Non-discrete effects in language,

or the Critique of Pure Reason 2

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The problem

- We tend to think about language as a system of discrete elements (phonemes, morphemes, words, sentences)

- But this view does not survive an encounter with reality

Simple example: morpheme fusion

- *детский*

  det-*sk*-*ij* 'children's, childish'

  Root-Suffix-Ending

  [deckij]

  suffix

  deck-*ij*

  root

Similar exampes abound on all lingustic levels

- Phonemes: coarticulation
  - *cat   keep   cool*
- Words: clitics
  - *iz mašiny* 'from the car'
  - *iz … mašiny* 'from … the car'
  - *iz taksi [is taksi]* 'from the taxi'
- Clauses: parcellation
  - *I'll come, in a minute*
- These are primarily syntagmatic examples: non-discrete boundaries between linearly arranged units

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Paradigmatics

- The same problem applies to paradigmatic boundaries, that is boundaries between classes, types, or categories in an inventory

- Questionable phonemes

  cf. *жури žuri* 'rebuke'
  - Russian *жюри žjuri* 'jury'
            [ž'ur'i]
    even though supposedly there is no palatalized [ž'] in Russian (in this position)

- Questionable words and clauses
  - *I want [to go]*
            particle   infinitival clause
  - *I wan[na go]* ??

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Semantics

- *X said smth* (Zaliznjak 2006: 186)
  - 'X uttered a sequence of sounds'
  - 'X meant smth'
  - 'X expressed his belief in smth'
  - 'X wanted Y to know smth'
  - 'X wanted Y to perform smth'
  - ....

- Some of these meanings are shared by *X told smth*, but some are not

Diachronic change

- Russian *писать pisat'* 'write'

- Funny slangish use:
  - *popisal nozhom* 'cut/slashed someone with a knife', lit. 'wrote with a knife'

- One of the Indo-European etymologies of the root *pis-* is 'create image by cutting'

- Apparently the ancient meaning of the root, several millennia old, is still present in a marginal usage of the modern verb

Language contact

- The Baltic language Prussian, spoken in this area until the 16th – 17th century

- Vladimir N. Toporov
  - In the existing texts Prussian syntax is almost fully copied from German (Luther's Catechism)
  - In the 18th century, when Prussian was extinct, German-speaking peasants of the area used many Prussian words
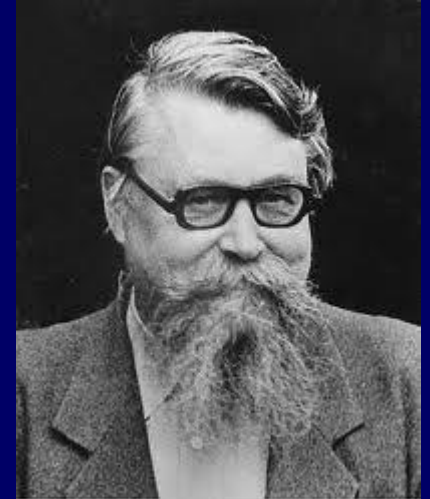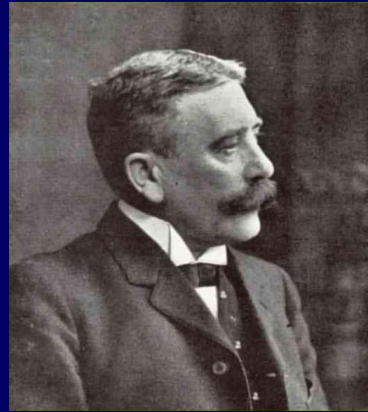
Intermediate conclusion

- Language simultaneously
  - longs for discrete, segmented structure
  - tries to avoid it

- Non-discrete effects permeate every single aspect of language

- This problem is in the core of theoretical debates about language

Possible reactions

- "Digital" linguistics (de Saussure, Bloomfield, Chomsky...):
  - ignore non-discrete phenomena or dismiss them as minor
  - Ferdinand de Saussure: language only consists of identities and differences
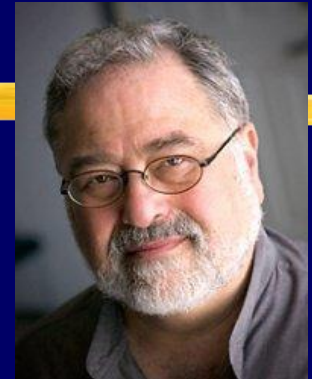
the discreteness delusion

appeal of scientific rigor but extreme reductionism
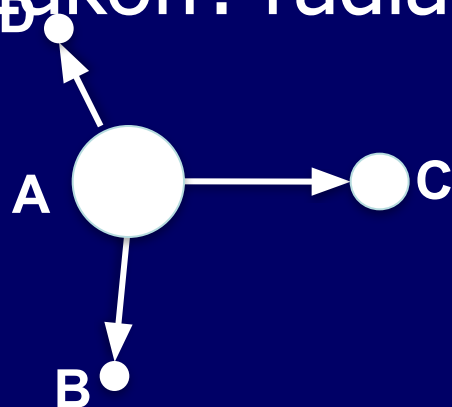
a bit too simple-minded

- More inclusive ("analog") linguistics:
  often a mere statement of continuous boundaries
  and countless intermediate/borderline cases

Cognitive science

- Rosch: prototype theory

- Lakoff: radial categories

  - A is the prototypical phoneme/word/clause/ meaning…

  - B, C, and D are less prototypical representatives

- We still need a theory for:
  - boundaries between related categories
  - boundaries in the syntagmatic structure

My main suggestion

- In the case of language we see the structure that combines the properties of discrete and non-discrete: focal structure

- Focal phenomena are simultaneously distinct and related

- Focal structure is a special kind of structure found in linguistic phenomena, alternative to the discrete structure

- It is the hallmark of linguistic and, possibly, cognitive phenomena, in constrast to simpler kinds of matter

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Various kinds of structures

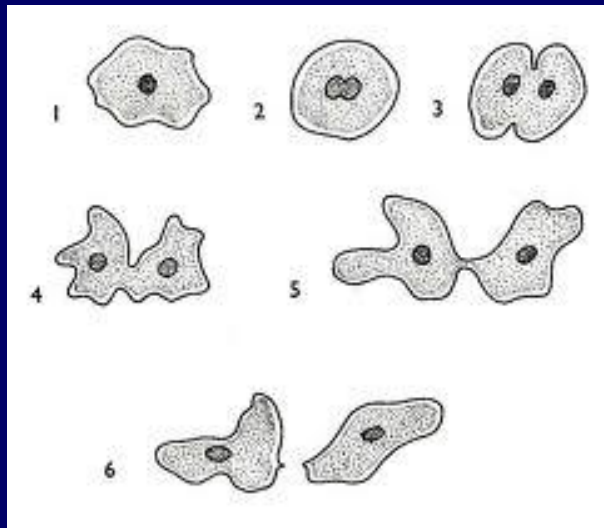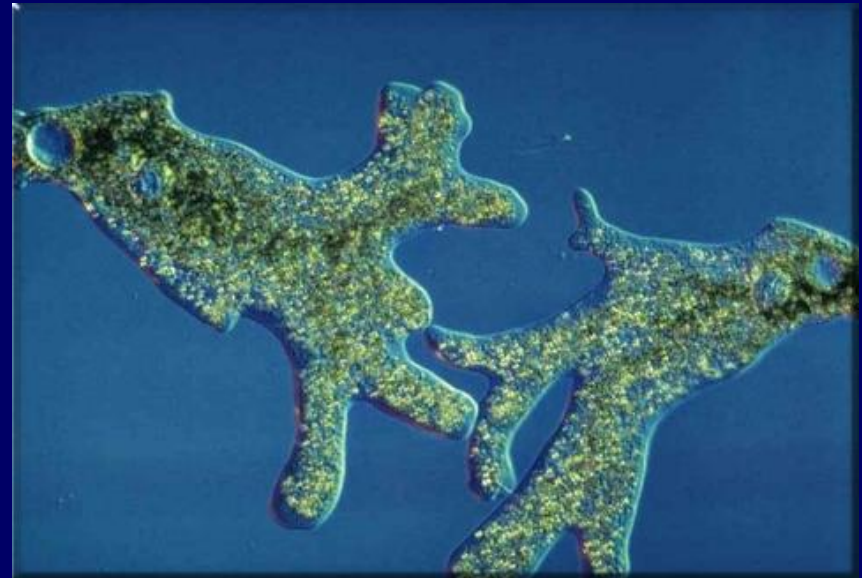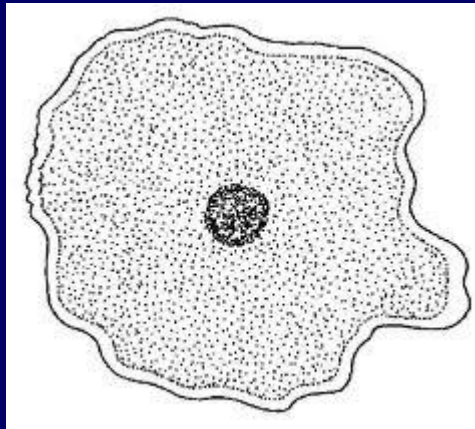1 rete structure 2
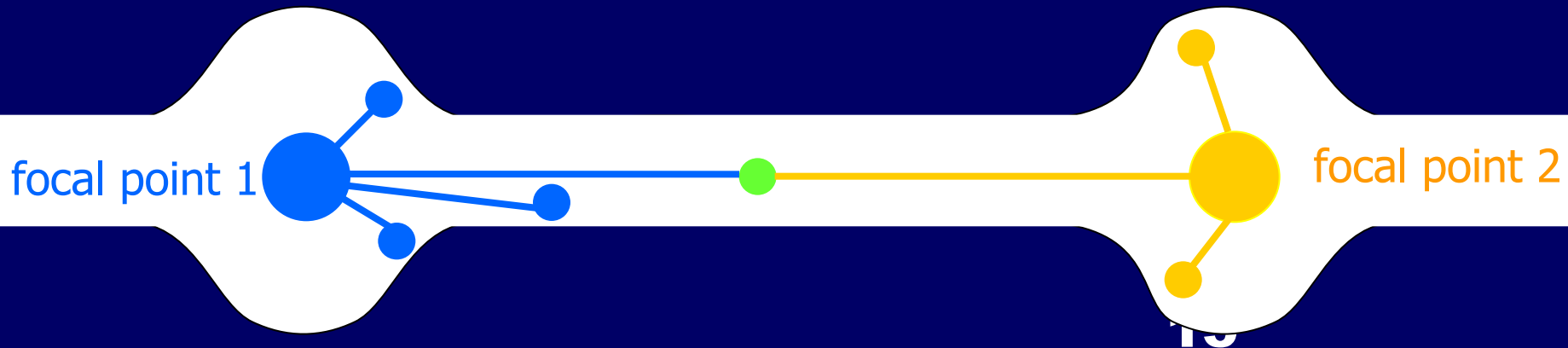
1 continuous structure 2

focal structure

focal point 1 focal point 2

Still more realistic: amoeba structure

Examples

Syntagm.	det	sk
Paradigm.	said	told
Diachr.	*pis-	pis-
Lg.contact	Prussian	German
etc., etc.		

focal point 1

focal point 2
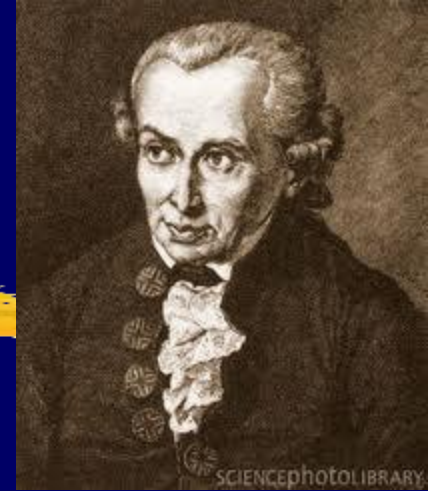
Peripheral status of non-discrete phenomena

- Where does it stem from?

- Objective properties of language?

  ▢ I don't think so

- Or, perhaps, properties of the observing human mind?

- This directly relates to one of the key issues in *The Critique of Pure Reason*

Kant's puzzle

- The role of observer, or cognizer, crucially affects the knowledge of the world

- "The schematicism by which our understanding deals with the phenomenal world … is a skill so deeply hidden in the human soul that we shall hardly guess the secret trick that Nature here employs."

- NB: Standards of scientific thought have developed on the basis of physical, rather than cognitive, reality

- Physical reality is much more prone to the discrete approach

- Compared to physical world, in the case of language and other cognitive processes Kant's problem is much more acute
  - because mind here functions both as an observer and an object of observation, so making the distinction between the two is difficult

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Recapitulation:
A paradoxical state of affairs

- Science is based on categorization (Aristotelian, "rationality", "left-hemispheric", etc.)

- The scientific approach is inherently biased to noticing only the fitting phenomena

- It is like eyeglasses filtering out a part of reality

- Addressing another part of it is perceived as pseudo-science, or quasi-science at best

- Language is unknowable, a *Ding an sich?*

What to do?

- We need to develop a more embracing linguistics and cognitive science that address non-discrete phenomena:
  - not as exceptions or periphery of language and cognition
  - but rather as their core

- Can we outwit our mind?

- Several avenues towards this goal

1. Start with prosody

- Prosody is the aspect of sound code that is obviously non-discrete

- Example: Sandro V. Kodzasov's analysis of formal quantity iconically depicting mental quantity

- It was lo-ong ago. Oh, tha-at's the reason.

- He just left. That's clear.

- Develop new approaches on the basis of prosody, then apply them to traditional, "segmental" language
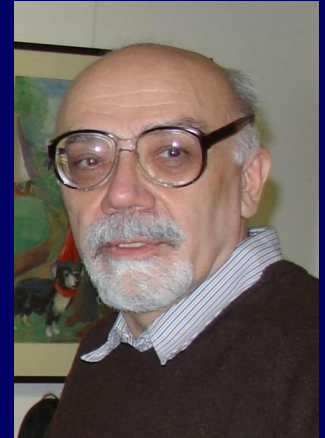
2. Explore gesticulation

- In addition to sound code, there is a visual code: gesticulation and generally "body language"

- Michael Tomasello: in order to "understand how humans communicate with one another using a language <…> we must first understand how humans communicate with one another using natural gestures"

Simultaneously: iconic gestures and pointing gestures
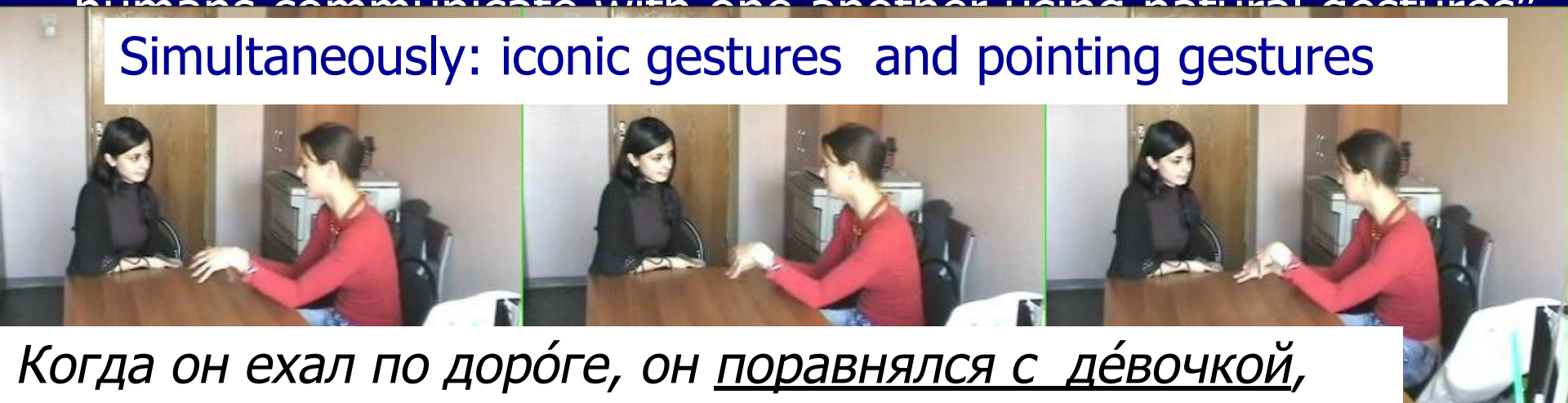
Когда он ехал по доро́ге, он <u>поравнялся с де́вочкой</u>,

(From the materials of Julia Nikolaeva)

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3. Employ mathematics appropriate for the "cognitive matter"

- Methodological point
- 1960s: a fashion of "mathematical methods" in linguistics
- This did not bring much fruit, primarily because of the non-discreteness effects
- Time for another attempt of bringing in more useful kinds of mathematics
- Ongoing project: study of non-categorical referential choice
- When we mention a person/object, we choose from a set of options, such as a proper name (*Kant*), a common name (*the philosopher*), or a reduced form (*he*)
- This choice is not always deterministic: sometimes both *Kant* and *he* are appropriate
- Probabilistic modelling and machine learning techniques used to simulate human behavior in non-categorical situations

Conclusion

- Just as we invoke scientific thinking, we tend to immediately turn to discrete analysis

- This is why discrete linguistics is so popular, in spite of the omnipresence and obviousness of non-discrete effects

- This may be our inherent bias, or a habit developed in natural sciences, or a cultural preference

- But in the case of language and other cognitive processes we do see the limits of the traditional discrete approach

- It remains an open question if cognitive scientists are able to eventually overcome the strong bias towards "pure reason" and discrete analysis, or language will remain a *Ding an sich*

- But it is worth trying to circumvent this bias and to seriously explore the focal, non-discrete structure that is in the very

The reason why this talk was so philosophical must be due to Kant's Geist

Immanuel Kant, lecturing to Russian officers