FOCUS MOVEMENT AND THE QUANTIFICATIONAL STRUCTURE OF FOCUS SENSITIVE OPERATORS

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1. Introduction

Focus-background partition has been discussed under a number of different names (e.g. focus-presupposition, theme-rheme, topic-comment, old-new information, etc.) in a wide variety of works in the discourse/pragmatic literature (cf. Givón (1979)). It has been widely acknowledged that focus-background is the informational structuring of sentences required by communicative purposes. The focus encodes what the sentence asserts and the background encodes what is already established in the given discourse context. While significant differences are found among different approaches, recent works in the area of formal semantics seem to share the view that the primary function of focus-background is not pragmatically motivated, but rather it is to provide a quantificational structure for focus sensitive operators.¹ The

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¹ Krifka (1988) proposes that focus-background provides a structured meaning equating to the <restrictor, nucleus> partition of quantification structures (see also Diesing (1992), Krifka (1995)). Alternatively, Rooth (1985) proposes that a focused phrase provides a set of alternatives, which determines the domain of quan-

communicative use of focus-background is understood as one of the properties of the resulting configuration.

The purpose of this paper is two-fold. In the first half of this paper, I will present an overview of the semantic theory of focus developed by Herburger (2000), who argues that focus restructures the quantificational structure of the event quantifier in that the non-focused material in its scope also contributes to its restriction. In the second half of this paper, I will show that there are many cases in which the “Herburger-style” focus-affected reading never arises, and argue that the syntax plays a major role in the restructuring of the quantificational structure of focus sensitive operators. While Herburger proposes a mechanism in which focus is interpreted *in-situ*, I will provide an alternative movement account for the presence or absence of the focus-affected reading. My analysis is primarily based on Diesing’s (1992) claim that semantic representations directly relate to syntactic representations. Diesing argues that there are two kinds of indefinites; non-quantificational indefinites are interpreted *in-situ*, whereas quantificational indefinites involve covert movement at LF. Following Diesing’s basic insight, I will present a number of empirical arguments supporting the view that “Herburger-style” focus affected interpretations arise only as a result of covert focus movement.²

2. Semantic Background

Within the framework of neo-Davidsonian semantics, it has been proposed in the literature that a sentence is understood as a description of events, and that all verbs are taken to denote one-place predicates taking an event variable (e.g. Parsons (1990)). Herburger assumes with Parsons (1990) that (1a) is translated as in (1b) rather than (1c).

- (1) a. Brutus stabbed Caesar.
- b. $\exists e$ (Stab(e) & Past(e) & Agent(e , brutus) & Theme(e , caesar))
- c. $\exists e$ (Past(e) & Stab(brutus, caesar))

tification for the operator that associates with a focused phrase.

² I assume that the structural realization of focus-background is subject to cross-linguistic variation. English resorts to covert focus movement, whereas languages like Hungarian and Japanese resort to overt focus movement (cf. Kiss (1995), Yanagida (1995, 1996)). It is known that *wh*-movement shows the same variation.

(1b) states that “there was a stabbing whose agent was Brutus and whose theme was Caesar.” The arguments are treated in the same way as the adjuncts in that they are linked to the verb by conjunction. According to Parsons (1990), the view that both arguments and adjuncts form their own conjuncts accounts for the fact that arguments are not always obligatory elements of the verb. The theme of the verb *stab* in (1a) is purely optional, and there are many cases where two place predicates happen to take only one theta-marked argument and yet the sentences are completely acceptable:

- (2) a. John ate fish.
- b. John ate.
- (3) a. John studied math.
- b. John studied.

The separation of arguments into their own conjuncts is certainly desirable in representing the meanings of (2) and (3). Parsons (1990) further indicates that decomposition accounts for the logical entailment patterns illustrated in (4a-c).

- (4) a. Brutus stabbed Caesar.
- b. Brutus stabbed Caesar in the back.
- c. Brutus stabbed Caesar in the back with a knife.

Note that both (4b) and (4c) entail (4a). If (4b) is true, then (4a) is also true. If (4c) is true, then both (4b) and (4a) are true. In other words, the longer sentences entail the shorter sentences. It is contradictory to assert the longer sentences and deny the shorter ones. This entailment pattern directly follows from the semantic representations of (4a-c), as given in (5a-c).

- (5) a. $\exists e$ (Stab(e) & Past(e) & Agent(e, brutus) & Theme(e, caesar))
- b. $\exists e$ (Stab(e) & Past(e) & Agent(e, brutus) & Theme(e, caesar) & In-the-back(e))
- c. $\exists e$ (Stab(e) & Past(e) & Agent(e, brutus) & Theme(e, caesar) & In-the-back(e) & With-a-knife(e))

Assuming that decomposition is radical enough to separate arguments into their own conjuncts, Herburger (2000) discusses how focus affects the quantificational structure of focus sensitive quantifiers.

One of the main aspects of Herburger’s theory of focus is that focus is interpreted *in-situ* and the semantic effect of focus is obtained by the interpretive process called “focal mapping,” as expressed in (6).

(6) Focal mapping

The nonfocused material in the c-command domain of Q also provides an internal argument for Q.

(Herburger (2000: 43))

Focal mapping is a process that takes LF representations as input, and makes the event quantifier Q binary in that it forms Q's internal argument translated as its restriction and Q's external argument as its scope.³ For example, prior to focal mapping, the LF structure of (7) looks like (8a), where the event quantifier, represented as *sometime*, is unary in that it has no internal argument, and becomes binary as in (8b) after focal mapping.

(7) PAUL ordered salmon.

(8) a. [*sometime* [PAUL ordered salmon]]

b. [[*sometime* [ordered salmon]] [PAUL ordered salmon]]

The non-focused material inside the c-command domain of the event quantifier in (8a) ends up contributing to its restriction in (8b). (8b), then, is mapped into the "structured Davidsonian decomposition" in (9).

(9) [$\exists e$: C(e) & Order(e) & Past(e) & Theme(e, salmon)]
(Agent(e, paul) & Order(e) & Past(e) & Theme(e, salmon))

(9) contains the context predicate C that restricts events relevant to the context in which the sentence is used. Note that the restrictive clause in (9) only states that there exists some relevant past event of ordering salmon but not of someone's ordering salmon. Our understanding that there exists such a person who ordered salmon is not described as part of the semantics of the verb, but as part of our world knowledge; that is, events of ordering require an agent. Importantly, Herburger claims that the non-focused material in the restriction of Q is entailed by the sentence. In other words, (7) is about some past event of ordering salmon and entails that there was such an event in the past. She uses the term "backgrounded focal entailment" (Herburger (2000: 20)) to refer to entailments that appear in the restriction of Q.

³ In Herburger's monograph, it is assumed that Q refers to quantifiers in general, which include both adverbial quantifiers such as *sometime*, *usually*, *always*, etc. and quantificational determiners such as *some*, *every*, *most*, etc.

3. Focal Presupposition to Entailment

Herburger presents a number of arguments against the view that (7) presupposes that someone ordered salmon. It is widely known that a presupposition is described as a proposition whose truth is taken for granted as part of the background of the conversation, and thus is a precondition for felicitous utterance of the sentence. Based on empirical considerations, however, presuppositions do fail. Under various nonstandard logics, in particular three-valued and supervaluational logics, the failure of presuppositions leads the sentence to have no semantic value. An important difference between the presuppositional analysis and Herburger's analysis is that her analysis retains a two valued semantics and that in case a "backgrounded focal entailment" fails, the sentence is not valueless, but is simply false. Let us now consider (10a, b).

- (10) a. MANY OF HIS COLLEAGUES like Bill.
b. NOBODY likes Bill.

Examples like (10a, b) are problematic under the presuppositional view that the non-focused part of a sentence expresses an existential presupposition. (10a), with the non-decreasing quantifier, presupposes that someone likes Bill, but (10b), with the decreasing quantifier, does not presuppose that someone likes Bill. By replacing presuppositions with entailments, Herburger provides a simple account for the difference between (10a) and (10b). Herburger claims that focal mapping applies after QR; that is, in (10a, b) the quantifiers undergo QR prior to focal mapping. The absence of the "backgrounded focal entailment" in (10b) is then accounted for by the view that the negative quantifier takes scope over the event operator. (10b) is translated in (11).

- (11) [nobody x] [$\exists e$: C(e) & Like(e) & Theme(e , bill)] (Experiencer(e , x) & Like(e) & Theme(e , bill))

"Nobody is such that some relevant event of liking Bill had him or her as its experiencer."

(11) is now about whether Bill is liked. Since the negative quantifier takes scope over the existential event quantifier, (10b) does not entail that Bill is liked. The non-decreasing quantifier in (10a), on the other hand, does not cancel the existential import of the event quantifier. Let us turn to cases in which focus is embedded within an *if*-clause or a clause inside the verb *discover*:

- (12) a. If HILLARY trusts Bill, all is well.
 b. Joan discovered that HILLARY trusts Bill.

In both (12a, b) even if the speaker does not believe that there exists someone who trusts Bill, the sentences do not become “valueless” (fail to be interpretable), but they are intuitively true. Under Herburger’s analysis, the absence of the existential import is again accounted for by the scopal interaction between the existential event operator and higher illocutionary, attitudinal or epistemic predicates such as *if* and *discover*. In other words, “backgrounded focal entailments,” which appear in the restriction of the event operator, can be suspended if a quantifier-like element appears in a position higher than the existential event operator.

4. Adverbs of Quantification

4.1. Association with Focus

I will now discuss how Herburger’s theory of focus accounts for “adverbs of quantification” that have been extensively discussed in the literature since the term was first used by Lewis (1975). It is widely acknowledged that adverbs of quantification (henceforth Q-adverbs) associate with focus and that examples like (13a, b) have different truth conditions (cf. Rooth (1985)).

- (13) a. MARY always said hi to John.
 b. Mary always said hi to JOHN.

If someone other than Mary said hi to John, (13a) is false but (13b) may be true. On the other hand, if Mary greeted someone other than John, (13a) may be true but (13b) is false. Herburger proposes that Q-adverbs such as *always* move via a process of Q-raising and focal mapping applies to the resultant structure. (13a, b) are represented in (14a, b) respectively.

- (14) a. [Always [said hi to John]] [Mary said hi to John]
 b. [Always [Mary said hi]] [Mary said hi to John]

In (14a), *always* quantifies over events of greeting John, while in (14b) it quantifies over events of Mary’s greeting. (14a, b) are mapped to the “structured Davidsonian decomposition,” as represented in (15a, b).

- (15) a. [all e: C(e) & Say-hi(e) & Past(e) & To(e, john)]
 (Agent(e, mary) & Say-hi(e) & Past(e) & To(e, john))
 “All (relevant) events of saying hi to John had Mary as

their agent.”

- b. [all e : $C(e)$ & Say-hi(e) & Past(e) & Agent(e , mary)]
 (To(e , john) & Say-hi(e) & Past(e) & Agent(e , mary))
 “All (relevant) events of Mary’s saying hi were directed
 to John.”

Herburger proposes that universal quantifiers have existential force and have the interpretation given in (16).

$$(16) \quad [\text{all } e: F(e)] G(e) \text{ iff } F \neq \{\} \ \& F \subseteq G$$

(16) states that “a universal quantification over events is true when it is the case that the restriction is not empty and every event that is an element of the restriction is also an element of the scope” (Herburger (2000: 106)). This ensures that in (15a) the set of past events involving saying hi to John is not empty and that all its members are also members of the set of events where Mary said hi to John.

4.2. Quantificational Variability

For a precise understanding of how Herburger’s theory of focus works for adverbs of quantification, the following will briefly review the Kamp-Heim theory and compare it with Herburger’s analysis. The main linguistic motivation for the Kamp-Heim approach to adverbs of quantification comes from the fact that classical logic fails to account for the truth conditions of so-called donkey sentences. For example, the most straightforward translation of (17a) into classical logic would be as in (17b).

- (17) a. If Pedro owns a donkey, he beats it.
 b. $(\exists x (\text{donkey}(x) \ \& \ \text{own}(\text{Pedro}, x)) \rightarrow \text{beat}(\text{he}, x))$

This treats the indefinite as an existential quantifier, which is the standard in classical logic. (17b), however, fails to capture the intuitive interpretation of (17a). A more appropriate semantic interpretation of (17a) would be (18).⁴

$$(18) \quad \forall x (\text{donkey}(x) \ \& \ \text{own}(\text{Pedro}, x) \rightarrow \text{beat}(\text{Pedro}, x))$$

(18) shows that the indefinite that appears inside the antecedent clause

⁴ Given the c-command requirement for variable binding, the LF representation that corresponds to (17b) is not well formed, since the existential quantifier in the antecedent clause fails to bind the pronoun *it*, which is translated as a variable. In (18), on the other hand, the universal quantifier has scope over the consequent clause and is able to bind the occurrence of x corresponding to the pronoun *it*.

in (17a) gets interpreted as a wide scope universal quantifier. A question then arises as to why indefinites sometimes must be existential quantifiers and at other times need to be analyzed as universal quantifiers.

Adverbs of quantification such as *always* and *rarely* introduce another problem:

- (19) a. If a man owns a donkey, he always beats it.
- b. Sometimes if a man owns a donkey, he beats it.
- c. If a man owns a donkey, he rarely beats it.

The quantificational force of the indefinite changes from an existential quantifier to different quantifiers depending on its environment. It is interpreted as a universal quantifier when used with the Q-adverb *always*, and becomes an existential quantifier when the sentence contains an existential adverb such as *sometimes*. The quantificational force of the indefinite varies depending on what Q-adverbs happen to be around. If we assume that the indefinite is an existential quantifier, how do we account for this change in quantificational force? Various versions of Discourse Representation Theory (DRT) including the Kamp-Heim approach addressed these problems and the basic proposals shared by DRT include the following (cf. Kamp (1981), Heim (1982), Landman (1989), Kadmon (1987), (1990), Diesing (1992) and many others).

- (a) Both definites and indefinites are treated as variables rather than quantifiers. Definite NPs (including pronouns) are assumed to introduce old variables, whereas indefinites introduce new variables.
- (b) Quantificational adverbs are unselective quantifiers binding all the variables in their scope that are not bound by other quantifiers.
- (c) Universal quantification and conditionals introduce an implicit unselective universal quantifier having scope over the antecedent and the consequent. There is an implicit unselective existential quantifier (existential closure) having scope over the consequent.

Herburger's neo-Davidsonian analysis differs radically from the DRT approach in the following main points.

- (a) Both definites and indefinites are genuine quantifiers and do not introduce free variables.
- (b) Quantificational adverbs are selective quantifiers over events.

(c) There is no default existential generalization of free variables. Herburger claims that quantificational determiners, frequency adverbs and the hidden operator in conditionals are selective in that they just bind one variable each, and that indefinites are treated as existential quantifiers. How the indefinite captures quantificational variability is illustrated by the following example (Herburger (2000: 75)).

- (20) a. A CLAUSTROPHOBIC usually avoids an elevator.
 b. [most e : $C(e)$ & $Avoid(e)$ & [an x : $Elevator(x)$]
 Theme(e , x)] [a y : $Claustrophobic(y)$] ($Experiencer(e$,
 y) & $Avoid(e)$ & [an x : $Elevator(x)$] Theme(e , x))
 “Most (relevant) events of avoiding an elevator are
 events of a claustrophobic’s avoiding the elevator.”

Herburger proposes that (20a) is translated into the structured Davidsonian decomposition in (20b); namely, focus reshapes the quantificational structure of the Q-adverb, and as a result, the non-focused indefinite *an elevator* appears in its restriction.⁵ The interpretation of the indefinite in the restriction varies with the assignments to the event variable e of the Q-adverb. (20) means that “in most events e of an elevator’s being avoided, the one avoiding it is a claustrophobic.” It follows that the non-focused indefinite gives rise to quantificational variability.

5. Analysis

In the above sections, I have presented an overview of the semantic theory of focus developed by Herburger (2000), in particular highlighting her claim that focus restructures quantificational structure in that the non-focused material in the scope of a quantifier also contributes to its restriction. In this section, I will argue that Herburger’s semantic approach does not always give correct interpretations of an indefinite in a conditional clause. My argument is given in relation to the two substantive problems that DRT theory runs into; namely, proportion problems and uniqueness, as addressed by Kadmon (1987, 1990).

⁵ In the translation given in (20b), the non-focused indefinite *an elevator* occurs twice, once in the restriction and once in the scope of the Q-adverb. Assuming with Larson and Segal (1995) that theta-roles have to be assigned exhaustively, Herburger claims that the same elevator is picked up in both instances.

5.1. Proportion Problems

Kadmon (1987, 1990) observes that a conditional with two indefinites as in (21) technically allows multiple interpretations.

(21) Mostly, if a woman owns a dog, she is rich.

One reading is obtained by counting woman-dog pairs (symmetric reading), and the other by counting dog-owning women (asymmetric reading). Suppose that among ten women, one woman who owns 50 dogs is rich, but the other nine women who own exactly one dog are poor. In this scenario (21) is true on the symmetric reading since there are 50 different woman-dog pairs and in most of those pairs the woman is rich. (21), however, is false under the asymmetric reading which is obtained by counting dog-owning women. On this reading, it does not matter how many dogs are owned by a single woman. The sentence is false because there are ten dog-owning women and only one of them is rich. A question then arises as to which of the indefinites is most likely to end up in the restriction of the quantifier. Bauerle and Egli (1985) (cited in Kadmon (1987, 1990)) propose that the Q-adverb quantifies over the indefinite in the antecedent that is linked to the pronoun in the consequent. That is, unless a suitable contextual story is added, *mostly* in (21) quantifies over dog-owning women because the pronoun *she* in the consequent is linked to *a woman* in the antecedent.

Under Herburger's account, the interpretation of the conditionals with two indefinites depends on which of the indefinites is focused. Herburger (2000: 78) claims that the indefinite linked with the pronoun in the consequent may not be focused, as exemplified by (22a, b).⁶

- (22) a. Mostly, if a woman owns A DOG, she is rich.
 b. #Mostly, if A WOMAN owns a dog, she is rich.

The Davidsonian decomposition of the *if*-clause that Herburger proposes looks like (23), where the Q-adverb *mostly* behaves as if it directly quantified over the events quantified by the conditional operator ($\forall e'$).

- (23) [most e : C(e) & [$\forall e'$: C(e') & One-to-one(e , e') & Own(e') & [an x : Woman(x)] Agent(e' , x)] [a y : Dog(y)] Theme(e' , y)] (Rich(e) & Theme(e , she))

⁶ Herburger (2000: 78) indicates that the pronoun in the consequent prefers taking the non-focused noun phrase as its antecedent. The reviewer, however, pointed out to me that (22b) can be read naturally as "among dog-owners, most women are rich (though not necessarily most men)."

The direct interpretation of (23) would be “most events *e* where every event *e'* of a woman's owning that corresponds one-to-one to *e* is an event involving a dog are such that the woman in *e* is rich.”⁷ According to Herburger, the quantificational variability is captured by the indefinite interpreted in the restriction of the conditional operator ($\forall e'$). Given that focus reshapes the quantificational structure of the conditional, (23) has only an asymmetric reading where we are counting dog-owning women, which may in fact give a correct interpretation.

5.2. Problems with Herburger's Analysis

Herburger assumes with Heim (1990) that although the pronoun in the consequent tends to be linked with the non-focused indefinite in the antecedent, the context makes it possible for the pronoun to be anaphoric on a focused phrase. This is illustrated in (24), as given originally by Heim (1990).

- (24) Donkeys that belong to peddlers generally are in miserable shape, whereas those that belong to farmers mostly have a comfortable life. The reason is that if A FARMER owns a donkey, he is usually rich (and uses tractors and other modern equipment for the hard work on his farm).

Under Herburger's approach, there is only one reading available in (24), namely, that in which the non-focused indefinite that appears in the restriction captures quantificational variability. However, as Heim (1990) pointed out, a preference for one reading over others is a mere tendency that can be overridden by other pragmatic factors (see also Kadmon (1987)).⁸ Contrary to what Herburger assumes, (24) could

⁷ Herburger introduced the one-to-one restriction in the semantics of *if*-clauses, by which *e* corresponds one-to-one to *e'*. The reviewer, however, pointed out to me that the one-to-one restriction introduced in the restriction adds no semantic effect, and thus can be eliminated from the translation. (23) then states that “most events *e* where every event *e'* of a woman's owning is an event involving a dog are such that the woman in *e* is rich.” Furthermore, in (23), the woman in *e* is not related to the woman in *e'*. Under Herburger's analysis, since the indefinite is treated as an existential quantifier, the anaphoric pronoun in the consequent cannot be treated as a bound variable. Herburger, however, left open the question of how to treat the existential binding of pronouns.

⁸ Heim (1990), in fact, proposes that a semantic theory should not be too successful in predicting the interpretation of the indefinite in multi-case conditionals.

have other readings, such as the reading that Bauerle and Egli (1985) predict, where the Q-adverb quantifies over farmers linked to the pronoun in the consequent clause. Note that even under the given context, we cannot ignore the farmers who own multiple donkeys to get the right interpretation. Suppose one farmer who owns 200 donkeys is rich, but 50 other farmers who own exactly one donkey are poor. Herburger's neo-Davidsonian approach predicts that (24) is true, since 200 out of 250 donkeys are owned by rich farmers. In this scenario, however, (24) can be false by counting donkey-owning farmers rather than donkeys owned by farmers. It seems that how the domain of quantification is delimited depends heavily on pragmatic factors and not merely on focus structure. The same observation holds of (25).

- (25) Drummers mostly live in crowded dormitories. But if a drummer lives in an APARTMENT COMPLEX, it is usually half empty.

Under Herburger's analysis, only the non-focused indefinite shows quantificational variability. (25) is false under the context where 200 out of 299 drummers who live in apartment complexes live in apartment complexes that are fully occupied. (25), however, can be read as having a so-called "uniqueness implication" in the sense of Kadmon (1987: 197); if a drummer lives in an apartment complex, there is a "unique" apartment complex per drummer. If this is so, the sentence has the same truth condition as a symmetric construal obtained by counting drummer-apartment pairs, rather than counting drummers living in an apartment complex. As for the asymmetric reading, whether we count the drummers or the apartment complexes is a context dependent affair. Suppose that the context is given in such a way that we count the apartment complexes. In such a case, if 20 drummers live in one apartment complex that is fully occupied, and exactly one drummer lives in each of 10 other apartment complexes that are half empty, (25) is intuitively true. In summary, although focusing may have some effect on the interpretation of the indefinite, multi-case conditionals with two indefinites allow multiple interpretations regardless of which of the indefinites is focused. The absence of the backgrounded focal entailment inside the *if*-clause illustrated by example (12a) and the proportion problem just discussed above suggest that focus does not affect the quantification structure of a conditional operator.

6. Syntactic Account

The aim of this section is to explore an alternative syntactic account for how focus affects quantificational structure. In this section, I will discuss cases in which the “Herburger-style” focus affected reading never arises, and claim that the syntax plays a crucial role in determining the presence or absence of a focus-affected reading. Following Diesing’s (1992) basic insight, I argue that a focused phrase moves covertly to the domain of CP and that covert focus movement allows for a straightforward mapping into the “Herburger-style” focus-affected reading.

6.1. Diesing’s Mapping Hypothesis

Before getting to my syntactic account, I give here a brief explanation of the Mapping Hypothesis proposed by Diesing (1992), which states that there is a direct link between semantic representations and syntactic representations. Following the Kamp-Heim approach, Diesing proposes that a tripartite logical structure consisting of a quantifier, a restrictive clause and the nuclear scope is derived directly from S-structure, as expressed by the Mapping Hypothesis in (26).

(26) Mapping Hypothesis (Diesing (1992: 10))

Material from VP is mapped into the nuclear scope.

Material from IP is mapped into a restrictive clause.

The Mapping Hypothesis accounts for the difference in the interpretation of bare plurals with stage and individual level predicates, as illustrated in (27a, b).

(27) a. Blowfish are available.

b. Blowfish are poisonous.

Diesing claims that the subject of the stage level predicate in (27a) is base-generated in Spec/VP, which is mapped into the nuclear scope, whereas the subject of the individual level predicate is base-generated in Spec/IP, and is mapped into the restrictive clause. (27a, b) are represented in (28a, b) respectively.

(28) a. $\exists x$ x is blowfish & x is available

b. Gen_x [x is blowfish] x is poisonous

(28a) involves only scope and no restriction is formed, whereas (28b) illustrates a tripartite logical structure consisting of the Gen-operator, the restrictive clause and the nuclear scope. Diesing (1992: 49) observes that focus contributes to the interpretation of bare plurals,

suggesting that focused material is mapped into the nuclear scope in its logical representation. This is illustrated by the contrast given in (29a, b).

- (29) a. I only said that [_F BLOWFISH are available].
 b. *I only said that [_F BLOWFISH are poisonous].

When the subject of the stage level predicate is focused, it allows a wide focus reading in which focus projects to the entire sentence. (29a) can be interpreted as “the only thing I said was that blowfish are available, and I did not say anything else.” When the subject of an individual level predicate is focused, in contrast, focus does not go beyond the NP. (29b) is not acceptable with the projected wide focus reading. What follows is that focus can project from Spec/VP, but not from Spec/IP. Herburger, however, argues against the Mapping Hypothesis that states that an element inside a VP is automatically mapped to the adverb’s nuclear scope. She observes that in examples (30a, b), the non-focused material inside the VP is mapped not to the scope of the Q-adverb, but to its restriction at the logical representation.

- (30) a. David rarely reads THE NEWSPAPER.
 b. DAVID rarely reads the newspaper.

Since Diesing’s analysis of focus mainly concerns a wide focus that is bound by existential closure, how the Mapping Hypothesis works for (30a, b) is entirely left open. In the following sections, I will argue that while the projected focus in (29a) is interpreted inside the VP, as proposed by Diesing, the unprojected narrow focus as in (29b) and (30a, b) involves covert focus movement that results in the restructuring of the quantificational structure of focus sensitive operators.

6.2. LF Movement Revisited

There has been a long-standing theoretical question whether focused materials are interpreted *in-situ* or they involve LF movement. A well-known empirical argument for the *in-situ* analysis of focus, as proposed by Herburger, is that focus is insensitive to syntactic island conditions such as Subjacency:

- (31) John only knows a boy who lives in TOKYO.

Despite the fact that *only* and the associated focused phrase are non-local in examples like (31), it will be shown that there is substantial evidence that the “Herburger-style” focus affected reading arises only as a

result of covert focus movement.⁹

The basic syntactic framework I will be assuming is that of the phase-based minimalist approach recently developed by Chomsky (2001a, 2001b). Two major components that differ crucially from the earlier versions of Chomsky's minimalist approach are as follows. First, Spell-out is taken to apply cyclically at the strong phase level, which is identified as vP (light verb phrase) and CP. The cyclic Spell-out system lends itself to the conclusion that three components: narrow syntax (NS), LF and PF, proceed cyclically in parallel. Subadjacency reduces to the so-called Phase Impenetrability Condition (PIC) that reduces the search domain for operations:

(32) The Phase Impenetrability Condition

In phase α with head H, the domain of H is not accessible to operations outside α , only H and its edge are accessible to such operations. (Chomsky (2001a: 13))

Due to PIC, the phonological components do not look into the earlier stages. For illustrative purposes, consider (33).

(33) [CP ...[vP α [_v [vP ...]]]]

VP is spelled-out at the level of vP. The status of the edge of vP, α and v, is determined at the next strong phase CP. This means that the edge of vP is accessible to operations outside vP and hence movement must uniformly proceed through the edge of the phase. The second component of the phase-based minimalist assumption that is crucial to the thesis of this paper concerns the assumption that the edge of the strong phase requires some particular interpretive mechanism at the conceptual-intentional (C-I) interface.

Given that the application of movement is motivated by non-theta theoretic C-I interface conditions, Chomsky (2001b) introduces the feature called OCC (meaning "I must be an occurrence of some β "),

⁹ I assume with Chomsky (2001a,b) that phrasal movement can take place either before or after Spell-out; after Spell-out, movement is covert and the moved element is spelled out *in-situ*. As for the Subadjacency effect, a similar phenomenon is widely observed for *wh*-questions; while overt *wh*-movement is sensitive to Subadjacency, *wh-in-situ* are insensitive to this condition. There are two major proposals that have been advanced in the literature; one is that the entire phrase containing a *wh*-word undergoes pied-piping (cf. Nishigauchi (1986)), and the other is that Subadjacency is a condition only applicable at S-structure (cf. Watanabe (1992)). I will leave this issue open.

which has the following characteristics:

“OCC should be available only when necessary: that is, when it contributes to an outcome at SEM that is not otherwise expressible. [A head] H has OCC only if it yields new scopal or discourse-related properties (or if required for other reasons). If H has OCC, then the new interpretive options are established if OCC is checked by internal Move; it is only necessary that the cyclic derivation D can continue so that they are ultimately satisfied with convergence of D. Informally, we can think of OCC as having the “function” of providing new interpretations.” (Chomsky (2001b: 11))

Scope of *wh*-phrases, for example, has a long distance property. Assuming that a subject is generated in Spec/vP, the PIC forces the *wh*-phrase to move through the outer edge of vP successive cyclically. Note importantly that this outer edge position is completely optional. The feature OCC not only makes this position available for *wh*-movement, but also makes each step of *wh*-movement satisfy C-I interface conditions.

In what follows, I will be assuming that the outer edge of the phase has a semantic effect and that covert focus movement directly feeds into semantic structure at the strong phase level.¹⁰ I propose that focal mapping in the sense of Herburger (2000) is taken to be the interface condition that applies at the phase level. The bipartite semantic structure is then compositionally derived from the structure provided by the syntax, as illustrated in (34a–d).

- (34) a. [_{vP} John loves MARY] Base structure
 b. [_{vP} MARY [_{vP} John loves t]] Focus movement
 c. [_{CP} MARY [_{vP} t [_{vP} John loves t]]]
 d. [John loves] [MARY John loves] Bipartite structure

Given that focus is licensed at the edge of the phase, the focused phrase MARY in (34a) moves covertly to the edge of vP, leaving be-

¹⁰ Following the basic minimalist conception, a computational system has no access to discourse-related interpretations. It follows that covert focus movement should not be described as driven by the semantic feature of a focused element. The focus-affected reading is then understood as one of the properties of the resulting configuration.

hind a trace.¹¹ After spelling out the vP, the vP in (34b) is mapped into the semantic restriction.¹² Crucially, since the edge of vP is interpreted at the next higher phase: CP (cf. Chomsky (2001a: 13)), a focused phrase uniformly moves to CP as in (34c), which is mapped into the scope of focus. The bipartite semantic structure compositionally constructed as in (34d) then is translated into the structured Davidsonian decomposition:

- (35) [$\exists e$: C(e) & love(e) & Experiencer(e, john)] (Theme(e, mary) & Experiencer(e, john) & love(e))

The interpretation of (35) states that some relevant event of John's loving is such that it is an event of John's loving and its theme is Mary. My proposed analysis, however, differs from Herburger's in that it assumes that there are two types of focus. A wide focus reading does not involve covert movement, and as a result, (36) is ambiguous between the "Diesing-style" reading and the "Herburger-style" reading.

- (36) CHILDREN are playing.

The "Diesing-style" reading simply asserts that there is an event where CHILDREN are playing (i.e. wide focus), and the "Herburger-style" reading states that some relevant event of playing is an event where CHILDREN are playing. The former involves no covert focus movement and hence no restriction is formed, whereas the latter involves covert focus movement, forming the restriction of the event quantifier. I propose that covert focus movement is treated as an optional movement, and that the "Herburger-style" focus-affected reading is understood as one of the properties of the resulting configuration.

The optionality of covert focus movement is motivated on both theoretical and empirical grounds. On theoretical grounds, focus movement is characterized as movement to the "edge" of the phase, which is driven by the feature OCC available only when it contributes to new interpretations. On empirical grounds, the optionality of focus

¹¹ For present purposes, it is assumed that at the conceptual-intentional (C-I) interface, only one member of the chain is interpreted and all other members actually delete (cf. Hornstein (1999)).

¹² The assumption that verbs are fully inflected in the lexicon allows tense information along with the VP to be mapped into the restriction of the event quantifier. Note that under Diesing's Mapping Hypothesis, a restrictive clause and the nuclear scope correspond to IP and VP respectively. I propose that focus has the reversed effect in that VP is mapped into the semantic restriction.

movement provides an account for why backgrounded focal entailments are suspended in embedded clauses like (37) (cf. (12a)).

(37) If HILLARY trusts Bill, all is well.

Suppose that the conditional operator is licensed at the edge of the phase CP. Then the embedded CP is not available for the focused phrase, and as a result, the focused phrase ends up staying *in-situ* and does not form a bipartite semantic structure.¹³ Note further that focus does not go beyond the *if*-clause and affect the quantificational structure of the matrix clause. The reason why focus cannot be raised out of the *if*-clause is accounted for by the Defective Intervention Constraints (DIC), which is assumed to be part of the definition of Move.

(38) Defective Intervention Constraints (Chomsky (2000: 123))

$$\alpha < \beta < \gamma$$

(*AGREE (α , γ), α is a probe and β is a matching goal, and β is inactive due to a prior AGREE with some other probe)

The DIC prohibits establishment of a checking relation between the matrix C and the focused phrase, in the presence of the conditional operator. In section 6.4, I will present more evidence for the view that covert focus movement is sensitive to the DIC.

6.3. Two Kinds of Determiners

The idea that there are two kinds of focus, one with quantificational force and the other without quantificational force, is strongly supported by the well-known descriptive observation concerning two types of determiners, which Milsark (1974) calls strong and weak. Milsark observes that strong determiners cannot appear in *there*-insertion contexts (the so-called “definiteness effect”), while weak determiners can appear in *there*-insertion contexts. This is illustrated in (39a, b).

- (39) a. *There is (are) every/each/all child(ren) in the garden.
 b. There are some/three/many/few/no children in the garden.

¹³ I assume that in a multiple Spec construction, only non-distinct XPs can be licensed at the edge of a phase. The view that the conditional operator is licensed at the edge of the phase CP is supported by the fact that subject-aux inversion is possible when *if* is not present:

- (i) a. If John had done that, he would be happy.
 b. Had John done that, he would be happy.

Milsark further indicates that strong determiners carry existential presuppositions:

- (40) a. Every child baked banana pie.
b. Most children ate banana pie.

Both the sentences in (40a, b) carry a presupposition that children must in fact exist. Weak determiners, on the other hand, are ambiguous. The non-presuppositional reading, which Milsark calls a cardinal reading, simply asserts the existence of entities:

- (41) a. There are some children in the garden.
b. Some children are in the garden; the others are in the kitchen.

(41a) favors the non-presuppositional reading; the sentence simply asserts the existence of children in the garden. If children turn out not to exist, the sentence is false. (40b) favors the presuppositional reading, and can be paraphrased as a partitive: some of the children. With the presuppositional reading, the absence of children does not make the sentence false, but rather its truth-value will be undefined. Given Milsark's classification of the two types of determiners, Herburger observes that the weak determiners, but not the strong determiners, allow focus-affected readings.¹⁴ This is exemplified by (42a, b).

- (42) a. Some/Few/Many/No/students from NEW YORK applied.
b. Every/All/Each students from NEW YORK applied.

(42a) allows a focus affected interpretation, stating that some/few/many/no students who applied were from New York. The focus-affected reading, however, is impossible in (42b). Namely, (42b) cannot be paraphrased as every/all/each student who applied was from New York. Under Herburger's analysis, weak determiners (some, few, etc.) behave like adverbial quantifiers in how they find their restrictions. Weak determiners take scope through Q-raising, as illustrated in (43).

- (43) D_i [$_{DP}$ t_i NP] YP

Focus reshapes the quantificational structure after Q-raising takes

¹⁴ Herburger does not appeal to the presuppositional treatment of the quantificational determiners. Under Herburger's analysis, the existence of children in (40) and (41) is entailed, rather than presupposed. If children do not exist, the sentences are not valueless, but they are simply false.

place. (42a) becomes (44a) after Q-raising, and then becomes (44b) after focal mapping.

- (44) a. [Some [student from NEW YORK applied]] [Q-raising]
 b. [[Some [student applied]] [student from NEW YORK
 applied]] [Focal mapping]

To account for the absence of the focus-affected reading in (42b), Herburger suggests that strong determiners do not undergo Q-raising. Note that focal mapping applies only after Q is raised to a position from which it c-commands both the focus and the rest of the non-focused material. It follows that if Q-raising does not take place, the focus-affected reading is not available. Although the Q-raising analysis seems to work for distinguishing between weak and strong determiners, Herburger provides no principled independent explanation for why weak determiners, but not strong determiners, undergo Q-raising. Without appeal to the Q-raising analysis, I will argue that the difference between (42a) and (42b) is attributable to the DIC.

6.4. Intervention Effects

It is well known that *wh*-movement out of an NP depends on the semantic properties of the NP, in particular, it is sensitive to a Specificity condition (cf. Fiengo and Higginbotham (1981)), as illustrated in (45a, b).

- (45) a. Who did you see a picture of?
 b. *Who did you see the picture of?

The *wh*-word can move out of an indefinite NP, but not out of a definite NP. Diesing (1992) suggests that the contrast given in (45a, b) can be assimilated to Milsark's characterization of two kinds of determiners: weak determiners in (46) and strong determiners in (47).

- (46) a. Who did you see a picture of?
 b. Who did you see many pictures of?
 c. Who did you see several pictures of?
 d. Who did you see some pictures of?
 (47) a. *?Who did you see the picture of?
 b. *?Who did you see every picture of?
 c. *?Who did you see most pictures of?
 d. *?Who did you see each picture of? (Diesing (1992: 97))

Diesing (1992) proposes that strong determiners with existential presuppositions have quantificational force of their own and undergo QR at LF, while non-presuppositional weak determiners have no quantifica-

tional force and involve no movement. The contrast given in (46) and (47) is accounted for by the following constraint.

- (48) Presuppositional NP constraint (Diesing (1992: 103))

Extraction cannot take place out of a presuppositional NP.

Diesing assumes that there are two kinds of indefinite NPs; indefinites with an existential reading are construed as non-quantificational variables bound by existential closure, whereas indefinites with a presuppositional reading have a quantificational force of their own and undergo QR. Due to the condition in (48), it is predicted that only the former allows *wh*-movement out of the NPs. This is evidenced by examples (49) and (50).

- (49) a. Who do you usually read a book by?
 b. Who do you usually play a sonata by?
 c. What do you usually buy a picture of?
 d. Who do you usually comment on an essay by?
 e. What do you usually publish a book about? (ibid.: 116)
- (50) a. *What do you usually like a picture of?
 b. *Who do you usually love a sonata by?
 c. *What you do usually appreciate a good joke about?
 d. *What do you usually hate an article about?
 e. *What do you generally detest an opera by? (ibid.: 117)

All the predicates in (49) have an indefinite object with an existential reading and extraction out of the NPs is possible. Experiencer predicates in (50), however, allow only a presuppositional reading of their object NPs and extraction out of the NPs is not possible. Under the phase-based minimalist framework, scopal properties of quantifiers are assigned at the edge of the phase, and the constraint (48) may be reformulated in (51).

- (51) Presuppositional NP constraint (Revised)

Extraction cannot take place out of an NP that must itself be interpreted at the edge of a phase.

It is clear that the constraint (51) is reducible to the DIC, as stated in (38).

Suppose that covert movement behaves exactly like overt *wh*-movement with respect to the DIC. It is predicted that focus *in-situ* may have the same distributional similarity. Consider (52) and (53).

- (52) a. I usually read a book by CHOMSKY.
 b. I usually play a sonata by DITTERSDORF.
 c. I usually buy a picture of THE CHIRICAHUAS.

- d. I usually comment on an essay by GEORGE WILL.
 - e. I usually publish a book on CHOMSKY.
- (53)
- a. I usually like a picture of MANATEES.
 - b. I usually love a sonata by DITTERSDORF.
 - c. I usually appreciate a joke about VIOLISTS.
 - d. I usually hate an article about CARPENTER ANTS.
 - e. I usually detest an opera by MOZART.

Unlike *wh*-movement, none of these sentences are excluded in the syntax, and yet the “Herburger-style” focus-affected reading is possible in (52), but not possible in (53). Example (52a), for instance, can mean that most events of my reading a book are events of my reading a book by Chomsky (here usually “associates” with CHOMSKY). (53a), however, cannot mean that most events of my liking a picture are events of my liking a picture of manatees. The unavailability of the “Herburger-style” focus-affected reading is not due to the fact that the predicate associated with the indefinite is stative since Herburger makes no distinction between episodic and stative predicates with respect to the notion of the event. (53a) only means that whenever I see a picture of manatees, I like it. In other words, the Q-adverb is restricted by the object NP and the focused phrase is interpreted inside the NP, which is automatically mapped into Q’s restriction. This supports the view that the presuppositional indefinite NP moves to the edge of the phase and a focused phrase inside the NP may not move out of the NP in violation of the DIC. Now consider (54a, b).

- (54)
- a. Some/Few/Many students from NEW YORK are intelligent.
 - b. Most students from NEW YORK are intelligent.

Although both (54a, b) are acceptable sentences, neither allows the focus-affected reading; these sentences cannot mean some/few/many/most intelligent students are from NEW YORK. The absence of the focus-affected reading in (54a, b) has to do with the fact that the focused phrases appear in the subject position of an individual-level predicate. Recall that under the Mapping Hypothesis, Diesing (1988, 1992) proposes that the subject of the individual-level predicate is base-generated in Spec/IP, which is mapped into the restrictive clause, and that the variable introduced in the restrictive clause is bound by a default generic operator Gen. Suppose that the scopal properties of Gen are assigned at the edge of the phase. The absence of the focus-affected reading in (54a, b) is then accounted for straightforwardly by

the DIC.

To summarize, it is argued that focus undergoes covert movement and that focus movement behaves exactly like *wh*-movement in that it is subject to the DIC. Covert focus movement, however, differs from *wh*-movement in that it is an optional movement that takes place only if it has a semantic effect on the outcome.

7. Concluding Remarks

Diesing has argued for a direct link between syntactic representations and semantic representations within the framework of generative grammar. Herburger's framework provides a non-transformational, compositional dynamic formalism for deducing the semantic representations. Despite their apparent radical distinctness, this paper has explored an attempt to mediate the two theories, showing that covert focus movement allows for a straightforward mapping into "Herburger-style" focus interpretations involving structured Davidsonian decomposition.

The paper has adopted two major syntactic components that are central to the phase-based minimalist framework. The first concerns the notion of cyclic Spell-out whereby syntactic structure feeds into semantic structure at the strong phase level; namely, the light verb phrase (vP) and CP. The system lends itself naturally to the conclusion that LF and PF components are accessible in a dynamic way. The second concerns the kind of feature, referred to as OCC, which is an optional feature available only when it contributes to new scopal or discourse-related interpretations. It is proposed that the "Herburger-style" focus-affected reading results from checking of OCC by internal Merge that involves covert focus movement. This provides a straightforward syntactic account for the conditions under which focus gives rise to "backgrounded focal entailments" in the sense of Herburger.

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