17.0   Linguistics

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The work of the Linguistics group is directed towards obtaining a better grasp of the mental capacities of human beings through the study of the nature, acquisition and use of language. Language is a uniquely human faculty in that only humans appear to be capable of learning and using a language and that every normal human acquires knowledge of one or more languages during his/her lifetime. This knowledge is represented somehow in the speaker's mind, which is a special organ located in the human brain. Viewed from this vantage point, the central issues of linguistics research are:

1. What is the nature of this knowledge? What do speakers of a particular language - Lattvian, Spanish or Walpiri - know, and how does knowledge of one language differ from and resemble that of some other language?

2. How do speakers acquire this knowledge?

3. How do speakers put this knowledge to use in producing and understanding utterances?

4. What are the physiological mechanisms that provide the material basis for the storage, acquisition and utilization of linguistic knowledge?

There are considerable differences in our ability to answer these questions. It would seem that at present we have advanced more with regard to question 1 and least with question 4. These differences are also reflected in the research conducted by the group. At this time, it is most heavily concentrated on issues concerned with the nature of the knowledge that characterizes fluent speakers of various languages. Yet the other three questions have not been overlooked, and significant efforts are being devoted to their solution.

The study of these topics is being carried out along a number of parallel lines. On the one hand, linguists have investigated the principles by means of which words are concantenated to form meaningful sentences. These principles have been the primary domain of inquiry of the disciplines of syntax and semantics. Phonology studies the sound structure of words while morphology examines the manner in which different languages combine different meaning-bearing units (specifically, stems, prefixes, suffixes and infixes) to form words. The latter topic has attracted increasing interest in recent years and is likely to become more prominent in the future.

Chains and Anaphoric Dependence: On Reconstruction and Its Implications

Andrew Barss

Abstract

This thesis is concerned with developing an account within the Government and Binding (GB) theory of the grammaticality of such structures as (1), and exploring the implications of this account for the theory of empty categories, chains, and scope. The hallmark characteristic of such grammatical S-Structure representations as (1) is that the anaphor is outside the c-command domain of its understood antecedent. The basic anaphoric effect is termed <u>connectivity.</u>

1) [which of each other's friends] [did the men see t] ?

Chapter 1 is a brief overview of the necessary definitions presumed in the thesis, and an outline of the subsequent chapters. Chapter 2 introduces a large body of data which must be treated on a par with (1), and reviews and criticizes several existing proposals which have been made to account for (1). The chapter argues that the binding theory must apply to structures having the essential form of (1). We demonstrate that no treatment which involves lowering the anaphor into the c-command domain of the antecendent via "reconstruction" operations, or involves applying the Binding Theory at a level at which WH movement is not represented, can be maintained. Chapter 3 develops a revision of the binding theory, focusing on Condition A, which is capable of treating all the connectivity data in a unified way. The major formal construct proposed in the chapter is the <u>chain accessibility sequence</u> , essentially a path of nodes through which the potential antecedents for an expression are accessed. The revised binding theory is defined in terms of such sequences; as the name implies, the notion <u>chain</u> plays a prominent role. This approach to connectivity is developed in the spirit of the Path theory of Kayne (1983) and Pesetsky (1982). We also discuss the properties of structures of the form of (1), but where the constituent containing the anaphor is predicative in nature. We shall see that the predicative nature of the constituent significantly constrains the possibilities of assigning the anaphor an antecedent. This chapter adopts, and argues in favor of, the Linking theory of binding introduced by Higgenbotham (1983).

Chapter 4 focuses on the theory of empty categories, arguing that it is desirable to construct the theory so that no empty categories bear binding features (the features [+/ − anaphoric] and [+/ − pronominal] are thus restricted to over categories). This proposal, which I term the <u>No Features Hypothesis</u> , departs from the characteristic treatment of ECs in GB theory. The chapter adopts Brody's (1985) proposals concerning the distribution of PRO and NP-trace. We adopt, and later extend, the Local Binding Condition (LBC) on A chains, argued by Rizzi (1982) to constrain the well-formedness of A chains. We reformulate it in terms of Linking theory, as the <u>Chain Obviation Condition</u> (COC), and argue that it holds of all chain types. This is shown

to be a principle with considerable generality, subsuming the LBC, Condition C of the binding theory, and the anti-c-command condition on linking. Adopting the COC, along with the NFH, allows the elimination of the class <u>R-expression</u> from the inventory of binding types. It will be shown that the anti-c-command condition on parasitic gaps derives directly from the COC, with no stipulations. The chapter concludes with a defense of the proposal that the theory of anaphora must recognize <u>anaphoric depend-ences</u> and <u>obviation</u> as separate relations as argued by Lasnick (1976, 1981), and Higgenbotham (1985).

Chapter 5 discusses constraints on the interpretation of sentences in which a quantificational NP is the antecedent of an NP-trace which it does not c-command. These considerations lead us to formulate a constraint on movement operations. The chapter also argues that the operations of WH-movement and QR are strictly ordered in the LF component.

A Case for Movement

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Abstract

This thesis defends the position that the syntactic level of D-structure has an existence autonomous from S-structure. It does this by showing that Movement, a relation between D- and S-structure, is constrained at intermediate levels. Two constraints on Movement are investigated. One subagency is argued to make reference to the syntax of thematic role assignment. The second, the Empty Category Principle, is held to make reference to the syntax of the Case assignment. The first holds at intermediate levels in the Syntax; the second at S-structure and Logical Form. Subajacency is shown to constrain rightward movement as well as leftward movement. The Empty Category Principle is factored into independent principles, one holding of chains, the other holding of empty categories. The assymetrical boundedness of leftward and rightward movement is argued to stem from this version of the Empty Category Principle. A short account of ps1 predicates is included.

A Theory of Category Projection and Its Applications

Naoki Fukui

Abstract

This thesis proposes a new system of category projection where Lexical categories and Nonlexical (or "Functional") categories project in different ways, which is crucially different from the standard views in which all categories project in the same fashion.

In Chapter 1, I introduce some of the basic notions of Government-Binding theory within which all of the discussion in this thesis takes place. The aim of Chapter 2 is to show the fundamental difference between Lexical categories and Functional categories. That is, Lexical categories have Lexical Conceptual Structures (LCS) in the sense of Hale and Keyser (1985), whereas Functional categories do not have Lexical Conceptual Structures comparable to the ones Lexical categories have, and the latter tyoe of categories only have the function of "connecting" two syntatic units via some sort of "binding" and "agreement." Based on this fundamental difference, a new projection system is introduced, in which Lexical categories project up to a single-bar level, allowing free recursion at that level, while Functional categories can project up to a double-bar level, taking a unique complement.

Chapter 3 explores various consequences of the projection system introduced in Chapter 2. One important consequence is that the proposed projection system, combined with "bottom-up" θ -marking mechanism, predicts that the so-called "external argument" appears within the projection of a Lexical head at D-structure, receiving the external θ -role in that position, and then moves outside the Lexical projection to its S-structure position, for Case reasons. This move makes possible the explicit syntactic representation of what has been called the "implicit argument" both in noun phrases and in clauses (in the case of passives).

In Chapter 4, I proceed to focus on Japanese and propose a new phrase structural configuration for this language in the light of the projection system introduced in Chapter 2. It is argued that Japanese lacks the Functional categories DET and COMP, and has a very defective INFL which contains no agreement features. From this, it immediately follows that Japanese has no specifiers, which close off the category projection. I argue there that this is indeed the case, i.e., that Japanese has no specifiers and every phrase in this language is always "open." Other consequences of my proposal, including the derivability of overt <u>wh</u> movement in Japanese, are also discussed in this chapter.

The Syntax of Operators

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Abstract

The aim of this thesis is to explore the implications that the existence of Logical Form has, both for the derivation of sentences and for the interaction of subtheories of Universal Grammar. Given that the behavior of lexical anaphors can be reduced to that of NP traces, as in Chomsky (1985a), it will be shown that principles A and B of the Binding theory can be derived from Theta theory. Arguments will be represented abstractly as chains, whose formation is governed by Principle A and the Empty Category Principle, as formulated by Kayne (1981a). In addition to argument movement certain predicates are shown to move at LF, to permit th-marking of their arguments. This movement will be similarly constrained.

A major claim of this thesis is that a bound prenominal confers operator status on the category which contains it, and hence must be assigned scope. This claim receives independent support insofar as it explains an apparent counter example to the hypothesis above, that Principle A must hold between links of a chain. Furthermore, this property of bound pronouns will play a central role in the availability of certain readings in sentences involving sloppy identity, and certain structures involving VP-deletion and parasitic gaps. In these structures, it is just the assignment of scope to the category containing the bound pronoun which gives rise to the appropriate logical forms.

In addition to standard types of LF movement, i.e., movement to COMP (as in wh-movement in Chinese), and adjunction (as in Quantifier Raising), it will be argued that a third type exists. This involves the identification of the moved category with its target, yielding a structure in which subtrees are represented on distinct planes, which meet at the merged (i.e., identified) node. The creation of such coordinates structures will account for the properties of parasitic gaps, which become across-the-board gaps at LF. Moreover, sloppy identity obtains only in coordinate structures, thus making it unnecessary to appeal to λ-abstraction to account for it.

In addition to permitting movement, LF licenses the insertion of material missing at S-structure. This enables various 'deletion' constructions to be properly interpreted.

Subject and Object in Turkish

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Abstract

This dissertation is a study of rules in Turkish which change grammatical relations
or are sensitive to them. It addresses issues of interest to descriptive Turkish grammar
and to general linguistic theory. Two chapters are devoted to questions about
intransitive clauses. Chapter 2 examines the claim that impersonal passivization, like
personal, impassivization, involves the advancement of a direct object to subject. Evi-
dence is presented that this is not the case in Turkish. Chapter 4 is an investigation of
the Unaccusative Hypothesis, the proposal that some intransitive clauses have an initial
direct object but no initial subject. It has been argued that there is one construction in
Turkish which provides evidence for the Unaccusative Hypothesis. The control rule that
operates in this construction is shown to be sensitive to thematic roles rather than
toinitial grammatical relations; it cannot, therefore, serve as a diagnostic for initial
unaccusativity.

The topic of Chapter 3 is non-referential direct objects and subjects. Evidence is
presented that a subset of such nominals, i.e., those that occur without the indefinite
article, undergo incorporation with the verb, which accounts in part for the observation
that sentences with non-referential subjects behave as if they were subjectless and that
those with non-referential direct objects behave as if they were intransitive. I propose
that incorporees are not final chomeurs, as have been claimed, but instead bear the
final-stratum relation INC(orporated). Furthermore, I argue that sentences with incor-
porated subjects lack a final subject and, consequently, that the Final 1 Law is too
strong.

The causative construction is the subject of the final chapter, and the central question
addressed is whether causative formation in Turkish is a lexical process which derives
one verb from another or a syntactic process which collapses clauses together (Clause
Union). While the lexical account explains a class of rule interaction phenomena, I
present evidence that causatives must be analyzed as underlying complex. A general
condition is proposed which blocks syntactic rules of a particular kind from applying
on the imbedded clause prior to Clause Union. The discussion of causatives includes
an analysis of quirky casemarking in Turkish.

Adjunctions and Projections in Syntax

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Abstract

This dissertation presents a theory of projection of syntactic configuration from the lexicon. The first chapter outlines a theory of the D-structure level of representation in which all well-formedness conditions on underlying structures are deductable from other independent principles of the Grammar. This theory extends the work of Stowell, who argued that linear precedence relations could be derived from independent principles. I propose that domination relations may likewise be derived from independent principles. This proposal is based on the theory of lexical representations of Higgenbotham (1985, 1986), in which words of all lexical categories (N, V, A, P) are thought to have a "theta grid"as part of their lexical entry. It is argued that the relations which hold among these grids are sufficient to give all the information that we need to deduce the domination relations which result when these lexical entries are projected from the lexicon. These structures which are so projected, which I call Thematic Structures, are universal <u>abstract relational</u> structures. They encode domination relations, which are derived from thematic relations, but do not encode precedence nor do they encode adjacency. It is further proposed that non-lexical or "Functional" categories are heads at D-Structure, but that the way that they project differs in significant ways from the way that lexical categories project. The first chaper concludes with a discussion of the properties of adjunction constructions, pointing out that the claims of May (1985) about domination relations in LF adjunction structures lead to the conclusion that such structures are always three-dimensional.

The second chapter has to do with the two related issues which have come to be associated with the term "Configurationality." The first is the question of whether all languages distinguish structurally between subject and object. The diverse data which have been adduced as evidence for variation in configurationality are brought together in order to clarify the issue. While it is often assumed that "nonconfigurational" languages are those with 'flat' structures, the data actually seem to call for some sort of dual representation.

The second issue is then shown to be related to, but independent of, the issue of underlying domination relations. It is claimed that the proposal of Jelinek (1984) that the Configurationality parameter should be stated in terms of the status of overt nominals as adjuncts and of pronominal clitics as arguments is on the right track, but it makes the wrong prediction in certain cases, and it could allow violations of the Projection Principle.

The language used as a case study is Navajo. It has been proposed that Navajo overt nominals are actually adjuncts, and that pronominals clitics are the 'real' arguments. There are two problems with this. First, by standard syntactic tests, overt nominals do not behave like adjuncts, they behave like arguments. Second, the pronominal clitics

are embedded within an apparently unstructured string of prefixes, and it is not obvious that they are accessible to syntax at all, let alone in argument positions.

Chapter 3 considers in detail the status of the Navajo prefixes which mark subject and object agreement. Arguments are given that these agreement prefixes must be infixes, that is, that they must be inserted into a discontinuous lexical item.

If this infixation model for Navajo is correct, then the problem of the accessibility of the pronominal agreement clitics in the syntax is not so serious; in fact, it might be proposed that they are in argument positions at D-Structure and S-Structure, and simply infix at PF. However, such a proposal would contradict the syntactic evidence that overt nominals are in argument, not adjoined, positions. As a solution to this problem, an extension of the definition of an allowable syntactic CHAIN is suggested, whereby the tail of a CHAIN may be in a non-theta position only if it is a subpart of a word.

The syntactic facts which have led previous researchers to consider Navajo to be nonconfigurational are considered in Chapter 4. These facts involve some curious restrictions on the interpretation of null pronominals, which seem to violate binding conditions. It is claimed that the data reveal a parallelismrestriction on the assignment of Grammatical Relations, which is best handled if we treat the relevant constructions as Across-the-Board (ATB) constructions. This explanation is designed to capture and explain the original insight of those who proposed that Navajo has a parsing strategy, while showing that the differences between Navajo and more familiar languages are a matter of variation in independently available grammatical principles.

After an ATB account of the Navajo facts is presented in general terms, the question of the status of these representations in grammatical theory is addressed. It turns out that all of the constructions for which an ATB account has been proposed share the configurational properties of adjunction constructions. As was pointed out in Chapter 1, what is currently known about adjunction structures in general leads us to expect parallelism effects in just these constructions.

Operations on Lexical Forms: Unaccusative Rules in Germanic Languages.

Lorraine S. Levin

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Abstract

This thesis describes a theory of relation changing rules in LFG, concentrating on rules which distinguish between unaccusative and unergative verbs. I call these rules Unaccusative Rules (URs). In order to handle URs I introduce a mechanism which I call Argument Classification (AR) which mediates between thematic roles and grammatical functions. AC puts thematic arguments into one of four argument classes: unexpressed, semantically restricted, subjective unrestricted, and general unrestricted. Then, grammatical functions are assigned to these classified arguments instead of being assigned to unprocessed thematic argument slots. The theory of relation changing rules specifies allowable argument classifications and allowable assignments of functions to classified arguments. In order to illustrate the theory, I formulate a number of rules in English and Dutch.

Chapter 1 provides background information about grammatical relations and relation changing rules in LFG. Chapter 2 summarizes properties of relation changing rules which a theory should account for: semantic conditioning, syntactic productivity, ability to distinguish between subjects of unaccusative verbs and subjects of unergative verbs, and apparent directionality of subject-to-object relation changes. Chapter 3 describes a new theory of relation changing rules based on the notion of argument classification and the distinction between semantically unrestrictedgrammatical functions. Chapter 4 applies the theory to several constructions in English and raises three additional issues: the status of Burzio's Generalization, the treatment of double object verbs, and the treatment of oblique subjects and dummy subjects. The theory yields particularly good insights on the latter two points. Chapter 5 illustrates the theory further using three Dutch URs. This chapter continues the discussion of non-nominative subjects and also discusses the problem of *rule mismatches*. Rule mismatches arise when a given predicate acts as if it were unaccusative in one construction and acts as if it were unergative in another. I discuss possible resolutions of the mismatches and their implications for the status of AC as a level of representation.
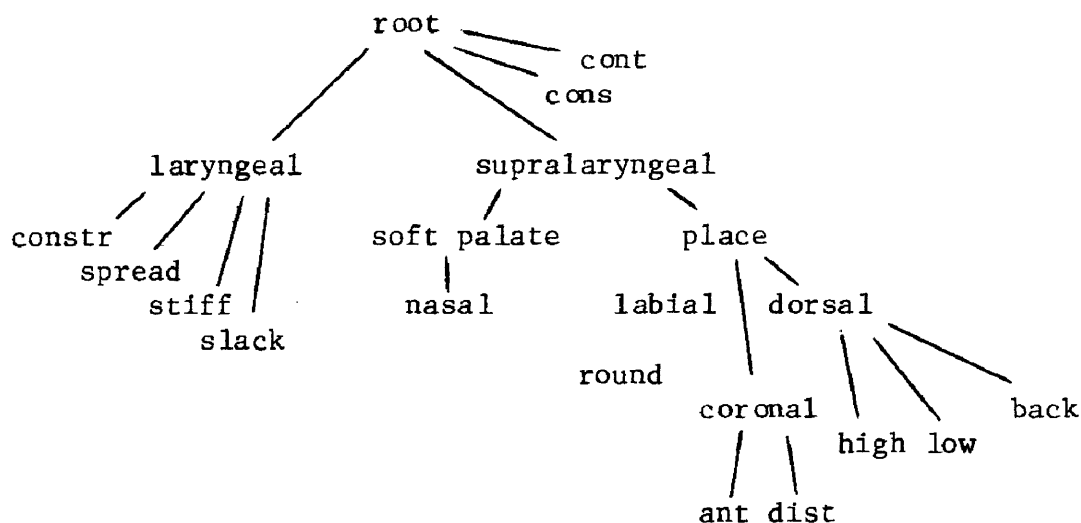
The Representation of Features and Relations in Non-Linear Phonology

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Abstract

In this thesis, I propose the following hierarchical representation for the distinctive features of phonology.

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                        root
                       /    \       cont
                      /       \    cons
                     /          \
            laryngeal          supralaryngeal
           / / | |              /        \
    constr / / | |        soft palate    place
       spread / /|           |           |   \
         stiff / |         nasal      labial | dorsal
           slack                        |    |
                                      round  |
                                           coronal  |    \     back
                                            /  \   high  low
                                           /    \
                                         ant   dist
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This hierarchy is based on phonetics: features are grouped according to articulator in the vocal tract that they are executed by. Articulators are grouped according to their acoustic effects on the formant structure. The hierarchy, which is proposed to be universal, provides a straightforward explanation for the complex phenomena that surround multiply-articulated segments, such as labiovelars, labiocoronals, coronovelars (e.g., clicks), and labialized, palatalized, or velarized consonants. This type of segment, with unordered or simultaneous multiple articulations, I refer to as a complex segment. The theory of representation I propose makes it possible to represent all the complex segments that occur, and provides an explanation of why those complex segments that occur are possible in language, as well as of why those that do not occur are impossible. Furthermore, it makes possible an account of the derivation of complex segments, where they are derived, and of their behavior with respect to phonological processes. In addition, the proposed theory of representation is shown to account for unrelated phenomena in languages without complex segments, which provides independent

support and shows that the representation is universal, rather than particular to complex segment languages.

In Chapters 1 and 2, I argue for the hierarchical feature groupings shown above. (The root, laryngeal, supralaryngeal, and place constituents were proposed by Mohanan (1983) and Clements (1985). I demonstrate that the only complex segments that occur are those combining two or more of the hierarchical constituents: labial, coronal, dorsal. I argue, based on timing, syllabification, reduplication, compensatory lengthening, prenasalization, and nasal assimilation, that complex segments occupy single x-slots, and, furthermore, that the multiple articulations in complex segments must be represented within a single place node. Complex segments are contrasted with contour segments, in that the latter involve sequences of articulation within a single segment - a distinction which determines phonological rules. Furthermore, I show that the structure within the place node required by complex segments finds independent support in languages without complex segments. For example, the structure allows us to account for patterns of blocking and transparency in harmony systems. Thus, the structure within the place mode is a universal property of the representation of distinctive features, rather than just a peculiarity of complex-segment languages.

In Chapter 3, I propose a mechanism for assigning the degree of closure features [continuant, consonantal] to the articulators that execute them. This representation of degree of closure features is necessary in order to account for the behavior of complex segments to be represented identically to that in simple segments. The modifications of the feature representation that are necessary to represent and account for the behavior of complex segments lead to a concise characterization of the possible complex segments in human language.

In Chapter 4, I redefine the distinctive features (i.e., the terminal nodes in the hierarchy) in light of the proposals made in Chapters 1, 2, and 3, and I define the non-terminal nodes in the hierarchy.

Chapter 5 contains a further demonstration of the possibility of explaining phonology in terms of external factors. I demonstrate that the association lines among features and x-slots that connect all the tiers in the hierarchy must represent the relation of overlap in time, and I show that when they are correctly defined as representing overlap, the ill-formedness of crossing association lines follows from the relations represented in a phonological representation, together with knowledge of the world, and need not be stipulated as a well-formedness condition in UG.

Finally, in Chapter 6, I discuss two aspects of phonetic representation that are made possible by the view of phonological representations taken in Chapters 1 through 5 - degrees of closure of individual articulators and subsegmental timing.

Event Logic and the Interpretation of Plurals

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Abstract

Simple sentences with plurals have interpretations that cannot be reduced to predications about individual objects. Such an interpretation for a sentence with $\underline{n}$ plurals cannot be represented by a logical form containing quanifiers over individuals that bind into an atomic $\underline{n}$ -adic predicate:

(i)   NP $_1(x_1)\ldots.,NP(x_n)V(x_{1,\ldots,xn})$

(ii) Ten boys ate ten pies.

Chapter 1 introduces the classes of interpretations that cannot be so represented. An example is that interpretation of (ii) which is true in a situation where there are ten boys and ten pies, the boys eat the pies and no one boy eats more than part of any one of the pies. No individual boy ate any individual pie.

Chapter 2 on set-denotative logic presents the standard view according to which the non-reducibility of plurals is taken to show that the $\underline{n}$ plurals in (i) are quantifiers over sets of individuals that bind into an atomic $\underline{n}$ -adic predicate expressing a relation among sets of individuals.

Chapter 3 proposes event logic as an account of plural interpretations. Adding an argument position for events, it assumes a Davidsonian (1967) decomposition of the predicate into constituents expressing the role of each NP in an event of V-ing:

(iii)   e's eaters are ten boys & eat(e) & e's eaten are ten pies

Quantifying over events in general replaces quantifying over sets. There are no atomic predicates expressing relations among sets of individuals.

An important feature of the event logic's syntax exploits the predicate's decomposition into constituents. It allows for restricted qualification, "[Q:A]" , in which one of the constituents occurring in, say, A is separated from the remaining constituents and from the verb itself which are in B. Note that the set-denotative logic's <u>atomic</u> predicate does not allow a NP's semantic role to be separated from it. It appears with its full valence, providing a place for every argument in the relation it expresses.

Chapter 4 shows that a domain of quantification in the set-denotative logic cannot include all subsets of individual objects. If there is to be quantification over sets, it is restricted by a relationship to events.

Chapter 5 considers the extension of set-denotative logic that admits in the predicate a place for events while retaining the view that plurals are quantifiers over sets of indi-

viduals binding into atomic $\underline{n}$ +1 -adic predicates. The event logic, by quantifying over events, quantifies indirectly and in a restricted way over sets containing their participants. Chapter 5 shows that the extended set-denotative logic must be constrained to recover the relationship between sets and events derived in the event logic. A predicate in the extended set-denotative logic must not denote a set unless it is all the participants of an event, and the predicate must be about the set's activity only with a single event.

Chapter 6 argues for the syntax of event logic, showing that the constituents of the predicate's decomposition must sometimes be divided between the restriction and the matrix on which a quantifier operates.