INTERPRETIVE EFFECTS OF HEAD MOVEMENT[1]

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1. INTRODUCTION

Traditionally, the taxonomy of movement distinguishes between head movement (HM), which consists in dislocation of terminals, and phrasal movement, which targets categories recursively built from terminals. Although the higher degree of abstractness underlying the concept of constituency makes HM the unmarked option, which should be given ontological privilege over phrasal movement, various recent trends in syntactic research converge in pursuing the opposite goal of eliminating HM from core syntax. Sceptics of HM have considered at least three different alternative options. While some researchers relocate HM into the phonological component (Chomsky 2000, 2001; Harley 2004a), others derive its effects by means of iterative applications of phrasal movement (*remnant movement*; Hinterhölzl 1997; Koopman and Szabolcsi 2000; Mahajan 2000; Müller 2004; Nilsen 2003). Still others make HM out to be epiphenomenal (Brody 2000).

The present project is part of a broader strategic move against such alternative conceptions of HM.[2] Specifically, the study aims at recruiting arguments for the standard view that HM consists in syntactic displacement of terminals by investigating phenomena which have so far only received sporadic attention in the literature: the interaction between HM and interpretation. This domain is of particular interest inasmuch as a demonstration that HM can affect interpretation, or can be affected by principles of interpretation, as expressed by the SAHM-conjecture in (1), generates a strong argument for computing HM in syntax, and not at PF.

(1) SAHM-CONJECTURE: There are instances of ***s***emantically ***a***ctive ***h***ead ***m***ovement.

More concretely, the combination of (1) and the assumption implicit in the current model that PF-operations do not influence LF representations entails (by contraposition[3]) that HM has to apply in the stem of the derivation. In addition, such a finding directly implies that HM cannot be epiphenomenal.

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[2]For further discussion of arguments pro and conrta HM see Fanselow (2002); Matushansky (2006); Riemsdijk (1998); Roberts (2004); Zwart (2001), among others.

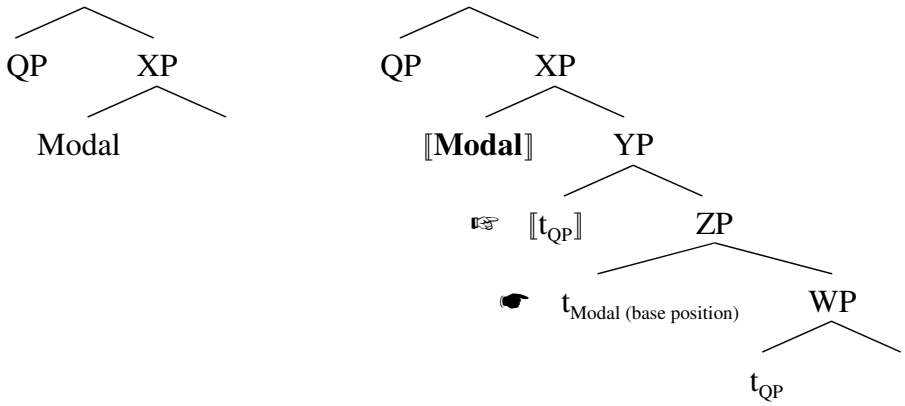
[3]The argument by contraposition: If α is a PF-operation, then α does not have an impact on interpretation. α has an impact on interpretation. Hence, α is not a PF-operation.

In what follows, I will outline a chain of evidence embedded in a discussion of scope splitting phenomena in English that will support the conclusion that HM indeed affects interpretation.[4] Section 2 outlines the essence of the argument for SAHM and introduces the core data. In section 3, I present background assumptions concerning the LF position of nominal quantifiers and the syntax of modality. Section 4 then assembles the argument, while section 5 expands on independent support for the specific analysis to be proposed. A second group of arguments for SHAM will be presented in section 6. Finally, section 7 addresses a possible solution to a long-standing problem for HM related to cyclicity.

2. THE ARGUMENT

In the following sections, I explicate an argument for the view that HM can have an effect on semantic interpretation. The argument is structured as follows: In certain contexts involving a modal verb, schematized in (2)a, the modal can take scope above a clause-mate quantifier, resulting in inverted scope order, as in (2)b.[5]

(2) a. **SYNTAX:** b. **INTERPRETATION:**



The position in which QP is interpreted (☞ in (2)b) can be shown to be located above the position in which the modal is base generated (☛ in (2)b). It follows that the modal has to be interpreted in a derived location. This result is directly compatible with the orthodox picture of HM, but contradicts the assumption that HM applies at PF. Only the former view predicts that HM operations have the potential of shifting the scope of the moved category by overt displacement, thereby generating new interpretations. Furthermore, the fact that such scope shifting applications of HM have not been identified before (an alleged generalization which has been used to motivate the PF-analysis) now turns out to be merely accidental.

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[4]For interactions in the other direction see Lechner (2001, 2004: chap. 3.4).

[5]Denotation brackets ('⟦' and '⟧') signal the position in which an expression is interpreted.

Empirically, the argument is centered around modal constructions exemplified in (3) to (5) below. The most prominent reading of these sentences denies the compatibility of a universal proposition with a circumstantial modal background. For instance, (3) means that it is not possible that every pearl is above average size, a proposition which is analytically true given the logical impossibility of mapping all pearls to a degree above the mean. This reading correlates with the scope order $\neg\Diamond \succ \forall$, in which the negation is separated from its surface host, the quantifier *every* (on the constituency of negation and *every NP* see section 4.2).

(3) Not every pearl can be above average size. $\neg\Diamond \succ \forall$
"It is not possible, that every pearl is above average size"
(Analytically true due to the definition of 'above average')

(4) Not everyone can be an orphan. $\neg\Diamond \succ \forall$ (André Gide)
"It is not possible, that everyone is an orphan"

(5) Not every boy can make the basketball team. $\neg\Diamond \succ \forall$
"It is not possible, that every boy makes the basketball team"

(3) to (5) represent instances of the so-called scope splitting construction. In the literature[6], scope splitting (or 'negative split') has been extensively discussed on the basis of examples such as (6), which differ from (3) to (5) in that negation is combined with a quantifier that carries existential and not universal force. (The negative QP in (6) is also construed as the object in order to avoid further complications regarding subject reconstruction; see section 3.1 for details.)

(6) Sam can find no solution.$\neg\Diamond \succ \exists$
"It is not possible, that Sam finds a solution"

For reasons of concreteness, I will adopt a version of the scope splitting analysis formulated in von Stechow (1993) and Penka (2002),[7] according to which all morphologically negative NPs bear a syntactic feature [+neg] which has to be licensed in the scope of an abstract semantic negation (NOT), as stated in (7)a.[8] NOT will be assumed to be located in the specifier of a NegP which is part of the same clause as the negative NP.

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[6]See Bech (1954/57: §80); von Fintel and Iatridou (2005); Heim (2000); Kratzer (1995); de Swart (2000); Penka (2002); Zeijlstra (2004) and references therein.

[7]See also Kratzer (1995: 144) and Penka and von Stechow (2001). Von Stechow and Geuder (1997: 19) credit Ede Zimmermann with the first explicit semantic analysis.

[8]Penka and von Stechow, who exclusively deal with German data, explicitly restrict (7)b to surface syntax. Loosening the requirement such that it may apply at LF in English seems plausible given that German, in contrast to English, is scope rigid, hence fixes (most) scope orders in surface syntax.

(7) a. Syntax: [+neg] must be in the scope of clause-mate NOT at LF.

b. Semantics: $[\![[\textit{No NP}]_{[+neg]}]\!] = [\![[\text{NP}]]\!]$
$[\![[\textit{Not every NP}]_{[+neg]}]\!] = [\![[\textit{every NP}]]\!]$

(adopted from Penka 2002; Penka and von Stechow 2001; von Stechow 1993)

The morphologically negative NPs themselves are assigned the meaning of their contradictories (e.g. *solution* for *no solution* and *everyone* for *not everyone*, respectively), as given by (7)b.[9]

Regular, non-split readings of negative NPs are the result of parsing the NP bearing the [+neg]-feature into the immediate scope of NOT. For subject NPs as in (8) this can be achieved by reconstruction of the subject into a lower specifier (the labels for XP and YP will be supplied in section 3.2; for further discussion of negative subjects see section 3.1 and 4).[10]

(8) a. $[_{XP}$ Nobody$_{[+neg],\,1}$ $[_{NegP}$ NOT $[_{YP}$ t_1 left]]]

b. $[_{XP}$ $[_{NegP}$ NOT $[_{YP}$ nobody$_{[+neg]}$ left]]] *Subject reconstruction into t_1*

Scope splitting is finally induced by configurations in which the abstract negation NOT is separated from the negative NP by another operator at LF. To exemplify, (6) can be represented as in (9). In the LF (9)a, the feature [+neg] is licensed by the abstract negative operator NOT in SpecNegP. Since the modal intervenes between NOT and [+neg], interpreting (9)a consequently leads to the split scope order (9)b, in which the morphologically negative object is translated as an indefinite (Acc denotes the accessibility relation which collects the modal base):

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[9]An alternative version of the proposal translates negative indefinites that bear a [+neg] as indefinites, but treats negative NPs without such a feature as genuinely negative quantifiers (see Penka 2002 for discussion). There is suggestive evidence from VP-ellipsis that morphologically negative NPs are always endowed with a [+neg]-feature. The latter conception notably has the virtue of offering an account for vehicle change under ellipsis from *no solution* to *(a) solution* in examples as in (i):

(i) I NOT can find no solution$_{[+neg]}$ but Holly might $\triangle$. Johnson (2001a: 468; (107))

a. $\triangle$ = find a solution

b. *$\triangle$ = find no solution

Suppose that the [+neg] feature on *no solution* in (i) is eliminated in course of the derivation. The antecedent NP is then sufficiently similar to *a solution* in the elliptical clause in order to pass the identity condition on VP-ellipsis. Moreover, give that abstract, semantic negation NOT must cooccur with [+neg] (von Stechow 1993), NOT is not licensed in the ellipsis clause, blocking a negative interpretation. If, on the other hand, *no solution* were taken to lack a [+neg]-feature, only reading (i)b is predicted to be well-formed by the identity condition.

[10]The clause mate condition ensures that structures like (i)a cannot be understood as in (i)b.

(i) a. They claimed that noone was on time

b. NOT they claimed $[_{CP}$ that someone was on time]
(= They didn't claim that someone was on time)

(9) a. John [$_{\text{NegP}}$ NOT [can find [no solution]$_{[+neg]}$]]

b. $\lambda w \neg \exists w' \exists x[Acc(w)(w') \wedge solution(x)(w') \wedge find(x)(John)(w')]$ $\neg \Diamond \succ$

As already mentioned, (3) to (5) essentially differ from the classic instances of splitting such as (6) in that the negation associates with a universal, and not with an indefinite. This particular contrast will turn out to be of specific relevance below, as universal QPs are subject to different, stricter conditions on where they can be interpreted in the tree (see section 3.1). Before proceeding to this point, it has to be demonstrated that the split reading of negated universals cannot be subsumed under the independently available *de re* interpretation ($\neg \forall \succ \Diamond$), though.

2.1. LOGICAL INDEPENDENCE

The split reading $\neg \Diamond \succ \forall$ can be clearly distinguished in its truth conditions from the surface scope *de re* interpretation $\neg \forall \succ \Diamond$. Consider for instance example (10):

(10) Not every lottery number can be drawn.

a. $\lambda w \neg \forall x[lottery\_number(x)(w) \rightarrow \exists w'[Acc(w)(w') \wedge be\_drawn(w')]]$ *de re*

b. $\lambda w \neg \exists w' \forall x[[Acc(w)(w') \wedge lottery\_number(x)(w')] \rightarrow be\_drawn(w')]$ split *de dicto*

The *de re* interpretation (10)a maintains that only a proper subset of all possible lottery numbers can ever be lucky numbers. The statement could e.g. be used to relate the finding that a lottery is rigged such that the machine which calculates the winning numbers never produces the number 7. The split reading (10)b, in which the universal is interpreted *de dicto*, on the other hand draws attention to the deplorable fact that the winning numbers are a proper (and usually small) subset of all lottery numbers. The logical independence of the latter is made visible by model (11), which fails to satisfy the *de re* interpretation (10)a (each lottery number in w_0 is a lucky number in one of the worlds), but verifies the split reading (10)b (there is no word in which all lottery numbers are lucky ones).

(11) *Model which satisfies split* de dicto *reading (10)b, but not de re reaing (10)a:*

	a	b	c
w_0	●	○	○
w_1	○	●	○
w_2	○	○	●

For any $x \in D_e$ and $w \in D_w$,

'○' *x is a lottery number in w*

'●' *x is a lottery number in w and x is drawn at the lottery in w*

Crucially, given that the split reading does not logically entail the *de re* reading, the split reading must be encoded separately in semantics.

Examples like (5), repeated below as (12), and model (13) can also be used to demonstrate that the *de dicto* interpretation is logically independent from the split reading.

(12) Not every boy can make the basketball team.

a. $\lambda w \neg \exists w' \forall x[[boy(x)(w') \wedge Acc(w)(w')] \rightarrow make\_the\_team(x)(w')]$ split *de dicto*
b. $\lambda w \exists w' \neg \forall x[[boy(x)(w') \wedge Acc(w)(w')] \rightarrow make\_the\_team(x)(w')]$ *de dicto*

In model (13), all the boys are on the team in w_1, falsifying the split reading (12)a (as well as the *de re* reading). Furthermore, model (13) satisfies the *de dicto* interpretation (12)b, because there are accessible worlds (w_0 and w_2) in which not every boy is on the team.[11] Consequently, the *de dicto* reading does not entail the split reading.[12]

(13) *Model which satisfies* de dicto *reading (12)b, but not the split reading (12)a:*

	a	b	c
w_0	○	●	●
w_1	●	●	●
w_2	○	●	●

For any $x \in D_e$ and $w \in D_w$,
'○' *x is a boy in w*
'●' *x is a boy in w and*
x is on the basketball team in w

Note on the side that as far as intuitions go, (12) appears to lack the *de dicto* reading, the sentence cannot be used to truthfully describe a scenario such as (13).[13] This observation will be traced back to the general resistance of negative quantifiers to take scope below their surface position. A more detailed discussion of additional logically possible readings, in particular interpretations that arise from construing the quantifier restriction *de re*, yet within the scope of the modal (Fodor 1970), can be found in the appendix. The appendix also presents justification for basing the argument to be developed on the more complex scope splitting construction with negated universals, instead of simpler alternatives with negative indefinites.

3. MAPPING SYNTAX TO INTERPRETATION

In this and the following section it will be demonstrated that mapping the split reading onto a syntactic structure has nontrivial consequences for the analysis of HM. There are two specific properties of the mapping procedure from syntax to interpretation which are of particular interest for

[11]The accessibility relation for circumstantial *can* is assumed to be reflexive.

[12]Independence in the opposite direction cannot be established because there are no scenarios which render only the split interpretation true. For the *de dicto* reading to come out as false, it must hold that in all accessible worlds, all boys make the team. But such models automatically fail to satisfy the split reading, too.

[13]This gap is not due to pragmatic reasons. The *de dicto* reading of (12) could e.g. be used as a qualification by a school which for the moment can accept all boys on the team, but guards against the possibility of a (future) shortage of funding, in case of which the team size would have to be reduced. Kayne (1988: fn. 25) makes a similar observation for (i), which, he notes, lacks a narrow scope reading.
(i) Not everybody is bound to be here.

present purposes, both of them involving empirical generalizations about the way in which movement interacts with interpretation. In section 3.1, I will comment on differences in the reconstruction behavior of different logical types of quantifiers. These findings will be used to set the lower structural bound for the interpretation of subjects and (by transitivity) categories that scope over subjects. Section 3.2 addresses the dissociation between the surface position and the base position of modals, presenting evidence for the view that modals are generated below the position in which they surface. According to this conception, the ordering of modals and other categories in the tree is derived by movement, and not by the availability of alternative insertion points for the modal or certain adverbs and negation. These results form the basis of the argument for semantically active HM (SAHM) to be presented in section 4.

3.1. CONSTRAINTS ON QP RECONSTRUCTION

When quantified NPs (QPs) surface in positions that do not correspond to their points of origin, the scope of these QPs can sometimes be reconstructed into a lower position. Although the exact mechanisms underlying 'scope diminishment' - borrowing a term from von Fintel and Iatridou (2004) - are poorly understood, there is an emerging consensus that the logical properties of the QP co-determine its ability to reconstruct. For present purposes, two descriptive generalizations about the scope properties of QPs in A-movement chains are central.[14] First, while indefinites may take scope below raising predicates, illustrated by (20), strong quantifiers (Milsark 1974) cannot reconstruct into the scope of *seem*, as shown by (14), and probably more clearly by (15):

(14) a. Every critic seemed to like the movie. *de re/*de dicto*
b. It seemed that every critic liked the movie. *de re/de dicto*

(15) a. Every movie which was promoted by a critic seemed to impress the jury.
*de re/*de dicto*
b. It seemed that every movie which was promoted by a critic impressed the jury.
de re/de dicto

For (15)a to be true, the individuals promoting the movie must be actual critics in the evaluation world, whereas (15)b leaves open the option that these individuals only appeared to be critics - it could turn out that in fact, they were radical Christians. Provided that the absent *de dicto* interpretation of (15)a is contingent upon reconstruction of *every movie* along with the relative

[14]See Iatridou (2002); Lasnik (1999); Lechner (1998); Wurmbrand and Bobaljik (1999); similar constraints are attested in scrambling chains (see Lechner 1998).

clause, it can be concluded that universals do not reconstruct below *seem.*[15] Further confirmation for the assumption that strong quantifiers resist reconstruction into the subordinate clause comes from contexts involving non-verbal raising predicates as in (16) (Lasnik 1998: 93). Sentence (16)a contradicts the laws of probability, while (16)b is evaluated as true in a situation with five events of tossing ($1/2^5 = 1/32 \approx 3\%$). Again, the absence of an equivalent reading for the raising construction (16)a indicates that strong QPs have only limited access to scope diminishment:

(16) a. Every coin is 3% likely to land heads. $\forall \succ$ *3% likely*/*$\forall \succ$ *3% likely*
b. It is 3% likely that every coin will land heads.

A provisional version of the descriptive condition on strong NPs that was seen to be active in (14) to (16) can be formulated as in (17):

(17) **Strong Constraint** (1st version)
A strong QP cannot reconstruct below raising predicates.

The specifics of (17) still require a minor amendment, though. In particular, the same constraint which is responsible for prohibiting reconstruction in the raising-to-subject constructions (14) to (16) should also operate in contexts in which raising arguably proceeds to an object position. Following Lasnik (1995), such environments are prominently exemplified by ECM-configurations like (18). As documented by (18)a, the ECM-subject has raised into the matrix sentence in overt syntax (see Lasnik 2005 for a diverging view):

(18) I expected everyone not to be there. $\forall \succ \neg/\neg \succ \forall$
a. Syntax: I expected$_1$ [$_{XP}$ *everyone*$_2$ [$_{VP}$ t_1 [$_{NegP}$ not [$_{TP}$ t_2 T° to be ...]]]]
b. LF: I [$_{XP}$ ~~everyone~~ [$_{VP}$ expected [$_{NegP}$ not [$_{TP}$ *everybody* to be ...]]]] $\neg \succ \forall$

Still, the universal retains the ability to be construed within the scope of the negation. This finding is unexpected from the perspective of (17) inasmuch as in order to generate the inverse reading (18)b, the ECM subject would have to reconstruct across the raising predicate *expect*, which itself is restored into its base position at LF. Thus, the Strong Constraint in (17) is too restrictive as it rules out the inverse reading (18)b, and will therefore be revised as in (19):

(19) **Strong Constraint** (final version)
Strong NPs cannot reconstruct below T°.

[15]It is immaterial that relative clauses do not *have* to reconstruct along with their host NPs (Lebeaux 1988). What matters is that if the host NP can reconstruct, the relative clause can do so, too.

According to (19), reconstruction in (18)b is licit because the universal does not cross T°. Thus, (19) tolerates limited applications of reconstruction as in (18), while the standard manifestations in (14) to (16) are not negatively affected by the changes in the revised version.

Next, negative quantifiers are widely believed to resist reconstruction, as e.g. demonstrated by the fact that the proposition expressed by (21) can only be understood *de re* (see von Fintel and Iatridou 2004; Iatridou 2002; Lasnik 1999; Wurmbrand and Bobaljik 1999, a.o.):

(20) a. A critic seemed to like the movie. *de re/de dicto*
b. It seemed that a critic liked the movie. *de dicto*

(21) a. No critic is certain[16] to like the movie. *de re/*de dicto*
b. It is certain that no critic likes the movie. *de dicto*

Negative NPs also differ from strong NPs in that only the latter may undergo short scope diminishment below negation. This disparity accounts for the availability of the inverse scope reading in (22) (Lasnik 1972) and its absence in (23), respectively. (Note on the side that, presupposing that negation is located above T°, the Strong Constraint permits subject reconstruction below negation in (22).)

(22) a. Every guest didn't show up. $\forall \succ \neg / \neg \succ \forall$
b. All that glitters isn't gold.

(23) No guest didn't show up. $\neg\exists\neg \Leftrightarrow \forall / {}^*\neg\neg\exists \Leftrightarrow \exists$

Thus, negative NPs are characterized by even more limited scope options than strong NPs. On present assumptions about the treatment of negative NPs as vehicles of [+neg]-features, the rigid behavior of negative quantifiers is already inherently encoded in the condition (7)a, repeated below as (24), which defines the syntactic aspect of the [+neg]-analysis. For ease of reference, (24)/(7)a will be referred to as 'Negative Constraint'.

(24) **Negative Constraint**
[+neg] must be in the scope of clause-mate NOT at LF.

(24) derives downward scope rigidity of negative NPs by fixing the maximal distance between an abstract category NOT which encodes negation and [+neg]-features licensed by this occurrence of

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[16] *seem* treats clause-mate negation semantically as if it were part of the lower proposition ('Neg-raising'; (i)). Neg-raising is also attested with negative subjects, as in (ii) (from Kayne 1998: fn. 26):
(i) ⟦John does not seem to be there⟧ ⇔ ⟦It seems that John is not there⟧
(ii) ⟦Nobody seems to be there⟧ ⇔ ⟦It seems that nobody is there⟧
The change from *seem* to *is certain* in the examples in the main text makes it possible to avoid interference from Neg-raising in the scope judgements (as e.g. pointed out in Kayne 1998: fn. 26).

NOT. For (21), this has e.g. the effect of ruling out wide reconstruction of *no critic* into the lower clause, blocking the order ¬ ≻ *certain* ≻ ∃ (on how to exclude *certain* ≻ ¬ ∃ and (23) see section 4.2; on discussion of a more natural version of the Negative Constraint see section 6.3).

It will also be useful to be able to refer at times to a more descriptive version of the Negative Constraint as in (25) (without any ontological commitment):

(25) **Negative Constraint**$_{\text{descriptive version}}$
An NP cannot reconstruct if it is interpreted as a negative quantifier

The descriptive version differs from the 'official' version in (24) in that the former expresses a generalization about where in the tree negative quantifier denotations can be found, whereas the latter regulates the distribution of morphologically negative NPs.

In order to parse the scope splitting constructions in (3) to (5) into a tree akin to (2)b, one last ingredient is still missing. Section 3.2 expands on this issue by providing a strategy for determining the structural location of modals, while section 4 will finally present the synthesis of the argument for SAHM.

3.2. THE POSITION OF MODALS

There is good reason to believe that English modals are generated in a VP-external position, from where they move into a higher head which is located above clausal negation and (some aspectual) adverbs. It is arguably the effect of this movement which carries the modal to the left of *not*, *always* and *never* in (26) to (28). In what follows, I will focus on examples involving negation, as in (26); this limitation does not adversely affect the generality of the argument, though.

(26) John can$_1$ not t$_1$ come along today. ¬ ≻ ◇ /??◇ ≻ ¬

(27) He can$_1$ always t$_1$ count on me. *always* ≻ ◇/*◇ ≻ *always*

(28) He can$_1$ never t$_1$ do that. *never* ≻ ◇/*◇ ≻ *never*

A first indication that modals are indeed generated in a position below negation and (certain aspectual) adverbs comes from the observation that modals precede these operators yet display a strong preference for narrow scope (Lerner and Sternefeld 1984; Öhlschläger 1989). This dissociation of surface position and scope is straightforwardly captured by an analysis that adopts low base-generation, movement from the lower to the higher position, and reconstruction. For ease of reference, the base and the derived position of the modal will be identified with T° and AgrS°,

respectively, with the modal passing through the intermediate head Neg°, as detailed in (29):[17]

(29) John $[_{AgrSP}$ can$_1$ $[_{NegP}$ not t_1 $[_{TP}$ t_1 come along today]]].

In order to establish that the scope order in (26) is actually the product of modal raising and reconstruction, it must be ascertained that scope reversal does not result from an alternative derivation in terms of covert movement of negation ('Neg-Shift') across the modal. A strong argument against Neg-Shift is furnished by slightly more complex examples such as (30). (30) includes a PPI (*sometimes*) which is assigned wide scope w.r.t. the modal, which in turn takes scope below negation:

(30) It can sometimes not be avoided to confront the enemy. *sometimes* $\succ \neg\Diamond$

The critical property of the PPI in (30) consists in its ability to introduce two additional scope criteria which will be seen to exclude a Neg-Shift analysis. First, the PPI must stay outside the scope of negation. Combined with the narrow scope tendency of circumstantial modals, this requirement leads to the scope order *sometimes* $\succ \neg\Diamond$. The LF underlying this reading can now either be attributed to reconstruction of the modal, as documented by (31), or to Neg-Shift followed by covert movement of the PPI *sometimes* as in (32):

(31) *Derivation A: reconstruction of modal*

a.		$[_{AgrSP}$ it can$_1$	[sometimes	$[_{NegP}$ not	$[_{TP}$ t_1	*Surface order*
b.			[sometimes	$[_{NegP}$ not	$[_{TP}$ can	*Reconstruction*

(32) *Derivation B: Neg-Shift*

a.		$[_{AgrSP}$ it can$_1$	[sometimes	$[_{NegP}$ not	$[_{TP}$ t_1	*Surface order*
b.	$[_{XP}$ not$_2$	$[_{AgrSP}$ it can$_1$	[sometimes	$[_{NegP}$ t_2	$[_{TP}$ t_1	*Covert Neg-Shift*
c.	$[_{YP}$ sometimes$_3$ $[_{XP}$ not$_2$	$[_{AgrSP}$ it can$_1$	[t_3	$[_{NegP}$ t_2	$[_{TP}$ t_1	sometimes *QRs*

Second, Szabolcsi (2002) discusses a property of an intriguing class of PPIs which makes it possible to adjudicate between the two competing analyses in (31) and in (32). She observes that the weak indefinite PPI *somewhat* in (33) has to satisfy two conflicting requirements simultaneously. As a PPI, *somewhat* would have to escape the scope of negation by Neg-Shift. However, being a weak indefinite, *somewhat* must not cross the negative island established by negation, resulting in an ill-formed output string:

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[17]Independent motivation for locating NegP inbetween TP and AgrSP, and movement from T° to AgrS° can e.g. be found in Johnson (2003: 68ff). For discussion of the syntax of negation see Zeijlstra (2004: 167ff). Cormack and Smith (1998, 1999, a.o.) present a non-derivational account for mismatches between scope and order which employs a non-standard procedure for mapping syntax to PF and LF.

(33) *John doesn't appreciate this somewhat

Sometimes in (30) behaves now just like *somewhat*, as illustrated by (34). This is entirely expected since *sometimes* is also interpreted as a weak, 'non-specific' indefinite.

(34) *John didn't sometimes come to class.

But given that *sometimes* must not covertly move across negation in (34), it should not be able to do so in (30), either. Moreover, since the success of the Neg-Shift derivation in (32) crucially depends on the ability of the adverb to cross negation subsequent to Neg-Shift ((32)c), it also follows that (30) cannot be the result of Neg-Shift. Thus, modals must be allowed to reconstruct, as implied by the derivation in (31), which lets modals originate below their surface position and moves them to the higher heads Neg° and AgrS°.

With these assumptions in the background, the next section proceeds to the core argument for the view that HM can have an effect on semantic interpretation (SAHM).

4. ANALYSIS

4.1. THE ARGUMENT FOR SAHM

From the discussion so far, it can be inferred that examples with negated universals, repeated below, are characterized by the following four properties listed under (35). These properties account for possible interpretations of (5) and, more importantly, also underlie the argument for SAHM.

(5) Not every boy can make the basketball team. $\neg\forall \succ \Diamond$ / $*\Diamond \succ \neg\forall$ / $\neg\Diamond \succ \forall$
(*de re* / **de dicto* / split)

(35) a. The modal *can* overtly moves from T° to Neg° to AgrS°
b. *not every boy* bears the [+neg]-feature and must be in the scope of abstract negation NOT (follows from Negative Constraint (24))
c. *not every boy* must not reconstruct below T° (follows from Strong Constraint (19))

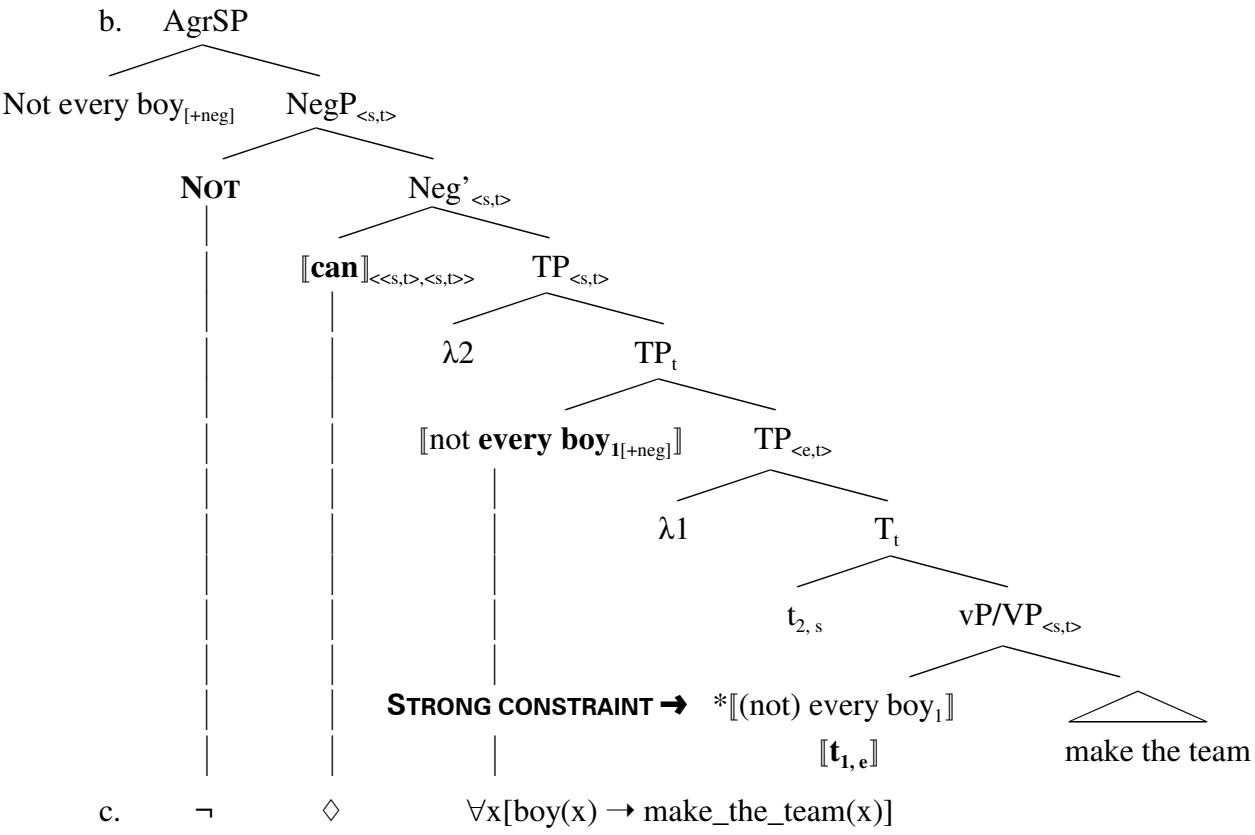
To begin with, consider the derivation of the split reading. Since *not every boy* is marked [+neg], and the subject in SpecAgrSP precedes the abstract negation NOT in NegP, the [+neg] licensing condition (7)a/(24) requires that the subject reconstructs into the local scope of its licensing operator. Hence, a lower copy of the subject is submitted to interpretation, as shown by representation (36)a, which is then mapped onto the split reading in (36)b by the interpretive convention that regulates the transition from a morphologically negative QP to its contradictory:

(36) a. ⟦NOT can [not every boy]$_{[+neg]}$ make the basketball team⟧ =
b. = ⟦NOT can every boy make the basketball team⟧ $\neg\Diamond \succ \forall$

The representations in (36) do not reveal the exact location in which the subject is to be interpreted yet. It can now be shown, though, that on plausible assumptions, the LF-position of the subject is above the node in which the modal originates. As a result, the modal would have to be interpreted in a derived position. The details of the representation for (5) are provided by tree (37).

(37) a. Not every boy can make the team. ¬◇ ≻ ∀ / ¬∀ ≻ ◇ / *◇≻ ¬ ∀

b.



c. ¬ ◇ ∀x[boy(x) → make_the_team(x)]

The distribution of subject copies in (37) is determined by the Strong Constraint (alias property (35)c), which blocks reconstruction of the subject into a slot below T°. The lowest interpretable subject copy (bold face ***every boy***) is consequently located in SpecTP at LF.[18,19] Since TP is above

[18]Sauerland (2003) presents evidence that subjects can be reconstructed into a low A-position he identifies with vP. As Sauerland demonstrates, this position must be below negation (see (i)), but still high enough to bind an experiencer (see (ii)):

(i) Every student mustn't get an A. □ ≻ ¬∀ (Sauerland 2003: 309; (4))

(ii) Every child$_2$ doesn't seem to his$_2$ father to be smart. ¬ ≻ ∀ (ibid, 310; (7))

Sauerland's insight can be maintained without loss in the present system if it is assumed that the modal in (i) is interpreted in AgrSP, the subject in SpecTP, and the negation in NegP, between AgrSP and TP.

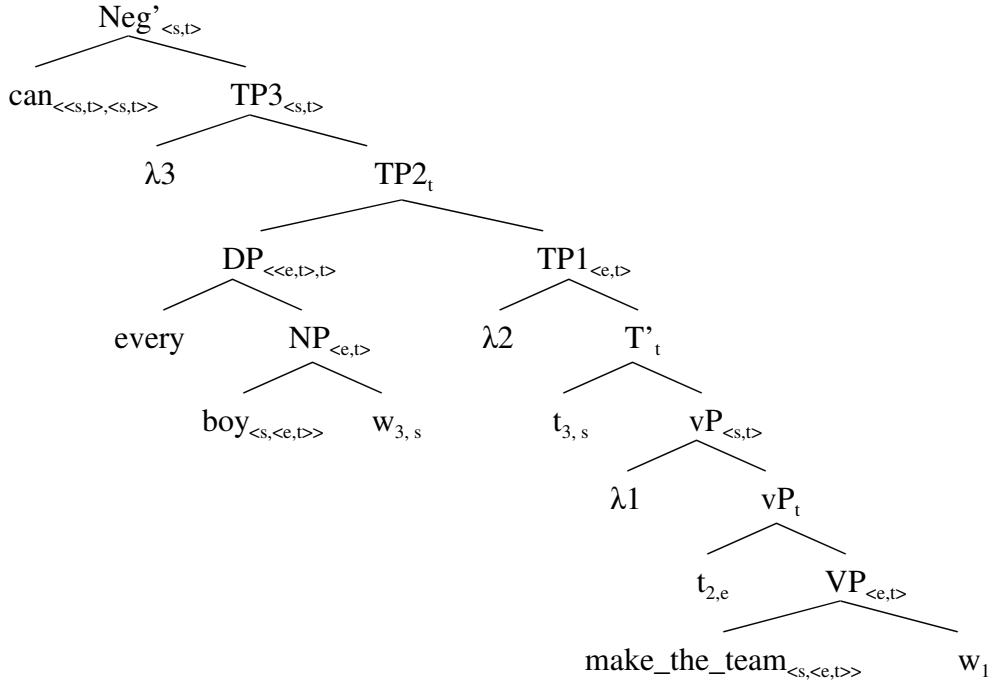
[19]Note that a subject copy in SpecvP is legitimate from the perspective of the Negative Constraint. For negative (indefinite) NPs which are interpreted in (about) this position see ex. (96).

the base position of the modal, and the modal takes scope above the universal, it follows that the split reading has to be derived from interpreting *can* in a derived head (Neg°). Thus, the availability of a split reading provides evidence in support of SAHM.

As for the remaining two readings, the surface *de re* interpretation $\neg\forall \succ \Diamond$ arises from interpreting the subject in SpecTP, where [+neg] can be licensed, and reconstruction of the modal into its base position T°. Finally, the absence of the *de dicto* reading is not accounted for under the present proposal, because it should also be possible to interpret the modal in AgrS° from where it takes scope above NOT. This shortcoming indicates that the present formulation of the Negative Constraint is too weak. More precisely, it seem that the final version of this condition must radically ban scope reversal of (semantically) negative NPs below lower operators, deriving something along the lines of the descriptive version of the Negative Constraint stated in (25). One possible venue to pursue might be to give up the assumption that NOT originates in the same projection NegP that also holds the overt clausal negation (*not*), and to generate NOT in a high position above the highest derived position of the subject (AgrSP; for some evidence for high and low NegP see section 6.3).

Turning to the semantic details of the proposal for the split reading next, I assume that world variables are explicitly represented as phonetically unrealized entities in the object language and that predicates always enter the derivation supplied with such empty arguments as their sister nodes (see Heim & Fintel 2000; Percus 2000, a.o.). For the relevant parts of (37), spelled out in (38) and (39), this has the consequence that the denotations of *make_the_team* (see (39)a) and *boy* (see (39)b) apply to silent world variables in an initial step of the semantic computation.

(38)



(39) a. $[\![TP1]\!] = \lambda 2[make\_the\_team(w_3)(2)]$

b. $[\![DP]\!] = \lambda Q \forall x[boy(w_3)(x) \rightarrow Q(x)]$

c. $[\![TP2]\!] = \forall x[boy(w_3)(x) \rightarrow make\_the\_team(t_3)(x)]$

d. $[\![TP3]\!] = \lambda 3 \forall x[boy(3)(x) \rightarrow make\_the\_team(3)(x)]$

e. $[\![Neg']\!] = \lambda R_{<s,t>} \lambda w \exists w'[Acc(w)(w') \wedge R(w')] ([\![TP3]\!]) =$
$= \lambda w \exists w'[Acc(w)(w') \wedge \forall x[boy(w')(x) \rightarrow make\_the\_team(w')(x)]]$

Combining the subject with its sister nodes results in the open formula (39)c, which contains two occurrences of the free world variable w_3. Next, the λ-binder introduced by movement of the modal (λ3) abstracts over these variables, serving a dual function (see (39)d). On the one side, λ3 abstracts over the trace of the modal, which is assumed to be of type s.[20] On the other side, λ3 captures the world variable inside the subject DP, yielding a *de dicto* interpretation for the restrictor. In the final step, depicted under (39)e, the modal (type <<s,t>,<s,t>>), which is interpreted in the derived position Neg°, applies to the TP denotation. In combination with higher negation, (38) accordingly yields the split *de dicto* reading. (Negation not represented in (38).)

Crucially, in the resulting logical representation (39)e, scope inversion between *can* and *every boy* is contingent upon head movement of the modal. Thus, the analysis underlying (37) entails that HM can have semantic reflexes, providing a first piece of evidence for SAHM. The particular interpretation of the data presented above also conflicts with a PF-analysis of HM, and can accordingly be used as an argument in support of a conservative syntactic treatment of displacement of terminals.

4.2. AN ATTEMPT AT DERIVING SCOPE RIGIDITY OF NEGATIVE NPS

The current section briefly expands on implications of the analysis for the treatment of reconstruction with negative quantifiers more generally. Together with standard views about the syntactic evolution of the tree, the [+neg] feature analysis not only naturally represents scope splitting in contexts such as (37), but also offers an explanation for the general resistance of negative NPs to reconstruct below raising predicates and (clause mate) negation.

The subject of (40) can in principle be interpreted in three different positions, but only a single reading - the surface scope interpretation - is actually attested.

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[20]The world variable t_1 is bound by the λ-binder introduced by vacuous movement of PRO, as suggested in Heim and Fintel (2001: 58). Note that on current assumptions, the modal can never be interpreted strictly *in-situ*, but always needs to undergo short (LF-)movement.

(40) No critic$_{[+Neg]}$ is certain to like the movie. (= (21))

a. [$_{NegP}$ NOT is [$_{TP}$ [no critic$_{[+Neg]}$] [$_{VP/AP}$ certain to like the movie]]] ¬∃ ≻ *certain*
b. *[$_{NegP}$ NOT is [$_{TP}$ [$_{VP/AP}$ certain [$_{TP}$ [no critic]$_{[+Neg]}$ to like the movie]]]] ¬ ≻ *certain* ≻ ∃
c. *is [$_{TP}$ [$_{VP/AP}$ certain [$_{NegP}$ NOT[$_{TP}$ [no critic]$_{[+Neg]}$ to like the movie]]]] *certain* ≻ ¬∃

In the well-formed *de re* representation (40)a, *no critic* undergoes short reconstruction into the matrix SpecTP, licensing the [+neg]-feature which now resides within the scope of NOT at LF. The parse in (40)b minimally differs from (40)a in that the subject has been reconstructed into the lower clause, resulting in an unattested split reading across a raising predicate. The structure is excluded by the Negative Constraint because reconstruction into the lower clause violates the clause mate condition on the relation between the [+neg] feature and NOT (see fn. 10 for independent motivation for this restriction). Finally, in (40)c, the subject reconstructs into the lower SpecTP again. But this time, the abstract NOT is generated in the embedded clause, too, in observance of economy. At first impression, one is therefore led to expect that the derivation for the unattested narrow-scope *de dicto* interpretation should converge.

(40)c can be excluded by independent syntactic considerations, though. To begin with, (41) illustrates that related constructions in which a raising subject enters a relation with an overt (*there*) instead of a covert (NOT) category inside the embedded clause are ill-formed. It is not implausible that (40)c is captured by the same condition that prohibits (41)a:

(41) a. *A man$_1$ seems *there* to be t$_1$ in the room
b. seems *there* to be [a man] in the room

Moreover, the LF in (40)c falls short of satisfying an independent criterion on derivations, viz. the Improper Movement Constraint, which rules out certain combinations of A- and Ā- dependencies. (42) provides a version that transposes the traditional concept of A/Ā-movement into the currently more popular Agree-based system:

(42) Improper movement constraint (Agree-version)

If a category C partakes in an Ā-Agree dependency at node n, it must not enter into an A-dependency at a node that dominates n.

Classic instances of improper movement prototypically involve *wh*-movement, where the constraint e.g. excludes subsequent applications of *wh*-movement and raising of one and the same category. Moreover, on a widely accepted view, the distribution of [+neg] features is governed by principles similar to the ones which are thought to be responsible for the licensing of *wh*-phrases. Haegeman and Zanuttini (1996), for one, express various restrictions on negative NPs by appealing to the Neg-

Criterion, which they define in analogy to the *wh*-criterion of Rizzi (1991).[21] It is therefore only natural to expect that the application of (42) also has empirical manifestations in the domain of negative licensing. I would like to suggest that exactly such a case has been identified above in the guise of (40)c.

As detailed by (43), the subject of (40)c enters both an Ā-dependency ([+neg]-licensing) and an A-dependency (raising). Moreover, the node delineating the Ā-dependency (☞) is dominated by the node which demarcates raising (☛). As a result, the derivation fails to satisfy the improper movement constraint.[22]

(43) a. is $[_{TP}\ [_{VP/AP}$ certain $[_{NegP}$ NOT ☞ $[_{TP}$ [no critic$_{[+Neg]}$] to ... *[+neg]-licensing*

b. ☛$[_{AgrSP}$[no critic$_{[+Neg]}$] is $[_{TP}\ [_{VP/AP}$ certain $[_{NegP}$ NOT $[_{TP}$ to ... *Raising*

Apart from raising, the (descriptive version of) the Negative Constraint was also intended to capture generalizations about monoclausal examples like (23), repeated below as (44).

(44) No guest$_{[+neg]}$ $[_{NegP}$ didn't show up]. ¬∃¬ ⇔ ∀ / * ¬¬∃ ⇔ ∃

Observationally, the unavailability of the reading *not - no guest* was taken to indicate that the subject must not reconstruct below negation, as schematized in (45):

(45) *$[_{NegP}$ NOT not $[_{TP}$ no guest$_{[+neg]}$ show up]]. ¬¬∃ ⇔ ∃

Since nothing what has been said so far prohibits the subject copy from being interpreted in SpecTP, it appears as if (45) can only be excluded by stipulation.

This initial conclusion is based on a misconstrual of the relations between overt and covert negative marking, though. English, which is not a Negative Concord language, demands that each overt negative expression is paired with a logical negation of its own. It follows that for the derivation to succeed, both *no guest* and *not* in (44) have to be supplied with a separate abstract NOT

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[21]For discussion see Zeijlstra (2004). The Neg-Criterion requires specifier-head relations, instead of scope (i.e. c-command at LF) to apply between the [+neg-]feature and the semantic negation. This difference is immaterial for present purposes, though.

[22]The system has enough flexibility in order to counter the potential objection that the creation of the Ā-dependency in (43) does not derivationally precede raising, but is delayed at LF. One way to remove this apparent disparity between Improper Movement with [+neg]-features and *wh*-phrases consists in assuming that negative NPs check their [+neg]-features already in overt syntax (as e.g. in Penka 2002), but that they also need to satisfy an independent scope requirement at LF which then drives reconstruction. The latter might be similar to that found with NPIs. On an alternative implementation, negative NPs are endowed with two features, which have to be eliminated in overt syntax and at LF, respectively.

operator. Representation (46), which renders the attested surface scope order ¬∃¬, satisfies this requirement by projecting an additional NegP (NegP2) that holds a second occurrence of NOT:

(46) $[_{NegP2}$ NOT [...[no guest]$_{[+neg]}$ $[_{NegP1}$ NOT $[_{Neg1'}$ not $_{[+neg]}$ $[_{TP}$ t ... ¬∃¬ ⇔ ∀

Crucially, the [+neg]-feature analysis does not produce the unavailable scope order, because there is no motivation for reconstructing the subject *no guest* into the scope of the lower NOT:

(47) *$[_{NegP2}$ NOT [... $[_{NegP1}$ NOT $[_{Neg1'}$ not $_{[+neg]}$ $[_{TP}$ ***[no guest]**$_{[+neg]}$ ...¬¬∃ ⇔ ∃

Given standard conceptions of economy, subject reconstruction in (47) in therefore blocked. Thus, the [+neg]-feature analysis also offers a principled explanation for the inability of negative subjects to be read within the scope of clausal negation.

5. THE LF-POSITION OF THE SUBJECT

The discussion in section 4.1 outlined the structure of an argument in favor of SAHM. But the validity of the argument falls and rises with the accuracy of the tools that are used to locate the interpretive position of the subject in tree (37). In particular, the evidence is conclusive only if it can be shown that the LF position of the subject is above the position in which the modal originates. In (37), this conclusion was secured by the Strong Constraint, which prohibits reconstruction of strong NPs below T°. This premis encounters a challenge, though. If vP and TP could be shown to be separated by further categories which may host additional subject copies (AspP, PerfP, AuxP,....), the evidence for the Strong Constraint presented in section 3.1 is compatible also with subject reconstruction into a position *below* T°. All that matters for the Strong Constraint is that strong subjects must not be relocated into the scope of a raising predicate at LF. It therefore has to be demonstrated that the subject is not interpreted in one of these intermediate landing sites in (37). Otherwise, the modal could be translated in its base position, invalidating the evidence for SAHM. (In addition, the subtle nature of the judgements which the Strong Constraint owes its existence to makes having an independent measure for the height of the subject all the more desirable.)

A first argument in this direction can be derived from the selectional properties of raising modals. On a widely shared assumption, raising modals embed small clauses (Stowell 1983, 2004). Moreover, as initially observed in Stowell (1981) and Williams (1983), small clauses are scope islands, they minimally contrast with clausal complements in that their subjects cannot be construed *de dicto:*[23]

[23]For a way to derive the scope island hood of small clauses see Johnson (2001b).

(48) a. A linguist seems to be unhappy. *de re/de dicto*
b. A linguist seems unhappy. *de re/*de dicto*

Turning to the scope splitting example (37), the combination of these two premisses is now sufficient in order to exclude subject reconstruction into specifiers potentially intervening between TP and vP. More precisely, transposing the small clause analysis to raising modal constructions entails that all nodes c-commanded by the base position of the modal (☛) are scope islands for the subject:

(49) Subject_k ... [$\text{Modal}_{\text{base position}}$ ☛[$_{\text{Small Clause}}$ t_k ....]] *No reconstruction into* t_k

On this view, the possibility that other functional categories could intervene between TP and vP in (37) turns out to be irrelevant for the strength of the argument.

In fact, adopting the analysis above has the even more radical consequence of rendering reconstruction below the base position of raising modals generally impossible. If correct, it would therefore follow that all *de dicto* readings below circumstantial modals derive from interpreting the modal in a derived position. Although this at first sight looks like an attractive further support for SAHM, the generality of claim makes it hard to be falsified, and therefore weak in its empirical foundation.

Moreover, the analogy between small clauses and complements of raising modals is less straightforward than one might hope. First, raising modals allow *de dicto* readings for weak subjects, while it was the absence of such readings in (48)b which formed the basis of the scope island hypothesis. Second, the evidence for treating complements of raising modals as small clauses is, as far as I know, not very strong, and at least requires further empirical justification. For at least these reasons, it would be advantageous if it were possible to find independent empirical support for the claim that the subject in (37) is interpreted no lower than in SpecTP. There are two pieces of evidence - one weaker and one stronger - indicating that this view might be correct, which I will outline in the following two subsections in turn.

5.1. SCOPE FREEZING

Barss (1986) pointed out that predicate fronting results in *scope freezing* (for discussion see Elbourne and Sauerland 2002; Lechner 1996, 1998). The fronted, VP-internal quantifier *every student* in (50) (from Huang 1993) cannot be assigned scope above the subject *noone*:

(50) [Teach every student], noone will. $\neg\exists \succ \forall$ / $^*\forall \succ \neg\exists$

Even though the concrete factors involved in the analysis of scope freezing are poorly understood, any successful theory has to achieve two objectives: first, it must prohibit QR out of the lower copy

of the predicate across the subject, and second, it must block reconstruction of the subject into the copy of the fronted constituent. In particular the second desideratum is of significance for the present discussion, because it establishes a lower boundary for the LF-position of the subject. If a derivation such as (51) admitted subject reconstruction into the lower copy of the fronted constituent, as in (51)c, it should be possible to generate the inverse scope reading represented in (51)d:

(51)	a.	$[_{XP}$ teach every student$]$ $[_{YP}$ noone will$]$		*Surface order*
	b.	$[_{YP}$ noone will$][_{XP}$ teach every student$]$		*Reconstruction of XP*
	c.	will $[_{YP}$ $[_{XP}$ noone teach every student$]]$		*Subject reconstruction*
	d.	will $[_{YP}$ $[_{XP}$ every student$_1$ $[_{XP}$ noone teach $t_1]]]$	$\forall \succ \neg\exists$	*(Short) object QR*

Thus, predicate fronting provides important clues as to the shape of clauses in that it allows one to measure the minimal height of the subject at LF. More specifically, in a construction in which a predicate denoting node XP has been fronted, the lowest possible LF position for the subject is excluded by XP. Before this test can be deployed, it is still necessary to determine the exact size (or categorial status) of the fronted constituent XP, though.

While the evidence for or against a particular view on how much structure is dislocated in predicate fronting is scarce, there are at least three considerations which can be interpreted as a bias toward an analysis in which XP is the sister node of T°, i.e. a large constituent which reaches up to the lower position of the subject.

First, Huang (1993) demonstrates that VP-fronting actually targets constituents which include the base position of the subject, i.e. vPs in current theorizing. Matsuo (2001) furthermore provides evidence that the node which undergoes fronting cannot be a vP, but must be at least as large as AspP (for arguments that VP never undergoes fronting alone see also Abels 2003).

Second, if movement can, in a given context, target more than one node, and if these nodes are ordered in a dominance relation, as α, β an γ are in (52)a, then the Minimal Link Condition (or Attract Closest) favors attraction of the highest node, as schematized by (52)b, over movement of more deeply embedded ones, as in (52)c or (52)d:

(52)	a.					[attractor	$[_\alpha$	$[_\beta$	$[_\gamma$	$]]]]$
	b.	$[_\alpha$	$[_\beta$	$[_\gamma$	$]]]$	[attractor	t_α			]
	c.	*	$[_\beta$	$[_\gamma$	$]]$	[attractor	$[_\alpha$	t_β		$]]$
	d.	*		$[_\gamma$	]	[attractor	$[_\alpha$	$[_\beta$	t_γ	$]]$

Finally, according to an influential view, ellipsis operations must be licensed by a local relationship with an overt head (Johnson 2001a; Lobeck 1995). Similar ideas have been popular in the analysis of movement ('ECP'). Again assuming that licensing conditions on ellipsis and on movement lend themselves to a common treatment, the licensing head *will* in predicate fronting

structures such as (51) has to be 'close' to the moved category, repeated as (53)a below:

(53) a. [$_{\alpha}$ teach every student] [$_{YP}$ noone [*will*$_{licensing\ head}$ t$_{\alpha}$]] (= (51))
b. *[$_{\beta}$ teach every student] [$_{YP}$ noone [*will*$_{licensing\ head}$ [$_{\alpha}$ t$_{\beta}$]]

As for the precise definition of 'closeness', it seems natural to adopt not only a linear condition (PF-adjacency), but also a structural one ('government'), as encoded in what used to be known as the ECP. This leaves as the most plausible candidate the requirement that the licensing head (*will*) be the sister of the moved category, as in (53)a. The parse in (53)b, in which the actually dislocated category (β) is *not* the largest category that can be moved (α) can then be excluded given that α intervenes between *will* and the trace/copy of the moved term. Again, these speculations, which clearly require further substantiation, support the view that predicate fronting targets the highest node compatible with surface ordering (i.e. the sister of T°).

In sum, there is suggestive yet accumulative evidence that VP-fronting pied-pipes the largest possible amount of structure. As a consequence, the finite verb (*will* in (51)) ends up as the sister node of the trace/copy. From these considerations and the observation that fronted predicates induce scope freezing it also follows now that the sister node of T° always functions as a scope island. It is this property of VP-topicalization which can be used to locate the subject position in scope splitting.

Note first that VP-fronting appears to be compatible with a split reading for a negated universal, as documented by (54). Even though clearly marked, (54) sharply contrasts with the ineligible instances of fronting with main raising verbs in (55):

(54) ?The photographer told them that not every child can sit in the first row, and/but [sit in the first row], not every child can. ¬◇ ≻ ∀

(55) a. *...and [sit in the first row], not every child seems to.
b. *...and [to sit in the first row], not every child seems.

What is of particular relevance for present concerns is that on the assumptions about predicate fronting made above, the split reading in (54) can only be produced by interpreting the subject in SpecTP, as shown in more detail by the LF representation (56)b:

(56) a. [$_{\alpha}$ sit in the first row], not every child can. ¬◇ ≻ ∀
b. LF: [$_{NegP}$ NOT [$_{Neg}$ can$_2$ [$_{TP}$ [**not every child**]$_{[+neg]}$ t$_2$ [$_{\alpha}$ sit in the first row]]]]

All other, intermediate subject positions inside the fronted constituent α are inaccessible for reconstruction due to the workings of whatever principle is responsible for scope freezing: Moreover, (56)b also highlights that in order to take scope above the subject, the modal has to be interpreted

in a derived position. Thus, combinations of VP-fronting and scope splitting present a first potential argument in defense of the SAHM-Conjecture.

5.2. NEGATIVE POLARITY LICENSING

The second piece of support for interpreting subjects high - and thereby also for SAHM - can be distilled from split scope configurations which include Negative Polarity Items (NPIs). Observe to begin with that negated universals license NPIs if the QP is assigned surface scope ((57) from Horn 2000: (49b); see also Penka 2002: fn. 37):

(57) Not everyone who works on negation has ever read any Jespersen. $\neg\forall \succ$ NPI

Interestingly, scope splitting for some reason appears to conflict with NPI-licensing, as demonstrated by the deviance of (58). The relative scope order of the NPI w.r.t. the universal and the modal (to the degree that they are logically independent) does not affect acceptability judgements; the example is ill-formed in all split interpretations.[24]

(58) *Not everyone can ever t be on the team. $\neg$ ($\succ$ NPI) $\succ \Diamond$ ($\succ$ NPI) $\succ \forall$ ($\succ$ NPI)

Moreover, (59) testifies to the fact that modals (and split indefinites) do not interfere with NPI-licensing, implying that the degraded status of (58) should not be blamed on the presence of *can* (see also (61) below; see also von Fintel and Iatridou 2005: 21f, who reach the same conclusion).

(59) Nobody can ever be on the team. $\neg\exists \succ \Diamond \succ$ NPI/$\neg\Diamond \succ \exists \succ$ NPI

A split reading for (58) is arguable unavailable for the same reason that the paraphrase of (58) given in (60), which is synonymous *modulo* tense, is ill-formed:

(60) *It is not possible that everybody will ever be on the team. $\neg\Diamond \succ \forall \succ$ NPI

In both cases, a universal intervenes between negation and the NPI. Removing the quantifier salvages (60).

(61) It is not possible that you will ever be on the team. $\neg\Diamond \succ$ NPI

Thus, it is tempting to relate the absence of the split interpretation in (58) to the same condition which is usually evoked in handling contrasts such as (60) vs. (61), or those illustrated in (62) and

[24]It is orthogonal for present purposes whether (60) is well-formed on a non-split interpretation. According to informants, this is not the case, raising the additional question why (60) contrasts with (57).

(63): Linebarger's (1980) Immediate Scope Constraint (see also Guerzoni, to appear).

(62) a. He didn't like anything. (Linebarger 1987)
b. *He didn't always like anything. * ¬ ≻ ∀ ≻ NPI

(63) a. I didn't want her to eat any cheese. (Linebarger 1980: 29)
b. *I didn't want every boy to eat any cheese. * ¬ ≻ ∀ ≻ NPI

For this analysis to succeed, the subject of (58) has to reconstruct into a position above the NPI, from where it can disrupt the relation between negation and *ever*, triggering a violation of the Immediate Scope Constraint. But before the subject can be associated with a concrete node, it is still necessary to identify the attachment site of the NPI *ever.*

Ever and *always* are both aspectual modifiers, but they are not in strict complementary distribution. If they cooccur, *ever* needs to precedee *always*, as the Immediate Scope Constraint might lead one to expect:

(64) a. No one source is ever always authoritative.
b. *No one source is *always* ever authoritative.

(65) a. Where in the world is it ever always easy?
b. *Where in the world is it *always* ever easy?

Furthermore, *always* takes scope above modals to its left (see section 3.2), indicating that *always* originates as a TP-adjunct, and that modals optionally reconstruct below *always:*

(27) $[_{AgrSP}$ He $[_{AgrS'}$ can$_1$ $[_{TP}$ always $[_{TP}$ $[_{T'}$ t$_1$ count on me]]]]] *always* ≻ ◇/*◇ ≻ *always*

According to the ordering generalization extracted from (64) and (65), *ever* is located higher than *always.* Together with the scope fact (27) this entails that *ever* is generated as a TP-adjunct or as an adjunct to a projection above TP.

It also follows now that the subject intervener in (58), repeated below, has to be squeezed inbetween the negation and the TP-adjunct *ever* in order to induce a violation of the Immediate Scope Constraint.

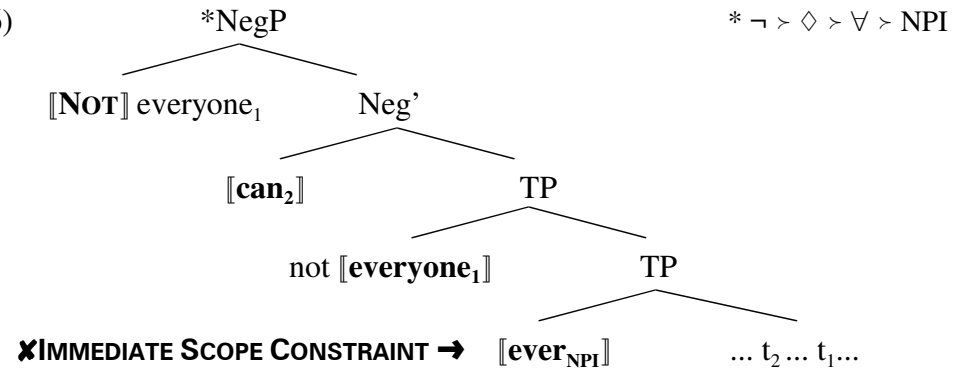
(58) *Not everyone can ever t be on the team. ¬ (≻ NPI) ≻ ◇ (≻ NPI) ≻ ∀ (≻ NPI)

Furthermore, as this strategy eliminates only one member of the family of readings for (58) (viz. ¬ ≻ ◇ ≻ ∀ ≻ NPI), the remaining two interpretations must be removed by independent means. I will comment on the two cases in turn.

One way to arrive at the desired structural configuration for the application of the Immediate Scope Constraint consists in parsing the subject copy into an outer specifier of TP, from where it

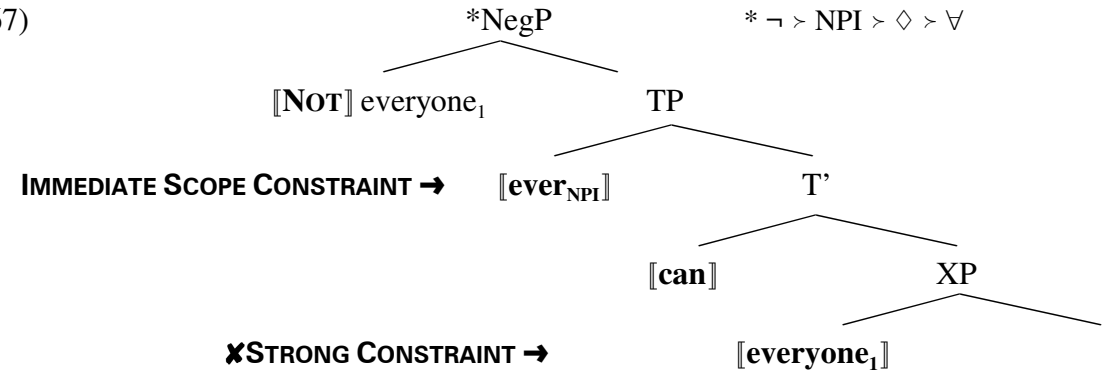
impedes NPI licensing, as shown by (66). This derivation excludes (58) by assuming that the split reading represents the scope order ¬ ≻ ◇ ≻ ∀ ≻ NPI:[25]

(66)



Next, the absence of the alternative split scope order ¬ ≻ NPI ≻ ◇ ≻ ∀ encapsulates the crucial (reductio) argument against long subject reconstruction below T° (and for SAHM). Suppose that the subject in (58) had the option to be interpreted below TP, in the specifier of some intermediate XP, as detailed in (67). In this alternative derivation, the modal is located in its base position T° at LF, and no category intervenes between the NPI and its licensing negation. Thus, (58) observes the Immediate Scope Constraint. Hence, if (58) could be parsed as in (67), one would wrongly be led to expect (58) to possess the split reading ¬ ≻ NPI ≻ ◇ ≻ ∀:

(67)



The unavailability of scope splitting for (58) can accordingly be traced back to the assumption that the universal subject is interpreted above XP, as demanded by the Strong Constraint. On current views, the Strong Constraint, which blocks reconstruction of strong NPs below T°, prevents the NPI from escaping the verdict of the Immediate Scope Constraint.

[25]Alternatively, the absence of this reading can be taken to indicate that subject reconstruction into a TP-adjoined position in not possible.

Considerations similar to the ones raised in the discussion of (67) also exclude the third logically possible scope order for (58) ($\neg \succ \Diamond \succ$ NPI $\succ \forall$). This last available derivation differs from (67) minimally in that the modal is interpreted in its derived position Neg°. Just like (67), this reading cannot be produced due to illicit long subject reconstruction into SpecXP.

Note in passing that the argument above has the objective of securing the LF-position of the subject, and is not concerned with extracting from the data direct support for SAHM. If structures that violate a syntactic constraint, but are otherwise well-formed (such as (66)) are nonetheless assigned a semantic value, the modal in (66) might indeed be interpreted in a derived position. Whether or not this view turns out to be correct is orthogonal for the soundness of the main argument, though.

Above, in connection with (66) and (67), it was argued that NPI-licensing elicits evidence that subjects must be interpreted at least as high as in SpecTP, furnishing support for the Strong Constraint. This descriptive generalization characterizing scope diminishment does not exist in isolation, though. The most organic analysis explains the prohibition on recycling of negative subject copies below TP as a function of syntactic economy, which prefers shorter reconstruction patterns over longer ones. More precisely, one might think that licensing of the [+neg]-feature on *not everyone* by the abstract negation NOT can already be achieved by interpreting the subject in SpecTP, blocking derivations which locate the subject further down in the tree. Attractive as it is, this approach is challenged by a selected class of contexts in which copies of negative subjects also appear to be attested *below* SpecTP (see (96) in section 6.2; the economy analysis may turn out to be tenable on a certain additional proviso; see section 6.3).

Recapitulating the results of section 5, the interaction between scope splitting and NPIs provides a second piece of independent evidence for the claim that universal subjects cannot be interpreted below TP. As explicated in section 4, this finding furthermore implies that certain contexts with raising modals manifest instances of SAHM.

6. TRANSITIVE 'NEED'

The argument for SAHM presented so far was predicated on the assumption of a highly volatile head, the modal *can*. It was assumed that this modal is generated in a position which excludes the main predicate and its arguments (vP, VP), and moves to a position above the derived position of the subject (for present purposes AgrSP). In what follows, I will present a second piece of evidence for SAHM. From its logic, the argument is identical to the one discussed before. It differs, though, in the way in which the head combines with its sister node. While the modal *can* is merged in a VP-external position, from where it moves to AgrS, the head of the second class of examples, which involve the predicate *need*, originates inside VP, and surfaces in the intermediate projection T°. As will be explicated below, there is good reason to believe that in the specific cases to be considered,

the overt position of *need* is also the position in which the head is interpreted, constituting a second group of data in support of SAHM.

A proper subset of opaque verbs, including *want* and *need*, may select both for a nominal or a sentential complement:

(68) a. I want an ice-cream. (Fodor 1970: 321; (13))
b. I want {to have/to eat} an ice-cream. (ibid, ex. (14))

(69) a. John needs a book.
b. John needs to have a book.
c. John needs ~~to have~~ a book.

These transitive intensional verb constructions lend themselves to at least three different types of analyses[26]. First, *need* can be directly combined with its nominal complement semantically (Montague 1973; Zimmermann 1993). Second, it is possible to derive (69)a from an underlying source such as (69)b by a syntactic deletion rule, or by the assumption that the complement contains phonetically unrealized material, as in (69)c (see e.g. Larson et al. 1997; den Dikken et al. 1997). Finally, one might assign (69)a and (69)b a common semantic representation without treating them as being syntactically related any closer than their surface appearance suggests (see e.g. Fodor and Lepore 1998). On this view, the lexical entry of the verb *need* includes an abstract possession relation that is not overtly expressed:

(70) $\lambda w \lambda x \lambda y \forall w'[Acc(w)(w') \rightarrow have(w')(y)(x)]$ (adapted from von Fintel and Heim 2002: 84)

In the following section, I will present an acount of transitive *need* that seems best compatible with a syntactic ellipsis approach. Based on this analysis, it will subsequently become possible to construct a further argument for SAHM (see section 6.2).

[26]Fodor (1970: 322) remarks: "I shall simply assume [...] that in the semantic component, there are no essential differences between the representations of opaque contexts which are superficially [sentential] complement structures and those which are not. [...] It still remains to be asked how the mapping between the semantic representations and the surface structure is effected, and at which point in the grammar the two kinds of examples are differentiated. In particular, is it necessary to assign [such examples] syntactic representations containing complement structure?" (Square brackets mark omissions in and changes from original.) See also discussion in den Dikken et al. (1997); von Fintel and Heim (2002: 83-88); Harley (2002, 2004b); Larson et al. (1997); Moltmann (1997); Partee (1974) and references therein.

6.1. THE SYNTAX AND INTERPRETATION OF 'NEED'

A version of an ellipsis analysis for transitive intensional verbs has recently been defended in Larson et al. (1997), who advocate a control structure for the complement of verbs such as *search, look for, want* and *need,* as in (71):

(71) John needs [PRO to have book]. (= (69)a)

While adopting the basic assumption that *need* embeds syntactic structure, I will present evidence below that suggests an analysis which slightly differs from Larson et. al (1997) in the details of its implementation. To anticipate, at least two sets of data indicate that the complement should not be parsed into a control structure, but into a small clause.[27] In order to avoid deviations into directions not directly pertinent to the construction of the argument for SAHM, the discussion will entirely concentrate on the predicate *need*. All of the examples are moreover compatible with an impersonal and non-realistic (irreflexive) modal base.

It is well-know that external arguments of control predicates differ from raising subjects in that the former cannot be construed *de dicto*:

(72) Several accomplices wanted to be involved. *de re/*de dicto*
(#But in reality, there weren't any accomplices) (von Fintel and Heim 2002: 56; (168))

In the literature, this generalization is usually explained as the result of certain assumptions about the admissible semantic types of predicates and possible modes of semantic composition (for details see e.g. von Fintel and Heim 2002: 92; von Stechow 2004: 219).[28] Irrespective of the precise mechanisms responsible for exluding the opaque reading for (72), the control analysis for transitive intensional verbs generates the prediction that a verb like *need* should behave just like *want* in lacking a narrow scope interpretation. This expectation is not borne out, though. In particular, negative subjects of *need* can be naturally assigned a split scope construal, which locates the indefinite part of the quantifier within the scope of the intensional operator. An observer at a card table might e.g. utter (73) with the intention to express the generalization that the specific game he has witnessed can be played (or won or enjoyed) without a partner.

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[27]This option is admitted by den Dikken et al. (1997: 1051), and considered, but discarded in Larson et al. (1997: fn. 26). Similarly, Harley (2002), an earlier version of Harley (2004b), explicitly argues that *want* selects a small clause, while Harley (2004b) reverts to a control analysis of *want.*

[28]This is not to say that it is not *possible* to define a semantic which derives the (unattested) opqaue interpretation. One way is discussed in von Fintel and Heim (2002: 92f).

(73) No player needs a partner at this game. ¬□ ≻ ∃
"It is not necessary that a player has a partner."

(74) No king needs an escort. ¬□ ≻ ∃
"It is not necessary that a king has an escort."

(75) No dictator needs a parliament. ¬□ ≻ ∃
"It is not necessary that a dictator has a parliament."

Although the examples above also possess wide scope *de re* interpretations for their subjects, these surface readings are too weak in order to express what the sentences are most commonly meant to convey (this argument - *modulo* model - is adopted from Penka 2002: 13). Evaluated at w_0, (73) translates into (76). Assume that in w_0 games are banned by law, while theorizing or speaking about them is not. In such a situation, made explicit in (77), the extension of *player* is empty, and (76) comes out as true.

(76) *de re* reading of (73):
$\neg\exists x[\text{player}(x)(w_0) \wedge \forall w'[\text{Acc}(w_0)(w') \rightarrow \text{has\_a\_partner\_at\_this\_game}(x)(w')]]$

(77) *Model that satisfies de re reading* (76), *but not split reading* (78):

	a	b	c	*For any $x \in D_e$ and $w \in D_w$,*	
w_0	†	†	†	'†'	*x is not a player in w*
w_1	●	○	○	'○'	*x is a player in w*
w_2	○	●	○	'●'	*x is a player in w and x has a partner in w*

Thus, sentence (73) should be vacuously satisfied in all models with empty restrictor extensions, irrespective of the properties of players in other situations. This interpretation evidently is too weak to capture the intuitive meaning of (73), as it fails to take into account how alternative worlds are structured. By contrast with the *de re* construal, the split interpretation, spelled out in (78), correctly makes the truth of the proposition contingent, relative to each world, upon the restrictor extension as well as on the predicate in its scope.

(78) Split reading of (73):
$\neg\forall w'[\text{Acc}(w_0)(w') \rightarrow \exists x[\text{player}(x)(w') \wedge \text{has\_a\_partner\_at\_this\_game}(x)(w')]]$

(78) is true in w if in at least one world that is compatible with how the game is played in w, there is a player that does not have a partner. Provided that the accessibility relation for *need* is irreflexive[29], the two readings can accordingly be kept apart by scenarios such as (77), which satisfies

[29]In a model such as (77), which is characterized by an empty restrictor extension in the evaluation world, a reflexive Acc relation would have the effect of letting the *de re* reading entail the split interpretation.

the *de re* interpretation (76), but not the split scope formula (78).[30]

Crucially for present purposes, the observation that (73) can be assigned the split interpretation (78) contradicts the assumptions of the control analysis of *need,* because control subjects systematically lack opaque readings. Thus, *need* either represents a case of exceptional control which for some yet to be identified reason also tolerates split *de dicto* subjects (for semantics see fn. 28), or *need* falls in the same group as raising predicates. In absence of evidence for the former claim I will adopt the second option.[31]

A second complication for the control analysis is posed by the fact that transitive *need* passivizes. Passivization may be not entirely productive, but appears to be attested in too wide a variety of contexts in order to classify all of these instances as idioms, as witnessed by (79) to (81) below (partially adapted from a random internet search).[32] Among others, the examples vary w.r.t. the semantic class of the subject (quantificational, definite, indefinite, mass noun and nominalization; see (79)), as well as number marking (singular in (79) vs. plural in (80)) and tense specification of the verb (present in (79) and (80) vs. past in (81)):

(79) a. Noone (of you) is needed any more.
b. Nothing is needed except confidence.
c. The following information is needed.
d. A Marxist cadre organization is needed.
e. A regime change is needed in Washington.
f. Why a strategy is needed.
g. New fat is needed to clear old fat from the system.

(80) a. New music rules are needed.
b. Sensible election safeguards are needed.
c. Neighbors are needed.

Given a reflexive Acc, it is not possible that $\neg\exists x[\text{player}(x)(w_0)]$ holds in (i) and that $\neg\forall w'[\text{Acc}(w_0)(w') \rightarrow \exists x[\text{player}(x)(w')]]$ is false. Note that if less exotic models, exemplified by (i), are used, *de re* readings can also be shown to be independent by assuming a reflexive Acc relation:

(i)

	a	b
w_0	●	○
w_1	○	●

[30]It cannot be demonstrated that the split reading is logically independent from the *de re* reading.

[31]In addition, transitive *need* is compatible with an impersonal modal base, which is usually taken to signal raising constructions. (i) does e.g. not expresses a 'need on the part of the debate'.
(i) The debate needs an end.

[32]den Dikken et al. (1997: 1051) judge the comparable case with *want* in (i) as marginal, and note that for speakers who accept (i), the complement should be analyzed as a small clause (see main text).
(i) ?A hyppogriff is wanted.

(81) a. New states, and their popular and electoral vote, were needed to re-elect Lincoln.
b. Pre-adaptation implies organs evolved before they were needed.

The alternation does not appear to involve adjectival passives, as documented by the possibility to express the external argument in a *by*-phrase:

(82) a. A glossary of certain terms needed by the Non-Specialist
b. Services anticipated to be needed by exiting students with disabilities

That the external argument is synactically projected is shown by the fact that *need* passives are compatibile with control into result clauses as well as with agent oriented modifiers:

(83) The instructions were urgently needed in order to complete the assignment.

Semantically, the argument alternation does not affect the predicate that is marked with overt passive morphology (*needed*), but the embedded, phonetically unrealized possession relation HAVE, as schematized by (84)b.

(84) a. $[NP_1$ [need $[HAVE_{active}$ $NP_2]]]$ *Active transitive* need
b. $[NP_2$ [be_needed $[HAVE_{pass}$ $t_2]]]$ *Passive transitive* need

Transitive *need* contrasts in this respect with typical control verbs, which do not license long argument externalization into the higher clause:[33]

(85) a. $John_1$ tried to read the $book_2$. *Active control predicate*
b. *The $book_2$ was tried to (be) read t_2. *(Long) passive control predicate*

This systematic difference is unexpected from the perspective of the control analysis of transitive *need* as it fails to provide a derivational procedure for passive formation with *need*.

Before proceeding to the alternative to be advocated here, notice that while English lacks control clauses that fit the scheme in (84)b, instances of 'long passivization' are attested in languages such as German:

(86) [weil das $Buch_2$ $[_{VP}$ zu lesen $t_2]$ versucht wurde]
since the book$_{NOM}$ to read tried$_{pass\text{-}part.}$ was
"since it was attempted to read the book"

On a popular account of German long passive (Haider 1993; Wurmbrand 2001), the embedded clause of (86) is too small to hold the projection that introduces the subject (vP) and the position

[33]See also Wurmbrand (1999: 604), who uses similar arguments for a raising analysis of modals.

responsible for object case assignment (AgrO°, vP, ...). It follows that the deep object *das Buch* cannot surface inside the complement clause and has to raise to the superordinate subject position, where it receives nominative case.

Turning to passivization with transitive *need*, suppose that not only long passives in German owe their existence to clauses that are too small to contain a case assigner, but that 'small clauses' are also implicated in the transitive *need* construction in English. More precisely, if *need* embeds a small clause (in the technical sense) headed by an abstract HAVE, as in (87)b, passive now resembles German long passives in all relevant aspects:

(87) a. Noone is needed. (= (79)a)
b. $[_{AgrSP}$ noone$_2$ $[_{TP}$ is $[_{VP}$ needed$_{pass\text{-}part.}$ $[_{sc}$ HAVE $t_2]]]]$

Just as in (86), the deep object of (87)b (*noone*) cannot be case marked inside the small clause, driving it into the surface subject position. On this conception, the availability of passivization can be derived from an idiosyncratic lexical property of *need* that leads to selected manifestations of restructuring in English.

At first sight, a challenge for this account is posed by the fact that passive is usually believed to be limited to predicates that project an external argument. A typical strategy to derive this condition is outlined in Marantz (1984), who employs the two assumptions in (88) (from Pesetsky 1995: 22):

(88) a. Passive morphology absorbs the external Θ-role.
b. Vacuous dethematization is impossible.

Clause (88)b blocks passivization of unaccusatives such as *arrive* and *seem*. Interestingly, transitive *need* satsifies both requirements in (88), defusing this potential objection to the analysis. In particular, dethematization does not apply vacuously, because passiviation is an argument changing operation that affects the abstract head HAVE, and not *need* itself. The fact that passive morphology is not overtly visible on HAVE but surfaces on *need* is expected inasmuch as overt *need* is the spell-out of '□_HAVE' in the same way in which *give* is the spell-out of 'CAUSE_TO_HAVE'. In both cases, morphology is realized on the form which instantiates the complex predicate at PF.[34, 35]

Active constructions with *need* differ from their passive variants w.r.t. two properties. First, for active *need*, a strategy must be found which makes it possible to assign case to the deep object of

[34]I am grateful to Elena Anagnostopoulou (p.c.) for discussion of this issue.

[35]Kayne (1984: 145) notes that *need* differs from other raising verbs in having a nominalization (*John's need for help*). The relation between nominal and verbal *need* might not be transparent, though.

HAVE. Since the detailed deliberations motivating different choices are not immediately relevant for present concerns, I will not go into a discussion here. Second, as will be specified below, *need* shares morphosyntactic properties with modals as well as with lexical verbs.[36] This intermediate status of *need* can be taken as a sign that active *need* - unlike lexical verbs - actually undergoes movement, but that movement carries the head - unlike modals - only a short distance, from V° to T°. I will briefly report some relevant characteristics of the construction which are directly consistent with the short movement analysis only.

A first symptom for overt raising of *need* originates in the observation that active *need* optionally precedes adverbs such as *often*, *rarely* and *certainly* which demarcate a position at least as high as the left edge of VP:

(89) a. Work out which supplies you will need$_1$ often t$_1$, and which you will need$_1$ less often t$_1$.
b. Target those you are likely to need$_1$ often t$_1$.

(90) a. The companies do not invest in antibiotics, which most people need$_1$ rarely t$_1$.
b. ASD patients needed$_1$ rarely t$_1$ reoperation.

But *need* does not raise as far as to the canonical surface position of auxiliaries and modals. Otherwise, it should be possible to find *need* also in C°, or to the left of TP-adjoined aspectual adverbs such as *never*:

(91) a. Did John need help
b. *Needs John need

(92) a. They never needed any help
b. *They needed$_1$ never t$_1$ any help

Finally, transitive *need* combines naturally with negative indefinite objects, and differs in this respect from regular lexical verbs such as *own* (see (94)):

(93) John needs no car

(94) ?John owns no car (Kayne 1998: 133; (27))

(95) John has no car (Kayne 1998: 133; (26))

Kayne (1998: 133), who observes a similar contrast between *own* and *have* ((94) vs. (95)), relates the improved acceptability of (95) to the application of short verb movement. If correct, Kayne's analysis therefore entails that *need* in (93) has also undergone movement.

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[36]Transitive *need* is presumably taking part in the same ongoing historical develoment that affects its clause-selecting variants (*I needn't go; I don't need to go*), changing them from lexical verbs into auxiliaries. On the latter group see van den Wouden (1996).

In sum, the existence of *de dicto* readings for the subject and passives certifies that transitive *need* does not group with control predicates, but rather emulates the behavior of raising verbs. The fact that the syntactic pattern of transitive *need* neither parallels that of auxiliaries, nor that of full lexical verbs supports the assumption that *need* originates like main verbs inside VP, but also shares properties of auxiliaries in dislocating - in this specific case from the base position in V° to T°.

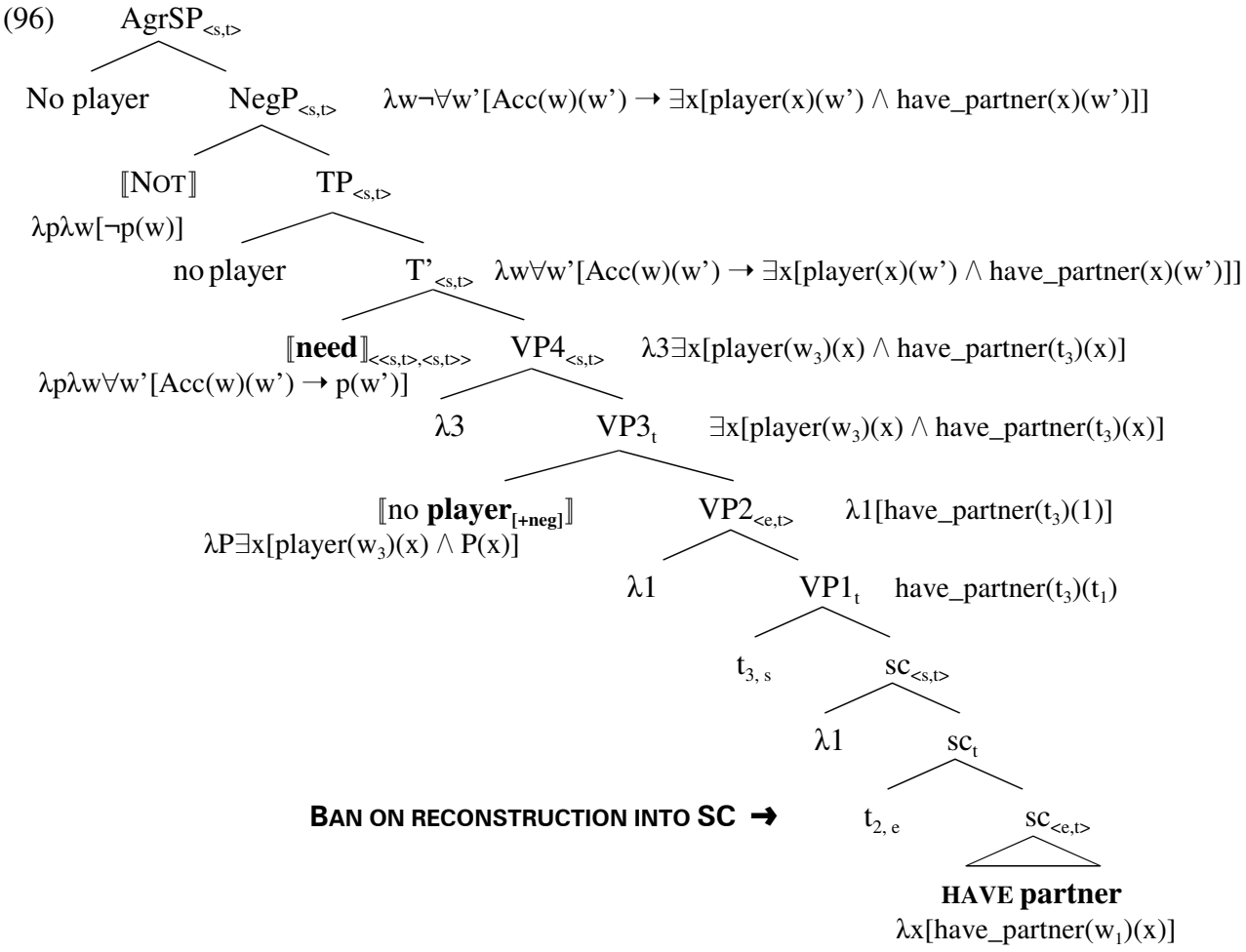
6.2. THE ARGUMENT FOR SAHM

Recall that the negative subject in (73), repeated below, can be assigned a split interpretation in addition to the *de re* construal.

(73) No player needs a partner (at this game). $\neg\Box \succ \exists$

Turning to the details of the mapping procedure from syntax to interpretation, and the argument for SAHM, the analysis assigns to (73) the factorization in (96).

(96)



The finite predicate *need* has raised from V° to T°, while subject copies are stranded from the base position inside the small clause headed by HAVE up to AgrSP.

As for the LF-output, the negative NP cannot be interpreted in the lowest available position, because this would violate the general ban on reconstruction into small clauses (see (48)). But already the next higher copy, adjoined to VP, represents a possible LF-location for negative NPs. This is so as on the one side, VP does not qualify as a small clause.[37] On the other side, the VP-adjoined position also resides within the local scope of NOT, and therefore renders the [+neg]-feature visible for checking by the abstract negation. Provided that the subject cannot be parsed lower than as a VP-adjunct, it can be inferred that *need*, which in the target reading takes scope above the subject, must be interpreted in the derived head T°.

The semantic composition runs parallel to that of (37). Subsequent to movement, *need* abstracts over its trace of type s as well as over the world variable inside the restrictor of the subject, resulting in *de dicto* interpretations for the denotation of *player* and the predicate *have partner.* To the extent that the tree (96) represents the actual relations in example (73), the analysis supplies a further argument in support of the hypothesis that head movement may have semantic reflexes (SAHM).[38]

The analysis is supported by a predication and a well-come consequence it entails for a minimal variant of (73). First, the semantic negation NOT in (73) is expressed above the derived position of *need*. Hence, one is correctly led to expect that negation cannot be assigned scope below the modal, excluding a non-split *de dicto* interpretation ($\Box \succ \neg\exists$). Intuitively, (73) cannot be used to express the proposition *Every player must play the game on his/her own.*

Second, in (73), the distribution of the negative indefinite is regulated by the Negative Constraint, whereas the Strong Constraint does not apply. Substituing in isomorphic contexts a negated universal for the subject, as in (97), should however activate the Strong Constraint, which is predicted to interfere with reconstruction below T°. As a result, the negative subject has to be parsed into SpecTP, a position which is outside the scope of the modal, bleeding the split construal. This expectation is corroborated, as evidenced by the observation that (97) appears to lack a split interpretation.

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[37]VP-adjunction in (37) of section 4.2 is prohibited by the Strong Constraint.

[38]Marcel denDikken (p.c.) observes that if a language possesses raising verbs such as *seem* that behave like *need* syntactically, raising contexts should support scope splitting and possibly *de dicto* readings. Idan Landau (p.c.) notes that past participles are usually assumed to stay in place. This property should disambiguate the perfect version of (73):

(i) No player has needed a partner.

Although (i) indeed appears to lack a split reading, this is probably due to the fact that split readings are most natural in generic contexts. I have to delegate answers to these issues to future research.

(97) Not every player needs a partner. *¬□ ≻ ∀/¬∀ ≻ □

a. λw¬∀x[player(x)(w) → ∀w'[Acc(w)(w') → has_a_partner(x)(w')]] *de re*
b. λw¬∀w'[Acc(w)(w') → ∀x[player(x)(w') → has_a_partner(x)(w')]] split reading

(97) expresses a proposition about actual players ((97)a), but for it to be true it is not sufficient that all the requirements on part of the players (i.e. to be able to play the game solitarily) are fulfilled in alternative worlds ((97)b). For this reason, (97) is e.g. not suitable to describe the relations made explicit in scenario (98), which - evaluated w_0 - satisfies the split reading and falsifies the *de re* interpretation:[39]

(98) *Model which verifies split reading (97)b, but not* de re *reading (97)a:*

	a	b	c	*For any $x \in D_e$ and $w \in D_w$,*	
w_0	●	†	†	'†'	*x is not a player in w*
w_1	●	○	○	'○'	*x is a player in w*
w_2	●	○	○	'●'	*x is a player in w and x has a partner in w*

Summarizing the findings of the current section, transitive *need* is generated in V°, where it selects a small clause headed by abstract HAVE, and overtly moves to T°. This conception offers two advantages over the competing control analysis. The control analysis cannot account for split *de dicto* readings for the subject, and also fails to provide an insight into why transitive *need* permits passivization. Split readings of negative indefinite subjects of *need* were derived from the conditions on [+neg]-licensing, in combination with the general ban on reconstruction into small clauses. Finally, a contrast between negative indefinites and negated universals could be attributed to the workings of the Strong Constraint.

6.3. A NOTE ON ECONOMY AND [+NEG]-LICENSING

Although the Negative Constraint (24) seems descriptively adequate for the fragment under consideration, it would be attractive to use a more natural way of expressing the condition on [+neg]-features, which substitutes (24) by a less stipulative principle.

(24) Negative Constraint
[+neg] must be in the scope of clause-mate NOT at LF.

A possible candidate for such a reduction is formulated in (99).

---

[39] Given an irreflexive accessibility relation, the model also satisfies the stronger statement (i):

(i) λw¬∃w'[Acc(w)(w') ∧ ∀x[player(x)(w') → has_a_partner(x)(w')]]

I do not understand why (97)b is not blocked by a scalar implicature induced by the truth of (i).

(99) Negative Constraint$_{\text{economy version}}$
$NP_{[+neg]}$ can reconstruct only into the highest position inside the scope of NOT.

Of particular significance is the fact that (99) does not have to be stipulated, but falls out from (i) the simple assumption that [+neg]-features need to be in the scope of NOT and (ii) syntactic economy, which prefers shorter over longer syntactic dependencies (see also discussion surrounding (46) and (67)). Intuitively, (99) derives downward scope rigidity of negative NPs by minimizing the distance between the abstract category NOT and the [+neg]-feature.

As far as I can see, such a reduction is possible as long as it can be ensured that the derivations which are compared all have in common that the raised head (i.e. *can* in (37) or *need* in (96)) is interpreted in the highest position possible position (Neg° or T°, respectively). On this view, adopting an analysis that permits HM to affect scope relations is not a consequence of empirical generalizations, but becomes a precondition for a natural re-interpretation of the Negative Constraint as an instance of syntactic economy. Thus, this aspect of such a system might be seen as indirect support for SAHM from a methodological perspective.

For the transitive *need* construction (96), adopting the economy version (99) has the effect that the regulations for where exactly *no player* is to be interpreted no longer have to be expressed in terms of a merely descriptive generalization prohibiting reconstruction into small clauses. Assuming that *need* is interpreted in the highest head below negation - T° in (96) - the economy analysis defines the node in the immediate scope of *need* - the daughter of VP3 in (96) - as the lowest possible reconstruction site for the subject. This finding matches the result reached for (96), but it is now purely motivated by the economy condition (99).

The main difference between *can* and *need* consists in the ability of *can* to reach a higher position in overt syntax (Neg°) than *need* (T°). Thus, in (37) (*No boy can make the team*), the modal was interpreted in Neg°, while the semantic contribution of the subject copy was accessed in SpecTP. Again, the same configuration can also be derived by the economy metric (99). Given that the LF-position of *can* is fixed with Neg°, the highest subject copy is the one in SpecTP.

In sum, a system that reduces the principles regulating the distribution of negative NPs to syntactic economy correctly predicts that subject copies reside in high positions at LF. It can do so only if the SAHM conjecture is adopted. Naturally, the properties which were used so far as support for high subject placement at LF (in particular the NPI-data from section 5.2) can, in such a system, not be taken to motivate the hypothesized parses, but have to be seen as a consequence of (99).

7. Head-Movement and Cyclicity

Any attempt to rescue a conservative analysis of HM in terms of displacement of terminals needs to address the widely reported obstacles which the standard account faces. Among these problems for HM, the most serious one is a corollary of the observation that HM can - unlike other movement operations - proceed counter-cyclically. This final section is dedicated to a brief explication of a possible strategy to avoid counter-cyclicity, while maintaining an orthodox view of HM (for recent discussion see Fanselow 2002; Matushansky 2006; Roberts 2004; a.o.).

The concrete proposal is based on the intuition that (i) counter-cyclicity can be excluded by a specific interpretation of the Extension Condition and that (ii) HM leads to a change of the label of the projecting category. This change in label directly follows from the axiom that the head passes its specification up to the highest node in a projection. In a Bare Phrase Structure implementation, the label of a complex category is exclusively determined by one of the two nodes which make up that category. Thus, a node comprising α and β can be rendered as the set-theoretic equivalent of an ordered pair (using Wiener-Hausdorff-Kuratowski notation)[40] as exemplified in (100)a. The first member of the pair represents the category sponsoring the label, while the second one denotes the non-projecting node. HM of γ to a position adjacent to head α in (100)b results in a complex head α∘γ that formally differs from the original projecting node α.[41] Provided that HM applies as soon in the derivation as possible, this modification of the projecting head is accompanied by a change of label of the root node from α to α∘γ (label is marked by underlining):

(100) a. $\{\underline{\alpha}, \{\alpha, \beta\}\} = \langle\alpha, \beta\rangle$: = the node immediately dominating α and β, with label α

b. $\{\underline{\alpha\circ\gamma}, \{\alpha\circ\gamma, \beta\}\} = \langle\alpha\circ\gamma, \beta\rangle$: = the node immediately dominating α∘γ and β, with label α∘γ

Moreover, the change in label can be interpreted as a sufficient criterion for the satisfaction of the Extension Condition. On a generalized reading, the Extension Condition expresses the requirement that each consecutive derivational step has to change the label of the root node, as formulated by (101):

(101) a. For any set A and any $n > 0$, $\wp_n(A) = 1$ iff A is the label of the root node at step n of the syntactic derivation.

b. $\forall X,Y[\wp_n(X) \wedge \wp_{n+1}(Y) \rightarrow \neg X = Y]$

---

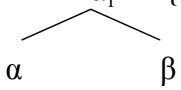
[40]If the label is neither α nor β, this is not possible as {γ, {α, β}} is not an ordered pair.

[41]It is immaterial for present purposes how the head and its host are combined, and how ∘ is interpreted (i.e. substitution or adjunction).

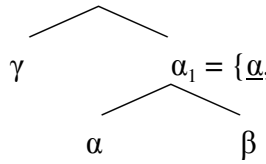
(101) maintains that the root nodes of two subsequent derivational steps involving movement must not bear identical labels. As HM leads to a change of label, and since the change of label affects the root node, which is the maximal projection of the head, HM now adheres to the Extension Condition.

Regular, cyclic movement of non-heads as in (102) observes the revised version of the Extension Condition (101) because movement takes place 'early enough' to affect the root label, as detailed by the trees in (102). In the derivational step from (102)a to (102)b, γ moves and is merged with the root category $\alpha_1 = \{\underline{\alpha}, \{\alpha, \beta\}\}$, which bears the label α. As the root label of the output set (label α_1) is not identical to the root label of the preceding step (label α), cyclic dislocation satisfies (101). This change of label reflects the two generalizations (i) the category which hosts the XP projects its label and (ii) the label is a structured object that contains information about the syntactic evolution of the tree. Moreover, in contexts of licit, cyclic XP-movement these variances can be detected in the root node.

(102) a. $\alpha_1 = \{\underline{\alpha}, \{\alpha, \beta\}\}$

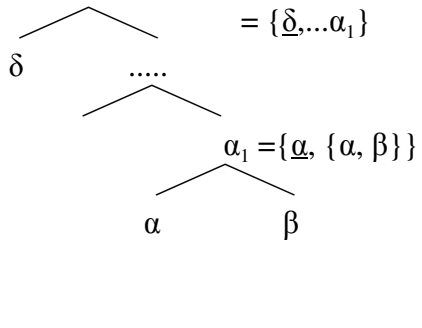


b. $\alpha_2 = \{\{\underline{\alpha}, \{\alpha, \beta\}\}, \{\{\alpha, \{\alpha, \beta\}\}, \gamma\}\} = \{\underline{\alpha}_1, \{\alpha_1, \gamma\}\}$

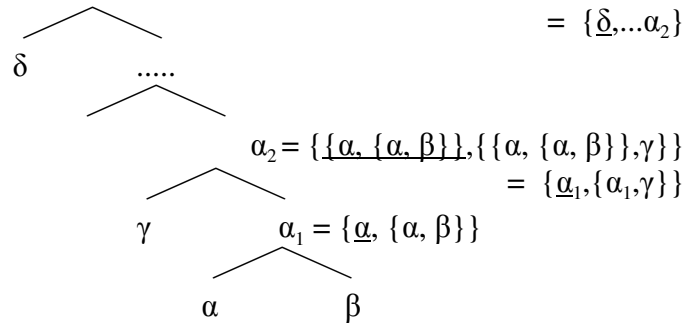


Conversely, counter-cyclic movement to non-head positions does not have any impact on the way the topmost head in the tree projects, as outlined by the diagrams in (103). (103)a depicts the larger structure consisting of α, β and δ, a proper subtree of which is targeted by counter-cyclic dislocation. The root node δ_1 bears the label δ. In contrast to (102), relocating the moved category γ in (103)b into a projection of α - SpecαP on a conservative interpretation - yields an output which preserves the root label δ. Thus, since attachment of γ does not induce a change of the root label, such dislocation processes, which are not sanctioned in current theories, also fail to satisfy the extension condition (101).

(103) a. $\delta_1 = \{\underline{\delta}, \ldots\{\alpha, \{\alpha, \beta\}\}\} = \{\underline{\delta}, \ldots\alpha_1\}$



b. $\delta_1 = \{\underline{\delta}, \ldots\{\{\alpha, \{\alpha, \beta\}\}, \{\{\alpha, \{\alpha, \beta\}\}, \gamma\}\}\} = \{\underline{\delta}, \ldots\alpha_2\}$



Further research has to specify a formalization of this intuition which will make it possible to

determine whether such a move for eliminating the problem of counter-cyclicity leads to a sound and consistent set of assumptions.

8. Conclusion

The present study presented at attempt at isolating an argument in favor of the view that certain instances of HM must be computaed in the syntactic component (SAHM). If HM can be shown to uniformly display the same behavior w.r.t. its defining characteristics, this implies that a PF-analysis of HM is not viable (contra e.g. Boeckx and Stjepanovic 2001; Chomsky 2000, 2001; Harley 2004a). The search for SAHM also produced some new evidence for particular analyses of some phenomena.

First, the interaction of PPI licensing and negation was seen to provide a new argument for generating modals low and moving them to a higher head position in overt syntax (contra non-derivational approaches such as Cormack and Smith 1998, 1999, a.o.).

Second, the discussion yielded new diagnostics (involving NPIs and VP-fronting) for identifying the position in which subject NPs are submitted to interpretation.

Third, the deliberations resulted in a novel way for expressing restrictions on scope diminishment. On the one hand, the inability of negative NPs to undergo reconstruction was attributed to an LF-licensing requirement on the [+neg]-feature. This approach not only offers the advantage of deriving the behavior of negative NPs from independent principles, but also supports the hypothesis that negative NPs are semantically decomposed into their contradictories and an abstract negative symbol NOT (von Stechow and Penka 2001; Penka 2002). On the other hand, the reconstruction properties of strong NPs led to the formulation of a specific descriptive generalization blocking scope diminishment below T° for this group of NPs.

Finally, accumulative evidence undermines the assumption that transitive *need* embeds an abstract control complement (contra Larson et al. 1997). Rather, the propositional complement of *need* displays properties alike to small clauses. The analysis is most directly compatible with the position that the node that *need* combines with contains syntactically articulated, yet empty structure (contra e.g. Fodor and Lepore 1998). Moreover, some intitial observations about word order were seen to dovetail naturally with a short-movement account for *need*.

Numerous open issues remain, some of which have been singled out in the text. Illustrative among the remaining puzzles is the question why negated universals in their split readings fail to license exceptives. That is, the account owes an explanation for why (104)a is ill-formed given that, on the present conception, its underlying LF in (104)b as well as its semantics resembles that of the well-formed string (105) in all relevant respects (on exceptives see e.g. von Fintel 1994; Gajewski 2004). In both cases, a compositional translation procedure returns identical values for the universal NP together with the except phrase (node α in (104)b and (105)):

(104) a. *Not every player except the dealer can win. ¬◇ ≻ ∀

b. LF: [NOT [can [$_{\alpha}$ every player except the dealer] ...

(105) It is not possible that [$_{\alpha}$ every player except the dealer wins]. ¬◇ ≻ ∀

It might be possible to resolve this conflict by assuming that the except phrase undergoes (obligatory) QR to a node dominating negation (on QR of exceptives see Gajewski 2004).

APPENDIX

This appendix reviews the motivation for using negated universals (*Not every boy can be on the team*) in furnishing the argument for SAHM in section 4, instead of simpler cases of scope splitting with negative indefinites, or contexts without splitting. All together, there are three reasons for choosing negated universals over these alternatives: conditions on reconstruction (see §I), unattested readings (§II) and entailment properties (§III).

I. Prototypical examples of the split scope phenomenon involve indefinites, as in (106):

(106) No Styrian can be elected president of the USA. ¬◇ ≻ ∃

However, it is well-known that the principles determining the scope of indefinites are more liberal than those responsible for fixing the scope of universals (see section 3.1). In particular, indefinites may freely reconstruct into a lower, non-finite clause in which they originate:

(107) A Styrian seems to John to be the governor of California. *seem* ≻ ∃

But as was seen in section 4, the argument for SAHM is contingent upon the subject being interpreted no lower than in SpecTP. Given that indefinites cannot be employed to secure such a high interpretive position for the subject, standard instances of scope splitting like (106) do not provide suitable tests for SAHM.

II. In the scope splitting construction, the negation and the universal quantifier are combined into a single constituent. In principle, it should also be possible to study the interaction of modals with a universally quantified subject if the negation is introduced as a separate constituent in the superordinate clause, as in (108):

(108) It is not the case that every boy can make the team. *¬◇ ≻ ∀

Curiously, (108) does not seem to admit an inverse reading for the subject, though. This peculiar restriction disqualifies these analytic structures as possible candidates for probing the abstract representation of scope inversion with modals.[42]

III. Finally, the presence of negation in the cases with negated universals is motivated by the fact that corresponding sentences with positive polarity such as (109) display different entailment properties (see below for details):

(109) Every suspect can be innocent.

This logical difference has the consequence that detecting the subject reconstruction reading in (109) requires the evaluation of more complex scenarios, which in turn negatively affects the robustness of the judgements. The original examples with negated universals on the other hand allow one to avoid these additional complications. The reminder of this appendix expands on some of the details underlying this contrast.

(109) can in principle be assigned the three different interpretations listed in (110). These readings - the first two of which will be central for the further discussion - are the product of the alternating scope relations between the modal (∃w') and the quantificational subject (∀x), together with the option of binding the world variable of the quantifier restriction either locally, yielding an opaque/*de dicto* reading, or at a distance, resulting in the transparent/*de re* construal:[43]

(110) a. λw∀x[suspect(w)(x) → ∃w'[Acc(s)(w') ∧ innocent(w')(x)]] wide scope *de re*
b. λw∃w'[Acc(w)(w') ∧ ∀x[suspect(w')(x) → innocent(w')(x)]] narrow scope *de dicto*
c. λw∃w'[Acc(w)(w') ∧ ∀x[suspect(w)(x) → innocent(w')(x)]] narrow scope *de re*

---

[42]Descriptively, the c-commanding negation in (108) blocks subject reconstruction. This fact might be related to another observation. For some speakers, psych verb *seem* (i.e. *seem* accompanied by an experiencer) contrasts with evidential *seem* (without experiencer) in that the latter also admits a *de dicto* interpretation for universal subjects (see e.g. Sportiche 2005: 22 for French; Orin Percus, p.c.):

(i) Every boy seems to be listening *de re/de dicto*
(ii) Every boy seems not to be listening *de re/*de dicto*

As illustrated by (ii), negation in the lower clause appears to block reconstruction even for this more permissive group of speakers. One might wonder whether a unified account could be given for the effect of the low negation in (ii) and the c-commanding negation in (108), which both inhibit subject reconstruction.

[43]Fodor (1970: 226ff) employed the terms 'specific transparent', 'non-specific opaque' and 'non-specific opaque' (for discussion see, a.o., Farkas 1997; von Fintel and Heim 2002: 70ff). A fourth, wide scope *de dicto* reading, as in (i), is excluded by the assumption that natural language only employs restricted quantification.

(i) λw∀x∃w'[suspect(w')(x) → ∃w'[Acc(w)(w') ∧ innocent(w')(x)]] wide scope *de dicto*

With one exception, the three formulas are logically independent.[44] Of particular relevance is the fact that the narrow scope *de dicto* reading (110)b, which signals subject reconstruction, does not entail the wide scope *de re* reading (110)a. Thus, examples without negation such as (109) should also provide a suitable testing ground for SAHM for the two reasons that (i) (109) involves a strong quantifier, ensuring the option of narrow reconstruction below the modal, and that (ii) it is possible to detect the effects of reconstruction, because the reconstructed reading is not stronger than the surface interpretation.

There is, however, a reason for choosing the original, more complex examples involving negated universals, after all. In order to discriminate the reconstructed reading from the surface interpretation in the simpler cases (109), it is necessary to also take into account the semantic opaqueness of the quantifier restriction, in addition to the scope permutation between the modal and the quantifier. But judgements about opaque readings of strong quantifiers are substantially weaker, and therefore notoriously hard to confirm. (Partially, this uncertainty is also reflected in the recent debate about reconstruction properties of universals; see Lasnik 1999; Wurmbrand and Bobaljik 1999, and in particular Sportiche 2005: section 6.2).

More precisely, in order to find evidence for subject reconstruction with scope splitting, it is sufficient to take into account scenarios in which only the extension of the scope of the quantifier (S in (111)) changes across worlds, as schematized by (111)a below:

(111) a. *Not every* (R) *can* (S) *R: restriction; S: scope*

Evidence for $\neg \succ \Diamond \succ \forall$ requires models which vary $[\![S]\!]$ across worlds
$\exists w \exists w' [\neg [w = w'] \wedge \neg [[\![S]\!](w) = [\![S]\!](w')]]$

b. *Every* (R) *can* (S)

Evidence for $\Diamond \succ \forall$ requires models which vary $[\![R]\!]$ across worlds
$\exists w \exists w' [\neg [w = w'] \wedge \neg [[\![R]\!](w) = [\![R]\!](w')]]$

In contrast, testing subject reconstruction on the basis of (109) requires scenarios which additionally vary the quantifier restriction R, as in (111)b, resulting in semantically opaque contexts. This further demand on the models considerably complicates the process of establishing reliable intuitions.

To illustrate, consider the scenario in (113) that, when used in combination with the scope splitting construction, separates the surface from the reconstructed reading spelled out in (112):

[44]The exception being that narrow scope *de re* (110)c entails wide scope *de re* (110)a.

(112) *Not every* (R) *can* (S)

a. $\lambda w \neg \forall x[R(w)(x) \rightarrow \exists w'[Acc(w)(w') \wedge S(w')(x)]]$ wide scope *de re*
b. $\lambda w \neg \exists w'[Acc(w)(w') \wedge \forall x[R(w')(x) \rightarrow S(w')(x)]]$ split *de dicto*

(113) *Model which falsifies* de re *reading (112)a, and verifies split reading (112)b:*

	a	b	*For any $x \in D_e$ and $w \in D_w$,*	
w_0	●	○	'○'	*x satisfies R in w*
w_1	○	●	'●'	*x satisfies R in w and S in w*

In (113), the extension of the restriction remains constant across worlds (i.e. for any x and w, $[\![R]\!](w)(x) = 1$). Still, the scenario distinguishes between the surface interpretation (112)a (which is evaluated as false) and the reconstructed reading (112)b (which is evaluated as true).

The simpler structure with positive polarity, schematized in (114), on the other hand reveals its ambiguity only if the extension of the quantifier restriction is modified across worlds.

(114) *Every* (R) *can* (S)

a. $\lambda w \forall x[R(w)(x) \rightarrow \exists w'[Acc(w)(w') \wedge S(w')(x)]]$ wide scope *de re*
b. $\lambda w \exists w'[Acc(w)(w') \wedge \forall x[R(w')(x) \rightarrow S(w')(x)]]$ narrow scope *de dicto*

Again, the goal is to identify evidence for the reconstructed reading, which once again exclusively emerges in scenarios that verify the *de dicto* reading ((114)b) only. The model (113) does not fall into this group, though. This is so because (113) assigns to the quantifier restriction values that essentially reduces it to a 'rigid designator': $[\![R]\!](w_1) = [\![R]\!](w_2) = \{a,b\}$. The scope permutation between $\exists$ and $\forall$ in the formulas in (114) can accordingly be interpreted extensionally. As a result, the *de dicto* construal (114)b entails the *de re* reading (114)a (since $\exists x \forall y \varphi \vDash \forall y \exists x \varphi$). Thus, models like (113), in which the R-extension of (114) remains constant across worlds cannot be used to isolate the reconstructed *de dicto* reading of (114).

Rather, finding the relevant evidence must be based on more complex scenarios such as (115), where the extension of the common noun denotation differs across worlds. The model in (115) satisfies formula (114)b, while (114)a is falsified.

(115) *Model which falsifies* de re *reading (114)a, and verifies* de dicto *reading (114)b:*

	a	b	*For any $x \in D_e$ and $w \in D_w$,*	
w_0	●	○	'†'	*x satisfies neither R in w not S in w*
w_1	●	†	'○'	*x satisfies R in w*
			'●'	*x satisfies R in w and S in w*

But this introduces an additional complication for obtaining reliable intuitions. Judgements for the

simpler sentences with universal subjects are therefore less robust than those for the examples choses in the text with negated universals. Intuitions seem more stable and easier to verify in the latter cases. Needless to say, these methodological considerations should be understood as such, and are not meant to imply that it is impossible for some deeper reason to use constructions with simple universal subjects in evaluating SAHM.[45]

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[45]There is a further, unrelated reason for using negative indefinites. Only negative contexts provide a suitable environment for the NPI-data discussed in section test discussed in section 5.2.

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