

# A PLEASURE OF LIFE IN WORDS

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## REMARKS ON OPTIMALITY-THEORETIC PRAGMATICS\*

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### ABSTRACT

Optimality Theory (OT) is an influential theoretical framework in phonology and grammar, and now it is being applied to semantics and pragmatics too. Its characteristic feature is the interaction of soft and violable constraints that can be relatively ordered in different ways in different languages. Constraints have to be satisfied as long as they do not conflict with a higher-order constraint. Some recent proposals try to use OT to exploit the major pragmatic principles of the Gricean tradition and offer an account of a number of facts which result from the interaction of syntactic, semantic and pragmatic constraints. We present a brief discussion of such proposals in order to point out some controversial issues in OT pragmatics. Certain serious problems (i.e. the status of constraints, or the nature of input and output representations) have still to be investigated and clarified if OT is to be accepted as a promising framework for semantics and pragmatics.

### KEY WORDS

Pragmatics – optimality – grammar – constraint - interpretation

## 1. INTRODUCTION

Since its appearance in the early nineties (Prince and Smolensky 1993), Optimality Theory has increasingly attracted the interest of researchers in different domains of linguistics. The structure of OT is inspired in connectionism, a model of computational architecture that tries to emulate the working of neural networks. Cognitive activity consists of a set of parallel processes distributed over a network of small, interconnected processing units. These units lack intrinsic content, but each one can show different degrees of activation, and the strength of the connections between them can be different as well. Two processes differ merely in the patterns of activation of the network (Prince and Smolensky 1997). Connectionism is a probabilistic and flexible model that favours “soft” computational solutions, and rejects the distinction between ‘representation’ and ‘computation’, a basic one in symbolic architectures. It has obtained very good results in the computational modelling of learning and other tasks involving the adaptation to changing circumstances (that is, precisely in those aspects in which classical representational models seem to step into greater difficulties). The main difference between OT and connectionism has to do with the relationships among the constraints: in connectionism constraints are assigned different numerical weights, so several lower-ranked constraints can join forces to overtake a higher constraint, whereas in OT there is a strict domination relation.

OT was first applied to phonology, a field in which it has provided an excellent modelling for the explanation of syllable structure and phonological changes as the result of affix combination (Prince and Smolensky 1993, Kager 1999, McCarthy (ed.) 2003). The success obtained led to an extension to the domain of syntax (cf. Legendre, Grimshaw and Vikner (eds.) 2001). It is no surprise, then, that in the latest years the attempt has emerged to apply the same framework to the aspects of utterance interpretation covered by semantics and pragmatics. Recent publications such as the special issues of *Journal of Semantics* (Hendriks et al. (eds.) 2000) and *Lingua* (Haverkort et al. (eds.) 2004), and Blutner and Zeevat (eds.) 2004, show that Optimality Theory has now become a stimulating framework for semantics and pragmatics too. In fact its application to interpretative processes opens new routes that seem to be worth following.

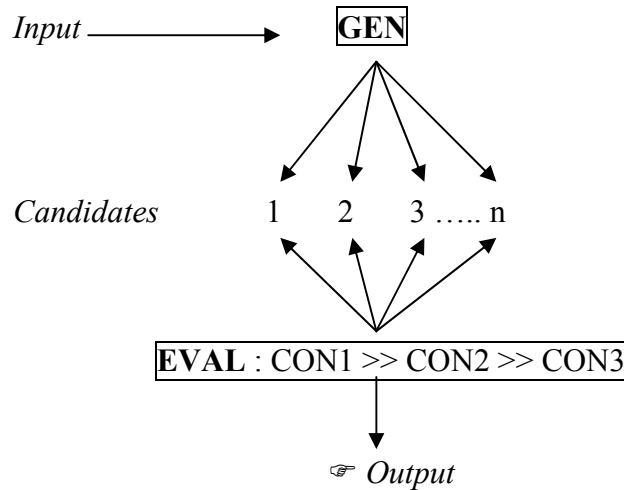
In this paper, our aim is to present a brief discussion of some recent proposals in optimality-theoretic pragmatics and to point out certain controversial issues, such as those related to the input-output relationship, the nature of the constraints and the semantics-pragmatics interface.

## 2. AN OVERVIEW OF OPTIMALITY THEORY

For Optimality Theory (hereinafter, OT) a grammar is a function from an input to an output, with the form of a fully ordered set of violable constraints (Prince & Smolensky 1993, McCarthy 2002). A constraint must be satisfied as long as it does not conflict with a higher-order constraint. The theory allows for clashes between constraints and has a device for resolving them: the higher-ranked constraint always wins, no matter how many other lower-ranked constraints could have been satisfied by a given candidate. The set of constraints is claimed to be the same for all languages, which is a strong hypothesis about universal grammar; what changes from language to language is the relative ranking of the constraints. An OT grammar consists of a

generative device GEN that generates all possible candidates for a given input, and an evaluation device EVAL that uses the hierarchy of constraints CON (as given for a certain language) to select the optimal candidate, as in (1); the optimal candidate is the best available one (i.e., the one that best satisfies the set of constraints).

(1) OT Grammar



Phonology, and more precisely the domain of syllabification, can provide a nice illustration of the mechanism (from Blutner, Hendriks and de Hoop –hereinafter BHH, forthcoming: chapter 1). The following are some constraints on syllable structure:

(2) Violable constraints on syllable structure

- PEAK            Syllables have one peak.
- \*COMPLEX    Syllables have at most one consonant at an edge.
- FAITHC        Consonants in the input must be in the output and vice versa.
- FAITHV        Vowels in the input must be in the output and vice versa.

Now suppose we want to combine two Spanish morphemes, the verb root *absorb-* (from *absorber*, ‘to absorb’) and the participle suffix *-to*. A problem arises with the resulting string of three consonants /rbt/, because the constraint \*COMPLEX disallows consonant clusters at the edge of a syllable. How does Spanish solve this problem? We know that the participle of *absorber* is *absorto*; this means that a consonant is deleted to obey \*COMPLEX (thus violating FAITHC). The *tableau* in (3) includes a list of syllabification possibilities for *absorb-to* –the candidates in the leftmost column–, and a list of ranked constraints on top –going from the highest ranked one on the left to the lowest ranked one on the right–. It shows how the resolution of conflicts among constraints depends on their relative ranking in a language. The pointing hand selects the optimal candidate.

### (3) Syllabification in Spanish

/absorb-to/	FAITHV	PEAK	*COMPLEX	FAITHC
☞ ab.sor.to				*
ab.sorb.to			*!	
ab.sor.be.to	*!			
ab.sor.b.to		*!		

Considering that an asterisk in a cell indicates a violation of a constraint and an exclamation mark indicates a fatal violation, one can see in (3) that a violation of FAITHC is the optimal solution for the syllabification of /*absorb-to*/, i.e. it represents a way of satisfying all the stronger constraints by violating the lowest ranked one. Spanish does not allow the insertion of an epenthetic vowel (as in *ab.sor.be.to*), nor a complex coda (as in *ab.sorb.to*), nor syllables without vowels as peaks (as in *ab.sor.b.to*), but it does allow the simplification of complex codas.

To account for different solutions to the same problem in different languages one simply has to reorder the constraints. The possible constraint rankings define the types of languages that are possible. Thus, OT views typological variation as a result of several language-specific rankings of the same set of universal constraints.

Other generative grammars, such as Chomsky's, postulate a system of rules or principles that generates all and only well-formed expressions. The grammarian's task is that of refining and improving the formulation of those principles, so that they have no exceptions. An OT grammar, on the contrary, contains no general principles, but merely a set of specific constraints; it is more like a filter, a set of hierarchically ranked constraints that discards all but one candidate, the optimal or grammatical one. Thus, grammaticality is not an inherent property of a candidate (i.e., a property dependent on its own features) but rather a relative result, dependent on the comparison with other competing candidates.

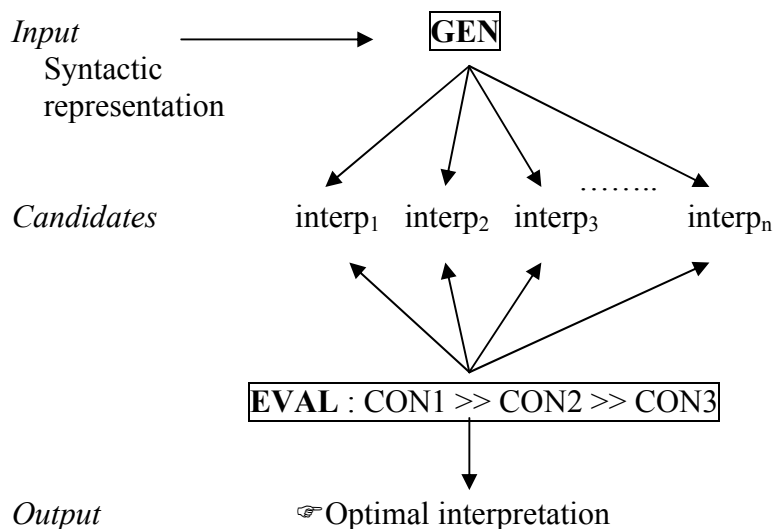
### 3. OT PRAGMATICS

The main hypothesis of OT semantics and pragmatics is that natural language understanding can be explained as the result of a hierarchy of constraints that select the best (optimal) interpretation (Blutner 2000, Hendriks and de Hoop 2001; Blutner and Zeevat (eds) 2004; BHH 2003, and forthcoming; Hendriks 2004). It is well known that linguistic knowledge does not fully determine the interpretation: as has been underlined in pragmatic theory, accounting for utterance interpretation involves the integration of both decoded and contextual information. Every grammatical expression can receive a potentially infinite number of interpretations; however, hearers are usually very quick and efficient at identifying the right one. This suggests that there are fixed restrictions that allow them to work out, in a predictable way, which should be the selected interpretation for a given context. It has been claimed that OT offers an adequate framework both to explain how information from different sources is combined, and to resolve the potential conflicts among the different constraints by invoking a well-known device based on strict dominance.

A theory of interpretation takes syntactic representations as the input and generates a potentially infinite set of candidate interpretations. Each candidate is evaluated in parallel, according to an ordered set of grammatical and contextual

constraints. The device selects the optimal, most harmonic candidate (the one that satisfies best the ordered set of constraints).

(4) OT Pragmatics



**3.1. Bidirectional OT**

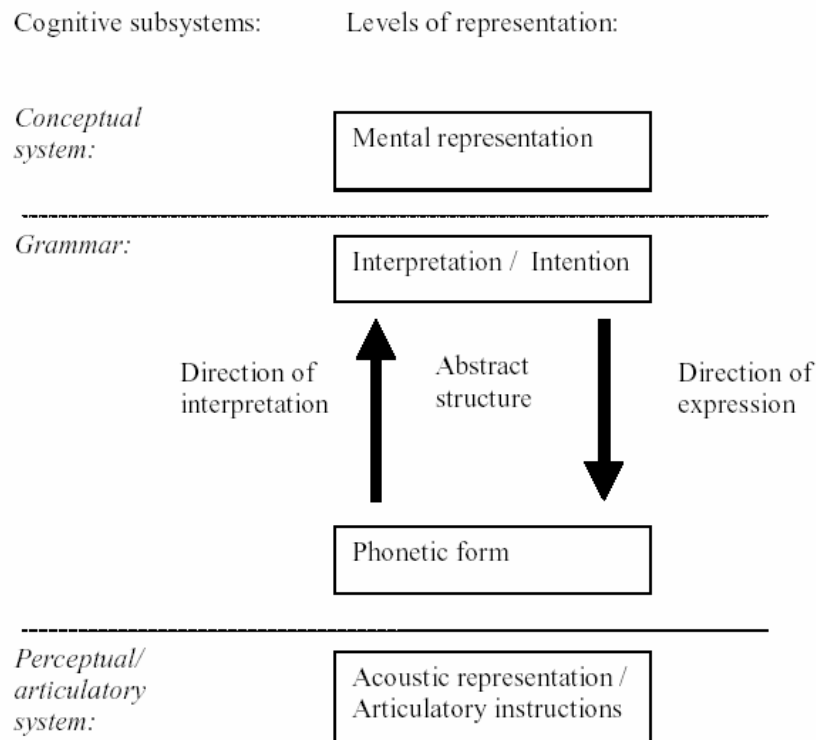
A theory of interpretation is, however, too limited. Recent developments in OT pragmatics elaborate on the idea that a grammar is a system that relates meanings to forms and forms to meanings, and argue for a bidirectional approach. Bidirectionality involves the search of an optimal candidate both in the direction from meaning to form (expressive optimization, in speaker's perspective), and from form to meaning (interpretive optimization, in hearer's perspective): speakers try to find the optimal form to express a given meaning, and hearers try to find the optimal meaning for a given form. In addition, speakers are able to understand what they produce, and hearers are able to produce what they understand. Though different versions of bidirectional OT have been suggested (see Beaver & Lee, 2004 for details) the current research in semantics and pragmatics seems to favour Jäger's (2002: 435) definition of weak bidirectional OT, with some minor notational changes, as it appears in Blutner and Zeevat (2004: 15):

(5) Bidirectional OT (*Weak Version*)

- A form-meaning pair  $(f, m)$  is called super-optimal iff  $(f, m) \in Gen$  and
  - (a) there is no other super-optimal pair  $(f, m') : (f, m') < (f, m)$
  - (b) there is no other super-optimal pair  $(f', m) : (f', m) < (f, m)$
- where  $<$  means *less costly / more harmonic*

The grammar interacts with other cognitive subsystems, namely the conceptual system, and the articulatory/perceptual system —an architecture reminiscent of Chomsky's (1995) minimalist programme in some respect—, as in the following scheme of the architecture of a bidirectional OT grammar (from BHH forthcoming: chapter 1):

(6) Architecture of a bidirectional OT grammar



### 3.2. An example

Krifka (2004) provides us with a simple application of Bidirectional Optimality Theory. Consider the following utterance pairs: in (7) B's answer is odd, in (8) it sounds natural and helpful.

(7) A: The distance between A and B is one thousand kilometers.  
B: #No, you are wrong, it's nine hundred and sixty five kilometers.

(8) A: The distance between A and B is nine hundred and seventy two kilometers.  
B: No, you are wrong, it's nine hundred and sixty five kilometers.

Apparently, the oddness in (7) is due to an inadequate (too high) precision level in B's measurement, given that A seems to be speaking loosely; however, that precision level is adequate in (8), because A's purpose is now to be quite precise. The basic generalization underlying this contrast is in (9), in Krifka's terms:

(9) Round Numbers, Round Interpretations (RN/RI)  
Short, simple, round numbers suggest low precision levels.  
Long, complex numbers suggest high precision levels.

It is desirable to deduce RN/RI from more general pragmatic principles. One could be a preference for brief expressions over complex ones, although we have to consider not only the expression used, but also its contextual alternatives; another one is our general preference for assigning vague readings to measure expressions. Krifka

resorts to the interaction of two pragmatic constraints, BRIEF EXPRESSION and VAGUE INTERPRETATION (operating on forms and meanings respectively):

(10) Pragmatic Constraints

BRIEF EXPRESSION: Precision levels with smaller average expression size are preferred over precision levels with longer average expression size.

VAGUE INTERPRETATION: Vague interpretations of measure expressions are preferred.

The application of the constraints to the measure expressions in (7)-(8) gives the following results:

(11) Brevity and vagueness

Form / Meaning pairs	BE	VI
☞ one thousand / vague		
nine hundred and sixty-five / vague	*	
one thousand / precise		*
nine hundred and sixty-five / precise	*	*

The pair <one thousand; vague> is optimal and super-optimal, given that there is no other super-optimal pair that blocks it, and the pair <nine hundred sixty-five; precise>, being a combination of marked form and marked meaning, is super-optimal too, because the remaining (non-optimal) pairs cannot be more harmonic (although it violates the two constraints). This accounts for the contrast in (7)-(8), and for the fact that speakers tend to assign to *one thousand* a vague interpretation, if no contextual factor prevents it. It is an illustration of how the bidirectional approach works with pragmatic phenomena (but see van der Henst, Carles and Sperber (2002) for an alternative analysis in Relevance-theoretic terms).

#### 4. SOME CONTROVERSIAL ISSUES

Many of the ideas in this brief presentation of OT pragmatics will sound familiar to any reader acquainted with semantic and pragmatic research. In addition to the idea that interpreting an utterance is not merely a matter of decoding a linguistic expression but involves also pieces of contextual information, other recurring topics that OT shares with current research in pragmatics are the following:

- An interpretation can depend on the interaction of competing restrictions. This is a major idea in Grice's (1967) proposal —a system of maxims that can be violated in order to satisfy a higher-order principle; it also appears in Horn's (1984) Q (quantity) and R (relation) principles; and it is a main component of Levinson's (2000) theory, with principles Q (quantity), I (informativity) and M (manner).
- Communication involves the search for a balance between two opposed tendencies: effort and effect, both on the side of the speaker and of the hearer. This idea can be found in all neo-Gricean approaches, including Sperber and Wilson's (1986/1995) Relevance Theory.



- Understanding is the result of a process aiming at the best interpretation, given the circumstances. This is a cornerstone of pragmatics (Grice, 1967; Horn, 1984; Levinson (2000); Sperber and Wilson, 1986/1995, 2002).

OT pragmatics shares, thus, a number of basic features with current pragmatic research, especially with the proposals made in the Gricean and post-Gricean tradition. However, despite these similarities, there are a number of aspects of the application of OT to pragmatics that require more in-depth consideration, with respect both to the issues that are seemingly shared and to those in which substantial differences are observed.

#### 4. 1. THE INPUT AND THE OUTPUT IN OT PRAGMATICS

##### 4.1.1. *The status of the interpretation*

The form-to-meaning side of OT pragmatics gives an interpretation as the output, but what does *interpretation* really mean? Is it an abstract semantic representation, like logical form, or rather a truth-conditional representation? Does it include implicit content?

The original goal of OT semantics seems to have been that of improving compositional theories of linguistic meaning and broadening the scope of semantic theory to account for truth-conditional content, more or less following the guidelines established by dynamic theories, such as DRT. As Hendriks and de Hoop (2001: 14) put it: ‘We take an OT perspective on semantics and aim to show this to be an improvement compared to the classical compositional interpretation of semantic relations in context’. The obvious counterargument to this proposal is that compositionality is not a property of meaning-in-context, but of a previous, more abstract level.

When presenting their model, BHH (forthcoming: chapter 1) state that ‘At the one end of the grammar, there is the **level of meaning** (namely: interpretation and intention). We will assume that the meaning of a sentence can be identified with the conditions under which this sentence is true.’ In this statement two different views of meaning are mentioned: one that seems to include intentions (a sort of *speaker’s meaning* à la Grice), and another one that apparently stops at a truth-conditional level. The trouble is that the application of each one of these two approaches does not yield the same result: speaker’s meaning is far more complex and elaborate than a representation that merely fills in the gaps of a grammatical structure to obtain a full, truth-conditionally evaluable propositional form. On a similar vein, Blutner and Zeevat (2004) establish that the task of OT pragmatics is to close the gap between formal (linguistic) meaning and interpretation.

Later on, BHH (forthcoming: chapter 4, p. 4) define their purpose in the following way: ‘The basic idea is to construct an inferential mechanism of utterance interpretation that conforms to the Gricean suggestion of conversational implicature.’ According to this view, the interpretation should include both the explicit and the implicit sides. But the authors reject Grice’s notion of *what is said* because it is found artificial. The relevance-theoretic notion of *explicature* is then brought into the picture: an explicature is the representation obtained after inferentially completing the schematic logical form obtained *via* linguistic decoding into a full-fledged representation of what the speaker wanted to communicate explicitly. BHH (forthcoming: chapter 4) conclude

that ‘...the present view does not completely conform to a Gricean perspective. It fits much better the framework of **relevance theory** (Sperber & Wilson, 1986).’

This statement, however, does not fit in well with the architecture suggested for the model, a system in which two different mechanisms should be distinguished:

- (i) A pragmasemantic mechanism that deals with the combinatorial aspects of meaning. This interpretive mechanism is allowed to include parts of contextual information if this is required to determine the **truth-conditional content** of the utterance under discussion...
- (ii) A pragmatic mechanism that deals with conceptual enrichment and reconstruction (= the construction of mental models). The architecture of the bidirectional OT system presented in chapter 1 (figure 2) relates this mechanism to the **conceptual system**, which builds on the semantic outcome of the OT grammar.

BHH (forthcoming: chapter 4, p. 2)

Such division is not consistent with the relevance-theoretic approach. Conceptual adjustment is a part of the same process that results in the identification of what the speaker wanted to convey in an explicit way, together with reference assignment and disambiguation: these are all pragmatic processes crucial to establishing the explicit content –and happen to be crucial to establishing truth-conditions as well. Thus, the suggested distinctions do not provide a valid criterion to distinguish between explicatures and implicatures, contrary to BHH’s (forthcoming: chapter 4, p 11) claim: ‘Calculating explicatures involves the interpretive component of the bidirectional OT grammar; calculating implicatures relates to the construction of mental models matters (conceptual system).’

To sum up, from a theoretical point of view the proposal seems to lie on a difficult combination of notions belonging to different theoretical frameworks. It is essential to find a better defined stance regarding the relevant level(s) of representation.

#### *4.1.2. The properties of the syntactic input*

If the interpretation is the result of processing an input, the next question one should answer is what the properties of the input are. In the semantic model of Hendriks and de Hoop (2001), the input is a well-formed syntactic representation. From such a representation, the generative mechanism GEN generates a set of candidate interpretations that are filtered out by the evaluation device EVAL following the ranked constraints. The output is the optimal candidate (i.e., the best, least offending one).

When is a syntactic representation well-formed? An expression is grammatical when it has been selected as the optimal candidate to express a given meaning. There is no independent system to establish the well-formedness of an expression from its own, intrinsic properties; rather, grammaticality is merely optimality. The problem is that we need an optimal syntactic structure as the input, which is the result of processing a semantic representation. What kind of semantic representation? Presumably, a well-formed one, so the question arises: How do we assess the well-formedness of a semantic representation? Again, if no independent conditions are established, a well-formed semantic representation must be the optimal output of some mechanism... The consequence is that well-formedness conditions on both syntactic and semantic structures are defined circularly, and an infinite recursion is prompted from which there

is no obvious way out unless some primitive, independent well-formedness conditions are imposed.

Bidirectionality seems to be identified as a combination of a production and an interpretation algorithm, but this cannot be adequate: if you take a meaning and produce a form, and then you take this form and produce a meaning, there is no guarantee that you get back to the original meaning. On the other hand, an expression can have a potentially open set of interpretations. This means that what we have is not a bidirectional link, but a one-to-many relationship. The very same expression can have different interpretations in different contexts. To stick to bidirectionality, contextual information should be allowed into the picture not as a part of the constraints, but as a part of the input itself. Since the possible combinations of a single expression and an infinite set of contexts constitute an infinite set too, bidirectionality has the undesirable effect of triggering a computational explosion.

In addition, if only grammatical expressions are accepted as the input, then the model could not account for one of the abilities exhibited by native speakers: that of interpreting some ill-formed expressions in some circumstances. An anomalous expression can be the result of a poor knowledge of grammar (such as the mistakes of a non-native speaker), or a deliberate exploiting of the rules of grammar with a communicative intention: in both cases, hearers are able to compute an interpretation despite the anomaly of the input.

## **4.2. THE NATURE AND FORM OF THE CONSTRAINTS**

### *4.2.1. Faithfulness constraints in pragmatics*

The set of constraints is the cornerstone of any OT system. What properties do constraints have? Constraints fall in two classes: faithfulness constraints and markedness constraints. Faithfulness constraints are those that impose a strict correspondence between input and output; markedness constraints impose a ban on marked forms (McCarthy 2002: 13 and ff.). The system tolerates conflicts between constraints: the higher ranked constraint always wins out.

The question is how unfaithful an interpretation can be. Consider the case of irony. Irony can represent the extreme instance of unfaithfulness to linguistic meaning. Obtaining an ironical interpretation would imply lowering the rank of all faithfulness constraints, so that other conditions could overtake them. Since the antiphrastic interpretation is, in principle, available for any expression, we should allow this in a general way, which does not seem a desirable move. Again, only the integration of contextual information as part of the input itself could settle the issue, but this is not the view taken by OT systems. Apart from this, the system assumes that for any expression one and only one optimal interpretation is selected. What about deliberate ambiguity, then? Many witty expressions exploit double senses, and both should be present at once. It is not clear how an OT system could explain this sort of uses.

Cases of optionality have been studied in the OT literature that would require that the system should produce not one, but two optimal candidates. Consider object scrambling in Dutch (taken from BHH: chapter 3). A well known syntactic feature of many Germanic languages, such as German, Dutch or Icelandic, is object scrambling: direct objects may appear in two different positions, one VP-internal (in situ, unscrambled), and one VP-external (shifted or scrambled), as the following Dutch examples illustrate:

- (12) a. Paul zei dat hij gisteren een boek heeft gelezen.  
 Paul said that he yesterday a book has read
- b. Paul zei dat hij een boek gisteren heeft gelezen.  
 Paul said that he a book yesterday has read  
 “Paul said that he read a book yesterday”

On the assumption that the adverb *gisteren* marks the left edge of the VP, (12a) shows the object *een boek* in a VP-internal position (in situ), while (12b) shows the object in the VP-external or scrambled position. Scrambling seems to be optional for definite NPs in Dutch, but almost obligatory for pronouns and highly restricted for indefinite NPs; indefinites usually receive a marked interpretation (specific, referential) when scrambled, and an unmarked interpretation (existential, non-referential) when they stay *in situ* (this is in fact the case in the examples in (12)). Syntactic optionality and the distribution of marked and unmarked readings make object scrambling an ideal candidate for a bidirectional OT analysis. Leaving aside, for reasons of space, the case of definite DPs, and assuming that under certain conditions indefinites can scramble and pronouns can even remain *in situ*, the basic constraints that have been invoked for indefinite NPs and pronouns are the following ones (but see Gärtner 2004a and b for other alternative analyses and an insightful discussion on scrambling and iconicity in OT):

(13) Constraints for object scrambling

MEANING INDEFINITE OBJECT (MIO): An indefinite object gets a non-referential reading.

FORM INDEFINITE OBJECT (FIO): An indefinite object does not scramble.

MEANING OBJECT PRONOUN (MOP): A pronoun gets an anaphoric reading.

FORM OBJECT PRONOUN (FOP): A pronominal object scrambles.

Recall that the unmarked position for indefinites is the VP-internal one, correlated with their (unmarked) non-referential interpretation. For pronouns the unmarked position is the VP-external one, which typically triggers an anaphoric interpretation; otherwise, in the marked unscrambled position, pronouns receive a (marked) deictic reading. Thus, object scrambling in Dutch seems to obey the Markedness Principle, which states that marked (less harmonic, more complex) forms are used for marked (less harmonic, more complex) meanings (Horn 1984, Levinson 2000); the Markedness Principle is itself a result of bidirectional optimization. The two super-optimal form-meaning pairs are <unmarked form, unmarked meaning> and <marked form, marked meaning>; the second pair is in fact a combination of sub-optimal form and sub-optimal meaning, but it is not blocked by any other super-optimal pair. The two *tableaux* in (14)-(15) (with the two constraints crucially not ranked with respect to each other, according to BHH forthcoming) show how the relevant pairs for indefinite and pronominal objects result from constraint interaction:

(14) Scrambling of indefinite objects

Indefinite object	FIO	MIO
☞ unscrambled, non-ref		
scrambled, non-ref	*	
unscrambled, ref		*
scrambled, ref	*	*

(15) Scrambling of pronouns

Pronominal object	FOP	MOP
☞ scrambled, anaphoric		
unscrambled, anaphoric	*	
scrambled, deictic		*
unscrambled, deictic	*	*

A bidirectional OT approach like this tries to account for the pairing of syntactic positions and NP interpretations relying both on the soft nature of constraints and on the cross-modular interaction of syntactic, semantic and pragmatic principles. But it works only if one admits that the two constraints are not ordered with respect to each other, or they are equally strong, and from an orthodox OT point of view either possibility is undesirable, since OT systems are based precisely on the strict dominance of constraints. The only solution might be to invoke different inputs, though this solution “may seem to throw out baby, bathwater, tub, sink and toilet.” (McCarthy 2002: 201).

In addition, a number of puzzling questions still remain unanswered in this proposal. It would be impossible to discuss them adequately here, so we just give a brief and non-exhaustive list for future discussion:

- Is there a principled way to control when the constraints are strictly ranked (as in classical OT) and when they are not (as in BHH’s analysis of scrambling)?
- How do we account for marked or unmarked status of syntactic operations and meanings without a previous semantic analysis? Why are certain interpretations marked or unmarked?
- How can we explain the possibility of strong, referential interpretations of indefinites in unscrambled positions?
- Should we accept an analysis of scrambling with different constraints invoked for definites and for indefinites, such as BHH’s? Shouldn’t we look for a unified account based on the semantics of determiners and the procedural semantics of scrambling?
- Should a theory of interpretation allow for free interaction of principles of different nature, as in OT, or should it maintain a stricter view, with syntactic principles systematically prevailing over pragmatic ones?

Thus, ambiguity, optionality, ineffability and uninterpretability are various instances of the same issue: the existence of mismatches between form and interpretation, which represents a serious empirical challenge to OT. As discussed in Beaver & Lee (2004), various versions of bidirectional OT have been suggested, but all

fail to explain the whole range of cases in which there is no isomorphism between forms and meanings.

#### 4.2.2. *Constraints on constraints*

In a system that does not work with symbolic representations, the weight of the processing device is put on the constraints and their ordering. Therefore, the way in which they are formulated and ordered is crucial.

For those of us who are used to other formal models, OT constraints may seem *ad hoc* conditions, too specific and not independently motivated. The whole mechanism may seem circular: a constraint is postulated to account for the occurrence of a certain form, and a form occurs as the result of a constraint. Are there well-formedness conditions on, or constraints on, constraints? As van Rooy (2004: 176) puts it, ‘if one can invent any OT constraint as long as it helps to describe the facts, it is not clear to what extent OT is still explanatory’. On this respect, McCarthy (2002: 39) stresses,

Positing a new constraint is not to be undertaken lightly. Constraints in OT are not merely solutions to language-particular problems; they are claims about UG with rich typological consequences. Moreover, the need for a new constraint has to be established securely.

This caution must be kept in mind when doing OT pragmatics: the kind of constraints that have to be used to account for utterance interpretation include both syntactic and contextual information. But contextual information is, by definition, situation-dependent, and it is not clear to what extent situational constraints can (or should) obey this universality requirement.

### 4.3. PRAGMATIC EXPLANATIONS

#### 4.3.1. *A code-like device*

One of the facts that must be given an account is the fact that (most of the time) we understand each other. If we do, the argument goes, it is because our communicative exchanges are systematic to some extent. To explain this, OT pragmaticists assume that interpretation is a stable function between a linguistic expression and the properties of its context: when both are given, one should be able to fully predict the interpretation.

Sensible as it may sound, this idea steps into both theoretical and empirical difficulties. On the one hand, a system like the one just envisaged would require a complete labelling of all the aspects and elements of the situation, which would imply that the context should be totally fixed and given in advance. This approach is a new version of the code-like model of communication, a model according to which communication is merely a matter of coding and decoding messages. But, as Sperber and Wilson (1986/1995) have convincingly argued, the context cannot be completely set up before utterance interpretation; rather, the context is built and adjusted as a part of the on-line interpretation process to satisfy the conditions of the processing itself. When the context is totally given, the picture of human communication we get is too simple and rigid. Utterance interpretation cannot be a purely mechanical activity, among other things because the wrong prediction would arise that misunderstandings could only be due to a misuse of the device.

Consider, for instance, Zeevat's (2004: 101) proposal on particles and discourse connectives: 'if the relation R obtains between context parameters and the current utterance, add the particle P to the utterance'. Thus, his idea is that the occurrence of particles is merely (and only) a formal result of a pre-existing, objective relation. However, as has been shown in the literature on discourse markers (cf. Blakemore 2002), they are neither obligatory, nor objective. Even if we assumed that a given relation holds (for example, that of consequence), speakers are totally free to choose between coding such link, and leaving it to the hearer's inference abilities (*It's raining, (so) you'd better take your umbrella*). On the other hand, speakers can use particles to create non-existing relations between propositions (*I'm your father, so you must go to bed*). A well-known former Spanish politician was often criticised for using *por consiguiente* ('as a consequence') to establish an artificial coherence between contiguous sentences. The approach in which particles contribute a specific relation, regardless of the fact that this relation may or may not be identified in the previous context, seems to better capture the essence of the production and interpretation of particles.

There is still a further problem: the set of conditions (including information about the situation) in which a linguistic expression is produced need not be the same in which the utterance is interpreted. If so, there can hardly be any guarantee that the interpretation arrived at by the hearer will be exactly the same as the meaning that generated the expression used by the speaker. This is not a problem, of course, for other approaches, such as Relevance Theory, which do not require this relationship to be one of perfect identity, but of similarity; indeed, the interpretation is merely the hearer's hypothesis on the speaker's communicative intentions. But it is a serious problem for a bidirectional OT approach requiring the strict biunivocal correspondence between forms and meanings.

#### 4.3.2. *Cross-modularity*

The constraints needed to account for some aspects of interpretation include constraints on syntactic structure, informational structure, economy, and relevance, among many others. In other frameworks these different requirements are seen as belonging to different levels of representation (syntax, phonology, pragmatics...), each with its own vocabulary and specific principles, forming a modular architecture. In OT pragmatics, however, all those constraints are put together. This is presented as a way to foster the integration of different components in an overall non-modular system. Cross-modularity is claimed to be a necessary feature of OT pragmatics.

The trouble with this view is that evidence for the autonomy of components is simply neglected, and generalisations about their internal properties inevitably lost. Moreover, if all constraints are put together, it will be hard to separate grammatical constraints from extra-linguistic constraints. As a consequence, no characterisation of linguistic knowledge will emerge, and one of the basic goals of linguistic theory will never be reached.

#### 4.3.3. *The ultimate meaning*

This has a further undesirable consequence. Paradoxically, a theory of interpretation like the one envisaged by BHH is doomed to give up any explanation of

linguistic meaning. Since representations (mental or of any other sort) play no role in connectionist architectures, there is no such a thing as the meaning of a noun or a determiner, neither conceptual nor procedural —to use Wilson and Sperber's (1993) distinction. To begin with, constraints are supposed to apply blindly, without any reference to the content of the words and phrases they apply to. In addition, from an output, we can draw no implication about what the contribution of linguistic meaning is to the overall interpretation, nor can we characterise the contribution of non-linguistic factors. Thus, the model is able to explain what constraints apply to a given input (and at the very best, to produce an optimal interpretation) but not what is the meaning of an item.

## 5. CONCLUSION

As a phonological theory, OT has proved to be a very adequate model to explain syllabic structure and the results of morphophonological combination, and a great deal of agreement has been reached about the central issues. For syntax, things are not that clear: the nature and status of the input, the form of the candidates, the formulation of the faithfulness constraints, among others, are still crucial questions of an open debate (see McCarthy 2002: §4.1). When adapted for semantics and pragmatics, the problematic matters multiply. In the previous sections some of such issues have been discussed.

Apart from those specific problems, there seems to be a deeper object of concern. OT is a theory of linguistic competence, not of performance. As McCarthy (2002: 217) emphasises, 'OT is a theory of competence in the sense and tradition of Chomsky (1965, 1968, 1995): a grammar is a function from inputs to outputs, and like any function it must be well defined.' In other words, 'A grammar is not (...) a description of how speakers actually go about computing that function.' (McCarthy 2002: 10)

But pragmatics is precisely concerned with performance. Any pragmatic theory should have something to say about how language is put to use: how the faculty of language and other cognitive systems interact to yield a full-fledged interpretation. A model of grammar like OT should not include pragmatic or discourse considerations. Grammar is an essential part of the picture, but when aiming at an explanation of our communicative abilities, something must be added about other cognitive subsystems and the principles governing them, about on-line processing, about the speakers' and hearers' abilities, preferences and intentions.

Connectionist modelling tries to account for regularities without invoking mental states of any kind. However, when one needs to account for higher manifestations of human cognition, such as communication, mental representations seem to be an ingredient that cannot be dispensed with. Language use and interpretation cannot be modelled as a strict function from linguistic inputs and contexts to interpretations: there is much more to interpretation than a mechanical computation on meanings and contexts. More flexibility is needed to account for our "not-always-perfect" performance. As McCarthy (2002: 4) puts it,

...the strictness of strict domination in OT (...) is somewhat counterintuitive, since it is quite unlike the more flexible system of priorities we apply in our everyday lives. For example, given a primary career goal of making lots of money and a secondary goal of living in an exciting city, few among us would



stubbornly persist with these priorities when faced with offers of a job paying \$61,000 in Paris, Texas, and a job paying \$60,000 in Paris, France. Yet constraint ranking in OT has exactly that stubborn persistence.

In this sense, strict domination in the ranking of the constraints is another source of trouble: a totally ordered hierarchy—a hallmark of OT—is needed to explain most aspects of subsymbolic computation, such as phonological combination. But when meanings, goals and intentions are brought into the picture, strict domination is not a valid explanation of the way we humans select optimal candidates. Maybe a better solution would have been that of developing a weighted-connection model, in which a conspiracy of lower-ranked constraints can beat a single higher constraint.

As the previous considerations have tried to show, most of the problems with OT pragmatics derive from the adoption of an inadequate research strategy: modelling a theory of pragmatics with the tools of grammatical theory. Thus OT, as it stands, is not so much wrong as a linguistic theory, but merely a bad choice as a model for pragmatics.

## ENDNOTES

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## REFERENCES

- Beaver, David and Hanjung Lee (2004). Input-Output mismatches in Optimality Theory. In Blutner, Reinhard and Henk Zeevat, eds., 112-153.
- Blakemore, Diane (2002). *Relevance and Linguistic Meaning: the Semantics and Pragmatics of Discourse Markers*. Cambridge: Cambridge University Press.
- Blutner, Reinhard (2000). Some aspects of optimality in natural language interpretation. *Journal of Semantics* 17.3: 189-216.
- Blutner, Reinhard, Petra Hendriks and Helen de Hoop (2003). A new hypothesis on compositionality. In Peter Slezak, ed., *Proceedings of the 4th International Conference on Cognitive Science*. Sydney.
- Blutner, Reinhard and Henk Zeevat (2004). Editors' introduction: Pragmatics in Optimality Theory. In Blutner, Reinhard and Henk Zeevat, eds., 1-24.
- Blutner, Reinhard and Henk Zeevat, eds.(2004). *Optimality Theory and Pragmatics*. New York: Palgrave MacMillan.
- Blutner, Reinhard, Petra Hendriks and Helen de Hoop (forthcoming). *Optimal Communication* (draft 2004).
- Chomsky, Noam (1995). *The Minimalist Program*. Cambridge (Mass.): MIT Press.
- Gärtner, Hans-Martin (2004a). On the optimality theoretic status of "Unambiguous Encoding". In Blutner, Reinhard and Henk Zeevat, eds., 154-172.
- Gärtner, Hans-Martin (2004b). On object-shift in Icelandic and partial iconicity. *Lingua* 114: 1235-1252.

- Grice, Paul (1967). Logic and conversation. In Peter Cole and Jerry Morgan, eds., *Syntax and Semantics, Volume 3: Speech Acts*. New York: Academic Press. 41-58.
- Haverkort, Marco, Helen de Hoop and Maurits van den Noort, eds. (2004). *Variation in form versus variation in meaning*, *Lingua*, 114 (9-10).
- Hendriks, Petra (2004). Optimization in focus identification. In Blutner, Reinhard and Henk Zeevat, eds., 42-62.
- Hendriks, Petra, Helen de Hoop, and Henriëtte de Swart, eds. (2000). *Journal of Semantics*, 17 (3).
- Hendriks, Petra and Helen de Hoop (2001). Optimality theoretic semantics. *Linguistics and Philosophy* 24:1-32.
- van der Henst, Jean Baptiste, Laure Carles, and Dan Sperber (2002). Truthfulness and relevance in telling the time. *Mind and Language*, 17: 457-466.
- Horn, Lawrence (1984). Towards a new taxonomy of pragmatic inference: Q-based and R-based implicature. In Schiffrin, Deborah, ed. (1984). *Meaning, Form, and Use in Context: Linguistic Applications*. Washington: Georgetown University Press, 11-42.
- Jäger, Gerhard (2002). Some notes on the formal properties of bidirectional optimality theory. *Journal of Logic, Language and Information* 11(4): 427-451.
- Kager, René (1999). *Optimality Theory*. Cambridge: Cambridge University Press.
- Krifka, Manfred (2004). Optimality theory and pragmatics. Lecture held at the V. Mathesius Center, Prague.
- Legendre, Géraldine, Jane Grimshaw and Sten Vikner, eds. (2001). *Optimality-Theoretic Syntax*. Cambridge (Mass.): MIT Press.
- Levinson, Stephen (2000). *Presumptive Meanings. The Theory of Generalized Conversational Implicature*. Cambridge (Mass.): MIT Press.
- McCarthy, John (2002). *A Thematic Guide to Optimality Theory*. Cambridge: Cambridge University Press.
- McCarthy, John, ed. (2003). *Optimality Theory in Phonology*. Oxford: Blackwell.
- Prince, Alan and Paul Smolensky (1993). *Optimality Theory. Constraint Interaction in Generative Grammar*. Oxford: Blackwell, 2004.
- Prince, Alan and Paul Smolensky (1997). Optimality: from neural networks to Universal Grammar. *Science* 275: 1604-1610.
- Sperber, Dan & Deirdre Wilson (1986/1995). *Relevance*. Oxford: Blackwell.
- Sperber, Dan & Deirdre Wilson (2002). Pragmatics, modularity and mindreading. *Mind and Language* 17: 3-23.
- Van Rooy, Robert (2004). Relevance and Bidirectional Optimality Theory. In Blutner, Reinhard and Henk Zeevat, eds., 173-210.
- Wilson, Deirdre and Dan Sperber (1993). Linguistic form and relevance. *Lingua* 90: 1-25.
- Zeevat, Henk (2004). Particles: Presupposition triggers, context markers or speech act markers. In Blutner, Reinhard and Henk Zeevat, eds., 91-111.