Disjunction, clause typing, and intonation

In Chapter 5 we considered various kinds of questions in English. We described their resolution conditions and specified their translations in InqB. We saw in particular that the interpretation of questions containing disjunction heavily depends on intonation. In the present chapter we will have a closer look at how disjunction interacts with clause typing (declarative versus interrogative) and intonation (intonational phrase structure and final pitch contours), showing that inquisitive semantics allows us to treat disjunction uniformly across statements and questions with various intonation patterns.

The types of sentences that we will be primarily interested in are exemplified in (1)–(5) below—though we will see shortly that our analysis applies to some closely related sentence types as well. As before, we use arrows to indicate falling and rising intonation at the end of an intonational phrase. Moreover, if two disjuncts are pronounced within a single intonational phrase, we use hyphens to explicitly indicate the absence of an intonational phrase break between the two disjuncts.

(1) Does Igor speak Spanish-or-French↑?
(2) Does Igor speak Spanish↑ or does he speak French↓?
(3) Does Igor speak Spanish↑ or does he speak French↑?
(4) Igor speaks Spanish-or-French↓.
(5) Igor speaks Spanish↑ or he speaks French↓.

The sentence types exemplified in (1)–(3) were already discussed in the previous chapter: (1) is a polar disjunctive question, which raises an issue whose resolution requires establishing that Igor speaks either Spanish or French, or establishing that he doesn’t speak either of the two languages; (2) is an alternative question, which presupposes that Igor speaks either Spanish or French and raises an issue whose resolution
requires establishing which of the two languages he speaks; and finally, (3) is an open disjunctive question, which raises an issue that can be resolved in three ways: by establishing that Igor speaks Spanish, by establishing that he speaks French, or by establishing that he does not speak either of the two languages.¹

The disjunctive sentence types in (4) and (5) were not discussed in the previous chapter yet, because they are statements rather than questions. The difference between them is that in (4) the two disjuncts are part of a single clause, while in (5) they are separate clauses. Unlike in the case of questions, however, this difference in syntactic structure does not result in a difference in interpretation. Both (4) and (5) convey the information that Igor speaks Spanish or French, and do not request any further information.

The similarities and differences in interpretation between (1)–(5) should be derivable in a systematic way from the similarities and differences in form between these sentences. Note that there are three formal aspects that seem to play a particularly important role in determining the interpretation of (1)–(5).

The first important aspect is clause type marking: the clauses in (1)–(3) are marked as interrogative clauses by the presence of a fronted auxiliary verb, while the clauses in (4)–(5) are marked as declarative clauses by the absence of such fronted auxiliary verbs. This has a semantic effect, as can be seen by comparing (2) and (5). We assume that these two examples form a minimal pair, i.e., that they only differ in that the former involves interrogative clause type marking, while the latter involves declarative clause type marking. This, then, should be the source of the difference in interpretation between the two sentences.

¹ As we saw in the previous chapter, open disjunctive questions are only used in rather specific kinds of contexts. For the open disjunctive question in (3) one could, for instance, imagine the following context. Igor has electronically applied for a grant from the European Research Council. Two officers are processing the applications together, and one of them is starting to compose a response letter to Igor. By default, such letters are in English, but if the applicant has indicated in their application form that they prefer correspondence in Spanish or French, then the letter will be in that language. The officer who is starting to compose the letter to Igor does not remember which language he had indicated on his application form. The other officer still has Igor’s application form on his computer screen. In this situation, it is natural for the first officer to ask his colleague the open disjunctive question in (3). On the other hand, the alternative question in (2) would not be appropriate, since the officer does not want to presuppose that Igor had indicated a preference for Spanish or French on his form, and the polar disjunctive question in (1) would not be suitable either, because the issue raised by that question could be resolved just by establishing that Igor speaks either Spanish or French, without establishing which of the two; this would not be sufficient to decide in which language the letter should be composed.
A second formal aspect that matters is whether the final pitch contour is falling or rising. That this has a semantic effect can be seen by comparing (2) and (3). Again, we take this to be a minimal pair—the only difference here is that (2) involves a final fall while (3) involves a final rise. This, then, must be the source of the difference in interpretation between the two.

Finally, a third important aspect is syntactic structure, in particular whether the two disjuncts are part of a single clause, or rather form two separate clauses. The fact that this has a semantic effect can be seen by comparing (1) and (3). Again, we take this to be a minimal pair. The only difference is that in (1) the two disjuncts are part of a single clause, while in (3) they form two separate clauses. This must be the source of the difference in interpretation between the two.  

Thus, our aim will be to show how the differences in meaning between (1)–(5) may be derived from the differences in clause type marking, final pitch contour, and syntactic structure. In doing so, we will maintain a uniform treatment of the English disjunction word *or* as expressing the *join* operation, just like the InqB connective ∨. In this respect, our account will differ from many previous analyses—in particular, the classical theories of Karttunen (1977) and Groenendijk and Stokhof (1984)—which do not offer a uniform treatment of disjunction across all types of disjunctive questions and statements, but rather assume that the semantic contribution of disjunction in alternative questions is different from its contribution in polar disjunctive questions and in statements.  

---

2 One may wonder whether sentences like (1) could possibly also be treated as cases where disjunction applies to two full clauses, where the second clause is almost entirely elided, i.e., left unpronounced. This, however, would be incompatible with the commonplace assumption that every syntactic clause boundary must align with an intonational phrase boundary (see, e.g., Truckenbrodt, 2007; Selkirk, 2011). If the sentence in (1) consisted of two full clauses, then there would have to be an intonational phrase break after the first, i.e., immediately preceding the disjunction word. Since by assumption there are no such intonational phrase breaks, (1) really has to be treated as involving a single clause, containing a sub-clausal disjunction.

Note that there are also cases like (i) below, which are just like (1) except that they do exhibit an intonational phrase boundary after the first disjunct:

(i) Does Igor speak Spanish↑ or French↑?

We will leave such cases out of consideration here and concentrate on those where it is clear whether disjunction applies to two separate clauses or clause-internally.

3 The uniform treatment of disjunction across questions and statements to be presented here is closely related to the treatment of disjunction in alternative semantics (Simons, 2005; Alonso-Ovalle, 2006; Aloni, 2007). See Section 4.8 for some discussion of how the latter treatment of disjunction is related to the inquisitive one. For more elaborate comparison, see Roelofsen (2015b); Ciardelli et al. (2017a); Ciardelli and Roelofsen (2018).
The account presented here will be a simplified version of the one developed in Roelofsen (2013c, 2015a). The same simplified account has also been presented in Roelofsen and Farkas (2015), where it serves as the basis for a theory of answer particles like *yes* and *no*. The main reason we present only a simplified version of the account here is that the full account does not only aim to capture the informative and inquisitive content of the various sentence types, but also their *presuppositional* content, which, as discussed in Section 5.2, requires an extension of the InqB system. While such an extension increases the empirical coverage of the account, a simplified non-presuppositional version should suffice to demonstrate the advantages of inquisitive semantics in formulating a uniform account of disjunction, clause type marking, and the relevant intonational features.4

While our focus here will be on English, we expect that the basic semantic operations that our account associates with the relevant lexical, morphological, and intonational features may play a central role in the interpretation of similar constructions in other languages as well. The division of labor between the various elements is bound to vary from language to language, but we expect that the basic repertoire of semantic operations that our account draws on will be relatively stable across languages.

We will proceed as follows. Section 6.1 provides an informal characterization of the kind of syntactic structures that we take sentences like (1)–(5) to have, Section 6.2 formally specifies their logical forms, and Section 6.3 specifies how these logical forms are to be interpreted in InqB.

### 6.1 List structures

Drawing inspiration from Zimmermann (2000), we will view the sentence types exemplified in (1)–(5) as *lists*.5 Lists either consist of a single

---

4 Besides leaving presuppositions out of consideration, the present account is simplified in another respect as well. Namely, in order to derive the fact that alternative questions presuppose that exactly one of the disjuncts holds, the full account assumes that such questions involve an *exclusive strengthening* operator. For simplicity, this operator is left out of consideration here.

5 The idea that disjunction can be used to form lists has also been put forth by Simons (2001, p. 616), independently of Zimmermann (2000). In Simons’ work, however, this idea does not form the basis for a particular semantic treatment of disjunctive sentences and their various intonational features, but is rather part of a pragmatic explanation for the fact that disjunctive declaratives are typically much more natural in response to a given question
clause, as in (1) and (4), or of multiple clauses separated by disjunction, as in (2), (3), and (5). We will refer to these clauses as 'list items'. We think of lists as being either open (signaled by a final rise), as in (1) and (3), or closed (signaled by a final fall), as in (2), (4), and (5). Non-final list items are canonically pronounced with rising intonation, both in open and in closed lists. Moreover, each item is pronounced in a separate intonational phrase, which means that there is an intonational phrase break after each non-final item, before the disjunction word. In fact, two non-final list items may be separated just by an intonational phrase break, i.e., the disjunction word may be omitted if neither of the items is final.

Thus, we take lists to differ along three basic parameters: they can be declarative or interrogative, they can be open or closed, and they can consist of a single clause or of multiple clauses separated by disjunction. Given these parameters, there are in total $2 \times 2 \times 2 = 8$ types of lists, five of which were exemplified in (1)–(5): the polar question in (1) is a mono-clausal open interrogative list, the alternative question in (2) a multi-clausal closed interrogative list, the open disjunctive question in (3) a multi-clausal open interrogative list, the statement in (4) a mono-clausal closed declarative list, and the statement in (5) a multi-clausal closed declarative list.

Note that, while the mono-clausal lists in (1) and (4) contain a disjunction, this is not a necessary feature of mono-clausal lists. Thus, plain non-disjunctive polar questions and statements, exemplified in (6)–(7) below, also count as lists under our perspective, and should therefore also be covered by our account.

(6) **Non-disjunctive mono-clausal open interrogative:**

Does Igor speak Spanish?/png-1

(7) **Non-disjunctive mono-clausal closed declarative:**

Igor speaks Spanish.

So far, only five out of eight list types have been exemplified. The three remaining list types are exemplified in (8)–(10) below.

than truth-conditionally equivalent non-disjunctive sentences. For instance, if the question is why Jane is not picking up the phone, then (ia) is a much more natural answer than (ib).

(i) a. Either she isn't home, or she can't hear the phone.
   b. It's not the case that she is at home and she can hear the phone.

To the extent that Simons’ analysis of this phenomenon is successful, it provides independent motivation for our general outlook on disjunctive sentences as lists. A proper discussion of Simons’ analysis, however, is beyond the scope of this book.
Sentences like (8), with declarative clause type marking and rising intonation, are referred to in the literature as *rising declaratives* or *declarative questions* (see, e.g., Gunlogson, 2001, 2008; Malamud and Stephenson, 2015; Farkas and Roelofsen, 2017; Westera, 2017). They raise the same issue as the corresponding rising polar interrogative. In the case of (8), this issue can be resolved either by establishing that Igor speaks Spanish or by establishing that he does not. However, unlike rising polar interrogatives, rising declaratives also convey some sort of bias towards the alternative that is explicitly mentioned, here the one that Igor does speak Spanish. We will not present an account of this bias here, but will derive that a rising declarative expresses the same issue as the corresponding rising polar interrogative, and offer an explanation of the fact that among a rising declarative and a rising polar interrogative expressing the same issue, the rising polar interrogative is seen as the canonical form to express that issue, and the rising declarative as a more ‘marked’ form. In light of the general tendency for the overall communicative effect of marked forms to be more complex than that of their unmarked, canonical counterparts (see, e.g., Horn, 1984; Blutner, 2000), it is unsurprising that rising declaratives have a special discourse effect (signalling a bias), which plain polar questions lack. For an extension of the account to be presented here which discusses the bias conveyed by rising declaratives and other marked question types in detail, we refer to Farkas and Roelofsen (2017).

Returning to the different list types, in (9) we have a mono-clausal closed interrogative list, i.e., a falling polar interrogative. This sentence, again, expresses exactly the same issue as the corresponding rising polar interrogative, and is also generally seen as a more marked form than the latter. Whether falling polar interrogatives are also systematically

---

6 For instance, Quirk et al. (1985) state that “Yes–no questions are usually formed by placing the operator before the subject and giving the sentence a rising intonation” (p. 807).

7 For instance, Hedberg et al. (2014) state that “the low-rise nuclear contour (e.g., L∗H-H%) is the unmarked question contour and is by far the most frequently occurring. Yes-no questions with falling intonation (e.g. H*L-L%) do not occur frequently, but
associated with a certain special discourse effect, like rising declaratives, is not so clear—certainly, there does not seem to be a broad consensus in the literature on what this effect would be (see Hedberg et al., 2014, for relevant recent discussion). In any case, our aim will just be to account for the fact that a falling polar interrogative raises the same issue as the corresponding rising polar interrogative, and to offer an explanation for the fact that it is seen as a relatively marked sentence type.

Finally, in (10) we have a multi-clausal open declarative list, i.e., a sentence consisting of two rising declarative clauses, joined by disjunction. This sentence type strikes us as very odd. It is difficult, if not impossible, to imagine a context in which it could be felicitously used. As far as we know, it has not been discussed in any depth in the literature. It is an interesting fact, however, that the commonplace ingredients that make up this construction—two declarative clauses, disjunction, and rising intonation—cannot be combined in this particular way. We will not be able to give an account of this empirical observation here; this would require a more detailed analysis of the bias associated with mono-clausal rising declaratives, as pursued in Farkas and Roelofsen (2017). However, we will offer an explanation of the fact that the construction is marked, in the sense that it is not the canonical way of conveying the issue that it expresses.

6.2 Logical forms

We now turn to a more formal specification of the syntactic structures—the logical forms—that we take list structures to have. Globally, we assume that a list with \( n \) items has the following logical form:

\[
(11)
\begin{array}{c}
\text{OPEN/CLOSED} \\
\text{DECL/INT} \\
\text{item}_1 \\
\text{or} \\
\text{...} \\
\text{or} \\
\text{item}_n
\end{array}
\]

when they do, they can be classified in speech act terms as ‘non-genuine’ questions, where one or more felicity conditions on genuine questions are not met."
We will refer to open/closed as completion markers, to decl/int as complementizers, and to the rest of the structure as the body of the list. We assume that each item in the body of the list is a full clause, headed by a declarative or interrogative clause type marker, $C_{\text{DECL}}$ or $C_{\text{INT}}$, depending on whether the list as a whole is headed by decl or int, respectively. That is, if the complementizer of a list is decl, then all clauses in the body of that list must be headed by $C_{\text{DECL}}$, and similarly if the complementizer of the list is int.

To give a concrete example, the polar question in (1), which consists of a single clause containing a disjunctive phrase and exhibits a final rise, is taken to have the following structure:

(12)

```
open int
  item1
C_{\text{INT}} \text{ does Igor speak Spanish or French}
```

On the other hand, the alternative question in (2), which consists of two clauses and exhibits a final fall, is taken to have the following structure:

(13)

```
closed int
  item1
  or
  item2
C_{\text{INT}} \text{ does Igor speak Spanish}
C_{\text{INT}} \text{ does he speak French}
```

6.3 Interpreting logical forms

We will now specify a semantic interpretation of these logical forms by translating them into InQB. Thereby we associate each logical form with a proposition, namely the proposition expressed by the formula that serves as its translation.
The body of a list. Let us first consider the body of a list, and after that turn to complementizers and completion markers. Recall that the body of a list consists of one or more list items, separated by disjunction. Every list item, in turn, is a full clause headed by a declarative or interrogative clause type marker (C\textsubscript{DECL/INT}). The rest of the clause is a tense phrase (TP), which may itself contain a disjunction.

The translation procedure is very straightforward. Any disjunction is translated as $\lor$, no matter whether it separates two list items or occurs within one of the list items. Every clause type marker, be it declarative or interrogative, is translated as $\lnot$. The rationale for this is that every list item is seen, intuitively speaking, as one block, i.e., as contributing a single alternative to the proposition expressed by the list as a whole. This is ensured by applying $\lnot$, which turns any proposition $P$ into a proposition with a single alternative, $\bigcup P$.\(^8\) Otherwise the procedure is straightforward: basic clauses are translated as atomic formulas, and English conjunction, disjunction, and negation are translated as the corresponding \textsc{lnqB} connectives. Thus, the body of a list is translated according to the rule in (14), where $\varphi_1,\ldots,\varphi_n$ are standard translations of $\text{TP}_1,\ldots,\text{TP}_n$ into our logical language.

(14) Rule for translating the body of a list:

$$[[\text{C}\textsubscript{DECL/INT} \text{TP}_1] \lor \ldots \lor [\text{C}\textsubscript{DECL/INT} \text{TP}_n]] \; \leadsto \; \lnot \varphi_1 \lor \ldots \lor \lnot \varphi_n$$

Returning to our concrete examples above, if we translate Igor speaks Spanish as $p$ and Igor speaks French as $q$, then we get the following translations for the list bodies of (1) and (2), respectively.\(^9\)

\(^8\) Syntactically, interrogative clause type markers differ from declarative ones in that they induce subject-auxiliary inversion. Semantically, both clause type markers are simply taken to apply $\lnot$ to the proposition expressed by the TP that they combine with. However, the corresponding complementizers, \textsc{decl} and \textsc{int}, differ in their semantic contribution. We will turn to this right below. Finally, we should note that in order to deal with \textsc{wh}-interrogatives, the treatment of interrogative clause type markers given here has to be generalized. We could assume, for instance, that interrogative clauses are generally headed by an $n$-place interrogative clause type marker $C^n_{\text{INT}}$, where $n \geq 0$ is the number of \textsc{wh}-phrases in the clause. This operator, then, could be assumed to take as its input an $n$-place property, i.e., an object $P$ of type $\langle e^n, T \rangle$, and to deliver the proposition $\exists \hat{x}. \lnot PX$, where $\hat{x}$ is a sequence of $n$ individual variables. In the special case where $n = 0$, i.e., the case of non-\textsc{wh}-questions that we focus on in the present chapter, this means that the clause type marker takes a 0-place property, i.e., a proposition $P$ as its input and delivers the proposition $\lnot P$, exactly as assumed in the main text. See Champollion \textit{et al.} (2015) for some further discussion.

\(^9\) In previous chapters, the logical language that we assumed was a first-order language, with predicate symbols and individual constants and variables. Here, we simply use a propositional language with atomic proposition symbols $p$ and $q$, since the internal structure of predicate-argument combinations is irrelevant for present purposes.
Complementizers and completion markers

Now let us turn to complementizers and completion markers. To specify their semantic contribution it is convenient to use some notation and terminology from type theory.\(^\text{10}\) Recall that in inquisitive semantics, propositions are sets of sets of possible worlds, i.e., objects of type \(\langle\langle s, t\rangle, t\rangle\). Let us abbreviate this type as \(T\). Now, we will treat \textsc{decl} and \textsc{int} as propositional operators, i.e., as functions that take a proposition as their input, and deliver another proposition as their output. This means that \textsc{decl} and \textsc{int} are of type \(\langle T, T\rangle\). On the other hand, we will treat \textsc{open} and \textsc{closed} as modifiers of propositional operators, i.e., as functions that take a propositional operator as their input, and deliver a modified propositional operator as their output. So \textsc{open} and \textsc{closed} are of type \(\langle\langle T, T\rangle, \langle T, T\rangle\rangle\). It will become clear in a moment why \textsc{open} and \textsc{closed} are treated as having this somewhat more complex type, rather than simply \(\langle T, T\rangle\), like \textsc{decl} and \textsc{int}. We will now take a more detailed look at each of the complementizers and completion markers in turn.

Let us start with \textsc{decl}. We will treat \textsc{decl} as making a list purely informative, i.e., as eliminating inquisitiveness. This effect can be achieved straightforwardly by treating \textsc{decl} as a function that takes the proposition \(P\) expressed by the body of a list as its input and applies the projection operator \(!\) to it, returning \(!P\). Using type-theoretic notation, this can be formulated concisely as follows:

\begin{align*}
\text{(17)} \quad \textsc{decl} \quad &\sim \lambda P. !P
\end{align*}

Next, consider \textsc{int}. We take the role of this operator to be that of ensuring inquisitiveness. This is done by applying a conditional variant of the \(?\) operator, which we will denote here as \(\langle ?\rangle\). If the proposition \(P\) that \(\langle ?\rangle\) takes as its input is not yet inquisitive, then \(?\) is applied to it. On the other hand, if \(P\) is already inquisitive, then it is left untouched. The only

\(^{10}\) We will only use some type-theoretical notation here in the meta-language to describe functions (as in, e.g., Heim and Kratzer, 1998). A more rigorous approach would be to extend the \textsc{InqB} system to a full-fledged type theoretic framework (as done in Ciardelli, Roelofsen, and Theiler, 2017a). We leave this step implicit here because it would involve quite some technicalities which are to a large extent orthogonal to our present concerns.
case in which this procedure does *not* yield an inquisitive output is when $P$ is a tautology or a contradiction. In this case $\langle ? \rangle P$ is a tautology. In all other cases, $\langle ? \rangle P$ is inquisitive. Thus, we assume the following treatment of \textsc{int}:

\begin{equation}
\text{int} \sim \lambda P. \langle ? \rangle P
\end{equation}

Finally, let us consider \textsc{open} and \textsc{closed}. Intuitively speaking, we treat these completion markers as encoding whether the list is ‘complete’ and ready to be ‘sealed off’, or rather left ‘open-ended’. The role of \textsc{closed} is to mark the list as being complete, and to allow \textsc{decl} or \textsc{int}, whichever is present, to seal off the list. Thus, \textsc{closed} is simply treated as the identity function, leaving the propositional operator $\pi$ expressed by \textsc{decl} or \textsc{int} untouched and letting it apply to the proposition expressed by the body of the list.

\begin{equation}
\text{closed} \sim \lambda \pi. \pi
\end{equation}

On the other hand, the role of \textsc{open} is to mark the list as being open-ended. It prevents \textsc{decl/int} from sealing off the body of the list, and instead applies the $?$ operator, which adds the set-theoretic complement of $\bigcup P$ as an additional alternative. This captures what we take to be the characteristic semantic property of open lists, which is that they always leave open the possibility that none of the given list items holds. Thus, unlike \textsc{closed}, \textsc{open} prevents the operator $\pi$ expressed by \textsc{decl} or \textsc{int} from becoming operative, and instead applies $?$ to the proposition $P$ expressed by the body of the list.

\begin{equation}
\text{open} \sim \lambda \pi. \lambda P. ? P
\end{equation}

In total there are four types of lists, each featuring a combination of one complementizer and one completion marker. From the treatment of the individual complementizers and completion markers given above, it follows that the four types of lists are translated into our logical language as specified in (21) below, where in each case $\phi$ stands for the translation of the body of the list, obtained according to the rule in (14) above.

\begin{footnote}
11 In addition to ensuring inquisitiveness, Roelofsen (2013c, 2015a) assumes that \textsc{int} has another effect as well: it *ensures non-informativity*, by introducing a presupposition that the actual world must be contained in $\bigcup P$. This second aspect of interrogativity is important in order to account for the presuppositional component of alternative questions (discussed in Section 5.2). Since in this section we are casting our account in \textsc{InqB}, which does not represent presuppositions, we set aside this second effect of \textsc{int}.
\end{footnote}
Table 6.1  Representative examples of all types of lists considered.

<table>
<thead>
<tr>
<th>—Closed declaratives—</th>
<th>Translation</th>
<th>Simplified</th>
</tr>
</thead>
<tbody>
<tr>
<td>Igor speaks Spanish</td>
<td>![p]</td>
<td>p</td>
</tr>
<tr>
<td>Igor speaks Spanish-or-French</td>
<td>![p \lor q]</td>
<td>!(p \lor q)</td>
</tr>
<tr>
<td>Igor speaks Spanish or he speaks French</td>
<td>![p \lor q]</td>
<td>!(p \lor q)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>—Open declaratives—</th>
<th>Translation</th>
<th>Simplified</th>
</tr>
</thead>
<tbody>
<tr>
<td>Igor speaks Spanish?</td>
<td>![p]</td>
<td>![p]</td>
</tr>
<tr>
<td>Igor speaks Spanish-or-French?</td>
<td>![p \lor q]</td>
<td>![p \lor q]</td>
</tr>
<tr>
<td>Igor speaks Spanish? or he speaks French?</td>
<td>![p \lor q]</td>
<td>![p \lor q]</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>—Closed interrogatives—</th>
<th>Translation</th>
<th>Simplified</th>
</tr>
</thead>
<tbody>
<tr>
<td>Does Igor speak Spanish?</td>
<td>![p]</td>
<td>![p]</td>
</tr>
<tr>
<td>Does Igor speak Spanish-or-French?</td>
<td>![p \lor q]</td>
<td>![p \lor q]</td>
</tr>
<tr>
<td>Does Igor speak Spanish? or does he speak French?</td>
<td>![p \lor q]</td>
<td>![p \lor q]</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>—Open interrogatives—</th>
<th>Translation</th>
<th>Simplified</th>
</tr>
</thead>
<tbody>
<tr>
<td>Does Igor speak Spanish?</td>
<td>![p]</td>
<td>![p]</td>
</tr>
<tr>
<td>Does Igor speak Spanish-or-French?</td>
<td>![p \lor q]</td>
<td>![p \lor q]</td>
</tr>
<tr>
<td>Does Igor speak Spanish? or does he speak French?</td>
<td>![p \lor q]</td>
<td>![p \lor q]</td>
</tr>
</tbody>
</table>

(21)  **Rules for translating lists**

a.  [[closed decl] body] \[\leadsto\] ![\varphi]

b.  [[closed int] body] \[\leadsto\] (?/\varphi)

c.  [[open decl] body] \[\leadsto\] ![\varphi]

d.  [[open int] body] \[\leadsto\] ![\varphi]

The rules in (14) and (21) together give a complete specification of how to translate declarative and interrogative lists in English into our logical language. In Table 6.1 we provide translations for a number of examples that are representative for all the types of lists that we are concerned with. In the Table, as well as in the discussion below, we use hyphens (Spanish-or-French) to indicate that the two disjuncts are pronounced within one intonational phrase. In the translations of the examples, p stands for *Igor speaks Spanish* and q for *Igor speaks French*, as above. In each case we provide the direct translation and also a simpler formula that is semantically equivalent in InqB to the direct translation. The propositions expressed by all these simplified translations are depicted in Figure 6.1.

The following two sections discuss these results in more detail. First, in Section 6.4, we consider the ‘unmarked’ disjunctive sentence types exemplified in (1)–(5) at the beginning of this chapter, as well as the unmarked non-disjunctive sentence types in (6)–(7). Then, in Section 6.5, we turn to the more ‘marked’ sentence types which were exemplified in (8)–(10).
6.4 Unmarked cases

We start with the simplest unmarked sentence type, namely a non-disjunctive declarative with falling intonation, repeated in (22):

(22) Igor speaks Spanish↓. closed declarative

This sentence is taken to have the following logical form:

(23) \[[\text{closed decl}] \quad [C_{\text{decl}} \text{Igor speaks Spanish}]\]

The translation of this logical form is $\neg \neg p$, which can be simplified to just $p$. The proposition expressed by this sentence is depicted in Figure 6.1(a). Thus, it is correctly predicted that the sentence provides the information that Igor speaks Spanish, without requesting any additional information.

Next, consider the disjunctive falling declaratives in (24) and (25):

(24) Igor speaks Spanish-or-French↓. closed declarative
(25) Igor speaks Spanish↑ or he speaks French↓. closed declarative

These sentences are taken to have the following logical forms, respectively:

(26) \[[\text{closed decl}] \quad [C_{\text{decl}} \text{Igor speaks Spanish or French}]\]
(27) \[[\text{closed decl}] \quad [[C_{\text{decl}} \text{Igor speaks Spanish}] \quad [C_{\text{decl}} \text{he speaks French}]]\]

These logical forms have the same simplified translation, namely $\neg(p \lor q)$, which expresses the proposition depicted in Figure 6.1(b).
Thus, the sentences are correctly predicted to provide the information that Igor speaks Spanish or French, without requesting any additional information.

Now let us turn to interrogatives. The simplest unmarked case here is the polar question in (28).

(28) Does Igor speak Spanish? open interrogative

This sentence is taken to have the following logical form:

(29) \[[\text{open int}] \ [C_{\text{int}} \text{ does Igor speak Spanish}]\]

The simplified translation of this logical form is \(?p\), which expresses the proposition depicted in Figure 6.1(c). Thus, the sentence is correctly predicted to request information as to whether Igor speaks Spanish, and not to provide any information.

Next, consider the disjunctive polar question in (30).

(30) Does Igor speak Spanish-or-French? open interrogative

This sentence is taken to have the following logical form:

(31) \[[\text{open int}] \ [C_{\text{int}} \text{ does Igor speak Spanish or French}]\]

The simplified translation of this logical form is \(?!(p \lor q)\), which expresses the proposition depicted in Figure 6.1(d). Again, the sentence is predicted to be inquisitive and non-informative. In order to resolve the issue that it raises, one either needs to establish that Igor indeed speaks at least one of the two languages, or that he does not speak either.

Next, consider the open disjunctive question in (32), which involves two full clauses joined by disjunction.

(32) Does Igor speak Spanish or does he speak French? open interrogative

This sentence is taken to have the following logical form:

(33) \[[\text{open int}] \ [[C_{\text{int}} \text{ does Igor speak Spanish}] or \ [C_{\text{int}} \text{ does he speak French}]]\]

The simplified translation of this logical form is \(?!(p \lor q)\), which expresses the proposition depicted in Figure 6.1(e). As desired, the sentence is predicted to be more inquisitive than (30): in order to resolve the issue that it raises, it is not sufficient to establish whether or not Igor speaks at least one of the two languages. Rather, it either needs to be
established that Igor speaks Spanish, or that he speaks French, or that he speaks neither.

Note in particular that (32) is \( \neg p \lor \neg q \), but rather as \( \neg(p \lor q) \). This is a desirable result, because if it were translated as \( \neg p \lor \neg q \), then the account would predict that in order to resolve the issue that (32) expresses, it would be sufficient to establish that Igor does not speak Spanish, or to establish that he does not speak French. This prediction would be wrong: to resolve the issue expressed by (32), establishing that Igor does not speak either language is sufficient, but establishing that Igor does not speak Spanish (or that he doesn’t speak French) is not. In order to achieve this result, it is crucial that the \( ? \) operator is not contributed by the interrogative clause type markers in (33). Rather, it is contributed by the incompleteness marker open, which scopes over the entire list structure.

Finally, consider the alternative question in (34), which again involves two full clauses joined by disjunction, but now with falling intonation on the second clause.

(34) Does Igor speak Spanish\(^\uparrow\) or does he speak French\(^\downarrow\)?

This sentence is taken to have the following logical form:

(35) \[[\text{CLOSED INT}] \left[ \left[ \text{C}_{\text{INT}} \text{ does Igor speak Spanish} \right] \lor \left[ \text{C}_{\text{INT}} \text{ does he speak French} \right] \right]\]

The translation of this logical form, on the simplified non-presuppositional account presented here, is \( p \lor q \), which expresses the proposition depicted in Figure 6.1(f). Notice that the \( ? \) operator is not invoked here because the proposition that \text{INT} gets as its input is already inquisitive. Since the role of \text{INT} is not to blindly apply \( ? \), but rather just to ensure inquisitiveness, it leaves the input proposition unaltered in this case. The prediction, then, is that the alternative question in (34) provides the information that Igor speaks at least one of the two languages, and raises an issue as to which of the two languages he speaks.

As anticipated, this prediction is not entirely satisfactory, because it does not capture the fact that alternative questions presuppose that exactly one of the disjuncts holds. However, as remarked at the outset, it is impossible to properly capture this fact in InqB, which concentrates exclusively on informative and inquisitive content and leaves presuppositional aspects of meaning out of consideration. Again, we refer to AnderBois (2012), Ciardelli et al. (2012) and Roelofsen (2015a) for
presuppositional extensions of InqB, and to the latter work for a more sophisticated version of the account presented here, which does capture the presuppositions triggered by alternative questions.

Aside from this loose end, we have seen that the present account derives the basic semantic properties of all the unmarked sentence types exemplified in (1)–(7) at the beginning of the chapter. Note that the account rests on a uniform treatment of disjunction, as well as a uniform treatment of completion markers (final pitch contours), which are used both in statements and in questions. Allowing for a uniform treatment of these common building blocks is, in our view, an important virtue of inquisitive semantics.

6.5 Marked cases

We now turn to the more marked sentence types: rising declaratives (consisting of one or multiple clauses) and falling polar interrogatives. The examples we gave in (8)–(10) are repeated in (36)–(38) below.

(36) Igor speaks Spanish↑?
(37) Does Igor speak Spanish↑?
(38) Igor speaks Spanish↑ or he speaks French↑?

We will first discuss which resolution conditions these sentences are predicted to have, and then consider how their marked status may be explained.

Resolution conditions  The rising declarative in (36) and the falling polar interrogative (37) are translated as ?p on our account, just like the corresponding rising polar interrogative in (39).

(39) Does Igor speak Spanish↑?

Thus, as desired, it is predicted that these sentences raise an issue which can be resolved by establishing either that Igor speaks Spanish, or that he does not. On the other hand, the simplified translation of (38) is ?(p ∨ q), just like the corresponding open disjunctive question in (40).

(40) Does Igor speak Spanish↑ or does he speak French↑?

Thus, it is predicted that the issue raised by (38) can be resolved in three ways: by establishing that Igor speaks Spanish, by establishing that he speaks French, or by establishing that he does not speak either of the two
languages. In this case, it is difficult to judge whether this prediction is correct, since, as discussed above, it seems quite impossible to imagine a context in which (38) could be felicitously used.

Why are these sentence types marked? Now let us consider how the marked status of these sentence types may be explained. The general idea that we will pursue, familiar from much work in neo-Gricean pragmatics and optimality theory (see, e.g., Horn, 1984; Blutner, 2000), is that an expression is perceived as marked if there is another expression that has the same semantic content and is, other things being equal, better suited to express that content. One reason for this may be that the latter expression is easier to produce; another reason may be that it has a greater chance of being interpreted as intended. This second reason will be most relevant for us.

Notice that the logical form of every sentence in (36)–(38) is either headed by \([\text{open decl}]\) or by \([\text{closed int}]\). Vice versa, every sentence type whose logical form is headed by one of these two complementizer-completion-marker combinations is represented in (36)–(38), except for alternative questions, i.e., multi-clausal closed interrogatives—we will return to this momentarily. Quite generally, then, there is something marked about closed interrogatives and open declaratives. Why would this be?

In Roelofsen (2015a); Farkas and Roelofsen (2017) it is proposed that the source of this markedness lies in the fact that these sentence types are generally in competition with open interrogatives, and that the latter are generally preferred because they maximize the chance of being interpreted as intended. This is because, in many configurations, \text{open} and \text{int} have precisely the same semantic effect, and even more importantly, in these configurations the same overall interpretation would result if either \text{open} or \text{int} were to be misinterpreted as \text{closed} or \text{decl}, respectively.

Let us look at an example to make this more concrete. The open declarative in (36) and the open interrogative in (39) are both translated as \(?p\), and are thus predicted to have exactly the same semantic content. Now suppose that someone hears (39) in a conversation and has to determine its intended interpretation. If all goes well, the sentence is
recognized as an open interrogative—through the interrogative word order and the final rise. However, even if the sentence is mistakenly parsed as an open declarative, or as a closed interrogative, the same interpretation would still be derived. Thus, open interrogatives are very robust: if one piece breaks, the whole construction still functions as intended. This is not the case for the open declarative in (36). If this sentence is mistakenly parsed as a closed declarative, the intended interpretation would not be obtained. This explains the non-optimal, marked nature of this sentence type.

Exactly the same reasoning applies to the closed interrogative in (37). This sentence also has ?p as its translation, so it is also in competition with the open interrogative in (39). And again, it does not have the same robustness as the open interrogative, because if it is mistakenly parsed as a closed declarative, the intended interpretation is not obtained.

Finally, the markedness of the bi-clausal open declarative in (38) can be explained in a similar way as well, although here the reasoning is somewhat more involved. As noted above, (38) is predicted to be semantically equivalent with the open interrogative in (40); both are translated as ?(p ∨ q). Now consider which interpretations arise if either (38) or (40) is not parsed as intended. If the open declarative in (38) is mistakenly parsed as an open interrogative it is translated as ?(p ∨ q), which is still its intended interpretation, but if it is mistakenly parsed as a closed declarative it is translated as !(p ∨ q), which is clearly different from ?(p ∨ q).

On the other hand, if the open interrogative in (40) is mistakenly parsed as an open declarative, it is translated as ?(p ∨ q), which is its intended interpretation, but if it is mistakenly parsed as a closed interrogative it is translated as p ∨ q, which is different from ?(p ∨ q). So if we just count the number of erroneous parses that lead to misinterpretation, there is no reason to prefer the open interrogative over the open declarative in this case. If we take a closer look, however, we find that such a reason does exist.

Consider the interpretations that arise if the two sentences are misinterpreted. In the case of (40) we obtain p ∨ q; in the case of (38) we get !(p ∨ q). Neither of these coincides with the intended interpretation, ?(p ∨ q). However, it may be argued that the former misinterpretation is less consequential than the latter. To see this, note that p ∨ q entails ?(p ∨ q), which means that every resolution of the former is also a resolution of the latter. Thus, even if (40) is misinterpreted as p ∨ q, it will still be taken to request information which would, if provided
by the addressee, resolve the issue expressed by the sentence under its intended interpretation. On the other hand, \((p \lor q)\) does not entail \(? (p \lor q)\). In fact, unlike \(? (p \lor q)\), \!(p \lor q)\ is not inquisitive at all. So if (38) is misinterpreted as \!(p \lor q), then the addressee will not be prompted to provide any information, let alone information that would resolve the issue expressed by the sentence under its intended interpretation.

Thus, the potential misinterpretation of the open interrogative in (40) is less consequential than the potential misinterpretation of the open declarative in (38). This is a reason for speakers to prefer (40) over (38) when they want to express the proposition associated with ?(p \lor q). This, then, explains the marked status of multi-clausal open declaratives like (38).

Finally, let us return to the case of alternative questions, i.e., multi-clausal closed interrogatives, which are not marked, even though uni-clausal closed interrogatives are. The reason for this is that multi-clausal closed interrogatives are not generally equivalent with the corresponding open interrogatives. So in this case there is no competition between the two types of lists.

To make this concrete again, consider the closed interrogative in (41).

(41) Does Igor speak Spanish\( \uparrow \) or does he speak French\( \downarrow \)?

The simplified translation of this sentence is \(p \lor q\). Thus, it does not have the same semantic content as the corresponding open interrogative in (40), nor is there any other competing list type. This explains its unmarked status.

This concludes our analysis of declarative and interrogative lists in \(\text{InqB}\). Even though there is much more to say about the linguistic properties of such lists, we hope that the bare bones account that we have presented here has succeeded in substantiating the general point that we set out to make in this chapter: a uniform treatment of connectives and intonational features across declarative and interrogative constructions is greatly facilitated by a semantic framework which treats informative and inquisitive content in an integrated way. If we want to give a uniform characterization of the role of disjunction in declarative and interrogative sentences, its lexical entry should specify its contribution to both informative and inquisitive content in full generality, independently of the kind of construction that it happens to be part of. And similarly for the relevant intonational features. Simply put, the fact that declarative and interrogative sentences are largely built up from the same parts constitutes an important piece of motivation for
inquisitive semantics, which treats informative and inquisitive content in an integrated way, as opposed to approaches in which the standard truth-conditional notion of meaning is maintained for declaratives and a separate notion of meaning is invoked for interrogatives (e.g., Karttunen, 1977; Groenendijk and Stokhof, 1984).

### 6.6 Exercises

**Exercise 6.1**

Determine the logical form of each of the examples below, and derive, step by step, how these logical forms are translated into InqB according to the rules in (14) and (21). Translate the indefinite expressions *a bike* and *a car* using existential quantifiers.

(42) a. Martina has a bike.

b. Martina has a bike or a car.

c. Martina has a bike or she has a car.

d. Does Martina have a bike?

e. Does Martina have a bike or a car?

f. Does Martina have a bike or does she have a car?

g. Does Martina have a bike or does she have a car?

**Exercise 6.2**

Extend the basic account given here in such a way that it predicts the acceptability and interpretation of *yes* and *no* in response to the various types of sentences considered.

- **Data to be accounted for.** Your theory should account for the acceptability and interpretation of *yes* and *no* in response to sentences (1)–(5). In particular, it should account for the fact that:
  - *yes* and *no* are both acceptable in response to (1), (4), and (5); in each case *yes* means that Igor speaks Spanish or French and *no* means that he doesn’t speak either Spanish or French.
  - *yes* and *no* are not acceptable in response to (2).
  - *no* is acceptable in response to (3), meaning that Igor doesn’t speak Spanish or French; plain *yes* is not satisfactory in this case, but *yes, he speaks Spanish* or *yes, he speaks French* are fine.

- **Assumptions you can make.** You can assume that:
  - A sentence, besides expressing a certain proposition that captures its informative and inquisitive content, generally also *highlights* a set
of propositions, which may serve as the antecedents for subsequent anaphoric expressions.

- *yes* and *no* are such anaphoric expressions:
  * Both *yes* and *no* presuppose that the previous sentence highlighted a unique proposition.
  * If this presupposition is met, *yes* confirms the unique highlighted proposition, while *no* rejects it.
  * If the presupposition is not met, the meaning of *yes* and *no* is not defined.

- A *yes/no* response is only fully satisfactory if its presupposition is met and it resolves the issue raised by the previous sentence.

**Your task.** Give a recursive definition of the set of propositions that are highlighted by sentences in InqB. You can restrict yourself to atomic sentences, ∨, !, and ?. Then show which propositions are highlighted by (1)–(5) according to your definition, and explain how this accounts for the varying acceptability and interpretation of *yes* and *no* in response to these sentences.