Negation

Matti Miestamo
University of Helsinki

In propositional logic negation is a connective that changes the truth value of a proposition. If p is true, then ¬p is false, and vice versa. As many sections in this article will show, things are not that straightforward in natural language. Philosophers have been interested in negation since ancient times. Within linguistics negation has been approached from various points of view, and a large number of topics related to negation is discussed in the literature. The central aspects of the most important issues will be covered here. Section 1 discusses the scope of negation, Section 2 takes up some issues pertaining to the markedness of negation, Section 3 looks at how negation is expressed in the world's languages, the topic of Section 4 is negative polarity, negation and scalarity is treated in Section 5, metalinguistic negation in Section 6, negative transport in Section 7, some diachronic issues in Section 8, and finally Section 9 addresses the acquisition of negation. Before going into questions of scope, it is perhaps appropriate to mention two central publications in the field: Jespersen (1917) can be considered the classical work on negation in linguistics, and Horn (1989), covering a wide range of issues in the semantics and pragmatics of negation, is indispensable to anybody doing research on the subject.[1]

1. Scope of negation

A long philosophical tradition holds that negation is ambiguous between an internal and an external reading. I will use the well-known "King of France" examples to illustrate the difference. In internal negation (2a), the subject (or topic) of the sentence is interpreted as being outside the scope of negation, whereas in external negation (2b) it is included in the scope.

(1)   The King of France is bald.
(2)   The King of France is not bald.

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[1]   The 2001 reissue of Horn's book contains a bibliography update and a summary of recents developments in the field.

a. $\exists x(Kx \,\&\, \forall y(Ky \supset y = x) \,\&\, \neg Bx)$
[The King of France is not-bald]

b. $\neg x(Kx \,\&\, \forall y(Ky \supset y = x) \,\&\, Bx)$
[not(the King of France is bald)]
(Horn 1989: 364)

Internal negation preserves the presuppositions of the corresponding affirmative. In the case of the French monarch, both (1) and (2a) presuppose the existence of the referent of the subject. External negation, on the contrary, denies the presuppositions. Thus (2b) does not presuppose the existence of the King of France. External negation is rare in natural language. Negation typically does not affect the presuppositions of a sentence. In fact, a useful test to see whether something is a presupposition is its constancy under negation.

In classical propositional logic there are only two possible truth values: every proposition is either true or false. An utterance of (2) in 2006, when France is a republic, would be nonsensical on the internal reading, and a multivalued logic, a system that allows for a third truth value (i.e. neuter, neither true nor false, undetermined), would be needed to account for it. On the external reading the utterance of (2) would not pose a problem for a two-valued logic, either.

The law of the excluded middle says that everything must be either true or false, formally $(p \lor \neg p)$. The law of contradiction says that two opposites, e.g. a proposition and its negation, cannot be true at the same time, formally $\neg(p \,\&\, \neg p)$. These laws help to clarify the distinction between contrary and contradictory negation. Contradictory opposition is governed by both laws, but contrary opposition only by the law of contradiction. Contrary opposites can thus be simultaneously false, but not simultaneously true. Contradictory opposites, on the other hand, cannot be simultaneously true nor simultaneously false. Pairs of antonyms such as *odd/even* or *married/unmarried* and pairs of affirmative vs. negative sentences involving ordinary sentential negation are contradictory opposites. Typical contrary opposites are pairs of antonyms such as *warm/cold* or *friendly/unfriendly*.

Von Wright (1959) introduces the distinction between strong and weak negation. Strong negation is an affirmation and a denial at the same time. It affirms a negative predicate of a subject (x is not-a). Weak negation is merely a denial (x is not a). The laws of contradiction and excluded middle are both valid for weak negation, but for strong negation only the law of contradiction applies.

Sentential negation takes the whole sentence in its scope, whereas constituent negation only applies to a part of the sentence. Jespersen (1917) uses the terms nexal and special negation: in nexal negation the negative operator belongs to the combination of two ideas, whereas in special negation it belongs to only one idea. Klima (1964) proposes the following criteria for identifying sentential negation in English: instances of sentence negation are those structures that permit the occurence of the *either*-clause, the negative appositive tag *not even* and the question

tag without *not*.[2] Furthermore, Klima suggests that strong sentence negation can be distinguished from weak sentence negation following the criterion of occurence with a *neither*-clause (of course strong and weak sentence negation are to be kept distinct from Von Wright's weak and strong negation). According to these criteria, (3) contains strong sentence negation (4) contains weak sentence negation and (5) does not contain sentence negation at all.

(3)   She doesn't like running, {either./not even in the forest./does she?/and neither does he.}

(4)   Scarcely anybody accepts suggestions, {either/not even writers/do people?/*and neither do writers}

(5)   She is unhappy, {*either./*not even with him./*is she?/*and neither is he.}

These criteria are specific for English, but similar language specific criteria can be and have been established for other languages as well. In Tottie's (1977) study different speakers show different degrees of negativity for different negative elements; it is argued that there can be no strict division between strong and weak sentence negation, and these negative elements should be placed on a continuum from strong to weak negativity: *not>never>hardly>little>few>seldom*.

Some have tried to identify sentential negation by paraphrasing it as *It is not the case that p*. It is, however, rare for the topic of a sentence to be in the scope of negation – as was already noted above, external negation is rare in natural language. Givón (1984: 326) notes that in actual (English) texts, there are usually no cases where a definite subject would fall under the scope of negation, and the rare cases where a subject is negated use special subject-negative forms. Payne (1985) argues that negation is semantically placed at the border of old and new information. Sentential negation can be given the following "performative paraphrase": *I say of X that it is not true that Y*, where X contains the contextually bound elements, i.e. old information. Thus the sentence *John is not running* could be paraphrased as *I say of John that it is not true that he is running*.

Finally, it should be noted that negation tends to be attracted to focused elements, and different ways of indicating focus (focus markers, special focus constructions, prosody etc.) can be used to restrict the scope of negation to a part of a sentence.

2.   Markedness of negation

This section addresses a number of differences, or asymmetries, between affirmation and negation. Negation is marked vis-à-vis affirmation both functionally (in cognitive,

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2.   Klima (1964) is a thorough investigation of English negation in an early generative perspective; for a more recent generative account, see Haegeman (1995).

semantic and pragmatic terms) and formally (in morphosyntactic terms). This section first discusses aspects of the functional asymmetry between affirmation and negation and the criteria of morphosyntactic markedness are taken up in the end of the section; evidence for the morphosyntactic markedness of negation will also be seen in Section 3, where the expression of negation is discussed from a cross-linguistic point of view.

Negation is conceptually marked with respect to affirmation. It is a mental process added by language users, and there is thus more semantic content in a negative sentence than in the corresponding affirmative. Psycholinguistic experiments have shown effects of this complexity (see Clark 1974). Negatives are harder to understand than affirmatives, which applies to both inherently negative terms (*remember*/*forget*, *present*/*absent*), where the positive terms are processed faster than the negative ones, and to explicitly negative structures. True affirmative and false affirmative sentences are both processed faster than their negative counterparts, true affirmatives being the fastest. But it is interesting to note that false negatives tend to be easier to process than true negatives. Different explanations have been suggested for this result, e.g. Clark's (1974) true model. Horn (1989, pace Wason 1965) argues that true negatives are actually more complex than false ones, because they involve the denial of a falsehood (i.e. double negation) whereas false negatives involve the denial of a fact.

Negatives differ from affirmatives in terms of the stativity/dynamicity of the states of affairs they report. Affirmatives can report both stative and dynamic states of affairs, but the states of affairs that negatives refer to are stative. Consider the following examples:

(6)   Chris knows the song.
(7)   Chris does not know the song.
(8)   Chris drank the coffee.
(9)   Chris did not drink the coffee. (Miestamo 2005: 196)

With stative predicates, both affirmation (6) and negation (7) are naturally stative. With dynamic predicates affirmatives are dynamic – there is change in the state of the universe in (8) – but negatives are stative – (9) refers to a state of affairs with no change in the universe (see e.g. Givón 1978: 103–108 and Miestamo 2005: 196–197 for more on the stativity of negation).

Negative sentences are prototypically used a denials. They are typically uttered in contexts where the corresponding affirmative is somehow present. Tottie (1991) classifies negatives in discourse-functional terms as follows:

i.   rejections (including refusals)
ii.   denials: a.   explicit
                  b.   implicit (Tottie 1991: 22)

Rejections reject suggestions and denials deny assertions. As to the distinction between explicit and implicit denials, the former deny something that has been explicitly asserted

and the latter "something which might merely have been expected, or which can be contextually inferred but which has not been asserted" (Tottie 1991: 21). In Tottie's conversation data, rejections constitute only a small minority of all uses of negatives – all the rest are denials, implicit denials being clearly more common than explicit ones. As Givón (1978) points out, (10) uttered out of the blue would be odd, but it is a perfectly plausible utterance if the pregnancy of the speaker's wife has already been discussed or alluded to.

(10)   Oh, my wife is not pregnant. (Givón 1978: 80)

Givón (1978, 1984, 2001) argues that negatives are discourse-presuppositionally more marked than their affirmative counterparts. When ¬p is uttered, p is present in the context as backgrounded information: "Negative assertions are typically made on the tacit assumption that the hearer either has heard about, believes in, is likely to take for granted, or is at least familiar with the corresponding affirmative" (Givón 2001: 370–371). In Clark's (1974) terms, negatives involve the supposition of their affirmative counterparts.

Events, e.g. the one reported by (8) above, occur at specific points in time, but there is an infinite number of moments when a given event does not take place and when its negation, e.g. (9), is thus true. From a perceptual point of view, as Givón (1978: 103–108) argues, an event (change in the state of the universe, reported by an affirmative sentence) can be associated with figure, and the absence of an event (no change in the state of the universe, reported by a negative sentence) can be associated with ground. In communication, the information value of figure is high, whereas the ground has low information value – there is less need to communicate anything about the inert background. Negatives need a special context to be plausibly used in discourse, and this context is provided by the supposition of the corresponding affirmative, which gives higher information value for negatives. The context thus involves a reversal of figure and ground.

Leech (1983) introduces the maxim of negative uniformativeness. Negative sentences are typically less informative than their affirmative counterparts. It is more informative to say (11) than (12).

(11)   Abraham Lincoln was shot by John Wilkes Booth.
(12)   Abraham Lincoln was not shot by Ivan Mazeppa. (Leech 1983: 100)

The maxim of negative uniformativeness, together with the maxim of quantity, says that a negative sentence should be avoided if a positive one can be used instead. It also implies that when negative sentences are used, there is a special purpose for doing so: They are used in contexts where they are not less informative than positives, i.e. when the supposition of a positive is present in the context. Leech argues that the maxim of negative uninformativeness thus provides an explanation for why negative

propositions are usually denials of positive propositions present in the context. Leech has been criticized for proliferating maxims beyond necessity. According to (Brown & Levinson 1987: 51) the maxim of negative uninformativeness, too, could be derived from other maxims. For Horn (1989: 198–201) the pragmatic markedness of negation results from the interplay of the maxims of quantity and relation.

A well known phenomenon connected with the markedness of negation is the tendency for indefinite NPs occurring in the scope of negation to be non-referential. The following English examples illustrate the situation. In the definite cases (13) and (15), the NPs are referential. The indefinite NP can get either a referential or a non-referential reading in the affirmative (14), but in the scope of negation the indefinite NP gets a non-referential reading (16).

(13)   John read the book.
(14)   John read a book.
(15)   John didn't read the book.
(16)   John didn't read a book. (Givón 1978: 71)

As (17) shows, this is not an absolute restriction. Examples like this are extremely rare in actual discourse and alternative structures are preferred for expressing the same information.

(17)   Well, she didn't read a book that was put on the required list, and as a result she
        failed her exam. (Givón 1978: 72)

Givón (1978, 1984: 333) explains the tendency for non-referentiality of indefinite NPs under negation by the discourse context of negation: as negatives are used in contexts where the corresponding affirmative is supposed, referential participants are definite in negatives – negatives do not introduce new participants into the discourse. Unlike in English, in some languages this pragmatic effect has been conventionalized in grammar. Finnish objects, for example, take partitive case under negation, whereas in the affirmative there is a choice between accusative and partitive objects. In French, objects marked by indefinite articles in affirmative contexts receive partitive marking by *de* in the scope of negation.

The markedness of negation also shows in the lexicon. Antonyms are positive/negative pairs where negativity can be overtly signalled (*happy*/*unhappy*) or it can be implicit (*happy*/*sad*). Again, the negative term is the marked one. The positive term is conceived of as neutral. *Long* can be used to designate the whole scale of length. It is natural to ask *How long is the rope?* but it would be a marked use to ask *How short is the rope?* It has also been noted that when pairs of antonyms are coordinated, the positive term tends to come first in the so-called fixed binominals or freezes (e.g. *positive or negative, all or none, many or few, plus or minus, win or lose, pro and con, tall and short, good and bad*). A cognitive motivation for these markedness patterns is that the positive

term is perceptually salient since it represents the presence of the property on the scale, whereas the negative term represents its absence.

The functional markedness of negation vis-vis affirmation is reflected in formal (morphosyntactic) markedness as well. In the world's languages, according to Greenberg (1966: 50), "[t]he negative always receives overt expression while the positive usually has zero expression"; there are indeed extremely few languages where no overt marker of negation is found, and in none of these do we find overt expression of affirmation (see Miestamo 2005: 121). Negation also satisfies the frequency criterion for markedness by occurring less frequently in discourse than affirmation. Similarly, negation appears as the marked member of the affirmative vs. negative opposition according to the behavioral potential criteria (Croft 2003: 95–99; see also Greenberg 1966): less grammatical distinctions are made in the negative than in the affirmative and negation can be embedded in fewer contexts than affirmation. The functional asymmetry between affirmation and negation discussed in this section is thus reflected in morphosyntactic asymmetry as well. The next section will, among other things, address the cross-linguistically common phenomenon of neutralization of grammatical categories in negatives, which is a clear indication of the morphosyntactic markedness of negation.

3.   The expression of negation in the world's languages

This section looks at negation from a typological point of view. Its main concern is clausal negation, with a special focus on standard negation – the basic strategies that languages use for negating declarative verbal main clauses. Some other aspects of negation, e.g. the negation of indefinite pronouns, will receive some space as well. According to Payne (1985) standard negation can be expressed by negative particles, negative verbs or in the morphology of the verb (and marginally also by negative nouns, although the examples he gives are not instances of standard negation). He also briefly mentions some "secondary modifications", i.e. ways in which negatives may differ from affirmatives structurally. Dahl (1979) makes a basic distinction between syntactic and morphological negation. Morphological negation is most typically affixal. Syntactic negation can be realized by negative particles or negative verbs, in addition to which there can be some changes in the lexical verb and a special finite element (FE) can be added in the negative construction.[3]

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3.   Dahl introduces the term finite element (FE) as a more abstract term for what is basically the finite verb of a clause. The FE added in negatives is usually an auxiliary verb.

More recent cross-linguistic studies of clausal negation have paid attention to the structure of negative clauses more globally, and observed the functional effects of the changes that negation can bring to the structure of a clause. Honda (1996) identifies three basic types of expression of negation according to the status of the FE of the negative clause: (1) the FE of the negative is not different from the FE of the corresponding affirmative, (2) there is a special (non-negative) FE added in the negative, and (3) the negative marker itself is the FE of the negative. Forest (1993) distinguishes two main types of negatives: "recusative" and "suspensive-reassertive" (négation récusative, négation suspensive-réassertive). To put it simply, in the former type the negative differs from the corresponding affirmative only by the presence of negative marking, whereas in the latter the morphosyntactic marking of some semantic domains differs from their marking in affirmatives. Both authors discuss ways in which negatives differ from affirmatives in the world's languages, e.g. neutralization of tense-aspect-mood (TAM) categories and obligatory non-indicative marking in negatives.

Miestamo (2005) distinguishes two basic types of negative structures – symmetric and asymmetric negation – according to whether or not negatives differ structurally from affirmatives in addition to the presence of negative markers. This distinction is observed from the point of view of constructions on the one hand and paradigms on the other. Symmetric negative constructions do not differ from the corresponding affirmative in any other way than by the addition of (a) negative marker(s) (e.g. in Washo 18), whereas in asymmetric constructions further differences – asymmetries – are observed (e.g. in Finnish 19). In symmetric paradigms the correspondences between the members of the paradigms used in affirmatives and negatives are one-to-one (e.g. in Italian 20), whereas in asymmetric paradigms such one-to-one correspondence does not obtain (e.g. in Maung 21 and in Burmese 22). Grammatical distinctions are often neutralized in paradigmatic asymmetry.

(18)   Washo (Jacobsen 1964: 603, 604–605)[4]

a.	Iᵉ-ímeʔ-hu-i	b.	Iᵉ-ímeʔ-é.s-hu-i
	1-drink- PL.INCL-IMPF		1-drink- NEG-PL.INCL-IMPF
	'We are drinking.'		'We are not drinking.'

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4.   Abbreviations used in the glosses: 1 – first person, 2 – second person, 3 – third person, ACT – actual, CNG – connegative, IMPF – imperfective, INCL – inclusive, IRR – irrealis, NEG – negation, NPST – nonpast, PERF – perfect, PL – plural, POT – potential, SG – singular.

(19) Finnish

a.	laula-n	b.	e-n	laula
	sing- 1SG		NEG-1SG	sing. CNG
	'I sing.'		'I do not sing.'	

(20) Italian

a.	cantare 'to sing', present		b.	cantare 'to sing', future	
		affirmative	negative		affirmative	negative
	1SG	canto	non canto		canterò	non canterò
	2SG	canti	non canti		canterai	non canterai
	3SG	canta	non canta		canterà	non canterà
	1PL	cantiamo	non cantiamo		canteremo	non canteremo
	2PL	cantate	non cantate		canterete	non canterete
	3PL	cantano	non cantano		canteranno	non canteranno

(21) Maung (Capell & Hinch 1970: 67)

a.	ŋi-udba	b.	ni-udba-ji	c.	marig	ni-udba-ji
	1SG.3-put		1SG.3-put- IRR.NPST		NEG	1SG.3-put- IRR.NPST
	'I put.'		'I can put.'		'I do/shall not put.'	

(22) Burmese (Cornyn 1944: 12–13)

a.	θwâ-dé	b.	θwâ-mé	c.	θwâ-bí	d.	ma-θwâ-bû
	go- ACT		go- POT		go- PERF		neg-go- NEG
	'goes, went'		'will go'		'has gone'		'does/did/will not go, has not gone'

Cross-cutting the constructional–paradigmatic distinction, asymmetric negation is divided into subtypes according to the nature of the asymmetry. In subtype A/Fin, the finiteness of the lexical verb is reduced or lost in the negative, and a new FE is usually added; in the Finnish SN construction (19) the negative verb *e-* appears as the FE of the clause taking person inflection and the lexical verb appears in the non-finite connegative form. In subtype A/NonReal, negatives are obligatorily marked for a category that refers to non-realized states of affairs; in Maung negation is marked with *marig* and the construction is symmetric (21b,c), but there is paradigmatic asymmetry since negatives obligatorily use the irrealis form of the verb and the distinction between realis and irrealis (21a,b) is lost in the negative (21c). There is a marginal subtype, A/Emph, characterized by the presence of marking that denotes emphasis in non-negatives (for lack of space not exemplified here). Finally, in subtype A/Cat negatives, the marking of

grammatical categories differs from their marking in affirmatives in other ways, the most commonly affected categories being TAM and person-number-gender; in Burmese (22) the affirmative makes a distinction between actual, potential and perfect, the negative construction is asymmetric since the suffixal part of the discontinuous negative marker replaces the TAM markers, and there is also paradigmatic asymmetry since these TAM distinctions are then lost.

The following principles of explanation are proposed for the typology in Miestamo (2005): Symmetric negation copies the linguistic structure of the affirmative and is thus language-internally analogous to the corresponding affirmative, ultimately motivated by pressure for system cohesion. Asymmetric negatives copy aspects of the functional asymmetry between affirmation and negation (see Section 2 above) and are thus language-externally analogous to these functional-level asymmetries. Different subtypes of asymmetric negation have conventionalized different aspects of the functional asymmetry in their grammars: A/Fin is motivated by the stativity of negation, A/NonReal by the semantic connection between negation and other conceptualizations of the non-realized, and type A/Emph and those type A/Cat structures where grammatical distinctions are lost are both motivated by the prototypical discourse context of negatives in different ways; see Miestamo (2005: 195–235) for more discussion.

It may also be noted that negatives are typically less transitive than affirmatives according to the criteria proposed by Hopper & Thompson (1980). Negation itself figures among the criteria of low transitivity and many of the other criteria are also satisfied by negatives: non-action and irrealis, as well as the non-affectedness and non-individuation of the object. This is very much in accordance with the classical view of transitivity as transfer of energy from agent to patient – in negatives, where the action does not happen (or happens less completely), there is no (or less) transfer.

Negation itself can be marked differently in connection with different categories. Even within standard negation, different negative constructions can be found for example in connection with different tense-aspect categories. In clausal negation more generally, the most typical environments for negative constructions to differ from standard negation are imperatives and existentials (see Kahrel 1996: 70–71). Van der Auwera & Lejeune (2005) found out that roughly two thirds of their sample languages used special negative marking in prohibitives (negative imperatives), i.e. negative marking not used in declarative negatives.[5] Van der Auwera (2006) examines diachronic developments behind these cases and proposes an explanation of the

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5. In fact, (western) Europe is the only area in the world where dedicated prohibitives are a minority. Note that Haspelmath et al. (eds. 2005) contains maps concerning other aspects of negation as well.

preference for dedicated prohibitives based on the radically different speech act status of prohibition vs. (the more frequent) declarative negation.

Turning now to word order, the position of negative markers is rarely determined in relation to the whole clause, i.e languages tend to place their clausal negators close to the finite verb rather than in clause-initial or clause-final position; this is a clear reflection of the fact that external negation is rare in natural language (see Section 1 above). Jespersen (1917: 5) introduced the Neg-first principle, according to which negative markers tend to be placed before the elements they negate. In standard negation, the element negated is the finite verbal element of the sentence, and according to Dryer (1992) there is indeed a tendency for negative particles to be placed preverbally, regardless of basic word order. Basic word order does play a role for negative auxiliaries, which tend to be placed before the lexical verb in VO-languages and after it in OV-languages.

Kahrel (1996) distinguishes the following types of constructions used for the negation of indefinite pronouns: (1) standard negation with ordinary (positive) indefinite, (2) standard negation with special indefinite, (3) inherently negative indefinite pronoun without standard negation, and (4) inherently negative indefinite pronoun with standard negation; there is a fifth type, usually found in languages with no indefinite pronouns, where the equivalent function is expressed by an existential construction. The first four types are also identified in Dahl (1979) and Bernini & Ramat (1992). Kahrel's typology works in isolation, but it is often more interesting to see how negative indefinite pronouns are related to other indefinite pronouns. Haspelmath (1997) proposes an implicational map for the functions/uses of indefinite pronouns. The functions range from specific known to direct negation and free-choice items. An indefinite pronoun in a given language serves only adjacent functions on the map. Negativeness being a property of the whole sentence, it is not easy to say categorically that an indefinite is negative or non-negative, but its different functions can be placed on the implicational map. The only important parameter of negative indefinite constructions that is not accounted for by the implicational map is the co-occurrence of negative indefinites with standard negation. There are three main types: NV-NI, where the negative indefinite always co-occurs with standard negation; V-NI, where standard negation and the negative indefinite never co-occur; and (N)V-NI, where negative indefinites sometimes do and sometimes do not co-occur with standard negation.[6] There are of course some interdependencies between the implicational map and co-occurrence with standard negation. It seems clear, for example, that an indefinite

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6.   In this third type, standard negation is present usually when the negative indefinite is postverbal. This is understandable via the Neg-first principle: it is communicatively effective to signal negativeness as early in the sentence as possible.

whose functions are at the positive end of the implicational map could not get a negative reading without standard negation.[7]

4.   Negative polarity items

A lot of research has been done on polarity items in recent years. Van der Wouden (1997: 61) proposes the following descriptive definitions of positive and negative polarity items: "Positive polarity items (PPIs) are expressions that cannot felicitously appear in negative contexts." "Negative polarity items (NPIs) are expressions that can only appear felicitously in negative contexts." NPIs include elements such as English *any*, *yet* or *a red cent*, and PPIs are elements like *some* and *already*. The behaviour of these elements is illustrated in (23)–(27).

(23)   The president signed {some/*any} of the papers yesterday.
(24)   The president didn't sign {*some/any} of the papers yesterday.
(25)   I've had coffee {already/*yet}.
(26)   I haven't had coffee {*already/yet}.
(27)   Chris {*gave/didn't give} a red cent to the Tsunami Relief Fund.

Polarity items are found in various syntactic and semantic classes. The fact that NPIs are a much larger, more productive and more frequently occurring class than PPIs can be considered an exception to the markedness of negation (cf. Section 2 above).

Van der Wouden (1997) examines different attempts to classify NPIs in the literature. He concludes that it is not fruitful to classify them on etymological or syntactic grounds. No simple semantic classification can be established either, but certain tendencies can be found. Most languages have NPIs that denote a minimal amount. Similarly, negatively polar verbal idioms are found in most languages. The rhetorical figures of understatement and litotes are found in many languages and these are a frequent source for NPIs. Many languages also have indefinites functioning as NPIs. Furthermore, many intensifiers are either NPIs or PPIs.

In studies dealing with negative polarity the crucial question is what licenses NPIs; what are the negative contexts that NPIs occur in? Many different answers – syntactic, semantic and pragmatic – have been proposed to the licensing question in the literature. The syntactic approaches are based on the presence of a negative operator in the sentence, and the notion of c-command is central to most of them.

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7.   In this context it is also worth noting that the so-called double negation, the pattern exemplified by e.g. Italian and Spanish, is by far more common in the languages of the world than the "logical" Standard English type, obeying the law of double negation.

According to the semantic approach proposed in Ladusaw (1980), NPI licensers are downward-entailing (monotone-decreasing, downward-monotonic) expressions. Downward-entailing expressions allow one to infer from sets to subsets.

(28)   Chris does not drink coffee.
(29)   Chris does not drink espresso.
(30)   Chris drinks little coffee.
(31)   Chris drinks little espresso.

We can infer (29) from (28) and (31) from (30); *not* and *little* are downward-entailing and they are both NPI licensers.

The approach to polarity licensing based on downward monotonicity is further elaborated in Van der Wouden (1997), where polarity is not seen as an isolated phenomenon in language, but polarity licensing (as well as some other phenomena connected with negation) is treated as a subcase of collocational behaviour. Furthermore, several contributions in Horn & Kato (2000) and Hoeksema et al. (2001) report results from the intensive work that has been done on negative polarity in recent years.

5.   Negation and scalarity

Ordinary sentential negation typically results in contradictory oppositions: *Mary is singing*/*Mary is not singing*, whereas constituent negation of the type *happy*/*unhappy* gives contrary opposites (see Section 1 above). When applied to scalar predicates, sentential negation shows some interesting effects. Fauconnier (1975) observes that negation has the effect of reversing the ordering of elements on a scale.

(32)   John had four cups of coffee.
(33)   John didn't have four cups of coffee.

The sentence in (32) implies that John had three cups, that he had two cups etc. In the negative (33), the implications go to the opposite direction: John did not have five or six cups etc.

In fact, already Jespersen (1924: 325–326) noted that negation when applied to certain (scalar) predicates means 'less than'. *Not good* implies *inferior* but not *excellent*. The same applies to numerals: Example (34) means the hill is lower than 200 feet.

(34)   The hill is not two hundred feet high. (Jespersen 1924: 326)

However, Jespersen notes that the same expression can exceptionally mean 'more than', as is shown by the Examples (35) and (36). This requires a special prosody in the utterance.

(35)   [It is] not lukewarm, but really hot.

(36)   His income is not two hundred a year, but at least three hundred. (Jespersen 1924: 326)

Horn (1989: 266–267) argues that these effects are not brought about by some special property of negation, but are rather due to the nature of the scalar predicates. The scalar operators are lower-bounded by their literal meaning and upper-bounded by a conversational implicature based on the maxim of quantity. This context-dependent implicature gives two readings for sentences containing these scalar operators: 'at least P' and 'exactly P'. Negation, on the normal reading, contradicts the literal meaning, yielding 'not (at least) P', i.e. 'less than P'. Thus in (34) negation applies to the literal (pre-upper-bounded) value of the scalar predicate yielding the reading 'not (at least) 200 feet', i.e. 'less than 200 feet'. In the marked cases (35) and (36), on the other hand, negation applies to the 'exactly'-reading produced by the conversational implicature. Thus (35) does not mean 'It is not (at least) lukewarm' but rather 'It is not (exactly) lukewarm'.[8] These examples can be analyzed as instances of metalinguistic negation, the topic of the next section.

6.   Metalinguistic negation

The term metalinguistic negation originates from Ducrot (1972). It is used for negations where what is negated is not the content of the proposition but rather the way it is expressed. Metalinguistic negation has received a lot of attention since Horn's seminal article (Horn 1985). This section will first present Horn's view of the phenomenon and then mention some alternative approaches and comments inspired by Horn's writings. For Horn metalinguistic negation is

> a device for objecting to a previous utterance on any grounds whatever, including the conventional or conversational implicata it potentially induces, its morphology, its style or register, or its phonetic realization. (Horn 1989: 363)

In opposition to the unmarked descriptive negation, which is internal and truth-functional, the marked metalinguistic negation is external and non-truth-functional.

As discussed in Section 1 above, on the internal reading it would be hard to assign a truth value to *The King of France is not bald*. The continuation *there is no King of France* in (38) forces an external presupposition-cancelling reading – this is a metalinguistic negation denying the assertability of (37) on the grounds that there is no King of France.

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8.   For alternative views of scalarity, see for example Carston's (1998a) Relevance Theoretic and van Kuppevelt's (1996) topic-based approaches.

(37)   The King of France is bald.
(38)   The King of France is not bald – there is no King of France.

The grounds for objecting to an utterance can be of many kinds. The objection can be due to presupposition-failure, as is the case with the King of France. It can be due to denial of implicatures, as in (39) and (40), where what is objected to is an upper-bounded conversational implicature – that he does not have more than three children in (39) and that coffee is merely liked, but not loved, in (40).

(39)   He doesn't have three children, he has four.
(40)   Around here we don't like coffee – we love it. (Horn 1989: 382)

The grounds for rejecting an utterance can be its phonetic realization, as in (41), or the stylistic effect of the utterance, as in (42). In these cases it is very clear that the objection has nothing to do with the content of the proposition.

(41)   He didn't call the [pólis], he called the [polís]
(42)   Phydeaux didn't shit the rug, he soiled the carpet. (Horn 1989: 371)

Metalinguistic negation also involves a special intonational pattern, as was already noticed by Jespersen in connection with the scalar cases (see previous section). In (43) the word *manage* has a special fall-rise intonation contour.

(43)   John didn't manage to solve the problem – it was quite easy for him to solve.
        (Horn 1985: 130)

One characteristic property of metalinguistic negation is that PPIs, rather than NPIs, are found in its scope. The affirmative sentence (44) contains the PPI *some* and (45) includes a descriptive negation with the NPI *any*. In (46) the negation is metalinguistic, and the PPI appears instead of the NPI.

(44)   John managed to solve some problems
(45)   John didn't manage to solve any problems
(46)   John didn't manage to solve {some/*any} problems – they were quite easy for him
        to do. (Horn 1985: 130)

This is understandable given that in the metalinguistic case the propositional content is not negated – in (46) it is not denied that problems were solved by John.

Horn (1985, 1989) argues for the pragmatic ambiguity of the negation operator:

> it can be a descriptive truth-functional operator, taking a proposition p into a proposition not-p, or a metalinguistic operator which can be glossed 'I object to u', where u is crucially a linguistic utterance rather than an abstract proposition. (1985: 136)

This has been both agreed with and criticized. Van der Sandt (1993) does not treat metalinguistic uses of negation differently from other denials and does not consider the marked use of negation a pragmatic phenomenon, but gives a semantic analysis instead. Carston (1996) emphasizes the echoic use of material in the scope of negation

and argues against the ambiguity of the negative operator; the two uses are attributed to the capacity of using language to represent states of affairs or other representations (including other utterances). For Geurts (1998) Horn's metalinguistic negation is not a unified phenomenon but involves different mechanisms of denial. Burton-Roberts (1989) agrees with Horn on the nature of metalinguistic negation, but emphasizes the fact that all cases of metalinguistic negation involve a contradiction, and it is the contradiction that triggers the need for a special pragmatic interpretation: to say that one does not like coffee and then to go on by saying that one loves it is a contradiction; to say that one does not have three children and assert that one has four is a contradiction. When one operates in a presuppositional semantics, a contradiction can be seen in the presupposition-denial cases as well.[9]

7.   Negative transport

Negative transport (Neg(ative)-raising or not-hopping) refers to the phenomenon by which a negative in a higher clause is interpreted as the negation of an embedded-clause predicate. In (47) the negative is in the higher clause and in (48) in the embedded one, but on the negative transport reading, (47) does not negate the thinking but the coming, and the sentences are (nearly) synonymous.

(47)   I don't think he has come.
(48)   I think he has not come. (Jespersen 1917: 53)

It has been noted that different verbal predicates behave in different ways as to whether they permit negative transport or not. As seen in (47) and (48), *think* allows negative transport but predicates such as *claim* and *hope* do not seem to do so: (49) has a clearly different meaning from (50), and (51) from (52). Of course, it also varies from dialect to dialect and language to language which predicates allow negative transport and which do not.

(49)   I don't claim he has come.
(50)   I claim he has not come.
(51)   I don't hope he has come.
(52)   I hope he has not come.

Horn (1978, 1989) suggests the following explanation. The different predicates can be arranged on a scale according to the strength of subjective certainty (for epistemic predicates) or strength of obligation (for deontic predicates). The predicates that allow negative transport have mid-scalar values on the scale (*believe, think, be likely, seem, should, want*), whereas predicates that do not allow negative transport have either

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9.   Discussion on the nature of metalinguistic negation continues in Carston (1998b, 1999) and Burton-Roberts (1999).

weak (*be able, be possible, may, can, permit, be allowed*) or strong (*know, be certain, must, cause, order*) values on the scale. When negated, predicates at different points on the scale behave differently:

a.   The (contradictory) negation of a weak scalar value (e.g. *possible, allow*) will be a strong value on the corresponding negative scale (*impossible, forbid*).

b.   The negation of a strong scalar value (e.g. *certain, have to*) will be a weak value on the corresponding negative scale (*not certain, do(es)n't have to*).

c.   The (contradictory) negation of a mid-scalar value (e.g. *likely, advisable*) will be an intermediate value on the corresponding negative scale (e.g. *not likely, not advisable*). (Horn 1978: 195)

The mid-scale predicates, thus, do not radically change their position on the scale when negated. This allows for the (partial) synonymy between sentences where the negation is in the upper clause and sentences where it is in the embedded clause. The issue of negative transport has been recently addressed by Tovena (2001).

8.   Negation in diachrony

Negative markers are often ancient elements whose origins cannot be reached. The Indo-European **ne* was a negative element already as far back in history as a protolanguage can be reconstructed. In some languages negative markers have grammaticalized from verbs with negative meanings, e.g. 'fail', 'lack', 'refuse', 'decline' or 'avoid', see e.g. Givón (2001: 267–268). Other possible sources are elements that reinforce negation and negative existentials, both of which will now be dealt with in more detail.

In the development known as Jespersen's cycle, elements that were introduced into negative clauses to reinforce negation are reanalysed as negative markers. I will illustrate this development with the best known example, viz. French negation. In Latin the standard negation marker was *non* (53).

(53)   Latin (Jespersen 1917: 7)

non   dic-o
NEG   say-1 SG
'I do not say.'

In Old French this negator had become phonetically weaker, it had reduced to *ne* (54).

(54)   Old French (Jespersen 1917: 7)

Jeo   ne   di
1 SG   NEG   say
'I do not say.'

To fulfil its communicative function, it was frequently reinforced by words such as *pas* 'step', *goutte* 'drop', *point* 'point', or *mie* 'crumb'. These words appeared in the direct object position after the verb and were originally found in contexts where they were motivated by their semantic content. Thus for example *pas* appeared in sentences that had to do with walking and *goutte* in contexts that involved liquids. These elements started to grammaticalize and lose their semantic content, and were then generalized to other contexts as well. Finally, *pas* ousted out the other elements (although *point* still survives as a marginal variant). It became an obligatory part of the negative construction and negation was expressed with a double particle appearing on both sides of the verb *ne…pas*. This is the situation in Modern Standard French (55).

(55) Modern Standard French

Je	ne	dis	pas
1 SG	NEG	say	NEG

'I do not say.'

Modern Spoken French has gone further; preverbal *ne* has disappeared, and standard negation is expressed with the postverbal particle *pas* (56).

(56) Modern Spoken French

Je	dis	pas
1 SG	say	NEG

'I do not say.'

As has been noted above, negative particles tend to be preverbal, and the postverbal negative particle in French thus seems typologically odd. This exceptional word order can be easily understood in the diachronic perspective. Some other European languages, e.g. English, German and Swedish, have gone through a similar development and their postverbal negators can be explained in the same way (for the history of English negation, see also Mazzon 2004). If the Neg-first principle is effective, we might expect the development to go through the whole cycle and postverbal particles to change their position becoming preverbal. This has indeed happened in most French Creoles.[10] According to Ramat & Bernini (1990: 30), Germanic (especially Scandinavian) postverbal negators are moving towards preverbal position.

Croft (1991) proposes a hypothesis of a cyclical development of negative existential predicates. He finds three distinct types in the languages of the world: A in which the ordinary existential predicate is negated by the verbal negator, B in which there is

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10. This view of course presupposes that we take French creoles to be historical continuations of French in the relevant sense.

a negative existential predicate different from the verbal negator, and C in which the negative existential is identical to the verbal negator. Some languages show variation between two different types: A˜B, B˜C and C˜A. Croft argues that these cases of variation can be interpreted as ongoing change from one type to another. The principles of grammaticalization theory suggest that the directionality of change is A>B>C>A. This is what Croft calls the negative existential cycle. Thus, one further origin of standard negators is the reanalysis of negative existent*ials as verbal negators (B>C).

9.   The acquisition of negation

As any well-behaved marked category, negation is more difficult for a child to learn than its unmarked counterpart. Negative sentences appear in children's speech later than affirmative ones, and as far as pairs of antonyms are concerned, the negative term is harder to acquire than its positive counterpart (see Clark & Clark 1977: 513).

According to Clark & Clark (1977: 348), the first expressions of negation are gestures that may be combined with single words, or a negative word may be used alone. Some children may mark single-word or two-word utterances as negative by using a different intonation pattern.

Klima & Bellugi (1966) identify three stages in the acquisition of English negation. At the first stage negation is sentence-external; a negative (*not* or *no*) is combined with a proposition by placing it at the beginning (or less commonly at the end) of a sentence. At the second stage negatives start to be incorporated into the sentence and negatives such as *can't* and *don't* are used in addition to *not*. At this stage the adult synthetic forms, e.g. *don't*, are unanalysed wholes for the child. At stage three children master the essentials of the adult system of English negation; they no longer use sentence-initial (or final) negative markers and *don't* is now analysed as the combination of *do* and *n't*.

Bloom (1970, 1991: 144–145) questions the sentence-initial first stage by arguing that Klima and Bellugi's data were not correctly analysed. When negation occurs at the beginning of a sentence, it is most often a negative sentence with the sentence subject omitted, otherwise it is anaphoric or emphatic. De Villiers & de Villiers (1985: 82) conclude that sentence-initial negatives do not constitute a universal first step, although individual children may adopt such a strategy. Cross-linguistically speaking the sentence-external first step is not valid, either. Lieven (1997: 230–231) points out that there are languages where children use a clearly sentence-internal negation strategy right from the beginning.

From the point of view of function, it has been noted that different semantic and pragmatic functions of negatives appear at different points in language development. According to Bloom (1970) the earliest negative sentences are expressions

of nonexistence. The categories of rejection and denial are acquired later (in this order). Thus the order of acquisition is: nonexistence > rejection > denial ('>' meaning 'is acquired before'). For more recent categorizations see for example Pea (1980) and Choi (1988).

It has been argued that the order reflects the level of cognitive difficulty of these categories. However, some variation in the order of acquisition has been found for individual children and for different languages. The cross-linguistic variation can at least partly be explained by whether or not each negative meaning is expressed by a different negative element in a given language, while some of the differences between individual children can be explained by differences in the input. Therefore, as Lieven (1997: 230) argues, the level of cognitive difficulty cannot be the only factor underlying the similarities and differences in the order of acquisition of negative functions.

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