

Production and Perception from Perspective of Focus

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Bokyung Noh. 2002. Production and Perception from Perspective of Focus. *Language and Information 6.1*, 105–121. This paper investigates the effect of semantic argument structure on the comprehension and production of sentences by observing the prosodic realizations of English secondary predications. Specifically, the goal of this study is to show how the theory of predication, argument structure, and focus semantically interact to account for similarities and differences between English resultative and depictive predications. To address this issue, production and comprehension tests were performed. In the fixed focus domain (verb phrase), subjects were asked to utter and to comprehend ambiguous sentences in the context monologues. The experimental results were generally consistent with general linguistic analyses: In the resultative constructions, secondary subject NPs tend to be accented, as in other argument-head constructions, while in the depictive constructions, secondary predicates tend to have accents, as in other adjunct-head constructions. (**Dongduk Women's University**)

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1. Introduction

In English secondary predication, the two major types, depictives and resultatives consist of the string V-NP-AdjP, as below.¹

- (1) a. I brought the soup hot. (Depictive)
b. I wiped the window clean. (Resultative)

The predication relations in both cases occur in addition to their main verbs. For example, the predicate *hot* is predicated of the theme *my soup*, while the resultative predicate *clean* is predicated of the object NP *the window* (a theme) in a transitive sentence, as in (1b). However, their meanings differ: the predication

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1. The terms 'depictive' and 'resultative' are taken from Halliday (1967). In Halliday's classification, both are two contrasting types of attributive clauses. Halliday defines an attribute as "a characteristic ascribed to one of the participants in the clause; but it is one that relates specifically to the process in question" (1967: 62).

in (1b) indicates that I caused the window to be clean by wiping it. In contrast, (1a) means that, when I brought the soup, it was hot.

This paper will examine the phenomenon of depictive and resultative predications with specific attention given to the relationship between accentual focus structure and argument structure. It is well known that focus, as a syntactic feature, triggers specific prosodic realization and semantic interpretation (Jackendoff, 1972). So in this paper, the goal will be pursued primarily through experiments (production and perception) and analyses designed to establish the interconnection between focus and argument structure.

2. Focus and Argument Structure

2.1 Broad focus and Narrow Focus

The notions of narrow focus and broad focus have to do with the issue of the size of a focused constituent, and how it is conveyed by an accent. In general, narrow focus shows the direct relation between accent and focus: what is focused is accented and what is accented is focused (Ladd, 1996), as in (2b), while broad focus does not show such a direct relationship between focus and accent. It is not the case that whatever is focused is accented and whatever is accented is focused. With broad focus, the issue is where to place the accent that denotes focus. That is, we do not accent each word as in the answer of (2a), but apply certain principles that decide which word takes the accent when a given constituent as a unit is focused. In (2a), accent is on the argument *apple*. []_F denotes focus domain.

- (2) a. What did John do?
 He [ate an APPLE]_F.
 b. What did John eat?
 He ate [an APPLE]_F.

With regard to this, note that experiments concern only broad focus to look at normal accentual patterns.

2.2 Deaccenting and Givenness

In English, accentuation is influenced by the semantic factor such as informativeness. The distinction between 'new' and 'given' information plays an important role in explaining patterns of intonational prominence, in the sense that the given items are generally deaccented in English.

Newness and givenness have different characteristics with regard to focus. Newness is often taken to be a derivative characteristic of focus, and so we must show that these notions are, to a certain degree, independent. If we take question-answer exchanges as the most reliable test for focus, then we indeed find cases in which given items can be part of focused constituents (where a given entity is included, following Halliday (1967), as "anaphorically recoverable" or "contextually recoverable")

- (3) What did you do when you lost your house key?
 I [looked for the key]_F. Then I [called to a locksmith]_F.

The question fixes the focus of the answer on a VP. In such a situation, the accent is on *looked* in the first sentence because it is new information, whereas it is on another new entity, *a locksmith*, in the second clause. The word *the key*, which we might expect to be accented because of focus, fails to have accent in a context where the entity to which it refers is already mentioned. This supports the assumption that the discourse status of a constituent as old or given may prevent it from being the target of accent percolation. So, expressions that were either anaphorically or contextually recoverable were avoided in designing experiments.

2.3 Focus and Argument Structure

Sentence accentuation reflects the intended focus of an utterance. In English phonology, a pitch accent is an intonational unit of pitch contours that accompanies a certain stressed syllable in a word. In this study, following Pierrehumbert (1980) and Uhmman (1991), I assume that a pitch accent is evidence for phonological phrasing. Here F0 (fundamental frequency) is used as a measurement of pitch accent because F0 contours are most easily accessible for the description of intonation among other factors such as duration, intensity. So, in this paper, phonological phrasing is determined by accent, which then indirectly shows syntactic and semantic information associated with argument structure.²

Now consider the relations between accent and argument structure in focus. In this paper, I will follow the so-called focus percolation approach (Gussenhoven 1992; Jacobs, 1991), rather than focus projection approach (Selkirk, 1984;1995). They differ in regard to the mechanism for the determination of the range of focus. As shown in (4a), for example, in focus projection approach, *a book* is focus marked since it is accented. Since the *a book* is an argument of *bought*, F-marking of *a book* allows F-marking of *bought*, which allows F-marking of the entire VP, *bought a book*. Thus, in argument-head structure, the single accent on *a book*, through focus projection, can indicate that the entire VP is the focus of the sentence. However, in accent percolation approach, focus is directly assigned to the VP *bought a book* and the accent is percolated down to the argument, *a book*, upon which the pitch accent is realized.

- (4) What did Mary do?
 a. She [bought [a book]_F]_F
 b. She [bought a book]_F

In adjunct-head structure, both approaches allow head and adjunct to have accents. However, in Selkirk(1995)'s focus projection approach, an accented adjunct

2. Phonological phrase formation is to a certain degree optional in that it allows different phonological phrases for the same sentences. As Selkirk(1984) showed, the sentence *Mary bought a black dog* can be divided to *(Mary bought)(a black dog)*, which is thus not a traditional syntactic analysis.

phrase fails to project focus because the notions of heads and complements are crucial to focus projection; Adjuncts are identified as syntactic constituents that are not relevant to focus projection. So, the adjunct and the head might be independently F-marked because they are accented, and the entire VP forms focus. However, in accent percolation approach, accents are just percolated down to the head and the adjunct in focus.

Given this, my choice for following the accent percolation framework is that it shows the relation between focus and accent in a more direct way, not relying on the issue of where focus is originated. Furthermore, based on accent percolation approach (Gussenhoven, 1992; Jacob, 1991), the so-called Phonological Accent Percolation Approach (PAPA) shows that argument-head structure is different from adjunct-head structure in sentence accentuation by the tool of phonological phrases. This model relates accentual focus structure to phonological phrasing and shows that an argument-head structure forms a single phonological phrase, whereas an adjunct-head structure forms two phonological phrases, one containing a head, and the other containing an adjunct. Note that each phonological phrase carries a single accent. Here, a phonological phrase represents a semantic unit as well as a prosodic unit. In doing so, the PAPA does not only capture how an argument-head structure differs from an adjunct-head structure in accentual focus structure, but also represents how the accentual differences are related with semantics. Argument-head and adjunct-head structures are represented with four rules, namely Focus Assignment (FA), Phonological Phrase Formation (PPF), Accent Percolation (AP) and Final Strengthening (FS): The accent words are in capitals. The more strongly accented words are underlined.

(5) Argument-Head Structure

a. [pred argu] _F	FA
b. [(pred argu)] _F	PPF
c. [(pred ARGU)] _F	AP
d. [(pred <u>ARGU</u>)] _F	FS(optional)

(6) Adjunct-Head Structure

a. [(pred adj)] _F	FA
b. [(pred) (adj)] _F	PPF
c. [(PRED) (ADJ)] _F	AP
d. [(PRED) (<u>ADJ</u>)] _F	FS (optional)

As shown in (5) and (6), both argument-head structure and adjunct-head structure go through the same stages, although the prosodic realizations are different. The FA rule determines a focus domain. Then, the PPF rule is applied based on Uhmman's proposal that each phonological phrase carry a single accent. Next, According to the AP rule (Gussenhoven, 1983, 1992; Jacob, 1991), accent goes to the argument in argument-head structure, whereas accents go to

the head and the adjunct respectively. Finally, the FS rule, which is reminiscent of Nuclear Stress Rule (Chomsky and Halle, 1968), indicates that the final phonological phrase has a stronger accent than the phonological phrase in the focus. In argument-head structure, as there is only one phonological phrase, the FS does not create any superficial difference, perhaps for strengthening the accented syllable on the argument. In contrast, in adjunct-head structure, the adjunct, which follows the head, receives a stronger accent than its head. So, the FS rule results in both structures having a similar accentual pattern. However, the FS rule can be optional in that strength of accent is a gradual, continuous dimension, and not a discrete role, so, at least for perception purposes, I might consider it optional.³

2.4 English Resultatives and Depictives in Syntax and Semantics.

Resultatives and Depictives are two major constructions of English secondary predications. Semantically, as for resultative constructions, many linguists point out that matrix verbs are notorious picky about the semantic class of the result phrase, as below.

- (7) John hammered the metal flat/smooth /(?shiny)/into the ground/*beautiful/*stained.

Hammering something is normally intended to change either its location(into the ground) or its shape and/or texture(flat/smooth) as in (7), and so the verb *hammer* selects for these kinds of result properties. This close tie between the verb and the resultative predicate promoted many linguists to analyze this construction as a sort of complex lexical predicate(e.g. hammer-flat). Williams (1997) recently support this general assumption by Heavy NP shift. For example, the sentence *John wiped the table clean* can appear in the form “V Predicate NP”, as in the sentence *John wiped clean the table* without any conditioning environment of Heavy NP Shift. With this, Williams (1998) formulates R-predications with a lexical rule, which adds a R-predicate to the meaning of a verb in the lexicon. Similarly, Wechsler and Noh (2001) propose that as in the sentence *I hammered the metal flat*, an argument is shared between the matrix and resultative predicates, showing semantic restriction for the result states. Then, it appears that the resultative predicate is part of the argument structure of the verb, and so is understood as part of action described by the verb.

On the other hand, a depictive predicate(D-predicate) mortifies an entity at the time of the action denoted by main verbs. It can not be part of the argument structure of the verb. In this sense, depictive predicates have been analyzed as adjuncts because they never contribute to the thematic structure of the verb. Consider following examples.

3. The optionality of the FS rule allows the head and the adjunct to have accents, which might make the locus of focal accent unclear. However, it does not affect the difference between argument-head and adjunct-head focus structure.

- (8) a. John sat on the bench drunk.
 b. John ate the vegetables fresh.

In (8a), depictive predicates *drunk*, *fresh* modify the subject *John*, and the object *vegetables*, respectively. However, regardless of the entities being predicated by each depictive predicate, there is no close connection between matrix verbs and their depictive predicates in terms of argument structure. For example, in (8a), there is no thematic relations between the verb *sat* and the depictive predicate *drunk*.

So, I assume that a resultative predicate forms a complex predicate as a part of a matrix verb, while a depictive predicate is an adjunct. This is consistent with the general assumption that resultatives form argument-head relations, while depictives form adjunct-head relations. Given this, in next section, I will perform experiments to investigate the issue of how the differences are realized in accentual patterns.

3. Experimental Designs

3.1 General Method

As mentioned in section 2, there were two crucial conditions for the experiments: first, the experiments concerned only broad focus (a verb phrase including a main verb, a secondary subject and a secondary predicate). Second, expressions that were anaphorically or contextually recoverable were avoided. That is, every effort was made to avoid entities in focus, in particular, secondary subject NPs (direct objects), that were already mentioned or contextually recoverable from the previous context, since givenness would trigger deaccenting in English (cf. Ladd, 1996).

3.2 Hypotheses and Variables

The experiments test a set of specific hypotheses which relate the discussion of the accentual properties of depictive predications (D-predications) and resultative predications (R-predications). Note that the hypotheses hold only for broad focus.

The hypotheses are as follows:

- (9) Hypothesis 1 (H1)
 In depictive predications, the main accent falls on the secondary predicate (SP)

Hypothesis 2 (H2)
 In resultative predications, the main accent falls on the secondary subject NP.

Hypothesis 1 (H1) assumes that the VP in D-predications tends to form more than one phonological phrase. Specifically, SP tends to form a separate phonological

phrase as adjuncts, having main accents on the secondary predicates. H2 assumes that the VP in R-predications tends to form one phonological phrase; the accent in argument-head constructions falls on the argument; and the secondary subject NP is the argument of a complex predicate formed by V and SP. (see 2.4.). However, the two hypotheses do not exclude the case where both NP and SP have accents equally, which is consistent with the theoretical framework (see 2.3). One reason to posit this assumption is that the strength of accent is gradient and relative and not categorically discrete. More specifically, the final strengthening of the last phonological phrase may be optional or may not be very prominent in perception of production, as it is our accentuation rule (cf. 2.3). So, H1 captures that a main accent is either on the SP or on both the NP and the SP, whereas H2 accounts for the case where a main accent is either on the NP or on both the NP and the SP.

Given this, four variables-secondary subject noun phrase (NP), secondary predicate (SP), NP=SP and Other-were used in this study. The following operational definitions of the variables were used for the present study.

- (10) Individual variables:
- a. NP(noun phrase): When the main accent fell on a secondary subject NP, the test item was coded as NP.
 - b. SP(Secondary Predicate): When the main accent fell on a secondary predicate, the test item was coded as SP.
 - c. NP=SP: When a main accent fell equally on both secondary subject NP and a secondary predicate, it was coded as NP=SP. This variable included the cases where it was not clear with element had a stronger accent where both NP and SP were accented.
 - d. Other: When accentual patterns did not corresponded to any of the above, or when the accent location was not clear to judge, the item was coded this way.

3.3 Judgement Process

Each subject's utterance was recorded on a separate cassette-tape. A native speaker of English, born and raised on the West Coast of the US, judged the ten subjects' utterances. At the time of the judgments, she was a third-year doctoral student in the Department of Linguistics at the University of Texas at Austin. I provided a general overview to the judge about R-predication and D-predication, explaining the similarities and differences between them, and informed her of the experimental purposes. In production test, the judge double-checked all the data after one week to make sure that she had not made any mistakes. When the judge finished the judgement process, the handwritten raw data in the judge's script were entered into the Data Entry program of the SPSS for Windows Statistical package.

4. Experiments

Two experiments, production and perceptions, were performed. They are designed based on the assumption that perception and production are two main aspects of knowledge of language. The perceptual and production evidence together enables us to construct a picture of the role of prosody in language, and the way this knowledge is put to use. In this sense, the experiments reported in this study use the existing relationship between production and perception to examine how pitch accents and meaning are mediated by the accentual focus structure.

4.1 Experiment 1: Production

This experiment addresses the issue of focus marking by testing whether the ambiguous sentences containing both resultative and depictive readings are prosodically disambiguated in the speakers' utterances.

4.1.1 Subjects and Procedure . Twenty native speakers of American English (14 females and 6 males) were participated. All were middle-class native speakers of American English, born and raised in the US. All of them were college graduates. The same subjects participated in perception test. They were randomly divided into two groups: Group A and Group B. This experiment consisted of six ambiguous test items which contained two context monologues each (see Appendix A for a complete list). There was no filler items. A test item had a pair of context monologues that conveyed either a depictive or resultative reading, as shown below (the test item was not underlined in the subjects' materials). Twelve monologues were tested. For example, the test item in (11a) has a resultative meaning, while that in (11b) has a depictive reading.

- (11) a. Mark is an excellent pastry cook. Yesterday I watched him making an apple pie. He took apples that were a bit sour, and soaked the raisins in wine. Then, he rolled the dough smooth, filled it with the apples and raisins and put it into the oven for 20 minutes.
- b. Mark is an excellent pastry cook. Yesterday I watched him making an apple pie. He first mixed flour, eggs, and sugar in a bowl. And he kneaded the mixture carefully. And he rolled the dough smooth. He told me that, if the dough isn't smooth, it can't be rolled thin enough.

Each context monologue including either a depictive or resultative reading of a sentence was written on a separate sheet of paper (8" × 5"). Among the twelve contexts from the six ambiguous sentences, six had only resultative readings and the other six had only depictive readings. Each group was randomly presented with a different context monologue of an ambiguous sentence (a test item), so the three resultative and the three depictive context monologues were given to each subject. Subjects were first asked to read an instruction script and then utter the given monologue.

4.1.2 Results . The results show that R- predications tend to have accents on the secondary subject NPs, whereas D-predication have on the secondary predicates. A chi-square test demonstrated that the accentual patterns between R- and D-predications are significantly different, $\chi^2 = 27.45$, $df = 3$, $p < .005$, thus supporting hypotheses. The results are shown in Table 1.

<Table 1> The Frequency and Percentage of Accent Location

Predicates	Accent Location				Total
	NP	SP	NP=SP	Others	
R-pred.	34(56.7)	10(16.7)	16(26.7)	0(0)	60(100)
D-pred.	9(15.0)	27(45.0)	24(40.0)	0(0)	60(100)
Total	43(71.7)	37(61.7)	40(66.7)	0(0)	120(200)

4.2 Experiment 2: Perception

This experiment was performed to answer whether the disambiguation strategies employed by the speakers in production test were psychologically real.

4.2.1 Subjects and Procedure. The subjects were assigned into the same group in the production test. Each group listened to the assigned listening stimuli. The same context monologues as used in the production experiment were used in this experiment. The stimuli were recorded by a female doctoral student in the Foreign Language Education program who was not familiar with the purposes of the hypotheses of the experiment. She was a native speaker of American English, having grown up in the US.

For Group A, three of six test items were chosen. Subjects had three context monologues with depictive readings and three context monologues with resultative readings for the final sentences of each monologue. Since subjects were in the same group as in production test, the context monologues given to Group A in this experiment contained the reading that was not given to them in production experiment. Then they were asked to listen to two accentual patterns, and to judge to which accentual pattern fit best to the test item. There are four possible responses the subjects could give:

- (12) a. The accentual pattern with accent on the secondary subject NP fits the context with a resultative reading, whereas the one with accent on the secondary predicate fits the context with a depictive reading.
 b. The accentual pattern with accent on the secondary subject NP fits the context with a depictive reading, whereas the one with accent on the secondary predicate fits the context with a resultative reading.
 c. Either accentual pattern fits the given context monologue.
 d. Neither accentual patterns fit to the given context monologue.

Group B were given two monologues of each test item. They were asked listen to the one accentual pattern of each the test items and to judge to which of two

given context it best corresponded. As in the case of Group A, the subjects were given the option of selecting among four possible answers:

- (13) a. The accentual pattern with accent on the secondary subject NP fits the context with a resultative reading, whereas the one with accent on the secondary predicate fits the context with a depictive reading.
 b. The accentual pattern with accent on the secondary subject NP fits the context with a depictive reading, whereas the accentual pattern with accent on the secondary predicate fits the context with a resultative reading.
 c. An accentual pattern fits either one of the given contexts.
 d. Neither contexts fit to the given accentual pattern.

4.2.2 Results. In the perception test, the theory I assume predicts that the secondary subject NP is accented and the SP is deaccented in R-predications. Hence, subjects exposed to this pattern would be expected to select a context that favors the R-predication interpretation. On the other hand, the SP should be accented in D-predications. Hence, subjects exposed to an accented SP would be expected to associate it with the context favoring the D-predication interpretation. The variable Perception=Accent captures the cases in which subjects behaved as predicted; Percept \neq Accent represents for cases in which subjects did not behave as predicted. A chi-square found that there was a statistically significant relationship between perception and accent, $\chi^2 = 32.657$, $df = 1$, $p < .01$, indicating that resultative readings were significantly perceived differently from depictive reading in terms of accentual patterns, as in Table 2.

<Table 2>: The Frequencies and Percentages of Perception(A/B)

Predicates-Accent (Group A/B)				
Predicates	Per-Acc	Per \neq Acc	Other	Total
R-predications	32/30	28/24	8/0	60/60
D-predications	60/52	0/8	0/0	60/60
Total	92/82	28/32	8/0	

5. Analyses

5.1 General Discussions

Generally speaking, subjects' production and perception tests were congruent with the hypotheses. In production and perception tests, it was found that R-predications and D-predications were significantly different. There was a clear tendency for secondary subject NPs to be accented in R-predications, whereas it was almost not in D-predications, as illustrated in (14). Note that the accentual patterns in (14) are generalized when secondary subject NPs and secondary predicates are new entities.

(14) General Accentual Patterns (assuming that NP and SP are new)

- | | |
|--|------------------|
| a. [_{VP} V <u>NP</u> SP] _F . | (R-predications) |
| b. [_{VP} V NP <u>SP</u>] _F . | (D-predications) |

Now, I will analyze the experimental results in terms of the so-called Phonological Accent Percolation Approach (PAPA), as mentioned in 2.3. According to the PAPA, the accentual patterns of R-predication and D-predication are analyzed as follows:

(15) Focus Accentual Structure of Resultative Predication

- | | |
|---|--------------|
| a. [pred argu result] _F . | FA |
| b. [(pred argu result)] _F . | PPF |
| c. [(pred ARGU result)] _F . | AP |
| d. [(pred <u>ARGU</u> result)] _F . | FS(Optional) |

(16) Focus Accentual Structure of Depictive Predication

- | | |
|---|--------------|
| a. [pred argu dep] _F . | FA |
| b. [(pred argu) (dep)] _F . | PPF |
| c. [(pred ARGU)(DEP)] _F . | AP |
| d. [(pred ARGU)(<u>DEP</u>)] _F . | FS(Optional) |

First, broad focus is assigned to the VP. Second, the whole VP forms a single phonological phrase in (15b), because it includes an argument-head construction. In (16b), the argument and the head form a single phonological phrase and the D-predicate forms an independent phonological phrase. Then, accent is realized on the argument (a secondary subject NP), by the AP rule in (15c). In (16c), accents are realized on the argument and the D-predicate each. Finally, the FS is optionally applied to the single phonological phrase, strengthening the pitch-accented syllable of the secondary subject NP as in other argument-head structure, as shown in (15d). Similarly, in (16d), the FS is optionally applied to the last phonological phrase, strengthening the accent on the D-predicate. So, as pointed out in 2.3, since the FS rule might be optional, it allows both the head and the adjunct to have accents in adjunct-head structure. However, note that it still differs from the accentual pattern in argument-head structure.

This analysis is consistent with previous studies. As mentioned in detail in section 2.4., R-predicates have been analyzed to be lexically related with a primary predicate in argument structure (Dowty, 1979; Williams, 1983; Larson, 1988; Rothstein, 1983; Winkler, 1997). The generalization is that the main predicate and the R-predicate construct a discontinuous word item, as a syntactic unit. Similarly, as in R-predications, this analysis is consistent with the general idea that D-predicates, as syntactic adjuncts, are not lexically related to a matrix verb in argument structure (Williams, 1980; Rothstein, 1983; Rapoport, 1986, 1992; Lebeaux, 1988).

5.2 Meaning Differences with Prosodic Phonology

The PAPA shows that by the notion of phonological phrase, a head and a direct object (argument) form a single semantic unit but that a head and an adjunct are separate semantic units (Selkirk, 1984; Jacobs, 1994; Krifka, to appear). These assumptions lead us to the conclusion that the phonological phrase in accentual focus structure is not only a prosodic unit but also a semantic unit.

Compare now R-predications with D-predications to investigate whether the interaction between phonology and semantics in primary predication is applied to secondary predication. Note that the main accent is capitalized, and the strongest accented words are underlined. I use the notation % for dispreference.

(17) Resultative Predications

- | | |
|---|----------------------|
| a. [(v NP sp)] _F . | Integration |
| b. [(V NP SP)] _F . | Integration Possible |
| c. %[(V NP) (<u>SP</u>)] _F . | Almost Dispreferred |

(18) Depictive Predications

- | | |
|--|---------------------|
| a. %[(v NP sp)] _F . | Almost Dispreferred |
| b. [(v NP) (SP)] _F . | Separation Possible |
| c. [(v NP) (<u>SP</u>)] _F . | Separation |

The three accentual patterns are possible in R-predications, as illustrated in (17). (17a), which is a main accentual pattern, shows that a R-predicate is integrated into the phonological phrase including a head and an argument. (17b) shows that the integration is still possible when the R-predicate is also treated as an argument of a main verb, having accents on both a secondary subject NP and a R-predicate. (17a) and (17b) are consistent with Jakob's notion of integration that "within a set of sister-constituents, integration takes place only if the elements of sister constituents do not function as separate informational units in the communication" (1991:18). A R-predicate does not function as a separate information unit with its main verb in that the R-predicate forms a complex predicate with its main verb in (17a), and it is also an argument of its main verb in (17b). However, as the condition for integration predicts, there is no specific rule that forces integration. In other words, integration does not always happen. So, when integration does not take place, R-predications still can allow an additional accentual pattern as in (17c). Thus, we cannot entirely rule out the possibility for (17c) where separation is possible in R-predications, although it is very rare.

On the other hand, in D-predications, the integration is almost dispreferred, as shown in (18a). This is consistent with Jakob's (1991) proposal that "non-arguments of head constituents in most cases behave like separate informational units and therefore cannot be integrated into the head" (1991:19). That is, separation is forced in D-predication as shown in (18b) and (18c), although (18c),

as a main accentual pattern, occurs much more frequently than (18b). In addition, major accentual focus structures represent semantic information associated with R-predications and D-predications. In R-predications, the whole VP including the R-predicate behaves as a semantic unit within the phonological phrase, showing that the R-predicate forms a complex predicate with the main verb or is an argument of the main verb. On the other hand, in D-predications, the D-predicate forms a separate semantic unit in its independent phonological phrase from a main verb. That is, the representations in (17) and (18) show the interaction between focus accentual patterns and semantic units. Being a part of the same semantic unit as the main verb, R-predicates tend to be deaccented and integrated within a single phonological phrase. On the other hand, as a separate semantic unit from a main verb, D-predicates tend to be accented so to form a separate phonological phrase.

This analysis is confirmed by the perception tests. The experimental results reveal that D-predications and R-predications were significantly different in the perception of the two kinds of predications, thus, supporting hypotheses, which predicted that, if there was one main accent, secondary predicates would be accented in D-predications, and secondary subject NPs would be accented in R-predications. In other words, as predicted, depictive readings were distinguished from resultative readings by different accentual patterns, although less than half of the R-predications went against the predictions. With regard to this, there might be several possible explanations. One is that the same context monologues in production test might affect subjects' judgement in perception test. In addition, I suggest that comprehension is different from production in that the task of comprehending an accentual input might involve specialized listening skills and specific knowledge of the language. These factors might have been more important in the perception test than in the production tests because the production tests required only basic native speakers' production skills. Finally, the detection of accentual differences between R- and D-predications might have been obscured by some uncontrolled variables, such as short context monologues, test items that favored a particular interpretation.

6. Conclusions

The findings in this work cumulatively provide strong evidence that focus interacts with argument structure. The data provides clear support for the assumption that resultative predication differs accentually from depictive predication. Production and perception depended substantially on the appropriate focus marking of these predication types. Subjects were sensitive to the appropriateness of the sentential accent patterns in producing and comprehending the sentences containing a resultative and a depictive predicate. In general, it was found that a resultative reading was obtained if the secondary subject was accented, whereas a depictive reading was obtained if the secondary predicate was accented, showing that the relationship between focus and accent depends at least in part on their

argument structure.

I conclude that the argument structure of resultative and depictive predications interacts with accentual focus structure, and the correlation between semantics and prosodic phonology is maximally transparent by the notion of phonological phrase.

Appendix A : Production

Group A

- (1) I go for a long walk by myself every evening. Walking for five hours is no problem for me. Yesterday, I walked my dog hungry.
- (2) He dresses like a model in a fashion magazine, always wearing a new suit and a new tie. But guess what happened yesterday? We all went to a Japanese restaurant and when he took off his shoes, everyone saw that inside his new shoes, he wore his socks ragged.
- (3) What did you do? You rode my horse tired! I told you to check whether it had enough rest, before going out on a ride.
- (4) Mark is an excellent pastry cook. Yesterday I watched him making an apple pie. He took apples that were a bit sour, and soaked the raisins in wine. Then he rolled the dough smooth, filled it with the apple and raisins and put it into the oven for 20 minutes.
- (5) Yesterday I fed some milk to my dog by accident. And imagine this: He liked it. He licked his plate clean.
- (6) John went to get a massage yesterday. The therapist asked him whether he would like some massage oil. John said no. Therefore the massage therapist rubbed his body dry.

Group B

- (1) Mark is an excellent pastry cook. Yesterday I watched him making an apple pie. He first mixed flour, eggs, and sugar in a bowl. And he kneaded the mixture carefully. And he rolled the dough smooth. He told me that, if the dough isn't smooth, it cannot be rolled thin one enough.
- (2) I know a man. The guy is really weird. He has a nice mansion and several cars. He changes his car every year for a brand-new one. But, for some reason, he hardly ever changes his clothes. He keeps wearing the same old pants until they are riddled with holes. And he wore his socks ragged.
- (3) Yesterday when I went to work, I was so busy that I forgot to feed my dog in the morning. I remember that there was nothing for him to eat. He must have been very hungry. When I came back in the late afternoon, I saw that he licked his plate clean.

- (4) What did you do? You rode my horse tired! I told you that you shouldn't exert it too much.
- (5) John took a bath and enjoyed it very much. When he came out of the shower, he took a towel and rubbed his body dry.
- (6) My sister usually does all the housework, cleaning, cooking and feeding the pets. Usually, I do not lift a finger. But she had an unplanned trip yesterday. Forgetting that she was not at home all day long, when I took a walk, I walked the dog hungry.

Appendix B : Perception

Group A

- (1) My sister usually does all the housework, cleaning, cooking and feeding the pets. Usually I do not lift a finger. But she had an unplanned trip yesterday. Forgetting that she was not at home all day long, when I took a walk, I walked the dog hungry.
- (2) I know a man. This guy is really weird. He has a nice mansion and several cars. He changes his car every year for a brand-new one. But, for some reason, he hardly ever changes his clothes. He keeps wearing the same old pants until they are riddled with holes. And he wore his socks ragged.
- (3) What did you do? You rode my horse tired! I told you that you shouldn't exert it too much.
- (4) Yesterday when I went to work, I was so busy that I forgot to feed my dog in the morning. I remember that there was nothing for him to eat. He must have been very hungry. When I came back in the late afternoon, I saw that he licked his plate clean.
- (5) Mark is an excellent pastry cook. Yesterday I watched him making an apple pie. He first mixed flour, eggs, and sugar in a bowl. And he kneaded it carefully. And he rolled the dough smooth. He told me that, if the dough is not smooth, it can't be rolled thin enough.
- (6) John took a bath and enjoyed it very much. When he came out of the shower, he took a towel and rubbed his body dry.

Group B

- (1) a. My sister usually does all the housework, cleaning, cooking and feeding the pets. Usually, I do not lift a finger. But she had an unplanned trip yesterday. Forgetting that she was not at home all day long, when I took a walk, I walked the dog hungry.

- b. I go for a long walk by myself every evening. Walking for five hours is no problem for me. But yesterday, I walked my dog hungry.
- (2) a. I know a man. This guy is really weird. He has a nice mansion and several cars. He changes his car every year for a brand-new one. But, for some reason, he hardly ever changes his clothes. He keeps wearing the same old pants until they are riddled with holes. And he wore his socks ragged.
- b. He dresses like a model in a fashion magazine, always wearing a new suit and a new tie. But guess what happened yesterday? We all went to a Japanese restaurant and when he took off his shoes, everyone saw that inside his new shoes, he wore his socks ragged.
- (3) a. Mark is an excellent pastry cook. Yesterday I watched him making an apple pie. He first mixed flour, eggs, and sugar in a bowl. And he kneaded the mixture carefully. And he rolled the dough smooth. He told me that, if the dough isn't smooth, it can't be rolled thin enough.
- b. Mark is an excellent pastry cook. Yesterday I watched him making an apple pie. He took apples that were a bit sour, and soaked the raisins in wine. Then he rolled the dough smooth, filled it with the apple and raisins and put it into the oven for 20 minutes.
- (4) a. What did you do? You rode my horse tired! I told you that you shouldn't exert it too much.
- b. What did you do? You rode my horse tired! I told you to check whether it had had enough rest, before you went out on a ride.
- (5) a. Yesterday I fed some milk to my dog by accident. And imagine this: He liked it. He licked his plate clean.
- b. Yesterday when I went to work, I was so busy that I forgot to feed my dog in the morning. I remember that there was nothing for him to eat. He must have been very hungry. When I came back in the late afternoon, I saw that he licked his plate clean.
- (6) a. John took a bath and enjoyed it very much. When he came out of the shower, he took a towel and rubbed his body dry.
- b. John went to get a massage yesterday. The therapist asked him whether he would like some massage oil. John said no. Therefore she rubbed his body dry.

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