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The Stative *s*- Morpheme in Pima

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by

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ABBREVIATIONS USED IN GLOSSES

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)
A	filler vowel in auxiliary
ADV	adverbial
AGT	agent
CAUS	causative
CMD	imperative
COMP	complementizer
COP	copula
DET	determiner
DEF	definite
DSD	desiderative
DXS	deictic particle
EV	evidently; inferred knowledge from information obtained firsthand
FOC	focus
GA	alienable possession
HSY	hearsay, information not obtained firsthand
IMP	imperfective
INCEP	inceptive
INCH	inchoative
INDEF	indefinite
IO	indirect object
IRR	irrealis
NEG	negative
NOM	nominalizer
NT	non-transitory
OBJ	direct object
PST	past
PFV	perfective
POS	possessive
RED	reduplicated
REF	reflexive
SHD	shared knowledge
ST	stative (this gloss is always and only used for the <i>s-</i> prefix)
SUB	subject
T	true characteristic
VB	verbalizer

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ABSTRACT OF THE THESIS

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This thesis describes the behavior of a prefix which occurs on adjectives and verbs in the O'odham languages of Pima and Papago, Tepiman languages of Southern Uto-Aztecan, spoken in Arizona and Mexico.

This prefix, whose phonological form is *s*-, shows a moderate, but not perfect, correlation with stative lexical aspect. Roughly 80% of monomorphemic adjectives and numerous stative verbs in Pima are preferred with this prefix; this preference also applies to adverbials derived from these adjectives and verbs. Active verbs are almost universally ungrammatical with this prefix. When words which typically license the *s*- prefix are used in contexts involving a change of state—as inchoatives or causatives—the *s*- prefix is frequently ungrammatical. Certain derivational affixes which derive stative predicates also license the *s*-.

There are exceptions to almost all of these generalizations, however, making the *s*- appear less clearly inflectional and regular. In addition, there are properties displayed

by the *s-* which cannot easily be associated with stativity: a suffix which derives adverbials from verbs licenses the *s-*, and intriguingly, the *s-* is disallowed on many stems which normally license it, within the scope of negation.

This paper models the behavior of the *s-* prefix within the non-Lexicalist framework of Distributed Morphology, treating the *s-* as the expression of a grammaticized semantic feature [+ STATIVE]. Although not every behavior of the *s-* can be accounted for in this way, several analyses of the *s-* from a syntactic perspective are briefly discussed, and shown to be insufficient, as well.

1. Introduction

Pima is a language of the Tepiman branch of Southern Uto-Aztecan, currently spoken in central and southern Arizona.¹ It is closely related to the language Tohono O'odham (also known as Papago), which is spoken in parts of Arizona and Mexico. This paper will examine in detail a single prefix in Pima (though Papago data will be introduced as well) whose phonological form is *s-*. An example of this prefix is shown below.

- (1) *S-keeg-aj* 'o *heg* *hoa*. (EJ5/6/02.11)
 ST-beautiful-VB IMP DET basket²
 'The basket is beautiful.'

Although this prefix often occurs on stative roots—a fact which has led some to conclude that it indicates stativity—it fails to occur on all stative roots, and sometimes occurs on words which are clearly not stative; in fact, the contexts in which this prefix is grammatical and ungrammatical cannot be easily described without invoking numerous lexical exceptions. The remainder of this section will provide a basic description of Pima grammar and clause structure, and §2 will describe the behavior of the Pima *s-* making as

¹ All data in this paper, unless otherwise noted, has been graciously provided through the patience and good humor of Mr. Virgil Lewis, who is a native speaker of Pima from the Gila River Indian Community. All errors remain my own.

²Data is presented in the orthography currently used by the UCLA Pima group. All Pima examples taken from Avelino *et al* (2001); the page and item number follow each example in parentheses. A hyphen is used orthographically to break up sequences of letters which would otherwise be interpreted as a digraph, and to indicate that a word receives non-initial stress (the syllable immediately following the hyphen is stressed). The ':' is part of a digraph in the orthography, but is also used in glosses where morphemes are not readily segmentable. Where glosses are not one-to-one, multiple words are joined with '·'.

few theoretical assumptions as possible. Theoretical conclusions to be drawn from this behavior will be discussed in §3, followed by a morphological analysis of the *s-* prefix within the framework of Distributed Morphology. Although this analysis is able to adequately model the behavior of the *s-* in many respects, it also requires many assumptions about the organization of grammar, and about Pima specifically, to succeed. I will then discuss several other possible analyses, showing why alternative accounts also pose problems.

Simple indicative sentences in Pima usually include a second position auxiliary element.³ The auxiliary typically expresses the person and number of the subject, as well as the aspect (perfective or imperfective) of the sentence, modality, and evidentiality information. The second position is determined syntactically and not prosodically; elements which often occur in first position include DPs, VPs without objects,⁴ adverbial phrases, floated quantifiers, postpositional phrases, and certain functional particles. Apart from the requirement of the second-position auxiliary, word order is relatively free in most types of sentences.⁵ Another example of a typical Pima sentence is shown in (2).

³ The auxiliary may occasionally be omitted for reasons which are not yet clear.

⁴ Verbal constituents which may occur in first position include combinations of adverb and verb, postposition and verb, and floated quantifier and verb, but not verb and object.

⁵ For instance, Munro (1984) has reported that in simple transitive sentences, all possible orders of subject, object, and verb are judged grammatical and occur in both volunteered and elicited sentences. The only types of sentences where word order seems to affect basic meaning are in morphological causatives, where the causee must occur closer to the verb than the object, if the base verb is transitive. Word order in simple ditransitive sentences may also be important for meaning, but the data on this point is inconsistent.

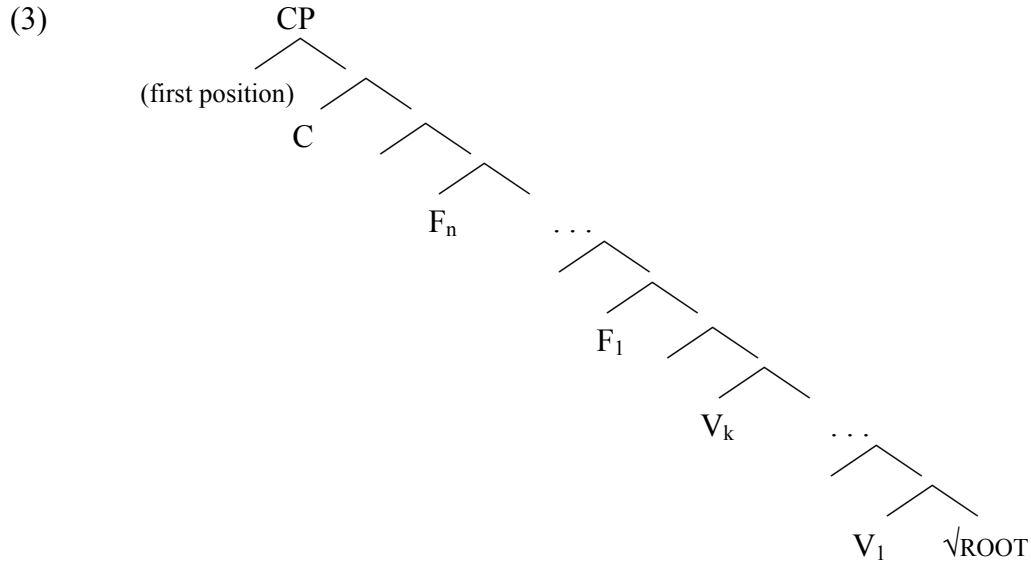
- (2) Cevho 'a-t ko'ito heg huuñ. (16.1)
gopher A-PFV eat:PFV DET corn
'A gopher ate the corn.'

Although many word orders are possible, in sentences in which the verb follows the auxiliary and no DPs intervene, many particle-like elements often occur between the auxiliary and the verb. These include irrealis *o* (Liu 2001) and negation *pi* (e.g., Saxton, Saxton, and Enos 1983), as well as '*apsh* 'just' or '*am* 'far away, facing away' (Madsen 2001), one of a set of deictic particles which describe the spatial (or metaphorically spatial) relationship between entities in the sentence. Manner adverbs are also frequently volunteered in this position.

Although no consensus has yet been reached on the precise nature of Pima clause structure, Smith (2001b) shows that several conclusions about Pima clauses can in fact be made: the position of the auxiliary is determined structurally, not prosodically; and the pre-auxiliary position is not an argument position and appears to carry some degree of focus (*cf.* Brown 2001). Since either a fronted constituent or a complementizer may occur before the auxiliary, I conclude that the first position constituent occupies the specifier of CP position, and that either C itself or the specifier of C may be filled with phonological material, but not both.

I will also make several assumptions which have less empirical justification within Pima. For instance, I assume an articulated verbal and inflectional structure in which some number *n* of functional heads dominates some number *k* of verbal heads (this follows the proposals of Cinque 1999, and also explains why functional particles and adverbials tend to occur between the auxiliary and a non-fronted verb). I will also

assume, following *e.g.* Marantz (1995) and Pesetsky (1995), that the lowest verbal head selects a category-neutral root, which carries the idiomatic (non-structural) meaning of the predicate. This is shown in (3).



Smith (2001b) has also proposed that the auxiliary represents the phonological cliticization of a series of functional heads which remain *in situ*. This would require an order of functional heads which differs from the proposed universal hierarchy given by Cinque (1999), however. The morpheme in the auxiliary which expresses evidentiality occurs after the morpheme expressing perfective aspect; if these represent heads *in situ*, the head which expresses perfective aspect should then occur higher in Pima than the head which expresses evidentiality. This is contrary to Cinque's hierarchy, however, which places evidential mood higher than perfective aspect, as seen in (4) (taken from Cinque 1999:76).

- (4) Mood_{speech act} > Mood_{evaluative} > Mood_{evidential} > Mod_{epistemic} > T(Past) > T(Future) > Mood_{irrealis} > Asp_{habitual} > T(Anterior) > Asp_{perfect} > Asp_{retrospective} > Asp_{durative} > Asp_{progressive} > Asp_{prospective} / Mod_{root} > Voice > Asp_{celerative} > Asp_{completive} > Asp_{(semel)repetitive} > Asp_{iterative}

If the Pima auxiliary is instead composed of heads suffixed by adjunction to a null verb (as discussed by Cinque (1999:68), who calls this a “null auxiliary,” not to be confused with the use of “auxiliary” for Pima), the order of morphemes in the auxiliary would reflect Cinque’s universal hierarchy. If this null auxiliary began below F₁ and underwent successive head raising through the hierarchy of functional heads, the order which would result (if all of these heads are taken to be suffixes) would be <null>-F₁-F₂-...-F_{n-1}-F_n. This order would reflect Cinque’s hierarchy from lowest to highest, and would correctly predict that the suffix expressing perfective aspect should occur to the left of the suffix expressing evidential mood. Since the morpheme expressing subject agreement also occurs to the left of the perfective suffix, then subject agreement must occur below perfective aspect—though Cinque allows specific languages to assign different positions of the agreement projections relative to the other functional heads. These conclusions cannot be certain, however, since they are based primarily on the relative order of only two morphemes (the morphemes expressing perfective aspect and second-hand knowledge). A better understanding of the Pima auxiliary and clausal functional structure is needed.

Certain aspects of Pima morphology will also be relevant to the analysis of the *s*-prefix. So-called “process” morphology (*i.e.*, expression of morphemes not by unique segmental material, but by manipulating the segmental material of other morphemes) is

commonly used in Pima, the most obvious example of which is reduplication (on nouns, reduplication expresses plural number, and on verbs, it expresses distributivity).

Typically, only the first consonant or the first consonant and vowel are reduplicated, though the details of reduplication are still a matter of contention (*e.g.*, Riggle (2002)).

Another process, truncation, is seen on some verb stems to express perfective aspect.

More central to the focus of this paper than reduplication or truncation, however, will be Pima's use of affixation. Many suffixes will be seen in the examples here, not all of which are well understood. In addition, several prefixes will be examined quite closely which appear to be associated with changes in verbal argument structure in particular ways. These will be introduced more fully below.

Pima also employs prefixes on verbs to express person and number agreement with objects. Examples illustrating agreement with different objects are shown in (5).

(Note that absence of an overt prefix indicates a third person singular object.)

- (5) a Pad:-c 'a-n-t heg heñ-kalit. (98.6)
 bad-CAUS:PFV A-1s:SUB-PFV DET 1s:POSS-car
 'I wrecked my car.'
- b Ha-pad:-c 'a-n-t heg heñ-gook kakalit. (99.11)
 3p:OBJ-bad-CAUS:PFV A-1s:SUB-PFV DET 1s:POSS-two RED:car
 'I wrecked my two cars.'

In sentences with one object, the person and number of the object are indicated straightforwardly by the prefix on the verb. Only one object prefix may ever occur on the verb, however, and for ditransitive verbs, the prefix preferentially expresses the features of the indirect object. In such cases, the only way for the prefix to express the features of the direct object is if the indirect object occurs with an overt adposition like *vehejed*:

‘for’, which then hosts a prefix expressing the features of the indirect object.

Pima also uses possessive clitics which have the same phonological form as the object agreement prefixes; one of these possessive clitics can in fact be seen in example (5) above. Although neither the verb prefixes nor the possessive clitics may receive stress, the structural analysis of the possessive clitics will be assumed to be different from that of the object agreement prefixes for the following reason: the possessive clitics may occur before a variety of grammatical categories within the DP, while the object agreement prefixes only occur immediately before a verb stem (Munro, in Avelino *et al* 2001). Therefore, it should not be surprising that the stative *s-* prefix does not behave the same with respect to both of these phonologically identical sets of prefixes.

Pima will also be assumed to have distinct grammatical categories of adjectives and verbs. Some languages have been claimed to lack a distinction between these categories, and Pima appears to be similar to these languages in that many words which modify nouns within a DP (*i.e.*, adjectives) may also occur as the predicate of a clause with no overt copula or verbalizing morphology. However, there are a small number of words which appear to be adjectives, but which do require an overt verbalizing suffix in order to occur as a clausal predicate. Moreover, many words which occur as clausal predicates may not modify a noun within a DP without the addition of certain affixes. Therefore, words which require a suffix to form a clausal predicate or which may be used to modify a noun without additional morphemes will be assumed to constitute the category of adjectives in Pima. In his grammar of Papago, Hale (1959) observes that the acceptability of use with the nominalizing suffix *-cu* is also diagnostic of adjectives.

2. Occurrence of the Pima *s-*

Zepeda has claimed that for Papago, “any verb with an *s-* prefix is a stative verb” (1983:111). Although she acknowledges that not all statives occur with the *s-* prefix, it seems reasonable to associate the *s-* morpheme with stativity. To a great extent, the *s-* prefix appears only on stative words—adjectives in general appear with the *s-* prefix, as do a subset of verbs which also seem stative, and non-stative verbs typically may not occur with the *s-* prefix. Closer examination, however, reveals that the number of adjectives and verbs which seem stative yet which cannot occur with the *s-* prefix is surprisingly high; roughly one-fifth of stative adjectives in Pima and Papago may not occur with the *s-* prefix. Moreover, certain stems which seem quite active are sometimes preferred with the *s-* prefix. To be completely accurate, then, the set of stems which license the *s-* prefix is therefore neither a subset nor a superset of the stative stems in Pima.

If it is to be argued that the *s-* correlates with the property of stativity, it will first be necessary to determine which predicates are stative. Definitions of and tests for stativity will therefore be discussed in §2.1. Some of the evidence that the *s-* is a distinct morpheme (and not simply the initial segment of a lexical root) will be shown §2.2, and evidence of the correlation between stativity and the *s-* will be presented in §2.3. The final subsection of §2 will present some of the behavior of the *s-* prefix which does not seem to correlate with stativity.

2.1 Stativity in Pima and in general

The distinction between stative and non-stative (sometimes referred to as stative and active) is relatively familiar from descriptive linguistics. In English, it has been used at least since Lakoff (1966) to account for, among other things, the fact that certain verbs and predicate adjectives may not be used in true imperatives and the progressive tenses. For Dowty (1979), states were semantically basic, and he attempted to semantically decompose the other three aspectual classes of Vendler (1967)—activities, accomplishments, and achievements— into states (simple predicates) and operators on (simple or complex) predicates.

From Dowty's work with these lexical aspects, STATES can be informally characterized as inactive properties which hold over an interval of time. They can be used with adverbials like *for an hour*, but not with adverbials which imply a particular end-point or climax, like *in an hour*; in English, states do not have a habitual interpretation in the simple present, and they may not occur in the progressive aspect. Examples of states in English are *be red*, *be like (someone or something)*, *know (someone or something)*, and *be located (in a particular place)*.⁶ ACTIVITIES are actions which hold over an interval of time, and like states, they can be used with adverbials like *for an hour*, but not *in an hour*. Unlike states, however, they cannot occur in the simple present in English without a habitual interpretation, and they may occur in the progressive aspect. Examples of English activities are *be brave*, *be a hero*, *roar*, *run*, and *seek (someone or*

⁶ All English examples are taken from Dowty (1979).

something). ACCOMPLISHMENTS, on the other hand, are actions which culminate in an instantaneous event; they may be used with both *for an hour* and *in an hour* adverbials. English accomplishments include *uncover (something)*, *build (something)*, *run a mile*, and *paint a house*. ACHIEVEMENTS, according to Vendler and Dowty, are simply instantaneous events, and although they cannot be used with adverbials like *for an hour*, they can be used with *in an hour*. The predicates *reach the summit*, *notice (something)*, *awaken*, and *realize (something)* are all achievements.

Tests like those in the preceding paragraph may help to determine the lexical aspect of a predicate, but for Vendler and Dowty, it was not sufficient to simply associate particular grammatical categories with these classes, since the classes of states and activities both included predicate adjectives and verbs.⁷ In some cases, the addition of material to a predicate, without changing its grammatical category, is sufficient to change the aspectual class of that predicate (*cf. John ran*, an activity, and *John ran a mile*, an accomplishment). The characteristics which Dowty presents in his early discussion of Vendler to distinguish stative predicates from predicates with other lexical aspects are shown below (compiled from Dowty 1979:55-6 and 60).

⁷ Dowty (1979) is undecided as to the proper aspectual classification of predicate nominals; he places them either with activities or with states (see his discussion on pp185-6). More recent authors, however, such as Rothstein (1999), note that the semantic contribution of the copula is not insignificant, and that care is required in dealing with predicates of different categories. For example, it may be that simple predicate nominals, as well as predicate adjectives, are only found in the class of states, and that these predicates are more complex when they occur as activities. For instance, *John is a hero* may denote a state, while the more complex *John is being a hero* may denote an activity.

- (6) Stative predicates...
- a. may not occur as complements of *force* or *persuade*.
 - b. may not occur as true imperatives.
 - c. may not occur with the adverbs *deliberately* or *carefully*.
 - d. may not occur in the progressive.
 - e. may not occur in the pseudocleft construction (with DO).
 - f. may occur in the simple present without a habitual or frequentative interpretation.
 - g. may occur with durational adverbials like *for an hour*; in such cases, it is entailed that the predicate was true at all times during that interval.
 - h. may not occur with time adverbials like *in an hour*.

The theoretical basis for some of these tests is not clear, and they do not provide a definition of stativity; they merely collect the properties which in English have been associated with the class of stative predicates. In particular, tests *g* and *h* do not distinguish states from activities like *run*, *watch*, or *be polite*. Moreover, several of these tests are not easily applied in Pima. Pima does not clearly have a progressive, it has not been found to have anything comparable to the English pseudocleft construction, and neither states nor activities are forced to have a habitual or frequentative interpretation in present imperfective, so tests *d*, *e*, and *f* are unhelpful. Those tests which would uniquely distinguish states in Pima are therefore *a*, *b*, and *c*.

Tests *a*, *b*, and *c*, however, seem to be sensitive not to the stativity of the predicate itself but to the non-volitionality or non-controllability of the predicate. As an example, the stative predicate *be green* typically produces the expected results for tests *a*, *b*, and *c*; it is normally incoherent to say *John forced Mary to be green*, or for John likewise to command Mary *Be green!*, since being a certain color is not normally expected to be under Mary's control. In cases where being green would be under Mary's control, however—suppose she were a chameleon, and could change color from pink to green—

these sentences would no longer seem odd. Similarly, in such a case, it would be fine to speak of Mary being *deliberately* or *carefully* green. Such issues of agency are discussed, for example, by Martin (1991).

Since none of these tests would clearly indicate the lexical aspect of a predicate in Pima, it may be necessary to employ a definition of stativity rather than a test.

Presumably, it would be most important for this definition to distinguish states from activities, since tests do exist in Pima (namely, (6)g and (6)h above) which distinguish the other classes, namely achievements and accomplishments, from states and activities.

Dowty's compositional analysis of verb classes assumes that states are basic; he therefore attempts to limit the types of predicates (specifically, the types of functions) that can be states by formulating a definition which all states must fit. Otherwise, as he observes, any predicate could be called a state, and his compositional analyses would be unnecessary. Dowty intends to distinguish states from other categories of predicates by the fact that many of them are properties which can be measurable (unlike activities like *running*), and that these properties can hold over any arbitrary interval. He formulates this definition of states in terms of van Fraassen's concept of logical space—a many-dimensional space, each of whose dimensions correspond to a possible measurable property. This logical space will have as many axes as there are kinds of measurement. To use his example, if weight, color, and hardness were the only measurable properties, then logical space would have only three axes—one each corresponding to weight, color, and hardness; the possible values of each of these properties would be a linear ordering. His requirement for states is therefore that:

“for each stative predicate there is a region of logical space such that at each index [indicating a possible world at some interval of time], 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)

He admits, however, that not all stative predicates may be statable in terms of measurable dimensions, like the adjectives *beautiful* or *pleasant*, or relations like *x knows y* or *x likes y*. Although measurability seems characteristic of many states, it may not be sufficient to pick out just those predicates which are stative.

Another characteristic which may seem useful for such a definition is the internal change or “granularity” which seems to be present in many activities. In Dowty’s refinement of Vendler’s categories, he claims that states entail no change, compared to the “definite or indefinite change” which is entailed by non-states. (Dowty 1979:184)

The following definition is an attempt to make Dowty’s concept of lack of change precise:⁸

A predicate is stative just in case the following implication holds: if the predicate is true for some interval of time, it will be true in exactly the same way for any arbitrarily small portion of that interval.

If one considers an interval over which an activity like *running* occurs, it is possible to define a subinterval which is short enough that the action of running may no longer be said to be occurring. Rather, running at that scale would be decomposable into, for example, the action of pushing off with one foot and jumping through the air. This is not the case with a state like *being green*—if *The ball is green* is true for some interval of

⁸ The precise wording of this definition is based largely on a discussion with Tim Stowell of this section of Dowty’s book.

time, it will be true in exactly the same way for any portion of that interval, no matter how small. In this sense, states would be the ultimate non-activity.

Unfortunately, there are other activities which seem to share this property with *being green*; for example, Dowty considers *watching (something)*, *smiling*, *sleeping*, and *being a rascal* to be activities, though they do not seem to be readily decomposable into sub-actions.⁹ Moreover, by the definition above, the predicate in *John is asleep* (a state) would be assigned the same stativity as the predicate in *John is sleeping* (an activity). The fact that predicates like *sleep* and *asleep* in English can describe identical situations yet differ in stativity indicates that meaning may not be sufficient to determine lexical aspect. Some degree of arbitrariness may be present in a stative/non-stative distinction in any language (as discussed by Mithun 1991, for example). Although absence of internal change seems intuitively characteristic of states, it may not be sufficient to determine the class of states by itself.

In the absence of any better definition, the concepts of internal change, measurability, and lack of volitionality or agency may be used to guide an intuitive sense of what constitutes stativity.

2.2 Initial evidence that the Pima *s-* is a distinct morpheme

Words which occur with the *s-* prefix are distinguished from simply *s*-initial words (of which there are very few in Pima and Papago) by the fact that a morpheme

⁹ Vendler seems to consider at least some predicate nominals to be stative (1967:108-9), though Dowty is undecided as to the best classification of predicate nominals. Predicate nominals may conceivably fall into both classes (*cf.* the discussion in footnote 7).

boundary follows the *s*- prefix: several morphemes have their location defined between the *s*- and the word stem, and phonotactic markedness and reduplication indicate that the *s*- prefix is followed by a morpheme boundary, as well.

The placement of the *s*- prefix at the left edge of the word has the potential to create phonotactically marked sequences when it occurs before another consonant. For instance, the sequences /sd/ and /st/ are contrastive word initially on words with the *s*- prefix (note the pair *sdoa* ‘be healthy’ and *stoa* ‘be white’), as are /sʔ/ and /sh/, but these sequences never contrast as complex onsets within a morpheme.¹⁰ In fact, Riggle (2002) observes that complex onsets are extremely rare in Pima in general. Moreover, the *s*- prefix can be found on several stems which have been borrowed from Spanish, where there is no [s] in the Spanish source, therefore implying that the *s*- prefix was productively added at some point in the history of Pima. An example of a borrowed word with the *s*- prefix is *s'oolad:ag* ‘golden’, from Spanish *oro* ‘gold’.¹¹

Reduplication also indicates that a morpheme boundary follows the initial *s*-, since the *s*- does not seem to be included in a word’s left-edge material for the purposes of reduplicative copying. Reduplication in Pima can follow any of several patterns, the exact choice of which depends on the segmental content each verb; a full account of Pima reduplication is given in Riggle (2002). For the present purposes, it is sufficient to note

¹⁰ Although the sequences /sd/ and /st/ may occur within morphemes, they are always divided by a syllable boundary and never form a complex onset.

¹¹ The Pima borrowing shows the addition both of the *s*- prefix and of a suffix, *-d:ag*, discussed in §2.3.

that one common pattern is reduplication of the initial consonant and vowel. In (7), this CV reduplication is seen taking place on a verb with the *s-* prefix; the *s-* is not included in the reduplicated material, and remains to the left of the reduplicant and base.

- (7) Si mu'i 'iida-m ceceoj 'o s-papad:ma. (521.17)
 very many this-PL RED:boy IMP ST-RED:lazy
 'Too many of these boys are lazy.'

Another type of evidence showing that the *s-* is more than just an initial segment is that several verbal prefixes, when present, intervene between the *s-* and the verb stem. For example, object agreement prefixes must occur between the *s-* and the stem, as in (8).

- (8) Si 'a-ñ s-ha-'eebid heg totkdod:. (23.15)
 very A-1s:SUB ST-3p:OBJ-fear DET RED:spider
 'I fear spiders.'

All verbal object prefixes, whether expressing direct and indirect objects, occur between the *s-* and the verb stem as in (8).

In addition to the object agreement prefixes, two derivational prefixes occur between the *s-* and the stem. Interestingly, whenever these derivational prefixes occur on a stem outside the scope of negation, the *s-* prefix is required, even when the stem by itself would not normally license the *s-* prefix. These prefixes will be discussed with the other affixes which productively license the *s-*, in the following section.

2.3 Correlation between the *s-* and stativity

As mentioned above, the most striking apparent generalization about the *s-* prefix is that it occurs on verbs and adjectives which denote states. At first examination, the list of stems which require the *s-* prefix when used in the affirmative appears to include all

the morphologically simple adjectives in Pima, with the addition of several quite stative verbs of sensation or thought with experiencer subjects. In all non-negated, non-inchoative, and non-causative simple or derived uses—as sentential predicates, attributive modifiers of nouns, or adverbials—they must occur with the *s-* prefix.¹² A list of such words which have been found in Pima is included in the Appendix; examples of an adjective and of a transitive verb which require the *s-* prefix are shown in (9) and (10).

- (9) a Hem-gogs-ga 'o ge s-'oam. (24.6b)
 2s:POSS-dog-GA IMP FOC¹³ ST-brown
 'Your dog is brown.'
 b Hem-s-'oam gogs-ga 'o koosh. (24.7)
 2s:POSS-ST-brown dog-GA IMP sleep
 'Your brown dog is sleeping.'
- (10) a S-hem-heegam 'a-n-t. (635.7)
 ST-2s:OBJ-jealous A-1s:SUB-PFV
 'I am jealous of you.'
 b Mary 'o ge s-heegam-k kun. (635.11)
 IMP FOC ST-jealous-NT husband
 'Mary (has) a jealous husband.'
 c Microsoft 'o si s-heegm-am ñuukud heg 'e-'a'agidag. (636.15)
 IMP very ST-jealous-ADV guard DET ¬1:REF-RED:secret
 'Microsoft guards its secrets jealously.'

The transitive verbs which require the *s-* prefix appear to be comprised mostly of psychological predicates with experiencer subjects, such as *hoohid* 'like', *'eebid* 'fear',

¹² The data for nominalizations based on roots which license the *s-* (e.g. the Pima equivalent of nominalizations like *jealousy*, or *knowledge* in the DP *my knowledge of the story*) is not yet clear. Some adjectives and verbs which normally license the *s-* are volunteered with *s-* when used in nominalizations, and some are volunteered without the *s-*, though forms with the *s-* seem to be judged grammatical when offered.

¹³ Here I follow Shademan (2001) in glossing *ge/ga/go* as focus.

heegam ‘envy’, *maac* ‘know’, and *naak* ‘like the taste of’. (See the Appendix for a complete list of transitive verbs licensing *s-* to date in Avelino *et al.* (2001).)

Likewise, many words which denote non-states are judged ungrammatical with the *s-* prefix; an example is the activity verb *med:* ‘run’, seen below.

- (11) a Hegai 'o'odham 'o med: (EJ12/10/01.21)
 that man IMP run
 ‘That man is running.’
 b *Hegai 'o'odham 'o s-med:.
 c Hegai med:-dam 'o'odham 'o coad:k. (EJ12/10/01.25)
 that run-NOM man IMP tall
 ‘That running man is tall.’
 d *Hegai s-med:dam 'o'odham 'o coad:k. (EJ12/17/01.2)

The only forms of the verb *med:* ‘run’ which allow the *s-* are those which are derived using affixes which productively license the *s-*, to be discussed later in this section.

Another characteristic of the *s-* which distinguishes it as a morpheme distinct from the stem is that it is sensitive to other morphemes in the word or phrase. This sensitivity provides a correlation between the *s-* and stativity when these other morphemes alter the lexical aspect of the stem. For example, although it is licensed (or, more correctly, required) on many predicates which denote states, it may not appear on those words when they are used causatively or inchoatively—denoting a change of state. This is shown below for the derived stative predicate *s'oolad:ag* ‘golden, be golden’.

- (12)a Vashai 'o ge s-'oola-d:ag. (813.36)
 grass IMP FOC ST-gold-VB
 ‘The grass is golden.’
 b Vashai 'a-t ge 'oola-d:ag-t. (EJ12/17/01.47)
 grass A-PFV FOC gold-VB-INCH
 ‘The grass became golden.’
 c *Vashai 'at ge s'oolad:agt. (EJ4/1/02.2)
 Intended: ‘The grass became golden.’

- d Tash 'a-t 'oola-da-c heg vashai. (EJ10/29/01.8)
 sun A-PFV gold-VB-CAUS:PFV DET grass
 'The sun made the grass golden.'
- e * Tash 'at s'ooladac heg vashai. (EJ10/29/01.9)
 Intended: 'The sun made the grass golden.'

A strong correlation between the *s-* and stativity would lead to the expectation that all words which license the *s-* share this property in causative and inchoative forms. Not all words with an *s-* prefix pattern exactly like *s'oolad:ag* 'golden', however. There is variation in the degree to which the *s-* prefix is judged ungrammatical on inchoative forms of verbs and adjectives which normally occur with the *s-* prefix. The example in (12)c represents one of the strongest negative judgements, but other inchoative stems with the *s-* are not considered to be as bad. Judgments on causatives with the *s-* prefix, however, are more consistently bad for all stems.

There are also several affixes which license the *s-* prefix—or, in many cases, require it—on their stems, even if their stems are otherwise non-stative. These include the denominal predicate suffix *-ig/-ag*, which allows nouns to be used as existential predicates distinct from a copular construction, the desiderative suffix *-imk/-amk*, which attaches to verbs to produce verbs meaning “want to *verb*”, the ability suffixes *-id* (attaching to intransitive verbs) and *-dag/-d:ag* (attaching to verbs and gerunds), which produce verbs meaning “be able to *verb*”, and two prefixes *cu-* and *ta-*, which combine with verbs to produce intransitive verbs indicating something like indefinite object and indefinite subject, respectively.

It is these affixes which license the occurrence of the *s-* prefix, rather than the *s-* licensing the affixes, since the *s-* is unable to attach without these affixes to many of the

stems on which the affixes occur. If the property which licenses the *s-* is the stativity of a (morphologically simple or complex) stem, then any affixes which license it should have clearly stative meanings—particularly when they license the *s-* on otherwise non-stative stems. If these affixes do not appear to have the proper sort of meanings to produce stative stems from non-stative ones, then stativity may not be the property which is expressed by the *s-*.

The first of these suffixes which licenses the *s-* prefix is used in the so-called “rabbity” construction, exemplified in (13). In this construction, a plural noun suffixed with *-ig* (or *-ag* after /t/, /d/, or /m/) can be used as a subjectless existential predicate. The inclusion of the *s-* prefix and overt marking of the noun for plurality appears to be optional in such cases, as in (13)b.

- (13)a M-o ge s-totobi-g kui veeco. (128.2)
 COMP-IMP FOC ST-RED:rabbit-VB tree under
 ‘There are rabbits under the tree; it is rabbity under the tree.’
 b M-o va ge toobi-g. (489.36)
 COMP-IMP SHD FOC rabbit-VB
 ‘There's rabbitness; there are rabbits around here somewhere.’

Unlike many other adjectives and verbs which normally occur with the *s-*, however, rabbity words may not be used as attributive modifiers of nouns.

According to Dowty (1979), the closest English equivalent to this, the verb *exist*, is stative. It is surprising, however, that other instances where existence is implied, such as definite nominals, are ungrammatical with the *s-* prefix. It may be the case that the *s-* prefix is restricted to roots and derived forms which can of themselves be predicates in Pima—adjectives, verbs, and these rabbity words, but not underived nouns. The *s-* might

then be expected to occur on adpositions as well—which can express stative locative predicates—but to date no adpositions have been found which license the *s-* prefix. It is therefore unclear what distinguishes this means of expressing existence from others in Pima. What is important for the question at hand, however, is that existence of the referent of a noun, even a deverbal one, is a condition which is stative, and shows a correlation between the *s-* and stativity.

Interestingly, “rabbity” words, in addition to their use as existential predicates, are also used in the formation of nicknames. In Pima, nicknames may be derived in any of several ways from nouns, verbs, or even whole phrases. Examples of nicknames include: *'Uugcu* ‘Boss, Bossy’ (111.12), a de-adjectival nominal; *Spad:ma* ‘Lazybones’ (111.17), normally a verbal predicate; and *Pi ha'icu 'amcud* ‘Not-very-smart (*lit.* not-understand-anything)’ (111.13), a phrase which includes negation, an indefinite (incorporated?) object, and a verb.¹⁴ The suffix *-ig/-ag* may also be used to construct a nickname, even operating on deverbal nouns. Example (14) shows a typical non-stative verb and several nicknames derived from it—the last of which is formed using the *-ig* suffix and licenses the *s-* prefix.

- (14)a Jason 'a-t gam.hu 'i vuush kii t-'amjed:. (676.15)
 A-PFV away INCEP get.out:PFV house INDEF:POSS-from
 ‘Jason left the house.’

¹⁴Unfortunately, although numerous nicknames are found in the notes, very few have actually been elicited in the context of a sentence. In one of the few examples of a verb-derived nickname in context—*Mañ ñeid heg S-huckuan*. ‘I saw *Trips-a-lot*.’ (676.22)—the nickname appears with the determiner *heg*, as expected for a nominal.

- b Shel 'i vuushke (676.16)
always INCEP get.out
'Always getting out' (nickname)
- c S-vuushñi-g (676.18)
ST-get.out-VB
'Gets-out' (nickname)
- d Svuushñig 'a-t-k pi vuush. (EJ1/28/02.5)
A-PFV-EV NEG get.out
'“Svuushñig” evidently didn't get out.'

It is difficult to determine how frequently this suffix is used to form nicknames, though it seems entirely productive. The use of a name does not entail the existence of its referent, however, and so there may not be a strong correlation with stativity in such uses.

Moreover, in the example shown above, the *-ig* suffix attaches to what appears to be a verb already. This may indicate that a different, though phonetically similar, suffix is actually at work the formation of nicknames. If so, it is even less clear why the *s-* should also occur here, particularly if the *s-* expresses stativity alone.

Another suffix which licenses the *s-* prefix is the desiderative *-imk* (*-amk* after /t/, /d/, and /m/), indicating that what is expressed by the verb stem is a desire of the subject. Few examples of the use of this suffix have been found in Pima, though it is described for Papago by SSE. The only examples of ditransitive verbs which license the *s-* prefix seem to be derived using this suffix; as shown in (15).

- (15) M-a-ñ s-hem-'aagid-amk heg 'aaga. (794.21)
COMP-A-1s:SUB ST-2s:OBJ-tell-DSD DET story
'I want to tell you a story.'

Here, the verb stem *'aagid* 'tell' normally disallows the *s-* prefix, as would be expected if the *s-* expresses stativity, since to *tell (someone) something* is an accomplishment (in English, according to Dowty), and not a state. However, to *want something* or to *want to*

do something is stative (in English, again according to Dowty). The meaning of this suffix, too, is therefore consistent with the *s-* prefix indicating stativity.

Other suffixes which license the *s-* are *-dag* (*-d:ag* after /a/) and *-id*, which both combine with verbs to derive verbs meaning ‘be able to *verb*’; the suffix *-dag* may attach to nouns to form verbs meaning ‘be *noun*-like’. It is unclear what further differences in meaning exist between these suffixes, and although *-id* is reported in SSE, no clear cases of this suffix have been observed in Avelino *et al* (2001). However, the suffix *-dag* appears quite frequently in Pima, for example in *s'ooladag* ‘golden’ (here attaching to the noun *'oola* ‘gold’ and meaning ‘gold-like’), and *smeldag* ‘be fast’ (derived from the verb *med* ‘run’, *smeldag* literally means ‘be able to run’). This verb is shown in context below.

- (16) a Hega'i 'o'odham 'o med:. (EJ12/10/01.21)
 that man IMP run
 ‘That man is running.’
 b Hega'i kalit 'o s-mel-dag.
 that car IMP ST-run-able.to
 ‘That car is fast.’ (*lit.* ‘That car can run.’)

Although the verb stem *med:* ‘run’ is an activity, the ability to perform that activity is a state. It requires no action, volition, or agency on the part of its argument, and the possession of passive ability requires no simultaneous internal change. That these suffixes license the *s-*, then, is also consistent with the *s-* expressing stativity in Pima.

In addition to these suffixes which license the *s-*, there are two prefixes which also license the *s-* on verb stems which would otherwise disallow it, and, like the object agreement prefixes, they occur between the *s-* and the stem. For example, the verb *'eesid*

‘steal’ is ungrammatical with the *s-* prefix, but the derived verb *sta-'eesima* ‘be likely to be stolen’ must occur with the *s-*.

These derivational prefixes have both been described by numerous authors for Papago. The first of these, the prefix *ta-*, is described by Saxton, Saxton, and Enos (1983:55, hereafter SSE) as preceding “transitive verbs to form combining elements [= bound morphemes] showing a characteristic of an undergoer of the action.” Hale (1959) glosses this for a single dialect of Papago as expressing an “indefinite agent” (1959:72). Although the effect of this prefix is similar to passive voice—reducing the number of arguments of the verb by one, promoting the former object to the subject position, and causing the former subject to become optional—native speakers often translate English passive sentences into Pima using a completely different construction (see Kim, 2002). The meaning of this prefix may be more like the English suffix *-able*, which results in a predicate denoting the property of a possible object of the verb—the *ta-* prefix in Pima and Papago results in a predicate denoting the property of a typical object of the verb. As with the English passive or *-able*, the indefinite agent in Pima may be optionally expressed, though it is not marked for case in any way (case is not overtly marked in Pima apart from the use of a small number of adpositions). Several examples of this morpheme are shown in (17) (in the second example, the prefix *ta-* occurs on the verb stem used in (8)). Here, *ta-* is provisionally glossed INDEF:AGT.

- (17)a Heñ-kalit 'o s-ta-'ees-im-a heg pi 'ap 'o'odham. (EJ12/10/01.5)
 1s:POSS-car IMP ST-INDEF:AGT-steal-ADV-T DET NEG good person
 ‘My car is likely to be stolen by a bad person.’

- b 'Iida tokdod: 'o s-ta-'eebd-am-a. (641.9)
 this spider IMP ST-INDEF:AGT-fear-ADV-T
 'This spider is dangerous.'

This prefix is felt by speakers to be no longer productive; moreover, the meaning which results from the application of this prefix may not be completely compositional. More than being simply a typical object of 'fear', the spider in (17)b is judged to be truly deadly. It is unclear whether this meaning is completely idiomatic, or could be contributed by the other morphemes in this word, since the semantic content of many of these suffixes is not well understood. Without the *-a* suffix, for example, this word is translated as 'scarily' (which is still not exactly the same meaning as 'typically feared'), and is usable only as an adverb.¹⁵ If the *-im/-am* suffix merely derives an adverb, then the word *s-ta-'eebid* would be expected to mean 'scary, a typical object of fear.'

Unfortunately, no such word exists, so it is not possible to confirm its meaning.

This prefix itself is not well understood, either. For example, based on the meaning given above, it might be expected that the *ta-* prefix would only occur on verbs with both subjects and objects, since the subject of the new verb seems to correspond to the object of the verb that the *ta-* prefix attaches to. This is a strong tendency, but a few Pima intransitives do allow this prefix. Hale also gives several examples of this prefix in Papago occurring on intransitive stems (1959:132), including (in the present

¹⁵ Specifically, the suffix *-a* appears to indicate a property which truly holds of an individual, and does not simply appear to hold; in SSE, however, three homophonous *-a* suffixes are listed, one of which combines with adverbs to form stative verbs which take the *s-* prefix. What is unclear here is whether the *-a* suffix is responsible for the shift from the expected meaning "likely to be feared" to the attested meaning "truly dangerous".

orthography) *sta-hehemima* ‘laughter-inducing’, from *hehem* ‘laugh’ (the Papago counterpart of the Pima verb seen below), and *sta-hi'ama* ‘urine-inducing’, from *hi'am* ‘urinate’. From this, it appears that the *ta-* prefix manipulates the meaning of the stem it attaches to, independent of the grammatical relations of its arguments and thematic roles it assigns. Note that the English suffix *-able*, even though it also seems to require a host stem which takes an object, may attach to some intransitive verbs like *laugh*. In the case of the English verb *laugh*, it is understood by speakers that when someone laughs, there is frequently something motivating that laughter. In English, this source of humor can be optionally expressed as the object of the preposition *at*. Speakers of Pima may also understand that laughter is typically motivated by something or someone, but a completely different form of the verb must be used to express who or what is being laughed at. Interestingly, it is the intransitive variant of ‘laugh’, *hehem*, shown in (18)a, rather than the transitive *'ash* ‘laugh at’, seen in (18)c, that the prefix *ta-* occurs on.

- (18) a *Three Stooges* 'o s-ta-hehem-ma. (EJ12/17/01.40)
 IMP ST-INDEF:SUB-RED:laugh-??
 ‘The Three Stooges are able to make one laugh.’ (*i.e.*, they are funny)
- b * Ha-hehem 'a-ñ. (EJ12/17/01.38)
 3p:OBJ-RED:laugh A-1s:SUB
 Intended: ‘I am laughing at them.’
- c Ha-'ash 'a-ñ. (EJ12/17/01.36)
 3p:OBJ-laugh.at A-1s:SUB
 ‘I am laughing at them.’

The other valency-modifying prefix which requires the *s-* prefix is *cu-*, which SSE describe as a “prefix added to transitive verbs to form s-class stative verbs [= stative verbs which take the *s-* prefix] indicating a characteristic of the subject.” Hale (1959) glosses *cu-* as “indefinite object.” As with *ta-*, the prefix *cu-* may be affixed to stems

which do not license the *s-* prefix, but the presence of the *cu-* prefix makes the *s-* prefix obligatory. The use of the prefix *cu-* is exemplified below; here, it is provisionally glossed INDEF:OBJ.¹⁶

- (19)a S-heegam 'a-n-t heg Brook. (50.23)
 ST-jealous A-1s:SUB-PFV DET
 'I am jealous of Brook.'
- b Ma-liiya kun 'o ge s-cu-heegam-k. (635.9)
 husband IMP FOC ST-INDEF:OBJ-jealous-NT
 'Mary's husband is jealous.'

The pair of prefixes *cu-* and *ta-* appear to complement each other. Each of these two morphemes results in an intransitive verbal predicate (usually by a reduction in the valency of a transitive verb)—the *ta-* prefix by making the subject optional, the *cu-* prefix by making the object optional.¹⁷ The resultant meaning of both also appears to be stative, providing another correlation between the *s-* prefix and stativity—the *ta-* prefix results in a predicate which denotes a typical object of the verb, and the *cu-* prefix results in a predicate which denotes one who or that which typically *verbs*.

Despite this systematicity in their meaning, the prefixes *cu-* and *ta-* appear to

¹⁶ Historically, the prefix *cu-* may be derived from incorporation and phonological reduction of the indefinite object *ha'icu*. In the synchronic grammar, however, the *cu-* prefix appears to have a slightly different meaning from an indefinite object expressed by *ha'icu*; indefinite objects expressed by *ha'icu* appear to be specific, while indefinite objects expressed by *cu-* appear to be non-specific. It is not understood how the indefinite object expressed by *cu-* differs from the indefinite object expressed with *ha-*, as in (21).

¹⁷ Although SSE and Hale (1959) describe the prefix *ta-* in thematic terms like “agent” and “undergoer of the action”, they describe *cu-* in terms of grammatical roles like “subject” and “object”. As discussed for the verb stem *hehem* ‘laugh’, the prefix *ta-* is even able to promote to subject position an entity (the object of laughter) to which that verb stem is not even able to assign a thematic role. It is therefore not clear what the

occur only on a limited set of roots, and the resultant meaning may at times be slightly idiomatic (compare (17)a). As mentioned before, they are not a regular way to passivize verbs, but just as in passive constructions, the demoted argument seems to be optionally expressible (though again it is not clear if the subject receives oblique case, as with passive). In the series of sentences below, the object of the transitive verb *'amicud* 'know', seen in (20)a, can be expressed even when the *cu-* prefix is used, as in (20)c, though (20)d shows that the object may no longer overtly agree with the verb.

- (20) a S-'amcud 'a-ñ heg ha'icu doa-kam. (797.10)
 ST-know A-1s:SUB DET thing alive-NOM
 'I understand living things.'
- b S-cu-'amcud 'a-ñ.
 ST-INDEF:OBJ-know A-1s:SUB
 'I am understanding; I am wise.'
- c S-cu-'amcud 'a-ñ heg ha'icu doa-kam. (797.11)
 ST-INDEF:OBJ-know A-1s:SUB DET thing alive-NOM
 'I am understanding of living things.'
- d * S-hem-cu-'amicud 'añ. (EJ 3/4/02.18)
 Intended: 'I am understanding of you.'

Since the prefixes *cu-* and *ta-* both require an initial *s-*, it might be claimed that these prefixes are in fact simply *scu-* and *sta-*, and that this is not an instance of the same *s-* prefix seen earlier. Some of the same arguments mentioned earlier can be used to show that a morpheme boundary still follows the *s-* in these cases. For example, the segmental sequences *scu-* and *sta-* include phonologically marked complex onsets, indicating that a morpheme boundary probably intervenes. Additionally, the *s-* which co-occurs with *cu-* and *ta-* displays the same sensitivity to causative and inchoative morphemes observed previously for the *s-* prefix. Moreover, the *s-* which co-occurs with

most appropriate way to characterize the effects of these prefixes is.

the *cu-* and *ta-* prefixes is dispreferred within the scope of negation, as with other instances of the *s-* prefix, as seen in (21).

- (21) D-o ge pi cu-'eebd-am ha-ceggia-dam. (550.25)
 COP-IMP FOC NEG INDEF:OBJ-fear-ADV INDEF:OBJ¹⁸-fight-NOM
 'He is a fearless warrior.' (*lit.* 'He is a not-fearing fighter-of-someone/thing.')

The behavior of the *s-* with respect to negation will be presented in the following section.

2.4 Breakdowns in the correlation between stativity and the *s-*

If the statements in the previous section accounted for all occurrences of the *s-* prefix, the association of the *s-* with stativity would be clear. In fact, a significant number of predicates (both adjectives and verbs) appear stative but cannot normally occur with the *s-* prefix. Words which license the *s-* are not even a subset of the stative predicates in Pima, however, since there are a small number of predicates which require the presence of the *s-* prefix but are arguably non-stative. If all of the non-stative predicates which license the *s-* are true statives which have simply been misanalyzed, it would be easier to associate the *s-* with stativity—in such a situation, at least, being stative would be a necessary condition for licensing the *s-* prefix—but the question would still remain why there are a significant number of statives which disallow the *s-*.

The adjective *co'adk* 'tall', seen in (11), is one example of an adjective which seems stative but which does not license the *s-* prefix. Another example, *'aj* 'narrow', is

¹⁸ Here I follow Munro (2001a) in glossing this use of *ha-* as indefinite object. It should be noted that, despite being glossed the same in this thesis, the prefixes *ha-* and *cu-* are not synonymous or interchangeable in Pima.

shown in (22). The derived form in (22)e does license the *s-* prefix, but it will be seen below that the suffix which is used here licenses the *s-* prefix, not the adjectival stem.

- (22)a Hega'i voog 'o 'aj-ij. (583.8)
 that path IMP narrow-VB
 'That path is narrow.'
- b * Hega'i voog 'o s'ajij. (583.9)
- c 'Aj voog 'a-c 'oid. (583.10)
 narrow path A-3p:SUB follow
 'We are following a narrow path.'
- d 'E-ceegig 'a-t 'aj-iñim 'o'oha. (583.12)
 -1:REF-name A-PFV narrow-ADV write:PFV
 'He wrote his name very narrowly.' (*i.e.*, with narrow letters or strokes)
- e Hega'i voog 'o s-'aj-ij-kim. (719.2)
 that path IMP ST-narrow-VB-PST?
 'That path used to be narrow.'

Words which denote states but which cannot occur with the stative *s-* also include the adjectives *shopolk* 'short', *sho'ig* 'poor, humble', and *hekia* 'pure, whole, holy', and the verbs *ñeid* 'see', *taatam* 'feel', and *tatcua* 'want'. More stative words in Pima which disallow the *s-* prefix are listed in the Appendix (found by comparing the data in Avelino *et al.* (2001) with the list of example stative predicates in Dowty 1979). Some of these words do occur with the *s-* prefix, but with different meanings; the shift in meaning does not seem systematic, however. For example, Pima includes the adjective pairs *co'ad:k* 'tall' vs. *s-co'ad:k* 'big-boned', and *doa* 'alive' vs. *s-doa* 'healthy'.

There does not seem to be any factor which distinguishes these words from others which do license the *s-* prefix: words which appear stative but which disallow the *s-* include both verbal roots and adjectival roots (and according to SSE, adverbial roots as well), and they do not have a phonological shape which would distinguish them from others. Every characteristic shared by many stems in one set also seems to be shared by

at least some stems in the other. For instance, although most statives which disallow the *s-* prefix describe spatial relationships or shapes, there are statives which describe shapes which do require the *s-*. The pair '*aj* 'narrow' and *s-tadañ* 'wide' is a good example of this—although both describe spatial properties, '*aj* 'narrow' disallows the *s-* prefix, but *s-tadañ* 'wide' requires it. Although many statives which disallow the *s-* prefix require overt suffixes to be used predicatively, there are similar statives which require the same predicative suffixes which do license the *s-* prefix. An example of this is the pair '*aj*/'*aj-ij* 'narrow(Adj)/be narrow(V)' which disallows the *s-* prefix, and *s-keeg*/*s-keeg-aj* 'beautiful(Adj)/be beautiful(V)', which requires it. For this reason, an analysis in which the *s-* prefix expresses stativity may be forced to simply list as exceptions those statives which instead do not allow the *s-* prefix.

Although these may be considered simply lexical exceptions, their number is not insignificant. Of the 56 stative adjectival roots listed in Appendix A, eleven roots, or 20% of the total, disallow the *s-*. The proportion seems to be similar in Papago: of the 44 stative adjectives in Zepeda (1983:109-110) ("stative verbs and adjectives" is her term, though all of those she lists there appear to be from adjectival roots) nine roots, which is also 20% of the total, disallow the *s-* prefix.

More difficult to account for are the small number of verbs which require the *s-* prefix, but which appear to be non-stative. The most extreme example is shown in (23).

- (23) a S-'oohod 'o heg 'oks heg 'e-kun. (EJ8/27/01.8)
 ST-reject IMP DET woman DET 1:REF-husband
 'The woman is separated from her husband.' *or* 'The woman is rejecting her husband.'

- b S-'oohod 'a-t heg 'oks heg 'e-kuñ. (663.9)
ST-reject A-PFV DET woman DET 1:REF-husband
'The woman divorced her husband.' *or* 'The woman rejected her husband.'
- c S-cu-'amicud-dam 'a-t 'am ha-'oohod-ac
ST-INDEF:OBJ-understand-NOM A-PFV DXS 3p:OBJ-reject-CAUS
heg 'e-kuukunam. (EJ3/4/02.35)
DET 1:REF-RED:husband
'The judge divorced the married couple.' *or* 'The judge caused the married couple to reject (each other).'
- d S-'e-'o'ohod 'a-t. (663.12)
ST-1:REF-RED:reject A-PFV
'They divorced each other.' *or* 'They rejected each other.'

The verb in these examples, *'oohod* 'reject, divorce', frequently seems to be non-stative, yet in all but the causative example (23)c, the *s-* prefix is required. The categorization of *'oohod* in (23)b as an achievement may be related to a change of state interpretation which is often preferred in the perfective aspect. As mentioned in the previous section, although the *s-* is dispreferred on some stems in inchoative uses, it is not dispreferred on all such stems. This is typical of the way grammatical aspect is indirectly related to the acceptability of the *s-*: many predicates which license the *s-* are preferentially volunteered in the imperfective aspect, and many also obligatorily receive an inchoative interpretation when they are used in the perfective aspect. Sentences (24)a and b show the same adjective with the *s-* prefix occurring in the imperfective aspect, and in the perfective aspect with an inchoative meaning. The sentences in (24)c and d are included to show that a similar alternation happens with verbs, although the meaning here may be better characterized as inceptive rather than inchoative.¹⁹

¹⁹Note that perfective or imperfective aspect of a clause is always indicated on its second position auxiliary. Perfective aspect is also sometimes indicated on the main verb by truncation or suppletion, though frequently aspect is not indicated on the verb at all.

- (24)a 'lida 'u'uhig 'o s-vegi. (EJ9/10/01.14)
 this bird IMP ST-red
 'The bird is red.'
- b 'lida 'u'uhig 'a-t vegii.
 this bird A-PFV red
 'The bird became red.'
- c John 'o s-hoohid hegai. (364.1b)
 IMP ST-like that
 'John likes that one.'
- d John 'a-t s-hoohi hegai. (364.1a)
 A-PFV ST-PFV:like that
 'John started liking that one.'

The examples of the *s-* prefix occurring on an achievement verb in (23)b and d (and on other such verbs in similar cases) may therefore be explained as a lexicalized exception to the generalization that stative verbs, when used inchoatively, no longer license the *s-*. Unfortunately, in this example it is not clear that the imperfective, non-inchoative use of *'oohod* 'reject, divorce' in (23)a is stative in the first place.

In the first two examples of (23), the intuition of speakers is that the subject is the agent of the separation. In such sentences, it is not possible to express an entity which is causing the separation distinct from the subject (*cf.* the possibility in English of the passivized causative 'The woman was separated from her husband by the judge.'). In addition, this verb has been used in Papago texts where the subject is clearly the agent (*Jiosh Wechij O'ohana* (Papago-Piman New Testament), Hebrews 10:28). Other examples of verbs which appear to include agents (*i.e.*, making them non-stative) but which license the *s-* prefix are the reflexive verbs *s-'e-mamce* 'be studying' and *s-'e-baabgiim* 'go slow, be careful'.²⁰ Adjectives which involve agentive subjects based on

²⁰ Some reflexives which license the *s-*, like *s-'e-gagd:adag* 'be a seller of oneself', and

Dowty (1979) and Lakoff (1966), but which license the *s-* prefix in Pima, include *s-nakosig* ‘noisy’ and *s-cecojim* ‘brave’. In a formalization like that presented by Dowty (1979), the inclusion of an agent is not even permitted in a purely stative predicate. It is possible that the original meanings of these verbs did not involve agents but have drifted over time, and that the *s-* prefix simply became grammaticized with these verbs. This possibility would need to be accounted for in a synchronic analysis of the *s-* prefix.²¹

There are also patterns of behavior of the *s-* in Pima which, although not contradictory to a correlation between stativity and the *s-* prefix, are simply hard to explain if stativity is all that is relevant for licensing the *s-*. One such pattern involves the licensing of the *s-* by a suffix which is implicated in the formation of adverbs from verbs, but whose exact meaning is unclear, seen in the following example. The *s-* is not normally grammatical on the verb *gigivk* ‘shiver, tremble, waver’ when it is used predicatively (without the *-im* suffix) as seen in (25)b, but when it is used adverbially with the *-im* suffix, the *s-* is actually preferred.

- (25)a Ñe'i 'o si gigivk. (599.16)
 music IMP very waver
 ‘The music was very tremulous.’
 b *Ñe'i 'o sgigivk. (599.17)
 c Celine Dion 'o s-gigivk-im ñe'e. (599.20)
 IMP ST-waver-ADV sing
 ‘Celine Dion sings tremulously.’

s-'e-vailadag ‘be a dancer’, are derived by the suffix *-dag*, which requires the *s-* prefix.

²¹ Other verbs, which license the *s-* prefix but do not involve agents, also appear to be non-stative. For example, although the reflexive verb *s-'e-cuhugi* ‘faint’ does not involve an agentive subject, it appears to be an achievement rather than a state.

- d ? Celine Dion 'o gigivkim ñe'e. (599.21)
 Intended: 'Celine Dion sings tremulously.'

The verb as used here appears to be an activity, not a state. Unfortunately, only a few other verbs are known for certain to behave similarly —*vevelig* 'to buzz' / *s-vevelgim* 'buzzingly' is an example. There is no obvious reason why these verbs would become stative when used to adverbially modify another activity, why the suffix *-im* (described by SSE as an adverbializing suffix) would introduce stativity, or even how stativity could be a property of an adverb at all.

A very similar suffix can be seen licensing the *s-* on a predicate adjective, however. Although this adjective does not normally license the *s-* prefix, the prefix is actually allowed (though not required) in the following context (repeated from (22)e).

- (22)e Hega'i voog 'o s-'aj-ij-kim. (719.2)
 that path IMP ST-narrow-VB-??
 'That path used to be narrow.'

If the *-kim* suffix here is related to the *-im* seen in *s-gigivk-im* 'tremblingly' and *s-vevelg-im* 'buzzingly', they could be allomorphs of the same suffix or, since no conditioning environment presents itself, the *[k]* in (22)e could represent a distinct morpheme. Several suffixes with the form *-k* have been observed in Pima, though it is not clear if they represent a single suffix or several homophonous suffixes. As seen earlier, some adjectives require a *-k* suffix to be used predicatively; on other stems, a *-k* suffix indicates that a verbal predicate is non-transitory, or individual level. Although non-transitory properties²² are often associated with stativity, it is not clear whether the *-k*

²² "Individual level", rather than "non-transitory", is the more frequently used term,

suffix, the *-im* suffix, or some other factor, is responsible for licensing the *s-* prefix in examples like these.

The other behavior of the *s-* prefix which is difficult to explain if stativity is all that it expresses is that it is often absent from stems which would normally license its presence when those stems are under the scope of negation. This generalization is true for at least some words in Pima, and has been claimed by Zepeda for many speakers of Papago as well (1983:111). This fact has led others (*e.g.*, SSE and Saxton (1982)) to propose that the *s-* prefix is not an indication of stativity, but rather indicates the affirmative, the opposite of the negated form. Several examples are shown below.

- (26) a S-hem-hoohid 'a-ñ. (812.24)
ST-2s:OBJ-like A-1s:SUB
'I like you'
- b ?? Hem-hoohid 'a-ñ. (812.26)
Intended: 'I like you.'
- c Pi 'a-ñ hem-hoohid. (812.28)
NEG A-1s:SUB 2s:OBJ-like
'I don't like you.'
- d * Pi 'añ s-hem-hoohid. (812.29)
Intended: 'I don't like you.'
- e M-o va s-doa heg Melissa. (EJ2/11/02.6)
COMP-IMP SHD ST-alive IMP DET
'Melissa is well.'
- f Mo va doa heg Melissa. (EJ2/11/02.5)
'Melissa is still alive.', * 'Melissa is well.'
- g Pi 'a-ñ doa. (EJ2/11/02.2)
NEG A-1s:SUB alive
'I'm not well.'
- h * Pi 'añ sdoa. (EJ2/11/02.4)
Intended: 'I'm not well.'

though Jäger (1999) shows that as it is typically used, the term “individual level” refers to three independent properties, only one of which is non-transitoriness. The more specific term is used here to avoid confusion with other uses of the term “individual level”.

On words which pattern this way, the *s-* prefix is ungrammatical regardless of the derivational context in which the word is being used—as a verb, adjective, or adverb. Furthermore, adverbial material between the negative *pi* and the *s-* prefix (like *sha'i* ‘really, at all’) does not block this effect.

This may indicate that the *s-* prefix is a positive polarity item. Notably, this effect is subject to a locality condition and does not apply to all stems c-commanded by a negative phrase at the surface. In (27)a, the *s-* prefix is dispreferred on the matrix verb *maac* ‘know’ since it is in the negated clause, although the verb *s-hoohid* ‘like’ in the embedded clause is perfectly acceptable with the *s-* (compare to *s-hoohid* ‘like’ in (26)d above). The embedded clause is marked with brackets. The relation of c-command must be relevant, as well, since the negative quantifier in the subject DP in (27)b causes the *s-* prefix to be dispreferred on the verb. When the negative quantifier occurs on an object in pre-auxiliary position, however, the *s-* is neither required, nor dispreferred, but optional.

- (27)a John 'o pi sha'i maac [m-o heg Mary 'am s-hoohid hega'i]. (EJ1/28/02.11)
IMP NEG really know COMP-IMP DET DXS ST-like that
‘John doesn't know that Mary likes that one.’
- b Pi hed:a'i 'o hoohid hega'i. (EJ4/1/02.7)
NEG someone IMP like that
‘No one likes that one.’
- c * Pi hed:a'i 'o s-hoohid hega'i. (EJ4/1/02.8)
Intended: ‘No one likes that one.’
- d Pi hed:a'i 'a-ñ hoohid. (EJ4/1/02.14)
NEG someone A-1s:SUB like
‘I like nothing.’
- e Pi hed:a'i 'a-ñ s-hoohid. (EJ4/1/02.15)
NEG someone A-1s:SUB ST-like
‘I like nothing.’

Generalizations concerning negation are complicated, however, by the fact that

judgements of the grammaticality of the *s-* within the scope of negation vary for different stems. For *s-hoohid* ‘like’, the *s-* prefix is strongly disallowed within the scope of negation, while for words like *s-'oam* ‘brown’, it merely becomes optional.

- (28)a Miitol-ga-j heg Brook 'o pi sha'i s-'oam. (73.26a)
 cat-GA-3s:POSS DET IMP NEG really ST-brown
 ‘Brook's cat isn't brown.’
 b Miitolgaj heg Brook 'o pi sha'i 'oam. (73.26b)
 ‘Brook's cat isn't brown.’

Although this does not constitute evidence against associating the *s-* prefix with stativity, it is puzzling why a morpheme which indicates stative lexical aspect on verbs and adjectives would be a positive polarity item. If lexical aspect was defined only in non-negated contexts, then the *s-* would not be expected to occur within the scope of negation at all, rather than simply being optional, as in (28).

A summary of the behavior of the *s-* as presented in this section is given in (29).

- (29) The *s-* prefix:
- occurs on many but not all stative predicates (roughly 80% of adjectives), but also occurs on a small number of predicates which do not seem stative.
 - occurs on open-class words (adjectives and some verbs).²³
 - occurs on intransitive, transitive, and (derived) ditransitive predicates.
 - occurs farther from the stem than object prefixes and the prefixes *cu-* and *ta-*.
 - interacts on some stems with aspect, inchoativity, causativity, and negation.
 - can be licensed on non-stative verbs by several derivational suffixes, many of which result in stative predicates (predicative *-ig/-ag*, desiderative *-imk/-amk*, and ability suffixes *-id* and *-dag*).

²³ The *s-* prefix is also claimed by SSE to occur on adverbial and nominal roots, though the evidence that any such roots are truly adverbial or nominal, and not verbal, is not strong for Pima.

3. Analysis of the *s-* prefix

Although the *s-* prefix displays some correlation with stativity, analysis of this morpheme is complicated by the differences in its behavior on different stems, and its susceptibility to lexical exceptions. Although the historical development of the *s-* is not clear, it may represent a semantic feature (namely, [+STATE]) that has somehow been grammaticized in the synchronic grammar of O'odham (Pima and Papago). The model of the behavior of the *s-* which will be presented here will assume that the *s-* expresses this once-meaningful feature.

In most Lexicalist theories of morphology, the characterization of a morpheme as derivational or inflectional would determine the type of mechanism used to model it. The *s-* prefix, however, is not easily characterized as either a derivational morpheme or an inflectional morpheme. Several of the characteristics of the *s-* prefix make it look like a derivational affix: the distribution of the *s-* prefix is not completely regular, and the stems on which it may or may not occur must be memorized by speakers as exceptions (*e.g.*, predicates like *s-'oohod* 'reject', which seem to license the *s-* even though they seem active, and predicates like *coad:k* 'tall', which do not license it even though they seem stative); also, the semantic irregularity of the *s-* prefix—seen particularly on those stems where its addition results in a specific meaning—is more frequently a property of derivational morphemes. In other respects, however, it appears to pattern like a traditionally inflectional morpheme: in most cases it does not by itself affect the meaning of the stem which hosts it; although it is associated with category-changing morphemes, by itself it never appears to change the category of the stem which hosts it; and it is

sensitive to syntactic facts, like being within the scope of a negative element.

Furthermore, if derivational morphemes are rigidly required to attach to stems before inflectional morphemes, then the *s-* must be inflectional—the object agreement morphemes, which are clearly inflectional, occur between the *s-* and the stem. If the *s-*, like a traditional derivational morpheme, was attached to the left edge of the stem, then the agreement morphemes could not subsequently be attached to the left edge of the derived stem, but would have to be inserted between the *s-* and the stem, posing a problem within traditional theories of morphology.

Two options are available to resolve this dilemma: either the *s-* represents an inflectional morpheme despite its irregularity in meaning and occurrence, or the division between derivational and inflectional morphology should be relaxed. In the former case, inflectional morphology that is not completely regular is, of course, not such an unusual proposition. English displays inflectional morphemes which are irregular in form, if not in meaning—past participles, and even past tense—and English also employs derivational morphemes which are quite regular and productive. An analysis of the *s-* as a functional, inflectional head has in fact been proposed by Avelino (2001), based on an analysis in Hale (2001) of Papago inchoatives. This will be discussed in §3.4, where it will be shown that this analysis, and other analyses which place the *s-* prefix in an inflectional terminal node independent of the stem, meet with serious difficulties.

Observations that the line between derivational and inflectional morphemes is sometimes difficult to draw (as in this case) have been used to argue for the option that the apparent distinctions between derivational and inflectional morphemes do not involve

a difference in the mechanism or type of structure which is represented. This option is adopted within the framework of Distributed Morphology, in which there is no distinction between derivational and inflectional morphology. In fact, Distributed Morphology goes even further, to say that linguistic structure below the level of the word (traditionally the domain of morphology) and linguistic structure above the level of the word (traditionally the domain of syntax) are derived by a single set of operations. This type of analysis will be presented in §3.3, where it will be assumed that the *s*- prefix expresses a feature carried by certain stems in Pima.

Although such an analysis could be used to describe a class of stems which is entirely arbitrary, it is still consistent with the *s*- prefix expressing a property like stativity, which is based, if somewhat inexactly, on lexical aspect. Whether the set of stems which license the *s*- is completely arbitrary, whether it is based solely on the meaning of each stem, or whether it is semi-arbitrary (semantically based for stems with prototypical meanings, with borderline cases patterning arbitrarily), it is assumed that they will be distinguished in the same way, by a feature.²⁴ It will be shown that although a feature-based analysis within Distributed Morphology is able to model the exceptional absence of the *s*- prefix on certain stems, there is a narrow window in the course of a derivation in which the feature which triggers insertion of the *s*- must percolate through the structure.

²⁴ The characteristic which would distinguish a completely arbitrary class from a non-arbitrary class is the behavior with respect to new stems: if new stems can be added to a class based on their meaning, then membership in the class cannot be entirely arbitrary.

Before this model of the behavior of the *s-* is presented in §3.3, however, §3.1 will review the structurally relevant behavior of the *s-* from a more theoretical perspective than the perspective taken in §2, to indicate which structural positions may be ruled out, and §3.2 will describe the theoretical framework of Distributed Morphology.

3.1 Observations relevant to a structural analysis of the *s-*

Several observations which provide useful information about the structural location of the *s-* prefix are listed in (30).

- (30)
- a. All other things being equal, for most stems the presence or absence of the *s-* affects the acceptability of a sentence, but not its meaning; for certain stems, however, the presence or absence of the *s-* results in a different semantic interpretation.
 - b. The acceptability of the *s-* depends on the presence of other morphemes within the word and within the phrase.
 - c. The *s-* occurs on both adjectives (attributive/prenominal and predicative) and verbs, and certain of their derived forms (at least adverbs, as in (10)c).
 - d. The acceptability of the *s-* generally correlates with stative lexical aspect of a stem, though a few stative predicates lack it, and a few non-stative predicates license it.
 - e. The *s-* is separated from the stem by the object agreement markers, and the prefixes *cu-* and *ta-*.

The first of these observations, that the presence or absence of the *s-* is relevant for semantic interpretation in at least some cases, shows that the *s-* prefix must be present in the representation which encodes meaning. In a traditional model of generative grammar, for instance, the *s-* could not be added by a morphological or phonological rule after spell-out, since it would then not be present at LF, where it would need to be in order to be relevant for meaning.

When the *s-* is omitted on many stems which normally license it, the grammaticality of the sentence is degraded, but there is no change in interpretation—it is

still clear what the speaker intends to say. When the *s-* is attached to certain stative stems which do not normally license it, however, the resulting sentence can be grammatical, but have an idiomatic interpretation of the stem hosting the *s-* (that is, the change in meaning associated with the addition of the *s-* appears to be unpredictable). The following pair of sentences illustrates this difference.

- (31) a Coad:k 'a-ñ. (EJ11/19/01.13)
 tall A-1s:SUB
 'I am tall.', * 'I am big-boned.'
 b S-coad:k 'a-ñ. (EJ11/19/01.14)
 ST-tall A-1s:SUB
 'I am big-boned.', * 'I am tall.'

The only difference between the two sentences in (31) which can signal a difference in meaning is the presence or absence of the *s-* on the verb. Its presence or absence must therefore be observable to the semantic component of the grammar. It is thus not possible for the *s-* to be added by a phonological rule after spell-out, or, more generally, after the point in the derivation at which form is relevant for meaning.

Similarly, the second observation in (30)—that the *s-* is sensitive to the presence of other morphemes in the word and in the phrase—also indicates that the *s-* must occupy a structural position within the syntax. From §2, recall that the *s-* is sometimes disallowed when the stem supporting it is inchoative or causative (recall also that the inchoative is not always overtly marked, though inchoative interpretations are often favored in the perfective), and that the *s-* is sometimes licensed on a non-stative root when certain derivational morphemes are part of the stem. The *s-* is also frequently dispreferred within the scope of negation, regardless of intervening phonological

material.

Under an analysis in which the *s-* prefix was added after spell-out, as described above, an initial *s-* would be added to the left edge of certain words after syntactic operations on those words had ceased (this could be after all syntactic operations had ceased, or, if syntactic derivation is taken to be cyclic, after syntactic operations for that particular cycle had ceased), correctly placing the *s-* as the leftmost prefix on a stem. Words to which this rule applies could be listed specifically in the rule, or picked out by a feature. The absence of the *s-* in certain contexts, such as within the scope of negation, would imply that the rule was blocked in those contexts. The description of the contexts where the *s-* could not occur, however, would require reference to information about the morphological and syntactic structure of a sentence—information which should not be available after spell-out, when the sentence had been passed to the phonological component. Since this type of rule would have to refer to syntactic structure, it would have to operate within the syntactic component, and not after spell-out.

Observation (30)c, that the *s-* occurs on stems with a variety of grammatical categories, restricts the possible structural locations that the *s-* may occupy. If the *s-* is to occupy a structural position which has been independently argued for in the linguistic literature, it must be a position which is common to the extended projection of all of these grammatical categories, or a projection which may take any of these categories as its complement.

Although the extended projection of verbs has been the focus of much recent research (Cinque 1999 is one example), comparatively less has been done to explore the

extended projection of adjectives and adverbs. Functional structure has been proposed to dominate adjectives (for example, by Corver (1990, 1997)), but this structure is not of the same type as clausal structure; specifically, in Corver's proposal, the extended projection of an adjective includes constituents like DEGREE PHRASE (DegP) and QUANTIFIER PHRASE (QP), and not clausal elements like the tense, aspect, mood, or modality projections of Cinque. Deverbal adjectives or participles, which tend to be non-stative, may include such meanings (compare *the opening door*, *the opened door*), but it is not obvious that morphologically simple adjectives do—for instance, does *the large door* indicate anything like tense, aspect, or mood? Kennedy and Levin (2002) do propose that the semantic representation of certain adjectives (*i.e.*, gradable adjectives, which would include adjectives like *large*) includes an argument for the time at which the property expressed by the adjective is evaluated. If this time argument is hosted by a dedicated head, this head might be similar to the tense projections of verbs—which express the time at which the predicate is evaluated—but Kennedy and Levin do not seem to intend that this time argument actually occupies a position in the extended projection of the adjective.

Just as it is unclear whether these categories share a projection which would host the *s-*, the alternative option—that the *s-* is associated with a head which takes any of these categories as complements—is also unclear. The intensifier *si* is an element which can occur with all of these categories—adjectives, verbs, and adverbs—and because the intensifier is the most likely historical source of the *s-* prefix, it is initially attractive to propose that the *s-* is simply a phonologically reduced form of the intensifier *si*.

Unfortunately, the *s-* and the intensifier *si* cannot share the same structural position synchronically, since they often occur together, as shown in (32). Sentence (10)c shows *si* and the *s-* prefix co-occurring in an adverbial, as well.²⁵

- (32) Heñ-miitol-ga 'o si s-ape. (72.10)
 1s:POS-cat-GA IMP very ST-good
 'My cat is nice.'

Since these options do not appear to lead to an insightful analysis, the analysis to be presented here will treat the *s-* as a marker of a class of predicates, whose presence is triggered by a feature. This feature will be introduced into a phrase marker either through the insertion of a lexical root, or through the insertion of an affix. Since this feature occurs on both roots and derivational morphemes, it can occur on a variety of open-class words (like adjectives, verbs, and adverbs).

The observation in (30)d, that the acceptability of the *s-* generally correlates with stativity but does not coincide exactly with it, shows that the grammaticality of the *s-* is subject to lexical exceptions. As Mithun (1991) observes, some degree of exceptionality should not be surprising in properties of the language which have developed over time. She notes, in the context of a discussion of agreement selection, that the choice of a certain set of agreement markers can become lexicalized with a certain stem; that stem

²⁵ If the intensifier *si* is the historical source of the *s-* prefix, the dispreference for the *s-* to occur within the scope of negation may be partially understood. Although the intensifier *si* is not absolutely ungrammatical within the scope of negation, the negative polarity intensifier *sha'i* is much more frequently used there; the *s-* prefix may have inherited this property of positive polarity from the intensifier. If so, the association between stativity and positive polarity may be indirect; what is not explained is why the intensifier should be a polarity item, nor why the intensifier should become associated with stativity.

may consistently be used with the same agreement markers, even when the meaning of the stem drifts far enough that it should properly be used with a different set of agreement markers.

As noted for the previous observation, the following analysis will represent this lexicalized choice by means of a feature carried by certain roots and affixes. Those stative stems which do not license the *s-* will have exceptionally lost this feature. Non-stative stems which do license the *s-* may be explained in either of two ways—they may exceptionally carry this feature because their meaning has drifted close to a stative lexical aspect; or they may have had completely stative meanings historically, which they had since drifted from.

If the acceptability of the *s-* is encoded by a feature of the root or stem, the final observation listed in (30) indicates that this feature is expressed in a location which may be structurally distant from the stem. Specifically, the *s-* is separated from the root by the object agreement prefixes, the indefinite object prefix *cu-*, and the indefinite agent prefix *ta-* (using Hale's terminology from Papago, as discussed in §2.2). In the morphological structure of these words, the *s-* will therefore occupy a structural position which is higher than these other prefixes. For the analysis to be presented here, it will be assumed (following Chomsky 1999) that object agreement is expressed by a light verbal head. The analysis of the *cu-* and *ta-* prefixes is not yet clear, but it will be assumed here that these morphemes also involve the structure dominated by a light verbal head, since (following Marantz 1997) the indefinite subject prefix *ta-*, at least, involves reference to the external argument of the verb. Since the feature which licenses the *s-* is realized in a

location separate from the morpheme which introduced it, this feature must be able to percolate up through morphosyntactic structure, at least as high as this light verbal head.

Both object prefixes and *cu-* and *ta-* occur exclusively on verbs, and it is unclear how the conclusions about the *s-* prefix based on the behavior of these other prefixes should be extended to instances of the *s-* which occur on adjectival roots (adverbial stems which license the *s-* all appear to be derived from verbs, and so do not pose the same problem). Since the *s-* prefix displays the same behavior with regard to negation, inchoativity and causativity on both adjectives and verbs, it does not seem justified to propose distinct, homophonous *s-* morphemes that attach to each grammatical category. It will be assumed here that the stative feature introduced by adjectives will also percolate away from the root which introduces it, in order to be expressed phonologically.

There do not appear to be any other morphemes which are clearly prefixes and which occur to the left of the *s-*, so as to constrain its highest possible position. The morpheme which seems to be closest to the *s-* on its left is an unstressed particle *'i*, which in Pima seems to indicate the initiation of an action or the temporal definiteness of an event with regard to other events.²⁶

²⁶ There is as yet some uncertainty of the exact status of this morpheme. Hale (2001) considers this a particle (distinct from a prefix) and glosses it as both ‘inceptive’ and ‘correlative’ in Papago. SSE, like Hale, do not consider it a prefix (1983:25), defining it as “indicat[ing] a specific point in an action, or a specific thing, place, time, number, direction, etc.” Zepeda, however, does view it as a verbal prefix, indicating “forward or positive movement” (1983:126) in directional imperatives. In Pima, we see this morpheme occurring in sentences like the one below.

The conclusions which will be adopted for the purpose of this analysis, based on the observations in (30), are thus: that the *s-* occupies a position within the morphosyntactic derivation of sentences; that the grammaticality of the *s-* on a given stem will be signaled by a feature which will be introduced into the morphosyntactic structure either by the root or by an affix; and, that the feature which licenses the *s-* is somehow displaced from the morphemes that introduce it into the derivation, at least as high as the light verb involved in other verb prefixes.

3.2 The Framework of Distributed Morphology²⁷

The framework of Distributed Morphology (hereafter DM), which will be assumed for this paper, is outlined in Halle and Marantz (1993, 1994), among others. Characteristic features of DM include late insertion of lexical material or VOCABULARY ITEMS, underspecification of vocabulary items, and “syntactic hierarchical structure all the way down” (*i.e.*, syntactic and morphological operations use the same

-
- | | |
|------|--|
| (i) | 'Tida 'u'uhig 'a-t 'i vegii. (797.15)
this bird A-PFV INCEP red:INCH
'This bird is beginning to turn red.' |
| (ii) | 'Tida 'iks 'a-t vegii. (265.17)
this cloth A-PFV red:INCH
'The cloth became red.' |

For the purposes of this paper, this morpheme in Pima will be referred to simply as the inceptive morpheme, although its meaning may be more generally associated with temporal or spatial specificity, as indicated by SSE. Whether it is a particle or a prefix, it will be taken to delimit the highest position of the *s-*.

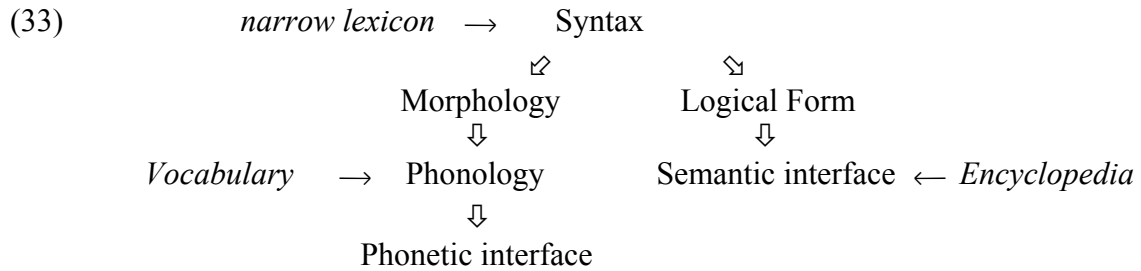
²⁷ The outline of a Distributed Morphology grammar which is briefly presented here follows most closely the presentation in Halle and Marantz (1994), though it also includes elements from Marantz (1997).

representation). Since this framework is not universally well-known, each of these characteristics will be explained below.

The derivation of a phrase marker within DM begins with syntactic operations on atomic elements. These atoms, provided in the narrow lexicon (see the figure in (33)), include atomic bundles of grammatical features (termed *f*-nodes) and atomic roots (in the sense of Marantz (1997); these will also be referred to as *l*-nodes). Crucially, phonological and other idiomatic material is not present at this point in the derivation. Syntactic structure is built from these atoms using the operations of MERGE and MOVE, as in a typical Minimalist grammar (*e.g.*, as outlined in Chomsky 1999). Following the syntactic structure-building, the phrase marker is sent to the morphological component and the semantic component of the grammar. The meaning associated with a phrase marker is evaluated using the ENCYCLOPEDIA, which pairs individual syntactic elements and possibly larger syntactic structures with meanings.

In the morphological component, a limited set of additional, morphological operations is allowed to perturb the structure prior to insertion of phonological material. These morphological functions include the projection of independent syntactic heads for purely grammatical/non-meaning-related morphemes like AGR; MERGER of structurally local nodes (similar to head movement), with the merged nodes becoming daughters of a single node; FUSION of sister nodes into a single node, combining their features; FISSION of features on a single node into separate nodes; and IMPOVERISHMENT or deletion of features in specific contexts. Following these morphological operations, phonological material from the VOCABULARY is inserted at each terminal node. The Vocabulary is a

list of pairings of roots or morphological features with phonological material. The choice of phonological material inserted at an *l*-node is determined by the category of the node which governs it, but the phonological material inserted at a given *f*-node is determined by a process of competition. Lastly, phonological and allomorphy rules are allowed to modify the inserted phonological material. This outline of a DM grammar is shown graphically in (33), modified from Halle and Marantz (1994). The italicized elements represent sources of “lexical” information, as the lexicon is normally construed.



The insertion of phonological material from the Vocabulary deserves further explanation. As stated above, each vocabulary item is a pairing of semantic, syntactic, and/or morphological features, or a specific root, with phonological material. At *f*-nodes, the competition for insertion takes place according to the subset principle: the vocabulary item which matches the largest subset of the features present on the node is chosen for insertion, so long as it does not also contain any features or feature values which are not present on that node. In this way, vocabulary items are a phonological expression of the grammatical features of a given node, and since they are inserted after syntactic operations have ceased, they cannot bring idiomatic information relevant for syntactic operations.

Insertion of phonological material at a root proceeds somewhat differently. The

narrow lexicon includes a generic place-holding, category-neutral root node, into which particular roots may be inserted from the Vocabulary later in the derivation. Any root may be inserted into a root node, so long as that root is licensed for that particular syntactic context (Harley and Noyer 1998); there may not be any competition for insertion of roots at *l*-nodes, as with other vocabulary items at *f*-nodes. The category of a root is then determined by the *f*-node which licenses it (*i.e.*, which governs it), and the phonological form of a root will be determined by the features of this licenser, though it may be modified by post-insertion phonological or allomorphy rules. Thus, the phonological features which will be inserted for the root $\sqrt{\text{DESTROY}}$ (using the notation of Pesetsky 1995) will be *destroy* when the root is governed by a light verb (or the appropriate verbal head), and *destruct-* when governed by a nominal head, which will be spelled out as *-ion*²⁸, resulting in the desired nominal form *destruction*. As with vocabulary items inserted at *f*-nodes, the features inserted at a root cannot be relevant to syntactic operations, since those operations can no longer operate on a phrase marker by the time vocabulary items are inserted.

The morphological operation of FISSION, which will be employed in the analysis of Pima, should be explained in greater detail. As described by Halle (1997), fission occurs during vocabulary insertion at a terminal node, and generates a new terminal node.²⁹ At a node marked [+FISSION], any features which are not expressed by the

²⁸ Here I differ from the account in Harley and Noyer (1998), where it is claimed that the nominalizing suffix *-ion* will be added later by a phonological rule.

²⁹ As proposed by Halle (1997), the node itself is marked for fission. Halle and Vaux

inserted vocabulary item³⁰ are copied into a distinct terminal node, and competition for vocabulary insertion is repeated for the new terminal node. In this way, vocabulary items which are relatively less marked can be inserted at a new fissioned node when a more specific vocabulary item originally inserted into that node does not express all the features present on the node. The process of fission is shown schematically in (34). The vocabulary items which will compete for insertion at the node in (34)a are shown in (34)b (here, the dummy vocabulary items ‘x’, ‘y’, and the *s*- prefix). Since the winning vocabulary item, item ‘y’, does not express all features at that node, the remaining features are fissioned—copied to a new sister node, as shown in (34)c. Competition for insertion of a vocabulary item at the new node would then continue, using the same set of vocabulary items. Here, the vocabulary item which would be inserted at the new node in (34)c is the *s*- prefix.

(1998), rather, propose that the inserted vocabulary item itself signals fission. The precise detail of the structure produced by fission is also a matter of debate. Halle (1997) describes the linear relationship of fissioned morphemes, but does not explicitly describe the structural relationship of the nodes which result from fission; in his examples, two affixes which result from the fission of a single agreement morpheme are allowed to occur on different sides of a stem, based on the listed preference of each vocabulary item to be a prefix or a suffix. Schlenker (1997) argues, based on ordering relations of determiner and adjectival declensions within German DPs, that the new node produced in fission is c-commanded by the original, fissioning node. McGinnis (1995), on the other hand, does not analyze fission in Ojibwa as producing a new node, but rather as movement of features to existing nodes, motivated independently of a feature [+FISSION].

³⁰ A vocabulary item is said to express just the features which are specified in its vocabulary entry, even though other features may be present on the node at which a given vocabulary item is inserted.

(34)a *Pre-insertion node:*

Y
[FEATURE 1]
[FEATURE 2]
[+STATIVE]
[+FISSION]

b *Vocabulary:*

[FEATURE 1, FEATURE 2] ↔ /waɪ/
'y'
[FEATURE 1] ↔ /ɛks/ 'x'
[+STATIVE] ↔ /s-/

c *Post-insertion, post-fission structure:*

Y
├── [+STATIVE]
└── Y
 ├── [+FISSION]
 └── Y
 ├── [FEATURE 1]
 └── [FEATURE 2]
 /waɪ/

Lastly, it is also distinctive of DM that there is no lexicon, or no separate computational system, in which to have word-building operations take place, or in which to define paradigms. The operations which manipulate bundles of features in sentences are the same operations responsible for producing structure in words, and in fact the structures for both are of the same sort—thus the claim “syntactic hierarchical structure all the way down”. There is no place for rules which relate words of the language apart from the syntax and morphology components, and there is no means of structure-building within words which is not in principle accessible to structure-building within phrases.

3.3 A morphological analysis within Distributed Morphology

As a consequence of these properties of DM, if the *s-* is to be a distinct morpheme—even if it expresses a feature introduced by other roots or affixes—then the phonological material associated with it must be inserted as a separate vocabulary item at

a unique syntactic terminal node. That is, the feature which is expressed by the *s-*, once introduced to a phrase marker by a root or an affix, must somehow move from the node on which it originates (which will be filled by the phonological material associated with that root or affix) to some distinct node, where a distinct vocabulary item (that is, distinct phonological material, namely /*s-*/) may be inserted to express it. As noted in §3.1, the feature triggering insertion of the *s-* (call it [+STATIVE]) must somehow be realized higher in the structure than the projection which mediates object agreement and which hosts the prefixes *cu-* and *ta-*. It will be assumed here that that relevant projection is the highest light verb.

In fact, if the feature percolates only to the point of a light verb, this should be sufficient to produce the ordering of prefixes which is observed, if certain other assumptions are made about the workings of object agreement. If, following Chomsky (1999) and others, object agreement occurs when the features of the object are copied to a case-assigning light verb,³¹ then the vocabulary items which compete for insertion at that terminal node may be those which express the features of the object—the agreement

³¹ Within a DM derivation, the operation of AGREE, as formulated in Chomsky (1999), must occur during the process of vocabulary insertion. Prior to insertion of a particular root within the object, the phi features for that object may not be completely determined. Specifically, although case, person, and number should already be expressed syntactically, gender (for those languages in which it is relevant) will not be determined until the choice of root has been made—at vocabulary insertion. Therefore, although AGREE must copy the features of the object to the light verb before a vocabulary item is inserted for the light verb, it would not be able to copy the features until after vocabulary insertion has taken place for the object; this is amenable to a treatment of syntactic derivation by phases, as described in Chomsky (1999). In the analysis outlined here, agreement will occur only with features presumed to enter the derivation from the narrow lexicon.

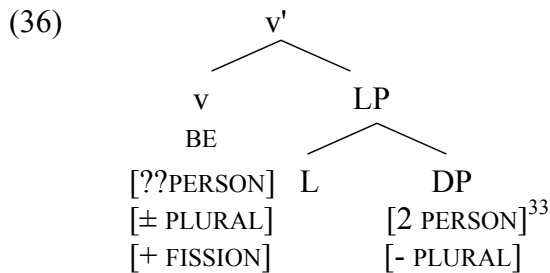
prefixes themselves. The agreement prefixes by themselves do not express the feature [+STATIVE], so if present on the light verb, this feature could be fissioned into a new node. The vocabulary item inserted at that new node could then be the *s-* prefix.

This means that, if the feature [+STATIVE] is inserted with the phonological material of the root, the feature must percolate up to the level of a light verb before competition for insertion of that light verb is completed. What is required is a means or motivation for the feature [+STATIVE] to move from the root or affix which introduces it into the structure to the light verbal head which enters into object agreement. This percolation cannot be done by MERGE, since all the merging of syntactic structure has, by hypothesis, already taken place by the time vocabulary items are being inserted. Motivation for the movement of features as employed by McGinnis (1995), for example, is the need of object clitics to check their features within the appropriate domain. If checking of features with another element is the general requirement for feature movement, it is not clear what other element of the sentence might relate to stativity such that it would require the checking of stative features, or why such an element would only be able to check such features when they occur on a light verbal head. One possibility is that the feature [+STATIVE] must be checked by a higher functional projection, and that the light verb, but not the verb root, is local to that functional projection. If Cinque's proposed hierarchy is correct (as shown in (4)), the functional projection which would immediately dominate the light verb—namely, iterative aspect—is not the most relevant to stative lexical aspect. The lack of apparent motivation for this feature percolation is a serious gap in the theory outlined here.

The vocabulary insertion for the sentence in (10)a will be outlined here, to illustrate this particular analysis. The sentence is reproduced as (35).

- (35) S-hem-heegam 'a-n-t. (635.7)
 ST-2s:OBJ-jealous A-1s:SUB-PFV
 'I am jealous of you.'

The derivation of this sentence will begin with the selection of morphemes from the narrow lexicon, and will proceed to the point shown in (36). Here, the category **L** indicates a root, or *l*-node.³²



At this point, the operation AGREE will apply to assign values to the unvalued features of the light verb BE. The nearest accessible target will be the object DP, and the values of its features will be copied to the unvalued features of the light verb. Following this, the subject will be merged in the specifier of the light verb, and the derivation will proceed.

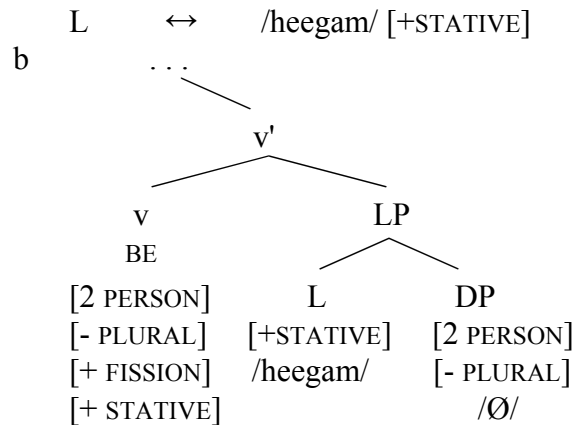
The derivation will continue until structure building is complete, and vocabulary

³² Here again, my structure differs from that of Harley and Noyer (1998), who propose that the light verb BE does not license a specifier, and that the subject of such sentences is merged as the specifier of the lexical root. If Chomsky's (1999) formulation of AGREE were to be used in such cases, the light verb would agree with the higher DP (the subject), rather than the object.

³³ The features used here for person are for illustration only, and may be replaced by a system like the one shown in Halle (1997), involving [±Author] and [±Participant in Speech Event].

insertion will begin. The vocabulary item for this lexical root may have the form shown in (37)a. After vocabulary insertion and feature percolation, the structure would have the form shown in (37)b.³⁴ (Note that Pima allows null pronouns in certain syntactic contexts, this being one of them.)

(37) a *Partial vocabulary list:*



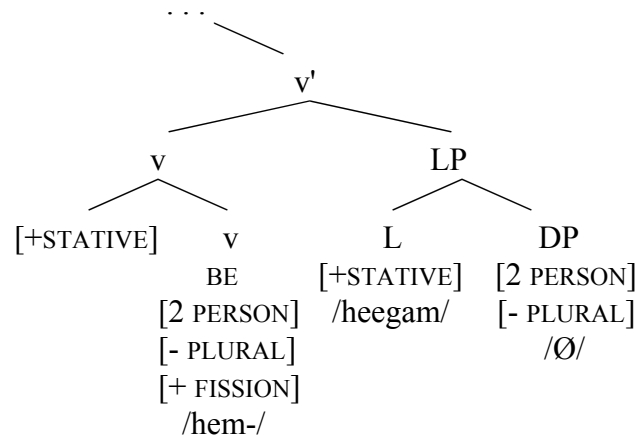
At this point, competition proceeds for insertion at the light verb. The vocabulary items which compete for this position include those listed in (38)a. The structure following this insertion is shown in (38)b; note that since the winning vocabulary item is not specified for all the features of the node, the unexpressed features (here, only the feature [+STATIVE] is shown) are fissioned to a new node.

³⁴ In this example, there are no intervening terminal nodes to which the feature [+STATIVE] might also percolate between the root node **L**, at which the feature enters the structure, and the light verb **v**, at which the feature is realized. If there were such nodes, it would be necessary to keep the */s-/* from being inserted anywhere lower than the light verb. It will therefore be assumed that the vocabulary item associated with the *s-* competes only for insertion at a light verb.

(38) a *Partial vocabulary list:*

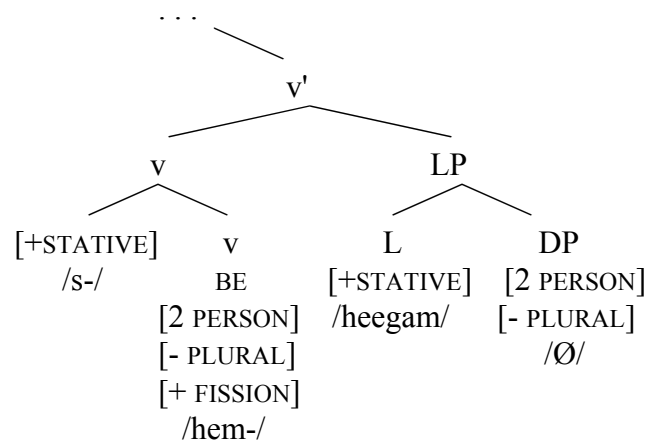
[1 PERSON, - PLURAL]	↔	/heñ-/
[1 PERSON, + PLURAL]	↔	/t-/
[2 PERSON, - PLURAL]	↔	/hem-/
[3 PERSON, - PLURAL]	↔	/Ø/
[+STATIVE]	↔	/s-/

b



Competition for vocabulary insertion at the new node occurs between the same vocabulary items listed in (38)a. The vocabulary item which will win this competition will be the *s-* prefix, resulting in the structure shown in (39).

(39)



In order to produce the surface form shown in (35), other syntactic operations would be required. For instance, the object DP must be moved out of the vP and the vP raised to

first position. The derivation shown here also makes other simplifying assumptions about the grammar of Pima. For instance, this derivation assumes cyclicity, as in Chomsky (1999), in that vocabulary items are inserted below the level of the light verb before the higher structure is built; further, this derivation assumes that the lexical root is not raised to adjoin to the light verb. The operations shown here would remain substantially the same, however, whether other operations were required or these assumptions were not so.

The analysis presented here fails to satisfyingly explain several of the earlier observations about the *s-*. For instance, if the *s-* simply marks an arbitrary class of stems—and the feature-based analysis by itself assumes that the feature [+STATIVE] may occur on any vocabulary item—it is puzzling why the *s-* should be sensitive to other morphemes. If this feature is synchronically sensitive to lexical aspect, it is reasonable for it not to occur on stems with inchoative or causative meanings, since they differ in lexical aspect; in this case, all stems should pattern the same way, however, rather than the mixed behavior which is seen in Pima. Sensitivity to lexical aspect would still fail to predict the facts involving negative scope. No theoretical model will be able to adequately address this, however, without a better understanding of the data.

Within DM, it is possible to at least model this behavior by positing a rule of IMPOVERISHMENT, which would delete the feature [+STATIVE] in the relevant environments—when occurring with the light verbs CAUSE or BECOME, or when falling within the scope of negation. Note that this rule, also, would have a very narrow window in which to apply: after the insertion of the root or stem which introduces the feature

[+STATIVE], but before vocabulary insertion for any light verb. Although this would produce the correct pattern of behavior, it would not provide an explanation for it; this would be entirely stipulative, and is another weakness of a feature-triggered analysis.

Although the analysis just outlined appears workable, a number of potentially undesirable assumptions were made about the nature of object agreement, the process of feature percolation, and so on. Other types of analyses, however, such as those involving more traditional syntactic principles, do not account for the behavior of the *s-* prefix in Pima with any greater success.

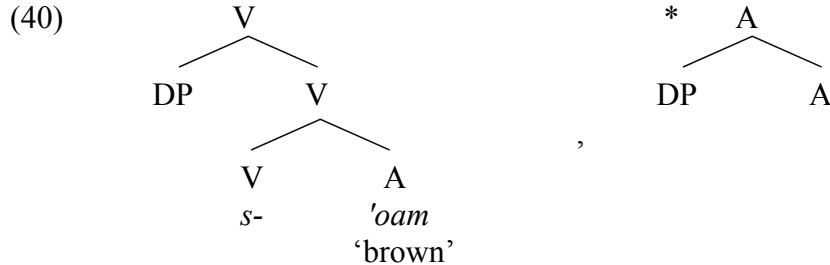
3.4 The *s-* as a verbal or functional head

The analysis outlined above assumed that the *s-* expressed a feature which was introduced to the phrase marker late in the derivation, and required fission of a light verb to be expressed. Other analyses are also conceivable, though none seems to be entirely satisfying. For instance, Avelino (2001) has proposed that the *s-* is itself a light verb meaning BE. It is also conceivable that the *s-* expresses a functional head—an ASP_{stative} head, which would be added to Cinque's hierarchy of functional heads. The drawbacks to such analyses will be briefly discussed.

The proposal of Avelino (2001) is based on an account of inchoative verbs in Hale (2000), which claims that adjectives in O'odham (by which Hale refers to both Pima and Papago) are characterized as taking a specifier, but no complement.³⁵ In Hale's system, however, heads which do not first take a complement may not themselves take a

³⁵ Hale does not address the issue of transitive adjectives.

specifier. To solve this problem, Hale proposes that an adjective would itself be taken as a complement by a verbal head, which would then inherit the specifier-taking property of the adjective, giving the adjective a specifier vicariously. For Hale, the verbal head is realized by the inchoative morpheme, but Avelino proposes to extend this account to the *s-* prefix: in non-inchoative contexts, the adjective would still require a verbal head to mediate its need for a specifier (the DP subject), and the *s-* would be the expression of that verbal head. The structure Avelino proposes is shown in (40) (adapted from *Figure 4* in Hale 2000), along with the structure he would disallow.³⁶



On Avelino's account, the inchoative verbal head competes for the same position that the *s-* verbal head occupies. Since Hale also analyzes causatives as containing inchoatives, this analysis predicts that the *s-* prefix would not occur on verbs used inchoatively or causatively. As mentioned in §2.3, this correctly describes the behavior of at least some Pima inchoatives and causatives.

Avelino's proposal faces other challenges, however. For instance, although it correctly describes the behavior of some inchoatives and causatives, it predicts that all

³⁶ Hale and Avelino do not use categoriless roots, though the proposal does not seem incompatible with theirs. The verbal head shown dominating the adjective in (40) might instead dominate a categoriless root node.

inchoatives and causatives should pattern the same way, which does not seem to be the case. Although it explains why many adjectives occur with the *s-*, it is also not easily extended to the instances of verbs which also license the *s-*: Hale's original analysis required a verbal head to license the specifier because the adjective was not able to take a complement (and hence not able to take a specifier, either), but transitive verbs which license the *s-* do take complements. Also, even prenominal attributive uses of adjectives would be required to take a verbal head by this analysis.

Further, his analysis treats the *s-* as a verbalizing affix, but the *s-* can be shown to be distinct from merely a verbalizing affix. Although some stems in Pima may occur as predicates or as adjectives with no overt morphological difference, there are roots which appear morphologically simple when occurring pre-nominally, but which require overt suffixes when used predicatively—these are taken to be adjectives (recall §1).³⁷ The set of adjectives which require overt verbalizing suffixes includes both adjectives which require the *s-* prefix and those which disallow it. An example of each is shown in (41).

- (41) a M-a-n-t kaa hega'i s-keeg ñe'i. (468.32)
 COMP-A-1s:SUB-PFV hear that ST-beautiful song
 'I heard that beautiful song.'
- b M-a-n-t kaa hega'i ñe'i m-o ge s-keeg-aj. (468.32)
 COMP-A-1s:SUB-PFV hear that song COMP-IMP FOC ST-beautiful-VB
 'I heard that song that is beautiful.'
- c 'Aj voog 'a-c 'oid. (583.10)
 narrow path A-3p:SUB follow
 'We are following a narrow path.'

³⁷ Likewise, there are stems which appear morphologically simple when used as predicates, but which require particular suffixes when used pre-nominally—these are taken to be verbs.

- d Hega'i voog 'o 'aj-ij. (583.8)
 that path IMP narrow-VB
 'That path is narrow.'

Since the suffix *-ij* or *-aj* represents the verbalizing head for these adjectives, the *s-* prefix cannot also be a verbalizing head simultaneously occupying the same structural position.

The other alternative analysis mentioned above is that the *s-* expresses a functional head. This analysis is suggested by the generalization that the *s-* prefix is restricted to stems which are predicated of something—adjectives, verbs, and deverbal adverbs—and is not licensed on stems which cannot be used as predicates—namely nouns, unless a noun is converted to a predicate through a morphological derivation.

One shortcoming of this proposal, as mentioned earlier, is that it requires attributive adjectives and deverbal adverbs to contain part of the structure of clauses—at least as high as the head that is expressed by the *s-* prefix. As discussed in §3.1, the functional structure which has been proposed to dominate adjectives shares nothing with the functional structure proposed to dominate verbs. Moreover, the rich functional structure which Cinque (1999) has proposed for clauses does not include any heads involved in stativity—or any lexical aspect at all. An early version of his hierarchy was shown in (4), reproduced here. The *s-* would either represent a head which Cinque does not provide evidence for, or it would express one of these heads which is not obviously related to stativity.

- (42) Mood_{speech act} > Mood_{evaluative} > Mood_{evidential} > Mod_{epistemic} > T(Past) > T(Future) >
 Mood_{irrealis} > Asp_{habitual} > T(Anterior) > Asp_{perfect} > Asp_{retrospective} > Asp_{durative} >
 Asp_{progressive} > Asp_{prospective} / Mod_{root} > Voice > Asp_{celerative} > Asp_{completive} >
 Asp_{(semel)repetitive} > Asp_{iterative}

Neither of these alternatives seems to provide a more insightful analysis of the *s-* than the one discussed in the previous section. Although a morphological expression of lexical aspect may be unusual, no better answer appears available.

4. Conclusion

Since so much of the evidence relating to the structural location of the *s-* prefix has yet to be completely analyzed—such as preverbal particles like the inceptive *'i*, the object prefixes, and the derivational prefixes *cu-* and *ta-*—a clearer picture of the *s-* prefix may only begin to emerge as more of the language becomes understood. So, although it appears reasonable based on the present data that the *s-* expresses the lexical aspect of a given stem, further research may lead to a more insightful analysis.

Although an analysis in which the *s-* expresses a morphological feature does capture the exceptional behavior of some roots and affixes, it does not provide any insight into the relationship between this feature and the lexical aspect of the stems it occurs on. Naming the feature [+STATIVE] obviously does not ensure that it will only occur on stems with stative lexical aspect, and although it is apparent that the distribution of this feature should not coincide exactly with stative lexical aspect, a better understanding of lexical aspect and the effect of meaning on the distribution of such features would be beneficial. Even more helpful would be a clear means of determining the lexical aspect of a stem, which would greatly help in interpreting the occurrence of the *s-* prefix on apparently active stems.

It is possible that the behavior of stems licensing the *s-* prefix is so confusing and exception-laden because its occurrence is a result of lexical specification for some words

or in some contexts, and a result of productive processes in other cases. Disentangling these patterns may only be possible with a better, more complete understanding of the behavior of this class of words as a whole.

It has been shown here that an analysis within Distributed Morphology which treats the *s-* prefix as the expression of stative lexical aspect, mediated by a grammatical feature like [+ STATIVE], can model much of the behavior of the *s-* as described in §2, in the following way: the feature [+STATIVE] is present on certain vocabulary items; this feature percolates or is copied upon vocabulary insertion at least as high as the light verb which expresses object agreement; before vocabulary insertion for this light verb, a rule of IMPOVERISHMENT deletes the feature [+STATIVE] in the context of the light verbs BECOME or CAUSE, or within the scope of negation, for certain stems; since the object agreement morphemes are not specified for the feature [+STATIVE], this feature is FISSIONED to a new node, at which the *s-* is inserted. Although some of these steps represent assumptions which may not be desirable, no simpler account of the Pima *s-* within a non-Lexicalist framework like Distributed Morphology seems plausible. Further detailed study of the Pima *s-*, lexical aspect, and the theory of Distributed Morphology, will help to answer the questions which are unanswered here.

Appendix: Pima data abstracted from Avelino *et al* (2001)³⁸

Intransitive/adjectival predicates which require s-

s-heegig 'happy'
s-tahadag 'fun,
interesting'
s-geevkog 'tired'
s-ko'osig 'sleepy'
s-bagam 'angry'
s-bihug 'hungry'
s-tonom 'thirsty'
s-eepid 'cold'
s-toñ 'hot'
s-huug 'warm'
s-moik 'soft'
s-mohogid 'itchy'
s-nakosig 'noisy'
s-'uuv 'smelly'

s-cekaidag 'well-
behaved'
s-meldag 'fast'
s-hottk 'quick'
s-gevk 'strong'
s-ape 'good'
s-keeg(aj) 'beautiful'
s-'iovi 'sweet'
s-peheg 'easy'
s-veec 'heavy'
s-giig 'fat'
s-gaki 'skinny, dry'
s-juhagi 'stretchy'
s-'a'agig 'secret'
s-vohom 'correct'
s-doa 'alive'

s-ñenashan 'energetic'
s-namkig 'expensive'
s-pad:ma 'lazy'
s-biitagi 'dirty'
s-hasig 'difficult'
s-juuk 'deep'
s-wuilogi 'albino'
s-balvañ 'grooved'
s-tadañ 'wide'
s-sheliñ 'straight'
s-'oam 'yellow, brown'
s-vegi 'red'
s-toa 'white'
s-cug 'black'
s-ceedagi 'blue, green'
s-'ooladag 'golden'

Reflexive verbs which require s-

s-'e-baabgii 'slow,
careful'

s-'e-ñeñed 'responsible'
s-'e-vamcud 'nasty'

s-'e-mamce 'study'
s-'e-cuhugi 'faint'

Transitive verbs which require s-

s-hoohid 'like'
s-naak 'like the taste of'
s-'eebid 'fear'

s-heegam 'envy'
s-'amicud 'understand'
s-maac 'know'

s-'oohod 'reject'
s-kaim 'be interested in'
s-ko'ok 'be pained by'

³⁸ The words listed here are near-complete for Avelino *et al* (2001) through p. 691.

Statives which disallow s-

coad:k ‘tall’

shopolk ‘short’

'aj(ij) ‘narrow’

cev(aj) ‘long’

ge'e(j) ‘big’

'al (ha'as) ‘little, small’

'uug ‘high’

hekia ‘pure’

komalk ‘flat’

komad:k ‘spread-eagled’

sho'ig ‘poor’

daha ‘be sitting’

keek ‘be standing’

ñeid ‘see’

tatcua ‘want’

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