
Introduction

My subject—infixation—is at once exotic and familiar. Russell Ultan in his pioneering study of the typology of infixation (1975) noted that infixes are rare compared to the frequency of other affixes. The presence of infixes in any language implies the presence of suffixes and/or prefixes, and no languages employ infixation exclusively (Greenberg 1966: 92). The term ‘infixation’ is also less familiar to students of linguistics than are such terms as prefixation and suffixation. The *Oxford English Dictionary* goes as far as defining infixes as what prefixes and suffixes are not:

A modifying element inserted in the body of a word, instead of being prefixed or suffixed to the stem. (May 14, 2003 Web edition)

Infixes are not at all difficult to find, however. English-speaking readers will no doubt recognize some, if not all, of the following infixation constructions:

- (1) Expletive infixation (McCarthy 1982)

impórtant	im- <i>bloody</i> -pórtant
fantástic	fan- <i>fuckin</i> -tástic
perháps	per- <i>bloody</i> -háps
Kalamazóo	Kalama- <i>goddamn</i> -zóo
Tatamagóuchee	Tatama- <i>fuckin</i> -góuchee
- (2) *Homer*-ic infixation (Yu 2004*b*)

saxophone	saxo <i>m</i> aphone
telephone	tele <i>m</i> aphone
violin	vioma <i>l</i> in
Michaelangelo	Micha <i>m</i> alangelo
- (3) Hip-hop *iz*-infixation (Viau 2002)

house	hi <i>z</i> ouse
bitch	bi <i>z</i> itch
soldiers	si <i>z</i> oldiers
ahead	ah <i>z</i> ead

Given the relative rarity of infixes in the world's languages, it is perhaps not surprising that infixes are often afforded a lesser consideration. Yet their richness and complexity have nonetheless captured the imaginations of many linguists. Hidden behind the veil of simplicity implied in the term 'infix', which suggests a sense of uniformity on par with that of prefixes and suffixes, is the diversity of the positions where infixes are found relative to the stem. The range of infixation patterns in English presented readily illustrates this point. While the expletive in its infixal usage generally appears before the stressed syllable (1), the Homeric infix must come after a trochaic foot (2). The *-iz-* infix popularized by hip-hop singers is attracted by stress as well. However, it differs from the first two patterns by lodging itself before the stressed vowel (3). Besides the diversity in infixal location, the semantic function of infixation is also wide-ranging. While the English language makes use of infixation mainly for paralinguistic purposes, languages as diverse as Greek, an Indo-European language (4), and Atayal, an Austronesian language (5), rely on infixation to signify important grammatical functions.

(4) Greek present stem formation *-N-* (Garrett, forthcoming)

Aorist stem	Present stem	Gloss
e-dak-	daŋk-an-	'bite'
e-lab-	lamb-an-	'take'
e-lat ^h -	lant ^h -an-	'escape notice'
e-lip-	limp-an-	'leave'
e-pat ^h -	pant ^h -an-	'suffer'
e-put ^h -	punt ^h -an-	'inquire'
e-p ^h ug-	p ^h uŋg-an-	'flee'
e-t ^h ig-	t ^h iŋg-an-	'touch'
e-mat ^h -	mant ^h -an-	'learn'

(5) Atayal animate actor focus *-m-* (Egerod 1965: 263–6)

qul	qmul	'snatch'
kat	kmat	'bite'
kuu	kmuu	'too tired, not in the mood'
hŋuʔ	hmŋuʔ	'soak'
skziap	kmziap	'catch'
sbil	smbil	'leave behind'

In fact, based on the languages surveyed in this work, infixes may signal a wide array of morphosyntactic functions: agreement (person, gender, number, focus), possession, intensification, nominalization, verbalization, diminution, derision, expletive, distribution, durative, frequentative, perfective/imperfective,

completion, aorist, intransitive, passive, negation, past, verbal/nominal plural, reflexive/reciprocal, and resulting state.

This apparent richness and diversity, however, mask another striking feature of infixes, namely, the asymmetric typology of the placement of infixes. It has long been recognized that the placement of infixes converges to two locales, despite its diversity in shape and function. A survey of 154 infixation patterns from more than 100 languages revealed that infixes invariably appear near one of the edges of a stem or next to a stressed unit (see Chapter 4 for details of the typological survey). However, while 137 of these infixes (i.e., 89 percent) are edge-oriented (6), only 17 are prominence-driven ($p < 0.01$, Fisher's exact test). That is, infixes predominately lodge themselves close to one of the edges of the domain of infixation, which may be a root, a stem (i.e., root or root plus some affixes) or a free-standing word (cf. Moravcsik 2000; Ultan 1975). I refer to this asymmetric distribution of infixes as the *Edge-Bias Effect*.

(6) Distribution of edge-oriented and prominence-driven infixes

	Fixed	RED	Total
Edge-oriented	94	43	137
Prominence-driven	6	11	17
Total			154

Thus, one of the fundamental problems motivating this research is the search for a principled explanation for this typological skewing. A theory of infixation must be able to account for the bias toward edge-oriented infixes without losing sight of the prominence-driven ones.

Infixes are also remarkable from a functional point of view. Hawkins and Cutler (1988) argue that the position of an affix relative to the stem is influenced by factors in language processing. Affixes tend to follow the stem rather than precede it (i.e., the typological bias toward suffixation over prefixation (Greenberg 1966)) because the stem-affix order facilitates the processing and recognition of the contentful and unpredictable part of a word, namely, the stem. Infixes should therefore be relatively difficult to process assuming that structural discontinuities complicate language processing. This disadvantage offers a compelling explanation for the paucity of infixes in the world's languages, yet the fact that infixes keep emerging over the ages suggests that there might be historical factors at work that favor the creation of infixes.

Moravcsik's pioneering 1977 monograph, *On Rules of Infixing*, was the first to articulate the basic challenges to linguistic theory presented by infixes. While the answers she supplies reflect the theoretical mode of the time, the questions

she poses remain relevant to this day. A complete theory of infixation has to address three major questions: (i) What is the total range of infix patterns? (This is an empirical question that concerns the typology.) (ii) What are the mechanisms and principles in terms of which such patterns are based? That is, what are the primitives and the principles for combining these primitives into representations of specific infixes? (iii) What are the metatheoretical constraints which permit just these mechanisms and principles and their particular language-internal co-occurrence and exclude others?

This book is devoted to an exploration of these issues, laying out and comparing different theories which address them. It aims to provide an overview and synthesis of the results of current research on infixation, to highlight questions which remain open, and to lay out the challenges such phenomena present for linguistic theory. Groundbreaking studies exploring this issue include McCarthy and Prince (1986), Inkelas (1990), McCarthy and Prince (1993*a*), and Prince and Smolensky (1993). Over the years many studies have dealt with the placement properties of infixes and several general theories of infix placement have been developed (Broselow and McCarthy 1983/84; Buckley 1997; Chiu 1987; Clements 1985; Crowhurst 1998; Davis 1988; Halle 2001; Hyman and Inkelas 1997; Inkelas 1990; Kaufman 2003; Kiparsky 1986; Kurisu and Sanders 1999; Lubowicz 2005; Marantz 1982; McCarthy 1982, 2000, 2003*b*; McCarthy and Prince 1986, 1990, 1993*a*, 1993*b*, 1994*b*; Moravcsik 1977, 2000; Rose 2003*a*, 2003*b*; Spaelti 1995, 1997; Urbanczyk 1993). Broadly speaking, there are two main traditions of analyzing infixes. One approach embraces the morpho-phonological mismatching nature of infixes by treating them as affixes that subcategorize for a phonological element, rather than for a morphological one (see e.g., Broselow and McCarthy 1983/84; Cohn 1992; Inkelas 1990; Kiparsky 1986; McCarthy and Prince 1986). I shall refer to this approach as *Phonological Subcategorization*. On the other hand, some have argued that infixes are 'defective' adpositional affixes, and that their underlying prefixing or suffixing nature is obscured by synchronically motivated (morpho)phonological factors (see e.g., Halle 2001; McCarthy and Prince 1993*a*; Moravcsik 1977; Prince and Smolensky 1993). This movement-based view of infixation is referred to as *Phonological Readjustment*. The theoretical context in which the Phonological Readjustment view of infixation comes under intense scrutiny is the claim by the fathers of Optimality Theory (McCarthy and Prince 1993*a*; Prince and Smolensky 1993) that the placement of an infix is intimately linked to its prosodic shape and the phonotactics of the language. From this perspective, infixes are predominantly edge-oriented because they are adpositional underlyingly; they are driven minimally inward due to the optimizing forces operating in the phonological grammar of the language.

The source of this long-standing suspicion that infixes are really adpositional affixes or adfixes (i.e., prefixes and suffixes) gone awry differs from theorist to theorist. Some reject the notion of phonological subcategorization out of methodological constraints against representation- and constituent-internal heteromodality (Halle 2001; Moravcsik 1977). Such theorists generally subscribe to a strictly modular model of the grammar in which morphological/syntactic operations are prohibited from referring to phonological information, a concept otherwise celebrated by the proponents of phonological subcategorization. Others object to phonological subcategorization out of the suspicion that generalizations would be missed in appealing to such a powerful device. For example, it has often been noted that infixes often have adpositional variants. One generalization that seems to hold across languages is that if an infix is concatenated adpositionally, it would have resulted in a phonotactically ill-formed output. Consider an example from Latin. Latin imperfective stems are formed by the infixing of a homorganic nasal before the root-final consonant (e.g., *rump* ‘break’ < \sqrt{rup}). However, when the root is vowel-final, the nasal appears suffixing (e.g., *sin* ‘allow’ < \sqrt{si} (Matthews 1974: 125)). Many researchers were impressed by the fact that had the nasal been suffixed after a consonant-final root, it would have resulted in an illegitimate coda cluster in Latin (e.g., **rupm*). The homorganic nasal is infixing to avoid phonotactically illicit clusters. No infixation is needed with respect to vowel-final roots since no illicit cluster may result by the suffixation of the nasal.

This concern over the underlying motivation for infixation has gained a renewed sense of urgency in recent years. Many current theories of infixation and of grammar in general, assume that, all else being equal, naturalness and the universal typological tendencies in phonology and morphology should be captured in the theory of grammar itself in order to attain explanatory adequacy (Chomsky 1986). That is, besides arriving at a formalism that describes what happens, many linguists consider it imperative to also restrict the formalism to capture why a phenomenon unfolds only the way it does. From this point of view, the theory of grammar not only should ‘account’ for what is found in language, but also ‘explain’ the source of the variations. This view has prompted some, for example, to incorporate into synchronic models articulatory and perceptual constraints in speech to account for cross-linguistic sound patterns (Boersma 1998; Flemming 1995; Gordon 1999, 2001, 2002; Hayes 1999; Kirchner 1998, 2000; Pater 1999; Silverman 1995; Smith 2002; Steriade 1994, 1995, 1997, 2000, 2001; Walker 2000a).

Such an all-encompassing view of the grammar is not without detractors, however. Many linguists argue that the sources of naturalness and typological

tendencies do not reside in the nature of the grammar *per se*, but must be recovered from grammar-external sources, such as diachronic factors or psycholinguistic constraints. These authors contend that, while the formal system should model productive grammatical effects, Universal Grammar-specific explanations should be appealed to only when a phenomenon cannot be accounted for by psychological or historical means. As Anderson (1988: 325) succinctly puts it,

Allowing one part of the grammar to ‘overgenerate’ in the context of constraints imposed by its interaction with other areas [e.g., morphological change, AY] often makes it possible to bring order and coherence to each independently—order and coherence that would be impossible if the principles determining the range of possible phenomena in each part of the grammar had to be limited to statements internal to that domain alone. Such a modular conception of grammar thus seems in many cases the only path to a constrained account.

Many phonological phenomena can be successfully understood in this perspective (e.g., Barnes 2002, 2006; Dolbey and Hansson 1999; Hale and Reiss 2000; Hume 2004; Kavitskaya 2001; Mielke 2004; Yu 2004a). Juliette Blevins’s program of Evolutionary Phonology (2004) has consolidated and extended this approach of linguistic explanation to a new level. To be sure, this perspective finds champions outside the domain of phonology as well. For example, Harris and Campbell (1995) have forcefully argued that many morpho-syntactic phenomena can be more insightfully analyzed if the contexts of their historical emergence are taken into account.

This book presents a treatment of infixation from the latter perspective. One of the main goals of this book is to provide a bridge between the line of linguistic research that emphasizes the synchronic forces operating in language and those that recognize the forces of diachrony that help shape them. Synchronists are most often interested in broad generalizations concerning nature of infix placement based on a small set of languages without paying sufficient attention to the actual typology. On the other hand, the diachronists often ignore the synchronic forces that often simultaneously drive and constrain linguistic change. In this book I attempt to synthesize and evaluate these strands of work, placing them in a unified perspective.

This book is organized as follows. Chapter 2 addresses the question of what infixes are. The focus is to adequately account for infixation from both descriptive and theoretical perspectives. The descriptive account allows us to delineate the scope of the problem to be addressed in this work. From the perspective of linguistic theory, however, infixes are formal elements that stand in combinatorial relation with other linguistic elements. As such, an

adequate theory of infixation is also a theory of affix placement that is sufficient to account for infixation as well as the more canonical concatenating morphology. In Chapter 2, I review different formal accounts that have been advanced to model infixation. I begin by laying out the basic properties of two main approaches to infixation mentioned above: Phonological Readjustment and Phonological Subcategorization. I show that the Phonological Readjustment approach includes much that is local and parochial and should be discarded in favor of principles of broad applicability.

As laid out in Chapter 3, the model of infix placement defended in this book is that of Phonological Subcategorization, formalized in terms of Generalized Alignment. Infixes are treated as affixes that subcategorize for a phonological unit (called the pivot point), rather than a morphological one. When the morphological domain coincides with the phonological one, adpositional affixation (or adfixation) obtains. However, when there is a mismatch, infixation may result. This theory of phonological subcategorization is couched within the framework of Signed-Based Morphology (Orgun 1996, 1998, 1999; Orgun and Inkelas 2002), which is a declarative, non-derivational theory of the morphology-phonology interface that utilizes the basic tools one finds in any constituent structure-based unificational approach to linguistics (e.g., Construction Grammar (Fillmore and Kay 1994) and HPSG (Pollard and Sag 1994)). Subcategorization restrictions are treated as declarative constraints and thus may never be violated. As such, the interaction between morphological alignment and the phonological grammar is much more limited.

The analysis of infixation cannot be conducted in a vacuum, however. The theory of affix placement, and indeed of grammar as a whole, must be embedded within a temporal axis. That is, the diachronic evolution of infixes is as much an integral part of the explanation as are their treatments within the synchronic grammar. As summarized in (7), the model of infixation advocated in this work has three parts. A holistic theory of infix distribution must elucidate the set of grammar-external forces that shape the synchronic profile of infix distribution, in addition to supplying a theory of phonological subcategorization (i.e., a source of grammar-internal constraints). Two important grammar-external factors are identified: the diachronic mechanisms that drive the emergence of infixation and the inductive biases in morphological learning that allow or, in some cases, favor the emergence of infixes.

(7) **A holistic theory of infix distribution**

a. Grammar-internal constraints:

A theory of phonological subcategorization

- b. Grammar-external constraints:
 - constraints on morphological learning
 - constraints on morphological change
- c. A theory of interaction between these grammar-internal and grammar-external constraints

Since the starting point for discussions of language change is acquisition in the context of current linguistic theory, I first articulate a theory of inductive bias in morphological learning in Chapter 4. This will pave the way for the discussion of the diachronic typology in Chapter 5. The main idea advanced in Chapter 4 is that learners are biased toward setting up subcategorization restrictions of a certain sort. In particular, I introduce a specific type of inductive bias, called the Pivot Theory, which proposes that the most subcategorizable elements are also the most salient and the easiest to recover. I show that the set of predicted salient pivots are also the same pivots that are subcategorized by infixes. The rest of Chapter 4 is dedicated to laying out the synchronic landscape of infixation patterns organized in terms of the different pivot points.

Chapter 5 is a survey of the diachronic pathways through which infixes emerge. I show that infixes are the results of morphological misparsing introduced by four mechanisms: phonetic metathesis, morphological entrapment, reduplication mutation, and morphological excrescence.

It is in the context of the synchronic and diachronic typologies of infixation laid out in Chapters 4 and 5 and the nature of morphological change and acquisition argued in this work that the Edge-Bias Effect can be fully understood. The diachronic typology shows that infixes originate predominately from adpositional affixes. Thus, it is not surprising that infixes are biased toward the edges to begin with. The birth of infixation also hinges on speakers misanalyzing in the direction of infixation, rather than reverting back to the historical antecedent. The nature of the inductive bias in morphological learning itself also favors pivot points close to the edge since such units are psycholinguistically more salient and can be more reliably recovered. Non-edge pivots that are not prominence-based are difficult to obtain either because no historical pathways may give rise to them or because they are rejected in the acquisition process.

In Chapter 6, I conclude by considering a set of residual issues raised by the theory of infixation advocated in this work. First, I examine the possibility of the so-called ‘genuine’ infixation. I then take a brief foray into the realm of infixal ludlings and endoclysis. Finally, I close by exploring further the ramifications of adopting a phonological subcategorization approach to infixation.

What is infixation?

Since the phenomenon of infixation tends to be less familiar to students of linguistics than other morphological operations are, and the term ‘infixation’ is often used in the literature quite liberally, it is instructive to discuss at the outset what sort of patterns falls within the scope of the present study.

2.1 Defining infixation descriptively

It is often stated that an affix is considered an infix when it ‘occur[s] within stem’ (Payne 1997: 30). This, however, is not quite adequate. Many instances of discontinuous morphology may fall under this definition. For example, the well-known vocalism marking tense and aspect in the verbal system of Semitic languages is ‘interdigitated’ with the consonantal root (e.g., Egyptian Arabic **ktb* ‘write’, *kita:b* ‘book’, *katab* ‘he wrote’, *yektub* ‘he is writing’; (Nida 1949: 68)). Likewise, internal modification (a.k.a. ablaut or replacive morphology) also involves surface discontinuity. It has, for example, been suggested that English irregular past tense and participle formations may be analyzed as a matter of infixation. That is, like the verbal morphology of the Semitic languages, the roots in (1) can be analyzed as C__C where the empty slot is filled in by the ‘infixal’ vowel.

(1)	Present	Past	Past Participle
	sing	sang	sung
	drink	drank	drunk
	fling	flang	flung
	sink	sank	sunk
	ring	rang	rung

Yet there are fundamental differences between the types of discontinuity found in the ‘interdigitation’ of the Semitic languages or the internal modification of English, and the discontinuity found in the infixation patterns presented in this work. What is missing from the conventional definition is the idea of *derived discontinuity*. The Semitic vocalism and the ‘infixal’ vowel

in English internal modification cannot be said to have created a disruption in the roots or stem since the discontinuity of the consonantal roots in Semitic languages or the C_C roots in the case of English internal modification is *intrinsic*. The Semitic consonantal roots are always interrupted by the vocalism; they never surface as fully continuous strings per se. The contiguity between segments within the consonantal root is therefore the exception rather than the norm (see, for example, Gafos 1998, 1999; McCarthy 1979, 1981; Ussishkin 1999, 2000 for more discussion on the templatic morphology of the Semitic languages). Discontinuity in the infixed word is *extrinsic* since infixes create derived discontinuous morphs by splitting apart meaningful roots or stems that otherwise surface as a unitary whole.

Operationally, I consider an affix infixing if it appears as a segmentally distinct entity between two strings that form a meaningful unit when combined but do not themselves exist as meaningful parts (2).¹

- (2) An affix, whose phonetic form is *A*, is infixing if
the combination of B_i & B_j constitutes exhaustively the non-null parts
of the terminal
phonetic form of a continuous stem, *B*,
and the terminal phonetic form of *A* is both immediately preceded by B_i
and also immediately followed by B_j ,
without any part of *A* being simultaneous with any part of *B*,
and such that B_i and B_j do not by themselves correspond to meanings
that would
jointly constitute the total meaning of *B*.

Thus, English expletive (e.g., *abso-bloody-lutely*) is considered an infix since the expletive (i.e., *bloody*) is both preceded and followed by non-null and non-meaningful parts (i.e., *abso* and *lutely*) of a meaningful non-discontinuous stem (i.e., *absolutely*) without being simultaneous with any non-null part of the stem.

Note, however, an affix should not be discounted as an infix based on the decomposability of the interrupted stem alone. The morphological hosts of an infix may in fact be complex. In the Timugon dialect of Sabah Murut (Austronesian), for example, the infix *-in-*, which marks 'Past Temporal Aspect, Object focus' in verbs or 'something resembling X' in nouns, comes before the first vowel of the stem. Depending on the nature of the stem itself,

¹ This is an amended version of the definition provided in Moravcsik's 1977 pioneering study on the formal properties of infixing.

the infix may appear internal to a root (3a), a reduplicant (3b), or a prefix (3c) (Prentice 1971: 126–39).

- (3) a. kinandoy ← kandoy ‘S works [on O]’
 linopot ← lopot ‘S wraps up O’
 b. minamoto ← ma-mato ← mato ‘eye’
 c. pinoonjoy ← po-onjoyon ← onjoy ‘S causes O to go’
 pinaakan ← pa-akanon ← akan ‘S causes O to eat [A]’
 pinansaduy ← pan-saduyon ← saduy ‘S causes O to swim’

The definition in (2) does not preclude infixes from lodging between two morphemes by happenstance either. For example, while the two parts separated by the expletive infix in forms such as *un-bloody-believable* do in fact constitute continuous morphs themselves, the infixal status of the expletive can nonetheless be unequivocally established by examples such as *e-bloody-nough* or, better yet, by infixed proper names, such as *Tatama-fuckin-gouchee* (see McCawley 1978 and McCarthy 1982 for more discussion on where the expletive might appear).

The infixal status of certain affixes can be difficult to access sometimes. For example, the direction object pronouns and subject/object relative markers in Old Irish are said to be infixes (Fife and King 1998). However, they only appear ‘infixes’ in verbs that are comprised of minimally a preverb and a stressed main verb (e.g., *as-beir* ‘says’ (< *as* + *beird*)), never in verbs lacking the preverbal element (e.g., (3 SG pres.) *berid* ‘come’). Some examples with the 1 SG, *-m-* (basic form) and *-dom-* (expanded form) are given below:

- (4) Old Irish
- | | | | |
|-------------|-------------------|---------------------|----------------------|
| ad-cí | ‘see’ | atom-chí | ‘sees me’ |
| ni accasi | ‘does not see’ | nim accai | ‘does not see me’ |
| ro-n-ánaic | ‘he reached’ | ro-n-dom-ánaic | ‘he reached me’ |
| intí do-eim | ‘he who protects’ | intí do-dom-eim | ‘he who protects me’ |
| for-comai | ‘preserve’ | for-dom-chomaitheir | ‘I am preserved’ |

Given that the preverbs are synchronically analyzable apart from the main stressed verb, the direction object pronouns and subject/object relative markers cannot be considered ‘infixing’ when they appear in the Old Irish stems. As will be discussed in detail in Chapter 5, however, the scenario found in Old Irish is often the precondition from which infixes arise: should the preverb and main verb complex lose their independent meanings and form a distinct meaningful whole together, the trapped personal affixes, previously prefixed

to the main verb, would have to be considered infixing. Ultan, in his pioneering 1975 study of the diachronic origins of infixation, termed this ‘entrapment’. Thus, while the Old Irish person markers might appear to be on the way to becoming infixes, they still have not yet achieved this status given that, to the best of my knowledge, the person markers always occur between parts that are decomposable based on the synchronic data available.

Decomposability of the host alone might not suffice to rule out the possibility of infixation, however. The morphology of a number of Bantu languages illustrates this point. According to Orgun (1996), certain affixes in these languages must be regarded as infixes before the last vowel of a verb stem even though the last vowel is co-extensive with the causative morpheme. For example, in ChiBemba, labials change to [f] (e.g., *-lob-* ‘be extinct’ → *-lof-ɨ* ‘exterminate’) and non-labials to [s] (e.g., *-lung-* ‘hunt’ → *-lúns-ɨ* ‘make hunt’) before the causative suffix [ɨ]. Nasals do not undergo this consonant mutation. Mutation overapplies, however, when the causative and applicative suffixes are both present in a stem. Both the root-final consonant and the /l/ of the applicative *-il* undergo mutation even though only the latter precedes [ɨ] on the surface (Hyman 1994).²

(5)	<i>-leep-el-</i>	‘be long for/at’	<i>-leef-es-ɨ-</i>	‘lengthen for/at’
	<i>-up-il-</i>	‘marry for/at’	<i>-uf-is-ɨ-</i>	‘marry off for/at’
	<i>-lub-il-</i>	‘be lost for/at’	<i>-luf-is-ɨ-</i>	‘lose for/at’
	<i>-lob-el-</i>	‘be extinct for/at’	<i>-lof-es-ɨ-</i>	‘exterminate for/at’
	<i>-fiit-il-</i>	‘be dark for/at’	<i>-fiis-is-ɨ-</i>	‘darken for/at’
	<i>-ónd-el-</i>	‘be slim for/at’	<i>-óns-es-ɨ-</i>	‘make slim for/at’
	<i>-lil-il-</i>	‘cry for/at’	<i>-lis-is-ɨ-</i>	‘make cry for/at’
	<i>-buuk-il-</i>	‘get up for/at’	<i>-buus-is-ɨ-</i>	‘get [s.o.] up for/at’
	<i>-lúng-il-</i>	‘hunt for/at’	<i>-lúns-is-ɨ-</i>	‘make hunt for/at’

Thus the applicative seems to have infixes before the last vowel of a causativized stem (e.g., *-leef-es-ɨ-* ‘to lengthen for/at’ from *-leef-ɨ-* ‘to lengthen’). It would not do to simply analyze the applicative as suffixing to the root directly since the root-final consonant would not have mutated appropriately (e.g., **-leep-es-ɨ-*). To be sure, it is also not viable to analyze the observed mutation as a matter of iterative right-to-left application of mutation triggered by the causative suffix. For example, mutation does not apply across the intransitive reversive suffix *-uk* even though the suffix itself undergoes mutation.

² The vowel of the applicative *-il-* harmonizes in height with the preceding vowel.

(6)	Verb	Intransitive	Intransitive-Causative	
	-kak-	-kak-uk-	-kak-us-ɨ-/*-kas-us-ɨ-	'tie'
	-ang-	-ang-uk-	-ang-us-ɨ-/*-ans-us-ɨ-	'feel light'
	-sup-	-sup-uk-	-sup-us-ɨ-/*-suf-us-ɨ-	'be lively'

At first glance, the applicativization appears to be an instance of interfixation. For example, in German, constituents within compounds are often interjected with the segment *s* (e.g., *Geburt-s-tag* 'birthday') or *en* (*Schwan-en-gesang* 'swan song'). The linker morphemes, *-s-* and *-en-*, are interfixes, rather than infixes, since they do not appear within a monomorphemic continuous morph. However, the interfixation analysis of the applicative is insufficient. The parts that appear before and after the applicative marker do not themselves correspond to meanings that would jointly constitute the total meaning of the causative stem in the sense that the mutated root itself does not exist as a root independent of the causative suffix. That is, the applicative must take a mutated causative stem as its input (i.e., *lof-ɨ* 'exterminate' is the input to *-lof-es-ɨ-* 'exterminate for/at' not *-lob-* 'be extinct'). From the perspective of applicativization, a derived discontinuous stem is created out of the causative stem. The infixal nature of the applicative marker is thus established not only by the meaning (i.e., the applicative element is clearly an addition to a base already containing the meaning of the causative), but also by the phonological fact that mutation on the root-final consonant by the causative suffix is preserved after the addition of the infix, which results in a situation where the mutated root-final consonant is no longer adjacent to the mutation-inducing vowel.

As a final note, it is also important to maintain a clear distinction between sporadic infixation and systematic infixation. Sporadic infixation refers to a discernible infix that is perhaps a relic of a previously productive infixation process. For example, some researchers have noted that the *-n-* in *stand*, *tangential*, and *succumb* could be considered an infix in English (Sapir 1921). However, this nasal marker is a historical relic that largely occurs only in loanwords from French. The distribution of this *-n-* is extremely restricted and its function is by no means recoverable synchronically. This and other erratic appearances of intruding segment(s) are excluded as viable cases of infixation and will not be considered further in this study. The cases of infixation that fall within the scope of the present study must, therefore, be at least partially productive, if not fully, and their function must be recoverable.

While the descriptive apparatus discussed above helps us delineate the scope of the present study, the analysis of infixation is ultimately a theoretical matter. That is, how should infixes be treated as a formal object within the context of a theory of grammar? This is the topic of the next section.

2.2 Infixes as formal objects

Theories of infixation differ in their understandings of the nature of the interruption in the linear order between morphological constituents that is infixation. There are two broad classes of theories concerning the placement properties of infixes: *Phonological Readjustment* and *Phonological Subcategorization*. While these approaches espouse quite opposing views on the nature of infixation, in practice, individual analyses do not always fall straightly on either end of the analytic spectrum. As I cannot evaluate all in detail, I focus on arguments that affect most instantiations of each particular approach, paying specific attention to those properties which have gained currency in recent research. My goal here is to present the core of these ideas and explicate how these views should be understood in the context of infixation research.

But before diving into the specifics of these two approaches, it is useful to point out at the outset that all theories of infixation assume, at the very basic level, that infixes are adpositional affixes, formally no different from prefixes and suffixes. This assumption is derived from the premise that a Morphological Hierarchy, such as (7), does not distinguish between the different types of affixes since it does not prescribe the linear order between morphological constituents.

- (7) Morphological Hierarchy
 MWd → Stem*
 Stem → Stem, Affix
 Stem → Root

A complete theory of morphology must provide a means to encode two types of relations between morphological elements—morphological dependence and linear precedence. Morphological dependence concerns the requirement of a morphological sister. One way to capture such a dependency is by way of subcategorization frames (Inkelas 1990; Kiparsky 1983; Lieber 1980; Selkirk 1982; Sproat 1985):

- (8) English suffix *-ity* N[A[] ity]
 English suffix *-ic* A[N[] ic]
 English prefix *un-* A[un A[]]

However, morphological structure represents only a commitment to the hierarchical organization of the constituent morphemes, not necessarily to linear ordering (Inkelas 1993; Sproat 1985: 80–1). Several formalisms for

capturing linear precedence relation between linguistic entities have been proposed in the past. To this end, some theorists have extended the notion of morphological subcategorization to the phonological domain, based on evidence for a phonological structure distinct and parallel to the morphological structure within the lexicon (Booij 1985; Booij and Rubach 1984, 1987; Cohn 1989; Inkelas 1990, 1993; Sproat 1985, 1986). In particular, it is argued that while morphological subcategorization frames encode dominance relations in morphological structure, phonological subcategorization frames encode linear precedence relations. Thus while the morphological subcategorization frames in (8) encode the type of morphological sister each suffix takes, the phonological subcategorization frames in (9) specify the linear precedence between the affix and its sister.

- (9) English suffix *-ity* $[[]_{p\omega} \text{ity}]_{p\omega}$
 English suffix *-ic* $[[]_{p\omega} \text{ic}]_{p\omega}$

This distinction between phonological vs morphological subcategorization is obscured in the context of Generalized Alignment (McCarthy and Prince 1993a) since the morphological element can align directly with the phonological one and vice versa. Generalized Alignment (GA) is a family of well-formedness constraints which ‘demands that a designated edge of each prosodic or morphological constituent of type Cat_1 coincide with a designated edge of some other constituent of Cat_2 ’ (McCarthy and Prince 1993a: 80). Although the formalism was originally developed within the context of Optimality Theory, GA is ‘relatively abstract, and not tied to the particular details of phonological or morphology sub-theory’ (McCarthy and Prince 1993a: 81).

- (10) Generalized Alignment
 $\text{Align}(Cat_1, Edge_1, Cat_2, Edge_2) =_{\text{def}}$
 $\forall Cat_1 \exists Cat_2$ such that $Edge_1$ of Cat_1 and $Edge_2$ of Cat_2 coincide.
 Where $Cat_1, Cat_2 \in \text{PCat} \cup \text{GCat}$
 $Edge_1, Edge_2 \in \{\text{Right}, \text{Left}\}$

The set of admissible GCat is derived from the morphological hierarchy stated below:

- (11) Morphological Hierarchy (McCarthy and Prince 1993a: 85)
 $\text{MWd} \rightarrow \text{Stem}^*$
 $\text{Stem} \rightarrow \text{Stem}, \text{Affix}$
 $\text{Stem} \rightarrow \text{Root}$

On the other hand, the PCat is taken to be categories within the Prosodic Hierarchy. McCarthy and Prince recognize that the moraic and skeletal levels may also be part of this hierarchy. However, based on the evidence available to them, these levels subordinating to the syllable were left out due to lack of examples illustrating their relevance to edge alignment in morphological and phonological processes.

(12) Prosodic Hierarchy

Prosodic Word	PrWd
Foot	Ft
Syllable	σ

As will be illustrated below, many of the approaches to infixation discussed below and the theory defended in this work in particular adopt the basic formalism of GA for the purpose of encoding the edge-alignment relations between linguistic elements. A more detailed discussion of this formalism and its implementation appears in Chapter 3. It is sufficient to note at this juncture that GA provides a means to capture the diverse ways in which constituent edges figure in morphological (and phonological) processes. GA also provides a handy way to capture the distinction between the Phonological Readjustment and the Phonological Subcategorization approach to infixation. The first approach, Phonological Readjustment, regards infixation as a by-product of phonological operations. All affixes align with respect to an edge of some morphological entity, be it root, stem or another affix. Phonological Subcategorization, on the other hand, takes infixes to be a by-product of mismatches between boundaries of phonological and morphological categories. On this view, the affix in question must align with respect to the edge of some phonological element, rather than a morphological one. When the edges of the phonological element and the morphological host coincide, the affix will surface as adpositional. However, when the phonological element is properly contained within the domain of the morphological host, the affix might appear infixal. The basic distinction between these two approaches is summarized in (13). On the view of Phonological Readjustment, both arguments of the alignment constraint are taken from the set of GCat.³ On the view of

³ To be sure, some Phonological Readjustment analyses treat prefixes and suffixes as aligning with respect to the PrWd. For example, while McCarthy and Prince (1993a: 102) analyze the actor focus marker *-um-* in Tagalog as aligning with respect to the stem (i.e., $\text{Align}([\text{um}]_{\Delta}, \text{L}, \text{Stem}, \text{L})$), Kager (2000: 122) treats *-um-* as aligning with respect to the PrWd.

Phonological Subcategorization, however, the universally quantified argument (Cat1) is of the GCat set while the existentially quantified argument (Cat2) is of the PCat set.

- (13)
- | | | | |
|--------------------------------|-------|-------|-------|
| | ALIGN | (Cat1 | Cat2) |
| Phonological Readjustment | | GCat | GCat |
| Phonological Subcategorization | | GCat | PCat |

In Sections 2.3 and 2.4, I survey the basic claims of these two approaches, rather than comparing and contrasting the myriad proposals for infixal placement. Section 2.4 is a critical discussion of these approaches. In particular, I focus on several issues which are highly problematic for the Phonological Readjustment approach and conclude that this line of analysis cannot be maintained. In the following chapters, I show that the Phonological Subcategorization approach, properly understood in the context of a holistic view of the theory of grammar, contains the machinery necessary for an explanation of the data which is problematic for the Phonological Readjustment analysis.

2.3 Infixation as a phonological process

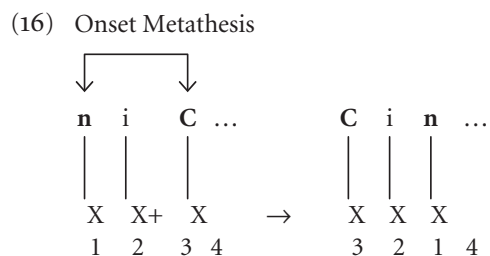
Phonological Readjustment analyses share the unifying, but often implicit, assumption that infixes are underlyingly adpositional morphologically; that is, they are sisters to some morphological constituent. The surface appearance of infixation comes about as the result of readjustments (see Buckley 1997; Halle 2001; Hyman and Inkelas 1997; Kaufman 2003; McCarthy 2003*b*; McCarthy and Prince 1993*a*, 1994*b*; Moravcsik 1977; Stemberger and Bernhard 1998). Derivational theories implement this idea differently from constraint-based approaches, however. From the perspective of a derivational theory of the grammar, infixation does not exist as a morphological process. The semblance of infixation is taken to be the result of segmental metathesis (Halle 2001; Moravcsik 1977). For example, Halle (2001) argues that many of the so-called VC infixes in many Austronesian languages are in fact CV prefixes. The apparent surface infixing pattern is a matter of Onset Metathesis. Take, for example, the [+realis] construction in Tagalog, as illustrated by the data below taken from Schachter and Otones (1972: 370):

- (14)
- | | | |
|-----------------|-------------------|---------------------|
| /in, ʔawi/ | → ʔ-in-awit | ‘sang’ |
| /in, bigy, an/ | → b-in-igy-an | ‘gave to’ |
| /ʔi, in, bilih/ | → ʔi-b-in-ilih | ‘bought for’ |
| /ʔi, ka-takoh/ | → ʔi-k-in-a-takoh | ‘caused to run for’ |

Contrary to Schachter and Otnes's morphological analysis, Halle (2001) proposes that the [+realis] morpheme is underlyingly a CV prefix, *ni-*. The prefix appears to be infixal due to a rule of onset metathesis.

(15)	UR <i>á la</i> Halle	SR	Gloss
	/ni, ʔawit/	→ ʔi-nawit	'sang'
	/ni, bigy, an/	→ bi-nigy-an	'gave to'
	/ʔi, ni, bilih/	→ ʔi-bi-nilih	'bought for'
	/ʔi, ni, ka-takboh/	→ ʔi-ki-na-takboh	'caused to run for'

Schematically, Halle's *Onset Metathesis* analysis of infixation can be stated as follows:



This understanding of 'infixation' follows from generative theories of grammar that are strictly modular. Operations in one module, like Syntax, are prevented from accessing or referring to information derived in another module, such as the phonological component. This view was reflected in Moravcsik's 1977 seminal treatise on the rules of infixing which implements the separation of information by proposing a metaconstraint against heteromodality in grammatical statements. However, nowhere is this modular view of the grammar and its implication for the analysis of infixation more succinctly articulated than in Halle's 2001 rebuttal against the Optimality Theoretic analysis of infixation:

[F]rom the point of view of syntax, morphemes are indivisible, atom pieces. The syntax is systematically oblivious of phonological aspects of the morphemes. In the theory of Distributed Morphology (Halle and Marantz 1993) this obliviousness is formally reflected by the absence—in syntactic representations—of the phonetic exponents of the morphemes. In the syntax proper, morphemes are nothing but complexes of syntactic and semantic features; their phonetic exponents are inserted by Vocabulary Insertion, which is part of the morphology. Since the phonetic exponents of morphemes are thus not present in the syntax, it is literally impossible within the syntax to infix /um/ or /in/ before the first vowel of the Tagalog stem. This can only be done in the morphology or phonology, after the phonetic exponents of the morpheme have been spelled out. (Halle 2001: 153)

While this analysis duly handles the data discussed by Halle, the status of Onset Metathesis within Tagalog and in the theory of infix placement in general remains obscured. Onset Metathesis cannot be a general phonological process in the language since there are many instances of prefixation that do not involve infixation (e.g., the irrealis *ma-* and realis *na-* are straightforwardly prefixing; *ma-takot* ‘fear.irrealis.perfective’ and *na-takot* ‘fear.realis.perfective’). Thus, Onset Metathesis must be treated as a morpheme-specific rule that is triggered only when the [+realis] morpheme is applied. On this view, ‘infixation’ is accounted for by stipulations. No general principle in the grammar triggers the application of segmental metathesis rules *per se*. The readjustment rule is specific to the morpheme in question.

On the other hand, for constraint-based models of phonology which eschew structure-building and structure-changing rules in favor of static well-formedness conditions evaluating output forms, interface between domains, if modularity still plays any substantial role at all in such a model, is often celebrated rather than avoided. The rationale behind this type of Phonological Readjustment analysis is not imposed by the intrinsic architecture of the grammar *per se*, but is rather a matter of methodological priorities. As McCarthy and Prince noted, the goal of all linguistic theories ‘is to achieve greater empirical coverage with fewer resources—maybe with no resources at all that are specific to the domain under investigation’ (McCarthy and Prince 1994: B13). In particular, the goal of Prosodic Morphology, the rubric under which infixation falls, is ‘[t]o explain properties of morphology/phonology dependency in terms of independent, general properties’ (McCarthy and Prince 1994*b*: B1). On this view, motivations for the Phonological Readjustment approach stem from (i) a concern of formal economy, that is, the elimination of infixes as formal objects by deriving infixes from other morphological primitives, such as prefixes and suffixes, and (ii) the drive to achieve explanatory adequacy in a theory of grammar. Within the context of a constraint-based framework like Optimality Theory, this was taken to mean that infixation should be derived, rather than stipulated, through constraint interaction. Consider, for example, the case of agreement infixation in the Siouan language, Dakota. The Dakotan agreement system consists of a set of person/number affixes which are prefixed to monosyllabic verb roots and some polysyllabic ones, but are infixes after the initial syllable into other polysyllabic verb roots of a lexically specified subclass.

- (17) Dakota agreement infixation (Moravcsik 1977: 95–6, based on Boas and Deloria 1941)

ća.pa	‘stab’	ća.wa.pca	‘I stab’
?i.kto.mi	‘Iktomi’	?i.ma.ktomi	‘I am Iktomi’
ma.nç	‘steal’	ma.wa.nç	‘I steal’
na.pca	‘swallow’	na.wa.pca	‘I swallow it’
la.k ^c ota	‘Lakota’	la.ma.k ^c ota	‘I am a Lakota’
na.wizi	‘jealous’	na.wa.wizi	‘I am jealous’

McCarthy and Prince (1993*a*) analyze the agreement markers as formally prefixes which are subject to the ALIGN-IN-STEM constraint in (18). This constraint states that the left edge of the agreement marker must coincide with the left edge of the stem.

- (18) ALIGN-IN-STEM(Dakota)
-
- Align([AGR]
- _{Af}
- L, Stem, L)

For the infix-taking subclass of verb roots, however, the agreement morphemes are prevented from surfacing as prefixes by the dominant ALIGN-ROOT constraint in (19).

- (19) ALIGN-ROOT(Dakota)
-
- Align(Root, L, PrWd, L)

As shown in Tableau (20), the agreement marker *-wa-* is infixal after the first CV of the root (20c) because of the dominance of ALIGN-ROOT over ALIGN-IN-STEM (see the failure of (20a)). Minimal displacement of the agreement markers from the absolute initial position, i.e., *ća.wa.a.pa*, does not suffice to derive the optimal output. McCarthy and Prince argue that the constraint ONSET is involved, disfavoring candidates with syllables that are onsetless.

(20)

<i>wa, ćapa</i>	ONSET	ALIGN-ROOT	ALIGN-IN-STEM
a. [-wa.lća.pa ⁴		*!	
b. [lć-wa.a.pa.	*!		ć
c. [☞] [lća.-wa.pa.			ća

⁴ The left edge of the root is denoted by ‘|’, the left edge of the affix by ‘-’, and the left edge of PrWd by ‘[’.

Thus, unlike the derivational theories of Phonological Readjustment, which derive the surface appearance of infixation by way of some phonological operation, on the view of the constraint-based approach, affix movement is key. As illustrated above, ‘infixation shows that phonological constraints can determine even the linear order of morphemes and morpheme parts’ (McCarthy and Prince 1993a: 85). In a constraint-based approach, affix reordering is motivated by reifying a long-standing intuition that the position of an infix is functionally linked to its shape. That is, affixes ‘migrate’ only when the infixed outcome yields ‘better’ surface realization (Anderson 1972; Buckley 1997; Cohn 1992; McCarthy and Prince 1993a; Prince and Smolensky 1993). What counts as the functional motivating factors for infixation are many, although not all of them have equal explanatory values. Some argue that affixes move away from the edge in order to improve syllable structure well-formedness (McCarthy 2003b; McCarthy and Prince 1993a, 1994b; Prince and Smolensky 1993). Others consider it a matter of featural preservation (Buckley 1997). Like the case of Dakota, many have also argued that infixation serves to preserve morphotactics (Lubowicz 2005; Stemberger and Bernhardt 1998).

In this section, I reviewed the logic of the Phonological Readjustment approach to infixation in both derivational and non-derivational frameworks. The fundamental assumption that unifies all Phonological Readjustment-based analyses is the insistence that the motivation for infixation must be exogenous. The Phonological Subcategorization approach, to be reviewed in the next section, eschews this analytic bias.

2.4 Infixation as morpho-phonological mismatch

Proponents of the Phonological Subcategorization approach embrace the mismatch between morphological and phonological representations. On this view, an infix is an affix that is sensitive to the phonological properties of its sister. Phonological sensitivity is often encoded in the form of *phonological subcategorization*, that is, an infix is an affix that subcategorizes specifically for a phonological constituent as its sister, rather than a morphological one. Simplifying the analysis at this juncture, the expletive infix in English, for example, can be treated as lodging before a stressed trochaic foot (FT^σ). Such a subcategorization requirement may be stated in terms of a subcategorization frame or a GA constraint (21). Crucially, when the left edge of the stressed foot and the left edge of a stem coincide, the expletive appears prefixing (e.g., *bloody-(háppy)*). When the left edge of the stem is to

the left of the stressed foot, the expletive appears infixing (e.g., *fan-bloody-(tástic)*, *Kalama-goddamn-(zóo)*).⁵

- (21) English expletive
 Subcategorization frame: ‘expletive’ $[(\sigma_s \dots)]$
 Generalized Alignment: Align (‘expletive’, R, FT’, L)

Likewise, some theories analyze infixes as *bi-dependent* in that infixes subcategorize for two entities simultaneously (Inkelas 1990; Kiparsky 1986). That is, infixes subcategorize for some prosodic constituent (i.e., the frame-internal $[]_p$ in (22)) and the material across which they are attached (i.e., the X in (22)).

- (22) $[X_ []_p]_p$

Thus, for example, the infix *-in-* in the Timugon dialect of Sabah Murut (see (3)) has the subcategorization frame $[(C) _ []_p]_p$ where *-in-* is understood to take a prosodic stem, in the sense of Inkelas 1990, as its right constituent and may optionally be preceded by a consonant.

To be sure, the ability for an affix to subcategorize for a phonological constituent is not unique to infixes. Adpositional affixes often have phonological subcategorization requirements as well. A typology of subcategorization types and examples of each type are given in (23).

- | | |
|------------------------------------|--|
| (23) Subcategorization | Examples |
| Morphological (Adpositional affix) | English nominalizing <i>-ness</i> |
| Morphological/Phonological | German perfective participle <i>ge-</i> |
| Phonological (Infix) | English <i>ma</i> -infixation, Ulwa
<i>ka</i> -infixation |

From the perspective of learning, phonological subcategorization takes place under two scenarios. When the placement of a morpheme can be determined by both morphological and prosodic/phonological means simultaneously, this analytical ambiguity often gives rise to selection of either one or both modes of affixation. Examples of simultaneous subcategorizations at the morphological and phonological levels are not difficult to find in the literature. For example, the German perfective participle, *ge-*, only attaches to stems that begin with a stressed syllable; the Lappish illative plural has two allomorphs: *-ide*, which appears after a stem with an even number of syllables, and *-ida*, which appears after a stem with an odd number of syllables (Bergsland 1976; Hargus 1993). Similarly, in Dyirbal, the ergative suffix is *-ŋgu* with disyllabic V-final nouns

⁵ In this work, I shall focus strictly on the purely phonologically governed distribution of the expletive and leave aside the issue of the interaction between expletive placement and morphological boundary for future research (but see McCawley 1978).

(24a), but is *-gu* when the stem is longer (24b). Stress is initial and alternating in Dyirbal although final syllables are never stressed (Dixon 1972: 274–6).

- (24) a. yaɽa-ŋgu ‘man’
 b. yamani-gu ‘rainbow’
 balagara-gu ‘they’

According to McCarthy and Prince (1993*b*), the *-ŋgu* suffix subcategorizes for the head foot as its left-sister (i.e., AFFIX-TO-FOOT). When direct suffixation to a disyllabic stem is not possible (i.e., when the right edge of the head foot does not coincide with the right edge of the stem), the general, non-phonological subcategorizing, suffixal allomorph, *-gu*, is used instead (see also Paster 2006). The subcategorization requirement of an infix is formally no different from that of these ergative suffixes. The only difference is in the response to the failure of Phonological Subcategorization satisfaction. In Dyirbal, for example, when the Phonological Subcategorization of the ergative *-ŋgu* cannot be satisfied adpositionally, instead of infixation (e.g., **yama-ŋgu-ni*), an alternative general suffixal allomorph, *-gu*, is used instead. Other languages may return no output (in which case, ineffability obtains) or make use of periphrasis. I will return to this topic in Section 6.4 in Chapter 6. The main point here is that, from this perspective, infixes are really just affixes without any subcategorization requirement stated at the morphological level. ‘Infixation’ is essentially epiphenomenal; nothing in the grammar requires morpheme interruption *per se*. There is no reordering of segments or movement of affixes. Infixation simply falls out from the cross-level edge-alignment property of phonological subcategorization; no stipulated mechanism is needed to account for infixation.

Before turning to the comparison between Phonological Readjustment and Phonological Subcategorization, it should be noted that phonological sensitivity in morphology, particularly in the context of infixation, may also be encoded indirectly, for example, in the form of stem alternation. For example, within the theory of Prosodic Morphology prior to the advent of Optimality Theory (McCarthy and Prince 1990, 1993*a*, 1993*b*), infixation is analyzed in terms of *operational prosodic circumscription*, which is a factoring function that allows a peripheral constituent to be parsed from a string. Operations can then be performed on that element (positive circumscription) or on the remainder (negative circumscription). In particular, prominence-driven infixes are analyzed in terms of positive operational prosodic circumscription while edge-oriented infixes are analyzed in terms of negative operational prosodic circumscription. Consider, for example, that in Samoan, a Polynesian language, plural is marked by reduplicating the penultimate, thus stressed,

syllable. Syllables are always open, thus the reduplicant is CV in shape. When the stem is more than two syllables long, the reduplicant appears to infix before the stressed syllable.

(25) Samoan plural (Mosel and Hovdhaugen 1992: 221–2)⁶

tóa	‘brave’	totóa
má:	‘ashamed’	mamá:
alófa	‘love’	a:lólófa
galúe	‘work’	ga:lulúe
a:vága	‘elope’	a:vavága
atamáí	‘clever’	atamamáí
maʔalíli	‘cold, feel cold’	maʔalilíli
toʔúlu	‘fall, drop’	toʔuʔúlu

Under positive prosodic circumscription, one first selects the prosodic constituent to be copied (represented by the function Φ), in this case, a stressed foot (step i). The Φ -delimited portion of the word is assembled with the non- Φ -delimited part of the stem (step ii). The reduplicative prefix O is then affixed to this circumscribed foot (step iii), followed by the reassembling in step iv.

(26)	i.	$O: \Phi(a[lófa]_{Ft})$	=	$a[lófa]_{Ft}/\Phi * O(a[lófa]_{Ft}:\Phi)$
	ii.		=	$a * O([lófa]_{Ft})$
	iii.		=	$a * lolófa$
	iv.		=	$alolófa$

In negative prosodic circumscription, the circumscribed prosodic constituent, rather than serving as the base of affixation, is stripped away temporarily for the purpose of affixation.

(27) Timugon Murut (McCarthy 2000; Prentice 1971)

a.	bulud	bu -bulud	‘hill/ridge’
	limo	li -limo	‘five/about five’
	ulampoy	u- la -lampoy	no gloss
	abalan	a- ba -balan	‘bathes/often bathes’
	ompodon	om- po -podon	‘flatter/always flatter’

b. Circumscriptional analysis

Φ (Onsetless Syllable, Left), O	=	Prefix σ_{μ} (reduplicative prefix)
O/Φ (ompodon)	=	$O(\text{ompodon}/\Phi) * \text{ompodon}:\Phi$
	=	$O(\text{podon}) * \text{om}$
	=	$\text{popodon} * \text{om}$
	=	Ompopodon

⁶ While stress is not marked in the source, stress marking is indicated to facilitate the presentation.

For example, partial reduplication in Timugon Murut, an Austronesian language spoken in Malaysia, can be analyzed in terms of negative circumscription where an initial onsetless syllable, if any, is circumscribed and stripped away temporarily (McCarthy 2000). The reduplicative morpheme is then attached to the residue (see (27b) for a step-wise illustration of this operation). Operational prosodic circumscription was abandoned in the wake of the advent of Optimality Theory. McCarthy (2000), for example, contends that infixation can be more insightfully analyzed in terms of the OT implementation of Phonological Readjustment. As reviewed in the next section, however, such a conclusion is not warranted.

2.5 Phonological Readjustment and Phonological Subcategorization compared

The differences between Phonological Readjustment and Phonological Subcategorization approaches to infixation can be summarized schematically as in (28). On the view of Phonological Subcategorization, an affix, *A*, takes a phonological constituent, *X*, as its left sister. When the right edge of *X* is within the domain of the morphological host (and if *A* is to be realized faithfully), the infixal distribution of *A* obtains. Infixation is epiphenomenal in the sense that no mechanism in the grammar requires the intramorphemic distribution of the affix in question. The infix does not undergo any movement at any level of the analysis either. If the stem boundary coincides with the edge of *X*, the affix will appear adpositionally. It is only when the morphological and the phonological edges misalign that the affix manifests as an infix.

From the perspective of Phonological Readjustment, on the other hand, infixation is the result of displacement. The affix *A* is prefixed to the stem *XYZ*. The phonology then repositions the terminal phonetic form of *A* (or the morpheme *A* itself) inside the terminal phonetic form of *XYZ* and infixation obtains. It should be noted that the nature of the displacement differs between the derivational and constraint-based approaches to Phonological Readjustment. From the perspective of the constraint-based model, it is the morpheme that moves. As McCarthy and Prince (1993a: 85) emphasize, ‘infixation shows that phonological constraints can determine even the linear order of *morphemes* and *morpheme parts*’. On the view of the derivational model, however, it is the phonological strings that permute, never the morpheme itself.

(28) Phonological Readjustment Phonological Subcategorization

Input	/A, XYZ/	/A, XYZ/
Morphology	A+XYZ	XAYZ
Phonology	XAYZ	XAYZ
Output	XAYZ	XAYZ

This work is a defense of the Phonological Subcategorization view of infixation. Before introducing in more detail the theoretic apparatus for the understanding of Phonological Subcategorization, I review in some detail arguments against the Phonological Readjustment approach. Since much research has demonstrated the need for simultaneous reference to phonological and morphological structures in languages (Booij 1985; Booij and Rubach 1984, 1987; Cohn 1989; Inkelas 1990, 1993; Sproat 1985, 1986), I see no reason to restrict our theoretical apparatus from accessing cross-modular information. This freedom with respect to cross-module interaction is particularly acute in the context of constraint-based approaches to language (see more discussion of this issue in the next chapter). As such, I shall limit my discussion of the derivational view of Phonological Readjustment and focus my attention instead on the constraint-based view of Phonological Readjustment, particularly as it is implemented in Optimality Theory (henceforth OT-PR). However, when appropriate, I will highlight critiques that are equally applicable to both views of Phonological Readjustment.

2.5.1 *On the ethological view of infixation*

One of the main arguments for OT-PR rests on the premise that the infixability of an affix is partly determined by the phonological composition of the affix itself and the context in which it appears. Similar ethological observations have been made repeatedly in the literature (Anderson 1972; Buckley 1997; Cohn 1992). Formally, this intuition is captured by the constraint-ranking schema, $P \gg M$, one of the three basic tenets of Prosodic Morphology within Optimality Theory.

(29) Prosodic Morphology within OT (McCarthy and Prince 1993*b*: 110)

a. Prosodic Morphology Hypothesis

Templates are constraints on the prosody/morphology interface, asserting the coincidence of morphological and prosodic constituent.

b. Template Satisfaction Condition

Templatic constraints may be undominated, in which case they are satisfied fully, or they may be dominated, in which case they are violated minimally, in accordance with general principles of Optimality Theory.

c. Ranking Schema
 P >> M

The main innovation of this conception of Prosodic Morphology lies in (29c), which embodies the idea that prosody-governed morphology is the result of phonological constraints (P) taking precedence over morphological ones (M). Phonological constraints may be of several varieties (e.g., segmental faithfulness, syllable well-formedness, segmental markedness, etc.). On the other hand, morphological constraints generally include constraints on faithfulness (e.g., FAITH-Root, FAITH-Affix, etc.) and linear precedence (i.e., alignment constraints). It is the latter that is most relevant in the case of infixation. For example, McCarthy (2003*b*) proposes that the affix *-um-* in Tagalog should be treated formally as a prefix and is infixated to avoid onsetless word-initial syllables in the outputs. The affix *-um-* is infixated after the stem-initial consonant since prefixing *-um-* would have resulted in a fatal violation of ONSET, which penalizes any onsetless syllables (30b). It serves little purpose to ameliorate the fatal ONSET violation by supplying the prefix with an onset (30c) due to the dominance of DEP-C, a constraint that penalizes consonant epenthesis. To be sure, gratuitous additional inward migration of *-um-* is not encouraged since it does not improve the standing of the candidate (see (30d)).

- (30) EDGEMOST(L, *um*) The morpheme *um* is located at the left edge;
 is a prefix.
 ONSET Syllables must begin with a consonant.
 DEP-C Do not epenthesize consonants.

/um, tata /	DEP-C	ONSET	EDGEMOST(L, <i>um</i>)
a. tumata			*
b. umtata		*!	
c. ?umtata	*!		
d. tatura			*!***

If infixation were indeed the result of phonological constraints taking precedence over morphological ones, and phonological constraints are constraints penalizing marked structures, it follows that one should never expect to find instances of infixation that yield structures that are more marked than their prefixing or suffixing counterparts. This observation has prompted,

for example, Buckley to revel at the dearth of examples of ‘CV infixes which occur after the onset’ (1997: 14).

Blevins (1999) reports just such a case in Leti, an Austronesian language spoken on the island of Leti, east of Timor.⁷ Leti nominalizing affixation has eight distinct phonological forms: three infixes *-ni-*, *-n-*, *-i-*; three prefixes *ni-*, *i-*, *nia*; a parafix *i+-i-*; and a zero allomorph. Each of these allomorphs has very specific distribution. The infix *-ni-* appears before the first vowel of the stem when the stem has an initial non-nasal or non-alveolar consonant followed by a non-high vowel (31a). The infix *-ni-* is realized as *-n-* when the stem contains a high vowel after the initial consonant (31b).

(31) Nominalizing *-ni-* in Leti (Blevins 1999)

a.	kaati	‘to carve’	k-ni-aati	‘carving’
	kasi	‘to dig’	k-ni-asi	‘act of digging’
	kakri	‘to cry’	k-ni-akri	‘act of crying’
	pèpna	‘to fence’	p-ni-èpna	‘act of fencing, fence’
	polu	‘to call’	p-ni-olu	‘act of calling, call’
	n-sai	‘to climb, rise, III (3SG)’	s-ni-ai	‘act of climbing, rising’
	n-teti	‘to chop, III (3SG)’	t-ni-eti	‘chop, chopping’
	n-vaka	‘to ask (for), III (3SG)’	v-ni-aka	‘act of asking, request’
b.	kili	‘to look’	k-n-ili	‘act of looking’
	kini	‘to kiss’	k-n-ini	‘act of kissing, kiss’
	surta	‘to write’	s-n-urta	‘act of writing, memory’
	tutu	‘to support’	t-n-utu	‘act of supporting, support’
	n-virna	‘to peel, II (3SG)’	v-n-irna	‘act of peeling’

Another allomorph of *-ni-* is *-i-*, which surfaces before the first vowel of the stem when the initial consonant is a sonorant or an alveolar consonant.

(32) Nominalizing *-i-* in Leti

davra	‘cut’	d-i-avra	‘act of cutting, cut’
dèdma	‘to smoke’	d-i-èdma	‘act of smoking’
l-lèvra	‘to disperse s.t.’	l-i-èvra	‘dispersal’
l-lòi	‘to dance’	l-i-òi	‘act of dancing’
mai	‘to come’	m-i-ai	‘arrival’
n-nasu	‘to cook’	n-i-asu	‘cooking’
n-navu	‘he sows’	n-i-avu	‘the act of sowing’
n-resi	‘to win’	r-i-esi	‘victory’
n-ròra	‘to draw (a line)’	r-i-òra	‘line’

⁷ Consonants [t, n, s] are dental in Leti, while [d, l, r] are alveolar. Following Blevins’s transcription, v = [β]; è = [ɛ]; ò = ɔ.

The fact that the nominalizing morph, *-ni-*, is infixated is puzzling within a prosodic optimization view of infixation. It is unclear what problems confront the strategy of simply prefixing *-ni-* to the stem (e.g., **ni-teti* instead of *t-ni-eti* ‘chop, chopping’). The infixal outputs invariably contain initial onset clusters and vowel-vowel sequences;⁸ both are marked structures typologically. To be sure, Leti infixation cannot be analyzed on the par as Dakota agreement infixation, that is, as an instance of edge avoidance. When the stem is vowel-initial, the nominalizer is prefixed. According to van Engelenhoven (2004), the *i-* prefix sometimes nominalizes the verb as an instrument while the *ni-* prefix nominalizes the verbal act.

(33) Nominalizing *-(n)i-* in Leti

n-osri	‘to hunt’	i-osri, ni-osri	‘act of hunting’
n-otlu	‘to push’	i-otlu, ni-otlu	‘act of pushing’
n-atu	‘to know’	i-atu, ni-atu	‘knowledge’
n-odi	‘to carry’	i-odi, ni-odi	‘pole, load, act of carrying’
n-èmnu	‘to drink’	i-èmnu, ni-èmnu	‘act of drinking, drink, beverage’
n-òra	‘to be with’	i-òra, ni-òra	‘companion’

A similarly puzzling case of infixation is found in Pingding Mandarin. As in most Mandarin dialects, Pingding has a diminutive/hypocoristic affixation process. However, unlike the other dialects, where this process is marked by the suffixing of a retroflexed morpheme (i.e., *-r*), the cognate morpheme in Pingding, *-l-*, is infixated before the rhyme of a syllable.

(34) Pingding *-l-*-infixation (Lin 2002; Xu 1981; Yu 2004b)

mən tuʂŋ	+ l	→	mən tʃuʂŋ	‘hole on the door’
lɔɔ tʰʂu	+ l	→	lɔɔ tʰʃu	‘old man’
ʒiɔɔ pʂŋ	+ l	→	ʒiɔɔ pʃŋ	‘small notebook’
xʂu mʂŋ	+ l	→	xʂu mʃŋ	‘back door’
ʒiɔɔ kuʂ	+ l	→	ʒiɔɔ kʃuʂ	‘small wok’
xuʂŋ xuʂ	+ l	→	xuʂŋ xʃuʂ	‘yellow flower’
ŋʂ	+ l	→	ŋʃʂ	‘moth’

Outside the domain of infixation, Pingding Mandarin has the canonical Chinese syllable structure, (C)(G)V(C) where G stands for a glide. The very fact that onset clusters should be tolerated just in the case of infixation should be evidence enough for rejecting the hypothesis that infixation is a matter of prosodic optimization. Lin (2002) notes that there is at least one redeeming aspect of *l*-infixation, that is, it follows the Sonority Sequencing Constraint.

⁸ The high vowel in a vowel-vowel sequence is realized as a glide.

However, recent work on the positional markedness effects of retroflexion (Steriade 1995) has demonstrated that retroflexion is perceptually most salient in post-vocalic positions. Thus, the ‘migration’ of [l] to post-consonantal position only endangers the identification of the retroflex feature, rather than enhancing it.

What the Leti and Pingding cases illustrate is that infixation can occur for no obvious prosodic or phonotactic gains. The optimization approach offers us no insight as to why such infixation patterns exist at all. One may appeal to edge avoidance to account for certain cases, but the fundamental appeal of the OT-Phonological Readjustment approach is lost in such an analysis. That is, the functional motivation for an affix to migrate inward is to minimize output prosodic or phonotactic markedness. This functional connection is not readily available for the edge-avoidance analysis.

The list of non-functionally motivated infixes may be expanded to include infixes that do not either improve or worsen output markedness. For example, in Hua, a Papuan language of the Eastern Highlands of New Guinea, the negative marker *-ʔa-* appears before the final syllable.

- (35) Hua negative formation (Haiman 1980)
- | | | |
|--------|----------|---------------|
| zgavo | zgaʔavo | ‘not embrace’ |
| harupo | haruʔapo | ‘not slip’ |

Prosodically speaking, the suffixal counterpart of this CV marker would have resulted in equally well-formed outputs (see also the Budukh case in (40)). No obvious functional motivations can be adduced for the infixing of such a morpheme.

In light of the cases reviewed above, the purported functional bond between the shape of an infix and its position with respect to the host is at best suspect. A closer look at the typology of infix shape and its placement property supports this position. Claims with regard to the functional connection between morpheme shape and infix position were established previously based on the perceived prevalence of VC affixes that infix after an onset consonant. Upon closer examination, however, the purported functional connection may actually reflect a bias introduced by impoverished sampling. Of the forty cases of fixed-segment VC infixation, twenty-three are from the Austronesian languages, eleven are from Austro-Asiatic languages, while only six are from other languages.⁹ More importantly, of the thirty-four VC infixes that appear after the first consonant or before the first vowel of the stem, all

⁹ The ethological connection between infix shape and its location was first noted in Anderson’s (1972) study of nasalization and infixation in Sundanese, an Austronesian language.

but one belongs to the Austronesian and the Austro-Asiatic families.¹⁰ The fact that the majority of the post-onset VC infixes belong to one of two language families suggests that such cases might be features inherited from their respective protolanguages.¹¹ In contrast, about 20 percent of the fixed-segment infixes surveyed are CV in shape, about 10 percent are just a single vowel, and about 44 percent are monoconsonantal. Of these coda- or cluster-generating monoconsonantal infixes, only five are from Austronesian and three from Austro-Asiatic.

(36) Breakdown of fixed segment infixes by shape (and position)

	Austronesian	Austro-Asiatic	Other languages	Total
VC after C ₁ or before V ₁	22	11	1	34
VC elsewhere	1	0	5	6
C	5	5	34	44
CV	3	0	17	20
V	3	1	6	10

Thus, a closer look at the cross-linguistic evidence shows that an ethological understanding of infixation cannot be substantiated. Since the OT-PR approach to infixation was built upon this ethological assumption of infix placement, the rejection of this premise left the foundation of the theory badly shaken. In the next section, I turn to the empirical adequacy of the OT-PR approach. Upon closer scrutiny, the theory crumbles as I reveal deep-rooted problems with both the derivational and constraint-based versions of Phonological Readjustment.

2.5.2 *On the issue of empirical coverage: Problems of undergeneration*

Both derivational and constraint-based Phonological Readjustment approaches to infix placement suffer from an inherent limitation on empirical coverage. The most effective demonstration of this limitation comes from the domain of iterative infixation. Iterative infixation is commonly found among language games and disguises (see Section 6.2 for more discussion). For example, a language game in Hausa involves inserting *-bV-* after the vowel of each word-internal syllable. The vowel of the infix is a copy of the preceding vowel.

¹⁰ The lone exception comes from the intensive *-eg-* infix in Yurok, an Algic language. The origin of this infix is discussed in Section 5.2.3.4 in Chapter 5.

¹¹ The Austronesian VC infixes are mainly reflexes of the actor focus **mu-/um-* or the perfective **ni-/in-* in Proto-Austronesian (Dahl 1976: ch. 22).

- (37) Hausa word game (Newman 2000: 297)
- | | | |
|---------|--------------|------------------|
| gidā | gibìda | ‘house’ |
| maskī | mabàski | ‘oily’ |
| Màimunà | Maibàimubùna | ‘Maimuna (name)’ |
| hatsī | habàtsi | ‘grain’ |

Similarly, in Tagalog, the infix *-gVVdV-* is inserted after the vowel of each syllable. The unspecified vowels of the infix copy the adjacent vocalism of the basic form (Conklin 1956, 1959).

- (38) Tagalog *baliktad* speech-disguise game (Conklin 1956)
- | | | |
|-----------|-------------------------|------------|
| hindí? | higíidindigíidi? | ‘not, not’ |
| taṅháali? | tagáadaṅhagáadaligíidi? | ‘noon’ |

It is unclear what type of phonological readjustment can account for the multitude of infixal locations if infixes are underlyingly adpositional. (Iterative infixation finds natural expression within a Phonological Subcategorization approach, however. See Section 6.3 in Chapter 6 for more discussion.)

The limitation of Phonological Readjustment extends beyond the domain of language games and disguises. For example, recall that Halle (2001) reanalyzes VC infixation as a matter of CV prefixation followed by Onset Metathesis. Thus, the fact that the passive completive marker in Toba Batak has two allomorphs (the allomorph *ni-* is prefixed to vowel-initial roots, while the allomorph *-in-* is infixal after the first consonant of consonant-initial roots (39a)) can be straightforwardly analyzed under the Onset Metathesis analysis. Yet, not all VC infixes can be reanalyzed in this way. Halle himself points out that the nominalizing marker *-al-* in Toba Batak is a bona fide infix (Halle 2001: 163). That is, while *-al-* is infixal before the first vowel when the stem begins with a consonant, it is straightforwardly prefixed to vowel-initial stems (39b). Onset metathesis is not applicable here since vowel-initial stems are genuinely vowel-initial (rather than beginning with a glottal stop as in Tagalog). Instead, infixation of the nominalizing *-al-* is treated as the result of *al-* prefixation followed by Stem Onset Preposing (e.g., *al-bátuk* → *b-al-átuk* ‘ladder’).

- (39) a. ni-ulÓs-an ‘have been covered’ (completive passive)
 b-in-úat ‘has been taken’ (completive passive)
 j-in-ou-an ‘have been called repeatedly’ (completive passive)
- b. b-al-átuk ‘ladder’
 al-ógo ‘wind’

Onset Metathesis also offers no recourse when the infix is CV in shape. As illustrated in (40), the prohibitive infix *-mE-* in Budukh, a Lezgian language spoken in the Caucasus, always appears after the initial vowel of the stem.

Onset Metathesis predicts the wrong results (e.g., $mə+yixər \rightarrow *yəm̩ixər$, not $yim̩əxər$).

(40) Budukh prohibitive (Alekseev 1994a: 279)

Root	Gloss	Prohibitive
yeçi	‘to arrive’	yemeçi
yixər	‘to be’	yim̩əxər
yuc’u	‘to give’	yumoc’u

Derivational accounts are particularly un insightful when dealing with *tmesis*, that is, instances of infixation involving a whole word into another (e.g., English expletive infixation: *abso-bloody-lutely*). Rule-based formulations of *tmesis* are riddled with shortcomings. Aronoff (1976: 70), for example, proposes the rule in (41) for expletive infixation in English. This rule dictates that the expletive infix must be preceded by a tertiary stress and follow immediately by the primary stress.

(41) Expletive infixation in English

	3		1								
[X	V	Q	V	Y]							
1	2	3	4	5	→	1	2	3	Expletive	4	5
								3			
Condition: Q does not contain V											

Not only does this rule fail to account for many attested examples (e.g., *Ne-bloody-braska*), as McCarthy (1982) noted, it crucially fails to explain the relationship among stress, syllabification, and the infixed expletive that is encoded into the rule.

Like its derivational cousin, OT-PR is limited in empirical coverage as well. There exists one class of infixes that has always been outside the purview of OT-PR, that is, the stress-driven infixes. From the outset, stress-driven infixes are treated in terms of prosodic subcategorization, a subtype of phonological subcategorization (see e.g., McCarthy and Prince 1993a). For example, in Ulwa, a Misumalpan language spoken in Nicaragua and Honduras, the construct-state (CNS) markers are affixed to the right edge of an iambic foot.

(42) Ulwa construct state (Green 1999: 64)

sú:lu	sú:-ma-lu	‘dog-CNS ₂ ’
áytak	áy-mana-tak	‘paper-CNS ₂₂ ’
alá:kum̩	alá:-ka-kum̩	‘Muscovy duck-CNS ₃ ’
waráɣwa	waráɣ-kana-wa	‘parrot sp.-CNS ₃₃ ’
ká:sirá:mah	ká:-ki-sirá:mah	‘lizard sp.-CNS ₁ ’

To account for these infixal markers, McCarthy and Prince (1993a) set up the prosodic subcategorization constraint in (43), formulated in the schema of Generalized Alignment.

- (43) Ulwa infixal construct noun marker
ALIGN-TO-FOOT
ALIGN ([POSS]_{AF} L, FT', R)
'The left edge of the construct noun marker is aligned to the right edge of the head foot.'

The Ulwa example thus highlights an important point about OT-PR. Unlike its derivational cousin, the constraint-based approach does not reject Phonological Subcategorization. It remains an integral part of its analytic arsenal. However, there is an implicit priority in analytical preference. OT-PR bears the main burden of explaining the Edge-Bias Effect. Phonological Subcategorization is invoked only when no OT-PR option is available. This analytic priority of Phonological Readjustment over Phonological Subcategorization is a reflection of two presuppositions. The first is the ethological attitude OT-PR analysts take toward infix placement. As demonstrated in the last section, however, the ethological view lacks empirical substance and should not be maintained. The second stems from a theory-internal bias against invoking sub-prosodic constituents in phonological analysis.

The theory of Prosodic Morphology, first articulated in McCarthy and Prince (1986), requires morphological processes that interact with phonology to refer to genuine prosodic constituents. The basic tenets of this theory are given in (44).

- (44) Basic tenets of Prosodic Morphology (McCarthy and Prince 1993*b*: 109)
- Prosodic Morphology Hypothesis:** Templates are defined in terms of the authentic units of prosody: mora (μ), syllable (σ), foot (Ft), prosodic word (PrWd).
- Template Satisfaction Condition:** Satisfaction of templatic constraints is obligatory and determined by the principles of prosody, both universal and language-specific.
- Prosodic Circumscription of Domains:** The domain to which morphological operations apply may be circumscribed by prosodic criteria as well as by the more familiar morphological ones.

The admittance of sub-prosodic unit into alignment or subcategorization relation has traditionally been seen as an embarrassment to the theory of Prosodic Morphology since the unit referred to by such an affix often does not match the units generally licensed by the Prosodic Hierarchy (see e.g., McCarthy and Prince 1993*a*). For example, on the view of Phonological Subcategorization, the animate actor focus marker, *-m-*, in Atayal is treated

as subcategorizing for the first consonant of the stem as its left-sister.¹² Yet, most theories of prosodic phonology do not admit a consonant as a possible constituent within the Prosodic Hierarchy (see Broselow 1995 for an overview of the evidence for and against skeletal units below the level of the mora).

- (45) Atayal animate actor focus (Egerod 1965: 263–6)
- | | | |
|--------|--------|------------------------------|
| qul | qmul | ‘snatch’ |
| kat | kmāt | ‘bite’ |
| kuu | kmuu | ‘too tired, not in the mood’ |
| hŋuʔ | hmŋuʔ | ‘soak’ |
| skziap | kmziap | ‘catch’ |
| sbil | smbil | ‘leave behind’ |

While the need to refer to sub-prosodic units remains controversial in the phonological literature, suggestive supportive evidence abounds. For example, in speech-error studies, many have found that consonants and vowels within words are often exchangeable.

- (46) a. Consonantal exchange (Fromkin 1980)
 Error (target)
my hetter baff (*My better half*)
The Folden Gleece award (*The Golden Fleece award*)
- b. Vocalic exchange (Shattuck-Hufnagel 1986)
 f[i]t the b[u]ll (foot the bill)
 st[ɪ]rred the sh[i]p (steered the ship)
 al[i]minum an’ st[u]l (aluminum an’ steel)
 ch[i]ps ‘n tw[ə]ts (chirps ‘n tweets)

Such an independent awareness of consonants from vowels is also observed in poetic devices such as alliteration and assonance.

- (47) *Alliteration*: In clichés: *sweet smell of success, a dime a dozen, bigger and better, jump for joy*
 Wordsworth: *And sings a solitary song | That whistles in the wind.*
- Assonance*: ‘fleet feet sweep by sleeping geeks.’

Language games and language disguise, which have provided some of the most useful evidence for investigating cognitive representations in sound

¹² Between consonants at syllable margins, a phonetically predictable weak vowel is often heard (e.g., /blaq/ ‘good’ [bəlaq] and /slaq/ ‘farmland’ [silaq]; Huang 2005). Egerod (1965) and Li (1980) argued against positing underlying schwas in the Atayal due to the predictability of the excrescent vowel. However, Kaufman (2003), following the analysis of Rau (1992), contends that the animate actor focus marker is underlyingly /əm/. Further investigation is needed to ascertain the underlying status of the weak vowel.

structures (Alidou 1997; Bagemihl 1988, 1995; Campbell 1986; Harrison and Kaun 1999, 2001; Hombert 1986; Lehiste 1985; Piñeros 1998; Vago 1985), have been argued to support the existence of sub-syllabic constituents, such as, mora, onset/rhyme, and CV skeleton (cf. Yip 2003). For example, a language game in Tigrinya inserts a -gV- sequence, where *V* is a copy of the preceding vowel, after every vowel in the word.

- (48) Tigrinya (Bagemihl 1988)
- | | | |
|------------|---------------|------------|
| Natural Lg | Play Lg 1 | |
| s'āhifu | s'āgāhigifugu | 'he wrote' |
| bič'a | bigič'aga | 'yellow' |
| ʔintay | ʔigintagay | 'what' |
| k'arma | k'agarmaga | 'gnat' |

Akin to the speech-error examples, there are also reports of apparent segmental and sequence exchange in language disguise (Bagemihl 1995).

- (49) Segmental exchanges
- | | | | | | |
|-----------|-------|---|-------|--------|-----------------|
| Tagalog: | dito | > | doti | 'here' | (Conklin 1956) |
| Javanese: | satus | > | tasus | '100' | (Saditano 1971) |
- Sequence exchanges
- | | | | | | |
|-----------|----------|---|----------|------------|-----------------------------|
| Hanunoo: | rignuk | > | nugrik | 'tame' | (Conklin 1959) |
| Thai: | khab rod | > | khod rab | 'to drive' | (Surintramont 1973) |
| Mandarin: | ma | > | ma key | > | mey ka (Bao 1990; Yip 1982) |

These phenomena provide strong support for the psychological reality of sub-syllabic and skeletal units in language. A theory that bans such possibilities a priori is far too restrictive. The bias against sub-prosodic units cannot be maintained on theory-internal grounds either. The need to refer to skeletal segmental units, like consonant and vowel, in the formulation of alignment is not new. Prosodic constraints such as ONSET and NoCODA, have been formulated in terms of Generalized Alignment (Ito and Mester 1999; McCarthy and Prince 1993*a*; Prince and Smolensky 1993; Yip 2003), which crucially refer to edges of consonants and vowels directly.

- (50) ALIGN (σ , L, C, L) ONSET
ALIGN (σ , R, V, R) NoCODA

Formally, the alignment restriction of an infix that targets the first consonant or the first vowel is no different from the syllable alignment constraints in (50). In particular, skeletal units such as C and V occupy the existentially quantified argument. The only distinction is that, in a morphological constraint, it is the affix that occupies the universally quantified first argument,

rather than a syllable. Thus the vexing question is not whether skeletal units can enter into alignment relations, but why only skeletal units at particular positions within a domain can be targeted.

In sum, the empirical and theoretical arguments demonstrate that the bias against sub-prosodic constituents has no place in deciding the merit between the Phonological Readjustment and the Phonological Subcategorization approaches to infixation. Given that both presumptions for the analytic bifurcation (i.e., the ethological view of infix placement and the prejudice against sub-prosodic constituents) symptomatic of the constraint-based approach to OT-PR are demonstrably not viable, it is difficult to justify maintaining Phonological Readjustment as a distinct analytic tool from Phonological Subcategorization for the analysis of infixation.

2.5.3 *On the predictive power of the theory: Problems with overgeneration*

Limitations of OT-PR run deeper than what has been mentioned thus far, however. The basic appeal of OT-PR is that infixation is explained as essentially a repair strategy. Following the logic of the $P \gg M$ constraint schema, output ill-formedness is ameliorated through affix movement. Taken to its logical extreme, this approach makes a queer prediction: under the right conditions, an affix may appear at the opposite edge of what its underlying subcategorization specifies. That is, a prefix may end up surfacing as a suffix, and vice versa. To illustrate this, let us reconsider the case of Dakota agreement infixation. As noted earlier, agreement morphemes in Dakota are infixed after the initial syllable into polysyllabic verb roots of a lexically specified subclass. However, the second-person dual marker \mathfrak{u} (k) is prefixed to vowel-initial roots, but is infixed to consonant-initial ones.¹³

(51) Patterning of Root Type and Infix Type in Dakota¹⁴

		CV affix /wa/ '1sg.'	VC affix / \mathfrak{u} (k)/ '1du.'
[C root	man \mathfrak{u}	ma-wa-n \mathfrak{u}	ma- \mathfrak{u} -n \mathfrak{u}
[V root	ali	a-wa-li	\mathfrak{u} k-ali

¹³ The allomorphs of the first-person dual morpheme are actually $u\eta$, which is used before consonants and $u\eta k$ before vowels (Moravcsik 1977: n. 57l).

¹⁴ These examples are taken from McCarthy and Prince (1993a: n. 26) who in turn cited them from or constructed them on the basis of the description in Boas and Deloria 1941: 78–9.

According to McCarthy and Prince (1993a), this state of affairs is due to the force of the ONSET constraint. Since ONSET dominates ALIGN-ROOT, the optimal, prefixal, candidate is *ɥ.kə.li* since it incurs one less onset violation than the infixing variant, *a.ɥ.li*. When the root is consonant-initial, however, the prefixal candidate, *ɥ.ma.nu*, holds no such an advantage since both the prefixal and infixal candidates incur an equal level of ONSET violations.

(52)

$ɥ(k), ali$	ONSET	ALIGN-ROOT	ALIGN-IN-STEM
a. $\text{☞}[-ɥ.kə.li]$	*	*	
b. $[la-ɥ.li]$	**!		*

This analysis, however, fails to account for why a candidate such as *al-ɥ.k-i* ($\leftarrow ali$), which shows the agreement morpheme embedded further inside the root, does not prevail over the prefixal candidate *ɥ.k.ali*. As shown in (53), the hyper-infixal candidate, *alɥ.ki* (53c) should be preferred over the prefixal one (53a) since (53c) not only minimizes violations of ONSET, but also satisfies the high-ranking ALIGN-ROOT constraint. The prefixal candidate, on the other hand, will always fatally violate ALIGN-ROOT. McCarthy and Prince contend that the prefixal candidate is the preferred output in Dakota because of a constraint enforcing integrity of root syllables. No independent empirical support for this claim is forthcoming, however. The effect of root syllable integrity notwithstanding, the significance of this illustration is clear. If infixes are indeed the result of the inward migration of peripheral affixes (as predicted by the $P \gg M$ schema of constraint interaction), hyperinfixation should be the norm, rather than the exception.

(53)

$ɥ(k), ali$	ONSET	ALIGN-ROOT	ALIGN-IN-STEM
a. $\text{☞}[-ɥ.kə.li]$	*	*!	
b. $[la-ɥ.li]$	**!		*
c. $\text{☞}^{\text{sc}}[la.l-ɥ.ki]$	*		**

Consider now the case of Tagalog *-um-* infixation. As described in (30), *-um-* is treated formally as a prefix under OT-PR and is infixal to avoid word-initial onsetless outputs. Tagalog bans the occurrence of *-um-* after a labial

sonorant (i.e., OCP-*um*). When confronted with forms like **mumeri* for *um* + *meri* ‘to marry’, the Tagalog speaker returns an absolute ungrammaticality judgment (see Orgun and Sprouse 1999 for further discussion). The fact of ineffability notwithstanding, it is not hard to imagine a situation where a speaker must produce an output. In such a case, the OT-PR approach predicts hyperinfixation. Consider the scenario where -*um*- is applied to the hypothetical loanword, *wawana*. From the point of view of avoiding onsetless syllables, the optimal candidate should have been (54c). However, the high-ranking OCP-*um* constraint, which prohibits -*um*- from appearing after a labial sonorant, precludes this possibility. As it turns out, infixing -*um*- further inward offers no relief since the medial consonant of the stem is also a labial sonorant (54d). In order to avoid fatal violations of the high-ranking constraints, the -*um*- prefix must realize as a suffix.

- (54) OCP-*um*, DEP-C, ONSET >> EDGEMOST(L, *um*)

/um, wawan/	OCP- <i>um</i>	DEP-C	ONSET	EDGEMOST(L, <i>um</i>)
a. um wawan			*!	
b. ʔum wawan		*!		
c. wum wawan	*!			
d. waw um an	*!			***
e. ɸ wawan um				*****

To be sure, this is not a problem unique to the gradient interpretation of alignment. In his attempt to eliminate gradient constraint evaluation in OT, McCarthy (2003*b*) reconceptualizes the nature of Alignment constraints by proposing a family of quantized alignment constraints, like those in (55).

- (55) Quantized ALIGN (Ft, Wd, R) (McCarthy 2003*b*: 3)
- a. ALIGN-BY-FT(Ft, Wd, R)
No foot stands between the right edge of Ft and the right edge of Wd.
 - b. ALIGN-BY-σ(Ft, Wd, R)
No syllable stands between the right edge of Ft and the right edge of Wd.
 - c. ALIGN-BY-SEG(Ft, Wd, R)
No segment stands between the right edge of Ft and the right edge of Wd.

Thus, for example, a constraint such as *ALIGN-BY-SEG(-um-, Wd, L)* requires that no segment comes between the left edge of *-um-* and the left edge of a word. Likewise, *ALIGN-BY-σ* requires the left edge of a word and the left edge of *-um-* not be separated by a syllable. Violations of these constraints are accessed categorically because each constraint can be violated only once by a candidate. As shown in (56), hyperinfixation obtains when the *OCP-um* dominates these quantized alignment constraints.

(56)

/um, wawan/	<i>OCP-um</i>	<i>DEP_C</i>	<i>ALIGN-BY-σ</i>	<i>ALIGN-BY-SEG</i>
☞ a. wu.ma.wan	*!			*
☹ b. wa.wa. num			*	*
c. ? um .wa.wan		*!		
d. wa. wu .man	*!		*	*

McCarthy (2003*b*) notes that hyperinfixation can be curtailed if *MPARSE(-um-)*, a constraint that demands the realization of *-um-*, were ranked between *ALIGN-BY-σ* and *ALIGN-BY-SEG*. In this case, the null parse candidate, (57c), emerges victorious over the other outputs in (57), since (57c) vacuously satisfies all high-ranking constraints.

(57)

/um, wawan/	<i>OCP-um</i>	<i>ALIGN-BY-σ</i>	<i>MPARSE</i>	<i>ALIGN-BY-SEG</i>
a. wu.ma.wan	*!			*
b. wa.wa. num		*!		*
☞ c. ∅			*	

While it is possible to contrive a solution to the hyperinfixation problem, it nonetheless misses the mark. To the best of my knowledge, hyperinfixation is not attested in any of the world's languages. A theory that predicts, as the normal case, that infixes should behave this way seems fundamentally misconceived.¹⁵ To be sure, the hyperinfixation problem is really a problem for the OT approach to Prosodic Morphology in general. Hyperinfixation will

¹⁵ Featural affixation, which has been treated in terms of affix displacement (e.g., Akinlabi 1996), displays what appears to be 'hyperinfixation'. However, the viability of this featural alignment

always remain a theoretical possibility as long as phonotactic/prosodic constraints can take precedence over constraints on affix placement as licensed by the $P \gg M$ schema. Thus a rejection of hyperinfixation also calls for a reevaluation of the nature of the morphology-phonology interface. I will address this issue directly in the next chapter. Finally, it is also worth highlighting the fact that the family of Align-by-X constraints exists solely for the purpose of maintaining an OT-PR treatment of infixation. No other application of this family of constraints has thus far been identified. Thus, if a theory can be called successful only to the extent that ‘it avoids positing its own special rules, constraints, or principles that are invoked to analyze a phenomenon but not applicable elsewhere’ (McCarthy 2003a: 177), then the Align-by-X-based Phonological Readjustment analysis of infixation is doubly undesirable.

The converse of hyperinfixation is what I referred to as *frivolous infixation*. The logic of the OT-PR framework dictates that an affix is only coerced to move when the result of infixation produces a more well-formed output; otherwise, an affix should remain at the periphery. Yet, non-prominence-driven infixes that have no adpositional counterpart are not difficult to find. For example, in Alabama, a Muskogean language, the mediopassive *-l-* must surface after the first vowel of the stem, regardless of whether the stem is consonant- or vowel-initial.

- (58) Alabama mediopassive (Martin and Munro 2005)
- | | | | |
|-------|---------------|---------|--------------------------|
| takco | ‘rope (v.)’ | talikco | ‘be roped’ ¹⁶ |
| hocca | ‘shoot’ | holicca | ‘be shot’ |
| o:ti | ‘make a fire’ | o:liti | ‘kindling’ |

Or in Oaxaca Chontal, one method of plural formation is by infixing *-l-* before the final syllable of the singular regardless whether the singular form is vowel-initial or vowel-final.

- (59) Oaxaca Chontal (Waterhouse 1962)
- | Singular | Plural | Gloss |
|----------|--------|-------------|
| cece | cełce | ‘squirrel’ |
| tuwa | tułwa | ‘foreigner’ |
| teʔa | tełʔa | ‘elder’ |

approach has been called into question in recent years. Piggott (2000), for example, argues that featural affixation is better understood as a consequence of featural licensing, rather than the result of displacement.

¹⁶ According to Martin and Munro (2005), an epenthetic *i* is inserted before consonant clusters in Alabama and Koasati while a copy of the preceded vowel is inserted in the Western languages.

akan [?] o?	akaɫn [?] o?	‘woman’
ɫipo	ɫiɫpo	‘possum’
meko?	meɫko?	‘spoon’
kwepo?	kwetpo?	‘lizard’

If infixation is motivated by prosodic well-formedness (e.g., avoidance of initial cluster or final coda consonant, etc.), it is puzzling why the adfixal option is not available in these languages (e.g., in Alabama **lo:ti* or **o:til* instead of *o:lti* ‘kindling’). Similarly, in Archi, a Daghestanian language spoken in the Caucasus, the number/class markers, *-w-*, *-r-*, and *-b-*, always appear after the first vowel of the stem, regardless of whether the stem is vowel-initial or vowel-final (Kibrik and Kodzasov 1988).

- (60) *daxi* *dabχdi* ‘to churn (AOR, III)’ (Kibrik and Kodzasov 1988: 33)
ak’a *abk’u* ‘to drive (AOR, III)’ (Kibrik and Kodzasov 1988: 33)
aχa *abχu* ‘to lie down (AOR, III)’ (Kibrik 1989: 458)

To be sure, a prefixal variant of the class markers is available. However, such an option is only available when the post-initial vowel position is filled, for example by the durative infix *-r-* (e.g., *ak’ar* ‘to drive’ → *ark’ar* ‘to drive, DUR’ → *b-ark’ar* ‘to drive, DUR, III’). On the view of the OT-PR approach, all else being equal, the prefixal variant should be preferred since it reflects the underlying adpositional nature of the affix. The fact that the infixal variant has priority over the prefixal option in Archi highlights the fact that the infixal variant is the canonical position of the affix while the prefixal variant is used only when infixation is not possible.

Kaufman (2003) proposes that the infixability of an affix is predictable based on the affixal properties of its paradigmatic neighbor. That is, if a phonotactically suboptimal affix belongs to a paradigm that contains phonotactically optimal neighbors, then no infixation is predicted due to paradigm uniformity. Conversely, if a phonotactically suboptimal affix belongs to a paradigm with other similarly suboptimal affix(es), infixation is predicted. For example, in Ilokano, an Austronesian language spoken in the Philippines, actor voice can be marked by either the prefix *ag-* or the infix *-um-*.

- (61) Ilokano active voice (Vanoverbergh 1955)
- | | | | |
|-------|---------|---------------------------|---------------------------|
| | | active voice ₁ | active voice ₂ |
| isem | ‘smile’ | umisem | agisem |
| kagat | ‘bite’ | kumagat | agkagat |

At first glance, the fact that these affixes have different surface distribution is puzzling since both are VC in shape. Couched within the theory of Optimal

Paradigm (McCarthy 2003a), Kaufman (2003) contends that the reason why /ag/ is prefixing in Ilokano is because it belongs to an aspectual paradigm containing a consonant-initial form /nag/. On the other hand, /um/ is in a paradigm with another VC affix, /im(m)/. Assuming that the affixes within the same paradigm must be uniformed with respect to their alignment, a VC-shaped affix will be prefixed if it has a prefixal paradigmatic neighbor, but will be infixal if it has an infixal paradigmatic neighbor. Following McCarthy’s (2003b) OT-PR approach to infixation, Kaufman argues that the infixation of /um/ and /im(m)/ is motivated by the avoidance of onsetless syllables in the language (note the failure of (63b)).¹⁷ Onset violations may be avoided by way of onset epenthesis (63c), but that would incur fatal violations of DEP_{IO-C}, which penalizes any epenthetic segment in the output.

- (62) ALIGN-BY-σ-L No syllable stands between the left edge of an affix and the left edge of a stem (McCarthy 2003b)
 - ALIGN-BY-SEG-L Assess a violation when the left edge of an affix is aligned with or past the first segment of the stem (McCarthy 2003b)
 - ANCHORING-OP Assess a violation mark when the left edge of the stem coincides with the left edge of the prosodic word in one paradigm member but not in another.
- (63) Ilokano active voice₁

stem: <i>kagat</i> ‘to bite’ morph: <i>um</i> (L); <i>im</i> (L)	ONSET	*COMPLEX	ALIGN-BY-σ-L	ANCHOR-OP	DEP _{IO-C}	ALIGN-BY-SEG-L
a. <k <u>u</u> magat, ki <u>m</u> agat>						**
b. < <u>u</u> mkagat, <u>i</u> mkagat>	**!					
c. <?u <u>m</u> kagat, ?i <u>m</u> kagat>					**!	

The effect of paradigm uniformity comes into play when paradigmatic members incur different markedness violations. As shown in (64), paradigm (64d), where /ag/ is infixal after the first consonant of the root while /nag/ is prefixed, is ruled out since it fatally violates ANCHOR-OP, which penalizes

¹⁷ The first member within each bracketed voice paradigm is the *irrealis* inflection and the second is the *realis*.

paradigms with members showing non-matching stem-alignment relations. An ANCHOR-OP violation cannot be ameliorated simply by infixing both /ag/ and /nag/ (see (64a)) due to a fatal violation of *COMPLEX incurred by the infixing of /nag/. While infixing /nag/ further inward would avoid the *COMPLEX violation (64b), the infixing paradigm remains suboptimal due to a fatal violation of ALIGN-BY- σ -L. The least costly strategy, as it turns out, is to realize both /ag/ and /nag/ as prefixing (64c).

(64) Ilokano active voice₂

stem: <i>kagat</i> 'to bite' morph: <i>ag</i> (L); <i>nag</i> (L)	ONSET	*COMPLEX	ALIGN-BY- σ -L	ANCHOR-OP	DEP _{IO} -C	ALIGN-BY-SEG-L
a. <kagagat, knagagat>		*!				**
b. <kagagat, kanaggat>			*!			*
c. \varnothing <?agkagat, nagkagat>					*	
d. <kagagat, nagkagat>				*!		*

This Optimal Paradigm approach to infixation is appealing since it avoids the necessity of positing parochial alignment constraints that stipulate the prefixing nature of /ag/ and the infixing distribution of /um/. The distribution of these VC affixes is derivative of the distribution of their paradigmatic neighbor. This line of analysis, at first glance, might provide a solution to the frivolous infixation problem. On this view, the affixes in (58)–(60) might be infixing because their paradigmatic neighbors are of the nature that favors infixation. But a closer look at these cases suggests otherwise. To begin with, while paradigm-based explanation is often invoked to better understand inflectional morphology, it is unclear how paradigmatic relations should be established in the case of derivational morphology. That is, in what paradigmatic relationship should the mediopassive in Alabama or the plural marker in Oaxaca Chontal participate? This quandary highlights a major weakness of paradigm-based explanations. That is, paradigm-based explanations have no explanatory force unless the notion of a paradigm can be defined in some rigorous fashion (Kenstowicz and Kisseberth 1977). To be sure, even within the domain of inflectional morphology, the Optimal Paradigm is still hard pressed to provide a principled explanation for the existence of frivolous infixation. For example, in the case of Archi, the class-number markers are first and foremost infixal (65a–c). Only when in the constative/durative aspect

(CONST) are the class-number markers prefixal (65d). Like any OT-PR analysis, the Optimal Paradigm approach to infixation still requires some displacement-triggering constraint to motivate phonological readjustment. Yet, no obvious phonotactic or prosodic advantage can be adduced for infixing the class-number markers. Edge avoidance offers no real solution in this case since prefixing the class-number marker is in fact possible (65d).

(65) *aχas* ‘lie down’ (Kibrik 1998: 457)

- | | | |
|----|---------------------------------|-----------|
| a. | <i>o-w-χ-u</i> ¹⁸ | AOR.1SG |
| b. | <i>o-w-χ-u-qi</i> | FUT.1SG |
| c. | <i>o-w-χa-s</i> | INF.1SG |
| d. | <i>w-a-r-χa-r</i> ¹⁹ | CONST.1SG |

True to the spirit of the ethological approach to infixation, the Optimal Paradigm approach to infixation offers an intriguing way to understanding why morphemes of similar prosodic shape nonetheless have different surface distributions within the same language: namely, by capitalizing on the paradigmatic nature of a certain type of morphology. However, such an approach falters when the paradigmatic relation is either difficult to motivate or provides no useful information.

2.6 Conclusion

This chapter presents an overview of the nature of infixation from both descriptive and theoretical perspectives. Formally, infixes have been treated as either the result of phonological readjustment or as the result of morpho-phonological mismatch due to phonological subcategorization. Previous scholars have suggested that the Phonological Readjustment account, particularly within the context of a constraint-based framework, is superior to the subcategorization approach on the grounds of simplicity (e.g., Kaufman 2003; McCarthy and Prince 1993*a*). That is, phonological readjustment-induced affix reordering, which results in surface infixation, can be derived from constraint interaction alone, an integral part of the explanatory machinery of Optimality Theory. In particular, it is argued that the goal of simplicity demands that predictable aspects of a surface form not be treated as part of its underlying representation. However, following the logic of Occam’s Razor, simplicity may only determine the superiority between theories that make comparable predictions. As reviewed above, the Phonological Readjustment treatment of

¹⁸ The perfective suffix is *-u*; *a* → *o* before *w*.

¹⁹ The constative/durative aspect is marked by the discontinuous transfix *-r...-r*.

infixation is neither sufficient nor necessary. Phonological Readjustment is inherently deficient as a theory of infixation since it is applicable only to a subset of infixal patterns in the world's languages. In order to account for the prominence-driven infixes, advocates of Phonological Readjustment must appeal to phonological subcategorization, the very machinery Phonological Readjustment is ostensibly trying to eliminate. It should also be noted that Phonological Subcategorization is no more complicated, if not in fact simpler, than Phonological Readjustment since Phonological Subcategorization is stated in terms of Generalized Alignment, a formal device that is also part of the theoretical arsenal of Phonological Readjustment. Some researchers reject Phonological Subcategorization on the grounds that it admits segmental units into alignment relationship. But as noted earlier, the hypothesis that only units in the prosodic hierarchy may enter into alignment relations, as pointed out in McCarthy and Prince (1993*a*), is a matter of empirical observation, rather than a theoretical necessity. In fact, alignment involving segmental-level information has been part of the theoretical arsenal since the inception of Optimality Theory. Thus, to claim that Phonological Subcategorization is somehow theoretically more burdensome than the Phonological Readjustment approach due to its need to refer to segmental information in alignment relations is misleading to say the least. Furthermore, as I will be demonstrating in detail in the following chapters, not just any segmental level unit may enter into alignment relations. Only a restricted set of subcategorizable phonological units is observed.

Thus while it has achieved some significant descriptive and analytic successes, Phonological Readjustment includes much that is local and parochial and therefore should be replaced by principles of broad applicability. Phonological Subcategorization, understood in the context of a holistic framework of linguistic explanation, provides just the right balance of empirical and explanatory adequacy. To be sure, aspects of the Phonological Subcategorization approach require further qualification. For example, some might argue that Phonological Subcategorization is overly powerful as it predicts alignment relationships between affixes and phonological constituents in odd positions within a word. That is, in its most basic formulation, it is possible to set up a GA constraint that requires an affix to subcategorize for, for example, the third consonant of the root. At first glance, such a prediction seems to seriously undermine the viability of phonological subcategorization as an insightful theory of infix placement. Such an objection, however, is misplaced from the perspective of the theory adopted in this monograph. The next chapter explains why.