Blocking effects

David Embick, Johanna Benz, and Lefteris Paparounas

Department of Linguistics, University of Pennsylvania

email: embick@ling.upenn.edu, jbenz@sas.upenn.edu, lefteris@sas.upenn.edu

ABSTRACT: We provide an overview and synthesis of grammatical approaches to *blocking effects*: informally, cases in which the ungrammaticality of one word (or phrase) is attributed to the existence of another. Our primary focus concerns the scope of competition for grammaticality. While discussions of blocking are often directed at particular parts of the grammar– e.g. derivational morphology– the larger set of questions raised by (putative) blocking effects has the potential to distinguish predictions made by major theoretical movements like the Minimalist Program and Optimality Theory, precisely because of the different roles they attribute to competition. Our review of theories of blocking is oriented towards larger questions of this type. As part of our review, we also examine the apparent absence of blocking; cases in which it looks as if one form should (all else equal) block another, yet both exist. Observations to this effect appear in early and influential accounts of blocking, where they have underappreciated theoretical consequences concerning how the 'paradigm space' associated with words and phrases is structured. A key theme throughout the paper is whether the phenomena that have been described as blocking effects are derivative of one grammatical (or extra-grammatical) mechanism, or several. While our review concludes that the latter view is correct, part of our argument is that the focus on unity is less important than the question of what evidence for (or against) competition in a given domain would look like in the first place.

KEYWORDS: blocking effects; competition; models of grammar; paradigmaticity; rule interaction

1 Introduction: *Blocking effects*

The term *blocking effect* is typically employed for scenarios in which the grammaticality of one expression appears to be correlated with the **un**grammaticality of another. Possible instances of blocking have been discussed in derivational morphology, where, for example, it has been argued that the existence and grammaticality of *glory* renders **gloriosity* ungrammatical; and in inflectional morphology, where the same type of reasoning is extended to *sang* in relation to ungrammatical **singed*. Outside of the domains of derivational and inflectional morphology as such, the notion of blocking is employed in both more syntactic and more semantic directions. On the syntactic side, we are referring to situations in which words and phrases appear to interact in a similar way to the derivational and inflectional pairs above; for example, when one-word *smarter* is a grammatical comparative form, while two-word **more smart* is not. Questions of this type can be generalized much further, to e.g. clause-clause competition, or to the question of whether derivations or inter-level pairings of structural descriptions compete for grammaticality. On the more semantic side, a pressing question is whether there is a type of blocking effect among elements that are close in meaning but not *lexically related*; e.g., does *thief* block *stealer*? More generally, this semantic perspective leads to the question of whether blocking effects reveal the workings of some constraint (or set of constraints) operating against elements that 'mean the same thing.'

The questions outlined above move quickly from relatively narrow ones involving particular corners of derivational morphology to questions about putative competitions among larger objects. This is one of the points on which major movements in linguistic theory stand in opposition. For instance, certain implementations of the Minimalist Program reduce competition for grammaticality considerably as compared to alternative theories, in ways that have been incorporated into versions of Distributed Morphology. On the other hand, Optimality Theory generalizes competition for grammaticality, in ways that are also under investigation in several grammatical domains. It is precisely this connection to larger issues that make blocking effects so important. They provide an instance in which the predictions made by theories with very different properties can be compared. For this reason, we begin our discussion in §2 by framing the positions different approaches take on competition. The main focus of our review in §3 is on prior approaches to blocking, and what they have said on this point.

After this, §4 examines theories of blocking along different dimensions. Our discussion highlights three points that arise throughout the paper. The first of these concerns which phenomena are taken to be instances of blocking– understood as competition for grammaticality– in the first place; theories disagree on this point, with some offering (apparently) unified competition-based treatments of a wide variety of effects, while others sharply restrict the role of competition for grammaticality. This point sets up two further lines of comparison. One of these examines the kind of empirical evidence that would support the idea that a particular part of the grammar shows the *competition logic* that is predicted by certain approaches. The second concerns what approaches have to say about the apparent *absence* of blocking. Here it will be shown that while certain types of morphology behave *paradigmatically*, with a single form selected in a 'winner-take-all' competition, another type of morphology behaves differently, producing multiple possible realizations. Our

conclusion §5 summarizes larger issues, and points to directions for further investigation.

2   Competition for grammaticality

To provide context for our look at blocking, we begin with an overview of some different grammatical architectures, selected because of the different roles that they attribute to competition.

Early generative theories like the one advanced in Chomsky (1957) provide a useful starting point. In this theory, ungrammatical objects (words, phrases, clauses) have this status because they are not derived by the rules of the grammar (they are thus hypothetical). This theory does not filter out particular phrases, words, etc., or make them ungrammatical because they lose a competition with another object. Theories with this property are often referred to as *generative*; we propose to be more specific about this and refer to them as *generative in the narrow sense*, since the unmodified term is also used in much broader ways (cf. Embick and Marantz 2008).

To illustrate, let us consider the derivation of an irregular past tense verb form like *took*, and its relation to ungrammatical **taked*. Examples like this play an important role at different points in §3, where it will be asked if the former word blocks the latter. The first part of the Chomsky (1957) grammar consists of phrase structure rules like the following, which, starting with a Sentence, distribute the major categories:

(1)   Rules from Chomsky (1957)

    a.   *Sentence → NP + VP*

    b.   *VP → Verb + NP*

    c.   *Verb → Aux + V*

    d.   *V → hit, take, walk, read,* etc.

    e.   *Aux → past*   (Collapsing a few rules from the original)

The rules in (1) produce (when augmented with rules for NPs) sequences like *Mary + past + take + the + book*. To derive the correct behavior of tense, additional transformational rules are needed. One of these affixes *past* to the verb; this is (2a), with *Af* for 'affix', which includes *past*. This rule prevents (by ordering) the rule of *do*-support (2b) from applying in the derivation under consideration:

(2)   Two additional rules (ordered!)

    a.   *Af + v → v + Af#*   *"Affix hopping"*

    b.   *#Af → do + Af*   *do*-support

Due to the way in which the rules in (2) interact, (3a) is derived, but (3b), which has *do*-support, is not; this is a first illustration of what it means to be ungrammatical in a narrow-sense generative theory:

(3)   a.   Mary take+past the book.

    b.   *Mary did take the book.

The same principles that make (3b) ungrammatical apply in morpho(phono)logy as well. The "morphophonemic" part of the grammar has a rule adding /t/ to form the past tense of verbs like e.g.

bake: /...C_{unv}/+*past* $\rightarrow$ /...C_{unv}/+/t/, where 'C_{unv}' indicates a voiceless consonant. But this rule does not apply to *take*; due to rule ordering, an earlier rule *take+past* $\rightarrow$ /tuk/ applies. The grammar thus derives grammatical *took*, but not ungrammatical **taked* (Chomsky 1957:32).

When generalized, the intuition behind the narrow-sense generative approach is that *grammatical* is defined as 'derived by the rules of the grammar', while *ungrammatical* is 'not derived by the rules of the grammar'. Importantly, the crucial interactions are between rules; not between objects derived by the rules.

We stress these initial details of narrow-sense generativity because they continue to be a topic of theoretical importance. Some further developments in grammatical theory help to frame this point, because of the way in which theories have moved away from (and in some cases back to) being generative in the narrow sense.

Looking at the grammar of *Government and Binding* theory (Chomsky 1981 and related work)– and passing over several steps that would be worthy of a review in their own right– we find a model that differs substantially from the narrow-sense generative one reviewed above. The theory dispenses with "construction specific" rules, employing instead a single movement rule, *Move-α*, to produce relations among levels in the "Y model" in (4). In this grammar, DS is an interface with the Lexicon; PF and LF interface with sound and meaning systems. SS is 'internal' (cf. Chomsky and Lasnik 1993, 'derivative'); effectively, an interface between interfaces.

(4)   GB Grammar

$$
\begin{array}{c}
\text{DS} \\
| \\
\text{SS} \\
\diagup \diagdown \\
\text{PF} \qquad \text{LF}
\end{array}
$$
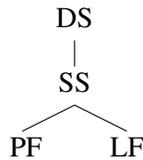
Grammaticality in this theory is a property of Structural Descriptions (SDs), where each SD contains each of the levels in (4): (π, λ, δ, σ) for Chomsky and Lasnik (1992), for PF/LF/DS/SS.

Crucially, and highlighting our contrast with narrow-sense generative theories like Chomsky (1957), the rule Move-α overgenerates; since it can move any element anywhere, it will create SDs that are ungrammatical because of what is moved where. SDs that contain illicit relations between levels must therefore be marked as ungrammatical. One way of enforcing this is with Principles, which restrain possible mappings between levels. So, for example, the Empty Category Principle (ECP) says that $[_\alpha\ e]$ (a trace) must be governed (Chomsky 1981:250ff). What this means in practice is that first (and ignoring PF), Move-α relates DS, SS, and LF by moving every element everywhere; those SDs that contain ungoverned traces are then ruled out, i.e. marked as ungrammatical. Grammatical SDs (which must be associated with appropriate PF representations as well) are those that comply with the ECP and other principles.

The difference in perspective between the GB approach and the narrow-sense generative one is striking. In the narrow-sense generative theory of Chomsky (1957), the rule system bears the explanatory burden in defining grammaticality, as elaborated above. In GB, the defining intuition is sharply different. Here, the rule system merely relates SDs, and the burden of defining grammaticality falls elsewhere: after being generated, the SDs are subjected to filters, which remove illicit representations (i.e. mark them as ungrammatical).[1]

---

1. Later work takes a more nuanced view on this point, and (in a way that is important for the study of competition)

Two subsequent developments in grammatical theory have competition-relevant properties that extend the opposing intuitions highlighted above; one reversing course away from GB, and the other offering new insights and formal tools for implementing competition for grammaticality.

In the first direction, the initiation of the Minimalist Program in (Chomsky 1993) returns in many ways to the narrow-sense generative view found in early Generative Grammar, in spirit if not always in letter (see Embick and Marantz 2008). In particular, the emphasis on derivations arrives hand in hand with the idea that there is no competition for grammaticality in the way that there is in GB. In addition to standing in stark contrast to GB, this aspect of the Minimalist Program moves in the opposite direction from a second major development, Optimality Theory (OT; Prince and Smolensky 1993, McCarthy and Prince 1993). Though initially developed for phonology, OT can be extended to other parts of the grammar in ways that provide further possibilities for exploring competition for grammaticality. OT formalizes such competitions with a set of violable constraints that select an optimal candidate for a given input. In allowing competition among an effectively infinite set, OT is similar to GB; in allowing constraints to be violable, it diverges from GB (though see Fn.1). Where OT stands out is in the predictions made by *ranking* violable constraints: the idea is that substantive predictions about cross-linguistic variation emerge from re-ranking.

To summarize, one of the primary differences behind the intuitions underlying the Minimalist Program and OT centers on competition for grammaticality: versions of the former approach minimize it, while the latter makes it completely general. At stake here are large issues involving comparisons across frameworks, which are difficult. Blocking effects provide an empirical domain in which theories embodying such very different intuitions about competition can be compared; and thus possible evidence for or against the opposing views framed above.

3   Approaches to blocking

In this section we review different approaches to blocking effects, with an emphasis on what they say about competition for grammaticality. A key point to track concerns the scope of what different approaches are trying to explain. Informally, this is the question of which phenomena should count as blocking effects, and therefore should be treated in the same way; that is, as deriving from the same grammatical or extra-grammatical principle.[2]

3.1   Standard blocking
The starting point for theories of blocking is Aronoff (1976), which examines and names the phenomenon in a chapter devoted to the notion of *productivity*. Because of its influence on subsequent developments, this theory will be referred to as *standard blocking*.

The data at the center of Aronoff's discussion are in (5). There, it can be seen that certain *-ous* adjectives in English (e.g. *curious*) have *-ity* nominals like (i.e. *curiosity*). Other Roots, however, show another pattern. *Furious*, for example, does not have a corresponding *-ity* form **furiosity*;

---

allows certain violations to be voided in ways that interact with "Economy" conditions (Chomsky 1992; also Chomsky and Lasnik 1992:90ff)

2. In choosing to focus on competition for grammaticality we are forced to leave other possible survey topics to the side. Among these, perhaps the most salient is the role that blocking plays in the debate between morpheme-based theories on the one hand, and morpheme-less or "amorphous" theories on the other; this is a large component of Halle and Marantz's (1993) critique of Anderson (1992). Though an important topic, the pieces-vs.-not debate moves in different directions and implicates different conclusions from those found in the "core" literature on blocking; we have therefore chosen not to include it here.

there is, however, a 'simple' nominal *fury*:[3]

(5) ous/nominals/ity/ness; Aronoff (1976:44)

Xous	*Nominal*	*+ity*	*#ness*
various	*	variety	variousness
curious	*	curiosity	curiousness
glorious	glory	*gloriosity	gloriousness
furious	fury	*furiousity	furiousness
specious	*	speciosity	speciousness
precious	*	preciosity	preciousness
gracious	grace	*graciosity	graciousness
spacious	space	*spaciosity	spaciousness
tenacious	*	tenacity	tenaciousness
fallacious	fallacy	*fallacity	fallaciousness
acrimonious	acrimony	*acrimoniosity	acrimoniousness
impecunious	*	impecuniosity	impecuniousness
laborious	labor	*laboriosity	laboriousness
bilious	bile	*biliosity	bilousness
pious	*	piety	piousness

There are two effects exemplified in (5) that Aronoff seeks to explain. One is the relationship between the simple nominals and the *-ity* forms derived from *-ous* adjectives. The latter are taken to result from a *Word Formation Rule* (WFR) that affixes *-ity*. The simple nominals and *-ity* forms appear to be complementary, i.e. competing with one another, in a way that renders certain *-ity* forms ungrammatical. This is what is called *blocking*: "...the nonoccurrence of one form due to the simple existence of another" (1976:43). The second effect concerns the nominals with *-ness*. These exist across the board. Part of what needs to be explained, then, is why these forms are neither blocked by the others, nor block them.

The intuition behind Aronoff's analysis is that the 'nominal' forms and *-ity* forms compete in a way that favors the former: if such a nominal exists, it is used, and the *-ity* form, though the output of a WFR, is marked as ungrammatical. The implementation of this intuition involves four components. We will highlight each one individually before discussing how they work in concert, because of how they are implicated (or abandoned, or extended) in subsequent treatments that are reviewed later in this section.

The first is that words like those in (5) are associated with a ***paradigm slot***. The intuition is that words like *glory* and **gloriosity* interact because they "mean the same thing"; that is, would occupy the same *paradigmatic slot* for that Root. An underlying assumption, which we will return to, is that each such slot can be occupied by at most one word. Visually, the extension of this intuition amounts to replacing the four columns in (5) with the three of (6), where we use *Noun1* as a label for the paradigm slot comprised of simple nouns and *-ity* derivatives:

(6) revised version of (5)

---

3. We will employ the term *Root* for the open class item underlying e.g. *curious* and *curiosity*; other terms (e.g. *stem*) are used in this way as well. Later in §3.5 a technical sense of Root will be introduced and identified as such.

Xous	*Noun1*	*#ness*
various	variety	variousness
curious	curiosity	curiousness
glorious	glory	gloriousness
furious	fury	furiousness
specious	speciosity	speciousness
precious	preciosity	preciousness
gracious	grace	graciousness
spacious	space	spaciousness
tenacious	tenacity	tenaciousness
fallacious	fallacy	fallaciousness
acrimonious	acrimony	acrimoniousness
impecunious	impecuniosity	impecuniousness
laborious	labor	laboriousness
bilious	bile	biliousness
pious	piety	piousness

The second component is that competition requires **lexical relatedness**: it occurs among derivatives of the same Root. With this assumption, *glory* and **gloriosity* may compete, but neither of these words interacts with e.g. *magnificence*. The third component of standard blocking implicates **irregularity**: in particular, only words that are irregular in at least one way (be it morphophonological or semantic) are able to enter blocking relations. This condition applies to all words in a possible blocking relation. This is why blocking is examined in the context of productivity: irregularity is intimately tied to *listedness*. As Aronoff (1976:45) puts it, "The words which must be listed are blocked, and those which must not be listed are not blocked." Finally, blocking is restricted to the lexicon, which is the domain of **words**. It is thus not predicted to occur between words and phrases (or for that matter, between phrases and phrases).

The WFRs posited by Aronoff relate *-ity* forms to *-ous* adjectives. The grammaticality of such forms depends on whether or not the cell they would occupy is filled. If it is filled by a simple noun, as in the case of *glory*, then, on the assumption that only one word can appear in a particular cell, the *-ity* form is ungrammatical. If there is no such simple noun, as is the case with *curiosity* (where there is no **cury*), the *-ity* form is grammatical. With the *-ness* forms the explanation also implicates listing, but in another direction. These are held to be completely regular in terms of phonology and semantics; as such, there is thus no need to list them. Since blocking is held to obtain only between words that must be listed, the *-ness* forms are predicted to neither block nor be blocked.

There are some subtleties involved in understanding why *glory* blocks **gloriosity*, and not vice versa; more generally, how the listing that is crucial to this account takes place. When *glory* is listed, it renders **gloriosity* ungrammatical, even though this word is the output of a WFR. This kind of reasoning invites questions about more complex interactions concerning e.g. order of acquistion– if a learner produced (or somehow heard) **gloriosity* before learning *glory*, would **gloriosity* be listed in the relevant paradigm slot, and block *glory*? Aronoff's approach is, however, not designed to address this sort of scenario. His theory, even though it makes use of WFRs, is not one that applies "online," with the WFRs applying in the derivation of every expression. Instead, "...the WFRs are merely rules for adding to and, derivatively, analyzing [dictionary] entries" (1976:46). Because of this, many of the questions about interactions that might conceivably be generated by standard blocking do not arise. It is simply assumed that all of the dictionary is "there," as it were– e.g., *glory*

is in the dictionary, and *gloriosity* is not– such that the job of morphological theory is to identify relations among the words that have entries.[4]

Evaluating standard blocking is not a simple matter. On the one hand, it is clearly the seminal approach to blocking effects, and exerts influence on all subsequent approaches to the topic. On the other hand, it is quite limited in scope. While the *-ity/-ness* relation can be taken as an illustrative example, the theory is by definition not capable of being extended to domains that reflect *prima facie* similar interactions. One important case of this type involves the interaction between irregular and regular inflection. The intuition that past tense forms like *sang* or *bent* or *hit* are grammatical at the expense of hypothetical regular forms like **singed/*bended/*hitted* is at least as strong as that regarding *glory* and **gloriosity*; perhaps even more so for reasons having to do with lexical meaning. But Aronoff's approach cannot be extended to interactions of this type, since the hypothetical regulars (e.g. **singed*) are not listed, and therefore cannot block or be blocked.

It is for this and other reasons that, despite its clear and lasting influence, many subsequent approaches to blocking move away from the details of standard blocking.[5] The following summary points offer an introduction to themes that are unpacked in the subsections to come:

- §3.2: Theories that attempt to reduce blocking effects to interactions among WFRs abandon the assumption that words are competing with words, and replace it with the idea that rules are competing with rules.

- §3.3: Semantic (and pragmatic) approaches to blocking dispense with the listedness part of standard blocking, as well as the requirement that blocking be restricted to lexically related words.

- §3.4: Dispensing with the part of standard blocking that restricts blocking to the lexicon allows words and phrases to compete. Competition between words and phrases (and between phrases and phrases) has been formalized in Optimality Theory, in ways that dispense with the listedness and lexicality requirements of standard blocking.

- §3.5: A narrow-sense generative approach to blocking effects denies that words or phrases ever compete for grammaticality, and returns to the idea that rules (and their interactions) are critical.

Following this review of the core approaches to blocking, §3.6 takes a slightly different direction, tracing a line of research on the apparent absence of blocking effects.

3.2   Interaction among WFRs

Many seminal theories of morphology can be characterized with respect to the stance they take on Word Formation Rules (WFRs). Our examination of WFRs centers on the relationship between

---

4. This aspect of the approach leads to further questions about the relationship between *existence in the dictionary* and *listedness*, particularly with respect to "productive" formations like those with *-ness*. Such words are not listed, but are apparently "in the dictionary" (in the sense that they are not created online/in the derivation of any given clause that contains them).

5. In fact, standard blocking, which comes from Aronoff's (1976) chapter 3, is abandoned later in that same work; analyses in the next chapter posit blocking of *-ness* words by words affixed with *-cy* (e.g. *decency/*decentness*; judgments those from the original). This is clearly at odds with the idea discussed above that *-ness* forms should never block or be blocked.

these rules and approaches to competition that involve *ordering*. A key theme is that prior arguments against rule ordering in general are in fact arguments against ordering of WFRs with particular properties. This theme paves the way both for the rejection of rule-ordering for blocking in Kiparsky (1983), examined in §3.3, and for the reintroduction of ordering for blocking in Distributed Morphology that is the topic of §3.5.

WFRs form an integral part of Aronoff (1976), but have properties that distinguish them from the type of WFRs used in prominent realizational approaches like Anderson (1992). By definition, Aronoff's WFRs take words as their input, and return other words. An example of such a rule (from Aronoff 1976: 55) is as follows:

(7)   X]$_N$-al]$_A$
      Condition: X $\neq$ [Y]$_V$ment

The WFR (7) forms an adjective by taking existing nouns and affixing *-al* to them. The rule also comes with a (negative) condition on its application: the base cannot be a deverbal noun in *-ment*, deriving the ungrammaticality of e.g. **employmental* (but allowing for e.g. *ornamental*, which is not deverbal in the way mentioned in (7)).

WFRs in Aronoff (1976) have two important properties. First, as mentioned above, they are not intended to be standard generative rules; instead, they are *static*, i.e. not involved in the generation of every sentence, as also mentioned in the preceding subsection. Second, and more importantly for the purposes of this subsection, a single WFR carries out two operations simultaneously: it both places the derived word in a particular paradigm slot (i.e., gives it a meaning), and imbues it with a phonological form. In the words of Aronoff (1976: 46), "a WFR and its associated phonological operation are one and simultaneous...as a consequence, words are entered in the lexicon in a fully concrete, specified form." Because they do double duty in this way, WFRs are more similar to e.g. Lieber's (1980) or Kiparsky's (1983) Lexical Items than they are to Anderson-style WFRs; and the overall approach is a non-realizational approach to morphology (i.e. it does not adopt the Separation Hypothesis; Beard 1966).

This second property becomes important when we consider how WFRs relate to blocking, both in Aronoff (1976) and in subsequent work. For one, rules like (7) have a negative condition that delimits the application of the WFR, such that it will fail to apply to e.g. *employment*. As a result, **employmental* is ungrammatical– importantly, though, this is not because of blocking. The general point is then that a theory with WFRs of this type can explain the ungrammaticality of certain words with rule interaction. A particular expectation along these lines is provided by Aronoff (1976: 55): '[i]n general, among rival rules only the rule which is most productive with a given class will be able to fill the slot for a given stem in that class.' Given the existence of both blocking and conditions on WFRs, it can be asked which instances of ungrammaticality are to be attributed to word/word competition, and which arise from the WFRs themselves.

Concerning the latter, ordering of WFRs may seem natural in the context of a theory of the type discussed here, but Aronoff (1976) explicitly argues against this option. One argument advanced on this point connects with his static conception of WFRs, pointed to more than once above. In short form, the argument is that WFRs are not standard generative rules, and thus cannot be embedded in a serial derivation-based conception of rule application to produce blocking effects.[6] Aronoff (1976: 56-61) also offers empirical arguments against ordering of WFRs, building on Chapin (1967, 1970).

---

6. See Halle (1973) for some distinct but correlated points concerning how morphological rules differ from phonological rules with respect to ordering.

These highlight ordering paradoxes in English derivational morphology. For example, words like *organizational* suggest that the WFR adding *-tion* must precede the WFR that adds *-al*, and forms like *industrialize* suggest that *-al* must precede *-ize*; by transitivity, *-tion* should then precede *-ize*. But derived nominals like *organization* suggest that the opposite ordering must be possible too. This sort of effect leads to the general dismissal of ordered WFRs. Abstracting away from the details, it can be observed that this type of argument is relevant to the theory of multiple affixation, but not to blocking or competition per se. For instance, ordered WFRs could still in principle be used to explain why *bent* is derived instead of **bended*, even if Aronoff does not consider this type of example.

Advancing this last theme, an important further development of a rule-based approach to blocking is found in Kiparsky (1982), which– importantly– employs another type of WFR. These have the general format in (8), where Y and Z correspond to the subcategorization frame for affix A, and X represents the affix's category.

(8)   Insert A in env. $[Y\_Z]_X$ (Kiparsky 1982: 6)

Though not explicitly discussed in these terms, these WFRs are (in contrast to Aronoff's) *dynamic*, actively involved in the generation of word forms; as such, the expectation naturally arises that they will be ordered with respect to each other. In turn, rule application may be expected to give rise to blocking effects, in conjunction with a principle that determines how rules are ordered (Kiparsky 1982: 7).

As an example of the relevant type of interaction, consider two WFRs involved in deriving agent nominals:

(9)   Ordered WFRs from Kiparsky (1982: 7)

    a.   Insert /Ø/ in env. $[V_n\_]_{Noun + Agent}$
        Where V_n = *guide*, *bore*, *gossip* ...

    b.   Insert *er* in env. $[V\_]_{Noun + Agent}$

Verbs forming agent nominals by (9a) do not undergo rule (9b); as a result, this grammar produces *guide* and not **guider*, *spy* and not **spier*. Kiparsky's approach holds that the blocking effect is derivative of the ordering: because (9a) is the more specific rule, it is ordered first; its application to e.g. *guide* precludes the formation of the *-er* nominal by the less specific WFR (9b). For verbs not in the context specified in (9a), this interaction will not obtain: so, for e.g. *bake*, (9a) will not apply, and (9b) thus applies to form *baker*. The general idea in this theory is to reduce blocking to ordering, with the Elsewhere principle determining which rules apply.[7]

It is important to consider how a rule-ordering account of this type differs from the paradigmatic account of blocking advanced in Aronoff (1976). In ways stressed above, in the ordering analysis, the crucial interactions are between the WFRs (adjudicated in Kiparsky 1982 by ordering), not the outputs of the rules. That is, per (9), there is no formal relationship between the noun *guide* and its hypothetical competitor **guider*; the latter is not derived to begin with. Kiparsky (1982) thus implements a WFR-based version of the guiding intuition between narrow-sense generative approaches to blocking effects, which we will encounter again in generalized form in §3.5.

---

7. Kiparsky does not elaborate on the origin of the frames that the WFRs apply to; i.e., how the 'meaning slot' for e.g. 'agent nominal' is produced. These are simply assumed to exist. Perhaps the assumption is (with Aronoff 1976) that the 'expected' paradigm slots for a given Root are simply given.

With its generalization of WFRs and ordering, Kiparsky (1982) is able to extend a uniform analysis to a wider range of phenomena than standard blocking. For example, the derivation of *singed* (or *sanged*) can be blocked given level ordering and the assumption that 'inherently marked' forms created at earlier levels are subject to a maximally specific "identity" rule that prevents later/less specific rules from applying (cp. the relation to Marantz's 1984 "No Vacuous Affixation," noted in Kiparsky 1983).

It is notable that while Kiparsky (1982) suggests that blocking can be reduced to WFRs interacting in a way that is adjudicated by the Elsewhere principle, he does not address the *glory*/*gloriosity* relation, i.e. the one that led to standard blocking in the first place. This point will resurface in §3.3.2, where Kiparsky (1983) rejects WFRs across the board.

3.3 Semantic and pragmatic approaches

Lexical semantics clearly plays a role in standard blocking. Forms compete with each other only if they would occupy the same paradigm slot; that is to say, express the same meaning. This raises the question of how this space is structured, and where it comes from. These matters are not part of Aronoff's introduction of standard blocking; Aronoff takes it to be sufficient to say that *glory* and *gloriosity* are competing, and that neither of these words competes with *gloriousness*. Reflections on how the meaning-space might be structured are found later, and are accompanied by changes. In particular, the move away from standard blocking in Aronoff's (1976) later chapter holds that blocking is "...basically a constraint against listing synonyms in a given stem" (1976:55). The question of how paradigm spaces (and hence synonymy relations) are structured is thus a crucial one– it is part of the rejection of standard blocking– but is not examined in detail.

The rest of this subsection focuses on two lines of reasoning connected with meaning-based blocking. The first involves what are essentially pragmatic accounts, which are critiqued in Poser (1992). The second, found in Kiparsky (1983), generalizes the idea that anti-synonymy is responsible for all blocking effects. Since the line of research targeted by Poser (1992) begins in the 1970s, we will start with his paper.

3.3.1 Early pragmatic approaches

Poser (1992) is primarily known for introducing word/phrase blocking; this is the topic of §3.4.1. But it also contains a valuable critique of a pragmatic approach to blocking effects, one whose components recur at several later points in the literature. The view in question is attributed to Householder (1971) and McCawley (1977), and is essentially Gricean in nature.[8] The idea is that competitions between ways of saying the same thing are resolved by the maxims governing conversation (presumably Manner and Quantity): speakers use "...the simplest available form" (Poser 1992: 14). For illustration, an example from Householder (1971) has the (putatively odd) *pale red* being deviant because of the existence of *pink*. If these sorts of expressions could be put into competition, there would be a possible explanation for what Poser is mainly interested in, viz. word/phrase interactions. He therefore poses the general question of how well the "minimize effort" pragmatic approach accounts for blocking effects, and concludes that such approaches are deficient.

Poser's arguments come in on different levels. Several of them have continuing relevance to later theories, as we will see later in this paper.

A first one concerns the status of examples like the one adduced by Householder. Poser questions

---

8. Poser also attributes this idea to di Sciullo and Williams (1987).

the idea that the 'pragmatically blocked' forms are actually ungrammatical in the first place. He notes that while *pale red* clearly seems to be generated by the grammar (it could be used as part of the definition of *pink*, for example), the same is not true of the relationship between *men* and **mans*, where the latter is "...not simply verbose; it is impossible" (1992: 16). This is a simple and important point, but one which is lost (or ignored) in many later works.

A second point raised by Poser is more technical in nature, and highlights the question of what counts as 'more' and 'less' for the purposes of a brevity-based constraint. He adduces several examples of irregularity in which it appears that the blocking form and the blocked form contain the same number of morphemes (e.g. *oxen* and *oxes*), or in which the blocking morpheme is larger than the blocked one (e.g. Japanese *suru* instead of expected **su* for the present neutral affirmative of 'do'). A pragmatic approach based on minimizing effort does not predict these kinds of effects.

A third argument is that delimiting the scope of competitions becomes difficult if 'meaning' is the only consideration at play. If meaning were the only factor determining possible blocking effects, then why would *the red book* not block *the book that is red*? Or, if we appeal to pragmatics to explain why *smarter* appears to block **more smart*, why does *John's intelligence exceeds Tom's* not block *John has more intelligence than Tom*? Poser's point is that even if something like 'minimize effort' is at play, a further factor has to circumscribe possible competitions, one that restricts them to 'structurally related forms' (1992: 17).

Taken together, Poser's arguments provide a clear and convincing case against reducing typical cases of blocking to a single Manner-like pragmatic constraint.

3.3.2 Synonymy blocking

Another line in the literature takes up the idea that blocking effects are semantic in nature (although we will see that the lines between semantics and pragmatics could be blurred without too much effort). The clearest expression of this is in Kiparsky (1983), which argues that blocking results from a principle that disallows (or more accurately, disfavors) synonymy (cp. Aronoff 1976:ch.4). While his approach makes crucial use of lexical semantics, it also places a strong burden on an extragrammatical meaning system.

As we saw in §3.2, Kiparsky (1982) produces blocking effects with WFRs, such that e.g. *sang* can block **singed*. This move allows for the scope of blocking to be extended beyond what standard blocking allows. Reasoning further on this point, Kiparsky (1983) argues that ordered WFRs must be dispensed with, on the grounds that they do not explain everything that he takes to be an instance of blocking. The most important element of this critique is the idea that the Elsewhere condition cannot explain the relationship between *glory* and **gloriosity*. Kiparsky does not spell this out in detail, and arrives directly at the conclusion that "There is no way, evidently, to extend [the Elsewhere condition] in such a way that it causes the mere existence of *glory* to block *-ity* from being added to *glorious* (1983:12)."

Some details of Kiparsky's system illustrate what is at issue. Building on §3.2, a WFR producing *-ity* affixed adjectives in Kiparsky's (1982) system would presumably take the form in (10):

(10)   Insert *ity* in env. $[A_x\_]_N$

There are different ways of thinking about what would be on the list defined by A_x. If it includes all adjectives ending in *-ous*, then the rule system will produce **gloriosity* and **furiosity* in addition to *curiosity*. This outcome could be avoided by making *glorious* etc. idiosyncratic exceptions to the *-ity* rule. Such a restriction produces the correct results, but not in a satisfying way. There is nothing

about this idiosyncratic restriction that takes into account the existence of *glory*. Rather, it happens to be the case that *glory* exists, and it happens to be the case that *glorious* is an exception to the *-ity* rule. Kiparsky is looking for something more explanatory than this, and concludes that the WFR-based approach should be abandoned because it cannot be extended all of the phenomena he believes are instances of blocking. We will see later in §3.5 that matters are more complicated than this. A closer examination of Kiparsky's system reveals a way of treating the relationship between *glory* and **gloriosity* that involves ordering and generalizations about these affixes. But in the context of Kiparsky (1983) and much subsequent work, it was assumed based on this line of argument that rule-ordering approaches to blocking were doomed to fail.[9]

The key element of this argument is the goal of having a single principle that accounts for everything that (Kiparsky 1983 elects to treat as) blocking. The principle that is posited is called AVOID SYNONYMY. Its simpler form is stated in (11):

(11) AVOID SYNONYMY: The output of a lexical rule may not be synonymous with an existing lexical item.

The more detailed version makes reference to levels: "The interpretation of a compound or of a stem plus affix combination is subject to the restriction that the resulting meaning must not already be expressed by an existing lexical item, that is a lexical item which is either basic or has been derived at or before the level at which the combination in question is interpreted" (1983:12-3). The level-ordering aspect of the proposal accounts for the ungrammaticality of 'later' **singed*, due to its synonymy with 'earlier' *sang*. It also rules out forms like **sanged*, which required additional assumptions on the Elsewhere-based alternative, by the same reasoning. For *glory/*gloriosity*, the latter is evidently produced but blocked because of total synonymy with the former. Or, to take another example, the grammar generates a non-existing word like **guider*, which is then marked as ungrammatical due to complete semantic overlap with *guide*. In some cases this effect is partial, with two forms coexisting. When this happens, the 'special' (ie. earlier) form is supposed to have a restricted meaning, and the form with the general affix takes on the remaining meanings; Kiparsky uses pairs like *drill* (device) and *driller* (person who drills) as illustration.

In addition to abandoning the listedness part of standard blocking, Kiparsky highlights the fact that AVOID SYNONYMY produces competition without lexical relatedness. So, for example, *thief* blocks **stealer*. This blocking relation is also potentially a partial one, in the sense that the two forms are said to be able to coexist given a specialized meaning for one of them: Kiparsky suggests that *stealer* can exist in specialized *base-stealer* (a baseball term), because the stealing here is done in a sense that does not involve the meanings associated with *thief*.[10]

Whatever the status of the particular examples adduced by Kiparsky, the general question at play here is one that has come up throughout this section: how is it determined what a particular word means– i.e., which 'paradigmatic slot' it would occupy? This question takes on special poignancy when lexical relatedness is abandoned (recall Poser's arguments above). Whereas standard blocking provides an intuitive schematization of the paradigm space for a given Root, as shown in (6) above, no such simple Root-defined paradigm can play a role in the kind of cross-Root competition required by AVOID SYNONYMY.

---

9. See e.g. Giegerich (2001), citing Rainer (1988).

10. The example is used due to its role in the original text; in fact both *base-stealer* and *base-thief* are grammatical and attested for the same baseball meaning.

Kiparsky does not examine this point directly. At one juncture he considers the idea that "...it may turn out to be more correct to view [AVOID SYNONYMY] as a language learning strategy rather than a formal constraint of grammar" (1982:13), but this is clearly at odds with the way in which this principle makes crucial use of the Lexical Morphology and Phonology grammar of ordered levels. A very general question raised by these comments concerns which aspects of meaning broadly construed are part of the grammar, and which derive from the operation of extra-grammatical systems. Discussing compounds like *strawberry*, *cranberry*, etc., Kiparsky (1983) argues that these have a lexical meaning that is 'type of berry', with their actual referents being represented in the *encyclopedia*, an extra-grammatical system. Though the particular argument that Kiparsky offers is somewhat forced,[11] the question of how 'meaning' broadly construed is represented is an important one that will surface later as well.

3.4 Extending the scope of competition

The idea that blocking is a lexical effect in the technical sense– i.e., that it occurs in the lexicon– restricts standard blocking to words. Two different lines of research challenge this claim: one concentrating on word-phrase interactions, and one that uses the OT formalism to generalize competition for grammaticality. We look at these developments in turn.

3.4.1 Poser blocking

Something conceptually quite close to Aronoff's approach is found in Poser's (1992) analysis of several different word/phrase interactions. Poser's goal is to argue that blocking needs to be extended out of the lexicon, in a way that allows for (certain) words and phrases to compete. The formation of English comparatives (and superlatives) provides a familiar example:

(12)   English comparatives

adjective	word	phrase
smart	smarter	*more smart
glib	glibber	*more glib
poor	poorer	*more poor
intelligent	*intelligenter	more intelligent
talkative	*talkativer	more talkative
impecunious	*impecuniouser	more impecunious

The (simplified) generalization is that with shorter adjectives, comparatives (and superlatives) are formed in a one-word or *synthetic* way, whereas with longer adjectives, they take a two-word *analytic* form. Poser's take on this and similar cases is that they are instances of blocking. In order to implement this analysis, two components of standard blocking need to be weakened: first, the idea that blocking involves irregularity; and second, the idea that it is restricted to words.

On the first point, the competition for comparative meaning is won by a synthetic form if that exists. However, such forms are not obviously irregular in any way, even if they are restricted in terms of their phonological shape; *wug*-type tests with nonce adjectives like *spont* result in comparatives like *sponter*, suggesting that these forms would not be listed under standard blocking (Berko

---

11. Kiparsky (1983) cannot hold that *strawberry* and *cranberry* mean only 'type of berry' in the lexical semantics; if they did, they would block each other (and many other berry terms) by AVOID SYNONYMY. He therefore includes 'not the same as other berry types' as part of their lexical meaning.

1958). On the second point, in order for *smarter* and **more smart* to interact, blocking must be extended "beyond the lexicon," because a word (lexical) is interacting with a phrase (syntactic).

This extension in turn involves two components. One is a limitation on its scope. Poser proposes that words and phrases can compete only for the expression of **certain** meanings; viz., those that are expressed morphologically– i.e. that *could* be lexical– in some language.[12] Rather than a full-fledged theory of word-phrase or phrase-phrase competition, then, this is a theory that posits a limited extension to what can compete for grammaticality. Effectively, the types of paradigm slots involved in blocking may now be filled syntactically as well as lexically.

Its second component is one that figures prominently in many subsequent theories. This is a general principle determining the winner of word/phrase competitions:

(13)   LEXICAL PREFERENCE: "if the lexical form exists ... the periphrastic form is blocked."

In summary form, the extension proposed by Poser requires both words and phrases to compete, with regular formations both blocking and being blocked. The rest of it works like standard blocking; for example, the rules of the grammar produce phrases like **more smart* which– by virtue of the existence of *smarter*– are marked as ungrammatical, losing a competition regulated by (13).

Poser's treatment is generalized in work by Hankamer and Mikkelsen (2002, 2005). These works focus on the distribution of definite marking in Danish, which is sometimes affixal on the noun as in (14a), where realization in a separate determiner is ungrammatical; and sometimes realized independently as in (14b) with a prenominal adjective, where affixation to the noun is ungrammatical:

(14)   a. hest-en / *den hest 'the horse'

        b. *gamle hest-en / den gamle hest 'the old horse'

The version of their approach that most closely resembles Poser's is based on the idea that words that are created in the Lexicon can compete with phrases, in a way that is adjudicated by LEXICAL PREFERENCE.[13] In the Lexicon, the rule in (15) creates affixed nouns with an affixed definiteness marker:

(15)   *Rule D* (Hankamer and Mikkelsen 2002:155)

$$\begin{bmatrix} \text{PFORM} & \alpha \\ \text{CAT} & \text{N} \end{bmatrix} \Rightarrow \begin{bmatrix} \text{PFORM} & \alpha+\text{EN} \\ \text{CAT} & \text{D} \\ \text{DEF} & + \end{bmatrix}$$

This rule creates words that compete with syntactic structures. Specifically, the syntax has the capacity to generate trees like (16). When this happens, the Lexicon is scanned to see if there is a word that has all and only those features that appear at the top node of this structure, assuming that features percolate. Since the Lexicon contains a word *hesten* that has the same features as (16), by LEXICAL PREFERENCE this structure is marked as ungrammatical, and the definite Noun (17) from the Lexicon wins:

---

12. This move is reminiscent of one made by Dowty (1979) in a different framework; his approach has both lexical and syntactic rules, either of which may be realized by a morphological or a syntactic operation.

13. Their work also posits syntactic alternatives; we focus on the lexicalist one because of its affinities with Poser's work.
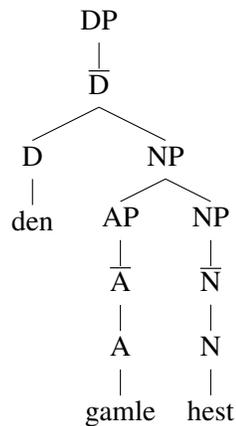
(16) DP/NP

```
        DP
        |
        D
       / \
      D   NP
      |   |
     den  N
          |
          N
          |
         hest
```
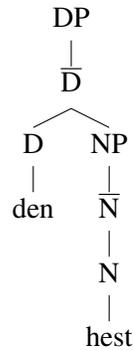
(17) Definite 'Noun'

```
      DP
      |
      D
      |
      D
      |
    hesten
```

The presence of an adjective as in (14b) results in structural intervention: there is no node that has just the features of the noun and the determiner. As a result, the determiner is realized as an independent word:

(18) Prenominal Adjective

```
            DP
            |
            D
          /   \
         D      NP
         |      / \
        den   AP   NP
              |     |
              A     N
              |     |
              A     N
              |     |
            gamle  hest
```

An important aspect of this approach is that the adjective in (14b) prevents the noun and determiner from sharing a node for structural reasons– not e.g. linear ones. All else equal, the approach predicts that affixed determiners should not be found when there is any type of nominal modification; but with e.g. postnominal PP modifers, affixation of D to N is in fact found:

(19) a. gris-en   med blå pletter
        pig-DEF with blue spots
        'the pig with blue spots'

    b. *den gris med blå   pletter
        the   pig with blue spots
        'the pig with blue spots'

As it turns out, the generalizations at play in this domain are quite complex. While pre-nominal modifiers invariably preclude affixation of D to N, post-nominal elements exhibit a more complicated behavior (Hankamer and Mikkelsen 2018). For our purposes, what is important is the idea

that Poser's approach can be generalized, to allow (in principle) word/phrase competitions across the board.

Although Hankamer and Mikkelsen move away from Lexicalist versions of Poser Blocking in their own work, they make the predictions of one type of word/phrase competition theory clear in a way that has played a role in much subsequent research. For example, the Danish case study is also examined with respect to its contribution to competition logic in a more general sense in Katzir (2008, 2011). Katzir's proposal is that it is indeed structural complexity that distinguishes linguistic expressions containing the affixed or unaffixed D, but he invokes no preference for words over phrases. Instead, an ECONOMY principle chooses the structure that contains the smallest number of *licensors* (here, of definiteness). On this account, it is the *d-* in *den* that is superfluous and renders the structure uneconomical, and thus ungrammatical unless a structurally high licensor of definiteness is required (as is the case with prenominal adjectives).

Another line of research that generalizes the scope of blocking uses Optimality Theory, for both word/phrase and phrase/phrase competition. We turn to this line of work next.

3.4.2   *Optimality theoretic approaches*

As outlined in the previous sections, the defining intuition of standard blocking is that blocking effects reflect competition for grammaticality. A further point to consider is how this intuition relates to the view that the grammar is more generally tasked with resolving competition – a view that finds a full and direct expression in Optimality Theory (OT). While there is clearly a connection between blocking phenomena and the OT framework, examination of specific proposals reveals that several core properties of OT are either not fully employed, or are set aside entirely in existing OT accounts of blocking effects. Two specific points at the center of the discussion to come are, first, how the input to competitions and the corresponding candidate set are circumscribed; and second, whether a particular analysis depends on constraints that could be potentially re-ranked, in the way that is familiar from applications of OT in other domains.

As a first illustration, an OT approach to blocking is sketched in Kiparsky (2005), which argues that blocking emerges as the interaction of the constraints ECONOMY and EXPRESSIVENESS.

(20)   Two constraints from Kiparsky (2005)

    a. ECONOMY: Avoid complexity.

    b. EXPRESSIVENESS: Express meaning.

Special emphasis is placed on the idea that these constraints should produce a **uniform** account of blocking phenomena: Kiparsky uses them to select winners for both word/word and word/phrase competitions, and roundly criticizes approaches that are not uniform in this way.

The ECONOMY constraint is evaluated by counting the number of morphemes in an expression. As such, it prefers the ostensibly monomorphemic candidate *worse* to the candidate forms **bad-der* and **more bad*. It is noteworthy that ECONOMY as formulated in (20) does not cover blocking between non-suppletive comparatives. For instance, in pairs like *more intelligent* and **intelligenter* or *smarter* and **more smart*, where both candidates are clearly bimorphemic, ECONOMY does not produce a winner. In Kiparsky (2012), a more general constraint MARKEDNESS is introduced, which prefers single words to multi-word phrases (recall LEXICAL PREFERENCE (13) above). If this reformulation is taken to supersede ECONOMY more generally, it now predicts *smarter* to beat **more smart*; but it does not make the correct prediction for *more intelligent* and **intelligenter*,

since the latter should be preferred. The key role in resolving this competition must be played by other constraints that are not named. The point is not that such constraints could not be provided; surely any account must incorporate an analysis of the prosodic effect in some form. The point at issue is what is being explained (in a uniform way) by ECONOMY and EXPRESSIVENESS, and what is the result of other constraints.

The question of how much is actually covered by these constraints is quite general. On their own, neither ECONOMY nor MARKEDNESS interacting with EXPRESSIVENESS determine a winner when there is a blocking relation between two allomorphs: e.g. participal *-en* in *beaten* beating default *-ed*. This kind of allomorphy, with bound morphemes showing contextual sensitivity, is by far the most well-attested phenomenon in which one form appears to block another. Kiparsky's approach thus turns out to be extremely restricted in its purview. As above, these observations are not meant to suggest that the approach as a whole lacks other ways of producing the correct results (though it remains to be seen what form they would take). Rather, they serve as a challenge to Kiparsky's claim that his approach to blocking is more unified than alternatives, a theme we return to in §4.1 below.

The second constraint in (20), EXPRESSIVENESS, works to rule out candidates that are not faithful to the 'input meaning'. For example, *bad* loses against *worse* as a comparative because it lacks the comparative meaning feature. Kiparsky (2005) introduces ECONOMY and EXPRESSIVENESS as constraints that are in conflict with each other, as is characteristic of OT constraints from the markedness and faithfulness constraint families. However, none of his case studies actually involve a competition between these two constraints. Instead, they seem to work like violable principles. What is at stake in a particular competition is whether a certain candidate is better or worse than all others with respect to ECONOMY **and** EXPRESSIVENESS, not which candidate is preferred by whichever of the two constraints is more highly ranked. This constraint set thus involves a significant departure from typical OT competition logic.

A further question raised by EXPRESSIVENESS is how the meaning spaces relevant to competition are defined. In order to provide the correct set of relevant candidates in an OT analysis, decisions need to be made about what competes with what. Kiparsky (2005) attempts to rein in the candidate set to some extent by proposing that only forms which share meaning features that are expressed morphologically in the language compete with one another (cf. Poser 1992 above). How precisely this is done is an important question. At issue is what is actually producing correct results in cases of blocking– the mechanism that determines the candidate space, or the constraints like ECONOMY/MARKEDNESS and EXPRESSIVENESS (see Kastner (to appear) for related considerations).

The question about how to delimit competitions serves as a useful transition to OT approaches like Bresnan (2001) that adopt clause/clause competition. An important observation to consider along the way is that even apparent word/word competitions actually appear to make crucial reference to clausal syntactic context. To illustrate, consider the irregular past tense forms like *sang* in relation to **singed*, which we have seen at various points above. On the face of it, a theory with word/word competition could take various paths towards explaining why the former wins a competition against the latter. But this is only part of what needs to be accounted for. It is not the case in the grammar of English that $\sqrt{\text{SING}}$ occurs as *sang* in every clause containing past tense T[+past]. In clauses with negation, for example, *sing* is realized: *Mary did not sing/*sang the aria*. The observation that both e.g. *sang* and *did ... sing* are grammatical in different syntactic contexts has important consequences. Kiparsky's MARKEDNESS, or any other version of LEXICAL PREFERENCE, must

then be adapted to something along the lines of 'words are better than phrases unless...', where the ellipsis after *unless* bears a great deal of explanatory burden.

This concern first arises independently of OT, in Andrews (1990), who analyzes the ungrammaticality of **Does John walks?*. From the perspective of morphology, *walk*, which should have been derived or inserted or won the competition in this sentence, is typically blocked by *walks* in third person singular contexts. In order for *walk* to surface, the competition between *walk* and *walks* must make reference the syntactic structure of the entire sentence. Details aside, the point is that the implementation of what appears to be word/word blocking requires reference to clausal context, which is tantamount to clause/clause competition.

Along these lines, Bresnan (2001) posits clause/clause competition in an OT version of LFG. One example analyzed there involves 'synthetic' negation in English. With OT's competition logic in mind, Bresnan argues that *lexical gaps* like the ungrammaticality of *amn't* in certain dialects (cp. *isn't*, *aren't*) can go hand in hand with the emergence of a less marked expression of negation (*aren't I ...?*) that would otherwise be blocked.

(21) Emergence of unmarked negation

     a. *Amn't I going?

     b. Aren't I going?

In Bresnan's approach, the highly ranked constraint LEX eliminates candidates with **amn't*, since this word does not exist. The result of eliminating the otherwise expected winner is that *aren't*, which would otherwise be blocked (cp. *Isn't/*aren't she tall?*) emerges as grammatical.

The *amn't* gap case study further emphasizes the role of syntactic context in explaining blocking effects. As Bresnan notes, the resolution of the competition in favor of *aren't* is possible only when verb and subject are inverted: in the declarative, synthetic **amn't* is equally impossible but beaten by analytic *am not*, while **I aren't going* is also ruled out. Bresnan links this effect to the scope-taking properties of different attachment sites of negation. Abstracting away from the specifics, these observations emphasize the point made above: if the scope of *competition logic* is extended not just to forms but to their syntactic distribution, then the competitions must apply globally, i.e. at the sentence level. Bresnan's extension of the scope of competition is thus directly connected to the issue of the circumscription of the candidate space that we outlined above with reference to Kiparsky's approach.

A further point that could be explored concerns the status of LEX. With reference to one aspect of OT, ranking, this constraint raises (puzzling) questions about what would happen if it were less highly ranked than it is on Bresnan's analysis. In another direction, Bresnan's proposals surrounding this constraint make explicit claims about what is predicted by competition-based approaches versus alternatives, viz. emergence of a form otherwise expected to be ungrammatical. This prediction is not shared by alternatives like the one to be examined next, an important theme that we will return to in §4.2.

3.5 A narrow-sense generative approach

One point that is shared by many of the otherwise quite varied set of approaches summarized above is what they assume about the scope of competition. With the exception of the WFR-based approach in §3.2, all other treatments of blocking posit competition for grammaticality between words, with possible extensions bringing words into competition with phrases, and beyond that, phrases with phrases.

The approach to blocking developed in Embick and Marantz (2008) argues for a different perspective, one that maximizes the narrow-sense generative intuition. In their view, competition for grammaticality is restricted to the phonological realization of morphemes: what is called *Vocabulary Insertion*, in the terminology of Distributed Morphology (Halle and Marantz 1993). The Vocabulary is comprised of items that pair a phonological exponent with a set of features that determine its distribution. Illustrating with the English past tense, it can be assumed that an abstract (= phonology-free) morpheme T[+past] is attached to a verb. The process of Vocabulary Insertion (VI) then applies to provide this morpheme with phonological content. Only one Vocabulary Item can apply to a morpheme, with the result that these items compete with each other in a way that is resolved (in the simplest case) by specificity.

(22) Vocabulary Items for past tense

$$T[+past] \leftrightarrow \text{-t}/\{\sqrt{\text{BEND}}, \sqrt{\text{LEAVE}}, ...\}\_\_$$
$$T[+past] \leftrightarrow \text{-Ø}/\{\sqrt{\text{HIT}}, \sqrt{\text{SING}}, ...\}\_\_$$
$$T[+past] \leftrightarrow \text{-d}$$

In the context of e.g. $\sqrt{\text{BEND}}$, the VI that inserts *-t* applies; although the VI inserting the default *-d* could in principle have applied, it is less specific than the one inserting *-t* and thus loses this particular competition. The phrasing here is important; VIs may block each other, but words do not; it is thus not the case that *bent* blocks **bended*. It can be seen that this version of blocking does not necessarily involve interactions between "irregular" formations; past tense *-d* is perfectly regular, but blocked when a more specific VI beats the one that inserts it.

Embick and Marantz argue that competition for grammaticality is limited to Vocabulary Insertion, and does not occur in other parts of the grammar. The key question is how to account for interactions that are attributed to blocking between words and larger objects in alternatives like those seen above. The general line of argument is that (i) the putatively blocked words are not derived in the first place, in ways that (ii) implicate generalizations for which there should be independent evidence. For illustration we will examine first *glory* and **gloriosity*, and then the formation of comparatives and superlatives.

An important facet of the theory is that it assumes that the basic elements of lexical meaning are *Roots*; category-free primitives (cf. Chomsky 1970, Marantz 1997 and much related work). A "basic noun" like *cat* or *glory* is thus morphologically complex, consisting of a Root and a category-defining head n:

(23) *cat*   (24) *glory*

$$\underset{\sqrt{\text{CAT}} \quad [n,\text{Ø}]}{n}$$ $$\underset{\sqrt{\text{GLORY}} \quad [n,\text{Ø}]}{n}$$
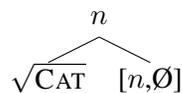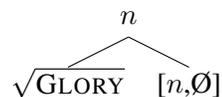
The structures in (23-24) are called *Root nominals*, since the n head is attached directly to the Root. While the n heads are not realized phonologically in the case of *cat* and *glory*, they are in other Root nominals, where a large number of allomorphs are found: *marri-age*, *perform-ance*, *refus-al*, *confus-ion* and so on.

The analysis of the examples central to standard blocking needs to derive *glory*, while ensuring that **gloriosity* is not derived. There are two components to this: the first concerns structures, and

the second, the distribution of *-ity*. Structurally speaking, the argument is that the Root $\sqrt{\text{GLORY}}$ has a Root nominal *glory*, and a Root adjective *glorious*:
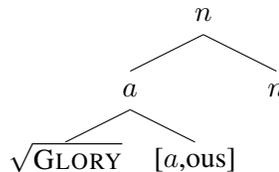
(25) *glory*   (26) *glorious*

$$n$$
$$\sqrt{\text{GLORY}} \quad [n,\text{Ø}]$$

$$a$$
$$\sqrt{\text{GLORY}} \quad [a,\text{ous}]$$
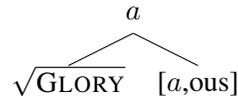
A de-adjectival noun like hypothetical **gloriosity* would therefore have the structure shown in (27):

(27) de-adjectival noun from *glorious*

$$n$$
$$a \qquad n$$
$$\sqrt{\text{GLORY}} \quad [a,\text{ous}]$$

The question then is whether there is a reason to expect that the n head in this structure should be pronounced as *-ity*. The argument is that there is not. In the terms employed above, the VI inserting *-ity* applies in certain Root nominals like *atroc-ity* and *san-ity*; and also to n heads that are realized outside of the adjectival a heads pronounced *-able* and *-al*. This is shown in (28), which also includes a VI inserting *-ness*, taken to be a kind of default:

(28) Vocabulary Items

 a. $n \leftrightarrow$ -ity/X__
     X = Roots ($\sqrt{\text{ATROC}}$, $\sqrt{\text{SANE}}$, $\sqrt{\text{CURIOUS}}$...); [a, -able], [a, -al]
 b. $n \leftrightarrow$ -ness

Crucially, the adjective a realized as *-ous* is not on this list; the grammar that has (28) therefore does not derive **gloriosity*. This is not to say that the structure in (27) is not derived, however; it is, but the n head is realized by the default in (28), to produce *gloriousness*. At the same time, forms like *curiosity* are derived, since the Root $\sqrt{\text{CURIOUS}}$ is on the list in (28a); see (29). This analysis requires that all forms ending in *ous* not be the same: some are adjectives where the *ous* is the realization of an a head (cp. (27)), whereas others like *curious* have this as part of the Root, as shown in (30).

(29) *curiosity*   (30) *curious*

$$n$$
$$\sqrt{\text{CURIOUS}} \quad [n,\text{ity}])$$

$$a$$
$$\sqrt{\text{CURIOUS}} \quad [a,\text{Ø}]$$
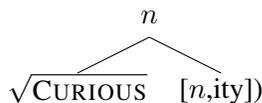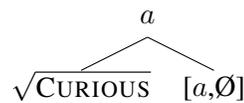
The argument in summary form is that there is no need to appeal to word/word blocking to account for the relation between *glory* and **gloriosity*. Rather, the grammar produces the correct

results by not deriving *gloriosity* in the first place. The more general (and by nature more programmatic) point is that this strategy should be applicable to all putative cases of word/word blocking. That is, if there is no need for word/word blocking in what was thought to be the case that provided the strongest motivation for it, competition between words should in principle be eliminated across the board.[14]

To summarize, while word/word (and word/phrase, and phrase/phrase) competition does not play a role in this theory, there is a restricted role for competition for grammaticality. Vocabulary Items that compete for insertion are ordered as in (22) such that the winner applies at the expense of a loser or losers that could in principle apply. Relative to standard blocking's claim that blocking is a property of words, this amounts to the alternative claim that blocking is found with VIs that apply to **morphemes**.

The same kind of argument– no evidence for competition at a particular level– is extended to other types of interactions including synonymy blocking (see §4.1), and word/phrase interactions. For the latter, recall §3.4.1, where the principle of LEXICAL PREFERENCE (or a more general constraint favoring "smaller" expressions) was appealed to in cases in which words appear to block phrases: *smarter/*more smart*. Embick and Marantz (2008) locate this kind of interaction in the theory of affixation (of a type developed in Marantz 1984, 1988, Embick and Noyer 2001, and Embick 2007b, and applied to alternations of this type in Embick 2000, 2007a). The syntax (and semantics) of comparatives is taken to be the same, whether they are realized as one word like *smarter*, or two like *more intelligent*. The difference between these two forms is whether an affixation rule attaches the comparative morpheme to the adjective or not. If it does, a single complex head (one word) results; if the rule does not apply, two phonological words are found. The result is that grammatical *smarter* and *more intelligent* are derived, but ungrammatical **more smart* and **intelligenter* are not, and hence do not need to be blocked.

As a final point, some comments are in order concerning the uniformity of explanations for blocking effects. For Embick and Marantz (2008), the principle that accounts for blocking effects is RULES APPLY:

(31)   RULES APPLY: Perform a computation when the structural description of the rule is met.

This is a (re)statement of the defining property of generative-in-the-narrow sense approaches: derive the grammatical, not the ungrammatical. While it is a single principle, it is relatively abstract, in the sense that the *rules* in questions have different loci in the grammar. So, for example, *tigress* is derived, and **turtless* is not, due to a rule that combines a head with the feature [+feminine] with $\sqrt{\text{TIGER}}$ but not with $\sqrt{\text{TURTLE}}$.[15] *Sang* is derived for the past tense of $\sqrt{\text{SING}}$, but **brang* is not derived for the past of $\sqrt{\text{BRING}}$, because the VIs and (morpho)phonological rules that apply in the past tense of these Roots are not the same. Looking ahead, for Embick and Marantz (2008), the fact that what have been called blocking effects are derivative of more than one rule type is not as important as identifying which parts of the phenomena are the result of competition for grammaticality and which are not. This is a major theme of §§4.1-2 below.

---

14. The analysis of *glory* etc. developed in Embick and Marantz (2008) could in principle be formed within Kiparsky's (1982) system of WFRs, which also makes use of Roots (though not in a completely generalized way). Kiparsky does not develop such an analysis, though.

15. By way of contrast cp. Giegerich (2001) on *mare* and its relation to **horsess*.

3.6 Absence of blocking

Our last topic for this review section takes a different orientation from the previous ones: it looks at the apparent *absence* of blocking effects. This phenomenon highlights two important sets of questions that are not always connected. The first concerns a distinction between potential versus actual words that begins with Halle (1973). The second involves the notion of *paradigm slot* that is invoked in many of the theories of blocking reviewed above. We approach this topic in two parts, beginning with Halle's proposals and some subsequent reactions, and then moving to more recent developments.

3.6.1 Potential versus actual words

Although Halle's (1973) paper does not refer to blocking effects per se, it clearly points to the intuitions surrounding standard blocking that are implemented in Aronoff (1976). Considering nominals in *-tion* and *-al*, Halle notes the three patterns in (32). The question these raise concerns how the rules of the grammar relate to the words that actually exist in the language: given that *-al* and *-ion* forms can coexist for (what is assumed to be) the same Root (32a), what is to be made of the fact that other Roots disallow either the *-al* form (32b) or the *-ion* form (32c)?

(32)   Three patterns from Halle 1973

    a. approbation approval
        recitation recital
        proposition proposal
        transmission transmittal
        reversion reversal

    b. derivation *derival
        description *describal
        conversion *conversal
        confusion *confusal
        permission *permittal
        observation *observal
        accusation *accusal

    c. *arrivation arrival
        *refus(at)ion refusal
        *rehearsion rehearsal
        *acquitation acquittal

The theory outlined in Halle (1973) involves three components: a morpheme list; a set of Word Formation Rules; and a Filter. After dismissing the idea that restrictions like those in (32) should be encoded in the morpheme list or WFRs, Halle proposes that in addition to adding special meanings and specifying phonological idiosyncrasies for certain words, the Filter specifies which derived words actually exist in the language:

> ...the fact that English lacks the nouns *derival* and *arrivation* would be reflected in
> the grammar by marking these words, which would be generated by the word formation
> rules, as not being subject to lexical insertion and therefore incapable of appearing in

> any actual sentence of the language, in spite of the fact that they are neither semantically
> nor syntactically or phonologically anomalous. (1973:5)

That is, rather than specifying in the WFRs (or the morphemes) that e.g. *arrivation* is not derived, the word is in fact generated, but then marked so that it cannot enter a sentence. In this theory the morpheme list plus WFRs produce the *potential* lexicon, i.e. the set of possible words; the actual words are those that survive the Filter.[16]

The status of words like *arrivation*– grammatical in the sense of being derived, but not grammatical in the sense of not entering derivations– implicates important questions about what it means to be generative in the narrow sense. In particular, Halle's theory does not employ competition between words, and in that sense is like the narrow-sense generative theory developed by Embick and Marantz (2008); but it is *prima facie* unlike that theory in that it generates words that are ungrammatical.[17]

While Halle does not employ a competition mechanism in his theory, he clearly has something like the intuition behind standard blocking in mind:

> That the content of the dictionary affects the formation of words is hardly to be doubted.
> Thus the existence of *arrival* and *confusion* is one reason why English lacks *arrivation*
> and *confusal*. However, it must immediately be noted that this cannot be the whole
> explanation, for doublets such as *recital* and *recitation*, *transmittal* and *transmission* do
> exist side by side. (1973:10-11)

Halle here makes two observations that resonate with themes discussed earlier in this section. The first is that, speaking at the level of intuitions, the * on *confusal* clearly relates to the existence of *confusion*; this is the kind of observation that launches the development of standard blocking. The second is that while relating the deviance of *confusal* to the existence of *confusion* accounts for part of what is going on, this relation cannot be implemented in terms of a principle that is too strong, since forms like *recital* and *recitation* do in fact coexist.

The matter of what type of principle is at play is not explored further in Halle's paper, but surfaces again in both Aronoff (1976) and Kiparsky (1983), where it raises slightly different questions. Aronoff considers pairs like *recital/recitation*, and suggests that certain words have 'drifted' to different paradigmatic slots (different meanings), such that they do not compete. This raises questions about how the paradigm space is structured– e.g., why this happens with these words, and not *glory* and *gloriosity*– which are not addressed.

Kiparsky's (1983) approach would allow words like *recital/recitation* to both be grammatical as long as they do not mean the same thing. The status of words like *confusal* or *arrivation* is not considered. The general thrust this synonymy-based theory suggests is that they are derived and blocked by *confusion* and *arrival*. This raises the question of why they are not e.g. assigned to distinct paradigm slots, as *recital* and *recitation* are. Based on the idea that there is an extra-grammatical meaning system (the encyclopedia) that distinguishes e.g. *strawberry* from *cranberry* (recall §3.3.2), it might be thought that *confusal* would be grammatical with the meaning 'related

---

16. For this reason it is perhaps unfortunate that words like *derival* and *arrivation* are marked with *'s. Since they are derived by the rules of the grammar, it would be useful to signal this in a way that distinguishes them from underived forms like *al-form-at-ion-trans*. For the moment we retain the *, but see §3.6.3 below.

17. Kiparsky (1982) offers something similar to Halle's distinction between potential and actual words; certain forms that might be expected (e.g. *arrivation*) are not derived by stipulation. The set of 'possible words' is then the WFRs minus these "idiosyncratic restrictions" (1982:27).

to *confuse* but not synonymous with *confusion*'. In any event, the matter is not explored in that paper.

3.6.2 Lists and multiple winners

Moving forward in time, Embick and Marantz (2008) has a brief but relatively focused discussion of the absence of blocking, one that prompts possible revisions to how competition for grammaticality functions in their theory. As reviewed above, they hold that blocking effects are derivative of the principle RULES APPLY. Competition for grammaticality is limited to Vocabulary Insertion, where the most specific VI that can apply to a particular morpheme takes precedence over others that could in principle apply.

In the case of both ungrammatical inflectional and derivational morphology (e.g. **bended*, **gloriosity*), the idea is that these hypothetical words are not derived by the grammar, and hence do not need to be blocked. Suppose we extend this intuition to some of the pairs at the center of this section. It could be held that the Vocabulary Item inserting *-al* applies in the context of $\sqrt{\text{ARRIVE}}$, producing *arrival* and precluding the derivation of **arrivation*; the reverse situation would obtain for $\sqrt{\text{DERIVE}}$. But what about for *recital* and *recitation*? How can both of these be generated, if Vocabulary Items compete for insertion in the way described in §3.5?

Embick and Marantz illustrate this with respect to the Root $\sqrt{\text{COVER}}$, and the nouns *cover* and *coverage*, both arguably Root nominals; to this pair could be added *covering*, on the meaning "object draped over another (e.g. a tarpaulin)." Two possibilities are discussed for the first pair. The first is that they are not actually structurally identical. Instead, they differ in terms of the nominalizing heads involved; abstractly, one has n_1, the other n_2. The differences in form and meaning between *cover* and *coverage* would then reflect the featural difference in n heads. The second option is that *cover* and *coverage* are realized in exactly the same structure; this requires an approach in which (i) $\sqrt{\text{COVER}}$ appears on more than one list; and (ii) the VIs realizing the n head are not ordered, such that more than one could in principle apply in the context of $\sqrt{\text{COVER}}$:

(33) Vocabulary Items (unordered)

$n \leftrightarrow$ -Ø/LIST__
  LIST = $\sqrt{\text{CAT}}$, $\sqrt{\text{DOG}}$, $\sqrt{\text{COVER}}$...
$n \leftrightarrow$ -age/LIST2__
  LIST2 = $\sqrt{\text{MARRY}}$, $\sqrt{\text{BOND}}$, $\sqrt{\text{COVER}}$...

In any particular derivation, only one of these VIs would apply to produce either *cover* or *coverage*. While *cover* and *coverage* are identical in terms of part of the grammar, viz. their syntax, they differ in terms of how the n head is realized phonologically. This difference correlates in turn with a difference in interpretation, due to what is called competition for use (by definition, an extragrammatical meaning system; cf. Kiparsky's (1982,1983) encyclopedic meaning). Informally, *cover*, *coverage*, and *covering* point to different parts of a 'lexical meaning space' connected to the Root $\sqrt{\text{COVER}}$.

A key question for this proposal is its scope: are VIs for all morphemes in principle capable of showing such ties– and hence correlated meaning effects? While this is attested for $\sqrt{\text{COVER}}$ forms, or for Halle's *proposal/proposition* type of examples, it does not appear to be found with e.g. past tense doublets like *dreamed/dreamt* and *dived/dove*. These kinds of doublets are instances of *variation* in the sense studied in the Labovian tradition (Weinreich et al. 1968). One of the central

premises of work in this vein is precisely that this kind of variation does not produce differences in lexical meaning. So, for example, the variants of the ING variable seen in *Mary is eating/eatin' an apple* are syntactically and semantically identical (though they have social/stylistic effects). Past tense doublets like *kneel/knelt*, or *dived/dove*, behave in the same way.[18]

By way of further illustration, if we encounter a word like *confusal*, there is a strong implicature that, whatever it means, it should not be synonymous with *confusion* (cp. Kiparsky 1983); consider *surprise* as a noun in contrast to the technical term *surprisal*. The same effect is not produced by past tense doublets; if we encounter both *dreamed* and *dreamt*, or *brought* and *brang*, or *sang* and *singed*, there is no implicature that distinct meanings of $\sqrt{\text{DREAM}}$, $\sqrt{\text{BRING}}$, or $\sqrt{\text{SING}}$ are involved (though there could be effects related to style, or dialect). These observations suggest that meanings associated with nouns like *confusion*, *surprise/surprisal* etc. behave differently from those produced by past tense formation in an important way. The question then is how these meaning effects relate to the absence of blocking.

3.6.3 *Connections to lexical potential*

The question of when absence of blocking occurs and when it does not is at the center of Embick (2016). This work explores a theory of locality from Marantz 2007 and Embick and Marantz (2008), which is developed for form (allomorphy) in Embick (2010), and for lexical meaning (allosemy) in Marantz (2013). The intuition guiding this line of research– grounded in Chomsky (1970) and developing the theory of phases from Chomsky (2000,2001)– is that there are two syntactically-defined domains for possible interactions: one in which morphemes are 'close', and potentially display special allomorphy, or special lexical-meaning effects; and another in which they cannot interact in this way (see Embick 2021 for review).

Embick (2016) considers three effects. The first two are introduced above; viz. (i) the absence of blocking discussed above, and (ii) the contrasting intuitions produced by words like *confusal* versus e.g. **bended* for the past tense of $\sqrt{\text{BEND}}$ discussed at the end of the preceding subsection. The third effect involves what appears to be non-local allomorphy. Embick (2010) follows earlier work in exploring the idea that morphemes can see each other for allomorphy only when they are linearly adjacent. Prefixed verbs with bound Roots in English look like counterexamples to this locality condition, as shown in (34), where we use parentheses around forms that do not exist (see below):[19]

(34) $\sqrt{\text{MIT}}$

> permit: permission, (permittal), (permitment), (permittance) ... pérmit
> omit: omission, (omittal), (omitment), (omittance) ... (omit)
> commit: commission, (committal), commitment, (commitance) ... (commit)
> remit: remission, remittal, (remitment), remittance, ... (remit)
> ⋮

If the patterns in (34) were instances of allomorphy, the grammar would have to include statements to the effect 'realize *n* as *-ment* in the context of $\sqrt{\text{MIT}}$, but only if *con-* is prefixed'; something that

---

18. For an elaboration of this point in the context of syntactic change see Kroch (1994) and the review of this proposal in Embick (2008), as well as the next section for some comments. There are perhaps additional patterns here that emerge when category-changing versus Root-based derivation is taken into account; see Adamson 2018 for discussion.

19. On apparent prefix/suffix interactions see also Aronoff (1976), as well as Borer (2013).

is not possible if linear adjacency determines when morphemes are visible to each other.[20]

One of the main lines of argument in Embick (2016) is that the three effects outlined above are reflections of the same phenomenon: 'free' insertion of allomorphs for certain morphemes, an effect that is referred to as *polymorphy*. Freedom here is qualified in terms of morphophonological well-formedness; it is not possible to e.g. attach a Latinate suffix to a non-Latinate base, for example. The resulting theory is one that posits a Halle (1973) style 'potential lexicon', but without a filter in the grammar, and only for certain morphemes, not others.

Working backwards, the explanation for the three effects is as follows. First, prefixed verbs do not require non-local allomorphy, in which the suffix sees the prefix. Rather, the grammar generates all of the forms in (34). Supporting the idea that this is not 'typical' allomorphy is the fact that multiple forms coexist in the first place: *commission/commitment*, *transmission/transmittal*, and so on. For the second effect– the observation that *confusal* etc. have a different status than e.g. **bended*– the idea is that while both e.g. *permitment* and *confusal* are grammatical, i.e. generated by the rules of the grammar, they do not have an established lexical meaning associated with them. For this reason, if they are encountered they produce the implicature that they will have meanings distinct from *permission* and *confusion*, but (by default) related to *permit* and *confuse*. Absent a specification of what these meanings are, such words are 'deviant'.

This leaves us with the difference between these words and e.g. **bended* and **singed*, where no such effect is found; how is this to be characterized? This is where the theory of local contexts enters the picture, in conjunction with the idea that certain types of morphemes interact with lexical meaning, while others do not. Presenting this in summary form for the sake of brevity, the proposal is stated in (35):

(35) Morphemes may interact with a Root's lexical meaning only when they are

    a. local to the Root; and

    b. have a meaning that is not typically compositional.

The first clause holds that while we might find both *proposition* and *proposal* as Root nouns, we would not expect to find e.g. both *vapor-iz-ation* and **vapor-ize-ment*, with a different meaning (or an implicature that there is one) for the latter: the n head is not local to the Root in the latter type of case due to intervening v realized as *-ize*. The second clause distinguishes morphemes according to their semantic contribution. At one extreme are Root-attached derivational morphemes (types of n, a, etc.) whose semantic contribution is often relatively unspecified. A comparison can be made with e.g. XN compounds (*blackboard, strawberry,...*), which behave similarly with respect to how X relates to N (see also Kiparsky 1982,1983). At another extreme are morphemes like Tense (with different features for present, past, etc.), which seem to always have a typical compositional meaning, or at least, one that does not interact with lexical semantics. How different morphemes/features behave with respect to this distinction is the subject of ongoing investigation. Borer 2013, for example, analyzes lexical meaning effects in Hebrew that arise from differences in gender features; Kramer 2016 reports this for certain plural morphemes in Amharic. It remains to be seen what further research will reveal on this topic.[21]

---

20. This argument assumes (with Aronoff 1976 and much subsequent work) that these verbs are internally complex, consisting of a prefix and a (bound) Root.

21. A further possibility to explore is that the second clause could be reduced to the first; for initial proposals on semantic locality, see Marantz (2013).

By way of summary, it is crucially not the case that all derivational morphemes may directly affect lexico-semantic meaning, while all inflectional morphemes may not. Rather, both derivational and inflectional morphemes can potentially interact in this way, as long as they comply with the conditions in (35). Such morphemes are in principle capable of showing polymorphy: that is, the absence of blocking. When either condition is not met, the morphemes in question behave 'paradigmatically', i.e. with a single winner. When morphemes of this type have two forms (e.g. *dreamt*/*dreamed*), this is analyzed as variation. Taken as a whole, the proposal adapts and extends the idea that certain types of morphology behave paradigmatically (with one winner, etc.), while others do not; this is the topic of §4.3.

4 Discussion

Though the theories reviewed above start with different assumptions and employ different tools, they implicate three primary points for comparison and contrast. Our discussion in this section centers on these.

The first such point, addressed in §4.1, concerns what counts as a *blocking effect* in the first place. Theories differ in terms of how many effects they treat as involving competition for grammaticality and blocking, raising the question of how much priority should be placed on the goal of achieving a unified explanation. Connecting to this is the topic of §4.2– whether there are arguments for or against competition for grammaticality. The general point at issue is what kind of evidence would show that the kind of competition logic embraced by many approaches is or is not part of the grammar. Finally, §4.3 looks further at the absence of blocking effects, with a specific focus on the intuition that certain parts of morphology behave paradigmatically, while others do not.

4.1 Uniformity

Which phenomena should be treated as blocking effects (and which should not) is a question that arises at various points above. In a sense, this is the most general question on which the theories reviewed in §3 differ.

One specific example of an argument for uniformity can be found in developments linking Kiparsky 1982 and 1983. The latter concludes that rule interactions should be dispensed with for blocking across the board, in favor of AVOID SYNONOYMY. This reduces blocking to a single principle, and considerably extends its scope, since competitions no longer require lexical relatedness. It is worth noting that the move to AVOID SYNONYMY represents only one possible direction to take. It could have been concluded that *bent*/**bended* and *glory*/**gloriosity* exemplify distinct phenomena; or that every attempt should be made to reduce *glory*/**gloriosity* to rule interactions.[22] But the semantic approach is preferred, in part because it is quite general and thus apparently uniform, and in part because of its connection with principles familiar from studies of language development.[23]

A similar line of reasoning that prioritizes uniformity is found in Williams (2008), who insists on a pragmatic approach to blocking based on what he calls "...the enormous similarity between the Paninian maxim, *use the most specific form*, and the Gricean maxim *use the most informative mode*

---

22. On this latter point, Kiparsky's (1983) theory has ordered WFRs, and Roots, meaning that the type of analysis of *glory*/**gloriosity* described in §3.5 could in principle be implemented in it.

23. More broadly, with the idea that 'differences are interpretable', familiar from Saussure (1986). This broader formulation raises the question of exactly where interpretable differences are expected, and where they are not, as discussed in §3.6; see also §4.3 below.

of expression," with Pāṇinian ordering perhaps being "...the projection of the Gricean principle onto grammar." Williams' desire to connect Pāṇini and Grice is a component of a larger critique directed at Distributed Morphology. The center of this line of criticism is the idea that the phenomena examined in §3 must in some cases be treated with different rule types in the grammar (or cannot be treated as blocking effects). In his view, this amounts to a non-uniform treatment of what he takes to be one phenomenon; and thus a major failing.

Putting to the side the important question of how to implement the Gricean intuition in the grammar, Williams' formulation brings together things that look like they should be kept distinct. For example, Williams holds that *yesterday* "beats" *the day before today*, "making the latter expression almost unusable." Why (recalling Poser's arguments) should we posit a grammar with a single principle that treats clearly grammatical but typically infelicitous phrases like *the day before today* in the same way as **bringed*, **intelligenter*, or **Mary read book the*? For Williams (2008), it is evidently the commitment to having a single principle that explains all apparent competition effects that must be respected. But the desire to have a unified analysis is one factor among many. At the level of abstraction assumed in many arguments about uniformity, it is easy to imagine alternative scenarios; would it not be better to partition phenomena such that there are e.g. two elegant explanations, rather than a single contrived one?

Williams does not flesh out a theory of competition whose details can be examined and compared against alternatives. But his sentiments regarding uniformity can be found elsewhere. Kiparsky (2005), for example, is at pains to stress that his approach reduces competition to a single effect, viz. the interaction of ECONOMY and EXPRESSIVENESS. As we saw above, though, this approach extends most naturally to cases of apparent one- versus two-word competitions, leaving 'garden variety' competition effects like those found with allomorphy unexplained. And even with analytic/synthetic alternations, it is questionable how uniform it is. It predicts e.g. *smarter* winning out over **more smart*. But what about **intelligenter* and *more intelligent*? The grammar that produces word/phrase blocking with the comparative of *smart* should do the same thing with *intelligent*, contrary to fact. To prevent this from happening, other constraints are required to render **intelligenter* ungrammatical, as discussed in §3.4.2. Whatever these constraints might be, they are responsible for the blocking effect in this class of examples, raising the question of how uniform the approach actually is.

With this in mind, it is worth asking what *kind* of uniformity is at issue in this debate. Williams' critique of Distributed Morphology is that it treats the phenomena associated with blocking with multiple mechanisms, i.e. in a non-uniform way. As noted in §3.5, however, the version of Distributed Morphology developed in Embick and Marantz (2008) is in fact based on a single principle: RULES APPLY. Perhaps the way in which this principle abstracts over different rule types makes it seem unsatisfactory for certain intuitions about what uniformity should look like. But surely the same level of abstraction would be involved in the Grice/Pāṇini approach to blocking envisioned by Williams if it were implemented.

The general conclusion we wish to highlight is that in investigating a particular domain, it is not clear in advance (i) whether one is dealing with one phenomenon, or many; or (ii) at what level of abstraction unification will occur. Whether one shares e.g. Williams' intuition about what should count as blocking (and therefore the same phenomenon), or the one from Embick and Marantz (2008), the 'conceptual' debate on uniformity and where it should be sought could go back and forth indefinitely without reaching any strong conclusions. The question to focus on concerns what kind of evidence could show that a particular phenomenon does or does not require competition

for grammaticality (and hence falls in the scope of blocking) in the first place. Some arguments of this type are found above; e.g. the idea that e.g. *the day before today* is different in kind (in terms of intuitions, in ways that could be tested with behavioral variables, neural variables, ...) from e.g. **bringed*. There are other types of arguments as well; we turn to this general point next.

4.2   Evidence for competition

What could count as evidence that there is competition for grammaticality in a particular domain? One type of argument in response to this question is found in Bresnan (2001), reviewed in §3.4.2. The same question plays a role in Embick and Marantz (2008), which develops two lines of argument. The first is that in cases in which it has been argued that blocking is required between words and words or words and phrases, there are in fact other generalizations at play that rule out the ungrammatical forms, i.e. no evidence that blocking between words or phrases is required. It is this type of argument that is summarized in §3.5. A second line of argument seeks to identify phenomena that would highlight the kind of competition logic reviewed in §3.4.2, to see whether the facts support the predictions of a constraint-based competition approach, or a narrow-sense generative one.

As an illustration, the competition logic at the heart of OT makes a clear prediction that emerges in Bresnan's (2001) discussion of English clausal syntax. In the special case in which a particular form is ruled out for arbitrary reasons– by virtue of there being a lexical gap– the mechanics of OT produce a winner that would otherwise have lost the competition. In a competition-free alternative, a different prediction is made. If there is an arbitrary restriction (with e.g. **amn't*) related to a particular derivation, it is not expected that another winner should 'pop out' and be grammatical; instead, there is ineffability. For the *amn't* gap, a competition-based theory thus predicts that *Am I not the best painter* should have a status that is different from e.g. *Is she not the best painter*– the latter competes with *Isn't she the best painter*, while there is no such competition for the former with **Amn't I the best painter* due to the lexical gap. Embick and Marantz (2008) argue that the *Am I not...* and *Is she not...* clauses have exactly the same status, contrary to the expectations of OT's competition logic. The problem here is not that OT has no way of analyzing ineffability; it certainly does. Rather, the question is one of finding **positive** evidence for the existence of competition. A lexical gap modeled with a constraint like Bresnan's Lex should allow for the emergence of relatively marked winners.[24] For the past tense of *forgo*, for instance, where many speakers do not accept either **forwent* or **forgoed*, the marked alternative could be an analytic past tense with unstressed *do*, as in *We did forgo the banquet*. The line of argument developed by Embick and Marantz is that this kind of pop-out effect is not in fact found, which they take as evidence against generalized competition and in favor of a narrow-sense generative approach.

Overall, arbitrary lexical gaps clearly present a number of challenges. At the same time, they produce the kind of situation in which competition-based approaches make a prediction that is clearly different from those made by a generative theory. It remains to be seen what other kinds of phenomena might provide similar evidence for one position or the other.

At a higher level of abstraction, it is worth considering how the arguments that were originally advanced in favor of competition-based OT in phonology could be extended to the parts of morphology and syntax implicated in blocking. The line of argument in phonology was not that rule-based

---

24. Evaluating these predictions requires specific commitments to concepts of markedness in morphosyntax. For Bresnan, for example, *are* counts as **un**marked by virtue of its distribution across both grammatical contexts and different varieties of English, which makes *Aren't I...* a relatively unmarked winner.

approaches were incapable of deriving the correct results; rather, it was that such approaches were not sufficiently explanatory. The primary failure pointed to was the inability to encode directly the observation that certain phonological alternations appear to favor certain surface properties at the expense of others. The OT formalism provides one way of stating such patterns directly in the grammar. For example, the idea that a number of *prima facie* different alternations produce outputs that can be understood as e.g. maximizing certain syllabic properties (presence of onsets, or absence of codas) is statable directly in OT constraints preferring or dispreferring certain syllable properties. In a rule-based approach, on the other hand, such effects arise indirectly, or by 'conspiracy'.

It might then be asked whether parallel lines of argument could be deployed for the parts of morphology and syntax where blocking is implicated. In effect, this would amount to the claim that theories without competition are missing generalizations (or not stating them in the grammar) about which forms are grammatical, and which are not, in ways that a competition-based grammar could make direct statements about. This would involve asking questions along the lines of: *Why does $\sqrt{\text{BEAT}}$ have an* -en *participle* beaten *rather than an* -ed *one* *beated*? Why does Latin* monēre *'warn' take the Perfect allomorph* -u *to form* monuī *while* augēre *'increase' takes* -s *in* augsī *(Mester 1994)? Why do 'short' adjectives in English take synthetic comparatives and superlatives, while longer adjectives form analytic ones?*– and so on.

These questions implicate different issues and discussions. The first might be steered towards lines of work which (connecting with work on phonotactics like Hayes and Wilson 2008) examines the distribution of affixes in terms of host input (and perhaps output) phonological properties (e.g. Albright and Hayes 2003, or more recently Gouskova, Newlin-Łukowicz, and Kasyanenko 2015). As far as this type of approach goes, while phono- and morpho-tactic generalizations about allomorph selection certainly exist, it is not necessarily the case that they require a treatment in a competition-based grammar; establishing this would require further argument. The second question asks whether allomorph selection involves (global) optimization of phonological properties, one of the themes of Embick (2010). These two lines of work are not typically connected to blocking effects, but clearly could be. The third question is the one on which the most explicit claims have been made, and where it appears that the kind of argument under consideration is least likely to be successful. Kiparsky (2005) and related work clearly takes the direct statement of something like 'words are better than phrases' (ECONOMY, or MARKEDNESS) to be a virtue of his approach. But as stressed above, it is unclear how much work the ECONOMY constraint is doing when we consider what goes into the input, and what other constraints must be appealed to in order to produce the correct results.

In summary, most (if not all) phenomena can be analyzed with either the tools employed in narrow-sense generative theories, or those available to competition-based ones. The question to consider is what would constitute evidence in favor of one or the other. For the reasons we have reviewed above, we believe that the burden of proof is on the claim that there is competition in a particular domain. But whether one starts with this assumption or not, the need for making explicit arguments for or against competition should be clear.

4.3 Paradigmaticity

Many of the approaches reviewed in §3 highlight the idea that competitions occur between expressions that (would) mean the same thing. This type of reasoning often invokes the notion of *paradigm*. As we saw in §3.1, the idea that there are paradigm slots of a particular type– with the ability to be filled by at most one form– plays a key role in standard blocking. Paradigm slots play a role in many

subsequent theories as well. As stressed by Carstairs-McCarthy (1992:47–), theories of blocking from standard blocking onwards owe an account of how semantic space is structured, as this defines the scope of possible competitions; but (as reviewed there) attempts to relate morphological and semantic relations often neglect the latter part of the equation. This section takes a deeper look at the role that paradigms might play in the theory of blocking and more generally.

An important theme is how lexical meanings are represented. Many approaches to blocking effects arrive at a point at which semantic issues become crucial. So, for example, it might be held that *glory* competes with **gloriosity* – but not with *gloriousness* – because the first two words would be represented in a meaning space that is different from the one associated with the last. Along the same lines *broken* would not compete with possible past tense forms of $\sqrt{\text{BREAK}}$ like *broke* because the former is syntactico-semantically a participle, whereas the latter is a finite past tense verb. Putting to the side questions of implementation, we will refer to the idea that there are slots associated with specific meanings as the *paradigm intuition*.

The paradigm intuition defined in this way is distinct from but connected to some other intuitions about paradigms and what it means for morphology to be paradigmatic. To illustrate these, consider (36), a typical way of representing paradigmatic slots. There it can be seen that the Root $\sqrt{\text{PLAY}}$ possesses a third person singular present form *plays*, a past tense *played*, a participle *played*, etc.; extended to Root-attached derivational morphology, we might consider that it has the noun *play*, the adjective *playful*, and so on:

(36) schematization of paradigm intuition

root	3s pres	past	participle	noun	adjective
$\sqrt{\text{PLAY}}$	plays	played	played	play	playful
$\sqrt{\text{SING}}$	sings	sang	sung	song	??
$\vdots$					

There are some important asymmetries at play in (36). For the distinct verbal forms, for one, it is expected by default that these should exist for any Root that can be a verb, even if the form is irregular, as is the case with e.g. the past tense of $\sqrt{\text{SING}}$. The meanings and distributions of these verbal forms are also completely predictable; although there may be differences resulting from whether e.g. a particular verb is stative or eventive, all verbs are expected to have past tense and participial forms. This is not the case with the nouns and adjectives, though. For one, the meanings of these might be quite varied with respect to the verb's meanings; the noun *play* overlaps with the verb to some extent, but also refers to dramatic works, for example. A second observation is that we might not expect to find anything in a given 'cell'. The Root $\sqrt{\text{SING}}$, for instance, does not have a Root adjective associated with it. These observations amount to two additional ways in which morphology can be paradigmatic (expected; meaning predictable) or not (cell might not be filled; special meanings occur).

We have, then, the following senses of *paradigmatic*:

(P1) *Blocking sense.* For a given Root, there are slots that can be filled by only one form.

(P2) *Existence sense.* For a given Root, a particular slot is expected to be filled by default.

(P3) *Regularity sense.* For a given Root, a particular slot has a predictable meaning.

The line of reasoning in §3.6 that connects potential words to absence of blocking provides a specific way of (i) connecting the different senses (P1-3), and (ii) specifying what role the paradigm intuition (P1) plays in blocking.

The basic idea builds on Marantz (2001), which concentrates on (P2-3). The theory of locality developed there is an implementation of the 'two domains' intuition that is outlined at the beginning of §3.6.3. For convenience, we can refer to interactions between morphemes in an *Inner* domain, close to a Root; and those that are in an *Outer* domain, where interactions with the Root are not possible. While the theory of such domains can take many forms, Marantz's proposal is that morphology in the Outer domain behaves paradigmatically with respect to (P2-P3), while this is not necessarily the case with Inner interactions. The idea (P1) that blocking may fail in the way implicated by the potential lexicon/polymorphic realization is, in effect, a further correlate of this claim. It says that in the Inner domain, competitions are not necessarily winner-take-all (i.e., multiple potential forms are found), because of the possibility to identify new lexical meanings through the form of a particular exponent. Put another way, the exponents **create** new lexical meaning distinctions.[25]

In summary form, the domain-based approach to P1-3 is given in (37):

(37)   Summary table

<div align="center">Domain</div>

	Inner	**Outer**
(P1)	'multiple winners' possible	only one winner
(P2)	certain Roots might have gaps	all forms expected
(P3)	possible meaning idiosyncrasies/restrictions	predictable meanings

Now, some theories posit actual paradigm slots (e.g. Aronoff 1976), while others employ virtual paradigms (e.g. Embick and Marantz 2008, where paradigm space is derivative of what the syntax assembles). The idea that morphology can be paradigmatic or not in the (P1) sense is in principle compatible with either type of approach. What is important are two points: first, that the set of effects in (37) are correlated; and second, that they correlate in a way that is defined by the theory of locality.

In summary, if this line of reasoning is on the correct track, then the absence of blocking provides crucial evidence on the question of why some types of morphology appear to behave in ways that are compatible with the paradigm intuition, while others do not. Importantly, the relevant distinctions appear to involve locality, not e.g. a split between derivational and inflectional morphology; on this theme, see Embick (2021) for comparisons with lexeme-based morphology (Aronoff 2007).

5   Conclusion

The study of blocking effects in contemporary theoretical linguistics begins in parts of derivational morphology, where the question of word/word competition for grammaticality takes center stage. After quickly extending to interactions among words more generally (including inflectional morphology) and compounding– the domain of the lexicon, according to certain versions of the Lexicalist Hypothesis– questions about blocking appear in grammatical interactions involving larger objects, i.e. in putative word/phrase and phrase/phrase competitions.

---

25. An implication of this view– touched on in Embick (2016) but not fully developed– is that this part of interpretation has access to both PF and LF simultaneously; see Marantz (1995).

These developments raise the question of which of the many phenomena considered in these lines of research should be treated as showing blocking, i.e. as involving competition for grammaticality. As we saw in §3, theories differ greatly on this point. With an eye towards more recent developments, the impetus in approaches adopting Optimality Theory has been to maximize the scope of competition. Conversely, a version of the Minimalist program instantiated in Distributed Morphology circumscribes the scope of blocking considerably, limiting it to the phonological realization of morphemes.

Our goal here has been to review key theoretical distinctions, the phenomena relevant to them, and how theories of competition have changed and evolved since standard blocking was originally proposed. From this review, we have by way of synthesis focused on three primary points of discussion. Two of these are closely linked. The first, espoused in many of the approaches reviewed above, is to what extent there should be a premium placed on there being a single or uniform explanation for blocking effects. For the reasons advanced above, we believe that this idea begs (or assumes an often unjustified answer to) the more important question of which phenomena should count as a blocking effect in the first place. Accordingly, our second discussion point emphasizes the need for clear arguments for or against the existence of competition in a particular domain. In our view, competition for grammaticality must be demonstrated; it cannot simply be assumed. Finally, we have highlighted the questions raised by the apparent absence of blocking in certain domains. This part of the paper brings together several threads that have been noted in prior work. In addition to their intrinsic interest for the theory of blocking, they also bear on the important question of lexical potential and 'possible words', and on the ongoing discussion of when morphology shows (and does not show) certain types of paradigmatic effects.

The question of competition for grammaticality is of central importance for several parts of grammatical theory. We hope to have shown here how the specific set of questions that arise in the study of blocking connect with the general sets of predictions that different theories make on this point.

References

Adamson, Luke. 2018. "Denominal Verbs: Past Tense Allomorphy, Event Frames, and Zero-Categorizers." In *University of Pennsylvania Working Papers in Linguistics,* vol. 24. 1.

Albright, Adam, and Bruce Hayes. 2003. "Rules vs. analogy in English past tenses: A computational/experimental study." *Cognition* 90 (2): 119–161.

Anderson, Stephen. 1992. *Amorphous Morphology.* Cambridge: Cambridge University Press.

Andrews, Avery. 1990. "Unification and Morphological Blocking." *Natural Language and Linguistic Theory* 8:507–57.

Aronoff, Mark. 1976. *Word Formation in Generative Grammar.* Cambridge, MA: MIT Press.

Aronoff, Mark. 2007. "In the Beginning Was the Word." *Language* 83 (4): 803–830.

Beard, Robert. 1966. "The Affixation of Adjectives in Contemporary Literary Serbo-Croatian." PhD diss., University of Michigan.

Berko, Jean. 1958. "The child's learning of English morphology." *Word* 14 (2-3): 150–177.

Borer, Hagit. 2013. *Taking Form.* Vol. 3. Structuring Sense. Oxford: Oxford University Press.

Bresnan, Joan. 2001. "Explaining morphosyntactic competition." In *Handbook of Contemporary Syntactic Theory,* edited by Mark Baltin and Chris Collins, 1–44. Blackwell.

Carstairs-McCarthy, Andrew. 1992. *Current Morphology.* London: Routledge.

Chapin, Paul G. 1967. "On the syntax of word-derivation in English." PhD diss., Massachusetts Institute of Technology.

Chapin, Paul G. 1970. "On Affixation in English." In *Progress in Linguistics,* edited by Manfred Bierwisch and Karl Erick Heidolph, 51–63. the Hague: Mouton.

Chomsky, Noam. 1957. *Syntactic Structures.* The Hague: Mouton.

Chomsky, Noam. 1970. "Remarks on Nominalization." In *Readings in English Transformational Grammar,* edited by R. Jacobs and P. Rosenbaum, 184–221. Washington D.C.: Georgetown University Press.

Chomsky, Noam. 1981. *Lectures on Government and Binding.* Dordrecht: Foris.

Chomsky, Noam. 1992. "Some notes on economy of derivation and representation." *Anuario del Seminario de Filologıa Vasca" Julio de Urquijo",* 53–82.

Chomsky, Noam. 1993. "A Minimalist Program for Linguistic Theory." In *The View from Building 20: Essays in Linguistics in Honor of Sylvain Bromberger,* edited by Ken Hale and Samuel Jay Keyser, 1–52. Cambridge, MA: MIT Press.

Chomsky, Noam. 2000. "Minimalist Inquiries: The Framework." In *Step by Step: Essays on Minimalist Syntax in Honor of Howard Lasnik,* edited by Roger Martin, David Michaels, and Juan Uriagereka, 89–156. MIT Press.

Chomsky, Noam. 2001. "Derivation by Phase." In *Ken Hale: A Life in Language,* edited by Michael Kenstowicz, 1–52. Cambridge, MA: MIT Press.

Chomsky, Noam, and Howard Lasnik. 1993. "Principles and parameters theory." In *Handbook of Syntax,* edited by J Jacobs, A von Stechow, W Sternefeld, and T Vennemann, 13–127. Berlin: Walter de Gruyter.

di Sciullo, Anna Maria, and Edwin Williams. 1987. *On the Definition of Word.* Cambridge, MA: MIT Press.

Dowty, David. 1979. *Word Meaning and Montague Grammar.* Dordrecht: D. Reidel Publishing Company.

Embick, David. 2000. "Features, Syntax and Categories in the Latin Perfect." *Linguistic Inquiry* 31 (2): 185–230.

Embick, David. 2007a. "*Blocking Effects* and Analytic/Synthetic Alternations." *Natural Language and Linguistic Theory* 25 (1): 1–37.

Embick, David. 2007b. "Linearization and Local Dislocation: Derivational mechanics and interactions." *Linguistic Analysis* 33 (3-4): 303–336.

Embick, David. 2008. "Variation and morphosyntactic theory: Competition fractionated." *Language and Linguistics Compass* 2 (1): 59–78.

Embick, David. 2010. *Localism versus Globalism in Morphology and Phonology.* Cambridge, MA: MIT Press.

Embick, David. 2016. "Approaching *polymorphy*." Handout of a talk series given at the Sociedad Argentina de Análisis Filosófico (SADAF), Buenos Aires, Argentina, available at https://sites.google.com/view/ba-lingphil/courses?authuser=0.

Embick, David. 2021. "The Motivation for Roots in Distributed Morphology." *Annual Review of Linguistics* 7 (1): 69–88. eprint: https://doi.org/10.1146/annurev-linguistics-040620-061341.

Embick, David, and Alec Marantz. 2008. "Architecture and Blocking." *Linguistic Inquiry* 39 (1): 1–53.

Embick, David, and Rolf Noyer. 2001. "Movement Operations after Syntax." *Linguistic Inquiry* 32 (4): 555–595.

Giegerich, Heinz. 2001. "Synonymy blocking and the elsewhere condition: Lexical moprphology and the speaker." *Transactions of the Philological Society* 99 (1): 65–98.

Gouskova, Maria, Luiza Newlin-Łukowicz, and Sofya Kasyanenko. 2015. "Selectional restrictions as phonotactics over sublexicons." *Lingua* 167:41–81.

Halle, Morris. 1973. "Prolegomena to a Theory of Word Formation." *Linguistic Inquiry,* 3–16.

Halle, Morris, and Alec Marantz. 1993. "Distributed Morphology and the Pieces of Inflection." In *The View from Building 20: Essays in Linguistics in Honor of Sylvain Bromberger,* edited by Kenneth Hale and Samuel Jay Keyser, 111–176. Cambridge, MA: MIT Press.

Hankamer, Jorge, and Line Mikkelsen. 2002. "A morphological analysis of definite nouns in Danish." *Journal of Germanic Linguistics,* 137–175.

Hankamer, Jorge, and Line Mikkelsen. 2005. "When Movement Must be Blocked: A Response to Embick and Noyer." *Linguistic Inquiry* 36 (1): 85–125.

Hankamer, Jorge, and Line Mikkelsen. 2018. "Structure, Architecture, and Blocking." *Linguistic Inquiry* 49 (1): 61–84.

Hayes, Bruce, and Colin Wilson. 2008. "A maximum entropy model of phonotactics and phonotactic learning." *Linguistic Inquiry* 39 (3): 379–440.

Householder, Frederick W. 1971. *Linguistic Speculations.* London: Cambridge University Press.

Kastner, Itamar. to appear. "Blocking in Distributed Morphology." To appear in the *Cambridge Handbook of Distributed Morphology*.

Katzir, Roni. 2008. "Structural competition in grammar." PhD diss., MIT.

Katzir, Roni. 2011. "Morphosemantic mismatches, structural economy, and licensing." *Linguistic Inquiry* 42 (1): 45–82.

Kiparsky, Paul. 1982. "Lexical Morphology and Phonology." In *Linguistics in the Morning Calm: Selected Essays from SICOL-1981,* edited by Linguistic Society of Korea, 3–91. Seoul: Hanshin.

Kiparsky, Paul. 1983. "Word formation and the lexicon." In *Proceedings of the 1982 Mid-America Linguistics Conference,* 3–29.

Kiparsky, Paul. 2005. "Blocking and periphrasis in inflectional paradigms." *Yearbook of Morphology 2004,* 113–135.

Kiparsky, Paul. 2010. "Dvandvas, blocking, and the associative: The bumpy ride from phrase to word." *Language,* 302–331.

Kiparsky, Paul. 2012. "Grammaticalization as optimization." *Grammatical change: Origins, nature, outcomes* 15:51.

Kramer, Ruth. 2016. "A split analysis of plurality: Number in Amharic." *Linguistic Inquiry* 47 (3): 527–559.

Kroch, Anthony. 1994. "Morphosyntactic Variation." In Papers from the 30th Regional Meeting of the Chicago Linguistics Society: Parasession on Variation and Linguistic Theory.

Lieber, Rochelle. 1980. "The Organization of the Lexicon." PhD diss., MIT.

Marantz, Alec. 1984. *On the Nature of Grammatical Relations.* Cambridge, MA: MIT Press.

Marantz, Alec. 1988. "Clitics, Morphological Merger, and the Mapping to Phonological Structure." In *Theoretical Morphology,* edited by Michael Hammond and Michael Noonan, 253–270. San Diego: Academic Press.

Marantz, Alec. 1995. "'Cat' as a Phrasal Idiom: Consequences of Late Insertion in Distributed Morphology." Ms., MIT.

Marantz, Alec. 1997. "No Escape from Syntax: Don't Try Morphological Analysis in the Privacy of Your Own Lexicon." In *Proceedings of the 21st Penn Linguistics Colloquium,* edited by Alexis Dimitriadis, Laura Siegel, Clarissa Surek-Clark, and Alexander Williams, 201–225. Philadelphia: UPenn Working Papers in Linguistics.

Marantz, Alec. 2001. "Words and Things." Handout, MIT.

Marantz, Alec. 2007. "Phases and words." In *Phases in the theory of grammar,* edited by S. H. Choe et al, 199–222. Seoul: Dong In Publisher.

Marantz, Alec. 2013. "Locality domains for contextual allomorphy across the interfaces." In *Distributed Morphology Today: Morphemes for Morris Halle,* edited by Ora Matushansky and Alec Marantz, 95–116. Cambridge, MA: MIT Press.

McCarthy, John, and Alan Prince. 1993. *Prosodic Morphology I: Constraint Interaction and Satisfaction.* Cambridge, MA: MIT Press.

McCawley, James. 1977. "Conversational Implicature and the Lexicon." In *Syntax and Semantics, Vol. 9: Pragmatics,* edited by Peter Cole, 245–259. Academic Press.

Mester, R Armin. 1994. "The Quantitative Trochee in Latin." *Natural Language and Linguistic Theory* 12:1–61.

Poser, William J. 1992. "Blocking of Phrasal Constructions by Lexical Items." In *Lexical Matters,* edited by Ivan Sag and Anna Szabolsci, 111–130. Stanford, CA: CSLI.

Prince, Alan, and Paul Smolensky. 1993. *Optimality Theory: Constraint Interaction in Generative Grammar.* New Brunswick: Rutgers Center for Cognitive Science.

Rainer, Franz. 1988. "Towards a theory of blocking." In *Yearbook of Morphology,* edited by Geert Booij and Jaap van Marle, 155–85. Dordrech: Kluwer.

Saussure, Ferdinand de. 1986. *Course in General Linguistics.* Chicago and La Salle, Illinois: Open Court.

Weinreich, Uriel, William Labov, and Marvin I. Herzog. 1968. "Empirical Foundations for a Theory of Language Change." In *Directions for Historical Linguistics,* edited by W. Lehmann and Y. Malkiel, 95–195. Austin: University of Texas Press.

Williams, Edwin. 2008. "Dumping Lexicalism." In *Oxford Handbook of Linguistic Interfaces,* edited by Gillian Ramchand and Charles Reiss, 353–382. Oxford University Press.