Last Resorts and Grammaticality[*]

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A "last resort" is argued to be nothing more than a winning, i.e. grammatical form, once it is understood in terms of competition between alternative candidates. It is a theorem of OT that we find last resort effects, since it follows from the nature of competition and constraint interaction.

Economy, Optimality Theory, Competition

1 Introduction

Every winning candidate (grammatical output) is a last resort under OT. It is the best one (or within the set of the best ones) left after the impossible have been eliminated: the last one standing.

I will refer to the observation that grammatical structures have a last resort appearance as the Last Resort (LR) effect. The LR effect is a theorem of OT. There is no "Last Resort" principle or constraint. There are no stipulations that a particular process or structure is possible only as a last resort. The LR effect follows from the very theory of competition and constraint interaction that determines grammatical well-formedness.

At the heart of OT (Prince and Smolensky1993/2002, 2004) is a principle which chooses an optimum among a set of competitors which do not violate the same constraints. Other components of OT, in particular GEN, the set of

constraints, and the nature of inputs, are to be studied empirically, under the logical structure imposed by this model of optimization. OT is a theory of constraint interaction. It defines a class of grammatical theories. The following statement of the principle follows that given in Grimshaw (1997):

> An optimal output form for a given input is selected from among the class of competitors in the following way: a form that, for every pairwise competition involving it, best satisfies the highest-ranking constraint on which the competitors conflict, is optimal.

Since the winning candidate is the one that "best satisfies" the constraints in the way just defined, it is not (necessarily) perfect. If all candidates but one are eliminated, the remaining candidate must be grammatical.

A number of structures or processes have been declared in the literature to be LRs.[1] Collins (2001) reviews some examples. The essence of the hypothesis is that operations or structures are possible only when necessary.

2   Illustrations

The analysis of *do* support in Grimshaw (1997) illustrates the point that the optimum in a grammatical evaluation in OT is the last resort. A skeletal version of the proposal goes as follows. The constraints relevant for *do* are:

FULL-INT   A syntactic element has a meaning
OB-HD   A projection has a head
NO-LEX-MVT   A lexical head cannot move

The English Ranking is:
NOLEXMVT, OBHD >> FULLINT

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(1) a.   Which books will they t read t?
     b. * Which books they will read t?

(2) a.   Which books did they t read t?
     b. * Which books read they?

(3) a.   They read books
     b. * They did read books

The interrogative in (2a), with *do* support, is optimal because it best satisfies the constraints in their English ranking. It violates FULLINT, but the presence of *do* makes it possible to satisfy the other two constraints under consideration. Choosing the optimum with *do* is no different from choosing any other optimum. Importantly, the constraint rankings which select *do* in this configuration are those of the grammar of English, and must therefore be consistent with every other grammatical property of the language. The only language particular aspect of *do* support is the ranking which is responsible for it. If both OB-HD and FULL-INT dominate NO-LEX-MVT, the result is a system in which a main verb will raise, and no *do*-like morpheme will appear. The constraints themselves are the constraints of universal grammar. Nothing more need be said.

(4)   Matrix Interrogatives with no auxiliary
Input: <read(x, y), x=they, y=which books, past>

Candidates	NOLEX MVT	OBHD	FULLINT
a. [CP which books e [IP DP [VP read t]]]		*!	
☞ b. [CP which books do_i [IPDP t_i [VP read t]]]			*
c. [CP which books read_i [IP DP will [VP t_i t]]]	*!		

My point here is that it is not just epenthesis that is a last resort phenomenon. All choice of grammatical forms is, even the order of elements

within simple phrases of English. The analysis which follows is from Grimshaw (2001, 2002), and analyzes phrases in terms of the three alignment constraints: SPECLFT, HDLFT and COMPLFT. These constraints are violated when a specifier, head or complement respectively is not aligned with the left edge of a phrase, designated as "HP" in the tableau. The references above contain the definitions of the constraints. Of the six logically possible candidates I consider only those in which the head (H) and the complement form a constituent, and are therefore adjacent.[2]

(5)   English: orders for Specifier, Head and Complement

		SPECLFT	HDLFT	COMPLFT
☞	a. [_{HP} Spec H Comp]		*	**
	b. [_{HP} Spec Comp H]		**!	*
	c. [_{HP} H Comp Spec]]	*!*		*
	d. [_{HP} Comp H Spec]	*!*	*	

> The ranking of these constraints for English is:
> SPECLFT >> HDLFT >> COMPLFT.

(5) illustrates the fact that the winner, candidate a., is the choice which remains after SPECLFT has eliminated all of the specifier-final options, and HDLFT has eliminated the head final option. The winning grammatical candidate, is thus the last resort.

What these instances show is that the status of a grammatical structure as a LR is not a matter to be declared as an aside – a statement of grammatical fact

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2   If GEN imposes this grouping, then there need be no constraint preferring Head Comp adjacency or constituency. If GEN does not impose this grouping, it must be imposed by a constraint, or perhaps a combination of constraints. If either HDLFT or COMPLFT dominates the grouping constraint(s), the specifier will separate the head from the complement.

that is outside the scope of, or in addition to, the grammatical structure of a particular language, or indeed Universal Grammar as a whole. The set of possible LRs is the set of possible optima, i.e. those that can be selected under rankings of the constraints of UG. The set of LRs found in a given language is the set of optima that are in fact selected under the actual ranking of the universal constraints, as set in the grammar of the language. The fact that the solution (i.e. the LR solution) for the structure of phrases in English is specifier-head-complement is the consequence of the ranking of the relevant markedness constraints. The fact that *do* support is the solution for filling a complementizer when a sentence contains no meaningful auxiliary is also the consequence of ranking among particular markedness constraints. In sum, LRs do not exist as grammatical structures that have a special status. There are winning candidates and that is it. Even a perfect candidate, should one exist, is an LR. Again, it is the candidate which best satisfies the constraints.

If the above is correct, why is it that the notion of a LR has significant appeal? The fundamental reason, I think, is that in a theory which does not work by comparative evaluation of alternative forms, the LR status of all grammatical structures is NOT a theorem. Consider Government-Binding theory, for example. A sentence containing *do* support violates any principle which requires that elements in syntactic structure have meaning. Hence it must be accommodated by appeal to some further notion, in this case the hypothesis that extra options are available to particular languages, as a last resort (see Chomsky 1991). This notion falls outside the theory proper, and is not connected in any way to properties of the theory, apart from the fact that it fixes mismatches between the predictions of the theory and empirical observation.[3]

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[3] The theory-external character of LR is reflected in its frequent positioning between quotation marks. On p.269 Lasnik et al 2005, the term appears 5 times in the penultimate paragraph, in quotes each time.

There is another reason why the concept of LR has a credible status. This is the simple observation that some grammatical phenomena seem to be rarer than others, or perhaps limited to languages with particular properties, or in other ways "marked". In the case of *do* and perhaps the behavior of *much* (Corver 1997) this may be accurate, although unrelated languages behave similarly, as we can see in the role of the verb *suru* in Japanese. The question is whether this motivates treating them as different in some fundamental way from other grammatical devices, and the sentences containing them as different in some fundamental way from other grammatical structures. Epenthesis violates faithfulness, whether it is phonological or syntactic.[4] There is a clear difference between phonological and syntactic systems in their tolerance of unfaithful mappings between inputs and outputs. In syntactic optimizations unfaithful candidates are winners only under particular circumstances. It is not impossible for them to be winners, however. Examples of proposals which crucially posit unfaithful optima include Legendre et al (1998), Grimshaw (2000).

These cases have in common the fact that they involve lack of faithfulness to grammatical, and not lexical, information in the input. Information such as "+wh" for example, or "+plural". While this has not been formalized, recoverability evidently prevents mass deletions in order to better satisfy markedness constraints, such as the alignment constraints discussed above. Since unfaithfulness is so limited, it is striking when it is found.

In these terms, what is a default? If an LR is a structure which best satisfies the constraints as ranked in a grammar, isn't a default exactly the same?

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4   The precise nature of the faithfulness violation involved in *do* support depends on some details of the analysis which I will not go into here. In Grimshaw 1997 I suggested that *do* is the verb of choice for epenthesis because it has the least meaning, hence to strip away its meaning is to minimally violate faithfulness. Since *do* is not in the input its presence in the output constitutes a faithfulness violation in addition.

Yes. However, in the case of epenthesis discussed above, we can separate the two as follows. The selection of a candidate with epenthesis as the optimum is determined by the ranking of constraints on configurations. The selection of *do* as the item to epenthesize is a function of markedness constraints evaluating *do* itself. The first set of constraints mandates the insertion of something, the second set of constraints decides what will be inserted. We call this a "default". This is comparable to the choice of an epenthetic vowel: constraints on syllable structure require the presence of a vowel, other constraints determine which vowel in fact occurs.

3   Last resorts as winning candidates

A fundamental prediction of the claim that LRs are nothing more than winning candidates is that the set of winning candidates across languages is the set of all candidates, minus the set of candidates which are harmonically bounded (Samek-Lodovici and Prince 2005). I will call this the "real winners". The set of last resorts must be the same. The logic of the argument is that LRs are chosen in exactly the same way as grammatical candidates, since this is what they are. There is no reason, then, to expect to find a universally identifiable set of LR "strategies". (More accurately, the universally identifiable set will be identical to the real winners). On the contrary, since languages with differently ranked constraints vary in their choice of grammatical structures, the range of possible last resorts must also be variable. Movement may be the choice of one grammar and no movement the choice of another. Insertion of *do* is the choice in some grammars and not in others. This point lies at the heart of deriving LR effects from constraint interaction. LRs will be entirely determined by the grammar of a given language, and it will not be possible to draw up a list of them which is invariant across languages. ".. the first one now will later be last".

4 Conclusion

This paper further develops a line of research which examines the status of economy and related notions in OT. In Grimshaw (2001, 2002) I argued that "Economy of Structure" is a theorem of OT. It follows from the nature of constraints on phrases, including the alignment constraints discussed in Section 2. These constraints conflict with constraints requiring the presence of a specifier and a head (the constraint OBHD from Section 2). Because of the conflict, every phrase is guaranteed to violate at least one constraint: the fewer phrases the better. In Grimshaw (2006) I sketched an argument that "Economy of Movement" is also a theorem of OT. It follows from faithfulness and markedness constraints, which inevitably penalize chains, since they are inevitably unfaithful.

The core hypothesis of this work is that these effects are not due to "Principles" which are added to a theory to regulate its effects. Rather they follow from the very factors that determine syntactic well-formedness in the first place. The nature of optimality theoretic competition enforces what we call economy, without any assistance from us. Nothing is possible unless it is necessary.

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