EXPRESSION AND INTERPRETATION OF NEGATION

AN OT TYPOLOGY

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EXPRESSION AND INTERPRETATION OF NEGATION

AN OT TYPOLOGY

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Springer

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Preface

This book applies recently developed tools in strong and weak bidirectional optimality theory (OT) as well as an evolutionary modeling of OT in a bidirectional setting to the empirical domain of negation across a wide range of languages. I have long been intrigued by the patterns of semantic variation we find in natural language, and negation has always been one of the topics I was fascinated by. In the past, I have proposed analyses of language-specific observations about *not…until* in English (de Swart 1996), Dutch negative polarity items (NPIs) occurring outside the c-command domain of the licensor (de Swart 1998b), the interaction of negation and aspect in French (de Swart and Molendijk 1999), scope ambiguities with negative quantifiers in Germanic (de Swart 2000), and negative concord in Romance (de Swart and Sag 2002).

Although I felt my proposals were contributing to a better understanding of the phenomena under consideration, they did not lead to an explanatory theory of cross-linguistic variation in the area of negation. Meanwhile, the discussion of semantic universals and cross-linguistic variation in meaning assumed more importance in the literature (cf. von Fintel and Matthewson 2008), which made it all the more urgent to develop such a theory. Other proposals came along in the literature, exploiting syntactic and lexical notions of variation, and making claims about universal grammar and typological generalizations. But I always took the distinction between negative concord and double negation to be semantic in nature, and I kept looking for the possibility to account for cross-linguistic variation in the grammar.

When I became acquainted with OT, I acquired a new set of tools for linguistic analysis. Furthermore, OT is embedded in a broader conception of language as part of our cognitive system and provides a new perspective on universal grammar and typological variation. It quickly occurred to me that this might be the appropriate framework to work out my ideas about semantic variation. For a while, I was struggling to make syntactic and semantic insights meet, but with the development of bidirectional OT in the project *Conflicts in Interpretation*, we obtained a new conception of the syntax-semantics interface (cf. Hendriks et al. 2009).

Many people contributed to the genesis of this book. I owe much to Frans Zwarts and Jack Hoeksema for raising my curiosity about negation while I was working in Groningen. I thank the members of the PICS working group on negation (Francis Corblin, Danièle Godard, Jacques Jayez, Lucia Tovena, and Viviane Déprez) for

teaching me everything they knew about the subject in French and other Romance languages. It was a lot of fun to work out the bidirectional OT model with Petra Hendriks, Helen de Hoop, Joost Zwarts, Gerlof Bouma, and Irene Krämer, and their friendly help was crucial when I was developing the basic ideas behind this book.

Financial support for our research by the NWO-Cognition program is hereby gratefully acknowledged (grant 051-02-070 for the project *Conflicts in Interpretation*). I thank the audiences at workshops and conferences in Utrecht, Nijmegen, Georgetown, Hopkins, New York, and Berlin for helpful feedback on my presentations. My proposals were first published as de Swart (2006). The ideas I presented there are worked out in more empirical, typological, and theoretical detail in this book. Over the years, many people volunteered data and helped me make sense of them, and I would like to thank them all!

This book would never have been completed had Rudie Botha not invited me to join the Netherlands Institute for Advanced Study in the Humanities and Social Sciences (NIAS) research group "Restricted Linguistic Systems as Windows on Language Evolution" in 2005–2006. The NIAS created a wonderful environment and provided excellent support for the completion of the manuscript. I would also like to gratefully acknowledge the financial support provided by NWO grant 365-70-015 for my sabbatical year.

Two anonymous reviewers read the manuscript for Springer, and wrote extensive reports. I also got valuable feedback from the series editor Liliane Haegeman. I considered their comments and incorporated whatever I felt necessary. I hope this has led to improvements in the final version. Of course, all remaining errors are my own.

The reader is invited to discover the rich inventory of the expression and interpretation of negation in natural language throughout this book. I hope (s)he will see the range and limits of the typological variation, and appreciate how the interaction of a small number of functionally and cognitively motivated principles embedded in an optimization approach to language accounts for the observations made.

May 2009

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Chapter 1
Negation in a Cross-Linguistic Perspective

Introduction and Overview Chapter 1 introduces the empirical scope of the study on the expression and interpretation of negation in natural language. Background notions on negation in logic and language are introduced, and a range of linguistic issues concerning negation at the syntax–semantics interface are discussed. Cross-linguistic variation is a major topic, in both synchronic (typology) and diachronic (language change) perspectives.

Besides expressions of propositional negation, this book analyzes the form and interpretation of indefinites in the scope of negation. This raises the issue of negative polarity and its relation to negative concord. The main facts, criteria, and proposals on this topic developed in the literature are presented. The chapter closes with an overview of the book.

Optimality theory is used in this book to account for the syntax and semantics of negation in a cross-linguistic perspective. This theoretical framework is introduced in Chapter 2.

1.1 Negation in Logic and Language

The main aim of this book is to provide an account of the patterns of negation found in natural language. The expression and interpretation of negation in natural language have long fascinated philosophers, logicians, and linguists. Horn's (1989) *A Natural History of Negation* opens with the following statement: "All human systems of communication contain a representation of negation. No animal communication system includes negative utterances, and consequently, none possesses a means for assigning truth value, for lying, for irony, or for coping with false or contradictory statements." A bit further on the first page, Horn states: "Despite the simplicity of the one-place connective of propositional logic (¬p is true if and only if p is not true) and of the laws of inference in which it participates (e.g. the Law of Double Negation: from ¬¬p infer p, and vice versa), the form and function of

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negative statements in ordinary language are far from simple and transparent. In particular, the absolute symmetry definable between affirmative and negative propositions in logic is not reflected by a comparable symmetry in language structure and language use."

The scope of this book is more modest than Horn's seminal study, but I will nevertheless attempt to work out some of the issues highlighted by Horn. The focus is on negation as a universal category of human language, with negation as the marked member of the pair <affirmation, negation>, and as the unmarked member of the pair <(single) negation, double negation>. Cross-linguistic variation in the marking and interpretation of propositional negation and negative indefinites is central to the investigation.

1.1.1 Markedness of Negation

The fact that all human languages establish a distinction between affirmative and negative statements is the starting point of my investigation. The relation with animal communication systems is investigated in de Swart (2009), where I draw implications for language genesis from my study of negation in L2 acquisition. Modern studies on animal cognition make it possible to assign a mental representation of (pre-logical) negation to certain primates. Under the view that language evolved from thought, I connect these findings to data from early L2 acquisition, and hypothesize a stepwise evolution of negation, leading up to the truth-functional operator familiar from first-order logic. These connections will not be discussed in this book, which assumes the semantics of negation as defined in first-order logic. Negation will thus be analyzed as a truth-functional operator represented by the connective ¬.

The fact that negation is a universal concept of human communication does not explain the asymmetry between affirmation and negation in natural language, as Horn observes. In first-order logic, the propositions p and ¬p have the same status, and we can go back and forth between ¬¬p and p without any change in meaning. Dahl (1979: 80) states that "although the semantics of Neg is connected with quite a few intricate problems, it still seems possible to give a relatively uncontroversial characterization of Neg in semantic terms. It is thus a necessary condition for something to be called Neg that it be a means for converting a sentence S_1 into another sentence S_2 such that S_2 is true whenever S_1 is false, and vice versa."

Dahl's definition of negation as a linguistic operator operating on truth values introduces an asymmetry between affirmation and negation. His definition is inspired by the observation that in natural language, negative sentences (1b, c) typically involve expressions not present in affirmative sentences (1a). Double negation sentences multiply the markings, and have a more complex structure than plain affirmative sentences (1d).

(1) a. Colyn believes that Phil plays chess.
b. Colyn believes that Phil does not play chess.
c. Colyn does not believe that Phil plays chess.
d. Colyn does not believe that Phil does not play chess.

In first-order logic, sentences like (1a) and (1d) are expected to have the same truth conditions. Negation in (1d) is truth-functional, but comes with a special communicative effect not present in (1a). The double negation of (1d) is known as the rhetorical figure of litotes. Litotes is not particular to English. Xiao and McEnery (2008) point out that the continuations of the Chinese example (2) in (2a) and (2b) convey a different meaning.

(2) Shixiong bu xiang tomorrow leave but dad say-out-Asp
Shixiong SN want mingtian zou, keshi diedie shuo-chulai-le,
Shixiong did not want to leave the next day, but now that his dad had said so,
a. jiu gan ying
then dare agree
'he dared to agree.'
b. jiu bu gan bu ying
then SN dare SN agree
'he did not dare not to agree.'

Pragmatic accounts of litotes are found in Horn (1989, 2001), van der Wouden (1994, 1997), and Blutner (2004). Postal (2000, 2004) is also concerned with syntactic and prosodic features of double negation in English. This book focuses on the truth-functional effects of single and double negation. However, we should always be aware of the fact that special prosody and syntactic restrictions, coupled with non truth-functional aspects of meaning are an integrative part of the semantics of double negation readings like (1d) and (2b).

As far as the expression of single negation meanings is concerned, I accept Horn's generalization that all natural languages have an expression for propositional negation. In all languages, this leads to a formal contrast between affirmation (1a) and negation (1b, c). Dahl (1979) takes negation to be a universal category of natural language. Inspired by Saussure, the Prague linguistic school developed a notion of markedness to deal with such asymmetries (Jakobson 1932, 1939, 1962, 1971). In a binary opposition, the unmarked term tends to be formally less complex (often with zero realization). Greenberg (1966) has observed that negation typically receives an overt expression, while affirmation usually has zero expression. Givón (1979) argues that negative structures are syntactically more constrained than their affirmative counterparts. The question arises whether we are only dealing with a morphosyntactic asymmetry, or whether the formal asymmetry is mirrored in interpretation. A semantic asymmetry is not supported by the standard interpretation of negation in (two-valued) first-order logic. However, Horn (1989: 161 sqq) cites psycholinguistic evidence concerning the acquisition of negation in L1 acquisition, and processing difficulties with negation as suggestive evidence in favor of the semantic markedness of negation. Haspelmath (2006) takes frequency asymmetries (rarity of meanings) to be the source of structural asymmetries. In Chapter 3, I argue that the relative infrequency of negative statements as compared to their affirmative counterparts makes it possible to derive the formal markedness of negation in a bidirectional evolutionary OT model.

Markedness is a relative notion in the sense that we always talk about the marked and unmarked members of a pair. Negation is the marked member of the

pair <affirmation, negation>, but the unmarked member of the pair <(single) negation, double negation>. This underlies the highly marked character of sentences like (1d) and (2b), which is further supported by the special prosody and syntactic restrictions associated with double negation (see above). The markedness of double negation plays a crucial role in the argumentation developed in Chapter 6.

1.1.2 Sentence Negation

There is little controversy about the characterization of sentences like those in (1b-d) and (2b) as negative. However, as Horn (1989: 31 sqq) reminds us, it is not always easy to draw the line between affirmative and negative sentences. Consider the pairs of examples in (3) and (4).

(3) a. Mary did not manage to secure her job.
    b. Mary failed to secure her job.
(4) a. Colyn is not happy.
    b. Colyn is unhappy.

The different forms in (3) and (4) can be truthful descriptions of the same situation with slightly different nuances of meaning. This highlights the impossibility of characterizing (extra-linguistic) situations as either positive or negative.

Even if the discussion is restricted to negative sentences (linguistic expressions) and negative meanings (semantic representations in terms of a particular formalism such as first-order logic), it is not easy to determine whether sentences like (3b) and (4b) are affirmative or negative in nature. Certain verbs contribute an inherently negative meaning. *Fail* in (3b) patterns with *deny*, *refuse*, *reject*, *dissuade*, *doubt* in this respect. Horn (1989: 522 sqq) treats inherent negation as pragmatically more complex, because it relies on propositions evoked in earlier discourse. The phenomenon of inherent negation, illustrated in (3b) is outside the scope of this study.

Klima (1964) provides some diagnostics that come in useful in the distinction between sentence negation and constituent negation relevant to (4). The (a) examples in (5) and (6) pass the test for sentential negation; the (b) sentences contain constituent negation.

(5) *either* vs. *too* tags:
    a. Mary isn't happy, and John isn't happy either.
    b. Mary is unhappy, and John is unhappy {*either/too}.
(6) positive vs. negative tag questions:
    a. It isn't possible to solve that problem, is it?
    b. It is impossible to solve that problem, {#is it/isn't it}?

Additional tests have been proposed in the literature. Horn (1989: 185) warns that the tests sometimes give conflicting results, so uncertainties remain. I will assume here that it is possible to draw the line between sentence negation (4a) and constituent negation (4b). Chapter 6 (Section 1) comes back to affixal negation like *un-* (4b), and shows that the special semantic and syntactic status of adjectives like *unhappy* explains their interaction with negation particles such as *not* and negative indefinites like *nobody* in double negation as well as negative concord languages.

Other than that, this book concentrates on sentence negation, as illustrated in (1b-d), (2b), (3a), (4a), (5a) and (6a).

1.1.3 Square of Oppositions

Since Aristotle, it is customary to distinguish types of oppositions, and Horn (1989: Chapter 1) discusses them extensively. Contrariety and contradiction both come into play in the study of negation. Contrariety is a relation between two opposites, e.g. *good* vs. *bad*. Contraries cannot both be true, but both can be false. For instance, nothing can be good and bad at the same time, along the same dimension, but something can be neither good nor bad. Contradiction is a relation between members of a pair such that it is necessary for one to be true and the other false. This phenomenon is known as the 'law of the excluded middle'. Negation and affirmation are contradictions in this sense.

The notions of contradiction and contrariety come into play in the square of oppositions for the first-order quantifiers exemplified in (7).

(7) a. All students are happy.
b. No students are happy.
c. Some student is happy.
d. Not all students are happy.

The pairs$\forall/\neg\forall$ and $\exists/\neg\exists$ are contradictories, because in any state of affairs, one member of each must be true, and the other false. Propositions are opposed as contraries when both the affirmation and the denial are universal. $\forall$ and $\neg\exists$ are contraries, as indicated in Figure 1.

The contradiction between $\exists$ and $\neg\exists$ will be central to the discussion of the status of indefinites under negation (Sections 3–5), because there is no agreement on the lexical semantics of negative indefinites in the literature. In fact, all four corners of the square of oppositions in Figure 1 have been explored as the possible lexical semantic representation of negative indefinites in some analysis or other. Fortunately, there is no disagreement about the truth conditions at the sentence level. The literature agrees that propositions involving indefinites under negation are universal in nature (involving $\forall\neg$ or $\neg\exists$), as opposed to their affirmative, existential counterparts (involving $\exists$).

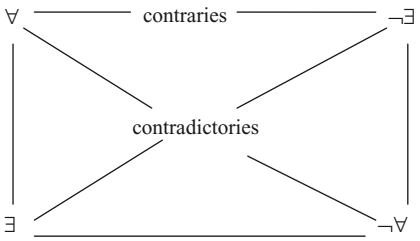

Figure 1 Square of oppositions for first-order quantifiers

1.2 Negation in Typology and Diachronic Linguistics

In English, sentence negation is realized by a negative particle (1b-d), (3a), (4a). In other languages, negative verbs express sentence negation. Payne (1985) provides examples of negative verbs (8a) and auxiliary negative verbs (8b).[1]

(8) a. Na'e 'ikai ke 'alu 'a Siale [Tongan]
ASP SN ASP go ABS Charlie
'Charlie did not go.'

b. Bi dukuwūn-ma ə-cə̄|-w duku-ra [Evenki]
I SN-PAST-1SG letter-OBJ write-PART

In (8a), the aspectual particle *na'e* bearing on the negative verb *'ikai* represents a complete and noncontinuing (simple past) action. The lexical verb *'alu* behaves like a complement clause verb. In (8b), the negative verb behaves like an auxiliary followed by the participle form of the main verb. The negative verb stem *ə-* inflects for tense and mood. Negative verbs have been understudied in linguistic theory, but see Mitchell (2006), Kaiser (2006) and Thomson (2006) for studies of negative verbs in Finno-Ugric languages, Finnish, and Bengali respectively.

Payne (1985) cites quite a few languages that use a negative verb. At the same time, he points out that the majority of natural languages use some kind of negative particle to express propositional negation. This book does not take negative verbs as in (8) into account, but focuses on negation particles and negative indefinites. Section 2 investigates the position of negation particles across languages. The study of negative indefinites is closely intertwined with the issue of negative polarity and negative concord, as worked out in Sections 3 and 4.

[1] Throughout this book, SN is used to gloss the marker of sentential negation, in order to avoid any confusion with Neg-expressions, used as the technical term to refer to negative indefinites (cf. Section 5 and Chapters 4 and 5 for more details).

1.2.1 Preverbal and Postverbal Negation

Syntacticians and typologists have extensively studied the position of the negation marker in the sentence. Greenberg (1966), Dahl (1979) and Dryer (1988, 2007) provide well-known examples of such studies. The main issue discussed in the literature concerns the position of negation with respect to the verb. The examples in (9) and (10) illustrate the preverbal and postverbal position of negation in a range of languages[2]:

(9) a. Maria *non* parla molto. [Italian]
Maria SN talks much.
'Maria doesn't talk much.'

b. *Nid* oedd Sioned yn gweithio. [formal Welsh]
SN be.IMPF.3SG Sioned PROG work
'Sioned was not working.'

c. ʔəli *ma*: raːħ lidda: ʔirə [Baghdad Arabic]
Ali SN went to the office
'Ali didn't go to the office.'

d. A vaga koŋ *ba* bɛnɛ [Koromfe]
ART dog.SG det.NONHUMAN.SG SN come.PAST
'The dog did not come.'

e. Mary does *not* talk much.

(10) a. Maria a parla *nen* tant. [Piedmontese]
Maria CL talks SN much.
'Maria doesn't talk much.'

b. Maria spricht *nicht* viel. [German]
Maria talks SN much.
'Maria doesn't talk much.'

c. Maria praat *niet* veel. [Dutch]
Maria talks SN much.
'Maria doesn't talk much.'

d. Mi-zɔk wi ndɔng *na* [Gbaya Kaka]
1SG-see person that SN
'I do not see those people.'

In most languages, negation systematically either precedes (9) or follows (10) the verb. English exemplifies a complex situation in which negation follows the auxiliary (4a), (5a), (6a), but precedes the main verb. This motivates the construction of *do*-support in sentences like (1b, c), (3a) and (9e) (cf. Chapter 3, Section 3 for an analysis).

[2] The Romance examples are from Zanuttini (1991, 1996). The Baghdad Arabic example is from Payne (1985). The Welsh example is from Borsley and Jones (2005). The Koromfe example and the Gbaya Kaka example are from Dryer (2007). Koromfe is a Niger-Congo language spoken in Burkina-Fasso and Mali; Gbaya Kaka is a Niger-Congo language spoken in Cameroon.

Dryer (1988) presents a systematic study of the placement of the marker of sentential negation in relation to the three main clausal elements of subject (S), object (O) and verb (V) in a worldwide sample of 345 languages. His results indicate that SOV languages are most commonly either SOVNeg or SONegV. NegSOV and SNegOV languages are infrequent. SVO languages are most commonly SNegVO, and V-initial languages are overwhelmingly NegV (i.e. NegVSO or NegVOS).

The patterns of negation in relation to the S, V and O system of the language are quite intriguing, but a full study of the placement of negation with respect to these three elements is outside the scope of this book. The position of the negative particle in relation to the verb will be the focus of this investigation, because this factor turns out to have important implications for the syntax–semantics interface.

There is an overall tendency for the negative marker to precede the verb. Out of 345 languages in the sample, Dryer (1988) finds that 227 (70%) place the negation marker before the verb. The patterns of preverbal (9) and postverbal negation (10) were first described by Jespersen (1917). Jespersen identifies a strong tendency "to place the negative first, or at any rate as soon as possible, very often immediately before the particular word to be negated (generally the verb)" (Jespersen 1924: 4). Horn (1989: 292–293) uses the term NegFirst for this tendency. NegFirst is motivated by communicative efficiency, i.e. to "put the negative word or element as early as possible, so as to leave no doubt in the mind of the hearer as to the purport of what is said" (Jespersen 1924: 297), quoted by Horn (1989: 293).

Although many languages have a preverbal marker of sentential negation, the examples in (10) indicate that NegFirst is not an absolute rule. In the OT system developed in Chapter 3, NegFirst is defined as a violable constraint that interacts with other constraints governing word order in the language. An opposing force coming from information structure favors a position of new or focused information late in the sentence (FocusLast). When this general tendency applies to negation, it favors a postverbal position of negation, so it is in conflict with NegFirst. The OT grammar of a language establishes a balance between these opposing tendencies in terms of constraint ranking.

1.2.2 Discontinuous Negation

The patterns in (9) and (10) represent cases in which a language expresses propositional negation by means of a single negative marker. A small number of languages use so-called discontinuous negation. In such languages, negation is expressed by two 'bits' of form, which appear in two different positions in the sentence, as illustrated in (11). In such cases, SN appears twice in the gloss.

(11) a. *Ne* bið he *na* geriht. [Old English]
SN is he SN righted
'He is not/never set right (=forgiven)'

b. Elle *ne* vient *pas*. [written French]
She SN comes SN.

c. *Ni* soniodd Sioned *ddim* am y digwyddiad. [formal Welsh]
SN mention.PAST.3SG Sioned SN about the event
'Sioned did not talk about the event.'

d. *D*oedd Gwyn *(*ddim*) yn cysgu. [informal Welsh]
NEG.be.IMPF.3SG Gwyn *(SN) PROG sleep
'Gwyn was not sleeping.'

e. baba wo-shìi nai tapa u. [Kanakuru]
father SN-he drink tobacco SN
'My father does not smoke tobacco.'

f. Haar suster het *nie* haar verjaarsdag vergeet *nie*. [Afrikaans]
Her sister has SN her birthday forgotten SN
'Her sister didn't forget her birthday.'

Even though there are two markers in the syntax, there is only one negation in the semantics, that is, all the sentences in (11) express a proposition of the form ¬p, with p an atomic proposition. However, negation is expressed by two 'bits' of form, one usually preceding the verb, the other following it, which is why I refer to it as discontinuous negation. The two markers are often (11a–e), though not always (11f), different lexical items.

The analysis of discontinuous negation raises important problems for the principle of compositionality of meaning. This foundational principle states that the meaning of a complex whole is a function of the meaning of its composing parts. If a sentence contains two expressions contributing negation, the question arises as to how to derive the single negation meaning of the sentences. The compositionality problem surfaces with negative indefinites as well. The compositionality problem, and possible solutions advanced in the literature, are discussed in more detail in Sections 4 and 5.

Example (11a) is from Mazzon (2004: 27), who indicates that discontinuous negation was a rather unstable phenomenon in the late Old English and Early Middle English period. The written French example in (11b) illustrates the bleaching of the preverbal *ne* to a co-negative, where the expressive force of negation is borne by the postverbal negator *pas* (cf. Godard 2004 and references therein). Formal Welsh reflects an older stage of the language in which the postverbal *ddim* is optional (11d) (Borsley and Jones 2005). In informal Welsh, the preverbal particle has disappeared, but it survives in an incorporated form in some verbs, such as *oedd-doedd* (11e). Although the verb appears in a negative form, it is unable to express semantic negation, and the presence of the postverbal adverb *ddim* is obligatory.

Discontinuous negation is not restricted to languages spoken in Europe. (11e) is cited as an example of discontinuous negation by Dryer (2007) in languages spoken on the African continent.

Typologically speaking, discontinuous negation does not occur in many languages, and when it does, it is usually not very stable in a diachronic sense (Haspelmath 1997). Modern English does not have a discontinuous negation anymore. In spoken French, preverbal *ne* is frequently dropped. In colloquial Welsh, the special negative form of the verb is limited to a small number of lexical verbs. This book argues that discontinuous negation is rare because it is uneconomical. Syntactically, discontinuous negation is of course rather costly: why use two markers to express a single negation, if one could do the job? Economy plays an important role in the analysis, but there are factors overruling economy in certain configurations.

Jespersen (1917) argues that discontinuous negation is a phase in a diachronic process in which preverbal negation is gradually replaced by postverbal negation. This process is commonly referred to as the 'Jespersen cycle'.

1.2.3 The Jespersen Cycle

Jespersen formulates the diachronic pattern of negation as follows: "The history of negative expressions in various languages makes us witness the following curious fluctuation: the original negative adverb is first weakened, then found insufficient and therefore strengthened, generally through some additional word, and this in turn may be felt as the negative proper and may then in course of time be subject to the same development as the original word' (Jespersen 1917: 4), quoted by Horn (1989: 452).

A few pages later, Jespersen adds: "Now, when the negative begins a sentence, it is on account of that very position more liable than elsewhere to fall out, by the phenomenon for which I venture to coin the term of *prosiopesis* (the opposite of what has been termed of old aposiopesis): the speaker begins to articulate, or thinks he begins to articulate, but produces no audible sound (either for want of expiration, or because he does not put his vocal chords in the proper position) till one or two syllables after the beginning of what he intended to say. (…) The interplay of these tendencies – weakening and strengthening and protraction – will be seen to lead to curiously similar, though in some respects different developments in Latin with its continuation in French, in Scandinavian and in English" (Jespersen 1917: 6).

The trajectory of the Jespersen cycle is well documented for English (Horn 1989, Mazzon 2004, Wallage 2005, 2008), French (Bréal 1897/1900, Clarke 1904, Tesnière 1959, Horn 1989, Godard 2004), Dutch/Flemish (Hoeksema 1997, Zeijlstra 2004, Breitbarth and Haegeman 2008) and German (Jäger 2008, Breitbarth, to appear). Although Borsley and Jones (2005) do not describe it in these terms, it is traceable for Welsh in their book.

Horn's (1989: 455) summary of the English and French development is given in Table 1. The preverbal negation *ne* in Old French is reinforced by the postverbal marker *pas*, which leads to the discontinuous negation *ne..pas* in modern written French. The discontinuous negation is currently giving way to a single postverbal negation in spoken French, even in the higher registers (Ashby 1981, 2001).

Table 1 Jespersen cycle in English and French

Old French	Jeo *ne* dis I SN say	Old English	Ic *ne* secge I SN say
Modern French (written/standard)	Je *ne* dis *pas* I SN say SN	Middle English	Ic *ne* seye *not* I SN say SN
Modern French (colloquial)	Je dis *pas* I say SN	Early Modern English	I say *not* I say SN
		Modern English	I do*n't* say I do SN say

In English, a similar development took place from the Old English preverbal negation *ne* via the discontinuous pattern *ne..not* in Middle English to the postverbal negation *not* in Early Modern English. Postverbal *not,* which originates from *nawiht/nogh/nahtet* 'nothing', has taken over the negative force in this phase. The *do*-support construction in Modern English signals a return to the preverbal position of negation, and supports Jespersen's view that the diachronic process is cyclic.

Chapter 3 provides an analysis of the Jespersen cycle in an optimality-theoretic model. This approach can explain why economy is overruled in certain grammars.

1.2.4 Negative Indefinites

In logic as well as linguistics, the analysis of sentence negation is closely intertwined with the treatment of quantifiers. If negation affects an indefinite in argument (12a) or adjunct position (12b, c), negation may be incorporated into the indefinite in languages like English.

(12) a. No one came.
¬∃x Came(x)
b. It never rains here.
¬∃t Rain(t)
c. The book was nowhere to be found.
¬∃l Be-Found(b, l)

Of course, the functional architecture of the clause is quite different from that of the nominal domain, so from a syntactic perspective, it may come as a surprise that propositional negation may be realized on a pronoun like *no one, nothing* or an adverb like *never, nowhere*. Semantically, sentences involving *not* and sentences involving *no one, never* are variants on the expression of truth-functional negation. Besides issues concerning the position and interpretation of the marker of sentential negation, the status of pronouns and adverbs such as English *no one, never, nowhere* in (12) is central to the syntax and semantics of negation. I borrow the terminology from Haspelmath (1997) and Penka (2006, 2007), and characterize these expressions as negative indefinites. I include temporal and spatial variables into the argument

structure of lexical verbs in order to treat the cases in (12a-c) in the same way. The predicate-logical translations given in (12) reflect the enriched view of argument structure adopted.

In Chapter 4, I refer to negative indefinites as Neg-expressions, and give this term a precise theoretical status. The translations provided in (12) are straightforward, and it seems sensible to treat expressions like *no one* as quantifiers, and assign them the lexical semantics ¬∃x. Further research reveals that the status of negative indefinites in natural language is much more complex than the examples in (12) might suggest. The lexical semantics one assigns to negative indefinites depends on one's views on negative polarity and negative concord. There is a wide range of proposals in the literature, which are spelled out in Sections 3–5.

1.3 Negative Polarity

Under the definition advanced by van der Wouden (1994: 1), negative polarity items are lexical elements with a restricted distribution: they occur in 'negative' contexts only (where 'negative' includes more than sentential negation, see below). This section discusses the status of negative polarity items as special indefinites occurring in the scope of negation, and the issues raised by the study of polarity items in natural language. The relation between negative polarity and negative concord will be addressed in Section 4.

1.3.1 Negative Polarity Items as Special Indefinites

Many languages use a special form of the indefinite if it occurs in the scope of negation. For propositional operators like negation or quantification, the semantic scope is defined as the proposition to which the operator is prefixed. English is a prime example of a language using so-called negative polarity items in negative contexts. Compare the sentences in (13) and (14).

(13) a. I did *not* buy *something*. [∃¬, *¬∃]
b. I did *not* buy *anything*. [¬∃, *∃¬]
(14) a. *Nobody* saw *something*. [∃¬∃, *¬∃∃]
b. *Nobody* saw *anything*. [¬∃∃, *∃¬∃]
c. *Nobody* said *anything* to *anyone*.

Examples (13a) and (14a) are grammatical if the indefinite takes wide scope over negation or the negative quantifier, but cannot be used to express the narrow scope of the indefinite. (13b) and (14b) mirror (13a) and (14a) in that *anything* obligatorily takes a narrow scope with respect to negation or the negative quantifier.

Support for the claim that a negative polarity item must be in the semantic scope of negation comes from pairs of sentences such as (15) (from de Swart 1998b).

(15) a. Sue did not read a book by Chomsky.
b. Sue did not read any book by Chomsky.

(15a) is ambiguous depending on the scope of the negation operator with respect to the existential quantifier introduced by the indefinite NP. The first-order representation of the two readings of (15a) in (16) makes this explicit.

(16) a. $\neg\exists$x (Book-by-Chomsky(x) $\wedge$ Read(x)) Neg > $\exists$
b. $\exists$x (Book-by-Chomsky(x) $\wedge \neg$Read(x)) $\exists$ > Neg

Expressions like the English *anything* are called 'negative polarity items', because such items can only be felicitously used in contexts with a certain "negative" flavor, and they always take a narrow scope with respect to their licensor (Ladusaw 1979). Accordingly, (15b) only has the interpretation in (16a). Items like the English *something* are called 'positive polarity items', because they are allergic to negative contexts, and want to be interpreted outside the scope of negation (Baker 1970). Thus, (13a) only gets the reading akin to (16b). Not all indefinites are either positive or negative polarity items: plain indefinites like the English *a book* are neither, as illustrated by (15a).

Analyses of negative and positive polarity are offered by Ladusaw (1979, 1996), Zwarts (1986, 1995, 1998), van der Wouden (1994, 1997), Szabolcsi (2004), Giannakidou (1998, 1999, 2008) and others. This book does not address the phenomenon of positive polarity as such, but is restricted to negative polarity, and more particularly the relation between negative polarity items (NPIs) and negative indefinites (Neg-expressions).

Negative polarity items occur in a wider range of contexts than just negation, as emphasized by Ladusaw (1979, 1996).

(17) a. If you saw *anything*, please tell the police.
b. Did *anyone* notice *anything* unusual?
c. Few commuters *ever* take the train to work.

The examples in (17) illustrate that NPIs such as *anything* do not inherently carry a negative meaning. Rather they have existential force, with some additional meaning component characterized as 'widening' of a set of alternatives by Kadmon and Landman (1993), and Lahiri (1995, 1998), as indicating the bottom of a scale by Fauconnier (1975, 1979), Linebarger (1980, 1987), Krifka (1995), Israel (1996), and de Swart (1998b), as sensitive to scalar implicatures by Chierchia (2006), or to a non-deictic interpretation of the variable (Giannakidou 2008).

This meaning is particularly strong in so-called 'minimizers', i.e. indications of a small quantity that function as the bottom of the scale. The sentences in (18) have a strong idiomatic flavor. Their affirmative counterparts in (18a') and (18b') are not ungrammatical, but have a literal meaning only. The truth conditions in (16) only spell out the existential import of the negative polarity item.

(18) a. He didn't *lift a finger* to help me.
a'. #He lifted a finger to help me.
c. Nobody had *a red cent*.
b'. #Everybody had a red cent.
c. Every restaurant that charges so much as *a dime* for iceberg lettuce ought to be closed down.
c'. #Some restaurant that charges so much as a dime for iceberg lettuce ought to be closed down.

Negative polarity items are found in a wide range of languages. Zwarts (1986) studied negative polarity early on for Dutch, cf. also van der Wouden (1994, 1997), from whom the examples in (19) are taken. Haspelmath (1997: 193, 215) provides examples of negative polarity items from Basque (20) and Swedish (21) (cf. Laka 1990 for more on Basque). The Mandarin Chinese example in (22) is from Xiao and McEnery (2008).

(19) a. Geen monnik zal *ook maar* iets bereiken. [Dutch]
No monk will NPI something achieve
'No monk will achieve anything.'
b. Weinig monniken *kunnen* vader abt *uitstaan*
Few monks can father abbot stand
'Few monks can stand father abbot.'

(20) Ez dut *inor* ikusi. [Basque]
SN I:have:him anybody seen.
'I haven't seen anybody.'

(21) Ja har inte sett *någon*. [Swedish]
I have SN seen anybody.
I have not seen anybody.'

(22) zhe bing bu yewei-zhe women jiang jujue [Mandarin Chinese]
this actually SN mean-ASP we will refuse
xiang *renheren* chushou *renhe* dongxi
to anyone sell any thing
'This does not mean that we will refuse to sell anything to anyone.'

Section 3.2 provides additional examples from Hindi. Negative polarity is not restricted to the nominal domain, as the examples in (23) show.

(23) a. She doesn't have a car *yet*.
b. This is the cleverest idea I have seen *in years*.
c. I could *stand* it no more.
d. Hij *hoeft* zijn huis niet te verkopen. [Dutch]
He needs his house SN to sell
'He doesn't need to sell his house.'
e. Daniel n'a pas *du tout* aimé le concert. [French]
Daniel SN has SN of all liked the concert
'Daniel didn't like the concert at all.'