

Focus Projection and Information Structure

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Abstract

Focus projection has attracted a number of structural analyses. But there are cases where focus projection depends on the context. This paper presents a pragmatic analysis of focus projection that refers to the felicity of the information structure. The analysis can be applied to a wider range of constructions and languages compared to structural analyses.

1 Introduction

The problem of ‘focus projection’, i.e., the relation between focus (realized as phonological prominence) and the breadth of focus, has been discussed by many researchers (e.g., Jackendoff, 1972; Gussenhoven, 1984; Selkirk, 1984). A typical case of narrow and broad foci are clearly demonstrated in the following examples in Ladd (1996, Secs. 5.2 and 5.4).

(1) *a.* I didn’t give him five marks, I gave him five [**francs**].

b. I didn’t give him a sandwich, I gave him [five **francs**].

The bold face indicates the location of phonological prominence (pitch accent in English), and the square brackets indicate the breadth of focus.

Ladd (1996, Sec. 5.1.3) analyzes focus projection in the following way. First, the breadth of focus is fixed by various factors including contextual effects. Second, the placement of a phonological prominence follows structural rules. Ladd calls this position ‘structure-based Focus-to-Accent’ theory (structure-based FTA). Following Ladd (1996), we assume this position over purely syntactic view (e.g., Chomsky and Halle, 1968) and completely pragmatic view (e.g., Bolinger, 1972).

As for the breadth of focus, Ladd (1996, p. 164) actually remains uncommitted, referring to it as “at best poorly understood”. This paper attempts to improve our understanding about this aspect by exploring the notion of ‘information structure’ in the sense of Vallduví (1990). In the following example, the breadth of focus coincides with the rheme, a component of information structure.

(2) *Q:* What did you give him?

A: [I gave him]_{Theme} [five **francs**]_{Rheme}.

Whereas the semantic component of the theme is already present in the question, that of the rheme is considered the key element to make the response informative. Although the components of information structure are called in various ways, we use the terms ‘theme’/‘rheme’ most closely following Steedman (2000a) (the same terms have been used by Halliday (1967) and others).

*I would like to thank Mark Steedman for comments.

The relation between information structure (theme-rheme division) and the presence of focus (phonological prominence) within the rheme (and possibly within the theme) has been observed in Halliday (1967) and Steedman (2000a). Building on these analyses, this paper explores the relation between focus projection and information structure, or more specifically, the contextual effects in focus projection.

In certain cases, it seems correct to associate the breadth of focus with the rheme as in the following examples (from Selkirk via Heycock (1994)).

(3) *Q*: Did Mary watch M*A*S*H last night?

A: She watched [**Kojak**]_{Rheme}.

(4) *Q*: What did Mary do last night?

A: She [watched **Kojak**]_{Rheme}.

(5) *Q*: What happened last night?

A: [My mother watched **Kojak**]_{Rheme}.

However, the following examples from Heycock (1994) pose a challenge.

(6) *a*. [**Blowfish**]_{Rheme} are available.

b. [**Blowfish** are available]_{Rheme}.

(7) *a*. [**Blowfish**]_{Rheme} are poisonous.

b. *[**Blowfish** are poisonous]_{Rheme}.

The above examples are discussed out of context in Heycock (1994). But we can provide certain contexts to elicit information structures except for (7*b*), which is judged ungrammatical by Heycock. The situation is usually described that in this example, the focus cannot project from the subject position. Diesing (1992) proposes that the contrast between (6*b*) and (7*b*) is due to the distinction between ‘stage-level’ and ‘individual-level’ predicates (respectively). Note that stage (e.g., *available*) and individual-level (e.g., *poisonous*) predicates roughly correspond to temporary and permanent properties, respectively (Carlson, 1980). But, Heycock (1994, Appendix) points out that even with individual predicates, focus projection from the subject position to the entire utterance is possible, providing the following examples.

(8) *Q*: What’s the problem with your new job?

A: [My **office** is small]_{Rheme}, [the **pay** is low]_{Rheme}, and [my **boss** is horrible]_{Rheme}.

(9) *Q*: So what do you like best about New Haven?

A: [The **buildings** are great]_{Rheme}.

(10) *Q*: Why do you want to leave early?

A: [The **roads** are dangerous]_{Rheme}.

Thus, Diesing’s (1992) purely syntactic analysis would fail to capture the effect in a general way. In contrast, Heycock (1994, Appendix) suggests that the phenomenon is not simply due to lexical distinction between stage and individual-level predicates but is due to pragmatic factors. More specifically, she states that (i) the ‘all-rheme’ (‘all-focus’ in her term) case such as (6*b*) and (7*b*) still requires a semantic component that could be considered as the theme (‘link’ in her term), which may be deleted, *and* (ii) such a theme can be an event argument for a stage-level predicate as proposed by Kratzer (1995), but is harder to obtain for individual-level predicates. According to Heycock, the examples (8-10) may have deleted themes, “my new job”, “in New Haven”, and “the return route”, respectively.

However, Heycock still maintains distinction about the possibility of focus projection from the subject position of an individual-level predicate. For example, the following is possible because a particular concert is considered as the deleted theme.

(11) *Q*: Why aren't you going to the concert?

A: [The **tickets** are expensive]_{Rheme}.

On the other hand, in the following example she states that the narrow focus is *favorable*, citing the existential and the generic interpretations of definite and indefinite plural NPs, respectively.

(12) [**Tickets**]_{Rheme} are expensive.

Although Heycock does not explicitly reject the possibility of broad focus in (12), we may interpret her position as a rejection considering that she does not question the ungrammaticality of (7*b*) in the paper.

However, it seems possible to extend Heycock's (1994) analysis, and consider certain deleted themes even for (7*b*) as shown below.

(13) *Q*: Why did those people die of poisoning at the Japanese restaurant?

A: (as for the reason for the incidence) [**Blowfish** are poisonous]_{Rheme}.

Then, there is a possibility that we could reach a more general conclusion.

This paper adopts and develops Heycock's (1994) idea in a more systematic manner by clarifying assumptions and propositions. I argue that focus projection from the subject position is more widely available, but it requires specific contexts that may be difficult to obtain.

First, our assumptions are as follows:

(14) *a*. The breadth of focus is bounded by the information structure boundary.

b. Whereas stage-level predicates have an extra argument position for events, individual-level predicates do not (Kratzer, 1995).

c. The information structure of an utterance is felicitous only if there is a contextual referent corresponding to the (possibly deleted) theme (cf. Erteschik-Shir, 1998, p. 217).

Heycock (1994) assumes (14*b*) but not (14*c*). (14*a*) is one way to refine the structure-based FTA approach of Ladd (1996) by providing an additional condition to specify the breadth of focus. It is implicit in Steedman (2000a).

The main proposition of this paper is as follows:

(15) The availability of focus projection depends on the felicity of the information structure (among other conditions).

This proposition is an explicit form of Heycock (1994), intended to be applied consistently to a wider range of constructions than in Heycock (1994). Applying the main proposition, we actually suspect Heycock's (1994) own grammaticality judgment of (7*b*) and analyze the distinction between (7*b*) and (8-10) as pragmatic. Although we will still examine the effect of the stage-level/individual-level distinction, we will see that the effect is indirect.

Focus projection is a complex phenomenon. There are factors we need to separate for the present paper. For example, we will not discuss cases where focus projection depends on focusing particles, e.g., *only*, and contrastiveness. Further, although a focus can be present in a theme and it may well project in a similar way, we limit the discussion of focus projection in a rheme.

This paper is organized as follows. In Section 2, we briefly discuss the assumption (14*a*). Section 3 explores the stage and individual-level distinction in detail (14*b*). Section 4 discusses the main proposition in conjunction with the felicity of information structure in connection to the requirement of a (possibly deleted) theme (14*c*). In Section 5, we explore more examples in English. Section 6 deals with some data in Romance languages.

2 Boundary of Focus Projection

This section briefly discusses the assumption (14a). In (3-5), we have seen that the breadth of focus may coincide with the rheme of the utterance. But this is not always the case. For example, the following information-structure partition is impossible as long as we align the information structure division along with some grammatical constituents.

(16) *I didn't give him five marks, [I gave him five]_{Theme} [**francs**]_{Rheme}.

The breadth of focus here is narrower than any possible rhemes. In this case, the primary factor that affects focus projection seems to be contrastiveness, which we decided to exclude from the current discussion as mentioned in Introduction. Although Combinatory Categorical Grammar (CCG) (Steedman, 2000a, Sec. 5.2) regards 'constituency' more flexibly, the above phrasing is not available in CCG either.

On the other hand, the assumption (14a) still appears correct because it only limits the breadth of focus. It is implicit in Steedman (2000a) in the discussion of two dimensions of information structure: one dimension is the theme-rheme partition and the other is focus-background partition within either a theme or a rheme as seen below.

(17) Q: I know that Marcel likes the man who wrote the musical.

But who does he **admire**?

A: [Marcel **admires**]_{Theme} [the woman who **directed** the musical]_{Rheme}.

$\begin{matrix} L+H^* \\ \text{focus} \end{matrix}$
 $\begin{matrix} H^* \\ \text{focus} \end{matrix}$

'L+H*' and 'H*' are argued to mark theme and rheme, respectively (Steedman, 2000a).

When there is neither contrastiveness as seen in (16) nor focusing particle that would limit the scope of a focus, a focus may project to the rheme. In (3-5), without identifying the rheme in a certain context, it would be impossible to identify the breadth of the focus.

3 Stage- and Individual-Level Predicates

As we have seen, the effect of distinction between stage-level and individual-level predicates is observable, but not absolute. This section reviews Kratzer's (1995) idea about the distinction (14b) and discusses the limitation with purely lexical analysis.

Kratzer (1995) argues that stage-level predicates (temporary status) have an event argument whereas individual-level predicates (permanent) do not. Prototypical stage-level predicates include *hit*, *dance*, *die*, *fall*, and *available*; prototypical individual-level predicates include *know*, *altruistic*, *belong*, *be known to*, and *poisonous*. The following are examples involving a *when*-clause. Informally speaking, the *when*-clause cannot go with predicates that do not have an event argument.

(18) a. When Mary speaks French, she speaks it well. (*speak* = stage-level)

b. *When Mary knows French, she knows it well. (*know* = individual-level)

More precisely, Kratzer's analysis is that *when* is a quantifier that binds variables. The distinction between (a) and (b) is that while the stage-level predicate *speak* provides an event variable, the individual-level variable *know* does not. She lists several other cases of justification for the hypothesis: locative, syntactic arguments, different readings of bare plurals, negative quantifiers in German, and objects and existential closure.

We now turn to the following examples involving a stage-level predicate *available*.

(19) Q: What are available today?

A: [Today]_{Theme}, [**blowfish**]_{Rheme} [are available]_{Theme}.

(20) Q: Is anything unusual available today? What do you recommend today?

A: [Today]_{Theme}, [**blowfish** are available]_{Rheme}.

If the redundant event arguments are omitted, the above responses are identical to the two cases in (6).

Next, let us consider the examples (7) involving an individual-level predicate *poisonous*, which lacks an event argument. First, the following case is straightforward.

(21) Q: What kind of fish are poisonous?

A: [**Blowfish**]_{Rheme} [are poisonous]_{Theme}.

As for the case (7b), i.e., “[**Blowfish** are poisonous]_{Rheme}”, Heycock’s (1994) analysis is that no theme is available for this response as she does not accept the assumption (14c). Note that we cannot use the following question-answer pair at all because the question asks for an event.

(22) Q: What happened?

A: #**Blowfish** are poisonous.

In this respect, although the above question is often used to elicit a response possible in the so-called out-of-the-blue context, such a context does not really exist.

At the same time, Heycock (1994) proposes that there are certain cases where a theme is available even for individual-level predicates. For example, as for (9), it would be possible to coerce the individual-level predicate *be great* to a stage-level proposition applicable to a particular location as can be seen below.

(23) Q: So what do you like best about New Haven?

A: [In New Haven]_{Theme}, [the **buildings** are great (as far as I am concerned)]_{Rheme}.

If the redundant theme is omitted, the example is identical to (9). Heycock (1994) discusses a justification for this analysis referring to a construction in Japanese (grammatical labels are TOP: Topic, NOM: Nominative, ACC: Accusative, LOC: Locative, COP: Copula) analogous to the following:

(24) Q: “So what do you like best about New Haven?”

A: [New Haven-de-wa]_{Theme}, [biru-ga subarasii]_{Rheme}.
New Haven-LOC-TOP building-NOM great

“In New Haven, the buildings are great.”

The response combines the use of thematic *wa* and neutral-description *ga*, that suggests the indicated information structure (Kuno, 1973). Again, if the redundant theme is omitted, the example directly corresponds to (9). Thus, the effect must be pragmatic. In this connection, Diesing’s (1992) purely syntactic account of focus projection for this type of distinction cannot be maintained.¹

This type of stage/individual-level coercion depending on the context seems reasonable, as in the case of aspectual coercion (Moens and Steedman, 1988). This point is also shared by Kratzer (1995: 125), who states that stage/individual-level distinction is not simply lexical. In addition, various cases of loose ends with respect to stage/individual-level predicates can be found in Fernald (2000). In addition to event themes coerced from individual-level predicates, Heycock (1994) also observes that different types of theme may be available as a theme, e.g., for (10), as can be seen below.

(25) Q: Why do you want to leave early?

A: [On the route]_{Theme}, [the **roads** are dangerous]_{Rheme}.

Following Heycock (1994)’s suggestion, we provide the corresponding example in Japanese.

(26) Q: “Why do you want to leave early?”

A: [Kaerimiti-wa]_{Theme}, [dooro-ga kikenda]_{Rheme}.
return route-TOP road-NOM dangerous

“As for the return route, the roads are dangerous.”

¹Additional problems with Diesing (1992) is discussed in Appendix A.

To summarize, we understand that the condition (14*b*) about the stage/individual-level distinction guarantees the availability of an implicit event theme for a stage-level predicate (if no event argument is pronounced explicitly). But it does not prohibit the subject of an individual-level predicate to project through the predicate. I would also like to point out the following. First, if a theme is available, focus projections that were initially considered impossible may turn out to be possible. Second, the theme is not limited to an event argument. Thus, if we assume (14*c*) and some kind of theme is available, focus projection may be possible in virtually all cases including (7*b*) and (12). In this respect, the present position is different from Heycock's (1994).

4 Felicity of Information Structure

This section turns to the effect of information structure on focus projection. First, we need to clarify the following. Unlike many previous analyses of focus projection, the current proposal for analyzing focus projection requires that we know both (i) the position of the focus (phonological property) and (ii) the context that identifies the information structure of the utterance in question. Thus, isolated examples such as those discussed in Diesing (1992) are not sufficient. In addition, our analysis inevitably involves inference and needs to assume Gricean maxims (Grice, 1975). Therefore, the accuracy of the analysis also depends on these pragmatic factors.

While it is generally considered that a theme is linked to the context, the previous literature acknowledges the existence of an utterance where no theme is present, i.e., without a contextual link. For example, Vallduví (1990, p. 63) states as follows (note that Vallduví's (1990) 'ground' corresponds to our 'theme'):

All-focus structures correspond to sentences where the ground is null. In such cases, speakers assume that hearers are capable of retrieving the information carried by the sentence without any need for a vehicular anchoring frame: information can be entered into the knowledge-store without the need for an address pointer, and there is no need for a tail to indicate how the information fits under an address.

In this paper, we reject the above statement, and assume (14*c*) in the spirit of Erteschik-Shir (1998).

To see the point, let us first observe the following from Schmerling (1976).

(27) [**Johnson** died]_{Rheme}.

According to Vallduví, (27) does not have an index on the card. On the contrary, we apply the analysis of the previous section and consider an implicit event argument as the index of the file card. For example, the information structure might be "(Today)_{deleted-Theme}, [**Johnson** died]_{Rheme}." As we hinted earlier, it is natural that such a redundant theme be deleted when the utterance is made.

Vallduví also discusses the following example.

(28) Waiter! [There is a fly in my cream of broccoli soup]_{Rheme}!

This is different in that the predicate here is individual-level and that there is no event argument. However, let us recall that the theme does not need to be an event argument. One interpretation of the intention of the speaker is not just to report the fact out of the blue, but to complain the current problem. In this regard, the utterance can be considered as "(My complaint to you is)_{deleted-Theme} [(that) there is a fly in my cream of broccoli soup]_{Rheme}".

If we consider various forms of deleted themes, not just events, Heycock's (1994) analysis could be extended to virtually all the cases of all-rheme utterances including (7*b*) and (12). For example, the following example would be possible.

(29) *Q*: Why did those people die of poisoning at the Japanese restaurant?

A: (They died)_{deleted-Theme} [(because) **blowfish** are poisonous]_{Rheme}.

In contrast to (20), where an event argument can be used as the theme, an appropriate question-answer pair such as (29) is more difficult to come up with because of the introduction of higher-order proposition. Unless, such a context is readily available, we may perceive that the focus projection is impossible.

As suggested by Heycock (1994) as an explanation for simpler cases, e.g., (24), we can also consider analogous construction in Japanese, where a higher-order proposition is linked with the particle *wa*.

(30) Q: “I wonder if Ken got any help. Why is Ken still alive?”

A: Ken-ga ikiteiru-no-wa, Naomi-ga Ken-o tasuketa-kara-da.
Ken-NOM alive-that-TOP Nami-NOM Ken-ACC helped-because-COP

“The reason why Ken is alive is because Naomi helped him.”

In Japanese, virtually any kind of relation can be established between the *wa*-marked phrase and the main clause. If we analyze the logic of the proposition this way, we could say that any utterance can be a rheme of this kind. But it requires a right context to support this type of higher-order proposition, which is not always easy to obtain. We generally accept that some kind of conversational implicature (Grice, 1975) is at work during conversation. But it is rather difficult to design a logical system that actually realize such a logic. The current proposal can serve as a condition to invoke certain kinds of inferences as shown in the above examples if an utterance is (at first) analyzed as all-rheme.

Now, let us return to the examples (8-10). In addition to the analyses (24) and (25), we may also apply the following.

(31) Q: What’s the problem with your new job?

A: (The problem with my new job is)_{deleted-Theme} [(that) my **office** is small]_{Rheme}, [the **pay** is low]_{Rheme}, and [my **boss** is horrible]_{Rheme}.

(32) Q: So what do you like best about New Haven?

A: (What I like about New Haven is)_{deleted-Theme} [(that) the **buildings** are great]_{Rheme}.

(33) Q: Why do you want to leave early?

A: (I want to leave early)_{deleted-Theme} [(because) the **roads** are dangerous]_{Rheme}.

In many cases, there can be multiple possibilities. Both the above and the earlier analyses are consistent with the current proposal. One subtle point about the difference between, e.g., (33) and (25) is that (33A) is a more direct response to the question, simplifying the information-structure analysis.

We can now generalize the common view that theme is linked to the context (Vallduví, 1990) to the case including deleted theme, and can basically state that every utterance contains an anaphoric component. Although anaphoricity is often limited to the individual type, it is not necessarily the case (Brown and Yule, 1983, Chapter 6). In the example (27), the reference is made to an event (as discussed by Moens and Steedman, 1988 and Webber, 1988). In fact, reference can also be made to a modal (Stone and Hardt, 1999) or even to an abstract object (Asher, 1993). By considering reference this way and applying the assumption (14c), we can analyze the felicity of an information structure in a general sense.

The assumption (14c) also predicts that even a discourse-initial utterance must have a theme. This phenomenon can be clearly seen in Japanese, where the theme is typically marked with a particular morpheme *wa* (Kuno, 1972). That is, even the discourse-initial utterance must have some link to the context, e.g., the current time, location, and the title of the text. The usual analysis of the presence of a theme in the discourse-initial utterance is to employ the idea of accommodation (Lewis, 1979). Thus, the current proposal can be applied to trigger an accommodation for the discourse-initial utterance.

This section admits the role of the theme regardless of its phonological realization (explicitness), and analyze the availability of focus projection in terms of the felicity of information structure (15). The proposal

is generally consistent with the previous linguistic observations and has reasonable connection to the use of inference in the interpretation of the utterance.

5 More Examples in English

Next, we explore the consequences of the proposal in reference to additional data in English. The first thing we want to emphasize is that the proposal is robust. While identification of information structure depends on certain language-specific properties, the main idea is meant to be general and explicit. That is, the proposal is applicable to a much wider range of languages and constructs than, say, Diesing (1992), and more explicit than Heycock (1994).

In contrast to Diesing's (1992) analysis, the current proposal predicts the following points with respect to focus projection, except for the case where the felicity of information structure is compromised: The analysis of focus projection proposed so far would apply to complex sentences as well as simple ones. As for the possibility of focus projection, there is no asymmetry between the subject position and the object position. Similarly, there is no distinction between multiple object positions, e.g., direct vs. indirect and no distinction between arguments and adjuncts. Several remarks are in order.

First, for stage-level predicates, subject-object asymmetry does not surface as long as the event argument is the theme of the utterance. One who pursues a syntactic analysis may argue against this position. But the current proposal is compatible with asymmetry derived from pragmatic conditions. The asymmetry observed for individual-level predicates are pragmatic, i.e., general difficulty with availability of higher-level proposition where some implicit element constitutes as the theme. In addition, word order has a close connection to pragmatic effects, and must be indirectly affecting focus projection as well. Note that most transitive verbs are stage-level.

Second, double objects are notoriously difficult for some syntactic theories (Barss and Lasnik, 1986; Larson, 1988). On the other hand, we can get away from this type of difficulty by choosing an appropriate grammatical theory, e.g., Combinatory Categorical Grammar (Steedman, 2000b). Then, more realistic analyses of information structure will become possible.

Third, analogous analysis can be made for argument/adjunct distinction. As long as appropriate information structure is identified, a focus may project to the rheme boundary, but not beyond that. In addition, there may be higher-level proposition with implicit theme.

We now return to yet another example in Heycock (1994). She tries to show the impossibility of focus projection from the subject of an individual-level predicate in an embedded environment.

(34) *a.* I only said that [**blowfish**]_{Rheme} are poisonous.

b. *I only said [that **blowfish** are poisonous]_{Rheme}.

The analysis is problematic because it is given in isolation without a context. We also question the appropriateness of applying grammatical judgment. If focus projection depends on the context in the main clause, as she observes, wouldn't it be possible to set up a context that allows the same situation in an embedded clause? To see this possibility, we now apply the current proposal excluding the effect of focusing particles, *only* in the above example. I argue that the following examples are possible.

(35) *Q:* I overheard that these people are poisoned at the Japanese restaurant. What did you tell the reporters?

A: [I told them]_{Theme} [that **blowfish** are poisonous]_{Rheme}.

(36) *Q:* I overheard that these people are poisoned at the Japanese restaurant. What did John refuse to believe?

A: [He refused to believe]_{Theme} [that **blowfish** are poisonous]_{Rheme}.

That is, the main proposition (15) applies not only to simple sentences but also to complex sentences. This is possible because the availability of focus projection is based on the pragmatic condition of information structure.

Now, let us observe some additional examples. First, what would happen if the event argument of a stage-level predicate is explicit? The prediction is that the case is analogous to individual-level predicates, e.g., (28). That is, it is available only in the context where the entire sentence constitutes the rheme with an implicit theme.

(37) *Q*: What is the most remarkable event recently?

A: (It is)_{deleted-Theme} [(that) **Johnson** died yesterday]_{Rheme}.

In many other contexts, such a response might appear as inappropriate.

We can also extend the analysis to sentences involving expletive *it*. First, let us observe a case with a stage-level predicate.

(38) *Q*: What's happening (now)?

A: (Now)_{deleted-Theme} [it's **raining**]_{Rheme}.

But it is more difficult to come up with a context for an individual-level predicate.

(39) *Q*: What is the main point of your theory about the distribution of H₂O on the earth?

A: ?(The main point is)_{deleted-Theme} [(that) it **rains**]_{Rheme}.

Most transitive verbs are stage level. Thus, we can easily come up with situations where some constituent(s) or the implicit event argument is the theme as shown in the following examples.

(40) *Q*: Who did John give the book to?

A: [He gave it]_{Theme} [to **Mary**]_{Rheme}.

(41) *Q*: What did John give to Mary?

A: [He gave her]_{Theme} [a **book**]_{Rheme}.

(42) *Q*: What did John give to whom?

A: [He gave]_{Theme} [a **book** to **Mary**]_{Rheme}.

Note: The rheme (NP-PP sequence) can be considered as a constituent, e.g., in Combinatory Categorical Grammar (Steedman, 2000b).

(43) *Q*: What did John do at the party?

A: [(At the party,) he]_{Theme} [gave a **book** to **Mary**]_{Rheme}.

(44) *Q*: What happened at the party?

A: (At the party,)_{deleted-Theme} [John gave a **book** to **Mary**]_{Rheme}.

In a similar context, it would also be possible to project a focus from the subject position.

(45) *Q*: What happened at the party?

A: (At the party,)_{deleted-Theme} [**John** gave something to somebody]_{Rheme}.

The current proposal can also be applied to NPs unlike previous work including Kennedy (1999). Generally, NPs in English form a constituent within which no information-structure division is possible. This situation can be captured by applying Combinatory Categorical Grammar (CCG). Then, it follows that focus projects at least to the entire NP. But in some languages, e.g., Scandinavian, extraction from a relative clause is possible (Maling and Zaenen, 1982). Although the authors do not explicitly relate such a case of extraction to information structure, they point out that it is related to 'aboutness', which seems to correspond to the notion of theme. We can specify an instance of Combinatory Categorical Grammar that would allow extraction for the case where the extracted constituent is the theme of the utterance. In this case, we can predict that focus projection would not extend to the extracted, thematic constituent.

6 Romance Languages

In this section, we discuss data in Romance languages. Zubizarreta (1998, Sec. 2.4) points out that the following examples are impossible in the out-of-the-blue context (Italian is similar to Spanish for the purpose of the present discussion).

(46) *a.* Spanish: *[**María** baila]_{Rheme}.

b. French: *[**Marie** dance]_{Rheme}.

Again, I do not believe that there is real out-of-the-blue context, but let us interpret the above examples as follows: focus projection from the subject position is not possible in these languages in any context.

In Spanish, it is not possible to have the following information structure (Zubizarreta, 1998, Sec. 1.2).

(47) *Q:* “Who ate an apple?”

*A:** [**Juan**]_{Rheme} comió una manzana.
Juan ate an apple

This seems to do with the pragmatic role of the subject position. Let us suppose that the subject in Spanish cannot be a part of the rheme. It is not the matter of prominence because the following is possible.

(48) **Juan** comió una manzana (no Pedro).

Juan ate an apple not Pedro

As a result, we can say that the impossibility of (46*a*) is due to the unavailability of the information structure as in the case of (47).

On the other hand, the following is possible in French (Zubizarreta, 1998, Sec. 1.2).

(49) *Q:* “Who ate an apple?”

A: [**Jean**]_{Rheme} a mangé une pomme.
Jean has eaten an apple

Then, the impossibility of (46*b*) must be of a different type. Without additional condition (cf. Zubizarreta (1998)), if we follow the discussion of the present paper, we predict that (46*b*) may be simply more difficult to come up with. I suggest that the following, or some variation of it, might be possible.

(50) *Q:* “Why did you laugh?”

A: (Je suis rit)_{deleted-Theme} [(parce que) **Marie** a dancé]_{Rheme}.

7 Conclusion

Starting from Heycock’s observation, this paper shows an account of focus projection different from previous analyses. We argue that focus projection is affected by the felicity of information structure. The felicity of information structure in turn depends on the availability of the contextual link from the theme or the deleted theme. As we have seen, the present analysis generally agrees with the previously proposed analysis of focus projection from the subject position, including the case sensitive to the distinction between stage and individual-level predicates. In addition, our analysis extends the coverage to a wider range of data including complement clauses, adjuncts, ditransitive verbs, and NPs. This analysis suggests that certain cases of focus projection require a context that is hard to come up with, not ungrammatical.

One natural direction for further work is to apply the current proposal to various constructs of different languages, which are likely to pose problems to purely syntactic analyses. Another possible direction is to explore the connection with Rooth’s (1996) ‘alternative semantics’ with respect to identification of the context set. Finally, we may also explore the effect of the current proposal on the interaction between focusing particle such as *only* and focus projection.

A Discussion on Diesing’s Analysis of Focus Projection

We have seen that Diesing’s (1992) purely syntactic analysis has problem accounting for contextual effects. This appendix discusses additional problems with her approach with respect to focus projection.

Diesing (1992) presents ‘mapping hypothesis’ that relates syntactic and semantic structures and argues that the phenomenon of focus projection (from the subject position) can be explained by her mapping hypothesis and stage/individual-level distinction. Now, we have already shown examples that are problematic for syntactic analyses of focus projection. So, rather than repeating that point, this section re-examines Diesing’s syntactic-semantic analysis for other types of difficulties.

Diesing’s main thesis is a link between syntactic and semantic structures. For the semantic structure, she adopts Kamp and Heim’s tripartite structure (via Diesing (1992)) shown below.

- (51) *a.* $Qx[R(x), N(x)]$
 Q for quantifier
 R for restrictive clause
 N for nuclear scope
b. E.g., “All men are mortal.” $\forall x[man(x) \Rightarrow mortal(x)]$
c. E.g., “Some men are happy.” $\exists x[man(x) \wedge happy(x)]$

Let us now turn to mapping hypothesis, as shown below.

- (52) Mapping hypothesis
 Material from VP is mapped into the nuclear scope.
b. Material from IP is mapped into a restrictive clause.

Next, to see the distinct role for focus projection between stage-level and individual-level predicates, we examine Diesing’s analysis of these two types of predicates.

- (53) Stage-level predicate:
 The subject is base-generated at [Spec,VP].
b. Infl does not assign a θ -role to [Spec,IP].
c. The subject is raised to [Spec,IP] to receive case leaving the trace behind.
d. The subject may or may not be lowered to [Spec,VP] at LF.

- (54) Individual-level predicate:
 The subject is base-generated at [Spec,IP].
b. Infl assign a θ -role to [Spec,IP].
c. Infl controls the PRO in [Spec,VP]
d. The subject cannot be lowered at LF to [Spec,VP].

Diesing’s analysis of distinct focus projections for stage-level and individual-level predicates goes as follows. Her main assumption is that the nuclear scope is the domain of focus projection [p. 50] (we will come back to this shortly). First, since the subject of an individual-level predicate cannot be lowered to [Spec, VP] (54), it cannot be mapped to the nuclear scope (52). On the other hand, the subject of a stage-level predicate can be lowered to [Spec, VP], and can be mapped to the nuclear scope. She argues that this explains the distinct focus projection from the subject position. Since the object is always within a VP, the focus projection from the object is always possible.

Here we need to investigate her argument in detail. Fernald (2000, p. 51) comments on the following. Diesing (1992, p. 26) points out that the government status of the PRO in [Spec, VP] is a potential problem for PRO Theorem of Chomsky. She mentions two possible ways to avoid this problem, but leaves the choice for future work. Thus, the exact nature of this control situation appears inconclusive.

Second, she also raises a question about the nuclear scope as the domain of focus projection, and provides no justification [p. 53]. In endnote 24 [p. 141], she also discusses the possibility of narrow focus on the subject, which can be outside the VP. She attempts to distinguish between contrastive focus and presupposition-inducing focus. But what about the following example:

(55) Q: Are blowfish available today or yesterday?

A: They were available [**yesterday**]_{Rheme}.

The event argument in the response, which is presumably outside the VP, is the rheme. Then, it cannot be in the domain of focus projection. But it seems possible that event argument at the end of a sentence can project to the entire sentence.

(56) Q: I know that blowfish is available only occasionally at this restaurant. And, you suspect that yesterday's patrons got food poisoning from blowfish. Why?

A: [Because blowfish were available **yesterday**]_{Rheme}.

We want to analyze the process of focus projection and its relation to information structure in a general way so that the above case can also be accounted for in a systematic manner.

Third, she discusses the connection between the external and the internal subject positions using floating quantifier [p. 23, 28]. But the argument seems weak. Only a few examples are given, and it is not clear why movement from [Spec, VP] to [Spec, IP] is the only solution. If the subject of *the violinists are all tone-deaf* is moved from [Spec, VP] and the quantifier was in the same position, what is the semantics of “*all the*”? Since Diesing allows splitting of this, there must be a composition. Then not both of them can bind a single variable.

Fourth, Diesing's analysis gives wrong prediction on individual-level unaccusative predicates [p. 29, 46]. Her proposal to separate the event argument and θ -role assignment to [Spec, IP] eliminates the possibility of accessing event argument for semantic analysis. But as discussed by Fernald (2000, p. 53), if this is the case, there must be 4-way distinctions involving these two parameters.

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