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On Merge and Move/Attract

1   Introduction

In this article, we will discuss the question whether the operation Merge is inherently more economical than the operation Move/Attract and therefore blocks the application of the latter operation, as has been claimed by Chomsky ever since his first formulation of the minimalist program for linguistic theory. A positive answer to this question implies that the derivation takes a numeration (or a lexical array) as its point of departure — if Merge is always preferred to Move/Attract, and the computational system has free access to the lexicon, movement would never apply, because any feature could be checked by merging it with some element taken from the lexicon directly. However, if Merge does not automatically block Move/Attract, it may be the case that the notion of a numeration is superfluous in several respects and can therefore be eliminated. Of course, we do need some criterion in order to decide which derivations are in competition, but it might be the case that this is simply a matter of semantics, as suggested by Grimshaw (1997), who claims that only semantically equivalent structures are part of the reference set (= candidate set in OT terminology).

In this article, we will argue that the answer to the question whether Merge is inherently more economical than Move/Attract is negative, and we will show that the notion of a numeration is indeed superfluous and actually gives rise to empirically wrong results, which is an important conclusion since this notion has become increasingly important in Chomsky's (1998/9) recent work on the minimalist program. We will start in Section 2 with a critical assessment of the arguments that have been given in favor of this assumption that Merge is "costless". In Section 3, we will discuss negative sentences in Dutch and English,

and argue that we can only derive the data by assuming (i) that both Merge and Move/Attract are costly operations and (ii) that the computation is not based on a numeration but has freely access to the lexicon.

The general theoretical framework of this paper is the Derivation-and-Evaluation (D&E) model, based on some ideas by Pesetsky (1997/8) and further developed by Broekhuis and Dekkers (2000). The D&E model is a hybrid model that incorporates aspects both from Chomsky's minimalist program and from the OT framework. Although not all aspects of the model will be relevant to our argument, we present it here in full as (1), for completeness' sake. In several ways, the model is similar to what is proposed in Chomsky's minimalist program. The main difference is, however, that the SPELL-OUT point is determined by an optimality theoretical evaluation (Broekhuis, to appear). Further, it is the goal of this article to show that the computational system takes its building blocks directly from the lexicon, without mediation of a numeration.[1]

(1)   **The Derivation-and-Evaluation model** (Broekhuis and Dekkers 2000)
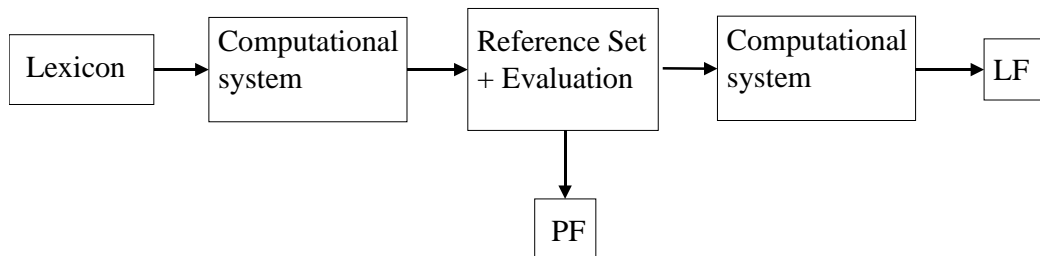
2   The motivation for Merge as a "costless" operation

The conceptual motivation for assuming that Merge is a "costless" operation has to do with assumptions about the nature of LF. Chomsky assumes that the conceptual-intentional system must assign an interpretation to the LF-representation, and that this is only possible if the LF-representation is a single syntactic object. Given the assumption that the elements in the numeration are syntactic objects, this condition is not met when the numeration is not empty. Given the fact that the numeration must be empty at LF, Merge must apply anyway in order to arrive at a converging derivation, so that the null hypothesis is that Merge applies "for free". Of course, this argument is theory-internal in the sense that it is only valid when we postulate a numeration. When there is no such entity, the argument no longer will stand. The derivation then just takes those elements from the lexicon that are needed at a certain point in the derivation, and since the lexicon is not a linguistic object in the relevant sense, the conceptual-intentional system just interprets the structure delivered to it.

In order to evaluate the hypothesis that Merge is "costless", we must therefore investigate the empirical evidence that has been put forth to support it. Actually, this evidence

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[1] In Dekkers (1999), it is argued that the computational system is not active after the OT-evaluation of the reference set, that is, in his view the D&E model is a standard OT-system that takes Chomsky's computational system as its generator. This implies that Full Interpretation is no longer a condition on LF and PF. Here we will adopt the model in (1), and assume that there are additional (OT-)evaluations in the PF- and LF-component of the grammar. See Broekhuis (to appear) for some reasons for doing this.

is rather meager, and only involves the expletive construction in Subject Raising constructions. The crucial type of data are given in (2).

(2)   a.   There is likely [$_{IP}$ t_i to be someone here]
        a′.   *There is likely [$_{IP}$ someone$_i$ to be t_i here]
        b.   Someone$_i$ is likely [$_{IP}$ t_i to be t_i here]

Examples (2a) and (2a′) differ in that in the first case the expletive *there* is merged in the subject position of the infinitival clause in order to satisfy the EPP-feature of the embedded I, and subsequently moved into the subject position of the matrix clause in order to check the EPP-feature of the matrix I. In (2a′), on the other hand, the subject *someone* is first moved to the subject position in order to check the EPP-feature of the embedded I, and subsequently the expletive is merged in the subject position of the matrix clause in order to check the EPP-feature of the matrix I. Movement of *someone* to the subject position is, however, obligatory when no expletive is present, as is shown in (2b). This can, of course, not be observed directly from the phonetic output of (2b), but is plausible given the fact that this movement must also apply in ECM-constructions, as is illustrated in (3b&b′).

(3)   a.   Jan wants there to be someone here at 6:00
        b.   John wants someone to be t_i here at 6:00
        b′.   *John wants *e* to be someone here at 6:00

Chomsky's account of the data in (2a&a′) is very simple. At the point in the derivation that the subject position of the embedded clause must be filled, there are two options: either Merge applies, placing the expletive in SpecIP, or I attracts the NP *someone*, with the result that this NP is moved into SpecIP. Given that the choice between these two options is made locally, the putative fact that Merge is "costless" - whereas Move/Attract is not - is assumed to force Merge to apply. In (2b), the Merge option is not available, since the numeration does not contain an expletive, and movement of the NP *someone* is the only option to check the strong EPP-feature.

    Of course, these data can only be used as conclusive evidence for the hypothesis that Merge is "costless", when no alternative analysis is available. There is, however, an alternative that fares equally well with these data and can be extended to cases on which Chomsky's hypothesis has nothing to say. In some analyses, the expletive *there* is considered a Small Clause predicate which is moved into SpecIP by means of (obligatory) Predicative Inversion (Moro 1997, Hoekstra and Mulder 1990, Den Dikken and Naess 1993, among others). In an analysis of this type, the same data can be handled. In (2a), the expletive is moved into the subject position of the embedded clause, so that at least the EPP-feature of the embedded I is checked (and possibly also some of the other features of I and of the NP *someone*, if the proposal of Hoekstra and Mulder 1990 is correct). After Predicate Inversion, only *there* can be moved into the subject position of the matrix clause, because moving the subject *someone* would violate the locality conditions on Move/Attract. The derivation of (2a) is therefore as given in (4a).[2] Example (2a′) cannot be derived, since after the subject *someone* has moved into the subject of the embedded clause, movement of *there* into the

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[2] Note that the locative predicate *here* is assumed to be an adjunct in the expletive construction, and not the actual predicate of the Small Clause.

subject position of the matrix clause would violate the locality conditions on Move/Attract. The derivation in (4a′) is therefore illicit. The analysis of (2b) remains essentially the same, and is given as (4b).

(4)   a.   There$_i$ is likely [$_{IP}$ t_i to be [$_{SC}$ someone t_i] here]
        a′. *There$_i$ is likely [$_{IP}$ someone$_j$ to be [$_{SC}$ t_j t_i] here]
        b.   Someone$_i$ is likely [$_{IP}$ t_i to be [$_{SC}$ t_i here]]

Independent evidence in favor of this Predicate Inversion analysis of the expletive construction can be found in (5). In (5a), the locative predicate *down the hill* has been moved into the subject position of the matrix clause via the subject position of the embedded clause, and the result is fine, which indicates that the locational predicate is able to satisfy the EPP-feature, just like *there*. In (5a′), on the other hand, movement of the predicate into the subject position is blocked by the locality conditions on Move/Attract. The derivation in (5b), of course, satisfies all the conditions on movement and is therefore licit. In other words, the analysis of the examples in (5) is essentially identical to the analysis of the expletive constructions in (4).

(5)   a.   Down the hill$_i$ seems [$_{IP}$ t_i to roll [$_{SC}$ a baby carriage t_i]]
        a′. *Down the hill$_i$ seems [$_{IP}$ a baby carriage$_j$ to roll [$_{SC}$ t_j t_i]]
        b.   A baby carriage$_i$ seems [$_{IP}$ t_i to roll [$_{SC}$ t_i down the hill]]

Given the fact that the Predicate Inversion analysis of the expletive construction can account for more data than Chomsky's hypothesis that Merge is "costless", we must conclude that the former is superior to the latter. This means that there is no empirical reason to adopt Chomsky's hypothesis. Hence, there is no reason to not assume that the derivation has immediate access to the lexicon and, consequently, the notion of a numeration can be dispensed with.[3] Although this should in principle be sufficient to eliminate this notion from the theory, we will show in the next section that there are even more compelling reasons to do so.

3   Against the notion of a numeration: on negation

3.1   Introduction

In the remainder of this article, we will be concerned with negative NPs, like Dutch *niets/niemand* and English *nothing/nobody*, and negative polarity items of the type *ook maar iets/iemand* and *anything/anybody*. Both negative NPs and negative polarity items can play a role in expressing sentence negation. This can be illustrated by means of the following examples from Dutch and English.

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[3] We do not believe it useful to discuss the metaphors Chomsky uses as a rhetorical means to render the idea implausible that the computational system has immediate access to the lexicon. All we have to say here is that a car with (yet to be invented) highly efficient solar cells is certainly better designed than a car with a gasoline tank.

(6)   a.   Jan is over niemand   tevreden.
               Jan is about nobody   satisfied
        b.   *Jan is niet over ook maar iemand   tevreden.
               Jan is not about anybody   satisfied

(7)   a.   *John is satisfied with nobody.
        b.   John is not satisfied with anybody.

In Dutch simple clauses of this type, sentence negation is expressed by means of the negative NP *niemand*; the negative polarity item *ook maar iemand* cannot be preceded by the negative adverb *niet*. In English, on the other hand, sentence negation here must be expressed by means of the negative adverb *not* followed by the negative polarity item *anybody*; use of the negative NP *nobody* gives rise to a reading with constituent negation (which does not lead to a very felicitous result in example (7b)).[4]

In this section, we will investigate how we can account for the distribution of these negative constituents and negative polarity items, and we will try to provide an answer to the question how we can account for the differences in distribution in Dutch and English. Our conclusion will be that this is only possible when we abolish the notion of a numeration, and assume that both Merge and Move/Attract are costly operations. Our analysis presupposes the D&E model in (1): Chomsky's computational system functions as the generator of an optimality system whose output is evaluated in an optimality theoretical manner.

Before we will discuss our analysis in detail, we first want to briefly characterize the line of research on negation we are pursuing here. Here, we simply adopt Chomsky's assumption that certain semantic properties of clauses can be expressed by means of formal features. The complementizer of interrogative clauses, for examples, contains a [+wh]-feature that must be checked by a *wh*-phrase. Similar suggestions have been made with respect to sentence negation. Sentence negation is expressed by means of a functional head Neg, which contains a [+neg]-feature that must be checked by moving a negative phrase into the specifier of NegP.[5]

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4 In case of e.g. a direct object, sentence negation can be expressed in two ways in English: it can either be expressed by means of a negative NP or by means of a negative polarity item preceded by the negative adverb *not.* This will be discussed in Section 3.3.2, but for the moment we will confine ourselves to prepositional arguments. Two other things must be noted. First, the Dutch *ook maar* XP and English *any*-X differ in that the former is typically used in negative contexts (and related contexts, such as conditional clauses and certain types of interrogative clauses), whereas the latter is subject to less restrictions and can also be used as so-called "free choice *any*" (see also footnote 8). Second, Dutch *ook maar*, but not English *any*, can also be used in isolation, as in *zonder ook maar te twijfelen, sprong Jan het water in* 'without hesitating a second, Jan jumped into the water'. In this article, we will not digress on these matters.

5. These insights are of course much older: in Haegeman (1992), they are formulated as the Affect-criterion in (i), in which [affective] refers to the features [+wh], [+neg], [+focus], etc. Originally, it was assumed that the two conditions in (i) are parameterized for the locus of application (S-structure or LF), but at this moment it seems to be generally accepted that at least (ib) must be observed before SPELL-OUT (cf. the discussion of (10)). The Affect-criterion originates from May (1985:17) and has been developed further in e.g. Brody (1990), Haegeman (1992, 1995) and Rizzi (1996).

(i)   Affect-criterion
        a.   An Affective operator must be in a Spec-head configuration with an [affective] X°.
        b.   An [affective] X° must be in a Spec-head configuration with an Affective operator.

That a negative phrase moves in order to check the [+neg]-feature is not always easy to demonstrate in languages like Dutch, because we may be dealing with string vacuous movement. However, consider the examples in (8) and (9), involving the adjective *tevreden* 'satisfied', which takes a prepositional complement, like *over Peter* 'about Peter'. In (8), the PP-complement can either precede or follow the adjective. Probably, (8a) is the base order — movement of a PP results in a "freezing" effect (cf. Ross' (1967) "Frozen Structure Constraint"), and R-extraction (cf. (8a′,b′)) is possible only when the stranded preposition follows the adjective.

(8)   a.   Jan is erg tevreden   over Peter.
              Jan is very satisfied about Peter
        a′.   de jongen waar$_j$ Jan [$_{AP}$ erg tevreden [$_{PP}$ over t_j]] is
              the boy   where Jan   very satisfied   about   is
              'the boy whom Jan is very satisfied about'
        b.   Jan is over Peter erg tevreden.
        b′. *de jongen waar$_j$ Jan [$_{PP}$ over t_j]$_i$ [$_{AP}$ erg tevreden t_i] is

Example (9) shows that the PP complement is moved obligatorily when sentence negation is expressed; this can be accounted for in a natural way if we assume that the PP is moved into SpecNegP in order to check the [+neg]-feature of the functional head Neg (cf. Haegeman 1992 and 1995, section 3.1, for an extensive discussion of West-Flemish and Klooster 1993 for Dutch).

(9)   a.   *Jan is erg tevreden over niemand.   (acceptable with constituency negation)
        b.   Jan is over niemand erg tevreden.
        b′.   Jan is [$_{NegP}$ [$_{PP}$ over niemand]$_i$ [Neg ... [$_{AP}$ erg tevreden t_i]]].

When Chomsky proposed his feature analysis for *wh*-movement, he noted immediately that the feature [+wh] is strong in all languages (see also Hornstein 1995), and hence applies universally before SPELL-OUT.[6] In Haegeman (1995) the same has been argued for the feature [+neg]. If this is really the case, this could give rise to the following generalization.

(10)   Formal features of functional heads that are relevant for the interpretation of the clause (such as [+wh], [+neg], [+focus], [+topic], etc.) are universally strong, and hence force overt movement (cf. footnote 6).

The generalization in (18) implies that all movements that are relevant for the semantic interpretation of the clause (that is: the A′-movements) precede SPELL-OUT. The movements after SPELL-OUT involve head- and A-movement only. This means that at SPELL-OUT all information that is needed to interpret the structure is already present; the structure is already available for interpretation by the conceptual-intentional system, although some formal features still need to be checked in order to satisfy Full Interpretation. This is important for

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[6] At first sight, this seems incompatible with the fact that many languages have the *wh*-phrase *in-situ*. However, Chomsky follows Watanabe (1991), who has shown that these languages do have *wh*-movement, albeit that the moved phrase is a phonetically empty operator. Note that this shows that the notion *overt* must not be taken too literally.

the D&E model in (1), since we cannot adopt Chomsky's assumption that all members in the reference set are based on the same numeration, but have to follow Grimshaw in assuming that the reference set consists of representations with the same meaning.

Determining the reference set and the optimal candidate will be the topic section 3.2. This subsection will also give the main ingredients of our analysis of the Dutch and English examples in (6) and (7). In Section 3.3, we will conclude with extending our analysis to a number of more complex cases.

3.2 Determining the reference set and the optimal candidate

In this section, we will challenge the assumption that it is the numeration that determines which LF-representations are part of the reference set. In Section 3.2.1, we will show on the basis of the examples in (6) and (7) that this assumption is not tenable. In the Sections 3.2.2 and 3.2.3, we will try to explain these data without making use of this notion. Roughly speaking, our proposal amounts to the idea that the reference set must be defined as consisting of representations with the same meaning (where "meaning" can be construed in the sense of predicate calculus for our present purpose; cf. footnote 7). The discussion in this subsection is strictly confined to the distribution of negative NPs and negative polarity items in simple clauses (See Section 3.3 for a discussion of complex sentences).

3.2.1 The problem

In the introduction of this section, we have seen that sentence negation can be expressed by means of a negative NP, as in the Dutch example in (11a), or by means of a negative polarity item preceded by the negative adverb *not*, as in the English example in (11b).

(11) a. Jan is over niemand   tevreden.
        Jan is about nobody   satisfied
    b. John is not satisfied with anybody.

According to the minimalist program, each acceptable sentence is derived from a numeration that contains at least the lexical elements and the required functional heads of that sentence. The derivation of the Dutch sentence in (11a) therefore has a numeration as its input that contains at least a negative NP and the functional head Neg associated with it. The derivation of the English sentence in (11b), on the other hand, has a numeration that contains at least a negative polarity item (NPI), the negative adverb *not* and the functional head Neg associated with it. This means that both sets of abstract numerations in (12) may in principle give rise to an acceptable negative sentence.

(12) a. $\{..., \text{Neg}, \text{NP}_{[+neg]}, ...\}$
    b. $\{..., \text{Neg}, niet/not, \text{NPI}, ...\}$

This is of course consistent with checking theory, which allows a feature on a head H to be checked either by a phrase moved into the specifier of H or by a phrase merged in that position (cf. Chomsky's analysis of the expletive construction in Section 2). In the derivation that takes (12a) as its input, the [+neg] feature of the functional head Neg can be checked by moving the negative NP into SpecNegP, as in (13a) (cf. the discussion of (9)); in the derivation that takes (12b) as its input, the [+neg] feature can be checked by merging the negative adverb in SpecNegP, as in (13b).

(13)   a.   Jan is [$_{NegP}$ over niemand$_i$ [$_{Neg'}$ Neg ... [$_{AP}$ tevreden t_i]]]
       b.   John is [$_{NegP}$ not [$_{Neg'}$ Neg ... [$_{AP}$ satisfied with anybody]]]

So far, the minimalist program does not impose special requirements on the numeration: when the computational system is able to derive a converging structure on the basis of a certain numeration, this must give rise to an acceptable sentence; when this is not the case, there is simply no grammatical output. Given the fact that the numeration type in (12a) results in the grammatical Dutch sentence in (11a), we expect that this type also gives rise to a grammatical sentence in English. And given the fact that the numeration type in (12b) gives rise to the grammatical English sentence in (11b), we expect that it also gives rise to a grammatical sentence in Dutch.

       We have seen earlier, however, that these expectations are not borne out. We will discuss the relevant examples again. Consider the examples in (14) and (15). As we have seen above, the Dutch examples take the numeration type in (12a) as its input. The ungrammaticality of (14b) shows that the numeration type in (12b) does not lead to a grammatical result in Dutch. In English the situation is just the other way around: the numeration type in (12b) leads to the acceptable sentence in (15b), but the ungrammaticality of (15a) shows that the numeration type in (12a) does not lead to an acceptable result. The problem for the minimalist program is therefore that it cannot exclude the unacceptable examples in (14b) and (15a).

(14)   a.   Jan is over niemand tevreden.
       b.   *Jan is niet over ook maar iemand tevreden.

(15)   a.   *John is satisfied with nobody.
       b.   John is not satisfied with anybody.

3.2.2   The reference set

The problem for the minimalist program discussed in the previous subsection is mainly due to the assumption in (16a), below, that it is the numeration that determines which LF-representations are part of the reference set. As a result of that, the examples in (14a) and (14b) are not in the same reference set and hence do not compete, and the same holds for the examples in (15a) and (15b). Of course, we need some restriction on the notion 'reference set' in order to avoid, for instance, the blocking of a relatively simple sentence like *John watched television* by a computationally more complex example like *John peeled the potatoes before he watched television*. This can be achieved by assuming, following Grimshaw (1997), that the reference set consists of examples with the same meaning.[7]

(16)   a.   Reference set (Chomsky 1995): the set of LF-representations based on the same numeration
       b.   Reference set (Grimshaw 1997): the set of representations with the same meaning.

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[7] For our present purpose, "meaning" can be construed in the sense of predicate calculus, but the sense of the word is actually somewhat broader including at least notions from the theory of information structure, such as focus and presupposition. Ultimately the proper definition is an empirical matter. Note in passing that Grimshaw actually takes a hybrid position by assuming that both the input *and* the meaning are relevant for determining the reference set.

Given Frege's principle of compositionality, according to which the meaning of a complex expression is constructed from the meaning of its parts, the definition in (16b) generally has the same result as the definition in (16a). In a small number of cases, however, the reference set defined by (16b) is slightly larger. The examples in (14) and (15) illustrate this in a straightforward manner. The meaning of (14a) can be expressed in predicate calculus by means of the formula in (17a). Hornstein (1984) has argued that a negative polarity item like *ook maar iemand* or *anybody* can be represented as a universal operator with wide scope (i.e. with scope over the other operators in the clause).[8] This implies the unacceptable example in (14b) can be semantically represented as in (17b). Since the formulas in (17a) and (17b) are semantically equivalent ($\neg\exists x\Phi \leftrightarrow \forall x\neg\Phi$), (14a) and (14b) are part of the same reference set according to (16b). This is not the case according to (16a) because they do not have the same numeration as their input.

(17) a. $\neg\exists x$ (x:person) (Jan is tevreden over x)
　　　 b. $\forall x$ (x:person) $\neg$(Jan is tevreden over x)

As has already been mentioned above, the problem for the minimalist program is that each numeration that gives rise to a convergent LF-representation should result in at least one acceptable sentence, so that according to (16a) both sentences in (14) should be acceptable. This does not follow when we replace (16a) by (16b): according to (16b), (14a) and (14b) are part of the same reference set, so that we can assume that the ungrammaticality of (14b) is caused by the fact that, for one reason or another, (14a) is preferred over (14b). Of course, this reason cannot be universal in nature — according to (16b), the English examples in (15) are also part of the same reference set, but now it is not the a-example but the b-example that is favored.

3.2.3　The selection of the optimal candidate

In order to account for the data in (14) and (15), we must postulate two language-specific hypotheses. One possibility would be to parameterize one or more properties of the computational system. However, the only parameterization that is allowed in the minimalist program is to make a distinction between weak and strong features, and this is not useful for our present purposes since it only expresses whether a certain formal feature must be checked before or after SPELL-OUT. The feature [+neg], that we are concerned with here, is checked overtly in both construction types (in accordance with the generalization in (10)); in the

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[8] Hornstein assumes this, because *any-X* can also be used in contexts like (ia), to which the meaning in (ib) can be assigned. Instead of assuming two different interpretations for *any*, he prefers assigning a single meaning to this element. In Dutch, this problem does not arise, since it is not the negative polarity item *ook maar iemand* that is used in contexts like (ia), but the expression *wie dan ook*. For Dutch, we could therefore represent the negative polarity item as an existential operator with narrow scope. For convenience, however, we will adopt Hornstein's proposal also for Dutch. In the contexts that we will discuss this is innocuous because of the equation rule mentioned in the main text. However, we want to refer to Zanuttini (1991:116), who notes (like others before her) that universal quantifiers like *everybody*, *all* and *everywhere*, can be modified by means of expressions like *almost* and *just about*, whereas other quantifiers like *some* and *any* cannot. She therefore assume that the latter are existential.

(i)　　a.　　John will be richer than any one here
　　　 b.　　$\forall x$ (x: a person here) (John will be richer than x)

a-examples it is checked by the negative NP, and in the b-example by the negative adverb *niet*/*not*. Therefore, we have to find a different solution.

In Broekhuis and Dekkers (2000), it is argued that Chomsky's computational system can be considered the generator in an OT-like system, as depicted in the model given in (1) in the introduction of this article. The model in (1) differs from the minimalist program in that it no longer includes a numeration: the lexical elements are drawn directly from the lexicon, and inserted in the syntactic structure. Just as is the case in the minimalist program, the derivation of LF and PF split at a certain point. At this point the reference set, which undergoes an optimality theoretical evaluation, is set.[9] The basic ideas of optimality can be summarized as in (18) (adapted from Archangeli 1997:15).

(18) a. The candidates in a reference set are evaluated on the basis of a set of universal violable constraints CON.
      b. A language L is a *ranking* of the constraints in CON: ranking a constraint C above D (C >> D) implies that, in L, violation of C is worse than violation of D.
      c. The evaluator finds the candidate that *best satisfies* the ranked constraints in L:
          (i) Violation of a lower ranked constraint may be tolerated in order to satisfy a higher ranked constraint.
          (ii) Ties (by violation or by satisfaction) of a higher ranked constraint are resolved by a lower ranked constraint.

Above we have seen that checking of the feature [+neg] can take place in either of two ways: in the case of (14a) and (15a) it is obtained by means of the operation Move/Attract, that is, the movement of the negative NP into SpecNegP; in the case of (14b) and (15b) it is obtained by application of Merge — the negative adverb is taken directly from the lexicon and placed into SpecNegP. Here, we want to suggest that both operations involve a certain "cost". This can be expressed by assuming the two constraints in (19): the star indicates that applying the operation in question induces a violation of the constraint (*MOVE is of course better known as STAY in the literature but we like the former notation more because it emphasizes the parallelism between the two constraints).

(19) a. *MOVE: Do not move
      b. *MERGE: Do not merge

Of course, these operations are violated in all syntactic constructions, because it is impossible to create a syntactic object without them. But this is allowed since the constraints are violable (cf. (18a)). The effect of the constraints, however, is that they block derivations in which there are superfluous applications of either Move or Merge. In other words, they are true economy constraints.

The contrast between the Dutch and English data can now be accounted for by assuming a different ranking of the two constraints in these languages (cf. (18b)). Given the fact that in the Dutch examples in (14), sentence negation is expressed by means of a negative NP, we must

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[9] Recall that this is compatible with the definition of reference set in (16b), because we have already established in (10) that all semantically relevant movements must have been applied before this point. The rational we can give for this fact now, is that if this is not the case, no meaning can be assigned to the representation, and the representation can therefore not be part of a reference set. Actually, instead of saying that the evaluation takes place at the SPELL-OUT point, it would be more accurate to say that the evaluation determines what the proper SPELL-OUT point is, but we will not go into that here (see Broekhuis, to appear, for extensive discussion).

conclude that Dutch prefers movement over the application of Merge; the Dutch ranking is therefore as given in (20a) — in this language, a violation of *MERGE is worse than a violation of *MOVE. English, on the other hand, prefers the use of a negative polarity item, so that we must assume that in this language the application of Merge is preferred over Move/Attract; the English ranking is therefore as in (20b).

(20)   a.   Dutch: *MERGE >> *MOVE
       b.   English: *MOVE >> *MERGE

The relevant evaluations can be represented as in the tableaus 1 and 2. The order of the constraints indicates their relative importance in the given language. A star in the cells below the constraints indicates violation, and an exclamation mark indicates that the violation is fatal for the representation — there is another representation that satisfies the constraints better. In the tableaus, we only give those violations with respect to which the candidates differ.

Tableau 1: Dutch		*MERGE	*MOVE
... [$_{NegP}$ niemand$_i$ [Neg ... t_i ...]]	☞		*
... [$_{NegP}$ niet [Neg ... NPI ...]]		*!	

Tableau 2: English		*MOVE	*MERGE
... [$_{NegP}$ nobody$_i$ [Neg ... t_i ...]]		*!	
... [$_{NegP}$ not [Neg ... NPI ...]]	☞		*

3.2.4   Conclusion

In this section, we have shown that the assumption in (16a) that it is the numeration that determines which candidates are part of the reference set is not tenable in the light of the data in (14) and (15). We therefore replaced this assumption by the assumption in (16b) that the candidates in the reference set have the same meaning. In addition, we assumed the existence of the "economy" constraints *MERGE and *MOVE, which essentially express that the operations Merge and Move/Attract are both costly The differences between Dutch and English can be accounted for by assuming that the ranking of these constraints differ in the two languages. The number of facts discussed in this subsection are of course very small. Therefore, we will show in the following subsection that our analysis can be extended to a number of other, more complex cases.

3.3   Extending the analysis

In Section 3.2, we illustrated the basic ingredients of our analysis by means of the examples in (14) and (15). In this section, we will extend our analysis to a number of other examples, and discuss a number of problems with respect to Dutch (3.3.1) and English (3.3.2). Especially our suggestions with respect to English are somewhat speculative in nature.

3.3.1   Dutch

As we have argued in Section 3.2, Dutch prefers the application of the operation Move/Attract over the application of Merge. From this, it follows that Dutch prefers the use of negative constituents over the use of negative polarity items. This preference is, however, not absolute: in some cases a negative polarity item must be used.

3.3.1.1   Negative polarity items in Dutch simple clauses

In (21), a first case is given in which a negative polarity item can appear in Dutch. This can be accounted for in the following way. The clause in (21) contains only one NegP. When we assume (contra Chomsky, 1995, and following Broekhuis, 1999/to appear) that each projection can have at most one specifier, it follows that at most one element can be moved into SpecNegP, in this case the negative subject NP *niemand*. The structure is therefore as given in (21b).[10] The NP *niemand* can be translated as a negative existential operator and the negative polarity item as a universal operator with wide scope, as in (21c), which is of course equivalent to the representation in (21c′).

(21)   a.   Niemand heeft ook maar iets gezien.
             Nobody   has   anything   seen
       b.   niemand$_i$ heeft [$_{NegP}$ t_i [Neg ... [t_i ook maar iets gezien]]]
       c. $\forall y \neg \exists x$ (x,y: persons) (x heeft y gezien)
       c′. $\neg \exists y \exists x$ (x,y: persons) (x heeft y gezien)

It must be noted that (21a) is more or less synonymous with example (22a). The negative NP in SpecNegP is translated as a negative existential operator and the NP *iets* is translated as an existential operator in the scope of the first one (note that $\neg \exists y \exists x$ is equivalent to $\neg \exists x \exists y$).

(22)   a.   Niemand heeft iets   gezien.
             Nobody   has   something   seen
       b.   niemand$_i$ heeft [$_{NegP}$ t_i [Neg ... [t_i iets gezien]]]
       c. $\neg \exists x \exists y$ (x,y: persons) (x heeft y gezien)

If these two examples are indeed equivalent, they must be in the same reference set. According to our proposal this is permitted. As is shown tableau 3, the two constructions involve the same number of applications of the operations Move/Attract and Merge. They therefore violate the constraints to the same extend, and are therefore both acceptable.[11]

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[10] Note that the subject *niemand* is subsequently moved from SpecNegP to the subject position SpecIP. This movement is generally considered impossible; usually, A′-movement cannot be followed by A-movement. See the discussion in 3.3.2 for a potential solution for this problem.

[11] The difference in interpretation between the two examples cannot be expressed by means of predicate calculus, and mainly seems to involve emphasis: (21a) is in a certain sense more resolute than (22a). When we want to place the two examples in the same reference set, we must conclude that this kind of emphasis is not part of the technical notion of "meaning" (cf. footnote 7). However, when we would come to the conclusion that (21a) and (22a) do differ in meaning, the prediction would of course also be that both are grammatical: according to (16b), the two candidates are then in two different reference sets, so that they cannot block each other by definition. We choose for the option in the main text, however, since the examples in (23) below would become a problem under this option — because both (23b) and (23c) are blocked by (23a), it follows from (16b) that (23a) is semantically equivalent to (23b) and (23c), from which it subsequently follows that also (23b) and (23c) are semantically equivalent. The

Tableau 3: Dutch		*MERGE	*MOVE
... [NegP niemand$_i$ [Neg ... t_i ... NPI ...]]	☞		*
... [NegP niemand$_i$ [Neg ... t_i ... iets ...]]	☞		*

The examples in (21a) and (22a) show that in negative contexts a non-specific, indefinite NP like *iets* and a negative polarity item like *ook maar iets* may alternate. Their distribution exhibits even more similarities: they are both excluded when SpecNegP is filled with the negative adverb *niet*, as is shown in (23). As we have discussed above, the structure containing a negative polarity item is blocked by the construction in (23a) with the negative NP *niets*. As is illustrated in tableau 4, the same holds for the example containing *iets* in (23c) — just like (23b), (23c) induces an additional violation of *MERGE that is lacking in (23a).

(23) a.   Jan heeft niet   gezien.
           Jan has   nothing seen
      b. *Jan heeft niet ook maar iets gezien.
           Jan has   not   anything   seen
      c. *Jan heeft niet iets   gezien.[12]
           Jan has   not   something seen

tableau 4: Dutch		*MERGE	*MOVE
... [NegP niets$_i$ [Neg ... t_i ...]]	☞		*
... [NegP niet [Neg ... NPI ...]]		*!	
... [NegP niet [Neg ... iets ...]]		*!	

indefinite pronoun *iets* and the negative polarity item *ook maar iets* must therefore be seen as semantically equivalent, as is done in the main text.

[12] There is also a grammatical reading of (23c). In the case of 'supposition negation' (Klooster 1984, to appear) *niet* followed by an indefinite NP is allowed. Examples are: *Ken jij niet iemand die zou kunnen helpen?* 'Don't you know someone who could help?', *Als je niet iets beters weet...,* 'If you can't think of anything better…', *Zolang je niet een antwoord hebt op die tegenwerping...* 'As long as you don't have an answer to that objection…', *Nee, hij woont niet ergens in de buurt, hij ligt op het kerkhof* 'No, he does NOT live somewhere in the neighborhood, he lies buried at the graveyard'. (23c), taken in its grammatical interpretation, however, belongs to a different reference set.

3.3.1.2 Negative polarity items in Dutch embedded clauses

A second case in which a negative polarity item can appear in Dutch, is in the context of 'adversative predicates'[13] like *ontkennen* 'to deny', *betwijfelen* 'to doubt', *er tegen zijn* 'be against', *verbaasd zijn* 'be surprised', *niet denken/geloven/hopen* 'to not believe/think/hope', etc. These (often multi-word) expression signify the matrix subject's denial, doubt etc. concerning the contention in the complement clause. Klooster (1993, 1995) accounts for this by assuming that these (collocations acting as) verbs select a 'negative CP', i.e. a CP whose specifier contains a (phonetically empty) negative operator, as indicated in (24b). (See, for convincing evidence in Basque, which has negative complementizers, Laka 1990.) Again the negative polarity item can be interpreted as having wide scope (that is, scope over the negation expressed by the negative operator), so that the meaning of this sentence can be expressed as in (24c,c′).

(24)   a.   Ik denk niet   dat   Jan   over ook maar iemand   tevreden is.
           I   think not   that   Jan   with anybody   satisfied   is
         b.   ik denk niet [$_{CP}$ OP$_{[+neg]}$ dat [$_{IP}$ Jan over ook maar iemand tevreden is]]
         c.   I think: $\forall$x (x:person) $\neg$(John is satisfied with x)
         c′.   I think: $\neg\exists$x (x:person) (John is satisfied with x)

The fact that the specifier of CP is already filled with a negative operator makes it impossible to make use of a negative word; the addition of a negative word, like in (25a), is possible only when the embedded clause contains an additional NegP, as in (25b). This implies that the clause contains two negative operators that cancel each other, as in (25c). For completeness' sake, observe that (25a) is actually ambiguous, because *niet denken* need not be interpreted as a collocation in the sense indicated above; the sentence can also be interpreted as the denial of the contention *ik denk dat Jan over niemand tevreden is* 'I think that Jan is not satisfied with anyone'. In that case the semantic representation is as given in (25d).

(25)   a.   Ik denk niet dat   Jan   over niemand tevreden is.
           I   think not that John with no-one   satisfied   is
         b.   ik denk niet [$_{CP}$ OP$_{[+neg]}$ dat [$_{IP}$ Jan ... [$_{NegP}$ over niemand$_i$ [Neg ... [$_{AP}$ tevreden t_i] is]]]]
         c.   I think: $\neg\neg\exists$x (x:person) (John is satisfied with x)
         c′.   I think: $\exists$x (x:person) (John is satisfied with x)
         d. $\neg$(I think: $\neg\exists$x (x:person) (John is satisfied with x))

     In connection with the discussion above, it must be noted that we cannot assume that the negative polarity item *ook maar iemand* in (24a) is licensed by the negative adverb *niet* in de matrix clause .[14] If that would be the case, we would wrongly expect that also examples like

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[13] See Baker (1970). Baker does not include, however, the so-called Negative Raising verbs combined with *n*-words, of the type 'to not believe' etc. as mentioned in the text. As is argued in Klooster (1984:86 sq.), *niet* does not express sentence negation in cases such as these, but is only construed with the verb. *Niet denken*, *niet hopen* etc. can thus be thought of as of fixed combinations, or collocations.

[14] This raises the question what motivates the presence of the negative adverb *niet* in the matrix clause in examples like (24a) and (25a) under the collocation reading. Two mutually exclusive solutions come to mind. We could assume that the matrix clause contains a NegP. Checking the [+neg] feature overtly is possible only by filling the specifier of NegP by *niet*, because sentential complements can never be placed in the middle field of the clause. Under this solution, adversative verbs like *ontkennen* 'to deny' and *betwijfelen* 'to doubt' constitute a

(26) would be acceptable. From Klooster's analysis, on the other hand, the unacceptability of (26) follows immediately: *niet antwoorden* 'to not reply' does not belong to the set of verbs that select a negative CP, so that *ook maar iemand* in (26) is not licensed.

(26))   *Ik antwoord niet dat   Jan over ook maar iemand tevreden is.
              I   reply   that   Jan with anybody   satisfied is

In addition, Klooster's analysis correctly predicts that the two negative adverbs in example (27a) cannot cancel each other, as is the case in (25) under the collocation reading; (27a) has the meaning in (27c) only — the interpretation in (27b) is impossible.

(27)   a.   Ik antwoord niet dat   Jan over niemand   tevreden is.
             I   answer   not that   John with nobody satisfied is
       b.   impossible reading: I answer: ∃x (x:person) (Jan is tevreden over x)
       c.   acceptable reading: ¬ (I answer: ¬∃x (x:person) (Jan is tevreden over x))

3.3.1.3 Conclusion

In sum, we can say that our analysis provides an explanation for the observational generalization that in Dutch, non-specific, indefinite NPs (including negative polarity items like *ook maar XP*) may never occur in the c-command domain of the negative adverb *niet*. It gives an explanation for the descriptive filter in (41). This filter is also applicable to numerous other constructions (e.g. *een bal* in *'t Kan me geen bal schelen* 'I don't care a hoot'), which have not been discussed here.

(28)   *[$_{CP}$ ... [$_{NegP}$ niet [Neg ... NP$_{[-def]}$ ...]]]

3.3.2 English

Contrary to Dutch, English prefers the application of the operation Merge over the application of Move/Attract, from which it follows that English has a preference for the use of negative polarity items over negative constituents. Again, the preference is not absolute. In this section we would like to suggest a solution to this problem that is based on an alternative view on phrase structure, adapted from Nash and Rouveret (1996). But, first, consider the examples in (29).

(..continued)

problem. Alternatively, we could assume that the matrix clause does not contain a NegP, and that verbs like *niet denken* 'to not think' are lexical units, that is, items comparable to verbs like *ontkennen* 'to deny' that select a sentential complement with a negative complementizer whose specifier contains an abstract negative operator. A problem for this solution is formed by examples like *Niemand gelooft dat er ook maar iets zal gebeuren* 'Nobody believes anything will happen', which would force us to conclude that combinations like *niemand + geloven* are lexical units as well. Things are more complicated, though, than these examples would seem to suggest. Consider, for example, a sentence like [?]*Niemand denkt dat daar met de beste wil van de wereld iets aan te doen is* (lit., No-one thinks that there with the best will of the world something about to do is) 'No-one thinks anything can be done about it with the best will in the world', which is far worse than the perfectly acceptable *Ik denk niet dat daar met de beste wil van de wereld iets aan te doen is* 'I don't think anything…etc.' There are many such subtle semantic vagaries of collocations. We leave these problems for future research.

(29)   a.   Nobody was sitting in the room.
        b.   *Anybody was not sitting in the room.

     The possibility of (29a) is clearly related to the fact that the subject has moved from its VP-internal position into the subject position of the clause. One possible approach to these data is to assume that that this forces the subject to cross the projection of the functional head Neg. Here, we would like to suggest that this is only possible when the subject moves via SpecNegP into SpecIP, that is, the computational system is designed in such a way that an element cannot cross a position in which it could potentially check a feature (cf. the discussion of the Dutch examples in (21a) and (22a)). The derivation that leads to the representation in (30a) is therefore allowed. We will not elaborate on an analysis of this type, because we will give an alternative analysis below, but we want to point out that the possibility of the derivation in (30a) could be related to the property of traces that they are not visible to the computational system (cf. Chomsky 1995:304,(93)). When *nobody* skips SpecNegP, the [+neg] feature cannot be checked, as the trace of the negative NP is not visible for the computational system and cannot be attracted by NEG; the negative NP itself cannot be attracted either, of course, since it is not c-commanded by NEG. Hence, moving the negative NP via SpecNEGP to IP is the only way to arrive at a converging derivation.

(30)   a.   [$_{IP}$ nobody$_i$ [was [$_{NegP}$ t_i [Neg ... [$_{VP}$ t_i sitting in the room]]]]]
        b.   *[$_{IP}$ anybody$_i$ [was [$_{NegP}$ not [Neg ... [$_{VP}$ t_i sitting in the room]]]]]

     The ungrammaticality of (29b) does not follow directly from this analysis. Traditionally, it is attributed to a condition according to which the negative polarity item must be in the c-command domain of the negative adverb *not*. It is, however, not clear whether such an account is still valid within the minimalist program, since licensing is assumed to involve a local relationship (Spec-Head, sisterhood, etc.). In an OT-approach in which *MOVE is ranked higher in English than *MERGE, we cannot derive the desired distinction either. This is shown in tableau 5:.

Tableau 5: English (incorrect)	*MOVE	*MERGE
a. [$_{IP}$ nobody$_i$ [was [$_{NegP}$ t_i [Neg ... [$_{VP}$ t_i ...	**!	
b. [$_{IP}$ anybody$_i$ [was [$_{NegP}$ not [Neg ... [$_{VP}$ t_i ... ☞	*	*

As is clear from this tableau, the structure in (30b) is preferred over (30a), because (30b) invokes just one violation of *MOVE, and (30a) two. Provided that the given ranking of the two constraints is correct for English, something must be wrong with the structures in (30). This conclusion can also be drawn on basis of the longstanding generalization according to which A′-movement cannot be followed by A-movement; structure (30a) violates this "improper movement" condition (cf. also footnote 10).

     An alternative for the structure in (30a) could be to assume that features like [+wh], [+neg], etc., are not realized on separate functional heads, but are part of the independently motivated (functional) heads like I and the (light) verb, that is, when we would radically reduce

the functional structure of the clause.[15] The structure of (29a) would then be as given in (31a), in which movement of the subject into SpecIP results in checking of *both* the case *and* the [+neg]-feature on I. For (29b) we can now assume that I has a proxi-head, as in (31b). The idea of proxi-heads, which is adopted from Nash and Rouveret (1996), is very simple. When a head H has a filled specifier, but still contains a feature that must be checked, an empty projection is formed above its own. As a second step, H moves in the empty head position (the proxi-head), the specifier of which is subsequently filled with an element that may check the unchecked feature of H (see Broekhuis, to appear, for a more extensive discussion). It can be assumed that as a result of the movement of H into the empty head position, the proxi-projection is of the same category as H (cf. also Grimshaw 1997)— for this reason, the structure in (31b) contains two IPs instead of one.

(31)   a.   [$_{IP}$ nobody$_i$ [[$_I$ was] [$_{VP}$ ... t_i ...]]]
        b.   [$_{IP}$ anybody$_i$ [[$_I$ was] [$_{IP}$ not [t_i [$_{VP}$... t_i ...]]]]]

The structures in (31) do provide the desired results: besides the violation of *MOVE induced by the obligatory movement of the subject that also takes place in the derivation of (31a), the derivation in (31b) involves an additional violation of this constraint as a result of the movement of the verb into the empty proxi-head (the derivation in (31b) also has an additional violation of *MERGE, but this is not relevant because the additional movement of the verb is already decisive).

Tableau 6: English		*MOVE	*MERGE
a. [$_{IP}$ nobody$_i$ [[$_I$ was] [$_{VP}$ ... t_i ...]]] ☞		*	
b. [$_{IP}$ anybody$_i$ [[$_I$ was] [$_{IP}$ not [t_I [$_{VP}$... t_i ...]]]]]		**!	*

        Also the behavior of the direct object in English is problematic. As can be seen in (32), the direct object can appear either as a negative NP or as a negative polarity item. Given the preference of English for negative polarity items, however, we would expect that only (32b) is acceptable.

(32)   a.   John said nothing.
        b.   John didn't say anything.

Here we like to suggest an analysis of (32a) along similar lines as the analysis of (29a). Chomsky (1995) assumes the direct object in English does not overtly move into SpecAGR$_O$P. However, over the years it has been suggested time and again that this view is not correct. Some of the data that have played an important role in this discussion are given in (33).

(33)   a.   John looked up the information.
        b.   John looked the information up.

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[15] Other proposals to reduce the functional structure of the clause can be found in e.g. Chomsky (1995: section 4.10) and Grimshaw (1991/7), with which the proposal of Nash and Rouveret share a number of properties.

As can be seen in (33), the direct object can appear in two different positions. In Johnson (1991) it is argued that this variation in word order is the result of the optional movement of the object, and in Koizuma (1993) it is argued that it must be identified with the movement that is needed to check the case feature of the object (see also Lasnik, 1999, for more semantic arguments in favor of overt movement of the object). When we assume that the (light) verb may contain both a case and a [+neg]-feature, this means that (32a) can receive a similar analysis as we suggested for (29a); movement of the object in (32b) results in checking of both the case and the [+neg]-feature. Under this analysis, the fact that (32a) and (32b) are both possible, could be related to optionality of movement of the direct object in (33). We leave it to future research to develop a full-fledged OT-analysis on the behavior of direct object in English.

4   Final conclusion

In this article, we discussed Chomsky's assumption that Merge is a "costless" operation, which is therefore preferred over the operation Move/Attract. We have shown that this assumption is not well-motivated, and argued that the two operations are both costly. This conclusion has made it possible to reconsider the need of assuming the notion of a numeration. Our conclusion is that this notion is superfluous and can therefore be abolished. We have further argued that this is not only desirable, but actually required, given that the assumption of a reference set based on one and the same numeration makes it impossible to give a descriptively adequate account for the distribution of negative constituents and negative polarity items.

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