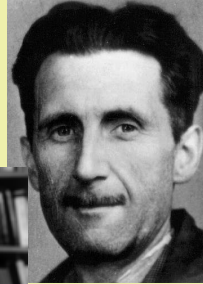**The thin line between facts and fiction – reflections on the pre-scientific state of the field**

Hubert Haider

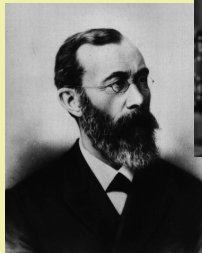FB Linguistik, Univ. Salzburg

Gottfried Wilhelm Freiherr von **Leibniz**

George **Orwell**

Francis Harry Compton **Crick**

Wilhelm **Wundt**

1

The thin line between facts and fiction

- *Wundt's problem*:   how to deal with **introspection**

- *Crick's problem*:   the black box is a **black** box

- *Orwell's problem*:   all **languages** are **equal**, but
      some are more equal than others

- *Leibniz's problem*: the **best** of all possibe worlds/**grammars**
      and the concept of **perfection**

2

1

Prescientific status

Prescientific is meant to refer to what defines the legitimate operations in a given theory, that is, the the **core convictions and premises** for the research programme.

These premises are, by definition, **prescientific** statements because it is **not possible** to **derive** them using empirical means. They are postulated.

3

Wundt's Problem

- *Introspective data* = results of self-informant work
  (Newmeyer 1983:48)

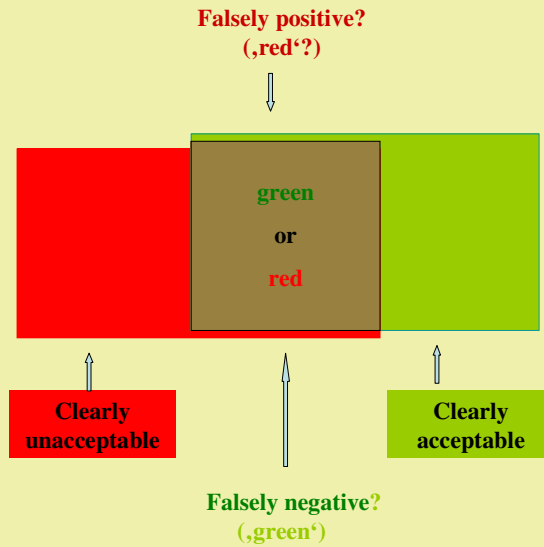- *Introspective data* = metalinguistic judgements by informants (including the self-informant)

  Why do we happily rely on self-informant work data?

- This paradigm has proven *productive* to a large extent

- These data are the *easiest* to obtain (Newmeyer 1983:50)

  F.Newmeyer. 1983. Grammatical Theory. Univ. Of Chicago Press

4

Is this a Problem? - Sometimes

Falsely positive?
(‚red'?)

⇓

<div style="text-align:center">

	green or red	
red	**green or red**	**green**

</div>

⇑   ⇑   ⇑

Clearly unacceptable   **Clearly acceptable**

Falsely negative?
(‚green')

5

The ‚unclear cases'

• Competing theories/hypotheses often account for the ‚clear cases' equally well.

Counterevidence (by opponents) or defensive evidence (by supporters), however, is not always recruited from the clear cases.

• In defense, counterevidence may be ‚expained' away as ungrammatical although it is not (falsely negative). The specific examples used in the argument may indeed be ungrammatical or merely degraded by intervening factors that are irrelevant. In the latter case, they are wrongly dismissed.

• On the other hand, the evidence that is raised against a hypothesis may be indeed irrelevant or mistaken as grammatical and judged falsely positive.

In both cases, the evidence needs to be assessed independently.

Does this happen in reality? – See slide on superiority data from Dutch

6

3

Present day theoretic syntax is largely built on the acceptability intuitions of syntacticians. This is a ***special subset of natives*** whose grammar competence has not been shown to be representative for the grammar competence of a native speaker without an inclination for, and training in, formal syntax.

- "Good practice in the more advanced sciences distrusts most of all the memory and impressions of the investigator himself" (Labov 1978, Sociolinguistics).

- "But, for an in-depth syntactic investigation, native command of the given language is indispensable: Only the most sophisticated speakers can supply the exquisite judgements required for writing a grammar" (Gleitman & Gleitman 1970. Phrase and Paraphrase).

7

Questionaire data on Dutch superiority, gathered and shared by Gisbert Fanselow

22 Raters (professional linguists)

⇓

0vp	1	5	6	4	3	9	7	2	8	10
	ik weet niet wie wat gekocht heeft	ik weet niet, wie wat an wie gegeven heeft	wie weet wie wat gekocht heeft	ik weet niet wat wie aan wie gegeven heeft	ik weet niet wat welke leraar gekocht heeft	wie weet wat wie gekoch heeft voor zijn zusje	wie weet wat wie gekocht heeft	ik weet niet wat wie gekocht heeft	ik weet niet wat wie gekocht heeft oor zijn zusje	wie weten al welke boeken deze studenten hebben gekocht, maar wij weten nog niet, wat wie precies heeft gekocht
1c	+	+	+	+	+	+	+	+	+	+
1d	+	+	+	+	+	+	+	+	+	
1p	+	+	+	+	+	+	+	+	+	+
1s	+	+	+	+	+	+	+	+	+	+
1u	+	+	+	+	+	o	+	+	-	o
2e	+	+	+	+	o	+	+		o	-
2f	+	+	+	+	o	+	+	o	0	
2g	+	+	+	+	+	+	o	0	o	0
301	+	+	+	+	+	o	o	0	-	-
30n	+	+	+	+	+			0	0	+
39r	+	+	+	+	+	-	-	-	-	0
39s	+	+	+	+		+		-	-	-
400u	+	+	+	0	+		+			
401q	+	+	+	0	0	0	0	0	-	0
41°	+	+	+	0		o	o	o	-	-
41j	+	+	+	o	0	-	-	0	-	+
41k	+	+	+	o	-	-	-	-	-	-
41m	+	+	+	o	0	-	-	-	-	o
41o	+	+	+	0	0	-	-	-	-	-
5b	+	+	+	o		-	-	-	-	o
6h	+	+	+		-	-	-	-	-	-
6t	+	+	+		-	-	-	-	-	-

Falsely negative? - Falsely positive? 8

4

Much of the criticism of intuitions suggests that they represent 'invented' data.

- Stubbs (Text & Corpus Analysis. 1996. 29,31): much linguistics is based on invented sentences; data often means invented data.

- Borsley (Lingua 2005.115:1477): "This is seriously confused. The sentences that linguists investigate may well be invented, but the speaker's judgements are not invented and it is in these that are the data with which theoretical linguists work".

- "It is hard to escape the feeling that many objections to intuitions are just a convenient excuse for ignoring a large body of often rather difficult literature." (Borsley 2005, Fn 4).

9

Linguists continue to insist that the ease of obtaining data is the reason for preferring oneself as a subject, ignoring *the inferior quality of the data* so obtained. (Schütze: p.187).

Parallels to the history of psychology

For the (late) 19th century psychology, introspection was the main access road to insights about the mind. It was Wilhelm Wundt (1832-1920) who argued that *introspection* needs to be controlled and integrated into a *systematic program of psycho-logical experimentation*.

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- For Wundt, ‚Introspection' is *ambiguous* and he distinguishes *self observation* ('**Selbstbeobachtung'**) from *internal perception* (‚**Innere Wahrnehmung'**)

- The introspectionist [in the sense of *self observation*] he contemptuously likens to **Baron Münchhausen** attempting to pull himself out of the bog by his own pigtail,

  but he emphasized introspection [in the sense of *internal perception, that is Innere Wahrnehmung*] as the *foundation of psychology*."

11

What do I *perceive* or *observe* if I ask myself how I as a native speaker judge sentences like the following:

(1)   Der Mann hat sich *angefangen*, -- für alles zu interessiern
            the man has himself begun, for everything to interest

(2) *   Der Mann hat sich *zugegeben*, -- für alles zu interessieren
            the man   has himself admitted, for everything to have-taken-interest-in

I 'observe' myself while '*perceiving'* a feeling of uneasiness when I process (2) and that I do not sense it when I process (1), and I interpret this feeling as an indication for the deviance of (2) in German – internal perception.

12

6

Is this a ***reliable datum***? It is, if I can be sure that the described sensation is *replicable* in terms of

- repeated exposures of myself to (1) and (2), e.g. while brushing my teeth or after having had a glass of beer, ...
- exposure of other native speakers to (1) and (2)
- exposure of myself to other members of the class of sentences I take (1) and (2) to be representative for
- exposure of other native speakers to other members of the the class of sentences I take (1) and (2) to be representative for

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But, can I be sure indeed? Yes, I could, if replicability had been tested. But it has not been tested. So I cannot be sure.

Experimental standards in psychology: data collection and data evaluation *under controlled circumstances* for data that are not already uncontroversial:

- large enough *number* of subjects
- subjects *ignorant* of the test hypotheses
- *randomized* presentation of stimuli
- *statistical analysis* of the collected data

Intuitions are a legitimate form of evidence for linguistic hypo-theses but they should be treated as what they are, namely experi-mental data dependent on experimental standards.

14

Wundt, Wilhelm. 1888. Selbstbeobachtung und innere Wahrnehmung. Philosophische Studien, Bd. IV. p. 292-309.

Es ist ganz in die Hand der Psychologen gegeben, dafür zu sorgen, dass diese Fehler mehr und mehr ganz verschwinden. Es ist dazu nur das eine nötig daß sie [....] sich der experimentellen Methode [...] bemächtigen.

It is totally in the hands of the psychologists to take care that these failures disappear more and more. The only thing they have to do is to seize the experimental method.

Es stehen dem gegenwärtig noch zwei Eigenschaften entgegen.

Presently, there are two properties that stand in its way.

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Die eine Eigenschaft ist der Hochmuth. Es gibt ja immer noch einige Leute, die das Experimentieren für eine banausische Kunst halten, mit der man sich nicht befassen dürfe, wenn man nicht des Privilegiums, im Aether des reinen Gedanken zu hausen, verlustig gehen wolle.

- *One property is arrogance. There are still some people who consider experimenting a philistine art, which one should not deal with, if one does not want to risk loosing the priviledge of residing in the pure ether of thoughts.*

Die andere Eigenschaft ist die falsche Bescheidenheit. Jede Kunst scheint in der Regel dem, der sie nicht versteht, viel schwerer als sie wirklich ist.

- *The other property is mistaken modesty. Every art usually tends to appear to be more difficult than it really is to those who do not understand it.*

16

Wundt, Wilhelm. 1888. Selbstbeobachtung und innere Wahrnehmung. Philosophische Studien, Bd. IV. p. 292-309.

p.308: Es ist aber in der experimentellen Psychologie nicht anders, als in anderen Wissenschaften auch. Die Antworten, die man erhält, sind nicht bloß von den Hülfsmitteln, über die man verfügt, sondern auch von den Fragen abhängig, die man stellt. Wer keine oder nur verkehrte Fragen zu stellen weiß, der darf sich nicht wundern, wenn er nichtssagende oder unbrauchbare Antworten erhält.

- Experimental psychology is not different from other sciences. The answers that you get are *not only* dependent on the technical aids you dispose of, but also on the questions you ask. Who asks no questions or only mistaken ones must not be surprised if he receives only irrelelevant or useless answers.

17

Wundt, na und? (and so what?)

- Data assessment: self informant data need to be strengthened by controlled data acquisition

- Data documentation: full list of stimuli, information on informant agreement/disagreement (variance, kappa)

- Data normalization: consensus on currency exchange rates for data acquired/assessed with different methods

It is a mark of the trained mind never to expect more precision in the treatment of any subject than the nature of that subject permits [or requires ?].

(Aristotle, *Nicomachean Ethics* 1094b 24-5)

18

NEXT: CRICK'S Problem

Francis Harry Compton Crick:

- The difficulty of the method of the black box is this. If the interior of the box does not have a very simple structure, the method soon will reach a stage in which different theories cover all observable results sufficiently well. Attempts to decide between the theories fail because new experiments only produce new complexities. One has no other choice than groping one's way into the box.

(*Spektrum der Wissenschaft* 11, 1979. Translattion by HH.).

- Die Schwierigkeit der Methode des schwarzen Kastens besteht darin, dass man - sofern das Innere des Kastens nicht sehr einfach strukturiert ist - sehr bald ein Stadium erreicht, in dem unterschiedliche Theorien alle beobachtbaren Resultate gleich gut zu erklären vermögen. Versuche, zwischen den Theorien zu entscheiden, schlagen fehl, weil neue Experimente nur neue Komplexitäten zutage fördern. Man hat dann keine andere Wahl, als sich in den Kasten hineinzutasten.

19

Crick's Problem

For reasons that have never been made explicit, many generative grammarians appear to regard primary intuitions as more direct evidence of linguistic competence than other types of data.

But there is no basis for this belief. Since knowledge of language is not directly observable, linguists should use every type of evidence available to help us infer what is in speakers' minds.

(Wasow & Arnold 2005:1484. *Lingua*. Intuitions in linguistic argumentation).

20

1996, *Language* published for the first time a neuro-imaging study:

Jaeger,J. & A.Lockwood & D.Kemmerer & R.D. van Valin & B.Murphy & H. Khalak 1996. A positron emission study of regular and irregular verb morphology in English. *Language*. 72: 451-497.

Claim: Based on different processing of regular and irregular forms, the authors argue for a dual route account of participle processing (rules + memory).

21

Positive replication for German:

Available online at www.sciencedirect.com

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Brain and Language 85 (2003) 67–92

Brain and Language

www.elsevier.com/locate/b&l

An ER-fMRI investigation of morphological inflection in German reveals that the brain makes a distinction between regular and irregular forms[☆]

Alan Beretta,[a,*] Carrie Campbell,[a] Thomas H. Carr,[b] Jie Huang,[c] Lothar M. Schmitt,[d] Kiel Christianson,[a] and Yue Cao[c]

[a] *Department of Linguistics, Michigan State University, East Lansing, MI 48824, USA*
[b] *Department of Psychology, Michigan State University, East Lansing, MI 48824, USA*
[c] *Department of Radiology, Michigan State University, East Lansing, MI 48824, USA*
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Accepted 5 September 2002

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A. Beretta et al. / Brain and Language 85 (2003) 67–92   81

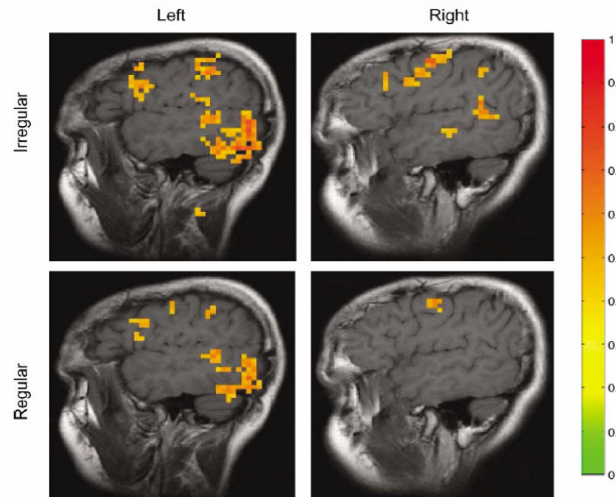Fig. 1. Left and right hemisphere contrasts between regular and irregular activation in a single subject Sidebar indicates the level of correlation of activity with the reference function.

23

Crick's Problem

BUT: Bornkessel-Schlesewsky & Schlesewsky 2007. *Theoretical Linguistics*. Vol. 33.3

- Experimental data may be superior to intuitions in terms of their reliability, but they still *require interpretation*. They allow just as much misinterpretation as intuitions. (p. 320)

- Single judgements of all kinds only reflect the *endpoint* of an interaction between a variety of linguistic **and** extralinguistic factors, thus rendering *direct* conclusions from grammatical theory just as useful or just as problematic as those drawn from careful intuitive judgements (p.321).

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Slide 1

Crick's Problem

How to open the black box?

- **fMRI**

- **EEG**

- **Eye movements**

- **…………………**

Presently, the arsenal of psycholin-
guistic experimental techniques is
impressive, but it is not yet deve-
loped that far that the experimental
outcomes could be factored into
their grammatical components

5

Slide 2
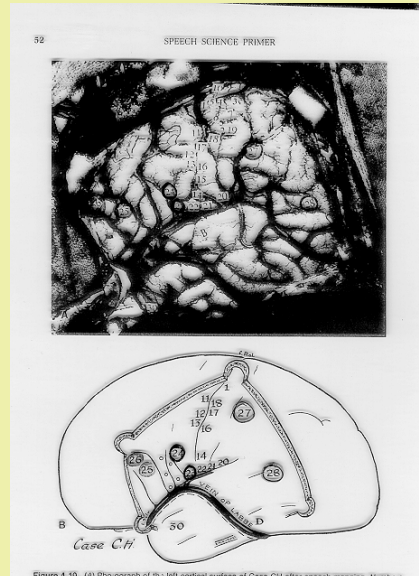
Functional magnetic resonance imaging

fMRI Project Stuttgart-Tübingen-Salzburg
1996-2002

Hermann Ackermann
Grzegorz Dogil
Wolfgang Grodd
Hubert Haider
Hans Kamp
Michael Klein
Jörg Mayer
Axel Riecker
Dirk Wildgruber

G.Dogil et als. 2002: The speaking brain.
*Journal of Neurolinguistics***, 15: 289-336.**

26

Syntactic task

Sentence reserialization (i.e. *movement of a phrase to the clause-initial position. Instance of A'-movement*).

see:
Ein junger Hund würde sich mit Kindern gut vertragen.
(A young dog would get along well with children.)

say:
Mit Kindern würde sich ein junger Hund gut vertragen.
(With children would a young dog get along well.)

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Control task

List reserialization, unstructured

see:
Kaffeemaschine   Waschmaschine   Bügelmaschine
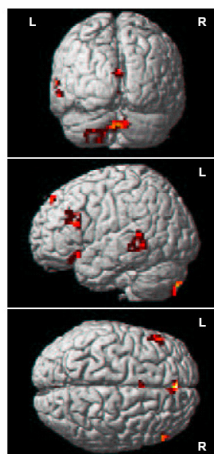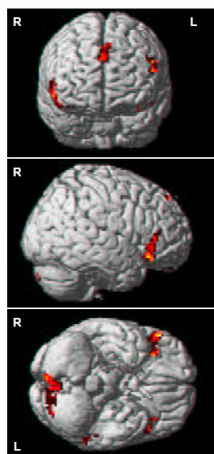 *coffee maschine*   *washing maschine*   *ironing maschine*

say:
Bügelmaschine   Kaffeemaschine   Waschmaschine

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Results

sentence reserialization *minus* list reserialization

FIGURE 17. SPM representation of group (n=10) random efffects analysis of the paired image cognitive subtraction: syntactic transformation - list reserialization.

- cerebellum (L>R)
- **left ventral frontal language region**
- prefrontal cortex (L>R)
- anterior cingulate gyrus
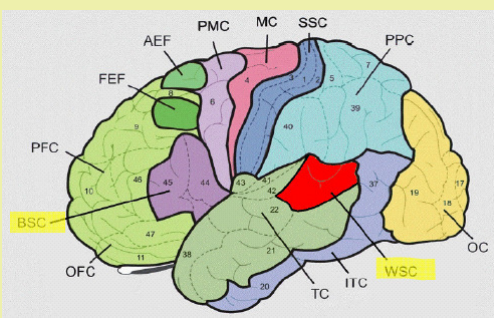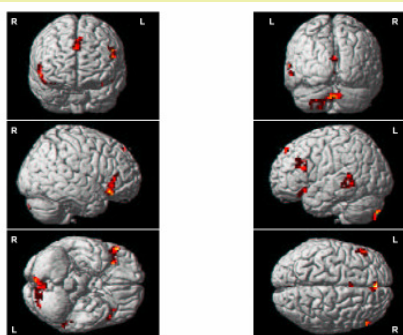- **left posterior temporal gyrus**

29

FIGURE 17. SPM representation of group (n=10) random efffects analysis of the paired image cognitive subtraction: syntactic transformation - list reserialization.

BSC = Broca's area

WSC = Wernicke's area

30

What do scans like these tell us?

The task stimulates the activation of a language processing network

There are focal areas of activities that correspond to the expected loci of activation in language processing:

• **Parts of Broca's area**

• **Parts of Wernicke's area**

   plus

• **Cerebellum activity**

• **Activity in the cingular cortex**

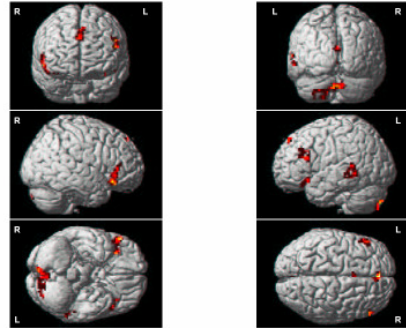**What we do NOT see: which activity is the activity that accomplishes the fronting task.**

FIGURE 17. SPM representation of group (n=10) random efffects analysis of the paired image cognitive subtraction: syntactic transformation - list reserialization.

Why? The fMRI is an *average* of the activity-driven rCBF effect in the timespan of 1-2 secs.

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EEG – Getting closer to the activity in *time resolution*

Conflict resolution (‚ungrammaticality' in the EEG)

a. What reaction, if there is an available resolution

b. What reaction if there is *no* available resolution

   Stimulus pattern

(1)   [XP V-*en*   ......]   ambiguous: 3rd P.Pl. or Infinitive)

   a. [XP [V-fin   [......]]]

   b. [[XP V-inf]_{VP} [V-fin .....]]

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- **No conflict**

(1) a. Den Katalog bearbeiten alle selbst

    b. Den Kalalog *bestellen* alle selbst ab

- **Resolvable conflict**

(2) a. Den Katalog bearbeiten müssen alle selbst

    b. Den Katalog **abbestellen** müssen alle selbst

- **Irresolvable conflict**

(3)*Den Katalog **abbestellten** alle selbst (past tense, finite)

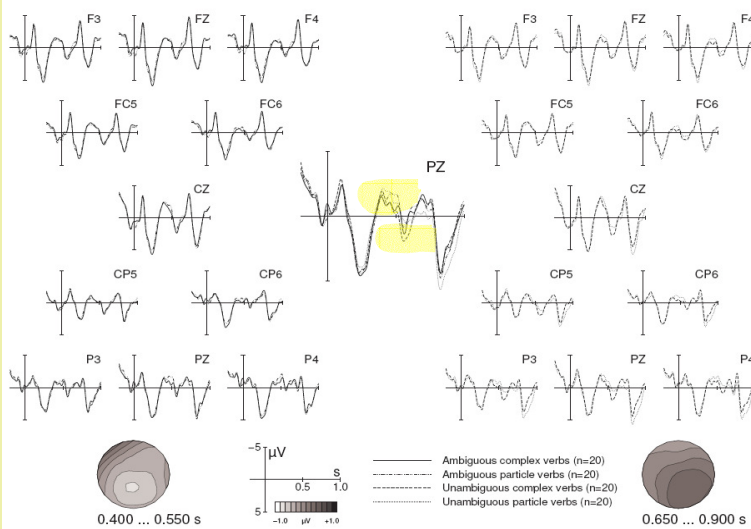   (*: Particle must be stranded. s. (1b))

33

Dietmar Roehm & Hubert Haider (2008). Small is beautiful: the processing of the left periphery in German. In press in: *Lingua*.

A. Ambiguous verbs   B. Unambiguous verbs

Ambiguous complex verbs (n=20)
Ambiguous particle verbs (n=20)
Unambiguous complex verbs (n=20)
Unambiguous particle verbs (n=20)

0.400 ... 0.550 s   0.650 ... 0.900 s

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Processing while Reading: eye movement recording

‚The third construction'

= A phrase of the *embedded, extraposed infinitival* construction is displaced. It appears within the matrix clause.

(1) Der Artist hat ***die Leute*** gehofft, damit beeindrucken zu können

the artist has the people hoped with-it impress to be-able-to

‚Hoffen' (hope) allows this construction, ‚abstreiten' (deny) does not.

(2)*Keiner hat ***das Haus*** abgestritten, gestern betreten zu haben

nobody has the house denied,   yesterday entered to have

35

Example

Eye movement recordings for the two sentences

(real time data)

(1) Der Artist hat ***die Leute*** gehofft, damit beeindrucken zu können
the artist has the people hoped with-it impress to be-able-to

(2)*Keiner hat ***das Haus*** abgestritten, gestern betreten zu haben
nobody has the house denied,   yesterday entered to have

Reading discriminates: watch the refixations and regressions on the verb in (2)

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NEXT: Orwell's Problem – evidence from diverse languages

Presently, the majority of languages covered by Generative Grammar belongs to a **single** language family (Indoeuropean: Germanic and Romance subfamilies), and to a **single** type, namely head-initial.

An archtitecture that has proven successful for the modelling of findings in VO languages constitutes the frame of reference for the integration of non-VO languages:

- architecture of head-initial lexical projections (VP-shells)
- clausal architecture in terms of cascading functional projections
- structural properties of subject placement (EPP)
- .....

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Orwell's Problem

In my perception, the VO architecture is often axiomatically *presupposed* as a given part of UG (as a cartographic blue print or a set of allegedly universal derivational steps that target at a VO type outcome) and the mis-matches between the VO and the OV structures are accounted for in a primarily *extrapolative* style (or they are ignored):

- extrapolated overt or covert steps in the derivation (covert subject raising, VP roll-up, ...)
- extrapolated structures (VP-shells)
- extrapolated silent elements (empty expletives for an empty subject for empty satisfaction of the EPP)
- ………

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Some examples of 'VO' – 'OV' mismatches

Note: They must not be explained away. They should
follow from an insightful account.

- edge effect
- compactness
- strict word order
- V-clustering
- ……..

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'**Edge effect**' = the *head* of a phrase that is *pre-adjoined*
to a *head-inital* phrase is *adjacent* to the phrase.

a. He has [[(*much more*) carefully (**than anyone else*)] [described it]]

No edge effect for adjuncts in German and Dutch (head-final VP)

b. Er hat es [(*sehr viel*) sorgfältiger (*als jeder andere*)] beschrieben
   he has it [(*much more*) carefully (*than anyone else*)] described

c. Hij heeft het [(heel veel) nauwkeuriger (*dan iemand anders*) beschreven
   he   has   it   [(very much) more-carefuly (*than anyone else*)] described

40

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Edge effect in German NPs: an attribute is an adjunct to a head-initial N-projection:

 a. eine [viel genauere (*als die von anderen)] Beschreibung
  a   much more-exact (than that of others) description'
 b. ein [unzufriedener (*damit)] Syntaktiker
    an unsatified   (it-with) syntactician'

Why? Adjuncts to a head-*initial* phrase are *merged* outside of the directionality domain of the head of the head-initial phrase. So the adjunct does not receive a structural license from the phrase it is merged with. Hence the adjunct itself has to enter a selection relation with the phrase it merges with. This is a *head-complement relation,* whence the *adjacency* property, since the complement is a sister of the head.

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Compactness: [head (*XP) complement]
a.   [analyze (*with care) the data]
        German:

b.   [die Daten (mit Sorgfalt) analysieren]$_{VP}$
      the data   (with care)   analyze
BUT
c.   das [Analysieren (*mit Sorgfalt) von Daten]$_{NP}$
      the   analyzing   (with care)   of   data

     Why? – Head-inital phrases need a shell structure, head final ones do not.

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Strict word order in 'VO', but not in 'OV'

Scrambling in the head-final VP in German
a. Decken an Obdachlose verteilen
   blankets to   homeless   distribute
b. an Obdachlose Decken verteilen

No Scrambling in the head-intial NP in German
c. das Verteilen von Decken an Obdachlose
    the distribut(ing) of blankets to   homeless
d.*das Verteilen an Obdachlose von Decken

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V-clustering in OV, not in VO
   Example: nominalized V cluster

   a. [Deadlines [verstreichen lassen]]$_{VP}$
       deadlines   expire   let

   b. das Verstreichenlassen$_{N°}$ von Deadlines
      the letting expire   of deadlines

   c. [Deadlines [verstreichen lassen müssen]]$_{VP}$
   d. das Verstreichenlassenmüssen$_{N°}$ von Deadlines

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How to deal with Orwell's problem?

If you extrapolate from VO, take this as what it is, namely a hypothesis that needs to be checked and supported by ***independent*** empirical evidence.

It is not enough to show that derivational amendments are sufficient to derive an expression.The must be shown to be empirically adequate.

45

NEXT: Leibniz's Problem

Perfection: UG as an example of *perfect* design?

- Perfection in grammar design?

- The quest for *perfection* and *virtual conceptual necessity*

- The (un)motivated turn from GB to MP

   Repressed evidence? What is 'wrong' with the body of data covered by GB that is ignored in the MP?

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23

Underlying the economy principles of the MP is the idea that grammar is a *perfect* computational system for mapping a selection of lexical items (a numeration) to a pair of interfaces <LF,PF> with conceptual (semantic-pragmatic) and articulatory (phonetic) cognitive modules, respectively

The notion of a 'perfect' computational system is a notion that is contemplated in logics, in terms of completeness, simplicity, non-redundancy, symmetry and economy. Economy refers to the number of premises in a given calculus, the number of basic elements in the inventory, the number of steps in a proof, etc. 'Perfection' is a property of a calculus.

47

Four centuries ago, people believed that the orbits of the planets must be *perfect geometrical* figures and concluded that they must be circles

In fact, from our terrestrial view point, planets appear to move in curls. The grand theoretical solution was the theory of epicycles. Planets move on circles, whose centres move on circles, whose centres move on circles.

Today, there is even a proof that every conceivable trajectory can be modelled in terms of movement on epicycles. Nevertheless we do not believe in epicycles anymore.

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How do we know that the idea that each feature is in a one-to-one relation with a functional projection is not a grammar-theoretical epicycle?

It is an empirical question. And the evidence from OV is not demonstrable.

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It is an ironic moment of the history of the field that the fruitfly language of grammar theory is the black sheep of its family. It surely is not the most impressive example of a perfect instantiation of perfect UG properties.

- It has **V2 patterns,** but only under exceptional circumstances
- It has **finite verbs** that *move* to higher functional head positions, but the majority of verbs do not
- For the verbs that do not move, an *expletive auxiliary* is the deus ex machina in contexts where a verb would have to move.
- It has **modals** that have only one tense and no infinitival form
- It has **subject expletives** but their distribution is so much restricted that an **intransitive passive** is unavailable in English.
- ....

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Lappin, Levine, and Johnson (2000): *Natural Language and Linguistic Theory* **18:** 665–671, 2000.

p. 669. "What is not readily comprehensible is that large numbers of researchers should substitute one theory for another simply on the basis of Chomsky's personal authority, without subjecting his assumptions to the sort of critical evaluation that they would normally apply to theoretical innovations proposed under different authorship."

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Lakatos' characterization of scientific progress

A new theory T', that is to replace the established paradigm T, *has to meet two conditions:*

• The new theory must *reproduce* the **success** of the old paradigm, i.e: correct predictions of T must be correct pre-dictions of T'.

• The new theory must *explain* the *failures* of the old para-digm, i.e: the predictions of T' that differ from the wrong pre-dictions of T must be empirically correct.

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p. 668: "If linguists wish to use the practices followed in the natural sciences as a guide, then it would be reasonable to expect the catalyst for the transition from GB to the MP to be a significant body of results that follow directly from minimalist principles, but are unavailable on any plausible version of GB theory.

But we see nothing of the kind in the comparison between the MP and earlier avatars of transformational grammar.

Why, then, are we witness to a mass rejection of the previous decade and a half of linguistic theory?"

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Lakatos:

A research programme is said to be progressing as long as its theoretical growth anticipates its empirical growth, that is, as long as it keeps predicting novel facts with some success ('*progressive problemshift*'); it is stagnating if its theoretical growth lags behind the empirical growth, that is, as long as it gives only post-hoc explanations either of chance discoveries or of facts anticipated by, and discovered in, a rival programme ('*degenerating problemshift*').

- Was there a '*degenerating problemshift*' in GB?

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Was there a '*degenerating problemshift*' in GB?

Maybe, in the attempt to unify the opacity conditions and locality constraints for non-local movements (A'-movement):

ECP, subjaceny, subject condition, adjunct condition, that-t-filter, ...

BUT: MP has nothing to offer in place of the discarded concepts.

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What I see in the replacement of GB by MP is more

- "a historical accident that the discipline has allowed itself to be dominated by a few very powerful personalities who happen not to be strongly attached to the scientific ethos" (Pullum 1996. Nostalgic views from Building 20. Journal of Linguistics. 137-147), and

- a move from a research programme with a positive heuristics in terms of the range of empirical coverage to a research programme with a heuristics limited to interests in the computational properties of grammar algorithms (perfect calculus)

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In sum, how are we to deal with

- ***Wundt's problem*:** adopt data assessment standards, like in psychology and other cognitive sciences

- ***Crick's problem*:** experimental ingenuity, more cooperation between theoreticians and experimenters

- ***Orwell's problem*:** less extrapolation, more empirical substantiation from diverse languages

- ***Leibniz's problem*:** "Nobody is perfect!" ☺ ☺ ☺

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