1. WHAT THE DEBATE IS ABOUT

Attempts to eliminate HM:

(1) a. HM as post-syntactic PF process (Chomsky 2001; Boeckx & Stjepanovic 2001; Harley 2004; i.a.)
   b. HM consists in Remnant Movement (RM₁; Hinterhölzl 1997; Koopman & Szabolcsi 2000; Nilsen 2003; Müller 2004; i.a.)
   c. HM is epiphenomenal (EPI; categorial grammars, Spanning; Brody 2000; Williams 2003; i.a.)
   d. HM as RM, with changes in definition of c-command/composition rules (RM₂; Nilsen 2003)

Motivation for eliminating HM:

(2) a. Axioms of natural language syntax: HM targets non-c-commanding nodes; violates Extension Condition & No Tampering condition (for more complete list see Roberts 2010; Hall 2010; cf. Lechner 2007; Funakoshi 2014)
   b. Reduction: behavior of HM parallels that of other known displacements (XP-movement)

Chain of evidence:

(3) Evidence against RM₁/RM₂ ⊆ evidence against PF ⊆ evidence against EPI

Setting aside RM₂, the strongest evidence for an orthodox conception of HM comes from interpretation:

(4) **SAHM-Conjecture** (Lechner 2006, 2007)
    There are instances of semantically active head movement.

(5) An operation O is semantically active iff either a or b
    a. O is affected by meaning in that properties of O are co-determined by interpretation
    b. O creates new meanings

(6) Three manifestations of SHM: evidence for orthodoxy (Y-model)
    a. **Type I**: HM reacts to interpretive properties of other items (contradicts PF and EPI)
    b. **Type II**: HM creates new interpretive options (contra RM₁, PF and EPI)
    c. **Type III**: HM fails to disrupt scope relations (Lechner 2009) (contra RM₁)

(7) **PRO SAHM**: Vincente (2007); Szabolcsi (2009, 2011); Hartman (2010); Roberts (2010); Funakoshi (2014); Matyiku (2014); Bhatt & Keine (2015); i.a.
    **Contra SAHM**: Hall (2015); McCloskey (2016); Richter & Sailer (2008); i.a.

Outline of presentation

§2 New type II evidence for SAHM
   §2.1 Comparatives  §2.2 Coordination
§3 Re-visiting type II evidence for SAHM, I (*can*)
§4 Re-visiting type II evidence for SAHM, II (*need*)
2. NEW EVIDENCE FOR SAHM

2.1. COMPARATIVES

Some intensional operators are scope commutative with the degree relation MORE (Heim 2000; Stateva 2000; s.a. Gawron 1995). require is interpreted in-situ and MORE scopes (AccDeon; deontic accessibility).

(8) (The draft is 10 pages.) The paper \( t_2 \) is required \([TP \ t_2 \text{ to be exactly } 5 \text{ pages longer than that}].

\[\lambda w. \forall w'[\text{AccDeon}(w)(w') \rightarrow \text{id}[\text{the paper is } d\text{-long in } w'] = 15 \text{ pages}] \]

a. The paper must be no longer than 15 pages.’ (required \( \gg \text{MORE, ‘maximum’})

b. \( \lambda w. \text{id}[\forall w'[\text{AccDeon}(w)(w') \rightarrow \text{the paper is } d\text{-long in } w'] = 15 \text{ pages}] \)

‘The paper must be at least 15 pages long.’ (MORE \( \gg \text{required, ‘minimum’})

\( \text{(9)} \)

a. \([\text{required} \ [\text{exactly } 5 \text{ pages MORE than } 10 \text{ pages}] \ [\lambda_1 \ [\text{TP } t_2 \text{ to be exactly } 5 \text{ pages longer than that}]] \]

b. \([\text{exactly } 5 \text{ pages MORE than } 10 \text{ pages}] \ [\lambda_1 \ [\text{required} \ [\text{TP } t_2 \text{ to be exactly } 5 \text{ pages longer than that}]] \]

\( \text{(10)} \) and \( \text{(11)} \) only admit the wide scope reading for the modal, they cannot be used to describe \( \text{(12)b} \):

\( \text{(10)} \) Maria muss genau doppelt so viele Artikel veröffentlichen als/wie Bücher herausgeben.

Mary must exactly twice as many articles publish than/as books edit

“Mary has to publish exactly twice as many articles as than she has to edit books.”

\[\lambda w. \forall w'[\text{AccDeon}(w)(w') \rightarrow \text{id}[\text{Mary is publishing } d\text{-many articles in } w'] = \text{id}[\text{Mary is editing } d\text{-many books in } w'] \times 2] \]

\((\square \gg \text{MORE, maximum})\)

b. \( \lambda.w.\text{id}[\forall w'[\text{AccDeon}(w)(w') \rightarrow \text{Mary is publishing } d\text{-many articles in } w'] = \text{id}[\forall w'[\text{AccDeon}(w)(w') \rightarrow \text{Mary is editing } d\text{-many books in } w'] \times 2] \)

\((\text{*MORE} \gg \square, \text{minimum})\)

\( \text{(11)} \) Maria muss genau doppelt so viele Artikel veröffentlichen als sie Bücher herausgeben muss.

Mary must exactly twice as many articles publish than she books edit must

“Mary has to publish exactly twice as many articles as she has to edit books.”

\( \text{(12)} \) a. \( \text{Scenario that verifies } \square \gg \text{MORE only} \)

\begin{align*}
\text{articles published by Mary} & \quad \text{books edited by Mary} \\
w_1 & \quad 6 & \quad 3 \\
w_2 & \quad 4 & \quad 2 \\
w_3 & \quad 12 & \quad 6 \\
\end{align*}

b. \( \text{Scenario that verifies MORE} \gg \square \text{only} \)

\begin{align*}
\text{articles published by Mary} & \quad \text{books edited by Mary} \\
w_1 & \quad 17 \ (= \text{id}[\forall w'[\text{...}]) & \quad 3 \\
w_2 & \quad 6 \ (= \text{id}[\forall w'[\text{...}]) & \quad 4 \\
\end{align*}

\( \text{(10)} \) can be parsed into an LF-representation in which the modal is interpreted in-situ:

\( \text{(13)} \) \([\text{TP} \ [\text{TP} \ \text{must} \ [\text{TP} \ [\text{TP} \ 2 \times \text{MORE than edit } d\text{-many books}] \ [\lambda_1 \ [\text{TP } \text{Mary publish } d\text{-many articles}]])] \]

“Mary has to publish exactly twice as many articles as than she has to edit books.”

By contrast, the wide scope reading of \( \text{(11)} \) requires covert ATB-movement (contra Bošković & Franks 2000) of the modal, resulting in a SAHM constellation:

\( \text{(14)} \) \([\text{TP} \ \text{must}_2 \ [\text{TP} \ 2 \times \text{MORE than } t_2 \text{edit } d\text{-many books}] \ [\lambda_1 \ [\text{TP } t_2 \text{ publish } d\text{-many articles}]])] \)

\text{Conclusion:} Interaction of modals and MORE elicits evidence in support of SAHM.
Interpreting both modals such that the lower is dependent on the higher one also yields incorrect reading, on which the number of articles published would have to be constant across worlds and twice the minimum number of edited books in all deontic alternatives. The problem: MORE combines with a degree, hence \( d \) inevitably scopes over \( \forall w' \).

\[
\begin{align*}
(15) & \quad [\text{TP}_T \text{ must } [\text{VP} \text{ MORE than } \lambda_x \text{ must edit } d_x-\text{many books}] [\lambda_t [\text{VP} \text{ Mary publish } d_t-\text{many articles}]])]

(16) & \quad \lambda w.\forall w'[\text{Acc}_\text{Dond}(w)(w')] \rightarrow \text{id. Mary is publishing } d\text{-many articles in } w' = \\
& \quad \text{id.}\forall w''[\text{Acc}_\text{Dond}(w')(w'')] \text{ Mary edited } d\text{-many books in } w'' \times 2
\end{align*}
\]

2.2. Coordination

Test contexts involve a verbal operator (negative verb, modal) and a coordinator and abide by (18).

\[
\text{Case 1. } \neg(A \land B) \equiv \neg A \lor \neg B, \text{ hence existence of } \neg x \land \text{ is informative about SAHM.}
\]

- **Scenario** that only verifies the wide scope reading of the negative predicate: John refused to do A (i.e. A=1), but not B (B=0). (20)b and (21)b are judged to be true in such models.
- **Size of conjuncts** is controlled by adverbials (decidedly, emphatically and evidently, probably, respectively) that are compatible with matrix predicate (refuse and forget, respectively) only.

\[
\begin{align*}
(17) & \quad \text{Test context for SAHM} \\
& \quad \text{verb} [[\lambda_t \ldots t_1 \ldots] \text{ coordinator } [\text{B ... } t_1 \ldots]] \quad \text{(target: verbal operator } \triangleright \text{ coordination)}

(18) & \quad \text{Diagnostics need to meet two requirements} \\
& \quad a. \quad \text{The structure in which HM has applied must be weaker than (i.e. asymmetrically entailed by) the structure without HM.} \\
& \quad b. \quad \text{Conjuncts must be large enough to include base position of the verb, in order to block (19).}

(19) & \quad \text{verb}_{\text{in-sim}} [[\lambda_t \ldots] \text{ coordinator } [\text{B ... } t_1 \ldots]] \quad \text{(uninformative about SAHM)}
\end{align*}
\]

\[
\begin{align*}
(20) & \quad a. \quad [\lambda_t \text{ Hans weigerte, sich, } \text{ dezitiert seine Zeugnisse einzureichen } t_2 \ t_1 \] \text{ und} \\
& \quad [\text{H. refused self } \text{ decidedly his certificates to submit } \text{ and} \\
& \quad [\text{er weigerte, sich, nachdrücklich eine Prüfung abzulegen } t_2 \ t_1 \] \quad (\neg \times \land \land \neg) \\
& \quad \text{he refused self } \text{ emphatically an exam to take} \\
& \quad \text{“John decidedly refused to submit his certificates and he emphatically refused to take an exam.”} \\

& \quad b. \quad [\lambda_t \text{ Hans weigerte, sich, } \text{ dezitiert seine Zeugnisse einzureichen } t_2 \ t_1 \] \text{ und} \\
& \quad [\text{H. refused self } \text{ decidedly his certificates submit } \text{ and} \\
& \quad [\text{er nachdrücklich eine Prüfung abzulegen } t_2 \ t_1 \] \quad (\neg \times \land \land \neg) \\
& \quad \text{emphatically an exam to take}
\end{align*}
\]

\[
\begin{align*}
(21) & \quad a. \quad [\lambda_t \text{ Hans vergaß } \text{ offensichtlich das } \text{ Fenster zu schließen und} \\
& \quad [\text{H. forgot evidently the window to close } \text{ and} \\
& \quad \text{er vergaß } \text{ wahrscheinlich auch die Türe zu öffnen.} \quad (\neg \times \land \land \neg) \\
& \quad \text{he forgot probably also the door to open} \\
& \quad \text{“John evidently forgot to close the window and he probably also forgot to open the door.”}

& \quad b. \quad [\lambda_t \text{ Hans vergaß } ] \text{ offensichtlich das Fenster zu schließen } t_1 \] \text{ und} \\
& \quad [\text{H. forgot evidently the window to close } \text{ and} \\
& \quad [\text{er wahrscheinlich auch die Türe zu öffnen } t_1]. \quad (\neg \times \land \land \neg) \\
& \quad \text{probably also the door to open}
\end{align*}
\]

\[\rightarrow\] The modal is interpreted in a derived position.
**Case 2.** $\Box (A \lor B) \neq \Box A \lor \Box B$, hence existence of $\Box \lor \Box$ is informative about SAHM.  

- **Scenario** which only verifies wide scope reading for modal: $A=1$ and $B=0$ in $w_1$ and $A=0$ and $B=1$ in $w_2$. (22)b is judged to be true in this scenario.
- **Conjunct size** (preliminary): examples in which the verb reconstructs show that conjuncts are large. Isomorphic structures with wide scope verbs arguably also include large conjuncts.

\[
\text{(22)} \quad \begin{align*}
&\text{a. Die Kandidaten} \ \text{müssen} \ \text{ihre Zeugnisse einreichen oder sie} \ \text{müssen} \ \text{eine Prüfung ablegen.} \\
&\text{the candidates must} \ \text{their certificates submit or they must} \ \text{an exam take} \\
&\text{“The candidates must submit their certificates submit or they must take an exam.”}
\end{align*}
\]

\[
\text{b. Die Kandidaten} \ \text{müssen} \ [A \text{ ihre Zeugnisse einreichen} \ t_1] \ \text{oder} \ [B \text{ eine Prüfung ablegen} \ t_1] \\
\text{the candidates must} \ \text{their certificates submit or an exam take} \\
\text{\quad} (\Box \lor \Box / \Box \lor \Box)
\]

**Case 3.** $\Box (A \lor B) \neq \Box A \lor \Box B$ in contexts with *Gapped* modals (Hulsey 2008; Johnson 2003, 2014).

\[
\text{(23)} \quad X \text{ can be true and } Y \text{ false, because they are logically independent.} \quad \text{(Johnson 2014: (88))}
\]

\[
\text{(24)} \quad \text{If a modal [...] Gaps alone, then it must scope over the coordination in Gapping.} \quad \text{(ibid., (86))}
\]

Following Johnson (2003; 2014), Gapping in (25)b/(26)b can be seen as an instance of ATB-V2 and asymmetric subject extraction.

- **Wide scope scenario**: speaker is ignorant whether $A$ or $B$. (25)b is judged true in this scenario.
- **Conjunct size** is controlled by presence of subject in second conjunct.

\[
\text{(25) a. Hans} \ \text{muß} \ \text{seine Zeugnisse einreichen oder Maria} \ \text{muß} \ \text{eine Prüfung ablegen} \\
\text{H. must his certificates submit or M. must an exam take} \\
\text{“John must submit his certificates or Mary must take an exam.”}
\]

\[
\text{b. Hans} \ [A t_2 \text{ seine Zeugnisse einreichen} \ t_1] \ \text{oder} \ [B \text{ Maria eine Prüfung ablegen} \ t_1] \\
\text{H. must his certificates submit or an exam take} \\
\text{\quad} (\Box \lor \Box / ?? \lor \Box)
\]

\[
\text{(26) a. Hans} \ \text{kann} \ \text{seine Zeugnisse einreichen und Maria} \ \text{kann} \ \text{eine Prüfung ablegen} \\
\text{H. can his certificates submit and M. can an exam take} \\
\text{“John can submit his certificates and Mary can take an exam.”} \\
\text{\quad} (\Box \lor \Box / \Box \lor \Box)
\]

\[
\text{b. Hans} \ [A t_2 \text{ seine Zeugnisse einreichen} \ t_1] \ \text{und} \ [B \text{ Maria eine Prüfung ablegen} \ t_1] \\
\text{H. can his certificates submit and M. an exam take}
\]

**Case 4.** $\Box (A \lor B) \neq \Box A \lor \Box B$ in contexts with bivalent coordination *either - or*.

- **Wide scope scenario**: $A=1$ and $B=0$ in $w_1$ and $A=0$ and $B=1$ in $w_2$.
- **Conjunct size**: see case 2

\[
\text{(27) a. Die Kandidaten} \ \text{müssen entweder ihre Zeugnisse einreichen oder} \\
\text{the candidates must either their certificates submit or} \\
\text{sie} \ \text{müssen} \ \text{eine Prüfung ablegen.} \\
\text{they must an exam take} \\
\text{“The candidates must either submit their certificates or they must take an exam.”}
\]

\[
\text{b. Die Kandidaten} \ [A \text{ entweder ihre Zeugnisse einreichen} \ t_1] \ \text{oder} \\
\text{the candidates must either their certificates submit or} \\
\text{[B eine Prüfung ablegen} \ t_1] \\
\text{an exam take}
\]

**Conclusion**: Behavior of verbal operators in coordination supports SAHM.
2.3. Obligatory Reconstruction

There are also cases where the verb obligatorily reconstructs, which are uninformative w.r.t. SAHM.

**Case 1.** \( \neg(A \vee \text{excl} B) \neq \neg A \vee \text{excl} B \) only admits surface reading \( \neg \vee \text{excl} \). (28) is judged true in scenarios that verify narrow scope only (e.g. door is open \( (A=0) \) and window is closed \( (B=1) \)), and false in situations that satisfy wide scope only \( (A=B=1) \) and \( A=B=0 \).

(28) Hans vergaß, [entweder die Türe zu schließen t₁] [oder das Fenster zu öffnen t₂]
H. forgot either the door to close or the window to open
“John either forgot to close the door or to open the window” \( (\neg \vee \text{excl} / \neg) \)

**Case 2.** \( \neg(A \vee B) \equiv A \vee B \neq \neg(A \vee \neg B) \equiv A \land B \): Unavailable wide scope reading verified if the door is open \( (A=0) \) and the window is open \( (B=1) \).

(29) Hans vergaß, [weder die Türe zu schließen t₁] [noch das Fenster zu öffnen t₂]
H. forgot neither the door to close nor the window to open
“John neither forgot to close the door nor to open the window” \( (\neg \neg \text{nor} / \neg \neg) \)

→ forgotten obligatorily reconstructs; orthogonal to argument about SAHM

**Case 3.** forget systematically takes wide scope also in other contexts, e.g. \( \neg \times \text{excl} \neq \forall \times \text{excl} \). Scenario that verifies wide scope reading only: two out of four times John forgot to close the windows.

(30) a. Hans vergaß immer die Fenster zu schliessen. \( (*\neg \times \text{excl} / \forall \times \neg) \)
H. forgot always the window to close
b. Hans vergaß jedes Mal, die Fenster zu schliessen. \( (*\neg \times \text{excl} / \forall \times \neg) \)
H. forgot each time the window to close

3. Old Evidence for SAHM I (can)

**Diagnostic:** Contexts in which narrow scope of modal across quantifier yields weaker readings.

(31) a. Surface syntax

\[
\text{QP} \quad \text{XP}
\]

\[
\text{modal}
\]

b. Scope relations: modal > QP

\[
\text{QP} \quad \text{XP}
\]

\[
\text{modal} \quad \text{YP}
\]

\[
\text{ZP} \quad \text{WP}
\]

\[
\text{t}_{\text{QP}} \quad \text{t}_{\text{modal}} \quad \text{t}_{\text{QP}}
\]

(32) Components of the argument

1. (At least some) modals are base-generated low and move
2. Compositional semantics for HM-chains
3. QP in (31) is interpreted above the base position of the modal

→ The modal is interpreted in a derived positions, in support of SAHM

**Objective:** Defending SAHM argument against recent attacks from Hall (2015) and McClosley (2016).

- Main contention by Hall and McClosley: 3 is based on an incorrect generalization.
- Reply: the crucial contexts do not fall under this alleged generalization.
3.1. MODALS MOVE

Modals move and reconstruct: circumstantial modals display strong preference for narrow scope w.r.t. negation (Fintel & Iatridou 2004a/b; Lerner & Sternefeld 1984; Öhlschläger 1989; a.m.o.):

(33) John can, not t₁ come along today \((\neg \Diamond /?\Diamond \neg)\)
(34) He can always t₂ count on me \((\text{always} \Diamond /\Diamond /\Diamond > \text{always})\)
(35) He can never t₃ do that \((\text{never} > \Diamond /\Diamond /\Diamond > \text{never})\)

(36) \[
\begin{array}{c}
\text{AgrSP} \\
\text{Subject}_2 \\
\text{AgrS'} \\
\text{can}_1 \\
\text{NegP} \\
\text{Neg}^\circ \\
\text{not} \\
\text{T}^\circ \\
\text{vP/VP} \\
\text{t}_1 \\
\text{t}_2 \\
\text{V}^\circ \\
\end{array}
\]

NB: The observation that some modals obligatorily reconstruct is orthogonal. In order to establish that modals move, it is sufficient to show that they can reconstruct. (This replies to a point in Hall 2015.)

(37) Neg-shift hypothesis: Inverse scope is the product of covert movement of the negation across the modal (henceforth Neg-Shift).

Testing (37): In (38), the PPI sometimes must not be construed within the scope of negation (judged to be marginal by some informants; Hall 2015, 122, fn. 20 consulted in)

(38) It can sometimes not be avoided to confront the enemy. \((\text{sometimes} \neg \Diamond)\)

The inverted scope order can either be attributed to reconstruction of the modal ((39)), or to covert Neg-Shift followed by covert movement of the PPI sometimes ((40)):

\[
\begin{array}{c}
\text{Derivation A: modal reconstruction} \\
\text{a. } [\text{AgrSP} \text{it can}_1 [\text{sometimes} [\text{NegP not}_1 [\text{TP} t_1]]]] \\
\text{b. } [\text{sometimes} [\text{NegP not}_1 [\text{TP can}_2]]] \\
\end{array}
\]

(39) \text{Derivation A: modal reconstruction}

\[
\begin{array}{c}
\text{a. } [\text{AgrSP it can}_1 [\text{sometimes} [\text{NegP not}_1 [\text{TP} t_1]]]] \\
\text{b. } [\text{sometimes} [\text{NegP not}_1 [\text{TP can}_2]]] \\
\end{array}
\]

(40) \text{Derivation B: Neg-Shift and modal base-generated}

\[
\begin{array}{c}
\text{a. } [\text{AgrSP it can}_1 [\text{sometimes} [\text{NegP not}_1 [\text{TP} t_1]]]] \\
\text{b. } [\text{sometimes} [\text{NegP not}_1 [\text{TP can}_2]]] \\
\text{c. } [\text{XP sometimes}_3 \text{XP not}_2 [\text{AgrSP it can}_1 [\text{I}_5 [\text{NegP not}_1 [\text{TP can}_2]]]]] \\
\end{array}
\]

Argument 1 against Neg-Shift: Szabolcsi (2002) notes that weak indefinite PPIs (somewhat in (41)) cannot satisfy two conflicting requirements (PPI: wide scope; weak indefinite: narrow scope).

(41) *John doesn’t appreciate this somewhat \((\text{somewhat} \text{can’t outscape negation})\)

Sometimes behaves like somewhat:

(42) *John didn’t sometimes come to class \((\text{sometimes} \text{can’t outscape negation})\)

Sometimes does not covertly move across negation in (42). Thus, it cannot do so in (38), either.

\(
\Rightarrow (38) \text{ derives from reconstruction of modal ((39)) and not Neg-Shift and PPI-movement ((40)).}
\)
**Argument 2 against Neg-Shift:** While regular PPI’s (*some NP*) may escape clausal negation, for many speakers these PPI’s cannot move across negative subjects. This can be expressed as in (44):

(43)  
   a. John didn’t buy some book  
   b. ??Nobody bought some book.

(44)  
**PPI Generalization**  
PPIs cannot covertly cross over the subject position (for present purposes: AgrSP).

The negative subject effect is even more pronounced with the PPI *sometimes*:

(45)  
   a. Nobody can always win  
   b. *Nobody can sometimes win

The Neg-Shift derivation (40) locates the LF position of the adverbial PPI *sometimes* to the left of the subject, contradicting the PPI-Generalization (44):

(46)  
   \[ [\text{YP} \text{sometimes}_2 \text{[XP} \text{not}_2 \text{[AgrSP \lor \text{it can}_1 \text{[T}_{\text{NegP}} \text{t}_2 \text{[T}_\text{TP} \text{t}_1 \ldots}}]]]] = (40)c

\[ \rightarrow (38) \text{derives from reconstruction of modal ((39)) and not Neg-Shift and PPI-movement ((40))}.\]

3.2. **Scope Splitting**

**Scope splitting:** dissociation of the surface position and the semantic scope of negation. Many cases of splitting involve negative quantifiers and modals (Bech 1954/57: §80; Kratzer 1989; Penka 2002; Heim 2000; de Swart 2000; Zeijlstra 2007; a.m.o).

(47)  
   a. *No Irish \_SUB need apply*.
   ‘It is not necessary that Irish apply’  
   (from Fintel & Iatridou 2004a)  
   b. No references have to be supplied.  
   (\(-\square > \exists\))  
   (Irene Heim)  
   c. No deposit is required.  
   (\(-\square > \exists\))  
   d. Sam can find no solution.  
   (\(-\Diamond > \exists\))  

Negative indefinites may also be assigned wide scope *de re* reading, which is characterized by weak t-conditions, though (de Swart 2000; Penka & Stechow 1999; (48)b from Penka 2002):

(48)  
   a. \([\text{No Irish VP}] = (\neg \exists > \square)\)  
   b. \(= \neg \exists x[\text{Irish}(x) \land [\text{VP}](x)] = \text{True if } \exists x[\text{Irish}(x)]‘ \text{is false, i.e. if there are no Irish}\)

**Analysis:** Scope splitting is an instance of NPI licensing. Negation is overtly morphologically marked on the negative quantifier, but interpreted in a higher position (NegP; von Stechow 1992/93; Penka 2002, 2010; Penka and von Stechow 2001; Zeijlstra 2004; Zeijlstra & Penka 2005):

(49)  
   a. Sam \([\text{XP} X^{\circ}_{+\text{neg}} \text{[YP can}_1 \text{[VP find}_1 \text{[DP no solution]_[+neg]]}]])  
   b. Sam \(_1 \text{[XP not}_1 \text{[VP can}_1 \text{[no solution]_[find(t)(t)]}]])  
   (\neg \Diamond > \exists)  
   c. \(\lambda w. \neg \exists x[\text{Acc}(w)(w') \land \text{solution}(x)(w') \land \text{find}(x)(\text{John})(w')]\)

(50)  
   a. Syntax: Negative NPs bear [+neg] that must be in scope of clause-mate NOT at LF.  
   b. Semantics: \([\text{[Not every NP]}_{+\text{neg}}] = [\text{every NP}]\)  
   \([\text{[Not every NP]}_{+\text{neg}}] = [\text{[every NP]}]\)

(51)  
   a. LF: \([\text{AgrSP Subject}_{\text{NP}} \text{[NegP NOT}_1 \text{[T}_\text{subject} \text{[NP}_{+\text{Neg}} \ldots]}]])\)  
   b. LF: \(*[\text{\forall NP}_{+\text{Neg}}] . \text{AgrSP Subject}_{\text{NP}} \text{[NegP NOT}_1 \text{[T}_\text{subject} \ldots}]\)\)
3.3. SPLIT READINGS WITH NEGATED UNIVERSALS: SAHM

Negated universals also have split readings. The universal can be interpreted de dicto w.r.t. the modal, while the modal is read within the scope of negation:

(52) Not everybody can be an orphan.  \((\neg \forall > \forall)\)  

‘It is not possible that everybody is an orphan’  

(Andre Gide)

(53) Not every pearl can be above average size.  

‘It is not possible that every pearl is above average size’

(54) Not every boy can make the team.  

‘It is not possible that every boy is on the team’

3.3.1. Logical independence

The split reading  \(-\forall > \forall\) can be truth conditionally distinguished from the surface scope de re interpretation  \(-\forall > \forall\). Consider the following example:

(55) Not every lottery number can be drawn.

a. \[\lambda w. \neg \forall x[\text{lottery_number(x)(w)} \rightarrow \exists w'[\text{Acc}(w)(w') \land \text{be_drawn}(w')]]\]  

\((\text{de re})\)

b. \[\lambda w. \exists w' \forall x[[\text{Acc}(w)(w') \land \text{lottery_number(x)(w')}] \rightarrow \text{be_drawn}(w')]\]  

\((\text{split de dicto})\)

de re reading: The de re interpretation (55)a conveys that only a proper subset of all possible lottery numbers can ever be lucky numbers; could e.g. be used to relate finding that a lottery is rigged and that 7 is never a winning number. The split reading (55)b, on which the universal is interpreted de dicto, entails that the winning numbers are a proper subset of all lottery numbers.

split reading: Model (56) verifies split reading (55)b (there is no world in which all lottery numbers are lucky ones) but fails to satisfy de re interpretation (55)a (each lottery number in \(w_0\) is a lucky number in one world):

(56) Model which satisfies split de dicto reading (55)b, but not de re reading (55)a:

<table>
<thead>
<tr>
<th>a</th>
<th>b</th>
<th>c</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

For any  \(x \in D_x\) and  \(w \in D_w\),

\[x \text{ is a lottery number in } w\]

\[x \text{ is drawn at the lottery in } w\]

The evidence for SAHM is based on the circumstantial reading of can (as opposed to dispositional interpretation, which has properties of a control structure).

(57) a. Sally can come along (because the car fits five)  

\(\text{Circumstantial}\)

b. Sally can swim  

\(\text{Dispositional}\)

(58) a. Circumstantial reading  \((-\forall)\)  

Raising complement  

\((<\text{st},\text{st}>)\)

b. Dispositional reading  \((-\forall)\)  

Control complement  

\((<<\text{e,}\text{st}>,<\text{e,}\text{st}>>)\)

Analysis of split reading of Not every boy can make the team generates an argument for SAHM:

(59) Syntax

1. The modal can overtly raises from  \(T^\circ\) to  \(\text{Neg}^\circ\) to  \(\text{AgrS}^\circ\).

2. not every boy bears [+neg]-feature and must be in the scope of abstract negation NOT

3. (not) every boy cannot reconstruct below  \(T^\circ\) (see subsection 3.4. for details)
Lechner: In defense of Sahm

s-variable binding has two effects

- HM leads to abstraction ($\lambda_3$) over trace $t_3$.
- $\lambda_3$ captures the world variable ($w_3$) inside the subject, resulting in opaque de dicto reading.

Next: Evidence that the subject of (60) is interpreted above the base position of the modal.
3.4. The LF Position of the Subject

Evidence for the assumption that subject of (60) is not interpreted below the base position of the modal falls out from the interaction of scope splitting and NPI-licensing. The argument has three ingredients.

**Ingredient 1.** The Immediate Scope Constraint (Linebarger 1980) demands that the licensing relation between an NPI and negation is not disrupted by a strong quantifier:

(63)  a. He didn’t like anything  \hspace{1cm} \text{(Linebarger 1987)}
    b. *He didn’t always like anything  \hspace{1cm} \text{(* ¬ > ∀ > NPI)}

(64)  a. I didn’t want her to eat any cheese  \hspace{1cm} \text{(Linebarger 1980: 29)}
    b. *I didn’t want every boy to eat any cheese  \hspace{1cm} \text{(* ¬ > ∀ > NPI)}

Negated universals license NPIs:

(65)  Not everyone who works on negation has ever read any Jespersen  \hspace{1cm} \text{(Horn 2000: (49b))}

NPIs and scope splitting are not in principle mutually exclusive:

(66)  a. No one can ever be on this team.  \hspace{1cm} \text{(" > NPI > ◊ > ∀)}
    b. *No one can ever be sure whether Homer was just one person.

NPIs are not licensed by negative universals:

(67)  *Not everyone, can ever be on the team.

**Observation:** The contrast (66) vs. (67) is due to the Immediate Scope Constraint. (67) is ill-formed for the same reason that (68) is - in both cases, a strong DP intervenes between the NPI and negation:

(68)  *It is not possible that everybody will ever be on the team.  \hspace{1cm} \text{(" > ◊ > ∀ > NPI)}
(69)  It is not possible that you/a dog will ever be on the team.  \hspace{1cm} \text{(" > ◊ > NPI)}

**Conclusion:** The universal part of not every serves as an intervener between NOT and NPIs.

**Ingredient 2 (locating ‘ever’).** Ever and always are aspectual modifiers. If they cooccur, ever needs to precede always (again, due to the Immediate Scope Constraint).

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

In (34), repeated from above, always scopes above the modal to its left. Thus, always originates as an adjunct to the node containing the base position but excludes the derived position of the modal (TP):

(34)  \[\text{[AgSpHe}_2\text{[Agr}: \text{can}_1 \text{[TP always [TP t}_5\text{[T: [ videogame me]]]]]} \hspace{1cm} \text{(always > ◊??◊ > always)}

Given (34) and the order restriction (70), ever must be parsed at least as high as an TP-adjunct:

(71)  a. ever precedes always
    b. always is a TP-adjunct (or an adjunct to a higher node, such as NegP)
    c. ever is adjoined to TP or above

**Ingredient 3 (locating the subject).** Combining the above yields a criterion for LF-position of subjects:

(72)  Triangulating the subject
    a. If at LF, the subject is above ever, it is located above TP.
    b. If at LF, the subject is lower than ever, it is located below TP.
(67) *Not everyone can ever be on the team

**Parse A.** Suppose the subject is located above *ever* at LF. Then, it becomes possible to exclude (67) as a violation of the Immediate Scope Constraint.

(73) *AgrSP
Not everyone, NegP

\[ \text{Not} \]

Neg'

\[ \text{can} \]

TP

\[ \text{everyone}, \]

TP

\[ \text{Immediate Scope Constraint} \]

\[ \text{ever}_{neg} \]

\[ \ldots \text{t}, \ldots \]

**Parse B.** If, alternatively, the subject is interpreted below *ever* and the base of the modal, (74) is a possible representation for (67). Thus, (67) is incorrectly predicted to be well-formed.

(74) AgrSP
Not everyone, NegP

\[ \text{Not} \]

TP

\[ \text{can} \]

TP

\[ \text{Immediate Scope Constraint} \]

\[ \text{ever}_{neg} \]

\[ \text{T'} \]

\[ \text{can} \]

vP

\[ \text{everyone}, \]

....

→ Only (73) is a possible representation for (67). The subject cannot be interpreted below T°.

(75) **An argument for SAHM**
a. T° is the base position of the raising modal *can*.
b. The subject in (60) (*every boy*) is interpreted above the base position of the modal (t3).
c. ∴ The modal must be interpreted in a derived position, in support of SAHM.

(60) Not every boy can make the team

\[ (\neg > \Diamond > \forall) \]

a. Overt: Not every boy, \[ \text{NegP NOT can}_3 [\text{TP t}_5, \text{subject} [T^* t_3, \text{modal} [\text{vP t}_2, \text{subject} m.t.t.]]] \]
b. LF: \[ \text{NegP NOT} \text{Neg can}_3 [\text{TP every boy}_2 [T^* t_3, \text{modal} [\text{vP t}_2, \text{m.t.t.}]]] \]

Comparatives again: Minimal variants of (8), in which the raising predicate required is substituted by a modal, also instantiate SAHM. On maximum reading, modal is interpreted in derived position:
The paper must be exactly 5 pages longer than 10 pages.

a. \( \lambda w. \forall w' [\text{Acc}(w)(w') \rightarrow \text{the paper is d-long in } w' = 15 \text{ pages}] \)
   ‘The paper must be no longer than 15 pages.’ \( (\text{must} \, > \, \text{MORE}, \text{maximum reading}) \)

b. \( \lambda w. id. \forall w' [\text{Acc}(w)(w') \rightarrow \text{the paper is d-long in } w'] = 15 \text{ pages} \)
   ‘The paper must be at least 15 pages long.’ \( (\text{MORE} \, > \, \text{must}, \text{minimum reading}) \)


Hall (2015) raises two main objections to the argument outlined in §3.4 above.

Objection 1. Subject reconstruction is possible after all. Some split scope orders can also be derived by subject reconstruction, instead of modal movement. For (78), this is the only option, as Hall notes.

(78) [Not every book about him can appear to each footballer, \( t_2 \) to be well written \( (\sim > \Diamond > \forall) \)]

(79) “Given that it appears that (at least in the case of strongly quantified NegDPs) reconstruction below \( T \) must be available, Lechner's invocation of head movement as the sole possible explanation for the split scope reading is no longer feasible.” \( (\text{Hall 2015: 133}) \)

Response: Yes, (78) indeed involves subject reconstruction - but this is immaterial because (78) is a bi-clausal raising structure which includes additional lower reconstruction sites for the subject below the base position of the modal. Relevant examples for SAHM are all mono-clausal.

Objection 2. The ‘Strong Constraint’. Hall correctly points out that the Strong Constraint undergenerates (Iatridou and Sichel 2011; McCloskey 2016)

(80) Strong Constraint

Strong NPs cannot reconstruct below \( T^o \).

McCloskey (2016) claims that “the argument for interpretive effects of head-movement, as Lechner recognizes […], stands or falls on the correctness of [(80)].”

Response 1: The argument for SAHM is not dependent on the validity of (80). It is sufficient to demonstrate that (i) there is an independent diagnostic for the height of subject reconstruction and that (i) at least one context displays the properties consistent with the SAHM argument. This was seen to be the case in §3.4 (see discussion surrounding (67)).

Response 2: A subset of the effects previously attributed to the Strong Constraint falls out from an independent constraint on the logical type of traces (Lechner 2007, 2009, to appear):

(81) Extensional Traces and Antecedents (ETA)

The denotations of generalized quantifiers and their traces do not include situation variables. (Thus, \( <e,t> \) is a possible type, but not e.g. \( <<e,}\text{st},>\text{st}> \) or \( <<<e,}\text{et},>\text{st}> \).

Consequence: Quantificational subjects cannot be interpreted in SpecvP (Johnson & Tomioka 1997).

(82) lists possible ways to interpret the thematic position of the subject. (82)a violates ETA, which bars intensional traces. (82)b abides by the ETA but results in a type mismatch. (82)c succeeds, because the computation combines with an s-variable first, followed by short subject QR.
Corollary 1 of ETA: Subjects do not reconstruct into vP, i.e. below base position of the modal.

4. OLD EVIDENCE FOR SAHM (NEED)

Goal: Provide evidence for SAHM from the behavior of transitive need.

John needs no books.

NB: The argument is not considered in Hall (2015) and McCloskey (2016); but see Szabolcsi (2009, 2011) for further elaboration on this theme.

4.1. COMPLEMENTATION PROPERTIES


John, needs [PRO₁ <to have> no books]

Problem 1. Control subjects cannot be interpreted with narrow scope/de dicto (Landau 2010, a.m.o). The control analysis wrongly predicts (split) de dicto readings for (85) - (87) to be absent.

a. de re reading of (85)
   \( \neg \exists x[\text{player}(x)(w_0) \land \forall w'[\text{Acc}(w_0)(w') \rightarrow \text{has_a_partner_at_this_game}(x)(w')]] \)
   \( (\forall, > \exists) \)

b. Split reading of (85):
   \( \forall w' [\text{Acc}(w_0)(w') \rightarrow \exists x[\text{player}(x)(w') \land \text{has_a_partner_at_this_game}(x)(w')]] \)

Model that satisfies de re reading (88)a, but not split reading (88)b:

\[
\begin{array}{ccc}
\text{a} & \text{b} & \text{c} \\
\text{w}_0 & \ddagger & \ddagger & \ddagger \\
\text{w}_1 & \bullet & \circ & \circ \\
\text{w}_2 & \circ & \bullet & \circ \\
\end{array}
\]

For any \( x \in D_e \) and \( w \in D_w \),
- ‘\( \ddagger \): ‘\( \ddagger \)’ x is a player in \( w \)
- ‘\( \circ \): ‘\( \circ \)’ x is not a player in \( w \)
- ‘\( \bullet \): ‘\( \bullet \)’ x is a player in \( w \) and x has a partner in \( w \)
De re readings have notoriously weak t-conditions, (85) would e.g. be verified by absence of players in evaluation world, irrespective of their properties.

**Problem 2.** Unlike control predicates, transitive need passivizes.

(90)  
(a) No one of you is needed any more.
(b) Nothing is needed except confidence.
(c) Nothing is needed from them.

Passivization affects abstract HAVE but is morphologically expressed on the overt head need.

(91)  
(a) No one of you is needed any more.
(b) Nothing is needed except confidence.
(c) Nothing is needed from them.

Corresponding control structures in which the embedded predicate is passivized are ill-formed:

(92)  
(a) John tried to show confidence
(b) *Confidence tried PRO to be shown
(c) *Confidence was tried PRO to be shown

See also Wurmbrand (1999: 604) for related argument in support of a raising analysis of modals.

**4.2. Analysis and evidence for SAHM**

The argument for SAHM consists of three ingredients.

**Ingredient 1.** need is a propositional operator that embeds small clause headed by possessive HAVE.

(93)  
(a) [need] = \lambda p.\lambda w. \forall w' [Acc(w)(w') \rightarrow p(w')]
(b) John needs noone
(c) [AgrSP John \lambda [TP needs [VP t3 [sc t1 HAVE noone]]]]

In passives, embedded small clause is too small to contain subject and needed lacks internal case. Hence, object of HAVE undergoes raising to subject position:

(94)  
(a) No one is needed
(b) [AgrSP noone \lambda [TP is [VP needed [sc HAVE tj]]]]

Passive need (90) homologous to long passive in German: the embedded predicate is too small to contain a subject and needed lacks internal case. Since the car was attempted to repair the car

**Ingredient 2.** need raises from V° to T°.

(95)  
[weil der Wagen zu reparieren versuchte, wurde]

since the car to repair tried was

“A since it was attempted to repair the car”

Passive need (90) homologous to long passive in German: the embedded predicate is too small to contain a subject and needed lacks internal case. Since the car was attempted to repair the car

**Ingredient 2.** need raises from V° to T°.

(96)  
(a) Work out which supplies you will need often t, and which you will need less often t'
(b) Target those you are likely to need often t.
(c) The companies do not invest in antibiotics, which most people need rarely t.
(d) #ASD patients needed rarely t, reoperation.

[A potential worry due to Greg Williamson (p.c): The objects in (96)a-c are not in-situ, so position of adverbs relative to need is hard to diagnose. In addition, (96)d is judged to be bad by many informants. Williamson notes that split scope facts elicit evidence for covert SAHM, though.]
**Ingredient 3.** Small clause subjects do not reconstruct for scope or referential transparency (Stowell 1991; Williams 1983; Moulton 2010, 2013; Lechner 2011, to appear):

(97) It appears that the imposter who performed plastic surgery using kitchen utensils in his kitchen is in the audience. We know this because we have heard that...

   a. #A doctor seemed nervous.  \((a \text{ doctor} \seem*/\seem > a \text{ doctor})\)
   b. A doctor seemed to be nervous.  \((a \text{ doctor} \seem/seem > a \text{ doctor})\)

(98) There are several empty seats in our otherwise totally full classroom.  \((\text{Moulton 2013: (3)})\)

   a. #Two students seemed sick today.  \((\text{two students} \seem*/\seem > \text{two students})\)
   b. Two students seemed to be sick today.  \((\text{two students} \seem/seem > \text{two students})\)

**Corollary 2 of ETA:** Quantificational subjects cannot be interpreted in subject position of small clauses.

(99) **Assumptions**

   a. Small clauses consist of predicate, excluding functional structure (Johnson 2001, a.m.o.).
   b. \(s\)-variables are located outside \(vP\) (fairly standard)

   \(\Rightarrow\) ETA blocks narrow scope \textit{de dicto} for small clause subjects.

(100) a. \(\text{TP} (\times\text{narrow scope de dicto})\)

\[ A \text{ doctor}_{<\text{est},t>} \quad \text{TP}_{<\text{est},t>,t>} \]
\[ \lambda_1 \quad \text{XP}_t \]
\[ s \quad \text{vP}/\text{VP}_{<t>},<t> \]
\[ \text{seemed}_{<\text{est},t>} \rightarrow \text{a doctor/T}_{<\text{est},t>} \quad \text{AP}_{<\text{est},t>} \]

b. \(\text{TP} (\checkmark\text{wide scope de re})\)

\[ A \text{ doctor}_{<t>},\text{TP}_{<t>,t>} \]
\[ \lambda_1 \quad \text{XP}_t \]
\[ s \quad \text{vP}/\text{VP}_{<t>},<t> \]
\[ \text{seemed}_{<\text{est},t>} \rightarrow \text{a doctor/T}_{<\text{est},t>} \quad \text{AP}_{<\text{est},t>} \]


\[ \text{blocked by ETA nervous} \]

From the ETA and the small clause analysis, it is possible to distill a final argument for \textbf{SAHM}.

(101) **An argument for SAHM**

   a. \textit{need} originates in \(V^\circ\)
   b. The subject in (102) is interpreted \textit{above} the base position of the modal (box).

   \(\Rightarrow\) c. \(\therefore\) \textit{need} is interpreted in a derived position, in support of \textbf{SAHM}.
No player needs a partner (at this game) \((\neg \Box > \exists)\)

\[
\text{AgrSP}_{\langle s,t \rangle} \\
\text{No player} \quad \text{NegP}_{\langle s,t \rangle} \quad \rightarrow \quad \lambda w. \neg \forall w' [\text{Acc}(w)(w') \rightarrow \exists x [\text{player}(x)(w') \land \text{have_partner}(x)(w')]]
\]

\[
\text{TP}_{\langle s,t \rangle} \\
\rightarrow \quad \lambda p. \lambda w. \neg p(w) \quad \rightarrow \quad \text{no player} \\
\text{T'}_{\langle s,t \rangle} \quad \rightarrow \quad \lambda w. \forall w' [\text{Acc}(w)(w') \rightarrow \exists x [\text{player}(x)(w') \land \text{have_partner}(x)(w')]]
\]

\[
\text{need}_{\langle s,t \rangle, \langle s,t \rangle} \quad \rightarrow \quad \lambda p. \lambda w. \forall w' [\text{Acc}(w)(w') \rightarrow p(w')]
\]

\[
\lambda_3 \quad \text{VP4}_{\langle s,t \rangle} \quad \rightarrow \quad \lambda 3. \exists x [\text{player}(w_3)(x) \land \text{have_partner}(t_3)(x)]
\]

\[
\lambda 3 \quad \text{VP3}_{\langle s,t \rangle} \quad \rightarrow \quad \exists x [\text{player}(w_3)(x) \land \text{have_partner}(t_3)(x)]
\]

\[
\lambda P. \exists x [\text{player}(w_3)(x) \land P(x)]
\]

\[
\lambda 1 \quad \text{VP2}_{\langle s,t \rangle} \quad \rightarrow \quad \lambda 1. \text{have_partner}(t_3)(1)
\]

\[
\lambda 1 \quad \text{VP1}_{\langle s,t \rangle} \quad \rightarrow \quad \text{have_partner}(t_3)(t_1)
\]

\[
\lambda 1 \quad \text{sc}_{\langle s,t \rangle} \quad \rightarrow \quad \text{t}_{3, s} \quad \text{sc}_{\langle s,t \rangle}
\]

\[
\lambda 1 \quad \text{sc}_{t} \quad \rightarrow \quad \text{t}_{2, c} \quad \text{sc}_{\langle s,t \rangle} \quad \rightarrow \quad \text{HAVE partner} \quad \rightarrow \quad \lambda x. \text{have_partner}(w_1)(x)
\]

5. **Summary**

The claim that there are instances of SAHM survives closer scrutiny, contra Hall (2015) and McCloskey (2016).

(103) □ New evidence for SAHM comes from
  - ATB-movement in comparatives
    *Side benefit*: evidence for covert ATB-movement, contra Boškovic and Franks (2000)
  - ATB-movement in coordination

□ Review of old evidence solidifies the original arguments in support of SAHM. The evidence includes:
  - Split scope and *can*
  - Split scope and *need*

□ Generalizations about reconstruction options are central for the older group of the SAHM arguments. These conditions fall out from a restriction on the logical type of QPs and their traces (ETA).
  - ETA derives ban on *in-situ* subjects.
  - ETA derives ban on reconstruction of small clause subjects.
Endnotes
1. Examples with a single modal also require the modal to take wide scope.

(i) Maria muss genau doppelt so viele Artikel veröffentlichen als sie Bücher herausgegeben hat.
   Mary must exactly twice as many articles publish than she books edited has
   “Mary has to publish exactly twice as many articles than she has edited books.”
   a. \( \lambda w. \forall w' [Acc_{det}(w)(w') \rightarrow \text{id.Mary is publishing d-many articles in w'}] = \text{id.Mary edited d-many books in } w \times 2 \) (must > MORE)
   b. \( \lambda w. \forall w' [Acc_{det}(w)(w') \rightarrow \text{Mary is publishing d-many articles in w'}] = \text{id.Mary edited d-many books in } w \times 2 \) (*MORE > must)

2. V-end structures pattern along with the V2-paradigm:

(i) weil die Kandidaten gute Zeugnisse mitbringen müssen oder eine Prüfung bestehen müssen.
   since the candidates good certificates bring must or an exam pass must
   “since the candidates must provide good certificates must pass an exam”
   a. weil die Kandidaten gute Zeugnisse mitbringen müssen oder eine Prüfung bestehen müssen.
      since the candidates good certificates bring or an exam pass must (\( \square > \land / \land > \square \))


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