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On Aristotle and Baldness – Topic, Reference, Presupposition of Existence, and Negation^{*}

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ABSTRACT

This paper is a contribution to the never settled debate on reference, negation and presupposition of existence in the linguistic/philosophical literature. Based on Swedish and English data, the discussion is an attempt to present a unified account of the opposing views put forward in the works of Aristotle, Frege (1892), Russell (1905) and Strawson (1950). The starting point is the observed asymmetry in Swedish (and English) that negation may precede a quantified subject NP in the first position, but not a definite subject NP or a proper name. This asymmetry is argued to be due to semantic, rather than syntactic, restrictions. In the model proposed here, negating a topic NP affects the “topic selection”. This is allowed with quantified NPs, since negating a quantifier leads only to a *modification* of the topic selection. For definite/generic subject NPs this cannot be allowed, since negating a definite NP equals *cancelling* the topic selection. This leads to a ‘crash’ at the semantic level.

1. Introduction

The question of how negation interacts with referential expressions has been debated in the linguistic literature literally since ancient times, discussed at length by Aristotle who in turn was influenced by Plato and the Sophists before him. Various (and quite opposing) solutions have been proposed in the literature, most notably in the seminal works of Frege (1892), Russell (1905) and Strawson (1950). This paper, perhaps somewhat presumptuous, will add further to this quite replete area of study, presenting a (still preliminary) sketch of how the opposing views of the mentioned scholars may be united.

^{*} An earlier version of this paper was presented at the Semantics Seminar and the Higher Seminar at the Centre for Languages and Literature, Lund University. I would like to thank the participants at these seminars for their valuable comments and suggestions. I am especially indebted to Christer Platzack and Valéria Molnar for all their support, patience and encouragement, and to Lars-Åke Henningsson for helping me to fit the last piece into this puzzle. I am of course solely responsible for all errors and shortcomings in this paper.

The starting point for my discussion is the intriguing asymmetry of the following Swedish sentences:

- (1) Inte alla (mina vänner) kom till festen.
not all my friends came to party-the
- (2) Inte många (av mina vänner) kom till festen.
not many of my friends came to party-the
- (3) * Inte Sven/chefen kom till festen.
not Sven boss-the came to party-the
- (4) * Inte lejon är randiga.
not lions are striped

All four clauses have a seemingly identical structure – [Neg S V] – but only the first two are grammatical. Why does Swedish allow negation of quantified subject NPs in the first position, as in (1) and (2), but not of definite and (generic) indefinite subject NPs, as in (3) and (4)? What is more, this “limitation” seems only to apply to the first position in Swedish, since negation can take scope over a definite subject NP in mid-position: *Den filmen ville inte Sven se* (‘That movie, Sven didn’t like to see’). The observed asymmetries of (1-4) will be the starting point for a more wide-ranging discussion on how negation interacts with *topic*, *reference* and *presupposition of existence*.

The paper is organized as follows. In section 2, I present the shifting philosophical and linguistic views on the semantics of negated sentences that create the background for the forthcoming discussion, starting with Aristotle and moving on through the centuries to Frege, Russell and Strawson. Section 3 focuses on the distinction between the semantic notion of narrow and wide scope negation, and the syntactic counterparts of constituent and sentential negation. Section 4 constitutes the main part of the paper, where I suggest an explanation for the asymmetries found in (1-4) above. In my proposal, I introduce a “unifying model” which aims at illustrating the relation between *topic*, *reference* and *presupposition of existence* on the one hand, and the interaction of these notions with negation on the other. I conclude this article with a few remarks on questions/problems in need of further investigation.

2. Background

As mentioned above, my discussion should be regarded as yet another contribution to the never settled debate on reference, negation and presupposition of existence in the linguistic/philosophical literature. Although the field has attracted attention since Aristotle’s *De Interpretatione*, I will just shortly review the seminal works of Frege, Russell and Strawson in this section. A reader inter-

ested in a more in depth discussion on these matters are referred to Horn 1989 and 1996 and von Fintel 2003.

2.1 Singular Subjects and Negation

One of Aristotle's most influential linguistic insights is his basic assumption that "every proposition is of subject-predicate form and is either true or false" (Horn 1996:1). The simplicity of this statement may conceal its fundamental semantic importance – in my proposed model, I will suggest a strengthened version of this claim.

According to Aristotle, the relation between the subject and the predicate can be either *affirmed* or *denied*. Thus, there is a *contradiction* between affirmative and negative sentences with identical subject-predicate form: both cannot be true at the same time. This is sometimes referred to as the Law of Contradiction (LC):

- (5) Socrates is ill.
- (6) Socrates is not ill.

If sentence (5) is true, (6) cannot be true simultaneously. For sentential negation, yet another law applies: the Law of the Excluded Middle (LEM). LEM "requires that of any two opposite propositions, one is true" (Zeijlstra 2005:46). These two laws predict, then, that sentences (5) and (6) can be neither true nor false at the same time: one of them *must* be true (by virtue of LEM), and the other *must* be false (by virtue of LC).

Aristotle adds an intriguing twist to the truth conditions of the sentences above: if the subject denotes an entity that does not exist (in this case *Socrates*), (5) must come out false, while (6) must come out true. This is so, since it is not possible for a dead or nonexistent man to be ill, but if he does not exist, it is also true that he is not ill¹.

Approximately two millennia later, Frege returned to the problematic notions of reference and existence. In his classic paper "Über Sinn und Bedeutung" (1892), he concludes that referring phrases carry the presuppositions that they do in fact refer². The problem of vacuous subjects is solved by Frege thus:

¹ This analysis has been subject to criticism, and it is not clear whether Aristotle was entirely convinced of its correctness himself. There is also a logic problem to this analysis, since "negative attributes are no more ascribable to nonexistent subjects than are positive attributes" (Horn 1989:15).

² Frege did not explicitly use the term *presupposition*. But his definition of the phenomenon is used today as the standard definition of presupposition.

in order for an assertion or a sentence to be either true or false, its presupposition must be true or satisfied. According to Frege then, sentences like (5) and (6) above are *neither true nor false*, in case the subject fails to denote.

Russell (1905) called Frege's analysis into question, reviving Aristotle's claim that every proposition must be either true or false. Whereas Frege divided any utterance into two separate parts (i.e. the presupposition and the assertion), Russell regarded utterances to consist of assertions only. His analysis was based on the now famous sentence about the present King of France (a subject referent that truly does not exist)³:

(7) The King of France is bald.

It is important to point out, that in Russell's analysis the sentence above is not a proposition in the Aristotelian sense, i.e. of subject-predicate form. Instead, it is "a complex kind of *existential proposition*" (Strawson 1950:322), consisting of a conjunction of three assertions: a) *existence*, there is a king of France; b) *uniqueness*, there is not more than one king of France; c) *property*, there is nothing which is king of France and is not bald. Russell assumed the following semantic form:

(8) $\exists x(Kx \ \& \ \forall y (Ky \rightarrow y = x) \ \& \ Bx)$

The conjuncts in (8) are all *assertions*; in Frege's analysis, the existence of the French king would be no more than a presupposition. And obeying to the laws of logic, any sentence is false if (at least) *one* of its assertions is false.

Russell analysed the negated counterpart of (7) as ambiguous with regards to the scope of negation. The subject NP – in Russell's analysis an existentially quantified conjunct (i.e. *There is a king of France*) – may or may not be in the scope of negation.

(9) The King of France is not bald.

(10) $\exists x(Kx \ \& \ \forall y (Ky \rightarrow y = x) \ \& \ \neg Bx)$

(11) $\neg \exists x (Kx \ \& \ \forall y (Ky \rightarrow y = x) \ \& \ Bx)$

³ Whereas both Aristotle and Frege experimented with vacuous proper names (*Socrates* and *Kepler* respectively), Russell deliberately chose a descriptive, definite NP. For Russell, "definite descriptions are devices for quantification, not devices for referring" (Reimer & Bezuidenhout 2003:1); only proper names are truly referring. As a consequence of this analysis, only proper names can function as subjects in the Aristotelian definition of a proposition – a conclusion severely criticized by Strawson (1950:323)

In case the quantifier has scope over the negation, as in (10), the proposition is simply false, since France is a republic. This is due to the fact that the assertion of existence is false. If the reverse scope relations hold, as in (11), the proposition turns out true, since there is no king of France. The negated assertion of existence correctly predicts that *it is not true, that there is a king of France*. Thus, Russell managed to uphold Aristotle's claim: sentence (7) must be false if the subject (i.e. the French king) does not exist, but the negated counterpart (9) may be true.

Both Aristotle's and Russell's analyses of negative scope and vacuous subjects can be criticized for being somewhat counter-intuitive. In ordinary language use, we prototypically *do* assume the existence of the subject, even in negated sentences. This led Strawson (1950) to attack Russell's view, basing his analysis more on language intuition than on predicate logic⁴. Crucially, Strawson made a division between *sentences* and *the use of sentences* (later labelled *statements*). Only statements can be evaluated truth-conditionally in a relevant context – consequently, only statements can obey LC and LEM. Strawson thus argued that *statements* like (7) and (9) are unambiguous: by uttering such statements the speaker does “commit herself to the existence of a king of France but (...) she does not thereby ASSERT (...) the corresponding existential proposition” (Horn 1996:4). By uttering (7) or (9), the speaker implies the existence of a French king, but if this implication (or presupposition) clashes with reality, the truth value of that statement cannot be evaluated – there would be truth-value gap.

2.2 Quantified subjects and negation

So far, we have only discussed singular subjects (with true or vacuous reference). Let us now turn our attention to quantifiers – the category that allowed for negation in the first position. Consider (12) and (13) below:

(12) Everyone could not get hold of tickets.

(13) Not everyone could get hold of tickets.

The sentences differ, obviously, with regards to the position of the negation (at least at surface structure). In (12) the quantifier *everyone* precedes the negation, in (13) the negation precedes the quantifier. This could be thought to effect the interpretations – but it doesn't. The standard reading of (12) is in fact (more or

⁴ “Neither Aristotelian nor Russellian rules give the exact logic of any expression of ordinary language; for ordinary language has no exact logic.” (Strawson 1950:344)

less) the same as in (13): *it is not the case, that everyone got hold of tickets* (there are at least some that did not get hold of them). But this is truly surprising, given that (12) and (13) then *both* must be analysed as having the quantifier within the scope of the negation ($\neg\forall$), regardless of word order. Remember Russell's ambiguous analysis of the nonexistent French king, where the *existential* quantifier was either within the scope of the negation ($\neg\exists$) or took scope over it ($\exists\neg$). As Strawson pointed out, the latter reading is generally the only one available, though: the presupposition of existence seems unimpaired by the negation. But for universal quantifiers, the reverse scope relations seem to hold: the negative operator outscopes the universal quantifier regardless of word order.

Admittedly, a logical reading of (12) is possible, in which the quantifier does take scope over the negation ($\forall\neg$); the analysis renders the marginal reading that *for everyone, it is the case that they did not get hold of tickets* (i.e. no one got hold of tickets). In some languages – for instance German, Dutch and Icelandic⁵ – the QP-NEG interpretation seems to be the only one possible (see Zeijlstra 2005:77). This fact is intriguing in itself, given the close relationship of these languages with Swedish and English. But the construction is still only marginally acceptable, probably for pragmatic reasons I will return to in section 4.3.

Interestingly, scalar quantifiers like *many* and *few* seem to display a true ambiguous behaviour, however:

- (14) Many arrows didn't hit the target
 (15) Not many arrows hit the target

The interpretation of (14) and (15) may be identical (especially with stress on *many* in (14)): *it is not the case that many arrows hit the target*. But this is not necessarily so. Whereas (15) presupposes that few arrows hit the target, (14) only presupposes that many arrows did not – but many arrows may have hit the target anyway. The (standard) analysis of (14) is thus that the negation is within the scope of the quantifier ($\forall\neg$), while the reverse is true for (15) ($\neg\forall$).

Summarizing the facts above, we have thus seen a rather puzzling pattern with regards to quantifiers and the scope of negation:

1. Existential QP (\exists)	<	\neg	=	$\exists\neg$ but $*\neg\exists$
2. Universal QP (\forall)	<	\neg	=	$\neg\forall$ but $?\forall\neg$
3. Scalar QP (∇)	<	\neg	=	$\nabla\neg$ or $\neg\nabla$

⁵ Thanks to Halldór Sigurðsson for Icelandic data (p.c.)

Later on, when provided with the accurate tools to analyse these relations, I will suggest that this pattern is not so asymmetric after all – but we are jumping ahead of things. Let us first discuss narrow and wide scope negation.

3. The Scope of Negation: Narrow vs. Wide

Negation is semantically and syntactically either *narrow*, taking scope over a limited number of clause constituents, or *wide*, taking scope over the sentence as a whole⁶. In Swedish, sentential negation is prototypically coded grammatically as a free adverb, as in (16) below. Constituent negation is coded as either a negative *prefix*, as in (17), or as a free adverb in a restricted domain, such as in the non-finite clause in (18), or in the adverbial phrase in (19):

- (16) Sven är *inte* vänlig
Sven is not unfriendly
- (17) Sven är *ovänlig* vs. Sven är vänlig
Sven is unfriendly Sven is friendly
- (18) genom < att *inte* röka inomhus > gör du oss en stor tjänst
by to not smoke inside do you us a great favour
- (19) en < ännu *inte* helt färdig > tavla
a still not quite finished painting

According to *Svenska Akademiens Grammatik*⁷ (SAG from now on), constituent negation may only occur in these environments (including adjectival phrases) (SAG 4:171). This view will be questioned in my analysis.

In Aristotelian logic, there is a crucial distinction between *predicate denial* (sentential negation) and *predicate term denial* (constituent negation). While sentential negation obeys two laws, the *Law of Contradiction* (LC) and the *Law of the Excluded Middle* (LEM), constituent negation only obeys the former (i.e. LC). In the two sentences in example (17), it is obvious that LC holds, since both propositions cannot be true at the same time. But LEM does not hold: it is possible that Sven is *neither* friendly nor unfriendly⁸. In other words, both propositions may be false simultaneously.

There is also a syntactic distinction between sentential and constituent negation. Several basic tests have been proposed in the syntactic literature for

⁶ Narrow scope negation is sometimes referred to as *strong*, while wide scope negation is *weak*. In this paper, I will stick to the distinction narrow vs. wide, since I find these terms more transparent.

⁷ Teleman et al 1999

⁸ These predicates are analysed by Horn (1989) as *scalar predicates*.

distinguishing between the two notions; the first set of tests was proposed in Klima 1964 (the list is not exhaustive):

- **either/too** (Swedish: *heller/också*)
Sentential negation: Sven is *not* friendly, and Bertil isn't, *either/*too*.
Constituent negation: Sven is *unfriendly*, and Bertil is, *too/*either*.
- **tag questions** (Swedish: positive or negative assertions)
Sentential negation: Sven is *not* friendly, *is he?* – No, he isn't.
Constituent negation: Sven is *unfriendly*, *isn't he?* – Yes, he is.

The standard negation in Swedish invariably triggers these tests. Less negative adverbs, such as *sällan* ('seldom') or *knappast* ('hardly'), may trigger some of them. The accuracy of Klima's tests has been questioned, however (see e.g. Jackendoff 1972, Culicover 1981), since the tests sometimes give rise to conflicting results. In the forthcoming discussion, the shortcomings of these tests will also become evident.

4. The Proposal

Returning to our initial problem, let us consider the scope asymmetries of examples (1-4) above in more detail, repeated here for convenience:

- (20) Inte alla (mina vänner) kom till festen.
 not all my friends came to party-the
- (21) Inte många (av mina vänner) kom till festen.
 not many of my friends came to party-the
- (22) * Inte Sven/chefen kom till festen.
 not Sven boss-the came to party-the
- (23) * Inte lejon är randiga.
 not lions are striped

These four sentences have what appears to be identical form, i.e. [Neg S V]. Given the V2 rule of Swedish, it is the *grammaticality* of (20) and (21) which is surprising, since two constituents seem to precede the finite verb. A possible syntactic solution would be to analyze the negation in (20) and (21) as being part of the subject NP, i.e. to assume that negation takes narrow scope over the quantified NPs. In (22) and (23), the negation may then be analysed as sentential, taking scope over the sentence as a whole – and this leads to a violation of V2. The difference between (20, 21) and (22, 23) would then be the scope of the negation: narrow vs. wide.

But things are a bit more complicated. Importantly, negation in (20) and (21) does in fact trigger Klima's test for sentential negation:

- (24) Inte alla mina kollegor kom till festen, och det gjorde inte alla mina vänner heller.
 Not all my colleagues came to party-the, and that did not all my friends either

So even though we may assume a narrow scope reading for the negation in (20) and (21) (in order to avoid a V2 violation), the negation is still *syntactically* wide according to Klima's tests. Note also that the sentences obey Aristotle's two laws: the Law of Contradiction and the Law of the Excluded Middle. The affirmative counterpart cannot be true at the same time (LC), and the negative and affirmative cannot be false at the same time: if none of my colleagues came to the party, it is true that not everyone came⁹. I address this issue in section 4.2.

Next, let us consider the examples with specific or generic singular subjects. Interestingly, we may "save" them from ungrammaticality by creating a contrastive reading (sometimes referred to as *corrective focus*):

- (25) Inte Sven, utan BERTIL, kom till festen igår
 not Sven, but BERTIL, came to party-the yesterday
 (26) Inte lejon, utan TIGRAR, är randiga
 not lions, but TIGERS are striped

The first subject is *rejected* in favour of another subject – the negation appears to be taking narrow scope over the definite subject. According to Klima's test, we are dealing with true constituent negation here:

- (27) a. Inte Sven, utan Bertil, kom till festen igår –
 not Sven but Bertil came to party-the yesterday
 b. Ja, det gjorde han. Och Arne också /*heller
 yes that did he and Arne too either

But how come this analysis isn't available for the negation in examples (22) and (23) above? The wide scope interpretation leads to a violation of V2, while the narrow scope interpretation seems impossible, unless a new referent is introduced.

Summarizing, we have found some intriguing asymmetries in the Swedish sentences (20-24):

⁹ A negative quantifier like *no one* asymmetrically entails *not everybody*. But we may feel awkward about regarding a sentence like *not everybody came* true, if in fact nobody came. This is more or less the same problem as in Aristotle's example: if Sokrates does not exist, then it is true that he is not ill.

- a) Quantified NPs may be negated in first position. They trigger Klima's test for sentential negation, as well as Aristotle's Law of Contradiction and the Law of the Excluded Middle.
- b) Specific or generic singular NPs may be negated in the first position, provided a new subject NP is introduced. In these cases, the negation takes narrow scope over the subject, triggering Klima's test for constituent negation.

I will address the different kinds of subjects separately, starting with definite NPs; the main proposal is also presented in this section. In section 4.2 and 4.3 respectively, universal and scalar quantifiers are fitted into the proposal, and in section 4.4 the last category, generic NPs, is accounted for.

4.1 Singular subjects

In this section, I will focus on specific, singular subjects – i.e. the ungrammatical cases in (3/22) and (4/23) above. In the first sub-section, I introduce a rough sketch, illustrating how I relate the notions of topic, reference and presupposed existence to each other. In the next sub-section, I fit negation into the model, trying to account for the ungrammaticality I initially promised to discuss. Finally, we will take a closer look on contrast and its implications for the model proposed here.

4.1.1 *Topic, reference and presupposition of existence*

Remember Aristotle's original claim, that every proposition must be of subject-predicate form. I take this to be a profound and fundamental insight, stating that for a proposition to be (semantically) well-formed, we need to predicate something of something/someone. This view is also predominant in the Chomsky-tradition, i.e. any sentence must contain a subject (Cardinaletti 1999:151). However, I think it is somewhat problematic to speak of subjects at this fundamental level, since we know that languages may permit omission of the *syntactic* subject. The crucial point is that a proposition must contain something *about* which we make a predication. Therefore, I propose to modify Aristotle's claim into stating that every proposition must be of *topic-comment* form: for a proposition to be semantically congruent, a relation between a *topic* (i.e. what a proposition is about) and a *comment* (what is said about the topic) must be established.

Next, let us consider the relation between reference and definite NPs/proper names. It is uncontroversial, I think, to assume that specific, definite NPs prototypically *denote* specific referents in a discourse universe. This is sometimes

thought of as a pointing device: a proper name or a definite NP *denotes/points to/refers to* a certain entity. As was discussed in section 2, we normally also assume that the entity referred to exists. Vangsnes (1999:25-26) presents a quite traditional view on how reference is connected to a presupposition of existence, and is therefore a good starting point for our further discussion:

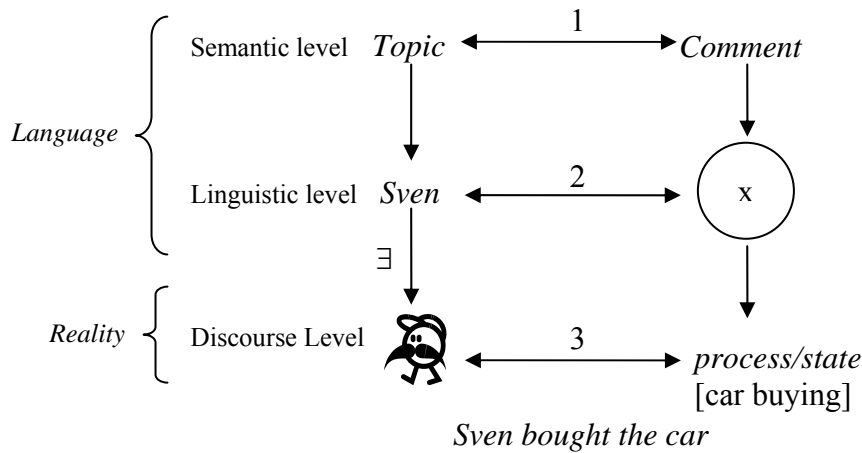
The core referential property of strong noun phrases [e.g. definite NPs] is that they carry the presupposition that their referents exist. This presupposition is fairly indirect and not logically necessary, but the listener must at least take it that the speaker is referring to entities assumed to exist. This presupposition of existence of course refers to either the real or some fictitious world, hence allowing noun phrases like *all unicorns* and *the present King of France* to have the same basic semantic properties as noun phrases where the noun denotes kinds of entities that no doubt exist.

Vangsnes calls the presupposition of existence a “referential property” of strong NPs (i.e. definite NPs and QPs). This is more or less the same view as advocated by Russell, who regarded definite descriptions as quantified conjuncts asserting existence. To save an analysis like this, Vangsnes (along with Russell) has to assume that for a vacuous subject to carry a presupposition (or assertion) of existence, it has to denote ‘*kinds of entities*’: “*the present king of France* denotes the kind, every instance of which, is a present king of France” (Pafel 2005:37). To put it differently: a definite NP that has no existing referent still carries a presupposition of existence, since it denotes a *kind* rather than an *individual*. But as Pafel acknowledges, “[t]his way of interpreting the definite should come as a last resort, not as an early option” (Pafel 2005:37).

The analyses of Russell, Vangsnes and Pafel thus assume a direct correlation between referentiality and existence. In my proposal, I would like to separate the presupposition of existence from the definite NP, hence only allowing *reference* to be a property of strong NPs.

Let me now present a rough sketch of how, in my view, the notions discussed above may be related:

Figure 1: The relation between topic, reference
and presupposition of existence



The figure should be interpreted in the following way. The semantic level is a visualisation of Aristotle's claim, i.e. that every proposition must be of topic-comment form. The topic *selects* an appropriate NP to be predicated about – in this case *Sven* who happens to be the syntactic subject as well¹⁰. Since the establishing of a topic-comment relation is required at the semantic level, a linguistic expression and a predicate set must be connected at the linguistic level: the topic NP must *be related* to a given set (the *predicate*). Relation (2) thus illustrates the *predication*.

Specific NPs, such as proper names and definite descriptions, prototypically denote referents in the discourse universe (real or fictitious). We call this relation *reference*. This discourse entity is related to some process/state, denoted by the predicate. This is relation (3), i.e. the (non-linguistic) *event*.

So we have now separated the *topic selection* from the *reference* (i.e. the entity in the world). But what about the *presupposition of existence*? We may say that we presuppose the existence of the selected topic referent, because we assert something of it – in other words, because a relation exists between the topic NP and the predicate. This was also Frege's standpoint: "If anything is asserted there is always an obvious presupposition that the simple or compound proper names used have a *Bedeutung*. If therefore one asserts 'Kepler died in misery', there is a presupposition that the name 'Kepler' designates something" (Frege 1892:162). This may suggest that the presupposition of existence is *not* a

¹⁰ I do not follow Russell's division of proper names and definite descriptions. Rather, I take it that both categories display the same pattern with regards to the model proposed here.

‘referential property’ of definite NPs – rather, it is a consequence of the assertion of the *relation* between the topic NP and the predicate¹¹.

Crucially, in my proposal only the first two relations are necessary for language: relation 3 (reality) illustrates the (non-linguistic) event in the discourse universe. But for a sentence to become a statement (in the Strawsonian sense), the third level is relevant. The truth of any statement can be evaluated at the semantic level by comparing the linguistic relation (2) with the event relation in (3): in the case of figure 1 above the statement is true: Sven does belong to the process of buying a car. If one of the relations does not hold (e.g. if there was no relation between the entity and the process/state), the statement would come out false.

Truth-evaluation is dependent on the reference of the NP in relation (2): if the reference of the definite NP is vacuous (i.e. if it does not denote), there can be no relation between that non-existing entity and a process/state, either (in other words there can be no event). Consequently, we have nothing to compare the relation in 2 against. At the semantic level, then, a truth-value fails to arise. The presupposition of existence thus arises in order to make a truth-evaluation possible. It is only when our world knowledge strongly contradicts this presupposition we get “squeamish” about assigning truth-values – which explains our unwillingness to evaluate a statement like *The king of France is bald*¹².

Let us now see how negation may be incorporated into this model.

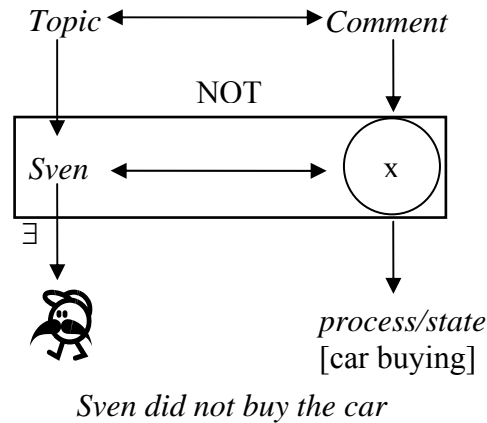
4.1.2 Negation

Returning to Aristotle, his original claim also stated that the relation between the subject and the topic may be either *affirmed* or *denied*. In the model proposed here, we can illustrate this thus: to deny a predication, negation has to take scope over the subject-predicate relation at the linguistic level. We would roughly get a figure like the following:

¹¹ Furthermore, Strawson (1964) made the observation that “it is not definite descriptions per se which induce existential presuppositions, but only those singular expressions which a sentence is understood as being about” (Horn 1989:488). This fact may be incorporated in my model – it is the NP selected by the topic we take to exist, whether that may be the syntactic subject, object or whatever.

¹² If I say, for example, *My best friend Sven is bald*, a hearer would prototypically presuppose that my friend exists, even though he did not previously know that I had a friend called *Sven*. Because of the presupposition, it would be natural to assume that my statement is true – even though the statement actually is close to impossible to evaluate truth-conditionally, since a true evaluation would require the hearer to actually check the names of all my friends (and even to check whether I have any friends to begin with).

Figure 2: Sentential negation



The illustration above illustrates, in Aristotle's terms, *predicate denial*. It can be paraphrased *it is not the case that Sven bought the car*. Comparing the denied predication with the event, we see that the statement is true (i.e. no relation exists between the referent of *Sven* and the process/state denoted by the predicate). Importantly, the denied predication is still semantically a proposition; *Sven* is still the topic.

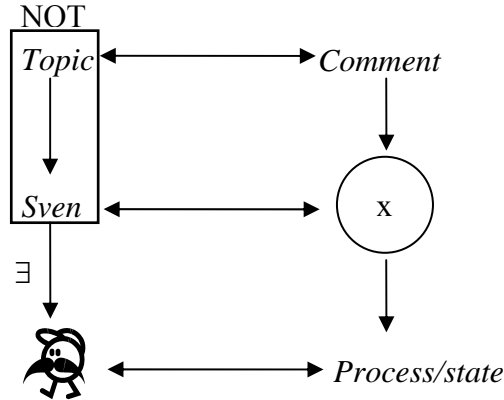
Following Horn (1989:504), I take it that negation takes scope over the predication relation as a whole, over both the subject and the predicate¹³. Note that the reference is left intact, along with the presupposition of existence; the topic NP still *refers* to a referent, and a relation between the topic NP and the predicate is still *asserted*. To put it differently, sentential negation denies that the *asserted relation* between the topic NP and the predicate holds.

Let us now (at last) turn to the ungrammatical sentence (3) above, i.e. **Inte Sven köpte bilen*. We concluded in section 3 that the negation, according to Klima's test, must be analysed as having narrow scope. In other words, it only takes scope over the topic NP. In the model proposed above, negation may be

¹³ Swedish provides rather strong evidence in favour of Horn's claim. It is a well-known fact that negation induces non-specific readings for indefinites within its scope. In Swedish, non-specific indefinites take the indefinite article *någon* (or *en*). Specific indefinites may never take *någon*, it invariably takes *en*. Now compare the following sentences: (i) *En bil står på gatan* (ii) *Någon bil står inte på gatan*. Example (i) is decidedly odd with negation (*??En bil står inte på gatan*), while the affirmative counterpart of (ii) is even worse (*??Någon bil står på gatan*). This seemingly strange asymmetry can easily be explained if we assume that negation does in fact take scope over the subject-predicate relation as a whole: the specific reading of the indefinite in (i) cannot be maintained in the negated counterpart – it has to be interpreted non-specifically.

said to cancel the *topic selection*. This leads to a crash at the semantic level, since the proposition is denied of its topic. We may illustrate this:

Figure 3: Negation of specific NPs



**Not Sven bought the car*

As is illustrated by figure 3, negating the proper name *Sven* equals denying that the topic of the sentence is *Sven*¹⁴. If we do not introduce another topic, the proposition (at the semantic level) is no longer congruent – we have nothing to predicate about, so to speak. This readily explains why the contrastive reading in (25) is grammatical (see next section). After rejecting, or cancelling the topic selection, a new selection is immediately introduced, which saves the proposition from crashing at the semantic level. According to my proposal, then, the “ungrammaticality” of (3-4) above is rather “unsemanticity”: cancelling the topic selection (by means of narrow negation) cannot be semantically allowed¹⁵.

4.1.3. Contrast

Before moving on to quantified and generic subjects, let us shortly discuss a related side issue, namely the notion of contrast. We saw that the ungrammatical sentences (3/22) and (4/23) above suddenly became grammatical in contrastive contexts. Intriguingly, Swedish displays some sort of acceptability scale with regards to contrastiveness. Consider:

¹⁴ Note that cancelling the assignment does not lead to denial of reference; the entity denoted by the NP (in this case *Sven*) is constant.

¹⁵ We would expect languages to be able to have wide scope negation preceding the topic, but this is impossible in the first position in Swedish, due to the V2-criterion.

- (28) *Inte BILEN står på gatan.
 not car-the is on street-the
- (29) ?Inte bilen står på gatan, utan CYKELN.
 not car-the is on street-the but bike-the
- (30) Inte bilen, utan CYKELN, står på gatan.
 not car-the but bike-the is on street-the
- (31) Det är inte bilen, utan CYKELN, som står på gatan
 That is not car-the but bike-the, that is on street-the
- (32) Det är inte bilen som står på gatan, utan CYKELN
 That is not car-the that is on street-the but bike-the,
- (33) Det är inte bilen som står på gatan
 That is not car-the that is on street-the

While (28) is downright ungrammatical, (29) is acceptable and (30) is perfect. In Swedish, contrastive readings tend to be conveyed in cleft sentences, as in (31), (32) and (33). Interestingly, the rejected subject only optionally needs to be replaced in cleft sentences, as is evident from these examples.

How can this seemingly strange finding be explained? I concluded in the previous section that a new topic selection must be introduced in order to save the semantic proposition from incongruence – cleft sentences seem to be a strong argument against my proposal. However, this is not necessarily so.

First of all, it is important to point out that *contrast is the exclusion of possible alternatives* – and in this sense contrast is also set-creating:

The basic idea behind the notion of *kontrast* [*sic*] is the following: if an expression **a** is kontrastive, a **membership set** $M = \{..., a, ...\}$ is generated and becomes available to semantic computation as some sort of quantificational domain.

(Vallduví & Vilkuña 1998:83)

Moving on from theory to language data, we may illustrate this generated membership set in contrastive sentences. Consider the examples below:

- (34) Sven didn't buy the car
 (35) SVEN didn't buy the car
 (36) It wasn't Sven who bought the car

In (34), no contrastive reading arises, i.e. no (membership) set of possible car buyers is created. The sentence simply states that *it is not the case that Sven bought the car*. In (35) and (36) on the other hand, we immediately get contrastive readings – *for Sven (at least), it is the case that he did not buy the car*. A standard assumption, upon hearing utterances like (35) and (36), is that someone else bought the car – the listener creates a set of possible car buyers. In (35), this

creative assumption is due to a Gricean *conversational implicature* – we may easily cancel this reading:

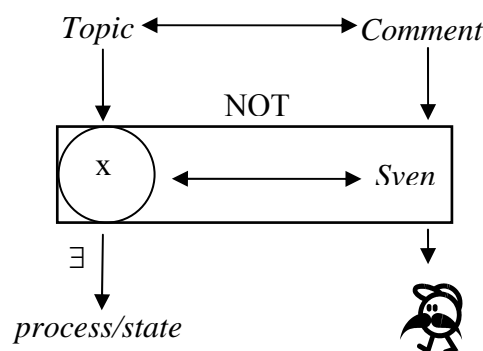
(37) SVEN didn't buy the car – and in fact no-one did

This is where (35) and (36) differ: in the cleft sentence (36), the assumption that someone else bought a car is presupposed, not merely implicated. Consequently, the presupposition of (36) cannot easily be cancelled:

(38) It wasn't Sven who bought the car – ?? and in fact no-one did

This difference is important, since it proves that cleft sentences in fact have a different informational structure than ordinary declaratives. Even if Sven (in this case) did not buy a car, it must still be true that the car was bought by someone else. And this is so, since it is the *car buying* that is the topic of the cleft-sentence, not *Sven*, who is focus. This also explains the presupposition of possible car-buyers – we assume that such an event has taken place since the car buying is the topic, the backdrop as it were, to the comment. So in Aristotelian terms, we still have a proposition – even though the topic happens to be the syntactic subordinate clause. We may illustrate this:

Figure 4: Cleft-sentences



It wasn't Sven who bought the car

In the cleft sentences (31), (32) and (33) the syntactic relation between the grammatical subject and the predicate is not equivalent with the *topic-comment* structure. The negated subject is in fact the *focus* of the sentence, not its topic. So negating the subject does not equal cancelling the topic. Hence, no conflict

arises at the semantic level; we may still assume a *topic-comment* structure. In the contrastive declarative sentences (29-33), the grammatical subject is also focus in some sense, but at the same time topic¹⁶. If the topic assignment is cancelled, as in (29) and (30), we must introduce a new topic to predicate about – and this is preferably done as soon as possible, as in (30). Otherwise, a topic-comment relation cannot be established at the semantic level – and this leads to a crash.

4.1.4 Summary

In this section, I have proposed a “unifying model”, where Aristotle’s claim that every proposition is of subject-predicate form has functioned as the main pillar. In my proposal, I have separated the notions of *topic selection*, *reference* and *presupposition of existence*. When a topic-comment relation is asserted, a presupposition of existence arises, in order to make a truth-evaluation possible at the semantic level. Sentential negation denies that the asserted relation between the topic NP and the predicate holds, while narrow negation cancels the topic selection. The latter leads to a semantic crash, unless a new selection is introduced. Reference and presupposition of existence are not directly affected by negation. In cleft-sentences, negation may precede a definite subject NP in Swedish, but this is because the subject is the focus, not the topic, of the sentence.

4.2 Negated universal quantifiers

Let us now turn our attention to quantified subjects, and see how they may be fitted into the current model. In the first sub-section, I will relate universal quantifiers to the notions of topic selection, reference and presupposed existence. In subsection 4.2.2, I discuss the scope asymmetries found in section 2.2, i.e. the observation that negation seems to outscope universal quantifiers regardless of word order.

4.2.1. Universal quantifiers

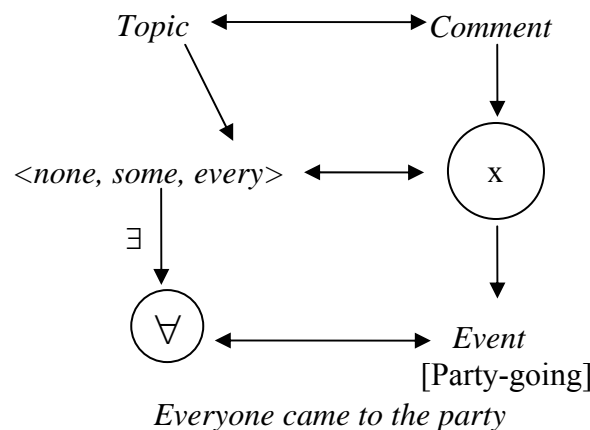
In the previous section we assumed that specific NPs refer to entities in the discourse universe we take to exist. Quantified NPs differ with regards to this ref-

¹⁶ Admittedly, I have yet to divide how a contrastive sentence like (35) should be analysed and incorporated into the model.

erence. Intuitively, we may feel that QPs do not refer in the simple way as definite NPs do¹⁷ – but how should we explain this intuition?

A standard explanation may be to say that whereas definite NPs refer to individuals, quantified NPs refer to sets. Sets are usually dividable, i.e. we may refer to a subset of the larger set. But I think it is important to realise that in some sense, the reference of any QP is always to a complete set. Let me illustrate this. If I say *all of my friends*, the quantifier obviously refers to that complete set – and if I say *many of my friends*, the quantifier refers to some part of that same set. But crucially I still make some assertion of that set as a whole, even when excluding some part of it. Differently put, when I say *many of my friends* I still refer to *all my friends*, even though I exclude the complete set from being the topic of my utterance. This means that we have a number of linguistic expressions to choose from when we want to refer to a set: all of them refer to the same specific set, but they include/exclude some part of that set from the linguistic predication. In our terminology, we have a number of different *topic selections* to choose from when referring to a set. This can be illustrated in figure 5:

Figure 5: Quantifiers



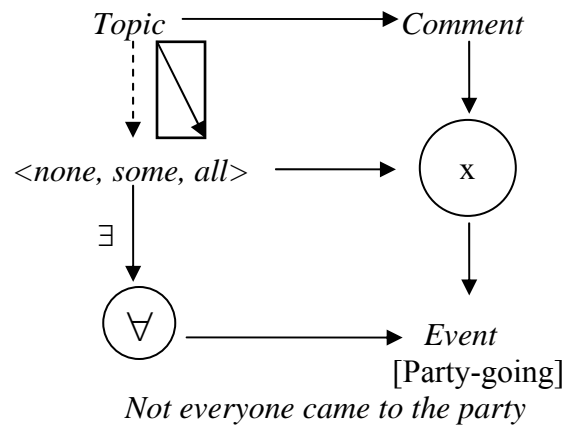
The crucial difference between definite descriptions and quantifiers, then, is the *topic selection*; we have a scale of QPs to choose from when referring to a set. And the choice only slightly affects the reference: it may be more or less inclusive, but the whole set is in some way referred to. The choice primarily affects the topic – that part of the set we predicate something of. Again, we also see the

¹⁷ According to some analyses, quantified NPs do not refer at all. See for example Buring 2005 (chapter 4) for details.

importance of distinguishing between reference and presupposition of existence. Regardless of the quantifier choice at the linguistic level, we still presuppose the existence of a complete set.

In exactly the same fashion as for definite NPs, negation may deny the relation between the topic NP and the predicate at the linguistic level: *it is not the case that everyone came to the party*. But intriguingly, negation may also cancel the topic selection, without loss of semantic congruence. If we negate a QP, by saying for example *not everyone*, what we do is cancel the *selection* to that particular referential alternative. In order to save the topic-comment structure, the selection immediately “searches for” a new topic alternative, which may be the next entry on the scale:

Figure 6: Negation of quantifiers



Cancelling the topic selection does not lead to topic denial – only to topic modification. Prototypically, we assume the new topic to be the next alternative on the scale: the standard implicature of *not everyone* is *some*, for example. But it is important to stress that it is only an implicature; it may easily be cancelled: *not everyone came – in fact no-one did*. Saying *not everybody* does not equal saying *some* – and we see this from the difference in truth-value assignment¹⁸:

- (39) Everyone came to the party vs. Not everyone came to the party (LC and LEM)
- (40) Everyone came to the party vs. Some came to the party (not LC, not LEM)

¹⁸ See also Paradis & Willners (2006) for Swedish data supporting this claim.

The pair in (39) is contradictory and cannot be false at the same time: if no-one came to the party, it is also true that not everyone came. But the sentences in (40) is both affirmative, so consequently they do not obey neither LC nor LEM.

This helps us understand a classic logical problem – summarized neatly by Sapir (1930:21, taken from Horn 1989:221):

‘*Not everybody came*’ does not mean ‘*some came*’, which is implied, but ‘*some did not come*’. Logically, the negated totalizer [*not every*] should include the totalized negative, i.e., opposite or contrary [*none*], as a possibility, but ordinarily this interpretation is excluded and the totalized negative (contrary) is expressed by negating the corresponding unitizer or non-specifying selective [*not {one/any/a}...*].

In our model, this logical problem (i.e. why *not everyone* is taken to mean *not some* instead of *some*) may be explained quite naturally. Since negation only modifies the topic selection (making it less inclusive), it does not deny the reference. Hence the negated QP (*not everyone*) still refers to that set as a whole. As a consequence, a negated QP in some way states that *of the totalized set, there are some members for which this predication does not hold*. This is the true meaning of a negated quantifier; that the relation may also hold for some other members is in fact only implied.

4.2.2 Scope Asymmetries

Let us now go back to the scope phenomena observed with negation and universal quantifiers. We saw that regardless of word order, negation seemed to take scope over the universal QP. With regards to the proposal sketched above, I suggest that the similarity is nothing but an illusion – there is fundamental scopal difference depending on word order. Wide negation takes scope over the subject-predicate relation – pragmatically we do however regard the topic as being outside the scope of negation (see Horn 1989:502-518). Narrow negation takes scope over the topic selection, i.e. over one of the referring alternatives. But while the former is a *predicate denial*, the latter is a *predicate affirmation* (since negation does not take scope over the predicate relation). In the case of a universal quantifier, both narrow and wide negation happen to have more or less identical interpretations: “predicating something (e.g., *flying*) of not every man amounts to denying it of every man. In the same way, the proposition that no man flies is not identical with, but logically equivalent to, the proposition that it is not the case that some man flies” (Horn 1989:509).

But we still have a rather problematic issue to address, as has become apparent. If sentences with negated quantifiers are affirmed predications, how come they trigger Klima's test for sentential negation? And vice-versa: if negation is sentential, how come syntax does not rule it out because of the strict V2-rule of Swedish?

An attempt at a syntactic explanation may be formulated along the following lines. Klima's tests are designed for syntactic scope only – and in terms of c-command, the negated subject does take wide scope. The negation, regarded in the syntactic literature as a unique head that projects its own phrasal category (Zanuttini 1991), is normally assumed to be generated outside the V(erb)P(hrase) (the verb and its complements, including the subject N(oun)P). In Swedish, the subject is assumed to move up to (at least) Spec-TP, crossing NegP (and possibly cliticizing) on its way. In terms of c-command, then, the negated subject obviously constitutes wide scope: it c-commands every constituent below it. This may explain the outcome of Klima's test.

4.2.3 Summary

In this section, I have suggested that universal quantifiers differ from definite NPs with regards to topic selection. Definite NPs denote individuals, while quantified NPs denote sets. But whereas only one selection is possible for definite NPs, there are several selections (alternatives) available for QPs. This is so, since any QP refers to a set as a whole: saying something of *no member* is also saying something about *all members*. Thus, negating a QP leads only to modification of the topic selection. In our proposal, the seemingly strange phenomenon that negation always outscopes the universal QP is explained away: it does not. For universal quantifiers, it just happens to be a logical fact that predicating something of not every man amounts to denying it of every man.

4.3. Negated Scalar Quantifiers

In section 2.2, we observed the need to distinguish between universal and scalar quantifiers, since they displayed different scopal behaviours. Let us once again look at the issues at hand:

- (41) Många pilar träffade inte tavlan
 Many arrows hit not target-the
- (42) Inte många pilar träffade tavlan
 Not many arrows hit target-the

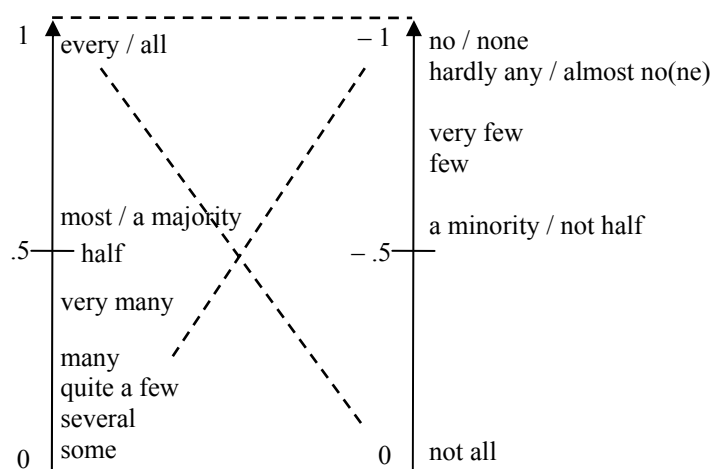
Examples (41) and (42) clearly have different interpretations. Whereas the quantifier in (41) takes scope over the negation (QP-NEG), the reverse holds for (42): the negation takes scope over the quantifier (NEG-QP).

Jackendoff (1972:327) elaborates on the differences between (41) and (42), and notes that only the interpretation in (42) holds in the passive:

(43) The target wasn't hit by many arrows

The reading of (42) is also compatible with the standard sentential reading of the negation *it is not the case that many arrows hit the target (i.e. few arrows hit the target)*. This leads Jackendoff to regard (42) as an instance of S(entence)-negation (1972:327), while (41) displays VP-negation. But this analysis is somewhat confused. In (42), the negated QP is the topic of the (affirmed) proposition. But in the passivized sentence (43) the definite NP *the target* is the topic – the quantified NP is within the comment. And obviously we are dealing with a standard sentential negation in (43): *it is not the case that the target was hit by many arrows*. Sentence (43) may thus be illustrated as in figure 4 above, the cleft-sentence illustration. So, on the basis of Jackendoff's passivization test, we have come no further in understanding the difference between (41) and (42). Let us instead turn to our proposal.

The seemingly strange interpretative difference has nothing to do with scope: negation may take scope over the predicate relation, as in (41), or negation may take scope over the topic selection, as in (42). The difference in interpretation has to do with the semantic nature of the quantifiers. The following table, taken from Horn (1989:237), may shed some light on these differences:



Quantifiers below the middle (i.e. *many*, *quite a few*, *some*) on the positive side, and those above the middle (i.e. *hardly any*, *few*) on the negative side are *tolerant*. An operator P is tolerant if the conjunction $[P(p) \ \& \ P(\neg)]$ is logically consistent – just as we saw from (41) above (many arrows may have missed and hit the target simultaneously). Quantifiers above the middle on the positive side are *intolerant* – the conjunction $[P(p) \ \& \ P(\neg)]$ is logically inconsistent. This fact we already observed from the universal QPs. If we relate this to our current proposal, we have an explanation for the different interpretations of the sentences (41) and (42) above.

Remember that quantifiers always predicate something of a set as a whole. A denied predication like (41) above does not exclude the possibility of many arrows hitting the target simultaneously. The predicate negation does not affect the topic selection or the reference, and a quantifier like *many* is imprecise and tolerant: how many of the totalized set is many? Example (42) on the other hand (i.e. *not many*), can never have the interpretation of (41), since narrow negation explicitly cancels the topic assignment of *many* in favour of some other topic alternative on the scale (for example *few*).

Horn's table also allows us to understand why a sentence like (41), i.e. *Many arrows didn't hit the target*, does not seem obey the Law of Contradiction. It does – but the contradiction is not the affirmative counterpart, but the negative QP opposite *few*: *Few arrows didn't hit the target*:

(44) Många pilar träffade *inte* tavlan

(45) Få pilar träffade *inte* tavlan

The sentences above cannot be true at the same time – so they obviously obey the Law of Contradiction. But they are not contraries – i.e. they do not obey the Law of the Excluded Middle. It is possible for (44) and (45) to be false simultaneously, in case no arrows (or *all* for that matter) hit the target. This is again where (45) differs from (42). Even though the negated QP (*not many*) implicates *few*, it does not mean *few*. We see this from the different truth-values: if no arrows hit the target, it is also true that *not many* arrows hit the target. But it is definitely not true that *few* arrows hit the target.

Summarizing, I have suggested that universal and scalar QPs share a similar topic selection. Thus, the observed scopal differences between universal and scalar QPs can be reduced to a difference with regards to the tolerance of the quantifier. In the case of universal QPs, denying something of everyone equals predicating something of not everyone. But for scalar QPs, denying something of many does not equal predicating something of not many. But crucially, the

processes involved are exactly similar: sentential negation denies the asserted relation between the topic NP and the predicate, while narrow negation modifies the topic assignment.

4.4 Generic NPs

Having analyzed singular specific NPs, universal QPs and scalar QPs in their interaction with negation, let us now turn to the last category: generic NPs. Generic NPs take an intermediate position: they cannot be negated in the first position in Swedish (like specific NPs), but they display a close interpretative resemblance to universal QPs. Let us see how generic NPs can be related to the notions of topic selection, reference and presupposed existence. As always, we start by revisiting the data:

- (46) Tigrar är randiga (\approx Alla tigrar är randiga)
Tigers are striped all tigers are striped
- (47) *Inte tigrar är randiga (cf. Inte alla tigrar är randiga)
Not tigers are striped not all tigers are striped
- (48) Inte några tigrar är randiga
Not any tigers are striped
- (49) Inga tigrar är randiga
No tigers are striped

Example (46) is more or less identical with the quantified equivalent in brackets. But only the quantified subject can be grammatically negated in the first position – (47) is just as ungrammatical as the singular specific subjects in section 4.1 above. So, by “adding” a quantifier to the indefinite NP in (48) we are able to get a (semantically) narrow scope reading of the negation. But why can negation not take narrow scope over generic indefinites?

I would like to suggest that generic NPs differ from quantified NPs with regards to reference and topic selection. In my view, QPs are sets made up of its individual parts (a set of individuals), while generic NPs are sets made up from *a closed, undividable set of properties*. From a simple test, we may show that generic NPs refer to undividable sets, while quantified NPs refer to dividable sets:

- (50) All tigers are striped, except two.
- (51) ??Tigers are striped, except two.

Tigers (as a generic, closed set) either have the property of being striped, or they have not. What we predicate of a generic subject must hold as a common property of that set as a whole. True, there may be exceptions (for example, albino

tigers lacking stripes). But the exceptions do not belong to that closed set, as it were, but to a completely different set (for example, a generic set of albino properties).

If we return to the *topic selection*, keeping in mind the differences between QPs and generics, we have a straightforward explanation of the asymmetries in (46-49). A generic NP refers to a closed set of properties, not to a set made up from individuals. Thus, no scale of alternatives is available for the topic selection to choose from (just as in the case of specific NPs). This is so, since if we cannot divide the referent into smaller units, the topic selection cannot induce alternatives. Thus if we cancel the topic selection by means of negation, we immediately deny the proposition of its topic. Consequently, a new topic must be explicitly introduced. This is why contrastive sentences are grammatical with generic NPs, just as with specific singular NPs (example (34) above is repeated here):

- (52) Inte lejon, utan TIGRAR, är randiga
 Not lions but tigers are striped

Quantifiers induce alternative topic selections, since the referent set is dividable. So cancelling one topic alternative implicates another on the same scale – we do explicitly need to introduce a new topic. Generic NPs refer to undividable sets, which is why no topic alternatives are induced.

5. Summary

In this paper, I have proposed a still preliminary account for how the notions of reference, presupposition of existence and negation are related. Based on the asymmetries of four Swedish sentences, I have put forward a model trying to unite the opposing views put forward by Aristotle, Frege, Russell and Strawson.

Aristotle's claim that every proposition must be of subject-predicate form has been the fundamental idea behind my model. I have taken this claim to mean that every proposition must predicate something of something, i.e. be of topic-comment form. The topic *selects* a linguistic expression, which is related to a predicate. This asserted relation I have taken to be the predication. I have argued against the view that presupposition of existence is a "referential property" of definite NPs; instead I argue (following Frege) that the presupposition of existence arises because the predication is asserted.

In my model, I have made a division between language and reality, to capture Strawson's observation that only statements (i.e. the use of sentences) may

be true or false. In order to evaluate the truth of a statement, the linguistic relation (the predication) must be compared to the (non-linguistic) event relation. If a topic NP has vacuous reference, there is no event to compare the linguistic relation to, hence we feel ‘squeamish’ about assigning truth-values to such statements.

Sentential negation takes scope over the subject-predicate relation as a whole, denying that the asserted relation holds. Narrow negation takes scope over the topic selection. In my view, quantifiers always *refer* to complete sets, but we may choose a subset of the larger set to predicate about. Quantifiers thus induce topic alternatives, and negating the topic selection implies that the next item on the scale is the topic. This is why grammar allows *not every/many arrows hit the target*. For singular and generic NPs, cancelling the topic selection leads to a crash at the semantic level, unless a new topic is explicitly introduced. This is so, since we cannot assume a scale of alternative topics – hence, the proposition is denied of its topic. This is why grammar does not allow **Not Sven bought the car*.

I would like to emphasize that the proposed model should be regarded as work in progress. It may be too simplistic, and even though I think it explains some scopal phenomena in English and Swedish quite accurately, it has yet to stand the test of the rest of the world’s languages. Also, I have deliberately chosen not to discuss indefinite NPs, and have yet to fit them into this model. A research question in need of investigation is the exact nature of the first position in Swedish. Is it a “free position” for any clause constituent, or is it a quite restricted topic position? The answer to this question may have serious implementations for the issues discussed in this paper.

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