Is the Human Language Faculty (HLF) a system that lets us express concepts that would be available—constructible, but unpronounceable—for primates without such a faculty? Or does the HLF provide cognitive equipment that is essential, in creatures like us, for creating at least many of the concepts we use in ordinary thought?

Any view should include a compatible conception of semantic composition that fits with...

(I) basic descriptions of adult linguistic competence
(a) how we understand linguistic signals as we do
(b) why we don’t understand linguistic signals in other coherent ways

(II) plausible accounts of language acquisition that fit with (I)
(a) how kids acquire the (typically shared) linguistic competence they do acquire
(b) why kids don’t acquire other signal-to-meaning systems, given their experience

(III) plausible accounts of the innate endowment suggested by (II)
(a) how certain primates came to have the Human Language Faculty
(b) why other animals don’t have the distinctive capacities that the HLF gives us

Chomsky’s TANSTAAFL: hypotheses that are initially tempting, given (Ia), often seem less attractive in light of other facts

(1) John is eager to please
(1a) John is eager that he please relevant parties
(1b) #John is eager that relevant parties please him

(2) John is easy to please
(2a) It is easy for relevant parties to please John
(2b) #It is easy for John to please relevant parties

(3) Who said he left early
(3a) for which person x: x said θthat-guy left early
(3a') for which person x: x said x left early

(4) Who did he say left early
(4a) for which person x: θthat-guy said x left early
(4b) #for which person x: x said x left early

(5) The senator called the millionaire from Texas
(5a) The senator called the millionaire, and the millionaire was from Texas
(5a') The senator called the millionaire, and the call was from Texas
(5b) #The senator called the millionaire, and the senator was from Texas
Agenda for Today

Sketch a simple conception of composition, contrasting it with two initially tempting alternatives

(α) expressions generated by the HLF don’t have meanings of their own:
There Ain’t No Such Thing As Compositional Semantics For Languages Like English

(ω) such expressions do have compositionally determined meanings of their own, but the lexical meanings (and syntax) and semantic modes of composition are complicated

Offer a proposal, prompted by suggestions from Spelke and others, according to which...

the Human Language Faculty can and does serve as a “concept integrator,” because
— the HLF is a system that lets us express concepts that are already available, and
— the HLF lets us create many of the concepts we humans use in ordinary thought

The Proposal

— available concepts, of various types, are lexicalized as monadic predicates with grammatical labels

\[
\begin{align*}
\text{RED} & \Rightarrow \text{Adjective: } & \text{BALL} & \Rightarrow \text{Noun: } \\
\text{STAB} & \Rightarrow \text{Verb: } & \text{CAESAR} & \Rightarrow \text{Designator: }
\end{align*}
\]

— expressions can be concatenated in accordance with grammatical constraints

\[
\begin{align*}
A: \text{red( ) + N:ball( )} & \Rightarrow A: \text{red( )}^\land N: \text{ball( )} \Rightarrow N: [A: \text{red( )}^\land N: \text{ball( )}] \\
V: \text{stab( ) + D:caesar( )} & \Rightarrow V: \text{stab( )}^\land D: \text{caesar( )} \Rightarrow V: [V: \text{stab( )}^\land D: \text{caesar( )}]
\end{align*}
\]

— concatenation is interpreted as predicate conjunction

\[
N: [A: \text{red( )}^\land N: \text{ball( )}] \Rightarrow N(x): [A: \text{red(x)} \land N: \text{ball(x)}]
\]

— and certain grammatical relations are interpreted, in a constrained way, as instructions to convert certain predicates into predicates of another type that facilitates conjunction

\[
\begin{align*}
V: [V: \text{stab( )}^\land D: \text{caesar( )}] & \Rightarrow V(x): [V: \text{stab(x)} \land D: \text{caesar(x)}] \\
V: [V: \text{stab( )}^\land D: \text{caesar( )}] & \Rightarrow V(e): [V: \text{stab(e)} \land \text{DIRECTOBJCONVERTER}^\land D: \text{caesar(x)}] \\
& \Rightarrow V(e): [V: \text{stab(e)} \land \exists x \{ \text{Theme(e, x)} \land D: \text{caesar(x)} \}]
\end{align*}
\]

Condensed Form

the HLF lets us build conjunctive concepts from monadic concepts that the HLF lets us create by lexicalizing—i.e., by imposing a certain format on, and thus transforming—available concepts
Section One: General Questions about Semantic Composition in Natural Language

What is the significance of combining two expressions, thereby forming a complex expression?

How does a complex expression—like ‘red ball’ or ‘This is the ball that Ramsey chased today’—differ from a mere list of labels for the relevant word meanings?

Which (if any) grammatical relations are semantically significant, in ways that go beyond the significance (whatever it is) of “mere” combination?

What is the simplest conception of semantic composition with a prayer of descriptive adequacy?

What constraints do semantic composition principles impose on how we lexicalize concepts?

Even if we know that ‘Ramsey’ is a name for a certain dog, and we are given truth-conditions for the sentences, the meanings of ‘saw’ and ‘chased’ and the other sentence-constituents depend on the meaning of ‘^’ (and vice versa).

Does the compositionality of spoken/signed languages help explain—or does it presuppose—our capacity to combine disparate concepts in a single thought?

‘Most of us here today have bought and read several good books about space or time’

‘Even on days when the sky is grey, many people know why the sky is blue’

Section Two: The Significance of Combination

Suppose we have predicates, arguments (predicate-fillers), and adjuncts (predicate-modifiers), but just one operation (^, a.k.a. MERGE) for concatenating lexical items in human languages.

Predicate + Argument ==> Pred
Pred / \ Arg

Pred + Pred ==> Pred
/ \ / \
Pred Arg Pred

first option: MERGE itself has no significance, but grammatical relations do; there are two rules of construal for such relations; and predicates are satisfied by n-tuples of entities

(a) Pred_n + Arg ==> Pred_{n-1}
/ \ / 
Pred_n Arg
saturation
(b) Pred_i + Pred_i ==> Pred_i
/ \ / 
Pred_i Pred_i
modification/restriction

Saw(x, y)^Ramsey ==> Saw(x, Ramsey)
Red(x)^Ball(x) ==> Red(x) & Ball(x)
second option: MERGE has univocal significance, geared to cases of saturation

\[(a) \quad \text{Pred}_n + \text{Arg} \implies \text{Pred}_{n-1} \quad \text{Pred}_n \quad \text{Arg} \quad \text{Pred}_n \]

\[(b) \quad \text{Pred}_1 + \text{Pred}_1 \implies \text{Pred}_1 \quad \text{Pred}_1 \quad \text{Pred}_1 \]

\[\text{Saw}(x, y)^\text{Ramsey} \implies \text{Saw}(x, \text{Ramsey})\]

\[\text{Red}(x) + \text{Ball}(x) \implies \text{RED}[(x), \text{Y}]^\text{Ball}(x) \implies \text{RED}[(x), \text{Ball}(x)] \implies \text{Red}(x) \& \text{Ball}(x)\]

\[\text{BEING AN ADJUNCT has conjunctive significance in addition}
\text{to the basic “saturational” significance of MERGE}\]

third option: MERGE has univocal significance, geared to cases of modification/restriction

\[(a) \quad \text{Pred} + \text{Arg} \implies \text{Pred} \quad \text{Pred} \quad \text{Arg} \quad \Theta \]

\[(b) \quad \text{Pred} + \text{Pred} \implies \text{Pred} \quad \text{Pred} \quad \text{Pred} \quad \Theta \]

\[\text{saw}^\text{Ramsey} \implies \text{Saw}(e) \& \Theta_\text{DirectObj}(e, \text{Ramsey}) \quad \text{Red}^\text{Ball} \implies \text{Red}(x) \& \text{Ball}(x)\]

\[\text{BEING AN ARGUMENT has “participatory” significance in addition}
\text{to the basic conjunctive significance of MERGE}\]

\[\text{Fido}^\text{saw}^\text{Ramsey} \implies \Theta_\text{Subj}(e, \text{Fido}) \& \Theta_\text{DirectObj}(e, \text{Ramsey}) \\
\text{Saw}(e) \& \Theta_\text{DirectObj}(e, \text{Ramsey}) \implies \text{Agent}(e, \text{Fido}) \& \text{PastSeeing}(e) \& \text{Theme}(e, \text{Ramsey})\]

Section Three: Verbs as Monadic Predicates of “Things with Participants”

(6) Plum stabbed Green quickly with a knife  
(7) Plum stabbed Green with a knife quickly  
(8) Plum stabbed Green quickly  
(9) Plum stabbed Green with a knife  
(10) Plum stabbed Green  

\[\text{Davidson (1967, 1985)}\]

(11) \[\exists x[\text{Red}(x) \& \text{Ball}(x)] \implies \exists x[\text{Red}(x)] \& \exists x[\text{Ball}(x)] =/\implies \exists x[\text{Red}(x) \& \text{Ball}(x)]\]

(12) At least one stabbing of Green by Plum was done quickly and with a knife

(13) \[\exists e[\text{PastStabOfGreenByPlum}(e) \& \text{Quick}(e) \& \text{With}(e, \text{a knife})]\]

(14) \[\exists e[\text{Agent}(e, \text{Plum}) \& \text{PastStab}(e) \& \text{Theme}(e, \text{Green}) \& \text{Quick}(e) \& \exists x:\text{Knife}(x)\{\text{With}(e, x)\}]\]
The senator called the millionaire from Texas

(5a) The senator called the millionaire, and the \textit{millionaire} was from Texas
(5a') The senator called the millionaire, and the \textit{call} was from Texas
(5b) #The senator called the millionaire, and the \textit{senator} was from Texas

the phrase \textit{millionaire from Texas} is understood as a predicate of individuals:
\[ \text{Millionaire}(x) \& \text{From}(x, \text{Texas}) \]

but the phrase \textit{called the millionaire from Texas} cannot be understood this way:
\[ \#\text{Called}(x, \text{the millionaire)} \& \text{From}(x, \text{Texas}) \]

\[ \text{PastCall}(e) \& \text{Theme}(e, \text{the millionaire}) \& \text{From}(e, \text{Texas}) \]

\[ \text{it is understood as a predicate of events; and it is understood as if no “agent variable” is available for modification at this stage} \]

The senator called the millionaire from Texas

(5) \[ \exists e \{ \text{Sen}(x)[\text{Agent}(e, x)] \& \text{PastCall}(e) \& \text{Mill}(x) \& \text{From}(x, \text{Texas})[\text{Theme}(e, x)] \} \]

My red ball

(15) \[ \text{PossessedBySpeaker}(x) \& \text{Red}(x) \& \text{Ball}(x) \]

This red ball

(16) \[ \text{DemonstratedThing}(x) \& \text{Red}(x) \& \text{Ball}(x) \]

This is a red ball

(17) \[ \exists x[\text{DemonstratedThing}(x) \& \text{Red}(x) \& \text{Ball}(x)] \]

ran quickly

(18) \[ \text{PastRun}(e) \& \text{Quick}(e) \]

She ran quickly

(19) \[ \exists e[\text{DoneByHer}(e) \& \text{PastRun}(e) \& \text{Quick}(e)] \]

Every dog barked

(20) \[ ??? \]

She saw every dog

(21) \[ ??????? \]

She saw every dog that he didn’t see

(22) \[ ????????? ????????? \]

Yesterday, she boiled every big egg that he didn’t

(23) \[ ????????????? ????????????? \]

\textit{Such questions invite a homework session (Pietroski 2005)...}

—provide a syntax and lexicon that preserves a simple “Conjunctivist” semantics for cases like (20-23)
—look for cases where such an account is better, empirically and conceptually, than alternatives
—and thus argue that (i) the \textit{recursive} core of natural language is a system for conjoining predicates,
 and (ii) certain grammatical relations—like \textit{being the subject/object of}—
 have “participatory” significance because this makes it possible to
 combine predicates that cannot be coherently conjoined

\textit{ASSERTIONS: (20-23) end up favoring Conjunctivism; many facts go unexplained by every theory, but Conjunctivism does well in terms of explanations; and while the truth-conditions of sentential utterances might not be determined by a Conjunctivist semantics that’s OK.}
**Module 1**

*Basic Symbols:* F, G, H, a, b, c, d  
*Generable Representations:*  
Fa, Fb, Fc,Fd, Ga, ..., Hd

**Module 2**

*Basic Symbols:* Φ, Ψ, α, β, γ  
*Generable Representations:*  
αΦβ, βΦα, αΦγ, γΦα, βΦγ, γΦβ,  
αΨβ, βΨα, αΨγ, γΨα, βΨγ, γΨβ

**Module 3**

*Basic Symbols:* &, ¬, [ ]  
*Generable Representations:*  
Fa & αΦβ, ¬Fa, ¬Fa & αΦβ, ¬(Fa & αΦβ),  
iBEL~Fa, ¬iBEL~Fa, uDES~¬(Fa & αΦβ),  
iBEL~[Fa & ¬uDES~¬(Fa & αΦβ)], ...  
“i think: Fa & u want not-[Fa & αΦβ]”

**Module 4**

*Basic Symbols:* BEL, DES, i, u, ~  
*Generable Representations:*  
iBEL~, uBEL~, iDES~, uDES~

---

**Section Four: A (perhaps hypothetical) Design Problem and Possible Solution**

given animals with this kind of cognitive architecture,  
what could be added that would make it possible for their descendants to  
**systematically** combine representational elements of the various intramodular languages—  
and thereby create “intermodal” representations of arbitrary complexity—  
and (perhaps as a later side benefit) let such animals talk to each other?

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**Modular Output Systematizer, requires Mentalese® central operating system:**  
associates each modular symbol with an expression of an inner language

---

**Overt Language* System, sold separately**  
(*No semantics. Mentalese–PhoneticForm associations only. Exercise caution when deploying  
this module to classify word-strings; perceived SyntacticStructures may be illusory.)

Ages 2-4. Not intended for use in metaphysics, logic, or philosophical psychology.
Another Possible Solution: HLF as “Modular Output Systematizer”

*Lexicalize* modular concepts, in a way that imposes a common format, thus making it possible to:

- systematically and meaningfully *combine* lexical items, given available “logical” operations; and then
- *use* expressions generable by the HLF to *create* human Concepts, which exhibit systematicities.

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**Two conceptions of the HLF**

*Lexicalizer as Abstracter*

Gb $\Rightarrow$ G_ $\Rightarrow$ Pred1:G

$\beta$ Arg:b

$\phi \beta \Rightarrow _\phi \beta \Rightarrow$ Pred2:$\phi$

$\alpha$ Arg:$\alpha$

$\phi \chi \Rightarrow _\phi \chi \Rightarrow$ Pred1:$\square$

*Combiner as saturater-or-conjoiner*

- **concatenate/saturate a Pred with an Arg**
  
  Pred2:$\Phi$^Arg:b $\Rightarrow$ [Hit(x, y)](bob) = Hit(x, bob)  
  
  Pred1:G^Arg:b $\Rightarrow$ [Green(x)](bob) = Green(bob)

- **concatenate/conjoin a Pred1 with a Pred1**
  
  Pred1:G^Pred1:G $\Rightarrow$ Green(x) & Square(x)

*Lexicalizer as PredMaker & ThetaMarker*

- modular symbols lexicalized as Preds

- some Preds can ThetaMark others, thereby creating Args

  |
  | Pred:b  Bob(x)  
  | Pred:G  Green(x)  
  | Pred:Φ  Hitting(e)  
  | Pred:□  Square(x)

*Combiner as Concatenater/Conjoiner*

- Pred:G^Pred:□ $\Rightarrow$ Green(x) & Square(x)

  - Pred:G^Pred:b $\Rightarrow$ Green(x) & Bob(x)

  - **Some Preds ThetaMark Others**

  $^\text{T}_\exists$Pred:Φ + Pred:b $\Rightarrow$ Pred:Φ$^\text{CONVERT}$-Pred:b

  $\Downarrow$

  Hitting(e) & $\exists x [\text{Theme}(e, x) & \text{Bob}(x)]$
Some References

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