OT Accounts of Optionality: A Comparison of Global Ties and Neutralization

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1 Introduction and Overview

At first sight, optionality poses a problem for all theories that assume a competition between candidates (e.g., transderivational Minimalism and to a much larger extent Optimality Theory (OT)). In such theories, the optimal (or the most economical) candidate blocks the non-optimal (less economical) candidates in a given candidate set (reference set). Only the optimal candidate is grammatical.

In this paper I will introduce and compare two accounts of optionality in OT and show that they are empirically equivalent. One account, the global tie approach (see, e.g., Ackema & Neeleman 1995, 1998), involves constraint ties and the other account, the neutralization approach (see Legendre et al. 1995, 1998; Baković & Keer 1999), makes use of the normal OT interaction of faithfulness and markedness constraints. Both accounts will be applied to different data sets. The accounts will be checked to determine whether one is superior to the other. The result will be that in fact both approaches can be used to account for the same kind of data. Nevertheless, to strengthen the theory, one account should be seen as superfluous. For conceptual and not empirical reasons, I will prefer the neutralization account in the end.

I will proceed as follows: In section 2, I will give a brief introduction to OT and discuss different OT accounts of optionality including the two mentioned above. In order to justify the focus on these two accounts I will briefly mention their advantages compared to other OT accounts of optionality.

In the following three sections, I will look at data for which either an account in terms of neutralization (section 4) or global ties (section 5) or both (section 6) has been given in the literature. In section 4 and in section 5, I first introduce the analysis proposed in the literature. Then I give a new account in
terms of the opposing approach, keeping the constraints as similar as possible. Section 4 will be concerned with complementizer optionality in English. In section 5, I will look at the optionality of wh-movement in root questions in standard and colloquial French and its breakdown in certain contexts. Section 6 gives an example of optional IPP constructions in German which again can be analyzed by both approaches. In section 7, some advantages and disadvantages of both approaches are presented. The last section briefly summarizes the results.

2 Basic Assumptions of OT

The following five ideas are central to Optimality Theory:

1. Basic assumptions (see among many others Prince & Smolensky 1993, Grimshaw 1997)
   a. Constraints are universal.
   b. Constraints are violable.
   c. Grammars are rankings of constraints.
   d. An optimal candidate in a candidate set is grammatical, all non-optimal candidates are ungrammatical.
   e. The grammaticality of a candidate not only depends on its inherent properties, but on the properties of the competing candidates as well.

(1-d) especially is problematic for optionality. How can optionality be achieved when only one optimal candidate in a competition is grammatical?

Several proposals have been made in the OT-literature, some of which will be introduced in the next section. At this point it should suffice to give a definition of optionality that allows for the possibility of more than one optimal candidate in one and the same competition. Such a definition is given in (2):

2. **Optimality** (following Müller 1999: 3):
   A candidate $C_i$ is optimal with respect to a constraint ranking ($\text{CON}_1 \gg ... \gg \text{CON}_n$) iff there is no candidate $C_j$ in the same candidate set such that:
   a. There is a constraint $\text{CON}_k$ that $C_j$ satisfies better than $C_i$; and
   b. $\text{CON}_k$ is the highest ranking constraint on which $C_i$ and $C_j$ differ.

The candidates in a given candidate set are generated by a part of the grammar (GEN, for generator) which contains only inviolable and unranked constraints. GEN takes an underlying form (the input) and builds up all possible output structures. These outputs, called the candidates, are evaluated by another part of the grammar, the function H-EVAL (Harmony Evaluation), which determines the optimal candidate(s) based on the constraint hierarchy of the language.

I will use the following notation in this paper:

3. (3) a. $\text{opt}$ : optimal candidate
   b. $!*$ : fatal violation
   c. $<=>$: constraint tie
   d. $\gg$ : constraint domination

3 OT Accounts of Optionality

The present definition of optionality is compatible with more than one optimal candidate in one and the same competition. This is exactly what I will understand by optionality from a theoretical point of view:

4. **Optionality**: Two (or more) different candidates are optimal, i.e., grammatical, though they are (or seem to be) in the same competition.

In OT, optionality is possible, but only under certain conditions. Opinions in the OT literature differ in what these conditions should look like (see Müller 1999 for an overview).

In this section, three different OT approaches towards optionality are introduced: In the first one, *identity of constraint profile* is the only condition that allows the optionality of two candidates, in the second one, *constraint ties* (local or global) are needed in addition, and in the third one, the so-called *neutralization approach*, the crucial condition for the optionality of two candidates is their optionality in different competitions which arise from slightly different inputs.

The introduction and discussion of several approaches to optionality will motivate the focus on the global tie approach and the neutralization approach throughout the paper. It will be shown that only these two approaches allow the optimal candidates to have a quite different constraint profile. This will be needed to account for certain sets of data.
3.1 Identity of Constraint Profile

The obvious way of allowing for optionality in OT is that the winning candidates in one and the same competition have the same constraint profile (Grimshaw 1997: 410f., and Vikner 1999 use identity of constraint profile to account for complementizer optionality). The condition for the optimality of two (or more) competing candidates under this point of view is absolute identity of the optimal constraint profile.

Identity of constraint profile is an intrinsic part of the theory that results directly from the basic mechanisms of OT. Regardless of any additional mechanisms and assumptions used, identity of constraint profile can never be excluded.

On the other hand, if the identity of the constraint profile is used as the only way to account for optionality, and nothing else is stipulated, will I speak of an “approach” to optionality along these lines. Then, however, the question arises as to whether this is sufficient to account for all cases of optionality. To illustrate the idea of identity of constraint profile, a very simplified example is given below:

(5) Abstract example of identity of constraint profile:

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>a.</td>
<td></td>
<td>*</td>
<td>**</td>
</tr>
<tr>
<td>b.</td>
<td></td>
<td>*</td>
<td>**</td>
</tr>
<tr>
<td>c.</td>
<td>*</td>
<td></td>
<td>**</td>
</tr>
</tbody>
</table>

Table 5 above shows one single competition with the three candidates C1, C2, and C3, and an extremely small grammar consisting of only three constraints, A, B, and C with the ranking A > B > C. Candidate C3, which violates the highest ranking constraint A. As both remaining candidates C1 and C2 have exactly the same constraint profile (they both violate constraint A once, constraint B not at all, and constraint C twice) and as this constraint profile is optimal (they fare better than C3 on the highest constraint on which they differ), both C1 and C2 are grammatical.

This approach is quite plausible for a small grammar, as in (5), but with a larger number of constraints it is unlikely that the optimal candidates are not distinguished by any constraint at all.

It is extremely difficult to keep an identical constraint profile of two (or more) candidates. For this reason, identity of constraint profile should not be seen as an independent approach to account for all cases of optionality, but merely as a theoretical possibility that is not sufficient on its own for most cases.

3.2 Constraint Ties

One additional assumption that is made in the literature to account for optionality is the possibility of constraint ties. Constraints that are tied are equally important, i.e., two (or more) competing candidates may differ with respect to the tied constraints but can nevertheless both (all) be optimal.

The notion of “constraint tie” is not used uniformly: At least five different concepts of tie can be found in the literature (see Müller 1999 for an overview). Prince & Smolensky (1993: 5), fn. 31 briefly mention the possibility of constraint ties and open the door to different interpretations:

(6) It is entirely conceivable that the grammar should recognize non-ranking of pairs of constraints, but this opens up the possibility of crucial non-ranking (either can dominate the other; both rankings are allowed), for which we have not yet found evidence.

I will continue by concentrating on two quite common notions of tie that are in accordance with Prince & Smolensky’s considerations. I will call them local ties and global ties. Local ties can be seen as special types of constraints and global ties as underspecifications of different constraint rankings, i.e., in a language with a global tie, multiple constraint rankings co-exist.1

3.2.1 Local Ties

Local ties follow one of the notions mentioned in Prince & Smolensky (1993: 51), namely, the “crucial non-ranking” of constraints.

With the type of local tie that I will introduce (see Müller 1997 for a crucial application), tied constraints count as a single constraint, i.e., “a candidate violates a tie if it violates a constraint that is part of this tie, and multiple violations add up” (Müller 1999: 6). A simplified abstract example is given in (7):
Two (or more) competing candidates are grammatical if they are optimal under one possible resolution of the tie. This means, contrary to what is the case with local ties, that the optimal candidates may show a different constraint profile below the tied constraint.

In (8) I give an abstract example of a global tie in the underspecified form. The resolutions of the tie are given in (9) and (10) below.

As before, the candidates C₁ and C₂ are both grammatical in their competition. In contrast to table (5), the simplified grammar this time includes a local tie of the constraints A and B (A ↔ B). Candidate C₁ violates both part A and part B of the tied constraint once and candidate C₂ violates part A twice but part B not at all. Added up, both candidates violate the tied constraint A ↔ B twice. On the lowest ranked constraint, C, the candidates C₁ and C₂ behave alike. They both violate it twice. Although the sole competing candidate C₂ does not violate constraint C, it is nevertheless suboptimal as it fares the worst on the highest ranking constraint on which the candidates differ, i.e., the tied constraint, which it violates three times.

In the local tie approach, the optimal candidates may differ, contrary to in the "identity of constraint profile" approach. But even here, they differ only to a certain extent, namely, on the tied constraint itself. The optionality would break down if the optimal candidates differed on constraint C or any other constraint below the tie.

Both accounts introduced so far have in common that they allow for optionality only if the constraint profile of the candidates in question is exactly (or nearly) the same. Apart from the improbability of this, cases can be found in which the optimal candidates look much more different than would be expected under such accounts. Examples will be discussed in the following sections. They suggest a necessity for other accounts of optionality.

3.2.2 Global Ties

The concept of global ties follows another consideration in Prince & Smolensky (1993: 51), namely, that "... both rankings are allowed" (see, e.g., Ackema & Neeleman 1995 for an application).

As mentioned above, a constraint ranking with a global tie A ↔ B is an underspecification and stands for two rankings: The constraint hierarchy splits into two rankings from the constraint tie A ↔ B onwards. Under one ranking, constraint A dominates constraint B, and under the opposite ranking, constraint B dominates constraint A (for a formal definition of global tie see Müller 1999: 5).

Under this resolution of the tie candidate C₁ is optimal. Candidate C₂ fatally
violates the highest ranking constraint 3 and candidate C3 fatally violates constraint A, on which it differs from candidate C. It does not matter that the optimal candidate C1 violates the constraints A and C more often than C2.

Global ties allow a greater number of differences in the constraint profiles of optimal candidates than the two other approaches introduced so far. Compared to the local tie approach, the optimal candidates may differ not only on the tied constraint itself, but even on constraints below the tie. This is necessary to account for the data sets shown in this paper.

The global tie approach, however, is not the only one that allows a greater number of differences in the constraint profile of two optimal candidates. Another approach with the same effect is introduced below, the so-called neutralization approach (see Legendre et al. 1995, 1998 and Baković & Keer 1999).

3.3 Neutralization

All accounts of optionality that I have introduced so far assume that two (or more) grammatical candidates are optimal in one and the same competition. The main idea of the neutralization account, however, is that the optimal candidates win different competitions, i.e., that they are not built from the same input (although they may be included in each other's constituent sets by GEN).

A crucial assumption for the neutralization approach to optionality is that the relevant inputs differ only minimally with respect to e.g., functional features (Baković & Keer 1999); otherwise, they are identical. The contrasts in the input are either preserved in the output (apparent optionality) or neutralized depending on the constraint ranking of the language.

Neutralization equals a "breakdown" of optionality: A candidate is optimal not only in a candidate set in which it is faithful to the input, but also in a candidate set in which it is unfaithful. This is the case when the unfaithful candidate blocks the faithful one due to a higher ranked (markedness) constraint, i.e., a difference in the input is neutralized in the output; hence the name "neutralization" for the whole approach.

An abstract example of both (apparent) optionality and neutralization is given in (11). The table is taken from Baković & Keer (1999) (figure 1).

(11) Abstract example of neutralization

\[
\begin{array}{c|c|c}
\text{FAITH} & \text{MARKEDNESS} & \text{MARKEDNESS} \gg \text{FAITH} \\
\hline
\text{INPUTS} & \text{OUTPUTS} & \text{INPUTS} \gg \text{OUTPUTS} \\
1_1 & \rightarrow O_1 & 1_1 \rightarrow O_1 \\
1_2 & \rightarrow O_2 & 1_2 \\
\end{array}
\]

Assume an abstract example in which the faithfulness constraint (FAITH) requires faithfulness to the input, and in which the markedness constraint does not allow the occurrence of a feature X in the output *feature X*. Assume further that input 1; differs from input 11 only in that it contains a feature X. When the faithfulness constraint is ranked above the markedness constraint (see lefthand side of the table) it is more important to be faithful to the input than to obey the markedness requirements. In this case, feature X of input 11 would occur in output O1 in the second competition. In the first, separate competition (with the input 1;), output O1 is optimal (without feature X which was not specified in 11). As feature X is the only difference between O1 and O2, (apparent) optionality occurs, although O1 and O2 are optimal in different competitions.

The righthand side of the table shows the mechanism of neutralization. Here, the markedness constraint is ranked higher than the faithfulness constraint. Under the assumption that everything else remains equal, it is now more important to fulfill the markedness requirements than to be faithful to the input. In the case at hand, the marked feature X that was present in 12 does not show up in the output. But now the output of 12 equals the output of a different competition, namely, that of 11, which was not specified for feature X from the beginning. In this case, feature specifications in the input are neutralized in the output.

In what follows, I will concentrate on global ties and neutralization.

Of all the approaches that I have introduced in this section, these two are similar enough to account for the same type of data, namely, data where the two optimal candidates differ greatly. Three sets of data will be checked to see whether both approaches can account for them, whether they are both needed, or whether one approach is superfluous.

4 English Complementizer Optionality

The first set of data in the comparison between the global tie approach and the neutralization approach comes from complementizer optionality in English.
A typical example of the optionality of complementizer drop is given in the embedded object clauses in (12):³

(12) a. Do you think \( \text{CP} \) that \( \text{IP} \) Jane looks like Mary?  
    b. Do you think \( \text{IP} \) Jane looks like Mary?

For these kinds of data, accounts in terms of neutralization have been proposed in the literature (Legendre et al. 1995, Baković & Keer 1999, Kurafuji 1997). I will proceed as follows: First, I will introduce a neutralization account based on those already proposed, and later on, I will give a new approach in terms of global ties that can account for the data as well.

4.1 The Constraints

The constraints that I will use are mostly taken from Baković & Keer (1999) and Kurafuji (1997),⁴ whose approaches I will combine. The constraints that will become relevant in this section are given below:³

(13) \( \ast \text{EXP} \): Expletives (e.g., complementizers).⁶  
(14) \text{FAITH}[\text{COMP}]: The output value of \( \text{[COMP]} \) is the same as the input value.  
(15) \text{PURE-EP}: Purity of Extended Projection: No adjunction to (and no movement into the head of) a subordinate clause (see Grimshaw 1997: 374).

4.2 The Two Approaches

English shows an alternation of optionality, obligatoriness and ineffability of complementizers, depending on the context. An example of optionality and one of obligatoriness of complementizers will be given below.⁷

4.2.1 The Neutralization Approach

The question of how the input is defined³ becomes very relevant for the neutralization approach because, under this approach, optionality is explicitly connected with faithfulness to the input.

The input in OT-syntax can be defined in the following way: "... a lexical head plus its argument structure (...) plus a specification of the associated tense ..." (Grimshaw 1997: 375f.). It is crucial for the neutralization approach to optionality that Baković & Keer (1999) add functional features like \( [+/-\text{COMP}] \) to this definition.

Furthermore, Baković & Keer (1999) need to assume the following:

- Embedded clauses with \( \text{that} \) are CPs and those without \( \text{that} \) are IPs.
- Embedded CPs and IPs differ in their specification for a feature \( \text{[COMP]} \).
- Bridge verbs like think can be equipped with either a \( [+\text{COMP}] \) or a \( [-\text{COMP}] \) feature; \( [+\text{COMP}] \) requires a CP and \( [-\text{COMP}] \) requires an IP.

The relevant faithfulness constraint that refers to the \( \text{COMP} \) feature is \text{FAITH}[\text{COMP}] and the relevant markedness constraint is \( \ast \text{EXP} \), which is violated in the presence of a complementizer.

In the neutralization approach, optionality of complementizers is due both to the existence of two inputs that differ only in their feature specification for \( \text{[COMP]} \) and to the ranking of \text{FAITH}[\text{COMP}] above the markedness constraint \( \ast \text{EXP} \).

The relevant ranking is given in (16):⁹

(16) \text{PURE-EP} \gg \text{FAITH}[\text{COMP}] \gg \ast \text{EXP}  

In the first relevant competition, think is equipped with a \( [+\text{COMP}] \) feature. The tableau is given in (17):¹⁰

(17) Input: ... think\([+\text{COMP}]\) ...

<table>
<thead>
<tr>
<th>a. ... think ( \text{CP} ) that ( \text{IP} ) ...</th>
<th>Pure-EP</th>
<th>Faith[COMP]</th>
<th>( \ast \text{EXP} )</th>
</tr>
</thead>
<tbody>
<tr>
<td>b. ... think ( \text{IP} ) ...</td>
<td>( \ast )</td>
<td>!</td>
<td>!</td>
</tr>
</tbody>
</table>

In this competition, candidate (a) with a complementizer is optimal although it violates the markedness constraint \( \ast \text{EXP} \). Contrary to its competitor (b) without a complementizer, it does not violate the higher ranked faithfulness constraint \text{FAITH}[\text{COMP}].

When, however, the specification in the input is \( [-\text{COMP}] \), then the result is different, as can be seen in (18):
This time, candidate (b) without a complementizer is faithful to the input and therefore optimal in the competition.

So far, it has been shown that the neutralization approach can account for optionality: Optionality is the result of faithfulness to slightly different input specifications.

4.2.2 The Global Tie Approach

In this section, I give a new account (in terms of global ties) for the same data. Contrary to the neutralization approach, two (or more) candidates emerge as optimal in one and the same competition in the global tie approach. Another difference concerns the role of the input, which does not need to be as explicitly specified. In all global tie accounts in syntax that I am aware of (Ackema & Neeleman 1995 and 1998, Broekhuis & Dekkers 1999, Schmid 1998 and 1999), markedness constraints are the only constraints that are needed to account for optionality. Faithfulness constraints sensitive to functional features seem not to be necessary.

When instead of the faithfulness constraint a markedness constraint is introduced that contradicts *Exp, and when these two constraints are tied, optionality can be accounted for. I assume that the markedness constraint in question is HAVE (CP), which requires a clause to be a CP (because, e.g., only there the information about sentence mood can be stored).

(19) HAVE (CP): A C-projection is obligatory in a clause.

The relevant ranking is shown below:

(20) Pure-EP >> HAVE (CP) >> *Exp

When the input sensitive faithfulness constraint is not crucial anymore, then it does not matter if the input is specified for [+COMP] or [+COMP]]. As markedness constraints make the decision, the result would be the same in either case.

The competition with a global tie (unresolved) is shown in (21):

(21) Global ties

<table>
<thead>
<tr>
<th>Pure-EP</th>
<th>HAVE (CP)</th>
<th>*Exp</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. ... think [CP that] [IP ...]</td>
<td>*!</td>
<td>*</td>
</tr>
</tbody>
</table>
| b. ... think [IP ...] | * | *

Under the resolution of the tie in which HAVE (CP) dominates *Exp, candidate (a) (with a complementizer) is optimal, and under the opposite resolution of the tie, candidate (b) (without a complementizer) is optimal.

In this section I have shown that both approaches can account for optionality. But what about cases in which the neutralization part of the neutralization approach becomes relevant? In the next section I illustrate how both approaches can handle obligatoryness of complementizers in a certain context.

4.3 Complementizer Obligatoriness in Complements with Adjunction

One context in which complementizers become obligatory for most speakers (see, e.g., Grimshaw 1997: 411) is sentential complements with adjunction. This is shown in (22), which is taken from Baković & Keer (1999), ex. (4).

(22) a. I think [CP that on him, no coat looks good t]  
    b. *I think [IP on him, no coat looks good t]

To account for cases like these, the constraint Pure-EP, inactive so far, becomes relevant. One part of Pure-EP prohibits adjunction to the highest projection of a subordinately clause. The CP that is introduced by the complementizer can function as a "shelter" for adjunction. When it is present, the projection to which the adjunction takes place is no longer the highest projection of the subordinately clause.

In the neutralization approach, Pure-EP is the markedness constraint that is responsible for neutralizing different feature specifications in the input to only one output specification when it is ranked above the relevant faithfulness constraint. No matter what the feature specification in the input, the output will always show a complementizer. This can be seen in the tableaux below.

In (23), the input is specified for [+COMP]:

<table>
<thead>
<tr>
<th>Pure-EP</th>
<th>HAVE (CP)</th>
<th>*Exp</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. ... think [CP that] [IP ...]</td>
<td>*!</td>
<td>*</td>
</tr>
</tbody>
</table>
| b. ... think [IP ...] | * | *
The complementizer in the faithful candidate (a) violates *EXP. Nevertheless, this candidate is optimal. Compared to its competitor (b) it does not violate FAITH[COMP] just as before (see tableau (17)). The only difference is an additional violation of PURE-EP by candidate (b) this time.

More interesting is the real neutralization case, in which the input is specified for [−COMP] and the output nevertheless shows a complementizer due to the highly ranked PURE-EP:

Again, candidate (a) (with a complementizer) is optimal although this time, it is unfaithful to the input. The decision is made by the highly ranked PURE-EP, which is obeyed by candidate (a) but violated by the faithful candidate (b). The optimal candidates (23-a) and (24-a) are identical outputs derived from different inputs ("derivational ambiguity").

As far as the global tie approach is concerned, obligatoriness of complementizers can be accounted for as well. The highly ranked PURE-EP determines the outcome, just as with neutralization, see (25):

The decision is made above the tie at PURE-EP, favouring candidate (a) with a complementizer.

In this section I have shown that cases of complementizer optionality and obligatoriness which have been accounted for under the neutralization approach in the literature can be accounted for just as well under the global tie approach. Note that *EXP, which is crucial for the global tie approach, is superfluous for the neutralization approach – at least for the cases that have been looked at here.

5 French Root Questions

The second set of data comes from French, in which wh-movement of argument XPs is optional in root questions. This time, an approach in terms of global ties is given in the literature; see Ackema & Neeleman (1995, 1998). As analysis along these lines will be introduced and taken as the basis for an account in terms of neutralization. The relevant set of data is given below:

As shown in (26) there are (at least) three possible ways of forming a root question in French. Example (a) shows wh-movement and subject-auxiliary inversion. In example (b) the wh-element remains in situ and in example (c) it is moved again, but this time without subject-auxiliary inversion. The only ungrammatical example is subject-auxiliary inversion without wh-movement as shown in (d). It is often assumed that (a) occurs in standard French and (b) and (c) in colloquial French (see, e.g., Confas 1985: 175). Unlike Ackema & Neeleman (1995), who are mainly interested in the optionality between (a) and (b), I will derive optionality inside the same register, i.e., between (a) and (c), in the following.

5.1 The Constraints

The relevant constraints from Ackema & Neeleman (1995, 1998) are shown below:

Every node crossed by movement creates a "*".
(28) Q-MARK: Q-marking: in a question, assign a [+Q] feature to the constituent corresponding to the proposition.

That is, the VP must be marked by a lexical X with a [+Q] feature. This [+Q] feature is assigned via sisterhood by a wh-element in Spec XP. In root clauses, this constraint can only be obeyed by a combination of wh-movement and X movement.

(29) Q-SCOPE: [+Q] elements must c-command the constituent corresponding to the proposition.

This constraint functions as a trigger for wh-movement.

5.2 The Global Tie Approach

First, I will introduce an account in terms of global ties along the lines of Ackema & Neeleman (1995). I will assume a global tie between SPC, which restricts movement, and Q-SCOPE, which potentially triggers movement.¹⁷

The input of the relevant competition is not explicitly defined by Ackema & Neeleman (1995, 1998). They implicitly assume, however, that a wh-(question)pronoun always bears a Q-feature. Whether this feature has to be in the input or may be added by CEN is not directly relevant for the global tie approach.

5.2.1 Standard French

In standard French, the markedness constraint Q-MARK will be ranked above the tie as shown in (30):

(30) Q-MARK \(\gg\) SPC \(\ll\) Q-SCOPE

The following tableaux (for standard French and for colloquial French below) are underspecified, representing two subtableaux simultaneously:

<table>
<thead>
<tr>
<th>a. Qui₁₉ as₂-tu t₂ v u t₁</th>
<th>Q-MARK</th>
<th>SPC</th>
<th>Q-SCOPE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Qu₁₉ as₂-tu t₂ v u t₁</td>
<td>✳✳✳✳✳✳</td>
<td>✳✳</td>
<td>✳</td>
</tr>
<tr>
<td>b. Tu as v u qui</td>
<td>✳</td>
<td>✳</td>
<td>✳</td>
</tr>
<tr>
<td>c. Qui₁₉ tu as v u t₁</td>
<td>✳</td>
<td>✳</td>
<td>✳</td>
</tr>
<tr>
<td>d. As₁₉-tu t₁ v u qui</td>
<td>✳</td>
<td>✳</td>
<td>✳</td>
</tr>
</tbody>
</table>

In standard French, only candidate (a) with movement of both the wh-phrase and the auxiliary is optimal. The highly ranked Q-MARK requiring both wh-movement and verb movement eliminates any other candidate, independently of the resolution of the tie.

5.2.2 Colloquial French

Now assume that the only difference between the two registers (i.e., the only one relevant for the case at hand) is the position of Q-MARK. Contrary to standard French, in which it is highly ranked, it is ranked below the tie in colloquial French:¹⁸

(32) SPC \(\ll\) Q-SCOPE \(\gg\) Q-MARK

(33) Colloquial French: global ties

<table>
<thead>
<tr>
<th>a. Qui₁₉ as₂-tu t₂ v u t₁</th>
<th>SPC</th>
<th>Q-SCOPE</th>
<th>Q-MARK</th>
</tr>
</thead>
<tbody>
<tr>
<td>Qu₁₉ as₂-tu t₂ v u t₁</td>
<td>✳(✳)</td>
<td>✳(✳)</td>
<td>✳(✳)</td>
</tr>
<tr>
<td>b. Tu as v u qui</td>
<td>✳(✳)*</td>
<td>✳</td>
<td>✳(✳)</td>
</tr>
<tr>
<td>c. Qui₁₉ tu as v u t₁</td>
<td>✳(✳)*</td>
<td>✳</td>
<td>✳(✳)</td>
</tr>
<tr>
<td>d. As₁₉-tu t₁ v u qui</td>
<td>✳(✳)*</td>
<td>✳</td>
<td>✳(✳)</td>
</tr>
</tbody>
</table>

Under one resolution of the constraint tie (SPC \(\ll\) Q-SCOPE), the requirement to minimize movement paths is more important than the need to fulfill scoping requirements via movement. Therefore, under this ranking, candidate (b) without wh-movement is optimal. Under the opposite ranking (Q-SCOPE \(\gg\) SPC), however, candidate (c) emerges as optimal because it respects Q-SCOPE with the shortest possible movement path.¹⁵

Thus, the global tie between two constraints can account for the optimality of wh-movement in colloquial French.²⁰

5.3 The Neutralization Approach

For the new account in terms of neutralization, a faithfulness constraint must be introduced that is sensitive to an input feature. In the case at hand, the presence vs. absence of this feature in connection with the placement of the faithfulness constraint reflects the presence vs. absence of wh-movement. I assume the feature to be [Q] and the relevant faithfulness constraint to be:

(34) **FAITH[Q]:** The output value of [Q] is the same as the input value.
The assumption will be that |Q| is a purely syntactic feature that may (+) or may not (−) be connected with a wh-question element in the input.

Note that it is crucial for the approach that the occurrence and interpretation of a wh-element is independent of its bearing a |Q|-feature or not. It must be possible to interpret even a wh-element in situ without a |Q|-feature as a question.²¹

5.3.1 Standard French

The markedness constraint Q-MARK is as highly ranked as in the global tie approach. In the neutralization approach, it is crucial that Q-MARK outranks the faithfulness constraint FAITH[Q]. The relevant parts of the constraint ranking are given below:

(35) Q-MARK ∨ FAITH[Q], and Q-MARK ∨ SPC

Under the assumption that the functional feature |Q| may be freely inserted in the input, more candidates than before need to be looked at. For all four candidates (a-d) a phonetically identical counterpart exists that differs only in the feature specification of the wh-element. These “counterpart candidates” are included in the tableau below.

The presence of a |Q|-feature on a wh-element will be marked by (+) and the absence of a |Q|-feature by (−).

In the input of the first competition, the wh-element is equipped with a |Q|-feature.

(36) Input: [+Q]

<table>
<thead>
<tr>
<th>Input: [+Q]</th>
<th>Q-MARK</th>
<th>FAITH[Q]</th>
<th>Q-SCOPE</th>
<th>SPC</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Qu[i+1] as₂-tu₁v₁t₁</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>b. Tu as vu qui[−]</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>c. Qu[i+1] tu as vu₁</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>d. As₁-tu₁v₁vu qui[−]</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>e. Qu[i−] as₂-tu₁v₁t₁</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>f. Tu as vu qui[+1]</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>g. Qu[i−] tu as vu₁</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>h. As₁-tu₁v₁vu qui[+1]</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
</tbody>
</table>

Only candidate (a) fulfills the highly ranked constraint Q-MARK by both moving the wh-element and the auxiliary. Therefore, it is optimal despite its many violations of the lower ranked SPC. In this competition, the optimal candidate is faithful to the input. Only the candidates (f) and (h) violate Q-SCOPE. They include a [+Q] element that does not show up in scope position.

As the markedness constraint Q-MARK is ranked above the faithfulness constraint: FAITH[Q], the same candidate will come out as optimal even if there is no |Q|-feature in the input. This is shown in (37):

(37) Input: [−Q] (i.e., no Q)

<table>
<thead>
<tr>
<th>Input: [−Q]</th>
<th>Q-MARK</th>
<th>FAITH[Q]</th>
<th>Q-SCOPE</th>
<th>SPC</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Qu[i+1] as₂-tu₁v₁t₁</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>b. Tu as vu qui[−]</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>c. Qu[i+1] tu as vu₁</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>d. As₁-tu₁v₁vu qui[−]</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>e. Qu[i−] as₂-tu₁v₁t₁</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>f. Tu as vu qui[+1]</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>g. Qu[i−] tu as vu₁</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>h. As₁-tu₁v₁vu qui[+1]</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
</tbody>
</table>

Again, candidate (a) is optimal although this time, it is unfaithful to the input. Only candidate (a) with movement of both the wh-phrase and the auxiliary is optimal in standard French under the neutralization approach – just as under the global tie approach. The highly ranked Q-MARK again eliminates any other candidate and forces a [+Q] element to occur even if it is not present in the input. Different underlying specifications are neutralized in the output.

5.3.2 Colloquial French

In colloquial French, the constraint ranking differs slightly from the one in standard French: As in the global tie approach, Q-MARK, which is highly ranked in standard French, is ranked low in colloquial French. The faithfulness constraint FAITH[Q] must be ranked above all markedness constraints, and among the markedness constraints, Q-SCOPE and SPC have to be ranked above Q-MARK. This is shown in (38):

(38) FAITH[Q] ∨ Q-SCOPE ∨ SPC ∨ Q-MARK

Under this ranking it is guaranteed that distinct feature specifications in the input come out differently in the output. Let us first look at an input in which the wh-element is specified for the |Q|-feature:
Due to reranking, all constraints are necessary in the neutralization approach here. Interestingly, the optionality is lost in embedded clauses.

### 5.4 Neutralization in Embedded Questions

Independently of the register, optionality of *wh*-movement breaks down in embedded questions:

(41) a. \*Je me demande qui\textsubscript{1} as\textsubscript{2}-tu \textsubscript{t\textsubscript{2}} vu \textsubscript{t\textsubscript{1}}  
   1 myself ask who you have seen

b. \*Je me demande tu as vu qui\textsubscript{1}  
   1 myself ask you have seen who

c. Je me demande qui\textsubscript{1} tu as vu \textsubscript{t\textsubscript{1}}  
   1 myself ask who you have seen

d. \*Je me demande as\textsubscript{1}-tu \textsubscript{t\textsubscript{1}} vu qui\textsubscript{1}  
   1 myself ask have-you seen who

Only the candidate with *wh*-movement is grammatical; all other candidates are ungrammatical.

To account for these data, two additional constraints are needed. They were not shown in the tableaux before because they are only active in connection with embedded clauses:

(42) SELECT(ion): Selectional requirements must be satisfied at S-structure (Ackema & Neeleman 1995: 40).

In the case of a matrix verb like *se demander* ("ask oneself") that selects an embedded question, SELECT is satisfied when the highest projection of the embedded clause carries a Q-feature\(^{23}\).

PURE-EP, which has already been introduced in section 4, will become crucial in standard French. It is repeated in (43):

(43) PURE-EP: Purity of Extended Projection: No adjunction to (and no movement into the head of) a subordinate clause (Grimshaw 1997: 374).

In both types of French (standard and colloquial) I assume SELECT and PURE-EP to be ranked above the other constraints, whose order, of course, remains the same as before. Only in standard French, however, is the ranking of PURE-EP crucial.
5.4.1 Standard French

Let us first look at a competition of standard French with a [Q]-feature in the input.\textsuperscript{24} It is crucial that \textit{PURE-EP} is ranked above \textit{Q-MARK} (cf. Grimshaw 1997 for the basic argument):

\begin{equation}
\text{Input: } Je\textit{ me demande ... }[+Q] ...
\end{equation}

<table>
<thead>
<tr>
<th>SELECT</th>
<th>PURE</th>
<th>Q-MARK</th>
<th>FAITH</th>
<th>SPC</th>
<th>Q-SCOPE</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. qui[t]\textsuperscript{q} as\textsuperscript{2}-tu\textsuperscript{t} vu\textsuperscript{t} t\textsubscript{1}</td>
<td>*!</td>
<td>*</td>
<td>**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. tu as vu qui[t]\textsuperscript{-}\textsuperscript{1}</td>
<td>*!</td>
<td>*</td>
<td>*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. qui[t]\textsuperscript{q} tu as vu t\textsuperscript{t} t\textsubscript{1}</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>d. as\textsuperscript{2}-tu\textsuperscript{t} t\textsubscript{1} vu qui[t]\textsuperscript{-}\textsuperscript{1}</td>
<td>*!</td>
<td>*</td>
<td>*</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The faithful candidate (c) with the [Q]-feature on the moved \textit{wh}-element is the optimal one. It is the only candidate that fulfills the highly ranked SELECT (the highest projection carries a [Q]-feature as demanded by the matrix verb) and \textit{PURE-EP} (no movement into the head of the highest embedded projection).

Nevertheless, with an input that does not show a [Q]-feature on the \textit{wh}-element, the same optimal candidate will result:

\begin{equation}
\text{Input: } Je\textit{ me demande ... }[-Q] ... (i.e., no Q)
\end{equation}

<table>
<thead>
<tr>
<th>SELECT</th>
<th>PURE</th>
<th>Q-MARK</th>
<th>FAITH</th>
<th>SPC</th>
<th>Q-SCOPE</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. qui[t]\textsuperscript{q} as\textsuperscript{2}-tu\textsuperscript{t} vu\textsuperscript{t} t\textsubscript{1}</td>
<td>*!</td>
<td>*</td>
<td>*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. tu as vu qui[t]\textsuperscript{-}\textsuperscript{1}</td>
<td>*!</td>
<td>*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. qui[t]\textsuperscript{q} tu as vu t\textsuperscript{t} t\textsubscript{1}</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>d. as\textsuperscript{2}-tu\textsuperscript{t} t\textsubscript{1} vu qui[t]\textsuperscript{-}\textsuperscript{1}</td>
<td>*!</td>
<td>*</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

As before, the highest ranked markedness constraints SELECT and \textit{PURE-EP} make the decision between themselves before \textit{Q-MARK} or the faithfulness constraint are brought into the picture. The only difference from the winner of the competition above is that this time, the optimal candidate is not faithful to the input.

5.4.2 Colloquial French

I will assume that the order of SELECT and \textit{PURE-EP} is the same as in standard French. It is important that SELECT outranks FAITH[Q]. The ranking of \textit{PURE-EP}, however, is not crucial. The remaining constraints are ranked as before in colloquial French (see (38)). Again, I will first look at the competition with a [Q]-feature in the input:

\begin{equation}
\text{Input: } Je\textit{ me demande ... }[+Q] ...
\end{equation}

<table>
<thead>
<tr>
<th>SELECT</th>
<th>PURE</th>
<th>FAITH</th>
<th>Q-SCOPE</th>
<th>SPC</th>
<th>Q-MARK</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. qui[t]\textsuperscript{q} as\textsuperscript{2}-tu\textsuperscript{t} vu\textsuperscript{t} t\textsubscript{1}</td>
<td>*!</td>
<td>*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. tu as vu qui[t]\textsuperscript{-}\textsuperscript{1}</td>
<td>*!</td>
<td>*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. qui[t]\textsuperscript{q} tu as vu t\textsuperscript{t} t\textsubscript{1}</td>
<td>*!</td>
<td>*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>d. as\textsuperscript{2}-tu\textsuperscript{t} t\textsubscript{1} vu qui[t]\textsuperscript{-}\textsuperscript{1}</td>
<td>*!</td>
<td>*</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Due to the highly ranked constraint SELECT, only a candidate with a [Q]-feature on a moved \textit{wh}-element can win the competition. With the given input, one of the faithful candidates (a) or (c) is possible. In the end, candidate (c) comes out as optimal. The movement path of the competing candidate (a) is longer. In addition to \textit{wh}-movement, it moves the auxiliary to the head of the highest projection of the embedded clause, thereby violating \textit{PURE-EP} and SPC more often than the optimal candidate (c).

With an input that does not show a [Q]-feature, the same optimal candidate will still result. What becomes crucial here is the ranking of SELECT above FAITH[Q]. It is responsible for neutralizing the underlying specifications of two different inputs of the feature [Q] to one single output, as shown in (47):

\begin{equation}
\text{Input: } Je\textit{ me demande ... }[-Q] ... (i.e., no Q)
\end{equation}

<table>
<thead>
<tr>
<th>SELECT</th>
<th>PURE</th>
<th>FAITH</th>
<th>Q-SCOPE</th>
<th>SPC</th>
<th>Q-MARK</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. qui[t]\textsuperscript{q} as\textsuperscript{2}-tu\textsuperscript{t} vu\textsuperscript{t} t\textsubscript{1}</td>
<td>*!</td>
<td>*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. tu as vu qui[t]\textsuperscript{-}\textsuperscript{1}</td>
<td>*!</td>
<td>*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. qui[t]\textsuperscript{q} tu as vu t\textsuperscript{t} t\textsubscript{1}</td>
<td>*!</td>
<td>*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>d. as\textsuperscript{2}-tu\textsuperscript{t} t\textsubscript{1} vu qui[t]\textsuperscript{-}\textsuperscript{1}</td>
<td>*!</td>
<td>*</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The optionality of \textit{wh}-movement that can be seen in root questions in colloquial French is blocked in embedded questions. This is due to the high ranking of SELECT (crucially above FAITH[Q]). Irrespective of the input, it requires the highest projection of the embedded clause to carry a [Q]-feature (in the case of embedded questions that are selected by, e.g., \textit{se demander}). This forces the optimal candidate to be unfaithful to its input. Of the unfaithful candidates, (c) wins for the same reason as before: It has one (crucial) movement less than its competitor, candidate (a).
The global tie approach can account for the breakdown of optionality in embedded questions along the same lines. The only thing to do is to rank the constraints SELECT and PURE-EP above the global tie.

The topic of this section was the optionality of wh-movement in root questions in colloquial French and its breakdown in standard French and in embedded questions of both registers. For these kind of data, an account along the lines of the global tie approach has been suggested in the literature. The neutralization approach, however, which was introduced here, turns out to account for the data as well.

6 IPP in German

The last set of data comes from IPP constructions in German. They may be optional, depending on the verb class involved. IPP is short for Infinitivus Pro Participio, which denotes a bare infinitive that, in a certain context replaces the expected past participle in some West Germanic languages. Simplifying a bit, this context is given in the perfect tense, when the verb that is selected by the temporal auxiliary takes a VP complement itself. IPP cases in German only occur with a particular word order: The auxiliary, which normally follows its complement verb in embedded sentences, precedes it. The connection between verb form and verb order is shown in (48) with the perception verb hören (‘hear’). Perception verbs optionally occur either in the IPP, with the finite auxiliary hat (‘has’) preceding the other verbs, or as the past participle in the “normal” verb order, with the finite auxiliary at the end.

Optionality of IPP with perception verbs:

(48) a. *... dass sie ihn singen hören hat that she him sing hear-inf has
b. ... dass sie ihn hat singen hören that she him has sing hear-inf
c. ... dass sie ihn singen gehört hat that she him sing heard-pastp has
d. *... dass sie ihn hat singen gehört that she him has sing heard-pastp

I have looked at these data in some detail in Schmid (998, 1999). Again, they can be analysed in both ways: either with the global tie approach or with the neutralization approach.

6.1 The Constraints

The following constraints will become relevant below (see Schmid 1998, 1999):

(49) MORPH: (morphological selection):
Morphological selectional properties of lexical items must be observed.

An example of a morphological selectional property is that a present perfect auxiliary in German selects a complement headed by a past participle. MORPH will be violated whenever the complement of a lexical item does not occur in the right (i.e., selected) form, as is the case with IPP.

(50) *PASTP/VP/V (‘V-complement of a past participle of perception verbs): A past participle of perception verbs may not take a verbal complement. This is the constraint that may act as a trigger for IPP.

(51) HD-LFT (head left): The base position of a head is immediately to the left of its complement.

(52) HD-RT (head right): The base position of a head is immediately to the right of its complement.

(53) HD-LFT &D MORPH; HD-LFT and MORPH may not be violated in the same domain D, i.e., HD-LFT &D MORPH is violated iff HD-LFT is violated & MORPH is violated in the same domain. A complex constraint like (53) is called a “Local Conjunction” (see Smolensky 1995, 1997). It can be defined as follows (Legendre et al. 1998: 262):

(54) Local Conjunction:

a. Given two constraints C1 and C2, their Local Conjunction with respect to a domain type D, C1 &D C2, is a new constraint which is violated when two distinct violations of C1 and C2 occur within a single domain of type D.

b. Universal ranking: C1 &D C2 ≫ C1, C2
6.2 The Global Tie Approach

One possibility to account for the data is in terms of the global tie approach (see Schmid 1999). I will assume that the constraint that demands the occurrence of a selected past participle (MORPH) is tied with the constraint that may demand the replacement of a past participle under certain conditions (*PASTP/PV/+V). Other crucial rankings are: HD-LFT & MORPH outranks HD-RT, HD-RT outranks HD-LFT, and the tied constraints outrank HD-RT. One possible (still underspecified) ranking is given in (55):

(55) HD-LFT & MORPH ⇒ MORPH ⇔ *PASTP/PV/+V ⇒ HD-RT ⇒ HD-LFT

A competition with the above constraint ranking is shown below. The competing candidates result from the manipulation of the verb form and of the order of the lexical items by GEN. 30

(56) Global ties

<table>
<thead>
<tr>
<th></th>
<th>HD-LFT &amp; MORPH</th>
<th>MORPH *PASTP/PV/+V</th>
<th>HD-RT</th>
<th>HD-LFT</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. singen hören hat</td>
<td>*!</td>
<td>*</td>
<td>***</td>
<td></td>
</tr>
<tr>
<td>b. hat singen hören</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>c. singen gehört hat</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>d. hat singen gehört</td>
<td>*</td>
<td>*!</td>
<td>*</td>
<td></td>
</tr>
</tbody>
</table>

Under one resolution of the tie (MORPH ⇒ *PASTP/PV/+V), it is more important to observe the morphological selectional properties of the temporal auxiliary hat than to obey the constraint against past participles in a certain context. Therefore, under this ranking, candidate (c) with the perception verb in the past participle is optimal (the other candidate with the past participle, (d), fatally violates HD-RT).

Under the opposite resolution of the tie (*PASTP/PV/+V ⇒ MORPH), a candidate with the perception verb in the bare infinitive (i.e., IPP) is optimal. It does not violate the highly ranked *PASTP/PV/+V. Of the two candidates with IPP, candidate (b) is optimal. Its competitor (a) fatally violates the conjoined constraint (hat "has") is on the right side of its complement, i.e., it violates HD-LFT, and its complement hören ("hear") occurs in the bare infinitive, i.e., it violates MORPH). Candidate (b), however, only violates one part of the conjoined constraint (MORPH), which is not enough to violate it as a whole.

Note that the two optimal candidates differ in their constraint profile below the tie. It is therefore crucial that the tie is global and not local.

6.3 The Neutralization Approach

For the neutralization approach to work, an additional faithfulness constraint is needed. 31

(57) FAITH(PASTP): When a past participle is specified in the input, then it must occur in the output and vice versa.

It is necessary that there are inputs that differ only with respect to their specification for the past participle. To allow for optionality, it is crucial that FAITH(PASTP) be ranked above the relevant markedness constraint, namely *PASTP/PV/+V:

(58) Relevant part of the ranking:

... FAITH(PASTP) ⇒ *PASTP/PV/+V ...

I will first look at a competition in which the input is specified for the past participle (marked by the past participle prefix [ge-]):

(59) Input: Past participle

<table>
<thead>
<tr>
<th></th>
<th>HD-LFT &amp; MORPH</th>
<th>FAITH(PASTP)</th>
<th>*PASTP/PV/+V</th>
<th>HD-RT</th>
<th>HD-LFT</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. singen hören hat</td>
<td>*!</td>
<td>*</td>
<td>*</td>
<td>***</td>
<td></td>
</tr>
<tr>
<td>b. hat singen hören</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>***</td>
<td></td>
</tr>
<tr>
<td>c. singen gehört hat</td>
<td>*!</td>
<td>*</td>
<td>*</td>
<td>***</td>
<td></td>
</tr>
<tr>
<td>d. hat singen gehört</td>
<td>*</td>
<td>*</td>
<td>*!</td>
<td>*</td>
<td></td>
</tr>
</tbody>
</table>

The winner in this competition is the faithful candidate (c) with the perception verb in the past participle and the temporal auxiliary following the other verbs. Although it violates the markedness constraint *PASTP/PV/+V, it is optimal due to the higher ranking of the faithfulness constraint.

Likewise, due to this ranking, a different winner emerges when the input is not specified for a past participle, as shown in (60):
In this competition, too, the winner is faithful to the input, i.e., this time, the perception verb occurs in the bare infinitive and not in the past participle. As candidate (a) fatally violates the conjoined constraint, candidate (b) emerges as optimal, with IPP and the auxiliary on the left side of its complement.

The result of section 6 is the same as before: Again, both the global tie approach and the neutralization approach can account for the data.

7 Advantages and Disadvantages of the Two Approaches

The reason for the discussion of the global tie approach and the neutralization approach in this paper is their ability to account for the same kind of data (which are difficult or impossible to account for under other approaches, like identity of constraint profile and local ties):

- Both approaches can handle cases of optionality in which the optimal candidates seem to differ in many respects (i.e., they are more impervious to differences lower down in the constraint hierarchy).
- Both approaches can account not only for optionality, but also for its “breakdown” in certain contexts (i.e., alternation).

The similarities of the two accounts of optionality given in this paper suggest that the neutralization approach may easily be translated into the global tie approach and vice versa. Some considerations on possible “translation rules” are given below:

- From the neutralization approach into the global tie approach:
  The markedness constraint (e.g., *EXP in section 4) that was crucially outranked by the relevant faithfulness constraint (e.g., FAITH(COMP)) in the neutralization approach will form a tie with a conflicting markedness constraint (e.g., HAVE (CP)). The faithfulness constraint is then either abandoned or ranked below the global tie. As the decision about the optimal candidate(s) in a competition is now made by markedness constraints alone, it does not matter which feature specification is given in the input.\(^\text{32}\)

- From the global tie approach into the neutralization approach:
  In the other direction, the relevant faithfulness constraint (e.g., FAITH(COMP)) in section 4 must be ranked above the markedness constraints that form the global tie (e.g., HAVE (CP) and *EXP). The tie is then no longer needed. It is crucial that the faithfulness constraint is sensitive to a functional feature (e.g., [COMP]) whose presence or absence is the only distinction between the inputs.

To sum up, it can be said that a global tie of two markedness constraints, one of which, say M1, prohibits [x] and the other of which, say M2, demands [x], has the same effect as a faithfulness constraint F which is sensitive to [x] and outranks the markedness constraints. This is so because F on its own either demands or prohibits [x] already, depending on the input. Only one optimal candidate results in both approaches if another relevant markedness constraint outranks either the tie M1 <-> M2 or the faithfulness constraint F.

If it should indeed be the case that the global tie approach and the neutralization approach can always be translated into each other without empirical consequences (as suggested by the examples in this paper),\(^\text{33}\) then it would be preferable to dispense with one of the two approaches to avoid redundancy in the grammar.

The question arises as to which approach should be dispensed with. As the approaches seem to be empirically equivalent, I will list some more conceptual and theoretical internal points below, both for and against each of the approaches.

7.1 The Neutralization Approach

The following points can be presented in favour of the neutralization approach:

- Optionality (and neutralization) comes as a result of the “normal” constraint interaction of faithfulness constraints and markedness constraints. Faithfulness constraints are needed anyway. If there were only markedness constraints in the grammar, the way would be open to “ba” everywhere (see Chomsky 1995: 224, fn. 4).
Neutralization can account for absolute ungrammaticality. By ranking a markedness constraint (M) above a faithfulness constraint (F), even an unfaithful candidate can be optimal in a competition when it differs from the faithful candidate by not violating M (see Legendre et al. 1998: 274f. for neutralization to a candidate with a different LF compared to its input, and Keer & Baković 1999).

The following points may be made against the neutralization approach:

- Candidate sets can become very large as unfaithful candidates must be included to a certain degree.
- Derivational ambiguity: One and the same output can be derived from several different inputs.
- It is neither completely clear what functional features a faithfulness constraint can refer to, nor is it clear whether it is desirable that different specifications of these functional features lead to different inputs.
- GEN must be able to manipulate functional features.
- There is no obvious way to distinguish repair/exceptional forms (cf. IPP) from regular forms.

Note, however, that most of the above points show general properties of an OT system (see, e.g., “richness of the base”). The neutralization approach only makes us more conscious of them.

7.2 The Global Tie Approach

Global ties allow the presence of two (or more) grammars simultaneously. One way to see this complexity as an advantage of the approach is that it may reflect the property of instability that languages show in their development. In studies of language change, it is not unusual to assume the simultaneous presence of two or more grammars (see, e.g., Kroch 1989, Pintzuk 1991). The following points, however, can be raised against the global tie approach:

- Global ties are problematic for learnability, see, e.g., Tesar (1998), who proposes a learning algorithm that builds on a total ranking of constraints. Something else that may complicate language acquisition is the increasing number of possible grammars. The number of grammars containing three constraints is 6 without, and 19 with allowing for the possibility of constraint ties (see Vikner 1999).

- Global ties are also problematic from a conceptual point of view. With one tie, two grammars may be simultaneously present in the mind of a single speaker, increasing to four grammars with two ties, six grammars with three ties, and so on. In addition, the possibility of a tie built by three (or more) constraints is not excluded and would increase the number of simultaneously present grammars enormously, resulting in (at least) six simultaneous grammars (see, e.g., Sells et al. 1995).

Given these considerations I am inclined to favour the neutralization approach over the global tie approach: it exploits the normal OT interaction of markedness constraints and faithfulness constraints, it is conceptually less complex and problematic than global ties and it can account for total ungrammaticality as well.

8 Summary

At first sight, optionality poses a problem for OT. In the OT literature, however, several accounts of optionality can be found. What I wanted to do in this paper was to compare two of these approaches that seem to be able to cover the same kind of data, namely the global tie approach and the neutralization approach. Where an account in terms of neutralization had already been suggested in the literature, I developed an account in terms of global ties and vice versa. Both approaches were applied to three different sets of data: complementizer optionality in English, optionality of wh-movement in French root questions and optionality of IPP constructions in German. The result in all three cases was the same: The approaches are empirically equivalent and can account for both optionality and the breakdown of optionality in certain contexts. If two approaches can account for the same set of data, one of them should be abandoned (for reasons of simplicity, elegance, “economy”). It was argued that the approach to be abandoned should be the global tie approach. The neutralization approach can do the same and more (account for ungrammaticality) without adding new mechanisms to the system. Both accounts increase complexity, but only global ties result in different grammars (i.e., rankings) for one and the same language and thus pose problems for learnability.
Notes

I would like to thank the audience of the Graduiertenkolleg-Workshop in Söllerhaus, June 1999, the audience of WOT 3 at the University of Stuttgart, November 1999 and especially Geroen Müller, Ian Roberts, and Sten Vikner for their suggestions and comments. All remaining shortcomings and errors are mine.

1. "Local" and "global" are the main criteria that Müller 1999: 5ff. use to classify the different concepts of a tie. What I call a local tie is named "conjunctive local tie" in his overview and what I call a global tie is named "ordered global tie". In this article, however, I concentrate on the local-global distinction and, for reasons of simplicity, pick out only one member of each set, leaving aside other distinctions.

2. Neutralization can be used to account for ineffability, another potential problem for an OT analysis; see Legendre et al. 1998 and Baković & Keer 1999.

3. Following Baković & Keer (1999) among many others, I mark the embedded sentence with that as a CP and the embedded sentence without that as an IP.


5. Some other constraints are implicitly assumed but left out of the tableau for reasons of simplicity:

   (i) *Lx-MV*: *Lexical Movement: *Movement of a lexical head.

   (ii) Pr-BD: Proper Binding: *Every trace that e-commands its antecedent.

   The ranking *Lx-MV > Pr-BD* is responsible for the lack of V-to-I movement in English (see Vikner 1999).

   The ranking of the next constraint relative to, e.g., *Exp* is responsible for the (non-)occurrence of a complementizer:

   (iii) Ob-HD: Obligatory Head: *Every empty head.

   For English, the ranking Pure-EF > O3-HD > *Exp* requires the insertion of the complementizer whenever a CP is available.


7. For cases of ineffability of complementizers, see, e.g., Baković & Keer (1999).

8. In general, this is an important but unanswered question in OT.

9. The ranking of Pure-EF above Faith[Comp] will become clear later on, when Pure-EF becomes active.

10. For neutralization account to work, Gen must be quite powerful as it has to be able to manipulate certain (functional) features of the input. It can, for example, add them or delete them.

11. See Prince & Smolensky (1993: 192) for a proposal of a mechanism to determine the optimal input for a given output ("input optimization").

12. In their 1998 paper they eventually reject the global tie analysis in favour of an approach of apparent optionality, i.e., they assume that the optimal candidates belong to different candidate sets.

13. Cases with est-ce que are commonly assumed to behave differently. I will ignore them here.

14. At the end of their 1998 paper Ackema & Neelam also briefly mention optionality in colloquial French (i.e., optionality between (b) and (c)) and sketch an account in terms of optional inclusion of a complementizer in the input which can optionally remain unpronounced.

15. This constraint is called STAY by Ackema & Neelam (1998).

16. Exactly how often a candidate violates SPC depends on specific assumptions about sentence structure.

17. Ackema & Neelam (1995) assume a global tie between SPC and Q-MARK. I will differ from them to be able to account for the optimality of candidate (26-c) with wh-movement but without movement of the auxiliary.

18. Note that different registers (standard, colloquial...) can be thought of as being different resolutions of a global tie (see, e.g., Sells et al. 1996). Under such a view, optionality in French root questions (in both registers) could also be accounted for by a tie of all three of the above constraints. For the sake of convenience, however, I will continue to show different tableaux for standard and colloquial French.

19. As pointed out by a reviewer, this analysis cannot straightforwardly be extended to multiple questions in Colloquial French.

20. Note that the local tie approach would not be sufficient in this case (assuming the constraints above): Candidate (b) violates the tied constraints only once, while candidate (c) violates them three times. Both candidates, however, emerge as optimal.

21. In this case the separation of a syntactic [Q]-feature and a semantic [wh]-feature must be assumed (for a discussion of the difference between these features, see, e.g., Müller 1993: 502 and the references given there).

22. But cf. fn. 18: There might also exist a language with three (or more) winners which could be accounted for by a tie of three (or more) constraints in the global tie approach. In this case, an account in terms of neutralization would be more difficult, at least if the binarity of formal input features should be maintained.

23. A few words are in order concerning the relationship between constraints like Select and Faith[.] (more generally between selectional constraints and faithfulness constraints; see, e.g., the relation between "morphological selection" and Faith[(PastP) in section 6].

These two types of constraints are not as similar as they may seem at first
sight. They may overlap, but they might contradict each other as well, depending on the input. They see the element/feature in question in relation to different entities: Selectional constraints in relation to the selecting element, and faithfulness constraints in relation to the input. Selectional constraints are markedness constraints in the sense that it can be decided whether a candidate fulfills or violates them without knowing the input. To decide, however, whether a faithfulness constraint is violated, the input must be taken into consideration. I will assume in the following that both constraint types are needed in the grammar. However, the question remains as to what the exact relation between them is and where selectional requirements fit into an OT system at all.

24. For the sake of simplicity, I have left out the candidates (c) to (h) of the former tableaux as they will never be optimal.

25. See Bech (1983) for an early and thorough investigation of verbal complementation in German.

26. As pointed out in Schmid (1998, 1999), this constraint is in fact part of a whole constraint subhierarchy sensitive to verb classes.

27. In this case, the domain D consists of a verbal head and its VP-complement.

28. C1 & D C2 is equivalent to a logical disjunction (C1 ∨ C2 in a given domain D), which is to be read as: C1 ∨ C2 is not violated if C1 is not violated ∨ C2 is not violated in D.

29. Note that “Local Conjunction” as defined in (54) is a recursive mechanism that could in principle lead to a nonfinite number of constraints, which I do not consider desirable. For my purposes here, however, it would suffice to see (53) as one complex, universal constraint. The reason why I have formulated it as a conjunction of two simplex constraints rather than as one complex constraint is that it becomes more transparent: It is bad to have the wrong form or be in the wrong place, but it is even worse to both have the wrong form and be in the wrong place.

30. That the bare infinitive and not the to-infinitive is used instead of the past participle could be due to yet another constraint like, e.g., *structure (under the assumption that a bare infinitive has less structure than a to-infinitive). As all non-selected to-infinitives are ruled out by this constraint, I have not included them in the tableaux.

31. Note that with the introduction of Faith(PastP), the constraint MorPH is only indirectly relevant, namely through Local Conjunction. For the sake of simplicity, I will leave out the simplex constraint in the following tableaux.

32. Note, however, that the faithfulness constraint (Faith[Compl]) could form a tie with the conflicting markedness constraint (*Exp; under the assumption that HAVE (CP) holds in the input, i.e., that a very always selects a CP in the input. Under this assumption, the input would be as relevant in the global tie approach as in the neutralization approach.

33. Remember, however, that cases with three (or more) optimal candidates are more difficult to account for in terms of neutralization. Nevertheless, a neutralization account does not seem to be impossible if, e.g., formal input features are not (always) assumed to be binary.

34. As pointed out by Tony Kroch p.c., it must be checked, however, if global ties really turn out to be this problematic for the learning algorithm. It could be the case that whenever the learner comes to a piece of data that contradicts an assumed ranking, the contradicting ranking is stored as a different grammar. The number of simultaneous grammars should be restricted nevertheless.

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