target state interpretation.

Another potential problem with the analysis presented in this section is that Kratzer (2000) observes that German verbs with a resultative secondary predicate only receive a post stative interpretation, not a target state interpretation as would be predicted if resultative secondary predication was given the analysis discussed in this section. Verbs in Pima like *dagkuan* ‘wipe (clean)’ are acceptable with adverbials like *still*, however, which is indicative of a target state interpretation rather than a post state interpretation. The problem may lie with Kratzer’s empirical claim, however, and not with this analysis. Details involving post stative interpretations will be discussed in section 4.3.3.5.

4.3.3.4 Morphological causatives

A number of problems were also seen in the previous section not with the analysis of the resultative morphemes themselves, but with the formulation of the agent-introducing light verb $v_{[AGENT]}$. As formulated thus far, the semantic representation of $v_{[AGENT]}$ also introduces lexical causation. The behavior of Pima resultative suffixes on

¹¹³ The verb *dagkuan* ‘to wipe’ in fact is morphologically complex, but in a different way than is indicated in (97); *dag-* indicates an action with the hands, and *-kuan* indicates an action along a surface. They may properly be analyzed as involving the combination of a root and a light verb, but not necessarily the same kind that is proposed in (94) and (97).

b. Constant expressions

$$\begin{aligned} \llbracket \sqrt{\text{KEEG}} \rrbracket &= \lambda s [\text{clean}'(s)] \\ \llbracket v_{[\text{BE}]} \rrbracket &= \lambda P [\lambda x [\lambda s [P(s) \wedge \text{in}'(x,s)]]]^{114} \end{aligned}$$

c. Calculations

$$\begin{aligned} \llbracket v' \rrbracket &= \lambda x [\lambda s [\text{clean}'(s) \wedge \text{in}'(x,s)]] \\ \llbracket vP \rrbracket &= \lambda s [\text{clean}'(s) \wedge \text{in}'(O,s)] \end{aligned}$$

Here, as before, I use *O* to represent the referent of the subject DP (assuming that the DP is a referring expression).

When the passive resultative suffix *-s* attaches directly to the root, as in (102)c, only an individual level interpretation for the predicate is allowed – presumably for the reason given in the previous section, that the subject must then be merged at a higher structural position associated with an individual level interpretation of the predicate.

The attachment of the *-s* to the causativized form of this adjective, however, motivates a revision of the above analysis regarding causation and the external argument.

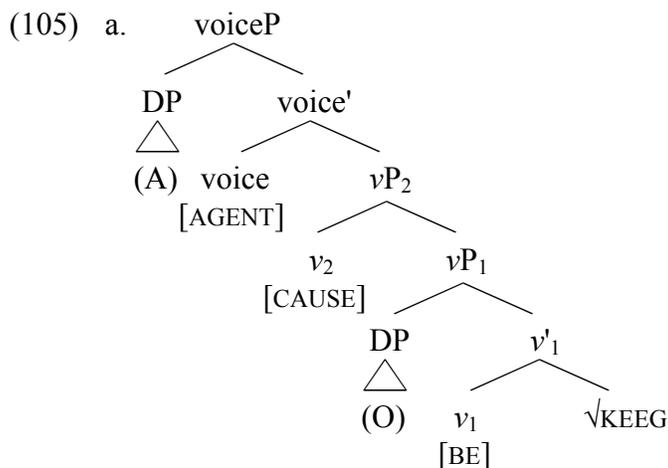
- (104) a. Marcus 'o keeg-cud heg gegosdakud:
 3:SUB:IMP clean-CAUS DET table
 Marcus is cleaning the table.
 b. Gegosdakud: 'o keeg-cud-s.
 table 3:SUB:IMP clean-CAUS-PASR
 The table is cleaned.

In the eventive causative sentence (104)a, the object which is clean – which fills the same role as the object that is introduced by the copular light verb in (103) – is still present; I therefore conclude that the light verb which introduced this argument in (102)b is still present in (104), even though it is not phonologically realized. While the causative suffix

¹¹⁴ I follow Parsons (1990) in using *in'*(*x,s*) to introduce the argument of which the state *s* holds; this means that the state *s* is true of the individual *x*. There appears to be no semantic reason why **hidden'** and **clean'** should differ in this way, so I interpret this to be part of the categorical distinction between verbs and adjectives (encoded in the semantic representation).

–*cud* is also present in (104)b, however, the causer argument is not. There is still an element of causation that is present, however: the passive resultative in (104)b is interpreted as a resultative proper, rather than a derived stative, meaning that some event results in the state of the table being clean. Recall from section 4.1 that this is the interpretation which results when the *-s* is attached outside of a verbalizing morpheme like the causative. Since on the structure-building analysis the *-s* does not result in deletion of any meaning, we are forced to conclude that the *-cud* suffix is associated only with the introduction of this causing event, and that some other phonologically unrealized morpheme must be responsible for the introduction of the causer argument in (104)a; in (104)b, the *-s* presumably obviates its attachment.

This sort of split between the introduction of a causing eventuality and an argument that is involved in that eventuality has already been proposed for a number of languages by Pylkkänen (2002). We may therefore refine the analysis presented previously by positing distinct causative and agent-introducing morphemes, as shown below; (105) shows the structure from which the eventive causative of (104)a is built.



b. Constant expressions

$$\begin{aligned} \llbracket \sqrt{\text{KEEG}} \rrbracket &= \lambda s [\mathbf{clean}'(s)] \\ \llbracket v_{[\text{BE}]} \rrbracket &= \lambda P [\lambda x [\lambda s [P(s) \wedge \mathbf{in}'(x,s)]]] \\ \llbracket v_{[\text{CAUSE}]} \rrbracket &= \lambda P [\lambda e [\exists e' [P(e') \wedge \mathbf{cause}'(e,e')]]] \text{(Pylkkänen 2002:76)}^{115} \\ \llbracket \text{voice}_{[\text{AGENT}]} \rrbracket &= \lambda x [\lambda e [\mathbf{agent}'(e,x)]]^{116} \text{(Pylkkänen 2002:79)} \end{aligned}$$

c. Calculations

$$\begin{aligned} \llbracket vP_1 \rrbracket &= \lambda s [\mathbf{clean}'(s) \wedge \mathbf{in}'(O,s)] && \text{(=(103)c)} \\ \llbracket vP_2 \rrbracket &= \lambda e [\exists e' [\mathbf{clean}'(e') \wedge \mathbf{in}'(O,e') \wedge \mathbf{cause}'(e,e')]] \\ \llbracket \text{voice}' \rrbracket &= \lambda x [\lambda e [\exists e' [\mathbf{clean}'(e') \wedge \mathbf{in}'(O,e') \wedge \mathbf{cause}'(e,e') \wedge \mathbf{agent}'(e,x)]]] \\ \llbracket \text{voiceP} \rrbracket &= \lambda e [\exists e' [\mathbf{clean}'(e') \wedge \mathbf{in}'(O,e') \wedge \mathbf{cause}'(e,e') \wedge \mathbf{agent}'(e,A)]] \end{aligned}$$

For the stativized causative in (104)b, the light verb from section 4.3.3 realized by the *-s* suffix would attach in place of the agentive voice head, resulting in a predicate whose semantic representation is as in (106), essentially the same as vP_2 of (105)c.¹¹⁷

$$(106) \quad \llbracket (O) \text{ keeg-cud-s} \rrbracket = \lambda e [\exists e' [\mathbf{clean}'(e') \wedge \mathbf{in}'(O,e') \wedge \mathbf{cause}'(e,e')]]$$

The absence of any further specification of the higher eventuality argument *e* (corresponding to the causing eventuality) would allow it to range over either states or events; this is not sufficient, however, to create a predicate which is always temporally stative. A predicate whose eventuality argument ranges over states would have this

¹¹⁵ Pylkkänen's causative morpheme includes existential quantification of the target state. If it did not, then the eventizer and target stativizer of the previous section could also be used here to select which eventuality tense will modify, though this would result in target state interpretations for such forms, rather than only post state interpretations.

¹¹⁶ While the roots and light verbal heads seen so far merge by means of a rule of function application, voice heads generally merge by means of a rule of event identification or event modification; for the formulation of such a rule, see Heim and Kratzer (1998).

¹¹⁷ Now that nominal- and eventuality-introducing morphemes have been distinguished, the agent-introducing head has been labeled *voice*; this distinction loosely follows Pylkkänen (2002). The maintainer-introducing morpheme has also been labeled as *voice*. It would be possible to label all nominal-introducing morphemes as *voice* and all eventuality-introducing morphemes as *v* (or to distinguish all morphemes which combine by event identification, for instance), though the only eventuality-introducing morpheme is the causative, and by this criterion, the morpheme currently labeled $v_{[\text{STATE}]}$ would not fit in either category, though intuitively it seems to form an opposition to $\text{voice}_{[\text{AGENT}]}$.

property, but restricting the causing eventuality e to states does not fit the data in Pima; verbs like *keegcuds* are stative even when this causing eventuality is taken to be an event proper. To derive a predicate which is temporally stative from a predicate of events like (106) would require an aspectual operator like the post stativizer proposed by Kratzer (2000), reproduced in (107)a (originally from (37)); in fact, Kratzer claims that a post state reading is the only reading available to state passives of causativized adjectives in German and English, like *geleert* ‘emptied’. The semantic representation of *keegcuds*, derived by combining (106) with the post state operator of (107)a, is shown in (107)b.

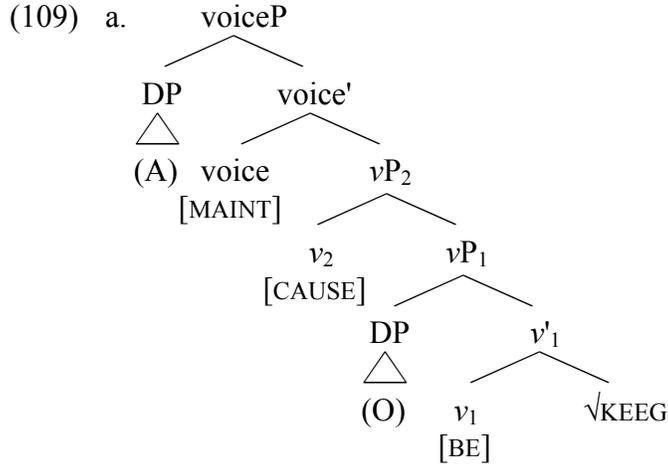
- (107) a. $\llbracket \text{Aspect}_{[\text{PERF}]} \rrbracket = \lambda P \lambda t \exists e [P(e) \wedge \tau(e) < t]$
 b. $\llbracket \text{Aspect}_{[\text{PERF}]} P \rrbracket = \lambda t [\exists e [\exists e' [\mathbf{clean}'(e') \wedge \mathbf{in}'(O, e') \wedge \mathbf{cause}'(e, e')] \wedge \tau(e) < t]]$

In words, this means that the running time of the causing event e occurred before some other time t , which would remain to be further modified by higher tense operators.

The light verb $v_{[\text{MAINT}]}$ which is expressed by the $-(k)c$ suffix would attach to the vP_2 from (105) in exactly the same way as the voice head that introduces the agent, likewise requiring causation and the external argument to be introduced by distinct heads.¹¹⁸ This is shown schematically in (109) for the sentence in (108).

- (108) Gegosdakud: 'a-ñ keeg-cud-c.
 table AUX-1s:SUB clean-CAUS-ST
 I keep the table cleaned.

¹¹⁸ As with the agent-introducing head, the head which introduces the maintainer must combine with its complement by event identification or event modification.



b. Constant expressions (new relative to (105))
 $\llbracket \text{voice}_{[\text{MAINT}]} \rrbracket = \lambda y [\lambda e [\mathbf{maintain}'(e,y)]]$ (revised from (89)b)

c. Calculations
 $\llbracket vP_2 \rrbracket = \lambda e [\exists e' [\mathbf{clean}'(e') \wedge \mathbf{in}'(O,e') \wedge \mathbf{cause}'(e,e')]]$ (from (105)c)
 $\llbracket v'_3 \rrbracket = \lambda y [\lambda e [\exists e' [\mathbf{clean}'(e') \wedge \mathbf{in}'(O,e') \wedge \mathbf{cause}'(e,e') \wedge \mathbf{maintain}'(e,y)]]]$
 $\llbracket vP_3 \rrbracket = \lambda e [\exists e' [\mathbf{clean}'(e') \wedge \mathbf{in}'(O,e') \wedge \mathbf{cause}'(e,e') \wedge \mathbf{maintain}'(e,A)]]$

The final representation for *keegcudc*, corresponding to vP_3 in (109)c, does not require the post stativizer of (107)a in order to be temporally stative. If the predicate **maintain'** requires that its eventuality argument range over states only, then the temporal stativity of the overall predicate is guaranteed, since a predicate of states is necessarily temporally stative.

The semantic representations of the stativized predicates in (107) and (109) make mention of two eventualities, one of which causes the other. This initially appears to be the desired result, since both of these forms were claimed earlier in this chapter to be resultatives proper, lacking derived stative readings; this is also the pattern of data claimed by Kratzer (2000) for German and English causativized adjectives. We will see in the next section, however, that this empirical claim may not be correct. Such forms

may involve a kind of target state reading, for which the precise representations here will pose problems. First, however, we must reconcile the changes made by splitting voice and causation with the initial analysis given for the Pima resultatives $-s$ and $-(k)c$ on lexical causative verbs like *'eestod*: ‘to hide’.

We may compare $[[keeg]cud]c$, where the $-(k)c$ attaches outside a morphological causative suffix, with the analysis of $['eesto]kc$ given above in section 4.3.3. The semantic representations of these verbs are repeated in (110).

- (110) a. $[[_{\text{voiceP}} 'eestokc]] = \lambda e [\mathbf{hidden}'(O,e) \wedge \mathbf{maintain}'(e,A)]$ (from (89)c)
 b. $[[_{\text{voiceP}} keegcudc]] = \lambda e [\exists e' [\mathbf{clean}'(e') \wedge \mathbf{in}'(O,e') \wedge \mathbf{cause}'(e,e') \wedge \mathbf{maintain}'(e,A)]]$ (from (109)c)

Apart from the difference in argument-taking ability between **hidden'** and **clean'**, these representations differ in the presence of **cause'** and in the eventuality that **maintain'** is predicated of. In the analysis of $-s$ and $-(k)c$ presented in section 4.3.3, these resultative suffixes attached directly to the root \sqrt{EESTOD} : in place of the voice head that introduced both causation and the agentive external argument. Now that causation and the agentive external argument are introduced by distinct heads, however, the possessive resultative might in principle attach directly to the root in place of the causative light verb, or might attach after the causative light verb but in place of the agent-introducing voice head.

There are several reasons to conclude that in fact the $-(k)c$ suffix always attaches outside of a causative light verb, however, with a revised representation for (110)a as in (111).

- (111) $[[_{\text{voiceP}} 'eestokc]] = \lambda e [\exists e' [\mathbf{hidden}'(O,e') \wedge \mathbf{cause}'(e,e') \wedge \mathbf{maintain}'(e,A)]]$

First, there is an asymmetry in the behavior of the $-s$ and $-(k)c$ suffixes which disfavors attaching the possessive resultative $-(k)c$ directly to a strictly state-denoting

root. While the passive resultative *-s* may attach to the apparent adjectival form of a word like *keeg* ‘clean’ (*i.e.*, without the copular *-aj* present, thus forcing an individual level interpretation), the possessive resultative *-(k)c* may not, as seen in (112).¹¹⁹

- (112) a. 'Oidag 'o s-keeg-s.
 field 3:SUB:IMP S-clean-PASR
 The field is (permanently) clean (*i.e.*, clear, barren).
 b. *'Oidag 'a-ñ s-keeg-c.
 field AUX-1s:SUB S-clean-POSR
 ('I keep the field clean', intended, but bad with any meaning)

Adjectives like *keeg* ‘clean’, *moik* ‘soft’, *toa* ‘white’, and *ko'ok* ‘painful’ do not license the *-(k)c* suffix, and, interestingly, neither do many non-positional stative verbs like *kee'id* ‘hate’ and *maac* ‘know’, even though the *-s* suffix attaches to all these forms; in contrast, the *-(k)c* suffix may attach to any of these when they are causativized. The possessive resultative *-(k)c* suffix in fact is sometimes associated with a causative interpretation even when no overt causative is present, as in (113) (repeated from (77)).

- (113) a. Juupin 'o heg kanaho.
 sink 3:SUB:IMP DET boat
 The boat is sinking.
 b. Kii damhod:ag 'o juupin-c heg Marcus.
 house ceiling 3:SUB:IMP sink-POSR DET
 The ceiling has Marcus hunched over.

The root involved in the verb *juupin* ‘to sink’ presumably involves motion along a path, and in fact patterns like other motion verbs with the *-s* suffix, yielding only nominal and extent interpretations. The affixation of the *-(k)c* suffix to the apparent bare verb is

¹¹⁹ In (112)b, the copular light verb which is normally expressed as *-aj* in predicative uses of this adjective must still be present, since it is the only possible way to introduce the object; the object cannot be merged in the position that the subject of an individual level predicate would occupy, since there is another argument in this clause that must occupy the subject position. This light verb is presumably silent.

accompanied by the introduction of (stative) causation: it is an inherent property of the ceiling – its low height – that is responsible for Marcus’s condition of being hunched over. The generalization about where the $-(k)c$ suffix may attach, then, is that it may only attach to a word that involves causation.¹²⁰

Secondly, the eventuality which the **maintain'** predicate is predicated of in (110) is different in the two cases: in the lexical causative *'eestokc* ‘keep hidden’ in (110)a, the eventuality which the maintainer maintains is the target state of the verb; in the morphological causative *keegcudc* ‘keep cleaned’ in (110)b, the eventuality which the maintainer maintains is the eventuality which causes the target state (presumably restricted to states by **maintain'**). For this reason, a parallel structure where **maintain'** modifies the causing eventuality seems better in both cases, as in (110)b and (111).

A third argument appears at first to be an argument in favor of assigning distinct structure to lexical causatives and morphological causatives, as in (110), but in fact supports a uniform structure when the empirical generalization concerning derived stative interpretations of Pima possessive resultatives is refined. One way that the two verbs represented in (110) were claimed to differ is in terms of an entailment of an event of the inception of the target state: the generalization made in section 4.2.2 was that since *keegcudc* includes an overt verbalizing affix (*i.e.*, the *-cud* suffix), it should only have an interpretation as a resultative proper, not as a derived stative, while *'eestokc*, which does not include an overt verbalizing affix, should have a derived stative interpretation, the same pattern seen with the passive resultative. If the presence of a causative light verb is

¹²⁰ That is, I assume that a phonologically null causative is present in cases like (113)b.

what produces the entailment of inception of the state, we would expect that the possessive resultative suffix $-(k)c$ should attach to \sqrt{EESTOD} : without such a causative light verb intervening.

We have now seen, however, that the causative light verb as formulated here does not require an event of the inception of the state. An eventuality in which an agent participates is necessarily an event proper, as indicated by the association between stativity and the lack of agency seen in section 2.1, and a causing eventuality which is an event proper does involve the inception of the target state. The general causative morpheme of Pylkkänen (2002), however, which does not introduce an agent, can be associated with either an eventive or a stative causing eventuality, and a stative cause need not involve the inception of the target state, just that one state is responsible for the existence of the target state. The **maintain'** predicate introduced by the possessive resultative is only defined when the eventuality that it takes as its argument ranges over states, so the only interpretation available with the $-(k)c$ suffix is one of stative causation, thus producing an interpretation without an entailment of the inception of the target state – just as for a derived stative interpretation.¹²¹

In fact, this interpretation of the generalization that was made in section 4.2.2, that the presence of an overt verbalizing affix is associated with an entailment of an event of the inception of the target state, while accurate for the cases involving the passive resultative suffix $-s$, is not accurate for the possessive resultative suffix $-(k)c$. The proper

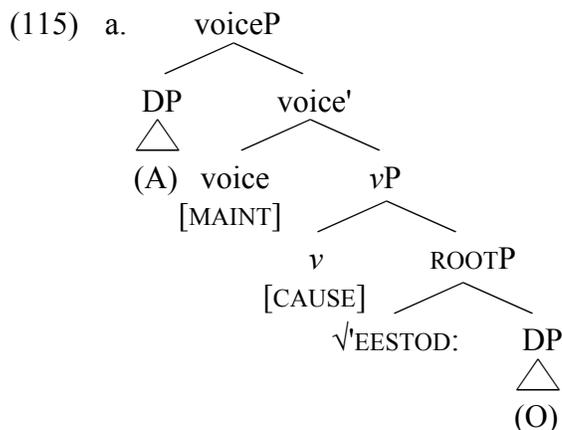
¹²¹ Recall that in order to guarantee a stative interpretation with the meaning contributed by the passive resultative $-s$, a post-state operator was needed, as well. This analysis will be shown in section 4.3.3.5 to make incorrect predictions.

use of *keegcudc* ‘keep clean’ requires that something be responsible for the current clean state of the direct object, but this something may involve merely the maintenance of a pre-existing clean state; it is because of some other state that the clean state holds, as in (114), inspired by Scotchguard.

- (114) 'Iks keeg-cud-akud: 'o keeg-cud-c heg 'iks.
 cloth clean-CAUS-INST 3:SUB:IMP clean-CAUS-POSR DET cloth
 The fabric treatment (*lit.* ‘the cloth cleaner’) keeps the fabric clean.

Although there is an entailment of a causing eventuality (such as the existence or presence of a substance like Scotchguard), it does not require an event of the inception of the target state; the cloth need not have been dirty before the fabric treatment began to keep it clean. In an entirely parallel way, then, *'eestokc* ‘keep hidden’ may be analyzed as involving stative causation which does not require a change of state, though it does entail that some eventuality is causally related to the target state, such as the spatial location or orientation of an object that is doing the hiding.

We should therefore revise the semantic and syntactic analysis for *'eestokc* to be as in (115), exactly parallel to the morphological causative case, with voice and causation separated into two syntactic heads.



b. Constant expressions

$$\begin{aligned} \llbracket \sqrt{\text{EESTOD}} \rrbracket &= \lambda x [\lambda s [\mathbf{hidden}'(x,s)]] \\ \llbracket v_{\text{[CAUSE]}} \rrbracket &= \lambda P [\lambda e [\exists e' [P(e') \wedge \mathbf{cause}'(e,e')]]] \\ \llbracket \text{voice}_{\text{[MAINT]}} \rrbracket &= \lambda y [\lambda e [\mathbf{maintain}'(e,y)]] \end{aligned}$$

c. Calculations

$$\begin{aligned} \llbracket \text{ROOTP} \rrbracket &= \lambda s [\mathbf{hidden}'(O,s)] \\ \llbracket vP \rrbracket &= \lambda e [\exists e' [\mathbf{hidden}'(O,e') \wedge \mathbf{cause}'(e,e')]] \\ \llbracket \text{voice}' \rrbracket &= \lambda y [\lambda e [\exists e' [\mathbf{hidden}'(O,e') \wedge \mathbf{cause}'(e,e') \wedge \mathbf{maintain}'(e,y)]]] \\ \llbracket \text{voiceP} \rrbracket &= \lambda e [\exists e' [\mathbf{hidden}'(O,e') \wedge \mathbf{cause}'(e,e') \wedge \mathbf{maintain}'(e,A)]] \end{aligned}$$

What distinguishes the lexical and morphological causatives like *'eestod*: ‘to hide’ and *keegcud* ‘to clean’ in terms of whether the causative is realized by phonological features is therefore just whether the causative light verb takes a root as its complement or another light verb. If the causative is adjacent to a root, the vocabulary item which realizes the causative morpheme has no phonological expression. (See Embick 2003 for arguments that the root-adjacent/non-root-adjacent distinction can determine distinct sets of vocabulary items for competition.)

The intent of this analysis was to predict the distribution of derived stative interpretations better than a deletion analysis (section 4.3.2) and the analysis proposed by Kratzer (2000) (discussed in sections 3.2.3 and 4.3.1). For her, event entailments are naturally present on all post state participles and on all target state participles whose corresponding verb forms lack a stative reading, and all other participial forms that receive a derived stative interpretation must have their meaning idiomatically specified. On the analysis presented in this section, all post state participles lack a derived stative interpretation (like Kratzer), as do all target state participles which involve a causing eventuality that is restricted to events proper; this restriction may result either from a restriction on its event type (for example, if it is an event of wiping) or from a restriction

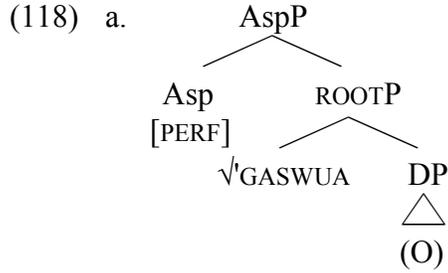
on the event's participants (for example, if it includes an agent or an instrument). Some of the possessive resultatives just discussed are caused by some eventuality, but remain stative because the causing eventuality is itself a state, and thus also lack an entailment of the inception of the target state. All other derived statives simply do not involve a causative morpheme, as seen in section 4.3.3.¹²²

4.3.3.5 Post state resultatives

A structure-building analysis of resultatives with post-state interpretations may follow exactly the analysis of Kratzer (2000). Wherever the highest eventuality argument of a predicate does not range over states alone (as is required by a predicate like **hidden'** or **maintain'**), and where a target state argument, if present, has been closed off by some other morpheme (such as the causative), only the aspectual post-stativizer will produce a predicate that is temporally stative. This should therefore be the interpretation that is associated with Pima verbs like *gaswua* 'to comb', which specify only an event type but not a resulting target state, and *keegcuds* 'to be cleaned', whose target state argument is made inaccessible for further aspectual and temporal modification by the existential quantifier within the causative.

There is a problem with claiming that all such resultatives have only a post state interpretation, however, one that arises in both the structure-building analysis as well as

¹²² An additional comparison may be made with the analysis proposed by Embick (2004), which would likewise fall into the structure-building category. To summarize his analysis, an event entailment is present everywhere that the aspectual head which he takes to form the resultative dominates a projection which is verbal in category. If this verbal projection is associated with the introduction of causation, or even with the existential closure of a state argument which might specify a resulting state, his predictions would agree with those made here. See section 4.3.3.5 for discussion regarding existential closure of the resulting state argument, however.



b. Constant expressions

$$\llbracket \text{Aspect}_{[\text{PERF}]} \rrbracket = \lambda P [\lambda t [\exists e [P(e) \wedge \tau(e) < t]]]$$

c. Calculations

$$\llbracket \text{ROOTP} \rrbracket = \lambda e [\mathbf{comb}'(O,e)]$$

$$\llbracket \text{AspP} \rrbracket = \lambda t [\exists e [\mathbf{comb}'(O,e) \wedge \tau(e) < t]]$$

This representation for *gaswuas* (the representation for AspP in (118)c) predicts that sentence (116)b with *gaswuas* should be true if there is an event e which is an event of combing the object O , and the running time of that event $\tau(e)$ is before a reference time t . Although Pima sentences are not marked for tense, we may assume that unless other morphemes are present, this time t is interpreted as the utterance time – so an event of combing must have occurred before the utterance time. This appears to be the interpretation that such sentences receive.

The problem can be seen, however, with a verb like *keegcuds*, whose semantic representation is shown in (119) (repeated from (107)).

$$(119) \quad \llbracket [_{\text{AspP}} \text{keegcuds}] \rrbracket = \lambda t [\exists e [\exists e' [\mathbf{clean}'(e') \wedge \mathbf{in}'(O,e') \wedge \mathbf{cause}'(e,e')] \wedge \tau(e) < t]]$$

The temporal reference to the resulting state (the argument of **clean'**) is quite indirect, mediated by a causing eventuality e and a time t . In certain contexts, however, the resulting state e' appears to be modified directly. This would pose no problem if the modifiers attach at a point where this eventuality argument is still open, such as before the causative *-cud* attaches to *keeg*, but there are instances where this cannot be the case.

For comparison, where the passive resultative $-s$ occurs on roots like $\sqrt{\text{EESTOD}}$; any higher modifiers do operate directly on the target state, given by e , since that is the only eventuality argument available for modification; recall (88), repeated as (120)(120).

(120) $\llbracket [\text{VP 'eestos}] \rrbracket = \lambda e [\text{hidden}'(O,e)]$ (e is restricted to states proper by **hidden'**)

Consider first the case of *keegcuds* (119) with no other temporal or aspectual modification, as in sentence (104)b. If the time t in (119) is taken to be the utterance time, then the running time of the causing event e is claimed to be before the utterance time. The time at which the caused state e' holds, however, is after the causing eventuality e has completed (this can be shown by the actual truth conditions for the predicate **cause'** as, for example, given by Dowty 1979; see footnote 101). The temporal relationship between the utterance time t and the caused eventuality e' (*i.e.*, the state of being clean) is therefore underdetermined: the clean state e' may be assumed through real-world knowledge to hold at some non-momentary interval which begins after the conclusion of the causing event e , and the time t is also after the causing event e , but nothing specifies whether the resulting state e' must still hold at the time t . It is possible that the state holds at the utterance time, but it is not required by this representation. The truthful utterance of the verb *keegcuds* is therefore predicted not to depend on the relationship between the resulting state and the utterance time, though perhaps there might be a conversational implicature in the present tense that the state holds at the moment of utterance – and as an implicature, it should be cancellable.¹²³

¹²³ This implicature might be present for Gricean reasons since, if the speaker merely wanted to say that the event occurred in the past, he or she could have used an eventive construction. Since the $-s$ on this verb expresses an aspectual head (an operator relating

This is not the interpretation that speakers give to this verb, however; it does seem to matter whether the target state holds at the utterance time (or at some other contextually-determined reference time, if other modifiers like *tako* ‘yesterday’ are present). Consider the following context: the speaker knows that a cleaning event went on in the past, resulting in the table being in a clean state. The speaker also knows that since that time, the clean state has ceased to hold; the table is no longer clean. The speaker cannot truthfully say sentence (121)a; this sentence does not have the feeling of being technically truthful but misleading, as it might have if it merely violated a conversational implicature, but is judged to be flatly untrue. This can be seen in (121)b, where a contradiction (indicated by @) results from explicitly denying the potential implicature in the second clause.

- (121) a. Keeg-cud-s 'o heg gegosdakud:
 clean-CAUS-PASR 3:SUB:IMP DET table
 The table is cleaned.
- b. @Keeg-cud-s 'o heg gegosdakud:, shaba hemuc heg
 clean-CAUS-PASR 3:SUB:IMP DET table but now DET
 gegosdakud: pi keeg-aj.
 table NEG clean-VB
 @ The table is cleaned, but now the table is not clean.¹²⁴

If the speaker wishes to communicate that the table was in a state of being clean before the utterance time, but is not clean at the utterance time, a suffix must be added to the verb, as in (122).

the causing event to a time), it is not clear what would make the state more relevant than the event in this case.

¹²⁴ The English gloss is also marginal and contrasts with a similar sentence where the first clause is a present perfect: ✓*The table has been cleaned, but now the table is not clean.*

- (122) Keeg-cud-s-kahim 'o heg gegosdakud:, shaba hemuc heg
 clean-CAUS-PASR-PDUR 3:SUB:IMP DET table but now DET
 gegosdakud: pi keeg-aj.
 table NEG clean-VB
 'The table was cleaned, but now the table is not clean.'

Although Pima does not mark tense, the *-kahim* suffix which was mentioned earlier in the description of the Pima resultatives (appearing as *-ahim* or *-dahim* on eventive predicates) has an interpretation which in some cases resembles a complex past tense, and in other cases resembles a continuative or progressive (Fitzgerald 2004 discusses a number of interpretations associated with this and similar suffixes, which she analyzes as being grammaticalizations from the verb *him* 'to go'). An example of this suffix on an eventive verb with a similar past durative interpretation is shown in (123).

- (123) Harold 'o ko'i-him heg sho'o.
 3:SUB:IMP eat-PDUR DET grasshopper
 Harold was eating grasshoppers.

Although it is glossed in (122) and (123) as simply PDUR, its meaning appears to be more complex than that. It is only licensed on verbs which denote an eventuality that may take place over a non-momentary interval of time; verbs which denote an instantaneous event may not occur with this suffix – or rather, when they do, they are reinterpreted as involving an eventuality which takes place for some interval of time. In the sentences seen here, however, this suffix is also associated with an assertion that this interval of time occurred before the moment of utterance, as in the context given for (122), which is an assertion shared by a simple past tense.¹²⁵

¹²⁵ Other interesting properties of this suffix include that a verb with this suffix may only occur with an imperfective sentential auxiliary. Where this suffix occurs on a telic predicate, the durative interval that is asserted by the derived predicate does not include

According to the semantic representation of *keegcuds* in (119), the temporal interpretation of the resulting state of being clean should not vary if other morphemes alter the interpretation of the reference time *t*. If the contribution (or part of the contribution) of the *-kahim* suffix is to assert that the reference time *t* is located before the utterance time, this would not yield the interpretation that *keegcudskahim* appears to have in (122) – yet the reference time *t* is the only element of the representation of *keegcuds* that a higher modifier may modify. Instead, what the *-kahim* suffix appears to do when it attaches to *keegcuds* is to assert that the state of being clean – the target state of the causative verb *keegcud* – held for some interval of time before the utterance time. According to the structure building analysis of resultatives given here, this sort of interpretation is predicted to be possible only if *-kahim* were to attach before the causative *-cud* existentially closes the target state variable, yet the surface order of morphemes shows the causative *-cud* and post stativizer *-s* attaching before *-kahim*. There does not appear to be any way to derive the observed meaning for *keegcudskahim* ‘was (in a state of being) cleaned’ on the analysis proposed here.

4.3.3.6 Potential solutions to the problems with post-state interpretations

If existential closure of the target state by the causative is taken to be the source of the problem, we might propose removing this portion of the meaning of the causative

the climax. Like past tense in English, it also results in an implicature that the interval of time occupied by the event or state denoted by the base predicate does not continue at the present time; this is shown to be an implicature rather than an assertion because it is cancellable. This *-kahim* is probably not a single suffix, since both *-k* and *-ahim* occur independently. While the precise meaning of *-k* is not clear in Pima, it has been analyzed as related to stativity (see Mathiot 1973 and Saxton 1982 for analyses in two varieties of Tohono O'odham), and *-kahim* is the form of this suffix which consistently occurs on stative predicates, such as adjectives and all those derived by the *-s* and *-(k)c* suffixes.

morpheme; the causative would introduce a causing event, as in (124), and a separate morpheme would close one or the other of the two open eventuality arguments – conceivably the target stativizer or eventizer that we have already proposed.

(124) $\llbracket v_{[CAUSE]} \rrbracket = \lambda P [\lambda e' [\lambda e [P(e') \wedge \mathbf{cause}'(e, e')]]]$ (potential reformulation)

If this formulation of the causative were used to derive a causativized adjective like *keegcud*, the target stativizer, rather than the post stativizer, could be the interpretation of the *-s* to derive a stative form *keegcuds*; this form would then receive a target state interpretation, with the target state variable open for modification by the *-kahim* suffix.

If the same causative were involved in the derivation of German causativized adjectives, like *leeren* ‘to empty’, however, these forms as well would be predicted to have target state interpretations. Since the participial forms of these verbs are claimed by Kratzer not to be acceptable with *immer noch* ‘still’, she concludes that they cannot have a target state interpretation, but only a post state interpretation. A meaning for the German causative as in (124) would make an incorrect prediction, according to Kratzer.

Since the parallel cases of causativized adjectives in Pima do not have the semantics predicted by Kratzer’s post stativizer, we might therefore propose, extending Pylkkänen (2002), that languages may vary with respect to causation and agentivity in several different respects: they may vary in whether the morpheme which introduces the causing eventuality is bundled into a single syntactic head with the morpheme which introduces an agent involved in that eventuality (which is her proposal for English), and they may vary in whether the morpheme which introduces the causing eventuality is bundled with a morpheme which existentially closes the caused eventuality (which is

needed to match Kratzer's claims for German, and which she extends to English as well, but makes incorrect predictions for Pima).

A number of speakers of German and English, however, find target state interpretations for causativized adjectives acceptable, judging not by the felicity of *immer noch* or *still*, but by the context in which such forms may be used, just as was noted for the Pima verb *keegcuds* in (121)b. For instance, consider the contexts in which it is acceptable to utter the following German and English sentences.

- (125) a. Der Briefkasten ist geleert.
DET mailbox BE:3s empty:CAUS:PPRT
'The mailbox is emptied.'
b. The table is cleaned.

The semantics of Kratzer's post stativizer predicts that these sentences with *geleert* 'emptied' and *cleaned* should be true in the present tense as long as an event of emptying or cleaning, respectively, has gone on prior to the moment of utterance, even if the mailbox is not currently empty or the table is not currently clean. This is the case because the truth of the post stativized forms merely requires that an emptying or cleaning event have gone on in the past, regardless of whether the condition of the mailbox and the table at the conclusion of that event persists to the moment of utterance. In fact, Kratzer explicitly states that this is the correct prediction.

- (126) Take (23) as an illustration.
(23) Das Gebäude ist geräumt.
The building is evacuated

As a target state passive, (23) implies that there are currently no tenants in the building. When understood as a [post state] passive, (23) does not have that implication. (23) could be uttered truthfully by a police officer who is reporting the successful evacuation of the building to his supervisor at a time when tenants have moved back in again. What the officer reports is merely that the job assigned to him is done.

(Kratzer 2000: 395)

A small number of speakers of German and English were informally surveyed to see if the sentences in (125) and others like them, which are claimed by Kratzer to have only a post state interpretation, could in fact be used in a context where a post state interpretation (but not a target state interpretation) would be true, as in (121). None of the speakers felt that these sentences would be true in that context; the target state specifying the condition of the mailbox and the table is still relevant in the present tense, which appears to mean that these predicates still have some kind of target state reading.¹²⁶ There is no other means to derive a resultative with a target state interpretation from a predicate whose only open eventuality argument ranges over events without resorting to deletion of semantic structure (*i.e.*, non-monotonic semantic operations), and so the only possible option within this system is to remove existential closure of the caused eventuality from the meaning of the causative, even in German and English. Some unknown (possibly pragmatic) factor must be responsible for the marginality of resultatives like *geleert* and *cleaned* with adverbials like *immer noch* and

¹²⁶ The same is true of state passives of verbs with resultative secondary predicates, like the English *hammered flat*; the condition of the metal at the moment of utterance is still relevant for the evaluation of a present tense sentence like *The metal is hammered flat*, which in Kratzer's system is also claimed to have only a post state interpretation, where the condition of the metal at the moment of utterance should be irrelevant. Thus, treating verbs with resultative secondary predicates the same syntactically as verbs which lexicalize both an event type and a target state, as in section 4.3.3.3 gives the desired result.

still.

4.4 Summary

This chapter began with a description of two resultative suffixes in Pima which had been described by Saxton (1982) as a passive/active pair, differing in the presence or absence of the verb's agentive external argument. The discussion in this chapter has shown that the differences between the passive resultative and the possessive resultative in Pima are not limited to argument-taking properties. The passive resultative *-s* is associated with at least three interpretations (a post state resultative or perfect in verbs like *gaswuis* 'be combed', a target state resultative in verbs like *dagkuan* 'be wiped clean', and a derived stative in verbs like *'eestos* 'be hidden'), differing in their event structure (*e.g.*, the availability of a target state) and their entailments (*e.g.*, an event of the inception of the target state). The possessive resultative *-(k)c* is associated with a single interpretation where the external argument maintains the direct object in the target state provided by the morphological base, not requiring an event of the inception of the target state.

Three logically possible types of analysis were considered to produce these interpretations: one in which all derived stative interpretations (the most difficult to account for compositionally) were simply listed in the lexicon as idioms, one in which semantic composition was non-monotonic (allowing the deletion of components of the meaning of eventive verbs to produce the derived statives), and one which assumed monotonicity of semantic composition to produce all forms. The latter analysis was presented in most detail, and it became clear that such an analysis would require a very

high degree of complexity and abstraction, imposing restrictions on the way that certain arguments (at least agents or external arguments, and similarly “maintainers” introduced by the $-(k)c$ suffix) were introduced, forcing a particular representation for the causative morpheme, and requiring a number of abstract aspectual morphemes which were frequently not associated with phonological material. Nevertheless, if monotonicity is to be maintained and if the criticisms of the listed-meaning approach are considered serious, there appears to be no other way to derive the range of meanings needed – and in fact the structure-building approach accounts for some of the non-resultative interpretations of the $-s$ suffix quite nicely.

One objection to the structure-building approach as presented here might be that the $-s$ suffix, in particular, must express at least three different abstract morphemes: a light verb whose meaning is (nearly) nothing (127)a, a target stativizer which attaches to constituents with two open eventuality arguments and selects the target state for modification by higher operators (127)b, and a post stativizer which is properly an aspectual morpheme (127)c.

- (127) a. $\llbracket v_{[STATE]} \rrbracket = \lambda P [\lambda e [P(e)]]^{127}$
 b. $\llbracket v_{[TGST]} \rrbracket = \lambda R [\lambda s [\exists e [R(s)(e)]]]$
 c. $\llbracket \text{Aspect}_{[PERF]} \rrbracket = \lambda P \lambda t \exists e [P(e) \wedge \tau(e) < t]$

There are semantic and grammatical properties that are shared by all instances of the $-s$ suffix, as discussed in section 4.1, and a satisfying analysis of this suffix, in which it really could be referred to as the “same” suffix, would provide some common feature in

¹²⁷ Once again, this morpheme may not be completely devoid of meaning, but may introduce a restriction, perhaps via a presupposition, that the eventuality argument in question ranges over states.

each of these contexts such that a single vocabulary item (to use the framework of Distributed Morphology) would be inserted to express all three of these abstract morphemes. The property of temporal stativity, as defined in chapter 2, would be a good candidate for this; other morphemes with the same property may be characterized by other features, as well (thus explaining why the *-s* does not appear on every predicate that is temporally stative). Any analysis of the Pima *-s*, however, must deal with its apparent range of interpretations, and the potentially stipulative nature of this common-feature analysis should not be cause to reject it outright.

The other side of the structure-building analysis involved a number of assumptions about the semantic representation of the linguistic objects to which these resultatives attached. It was assumed, following Kratzer (1996, 2000) and others, that the agent of a verb – the external argument – was not an argument of the verb root itself; this was useful in accounting for the absence of agents in both the passive and possessive resultatives. The verbal and adjectival roots to which the resultative suffixes attached also differed in the number and type of arguments that they took: some roots took a single eventuality – either a state or an event – as an argument ($\sqrt{\text{DAGKUAN}}$, $\sqrt{\text{KEEG}}$); others took an eventuality of some kind and a nominal argument ($\sqrt{\text{GASWUA}}$, $\sqrt{\text{EESTOD}}$); roots that were implicated in certain motion verbs involved an eventuality and a path, indexed to an axis ($\sqrt{\text{HIMS}}$). A large part of the explanation of the different interpretations of the *-s* suffix in particular rested on these assumptions concerning the interpretation of roots.

To argue most forcefully that the Pima resultative suffixes do in fact have the analysis that is proposed here, independent evidence would be needed to show that these

roots have the interpretations that were assumed; the analysis of the resultatives would then be supported when the predicted meanings for these roots in combination with the resultatives are shown to agree with the observed meanings. On the other hand, if the analysis of Pima resultatives is taken to be accurate, then it can provide a diagnostic for determining the meanings of roots; if the evidence from resultative alternations agrees with evidence from other types of alternations, an ontology of root meanings may be established. This type of work, in the spirit of Levin's (1993) catalog of verb properties and verb classes of English, would provide a very interesting area for cross-linguistic comparison if careful, extensive work could be done in a number of typologically varied languages. Resultatives and similar phenomena in these languages could provide a rich source of information on the semantic representation of roots.

Adopting this proposal for Pima as well as for German, English, and Chichewa (and possibly others with passive resultatives) does not mean that the resultatives in these languages are identical except for the phonological features; even with the same analysis, these languages may differ in a number of ways. Morphosyntactically, the morphemes in these languages may differ in their status as a free morpheme, as a prefix or suffix, or as some type of process morpheme – as may be the case, for example, with Chickasaw Y- and G-grade verb forms that receive stative interpretations (Munro and Willmond 1994), which involve nonconcatenative morphological changes in the derived form. Languages may also differ in the interpretations that are available to resultative or resultative-like morphemes; even in the languages discussed here, Pima was seen to allow more interpretations of the passive resultative suffix *-s* than were available for resultatives in

German and English, and the Chichewa stative was seen to allow fewer interpretations even than German and English. Further, the truth conditions of predicates in different languages may vary in ways that were not explored at all in this dissertation; there is no reason that **hidden'** in English and **hidden'** in Pima, for instance, should be true in all of the same contexts – though their status as translation equivalents indicates that their truth conditions must be fairly similar.

Instead, what I have proposed in the structure-building approach is a common algebra for determining the meaning of resultatives and their associated eventive verbal forms. This common algebra is intended to explain the typological similarities among resultatives that are present in the papers in Nedjalkov (1988), for instance. Any analysis of resultatives must address this cross-linguistic pattern in some way.

5. Conclusion

This dissertation began by examining the descriptive and formal distinction between predicates that are stative and those that are not, a distinction which is commonly made in the tradition of lexical aspect or *Aktionsart*. In chapter two, it was claimed that stativity as a temporal property is equivalent to having the Subinterval Property (8) down to single points or instants of time; a predicate may be temporally stative in this sense for one of two reasons: (1) because it takes as argument an eventuality which is a state (and presumably all states – *i.e.*, as cognitive objects – have a property like this, which is passed on by a homomorphic mapping to the predicates – *i.e.*, the linguistic objects – which take states as an argument); or (2) because it has been aspectually modified in some way such that the derived predicate has this property, as with the progressive and the perfect. A number of syntactic and semantic reflexes of the Subinterval Property were presented, as well as a means for determining the reason behind the temporal stativity of a predicate.

This chapter also presented evidence that many, if not all, predicates have an eventuality argument, as proposed within the neo-Davidsonian tradition (*e.g.*, Parsons 1990), which is filled by either an event or a state of some kind. Although events and states may differ in their properties, and although there may be distinct kinds of states (*e.g.*, Davidsonian and Kimian states, as proposed by Maienborn 2004a,b), all states which are not associated with individual level interpretation appear to be temporally modifiable, so constructions which are sensitive to the temporal extent of states should be able to detect at least those that are not associated with individual level interpretations.

Chapter three examined some of the stronger evidence (which involved precisely this type of temporal modification) for decomposing target states within the meaning of eventive verbs, and concluded that properties of temporal modification supported, and could be diagnostic of, the presence of a target state within the meaning of certain verbs. This chapter also considered several ways to morphologically and semantically derive a temporally stative predicate from one that is not, several of which crucially assume that such target state decomposition is possible: the non-stative components of meaning may be deleted, leaving only a predicate of states (*e.g.*, Dubinsky and Simango's (1996) analysis of the Chichewa stative); both the eventive and stative forms may be derived from an abstract base by selecting either an event or a state for temporal modification (*e.g.*, Kratzer's (2000) target state passive); an aspectual modifier may be added to produce a predicate that is temporally stative (*e.g.*, Kratzer's (2000) post state passive); or the stative forms may in fact not be derived semantically, but may have their meaning listed lexically. The properties of the statives derived by these methods are predicted to differ, and so all of these methods may not be appropriate to derive statives in a particular language; theoretical considerations may also make several of these unavailable – such as monotonicity of semantic derivation (*i.e.*, that meaning cannot be deleted), or the assumption that listing meanings of derived forms should be a last-resort.

The last chapter offered a detailed look at two resultative suffixes in Pima, which were argued to provide additional support for a decompositional approach to the meaning of eventive verbs. The passive resultatives of several classes of Pima verbs were seen to have interpretations which are very similar to the interpretations available for resultatives

in Chichewa and German/English (which were discussed in chapter three), though in certain contexts the Pima resultatives also have interpretations that the Chichewa and German/English resultatives do not have. Pima possessive resultatives were also seen to have several interpretations, depending on the meaning of the morphological base. Some of the interpretations of these resultatives may be derived straightforwardly from the meaning of the morphological base, but others – particularly the derived stative interpretations – pose problems for a straightforward analysis, since there appear to be elements of the meaning of the base that are not preserved in the derived form.

There are three logically possible ways (that were seen in chapter 3) to derive stative predicates from eventive predicates. In accounting for the Pima resultatives, the most economical of these appears to be a structure-building account, where both eventive verbs and the resultatives which appear to be derived from them are in fact derived from a common root, whose meaning includes only the meaning that these two types of verbs have in common – namely, that some state holds.

The superiority of the structure-building analysis depends on a number of other assumptions concerning the meaning of several types of verbs (as well as assumptions concerning syntactic expression of the stage level / individual level difference); the conclusion that the structure-building analysis is in fact best could be verified by finding additional evidence supporting the meaning representation that was assumed here for the range of verbs in Pima. Alternatively, future work might support a different representation for these roots and other constructions – hopefully leading to a better understanding of the semantics of these resultatives, as well.

Appendix: Pima resultatives data

This appendix summarizes a portion of the data which was used obtained in the course of this dissertation research. It lists information on the words and interpretations that were obtained from native speakers of Pima. While it does not list all the information about every verb that was studied (such as the interpretation of various temporal modifiers, the availability of different aspectual forms, and the like), it is intended to give an idea of the range of verbs (and other categories) that the Pima resultatives occur on. In some cases words are listed as being nonexistent or not having some interpretation; this is not equivalent to the absence of a word or interpretation from the list, however. Although in many cases we did not discuss particular interpretations because they were clearly unacceptable, the absence of a word or interpretation may also indicate that we did not have time to discuss that word or that interpretation of a word.

The first table lists a number of Pima verbs and adjectives, their meaning, and the interpretation(s) that result when the passive resultative suffix *-s* occurs on that base. Two comments are in order in interpreting this list, however. The first is that regular phonological patterns sometimes obscure the morphological relationships between words. One case of regular phonological change is the change of a final /a/ to /i/ before a suffix like the *-s*, as can be seen in *melckua* ‘to run into, run over’ and *melckuis* ‘be run into or run over’. In a number of other cases, the *-s* suffix appears to attach to a base which is shorter than, or sometimes simply not identical to, the unsuffixed form. This indicates that the *-s* suffix may apparently attach to either the imperfective form of a verb or to the perfective form; the perfective typically lacks a final consonant (or a final vowel and

consonant) relative to the imperfective. One example is the verb *naatog* ‘to make ready, prepare (transitive)’, which appears to allow the *-s* suffix to attach to both the imperfective and perfective forms, *naatogs* and *naatos* ‘be made ready’.

The other comment is that in some cases the meaning of a suffixed form differs from the meaning of the base in a number of ways that are not immediately explained by the general interpretation of the *-s* suffix. An example of this can be seen with the verb *moikajid* ‘to soften’; when the *-s* suffix is present, the example sentence which was volunteered included a benefactive meaning for *moikajids* ‘to be softened for’. Such cases may involve additional zero morphemes or may indicate performance errors, though a precise account of such cases would require much further work.

Table 1. *Interpretations of Pima words with the passive resultative suffix -s*

Base	category ¹	meaning	Suffixed form	meaning	category	acceptable
<i>'oam</i>	A	yellow, brown	<i>s'oams</i>	be yellowish, brownish	Vs ?	yes
<i>'ola</i>	N	a ball; a puck for field hockey	<i>'olas</i>	be round	Vs ?	yes
<i>'uug</i>	A	tall	<i>'uugs</i>	be tall	Vs ?	yes
<i>gev</i>	A, N	cold, icy (as A, with s-); ice (as N, no s-)	<i>sgevs</i>	be iced	Vs ?	yes
<i>jev</i>	A	rotten	<i>sjevs</i>	be rotten	Vs ?	yes
<i>jujul</i>	A	crooked	<i>jujuls</i>	be crooked	Vs	yes
<i>keeg</i>	A	clean, nice, good, beautiful	<i>skeegs</i>	be clear (permanently)	Vs	yes

¹ The categories listed here are generally similar to those used in Saxton, Saxton, and Enos (1983): A = adjective; N = noun; V = intransitive verb; Vt = transitive verb (*i.e.*, one which takes two nominal arguments); Vdt = ditransitive verb (*i.e.*, one which takes three nominal arguments); Vr = reflexive verb (*i.e.*, one which necessarily occurs with one nominal argument and a reflexive marker). Other category suffixes further specify aspectual and argument-taking properties of verbs: ben = the verb takes one additional benefactive argument; comp = the verb takes a finite complement clause; inf = the verb takes a non-finite complement clause; loc = the verb takes a locative phrase (either an adverb or a postpositional phrase); s = the verb is stative (*i.e.*, the verb occurs only in the imperfective aspect). A question mark indicates where category data is unclear.

<i>keegaj</i>	Vs	to be clean, nice, good, beautiful	<i>skeegajs</i>	be kept nice	Vs ?	yes
<i>ko'ok</i>	A	spicy, painful	<i>sko'oks</i>	be painfully spicy	Vs ?	yes
<i>moik</i>	A	soft	<i>moiks</i>	be soft, be the soft kind (or 'be soft-ish?')	Vs ?	yes
<i>pehegii</i>	A	easy	<i>spehegs</i>	be (very?) easy	Vs ?	yes
<i>toa</i>	A	white	<i>stoas</i>	be whitish	Vs ?	yes
<i>vaadag</i>	A	wet, damp	<i>svaadags</i>	be wet, damp	Vs ?	yes
<i>vijin</i>	A	wrinkly, twisted	<i>(s)vijins</i>	be twisted	Vs ?	yes
<hr/>						
<i>'aha</i>	Vr	to arrive, reach	<i>'ais</i>	reach, extend to	Vts	yes
<i>'a'ahē</i>	Vr	to arrive, reach (pl argument)	<i>'a'ahes</i>	reach, extend to (pl argument)	Vts	yes
<i>'atoshad:ad</i>	Vt	to put a diaper on (from <i>'atosha</i> N 'diaper')	<i>'atoshad:ads</i>	be diapered; have a diaper on	Vs ?	yes
<i>'aa'ad</i>	Vdt	to promise to	<i>'aa'ads</i>	a promise (made to someone)	N	yes
			<i>'aa'ads</i>	be promised to	Vts ?	yes
<i>'aag</i>	Vt	to say; to think (=say to oneself); to sing	<i>'aagas</i>	to tell (indiv. level)	Vscomp	yes
<i>'aagid</i>	Vdt Vtcomp	to tell to	<i>'aagidas</i>	be told	Vscomp	yes
<i>'aagidamk</i>	Vdts	to like to tell to	<i>s'aagidams</i>	like to tell (unspecified as to the recipient)	Vts ?	yes
			<i>s'aagidamks</i>	something that is told; gossip	N	yes
<i>'ebkiod</i>	Vt	to scare, frighten	<i>'ebkios</i>	be haunted	Vs	yes
<i>'elid</i>	Vcomps	to want	<i>'elids</i>	intentions	N	yes
<i>'eñgad:ad</i>	Vt	to put clothes on, to dress (from <i>'eñiga</i> N 'clothes')	<i>'eñgad:ads</i>	be dressed, have clothes on	Vs	yes
<i>'eestod:</i>	Vt	to hide	<i>'eestod</i>	a dressed thing	N	yes
		to fall and		be hidden	Vs ?	yes
<i>'iig</i>	V	become scattered (like leaves or seeds)	<i>'iigs</i>	be fallen, strewn about	Vs ?	yes
<i>'iim</i>	Vt	to greet with a kinship greeting	<i>'iims</i>	be related	Vs	yes
<i>'o'ohan</i>	Vt	to write	<i>'o'ohanas</i>	be written	Vscomp	yes
<i>'o'osmad</i>	Vt	to splatter	<i>'o'osmads</i>	look splattered	Vs	yes

<i>'o'osmagi</i>	Vs	to have splatter applied	<i>'o'osmags</i>	look splattery (natural, not a result)	Vs	yes
<i>'oid</i>	Vt	to follow	<i>'ois</i>	a following	N	yes
<i>'oidam</i>	Vcomp	to think to reject; (in perfective aspect) to divorce	<i>'oidams</i>	thoughts	N	yes
<i>'oohod</i>	Vt		<i>s'oohods</i>	be about to reject	Vt	yes
			<i>s'oohods</i>	a rejected thing, an outcast	N	yes
<i>'u'a</i>	Vt	to carry	<i>'u'as</i>	carrier (nickname)	N	yes
			<i>'u'ugs</i>	carried things; Carrier (nickname)	N	yes
<i>bidhun</i>	Vt	to plaster, put plaster on	<i>bidhuns</i>	be plastered	Vs	yes
		to be chronically hungry, malnourished (indiv. level only)				
<i>bihug</i>	V		<i>bihugs</i>	be hungry	Vs	yes
<i>bihugim</i>	V	to get hungry	<i>bihugims</i>	be hungry	Vs	yes
<i>cemaitcud</i>	Vtben	to bake (a cake) for	<i>cemaitcuds</i>	bake cakes (habitually)	Vs ?	yes
<i>ceeg</i>	Vt	to find	<i>ceegs</i>	be found	Vrs ?	yes
<i>ceegid</i>	Vdt	to show	<i>ceegidas</i>	be shown to; to show to (indiv. level)	Vdts	yes
			<i>ceegids</i>	show to (indiv. level)	Vdts ?	yes
<i>ceek</i>	Vt	to put or place	<i>to'as</i>	be placed (pl argument)	Vs ?	yes
<i>cikpan</i>	V, Vt	to work (on)	<i>cikpans</i>	be worked on	Vs	yes
<i>cindat</i>	Vt	to kiss	<i>cindats</i>	a lip print	N	yes
<i>co'akka</i>	Vt	to tattoo	<i>co'akkas</i>	be tattooed	Vscomp ?	yes
<i>cu'a</i>	Vt	to grind	<i>cu'as</i>	be ground	Vs	yes
			<i>cu'is</i>	be ground	Vs	yes
			<i>cu'amuñs</i>	be ground	Vs	yes
<i>cuuk 2</i>	Vt	to carry piggy-back	<i>cuuks</i>	carry on one's back	Vts	yes
<i>da'a¹</i>	V	to fly, jump, take off	<i>da'is</i>	be thrown, scattered; fly	Vs	yes
<i>da'a²</i>	Vs	to be greedy, stingy (with s-)	<i>sda'is</i>	a greedily-kept thing	N	yes
<i>dagkuan</i>	Vt	to drop; to wipe	<i>dagkuis</i>	be wiped	Vs	yes
			<i>dagkuans</i>	be wiped	Vs	yes
<i>daha</i>	V	to sit	<i>dahas</i>	sit (indiv. level)	Vs	yes

<i>dakosh</i>	Vt	to put a muzzle on	<i>dakoshs</i>	be muzzled	Vs ?	yes
			<i>dakoshs</i>		N	no
<i>gantán</i>	V Vt	to scatter; to be scattered	<i>sgantañs</i>	be scattered	Vs ?	yes
<i>gaswua</i>	Vt	to comb	<i>gaswuas</i>	be combed	Vs	yes
			<i>gaswuis</i>	be combed	Vs	yes
<i>ge'eda</i>	V	to become big	<i>ge'edas</i>	be inflated, made bigger	Vs	yes
			<i>ge'es</i>			no
<i>geesh</i>	V	to fall	<i>gees</i>	be fallen	Vs ?	yes
<i>gikujk</i>	V Vt	to whistle (a tune); to be whistling	<i>gikujks</i>	whistler (a nickname)	N	yes
			<i>gikujs</i>			no
<i>golvin</i>	V	to dig	<i>golvins</i>	be dug up	Vs ?	yes
<i>ha'adkat</i>	Vr	to open one's mouth wide; gape	<i>ha'adkats</i>	a gap, an open space	N	yes
<i>hain</i>	Vt	to break, crack, shatter	<i>hais</i>	be broken, crumbled (not necessarily dispersed)	Vrs ?	yes
			<i>hains</i>	be broken (in pieces, dispersed)	Vs	yes
<i>helig</i>	Vt	to spread out	<i>heligs</i>	be spread out	Vs ?	yes
<i>hemapad</i>	Vt	to bring together; to cause to gather	<i>hemapads</i>	be gathered	Vs ?	yes
<i>hevagid</i>	Vt	to smell	<i>s-hevags</i>	be stinky	Vs ?	yes
<i>hiashp</i>	Vt	to bury; to cover with dirt (from <i>hia</i> N 'sand, dirt')	<i>hiashs</i>	be buried	Vs ?	yes
<i>hidod:</i>	Vt	to cook, prepare (food)	<i>hidod:s</i>	be cooked	Vs ?	yes
<i>hidod:cud</i>	Vtben	to prepare (food) for	<i>hidod:cuds</i>	have (food) prepared for	Vtben ?	yes
			<i>hidod:cuds</i>	food prepared for	N	no
<i>him</i>	V	to go	<i>hims</i>	go (indiv. level)	V ?	yes
<i>himcud</i>	Vt	to make go; move	<i>himcuds</i>	be made to go (indiv. level)	Vs ?	yes
<i>hipshun</i>	Vt	to spray	<i>hipshuns</i>	be sprayed	Vs ?	yes
			<i>hipshuns</i>	a spraying	N ?	yes
<i>hivig</i>	Vts	to trust	<i>hivigs</i>	a trusted one	N	yes
<i>hivigid</i>	Vdt Vtinf	to lend; allow	<i>hivigdas</i>	be allowed	Vs ?	yes
<i>hiviumn</i>	Vt	to shave	<i>hiviumnas</i>	be shaved	Vs ?	yes
<i>ho'igid</i>	Vts	to pity (without s-, 'to pray'); to like?	<i>s-ho'igids</i>	like	Vts	yes

<i>hoat</i>	V	to make a basket (from <i>hoa</i> N 'basket')	<i>hoats</i>	be basket-like (of a location)	Vs ?	yes
<i>hobinod:</i>	Vt	to wrap	<i>hobins</i>	be wrapped in	Vs ?	yes
<i>hukshan</i>	Vt	to scratch	<i>hukshans</i>	be scratched	Vs	yes
<i>hukshp</i>	Vt	to hook or snag, put a hook on or in, or put on a hook	<i>hukshs</i>	be hooked, snagged	Vs	yes
<i>huktsh</i>	Vt	to scratch	<i>huktshs</i>	keep hooked, snagged be scratched	Vts Vs	yes yes
<i>jivia</i>	V	to arrive	<i>jivias</i>	end (in a location) (indiv. level)	Vs	yes
<i>jujulcud</i>	Vt	to make crooked	<i>jujulcuds</i>	make crooked (habitually)	Vts ?	yes
<i>juupin</i>	V	to sink	<i>juupins</i>	a depression, sunken area	N	yes
<i>kaipig</i>	Vt	to remove seeds from	<i>kaipigs</i>	be (de-)seeded	Vs ?	yes
<i>keliv</i>	Vt	to decob (corn)	<i>kelivs</i>	be decobbed	Vs ?	yes
<i>kee'id</i>	Vt	to hate	<i>kee'ids</i>	a backwards person hate	N Vts ?	yes yes
<i>keega</i>	V	to become clean	<i>keegas</i>	be cleared (necessarily a result); be kept clear	Vs	yes
<i>keegcud</i>	Vt	to make nice; clean, make good	<i>keegcuds / keegcdas</i>	be cleaned	Vs	yes
<i>keesh</i>	Vt	to erect, stand up	<i>keeshs</i>	N be set up	N Vs	bad yes
<i>ki'ikkash</i>	Vt	to bite	<i>ki'ikkas</i>	a bite mark	N	yes
<i>kuvijk</i>	Vt	to be domed, peaked (with -k, imperfective only); to put a dome on (without -k, perfective only)	<i>kuvijks</i>	be domed	Vs ?	yes
<i>kuup</i>	Vt	to close, block	<i>kuvijks</i> <i>kuups</i>	a dome be closed	N Vs ?	yes yes
<i>kuupi'ok</i>	Vt	to open	<i>kuupi'oks</i> <i>kuupi'os</i>	be open be open	Vs ? Vs ?	yes yes
<i>ma'ishp</i>	Vt	to cover, cover up	<i>ma'ishs</i>	be covering	Vs ?	yes
<i>matog</i>	Vt	to take apart, disassemble	<i>ma'ishps</i> <i>matogs</i>	be covering be disassembled	Vs Vs ?	yes yes

<i>maac 1</i>	Vts	to know	<i>smaacs</i>	know of	Vts ?	yes
<i>maak</i>	Vcomps					
	Vdt	to give to	<i>maaks</i>	inheritance, gift	N	yes
			<i>maaks</i>	be given, have been given	Vs ?	no
<i>maawua</i>	Vt	to feel, to cop a feel	<i>maawuas</i>	be feeling	Vts ?	yes
<i>med:</i>	V	to run	<i>mels</i>	run (indiv. level, as a river)	Vs ?	yes
<i>mehid</i>	Vt	to burn, burn up	<i>mehids</i>	be burned up	Vs	yes
<i>mei</i>	V	to burn	<i>smeis</i>	be burned	Vs	yes
<i>melckua</i>	Vt	to run into, run over	<i>melckuis</i>	be run into, run over	Vs ?	yes
			<i>melckuis</i>	something which is run into	N	yes
<i>melnogi</i>	V	to turn while moving	<i>melnogs</i>	bend (in a particular direction) (indiv. level)	Vs	yes
<i>moikajid</i>	Vt	to soften	<i>moikajids</i>	soften (s.t.) for (s.o.) (adds a benefactive sense?)	Vdt ?	yes
<i>namk</i>	Vt	to meet	<i>nams</i>	meet (indiv. level)	Vts	yes
<i>naatog</i>	Vt	to make ready, prepare	<i>naatogs</i>	be made ready	Vs ?	yes
			<i>naatos</i>	be made ready	Vs ?	yes
<i>nod:</i>	V	to turn	<i>nod:s</i>	turn to the side (indiv. level)	Vs ?	yes
<i>nod:agid</i>	Vt	to turn; to make dizzy, crazy	<i>nod:ags</i>	turn to the side (indiv. level, as a road)	Vs ?	yes
			<i>nod:ags</i>	be turned, crazy, dizzy, high on drugs	Vs	yes
<i>nolavt</i>	Vdt	to buy from	<i>nolavs</i>	a purchase	N	yes
<i>ñe'e</i>	Vt	to sing	<i>ñeis</i>	(of a song) be sung	Vs	yes
<i>ñeickua</i>	Vt	to push	<i>ñeickuis</i>	be (have been?) pushed	Vs	yes
			<i>ñeickuans</i>	be (have been?) pushed	Vs	yes
<i>ñuukud</i>	Vt	to take care of, watch over, guard, protect	<i>ñuukudas</i>	a ward, someone taken care of	N	yes
<i>paant</i>	V	to make bread (from <i>paan</i> N 'bread')	<i>paantas</i>	bread existing (in a certain location)	Vs	yes
<i>pi'ata</i>	V	to disappear, vanish	<i>pi'atas</i>	erased, no longer there	Vs ?	yes

<i>pikcelid</i>	Vt	to take a picture of	<i>pikcelidas</i>	depict (indiv. level)	Vts ?	yes
<i>piintogid</i>	Vt	to paint	<i>piintogs</i>	be painted	Vs	yes
<i>shoñckua</i>	Vt	to chop down, knock down	<i>shoñckuis</i>	be chopped down	Vs	yes
<i>shuudagi</i>	Vs N	to be full of water; water	<i>shuudags</i>	be watery, be filled with water	Vs ?	yes
<i>tatcua</i>	Vts	to want	<i>tatcuas</i>	a desire nuisance	N	yes
<i>taamhogid</i>	Vts	to be a nuisance to	<i>staamhogs</i>	existing (in a location)	Vs ?	yes
<i>taatam</i>	Vt	to touch	<i>taats</i>	be (have been) touched	Vs ?	yes
			<i>taats</i>	a touched one	N	yes
			<i>taatams</i>	touch (indiv. level)	Vts ?	yes
<i>toskua</i>	V	to swell up	<i>toskuas</i>	be swollen	Vs	yes
<i>toobin</i>	Vt	to twist, wring	<i>toobins</i>	be twisted (literal meaning only)	Vs	yes
			<i>toobs</i>	be twisted (metaphorical meanings okay)	Vs	yes
<i>vakuan</i>	Vt	to wash; to baptize	<i>vakuanas</i>	be washed	Vs ?	yes
<i>vattok</i>	V ?	to make a ramada (from <i>vatto</i> N 'ramada')	<i>vattoks</i>	ramadas existing (in a certain location)	Vs ?	yes
<i>vattot</i>	V	to make a ramada (from <i>vatto</i> N 'ramada')	<i>vattots</i>	ramadas existing (in a certain location)	Vs	yes
<i>vaak 2</i>	Vt	to put on (clothing)	<i>vaaks</i>	to have on	Vts	yes
<i>via 1</i>	Vt	to wear out	<i>sviis</i>	to be worn out	Vs	yes
<i>vid:ut</i>	Vt	to turn, flutter (as by the wind)	<i>vid:us</i>	be turned (in a certain direction)	Vs ?	yes
<i>viitkuan</i>	Vt	to roll up	<i>viitkuanas</i>	to be rolled up	Vs ?	yes
<i>vo'o</i>	Vs	to be lying flat (in a specified location)	<i>vo'os</i>	to be lying (indiv. level)	Vs ?	yes
<i>vohid</i>	Vt	to burn (incompletely), singe	<i>vohis</i>	to be burned	Vs	yes
			<i>vohids</i>			no
<i>voson</i>	Vt	to sweep	<i>vosons</i>	(of an area) to be swept	Vs	yes

<i>vood</i>	Vt	to lay down flat	<i>vois</i>	to be lain down (indiv. level only?)	Vs ?	yes
			<i>voods</i>			no
<i>voolakud:t</i>	V	to make a ball court (from <i>voolakud</i> : N 'ball court')	<i>voolakud:ts</i>	ballcourts existing (in a location?)	Vs ?	yes
			<i>voolakud:ts</i>	a ballcourt something	N	yes
<i>voopoid</i>	Vdt	to take from	<i>voopois</i>	taken from someone	N	yes
<i>vuushaĩ</i>	V	to come out, appear	<i>vuushs</i>	be coming out (i.e., to be sticking out)	Vs ?	yes
<i>'e'ejk</i>	V	creak	<i>'e'ejks</i>			no
<i>'eestocud</i>	Vtben	to hide for (from <i>'eestod</i> : N 'to hide')	<i>'eestocuds</i>			no
<i>gikuid</i>	Vt	whistle at	<i>gikuids</i>			no
<i>halivua</i>	Vr	to skip along	<i>halivuas</i>			no
<i>kiit</i>	V	to make a house (from <i>kii</i> N 'house')	<i>kiits</i>			no
<i>mavgid</i>	V	gesture, wave	<i>mavgids</i>			no
<i>maas</i>	Vt	to look (a certain way), look like	<i>maass</i>			no
<i>ñeid</i>	Vt	to see; to read	<i>ñeids</i>			no
<i>tonod:</i>	V	shine	<i>tonod:s</i>			no

Table 2 below lists data for the possessive resultative suffix $-(k)c$ similar to what was listed above. A major complication in obtaining data on the $-(k)c$ suffix is that it is frequently homophonous or nearly homophonous with two other possible morphological parses: verbs with truncated forms of several causative suffixes ($-jid$ and $-cud$, which are truncated to be $-j$ and $-c$, respectively), and verbs with the clausal conjunction $-(k)c$.² Since truncated forms of these suffixes occur only in the perfective aspect and the $-(k)c$ suffix only occurs in the imperfective aspect (where aspect is indicated by the second position auxiliary), the aspect of a sentence distinguishes “true” instances of the $-(k)c$

² The clausal conjunction $-(k)c$ ‘and’ shows the same phonological pattern as the possessive resultative suffix $-(k)c$.

suffix. Similarly, verbs with the clausal conjunction $-(k)c$ must be followed by another clause. Where a form below is marked as being unacceptable, therefore, this should be taken to mean that it is unacceptable to interpret it as the $-(k)c$ suffix, though a homophonous (or near-homophonous) form may have an interpretation involving one of the other causative suffixes or the clausal conjunction.

Table 2. *Interpretations of Pima words with the possessive resultative suffix $-(k)c$*

Base	category	meaning	Suffixed form	meaning	category	acceptable
'atoshad:ad	Vt	to put a diaper on (s.o.) (from 'atosha N 'diaper')	'atoshad:akc	to have a diaper put on	Vts	yes
'atoshat	Vt	to make a diaper (on s.o.) (from 'atosha N 'diaper')	'atoshatc	to have a diaper on	Vts	yes
'aa'ad	Vdt	to promise (s.t.) to (s.o.)	'aa'adc	to keep promised	Vdts	yes
'aagidamk	Vdts	to want to tell to	s'aagidamc	to want to tell (s.t.) to (s.o.)	Vdts ?	yes
'ebkiod	Vt	to scare, frighten	'ebkiodc	to keep scared	Vts	yes
'eñgad:ad	Vt	to put clothes on, dress (from 'eñga N 'clothes')	'eñgad:adc	to keep dressed	Vts	yes
'eestocud	Vtben	to hide for	'eestocudc	to keep hidden for	Vtbens	yes
'eestod:	Vt	to hide	'eestokc	to have hidden	Vts	yes
'eestojid	Vtben	to hide for	'eestojidc	to keep hidden for	Vtbens	yes
'iim	Vt	to greet (with a kinship term)	'iimc	to be related to	Vts	yes
'o'osmad	V	to splatter (intr)	'o'osmadc	to keep (s.t.) splattering	Vts	yes
'oama	V	to become brown, yellow (from 'oam A 'brown, yellow')	'oamakc	to have a browned/brownish look?	Vs ?	yes
'oid	Vt	to follow	'oidc	to keep following	Vts	yes
'oidamk	Vts	to want to follow ?	'oidamc	to want to follow	Vts	yes
'u'a	Vt	to carry	'u'akc	to bring, to have carried	Vts ?	yes

<i>behe</i>	Vt	to get, catch	<i>bec</i>	to be holding; to claim	Vts	yes
			<i>'u'akc</i>	to be holding (pl obj)	Vts	yes
<i>bidhun</i>	Vt	to plaster; put plaster on	<i>bidhunc</i>	to keep plastered	Vts	yes
<i>ceka</i>	Vt	to put on (footwear)	<i>cekakc</i>	to be wearing (footwear)	Vts	yes
<i>ceegid</i>	Vdt	to show	<i>ceegidc</i>	to be showing to have (s.t.)	Vdts ?	yes
<i>ceek</i>	Vtloc	to put (in a location)	<i>cekc</i>	put (in a location) to have (s.t., plural) put (in a location)	Vtlocs	yes
			<i>to'akc</i>	plural) put (in a location)	Vtlocs	yes
<i>cindat</i>	Vt	to kiss	<i>cindatc</i>	to keep kissing	Vts	yes
<i>cuuk 2</i>	Vt	to carry piggy- back	<i>cuukc</i>	to have carried piggy-back	Vts	yes
<i>dagkuan</i>	Vt	to drop; to wipe	<i>dagkuakc</i>	to keep wiped clean	Vts	yes
<i>dakosh</i>	Vt	to muzzle; to put a muzzle on	<i>dakoshc</i>	to keep muzzled	Vts	yes
<i>daakshp</i>	Vt	to push with one's nose	<i>daakshc</i>	to have/keep pushed (with one's nose)	Vts	yes
<i>daash</i>	Vt	to place, appoint to office	<i>daashc</i>	keep put/placed	Vts	yes
<i>gaswua</i>	Vt	to comb	<i>gaswuakc</i>	to keep combed	Vts	yes
<i>ge'eda</i>	V	to become big (from <i>ge'e</i> A 'big')	<i>ge'edakc</i>	to have/keep inflated, made bigger	Vts	yes
			<i>ge'ekc</i>			no
<i>gevshp</i>	Vt	to pin down, lean against (in perfective only)	<i>gevshc</i>	keep pinned down, leaned against	Vts	yes
<i>golvin</i>	V Vt	to dig	<i>golvinc</i>	to keep (s.t.) dug out	Vts	yes
<i>ha'adkat</i>	Vr	to open one's mouth	<i>ha'adkatc</i>	to have one's mouth open to keep s.t.	Vrs	yes
<i>hagtog</i>	Vt	to melt	<i>hagtogc</i>	melted; to keep (a fire) extinguished to keep (s.t.)	Vts	yes
<i>hain</i>	Vt	to break, crack, shatter	<i>hainc</i>	broken (as against some tendency) (in pieces, dispersed)	Vts	yes

			<i>haikc</i>	to keep (s.t.) broken (as against some tendency) (not dispersed)	Vts	yes
<i>he'edkat</i>	Vr	to smile	<i>he'edkatc</i>	to be smiling	Vrs	yes
<i>helig</i>	Vt	to spread (s.t.) out	<i>heligc</i>	to have/keep spread out	Vts	yes
<i>hemapad</i>	Vt	to bring together; to cause to gather	<i>hemapadc</i>	to have gathered	Vts	yes
<i>hevagid</i>	Vt	to smell (tr)	<i>hevagidc</i>	to keep smelling	Vts	yes
<i>hiashp</i>	Vt	to bury; to cover with dirt (from <i>hia</i> N 'dirt')	<i>hiashpc</i>	to have/keep (s.t.) buried	Vts	yes
			<i>hiashc</i>	to have/keep (s.t.) buried	Vts	yes
<i>hidod:</i>	Vt	to cook, prepare (food)	<i>hidod:c</i>	to have (s.t.) cooked	Vts	yes
<i>hidod:cud</i>	Vtben	to prepare for	<i>hidod:cudc</i>	to keep (s.t.) prepared for (s.o.)	Vtbens	yes
<i>hivig</i>	Vt	to trust	<i>hivigc</i>	to keep trusted	Vts ?	yes
<i>hiviumn</i>	Vt	to shave (tr)	<i>hiviumnacc</i>	to keep (s.t.) shaved	Vts	yes
<i>hukshan</i>	Vt	to scratch	<i>hukshanc</i>	to keep scratched		no
			<i>hukshanc</i>	to hook, snag?		yes
<i>hukshp</i>	Vt	to hook or snag (s.t.), put a hook on or in, or put on a hook	<i>hukshc</i>	to keep hooked, snagged	yes	<i>hukshp</i>
<i>huktsh</i>	Vt	to scratch	<i>huktshc</i>	keep scratched		yes
<i>jujul</i>	A	crooked, bent	<i>jujulc</i>	to keep crooked	Vts	yes
<i>juupin</i>	V	to sink	<i>juupinc</i>	to have stooped over	Vts	yes
<i>kaipig</i>	Vt	to remove seeds from	<i>kaipigc</i>	to keep seeds out of	Vts	yes
<i>keishp</i>	Vt	to stand on	<i>keishpc</i>	to keep (s.t.) stepped on	Vts	yes
<i>keliv</i>	Vt	to remove (corn) from the cob	<i>kelivc</i>	to keep decobbed	Vts	yes
<i>keega</i>	V	to become clean, nice, good, beautiful (from <i>keeg</i> A 'clean, nice, good, beautiful')	<i>keegacc</i>	to keep clean	Vts	yes
			<i>keegc</i>			no

<i>keegcud</i>	Vt	to make clean, nice, good, beautiful	<i>keegcudc</i>	to keep cleaned	Vts	yes
<i>keesh</i>	Vt	to erect, stand up	<i>keeshc</i>	to have erected (sg obj)	Vts	yes
			<i>cuucuakc</i>	to have erected (pl obj)	Vts	yes
<i>kud:ut</i>	Vt	to bother	<i>kud:utc</i>	to keep bothered	Vts	yes ?
<i>kuint</i>	Vt	to count; to measure	<i>kuintc</i>	to keep measured, to keep counted	Vts	yes
<i>kuvijk</i>	Vt	(with -k, imperfective only) to be domed, peaked; (without -k, perfective only) to put a dome on	<i>kuvijkc</i>	to keep domed (as against some tendency to become not- domed)	Vts	yes
<i>kuup</i>	Vt	to close, block	<i>kuupc</i>	to have/keep closed or blocked	Vts	yes
<i>ma'ishp</i>	Vt	to cover, cover up	<i>ma'ishc</i>	to have/keep covered	Vts	yes
			<i>ma'ishpc</i>	to have/keep covered	Vts	yes
<i>matog</i>	Vt	to take apart, disassemble	<i>matogc</i>	to have taken apart	Vts	yes
<i>mavgid</i>	Vt	to wave	<i>mavgidc</i>	to keep waving	Vts	yes
<i>maak</i>	Vdt	to give to	<i>maakc</i>	to have/keep given to	Vdts	yes
			<i>maakc</i>	a gift, inheritance	N	yes
<i>maascud</i>	Vdt	make (s.t.) look like (s.t.), make (s.t.) look (a certain way)	<i>maascudc</i>	keep (s.t.) looking like (s.t.), keep (s.t.) looking (a certain way)	Vdts	yes
<i>maawua</i>	Vt	to feel, cop a feel	<i>maawuakc</i>	to have one's hand in	Vts	yes
<i>mehid</i>	Vt	to burn, burn up	<i>mehidc</i>	keep burning	Vts	yes
			<i>mehikc</i>	keep burning	Vts	yes
<i>melckua</i>	Vt	to run down, run into	<i>melckuakc</i>	to keep run- down, run-into	Vts	yes
<i>melcud</i>	Vt	to make run; to drive	<i>melcudc</i>	keep (s.t.) running	Vts	yes
<i>melnogi</i>	V	to turn (while running)	<i>melnogc</i>	to have (s.t.) turned	Vts	yes
<i>moikajid</i>	Vt	to make soft	<i>moikajidc</i>	to keep (s.t.) soft for	Vtbens ?	yes
<i>naggia</i>	Vs Vt	to hang	<i>naggiakc</i>	to be hanging	Vrs	yes

<i>naad</i>	Vt	to light (a candle, light, fire)	<i>naandakc</i>	to keep (fires, lights) lit	Vts	yes
<i>naatog</i>	Vt	to make ready, prepare	<i>naatogc</i>	to have ready	Vts	yes
<i>ñeickua</i>	Vt	to push	<i>ñeickuakc</i>	to keep pushed to touch	Vts	yes
<i>taatam</i>	Vt	to touch, feel	<i>taatamc</i>	(geographic meaning)	Vts	yes
<i>totsid</i>	Vt	to spook, surprise	<i>totsidc</i>	to keep (s.o.) surprised	Vts	yes
<i>toobin</i>	Vt	to twist	<i>toobinc</i>	to have/keep twisted	Vts	yes
			<i>toobc</i>	to have/keep twisted	Vts ?	yes
<i>vakuan</i>	Vt	to wash; to baptize	<i>vakuanc</i>	keep washed, have washed	Vts	yes
<i>vattot</i>	V	to make a ramada (from <i>vatto</i> N 'ramada')	<i>vattotc</i>	to have/keep shaded	Vts	yes
<i>vaadagid</i>	Vt	to dampen	<i>vaadagikc</i>	to keep damp	Vts	yes
<i>vaak 2</i>	Vt	to put on (clothing)	<i>vaakc</i>	to have put-on, be wearing	Vts ?	yes
<i>via 1</i>	Vt	to tear, wear out	<i>sviakc</i>	to keep torn	Vts	yes
<i>vid:ut</i>	Vt	to turn (s.t.), flutter (as by the wind)	<i>vid:ukc</i>	to keep turned sideways	Vts	yes
				to be turned	Vs	yes
<i>vijiñid</i>	Vt	to make wrinkled	<i>vijiñidc</i>	to keep wrinkled	Vts	yes
<i>viitkuan</i>	Vt	to roll up	<i>viitkuanc</i>	to have rolled up	Vts	yes
<i>vo'o</i>	Vs	to be lying flat (in a specified location)	<i>vo'okc</i>	to have (s.t.) lying flat	Vts	yes
<i>voson</i>	Vt	to sweep	<i>vosonc</i>	to keep swept	Vts	yes
<i>vood</i>	Vt	to lay (s.t.) down flat	<i>voodc</i>	to have lain down	Vts	yes
<i>voopoid</i>	Vdt	to take away from, deprive of	<i>voppoidc</i>	to keep taking away from	Vdts	yes
			<i>voppoikc</i>	to keep taking away from	Vdts	yes
<i>'e'ejk</i>	V	to creak	<i>'e'ejkc</i>			no
<i>'ibhuiñ</i>	Vt	to make breathless	<i>'ibhuinc</i>			no
<i>'iig</i>	V	to fall and become scattered (like leaves or seeds)	<i>'iigc</i>			no

<i>'oohod</i>	Vt	to reject; divorce (in perfective)	<i>s'oohodc</i>	no
<i>cikpan</i>	V	to work	<i>cikpanc</i>	no
<i>cu'a</i>	Vt	to grind	<i>cu'ikc</i>	no
<i>gatwuid</i>	Vt	to shoot	<i>gatwuidac</i>	no
			<i>gatwuidakc</i>	no
			<i>gatwuikc</i>	no
<i>gikujk</i>	V Vt	to whistle (a tune); to be whistling	<i>gikujkc</i>	no
<i>giidahim</i>	V	to go scouting	<i>giidahimc</i>	no
<i>ha'icug</i>	Vloc	to exist (in a specified location)	<i>ha'icugc</i>	no
<i>halivua</i>	Vr	to skip	<i>halivuakc</i>	no
<i>hehhem</i>	V	to laugh	<i>hehhemc</i>	no
<i>heubgid</i>	Vt Vr	to make cool; rest (reflexive)	<i>heubgidc</i>	no
<i>hipshun</i>	Vt	to spray	<i>hipshunc</i>	no
<i>kee'id</i>	Vt	to hate	<i>skee'idc</i>	no
<i>ki'ikkash</i>	Vt	to bite	<i>ki'ikkashc</i>	no
			<i>ki'ikkakc</i>	no
<i>kiit</i>	V	to make a house	<i>kiitc</i>	no
<i>ko'ok</i>	A	painful	<i>sko'okc</i>	no
<i>lial</i>	N	money	<i>lialc</i>	no
<i>maac 1</i>	Vt	to know	<i>smaacc</i>	no
<i>maas</i>	Vt	to look (a certain way), look like	<i>maasc</i>	no
<i>med:</i>	V	to run	<i>melc</i>	no
			<i>med:c</i>	no
<i>moik</i>	A	soft	<i>moikc</i>	no
<i>moika</i>	V	to become soft	<i>moikakc</i>	no
<i>nod:agid</i>	Vt	to turn; to make dizzy, crazy	<i>nod:agc</i>	no
<i>ñe'e</i>	V	to sing	<i>ñe'ekc</i>	no
<i>ñea 1</i>	V	to wake up	<i>ñeakc</i>	no
<i>ñeid</i>	Vt	to see; to read	<i>ñeidc</i>	no
<i>paant</i>	V	to make bread (from <i>paan</i> N 'bread')	<i>paantc</i>	no
			<i>paantakc</i>	no
<i>shaashañ</i>	V	to groan	<i>shaashañc</i>	no
<i>shoak</i>	V	to cry	<i>shoakc</i>	no
<i>tatcua</i>	Vt	to want	<i>tatcuakc</i>	no
<i>taamhog</i>	V	to be a nuisance	<i>taamhogc</i>	no
<i>toa</i>	A	white	<i>stoakc</i>	no
<i>tonod:</i>	V	to shine	<i>tonod:c</i>	no
<i>vaila</i>	Vr	to dance	<i>vailakc</i>	no
<i>vaadag</i>	A	damp	<i>vaadagc</i>	no

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