# Non-discrete effects in language,

## *or the Critique of Pure Reason 2*

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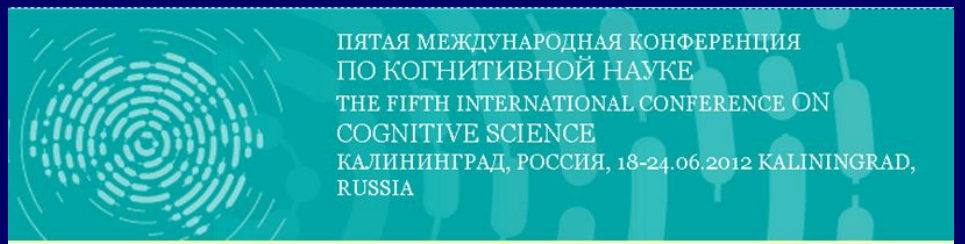


# The problem

- 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

# Paradigmatics

- The same problem applies to paradigmatic boundaries, that is boundaries between classes, types, or categories in an inventory
- Questionable phonemes
  - Russian *жюри žjuri* 'jury'
    [ž'ur'i]
    even though supposedly there is no palatalized [ž'] in Russian (in this position)

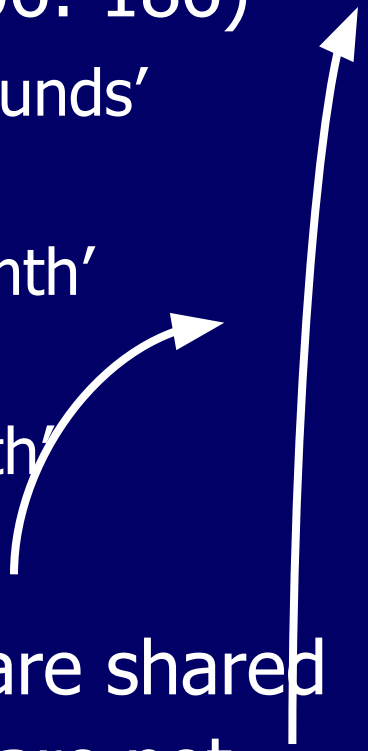
cf. *жури žuri* 'rebuke'

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

# 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'

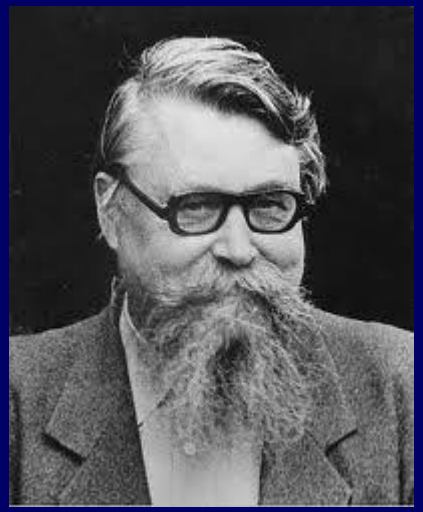
  .....
- Some of these meanings are shared by *X told smth*, but some are not



# 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

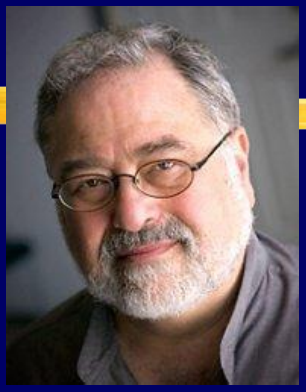
the discreteness delusion

appeal of scientific rigor but extreme reductionism

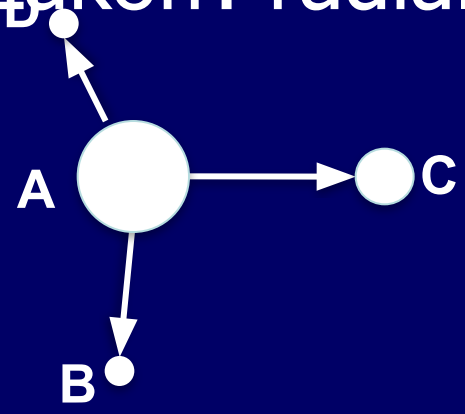
a bit too simple-minded

- 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

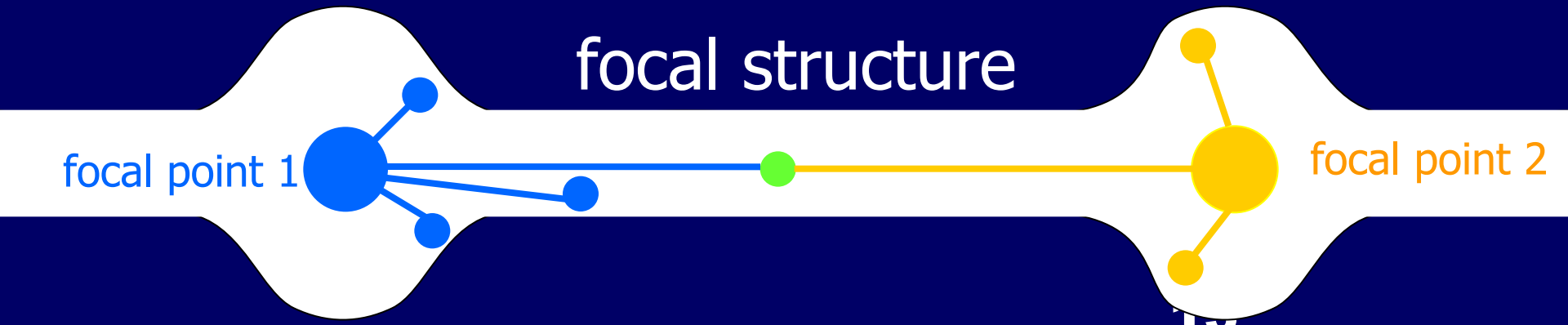
- We still need a theory for:
  - boundaries between related categories
  - boundaries in the syntagmatic structure

# My main suggestion

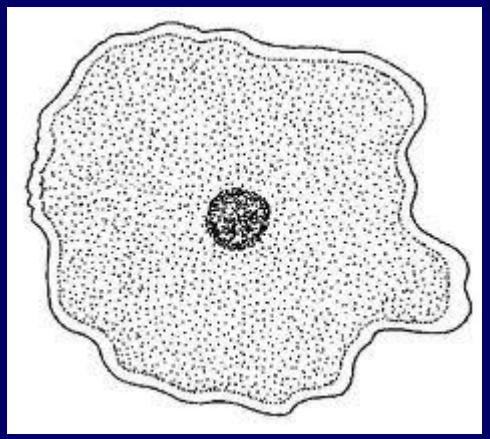
- In the case of language we see the structure that combines the properties of discrete and non-discrete: focal structure
- Focal phenomena are simultaneously distinct and related
- Focal structure is a special kind of structure found in linguistic phenomena, alternative to the discrete structure
- It is the hallmark of linguistic and, possibly, cognitive phenomena, in constrast to simpler kinds of matter

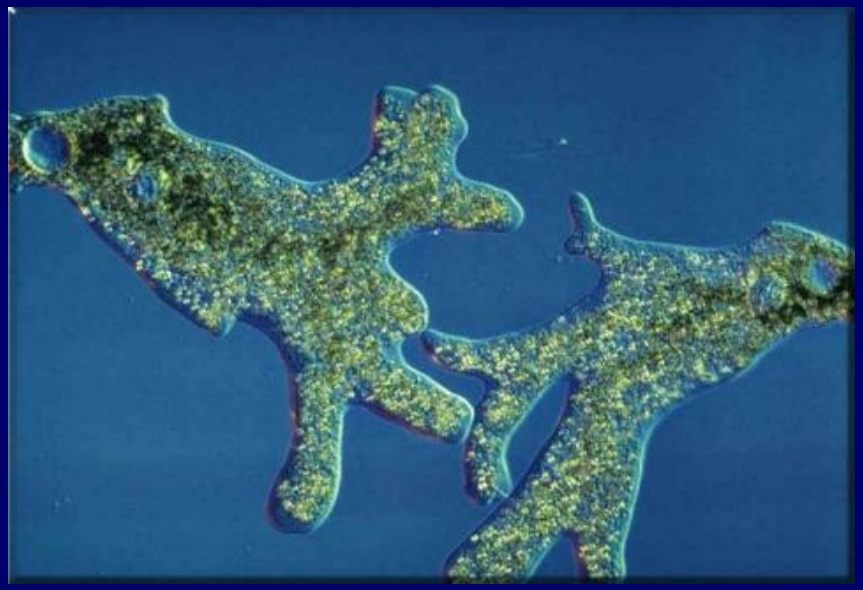
# Various kinds of structures

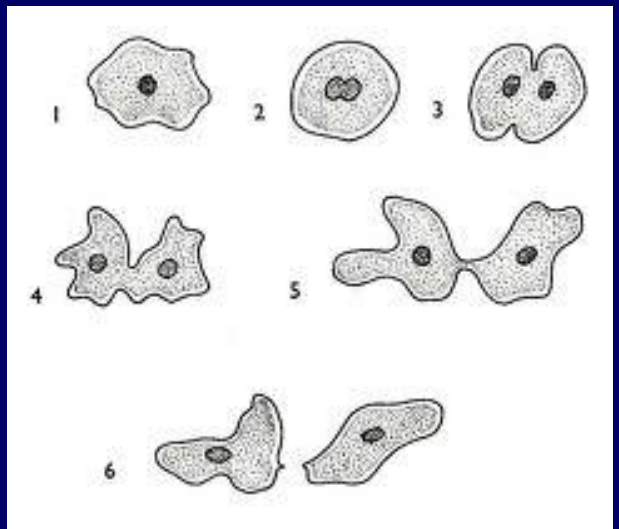




# Still more realistic: amoeba structure



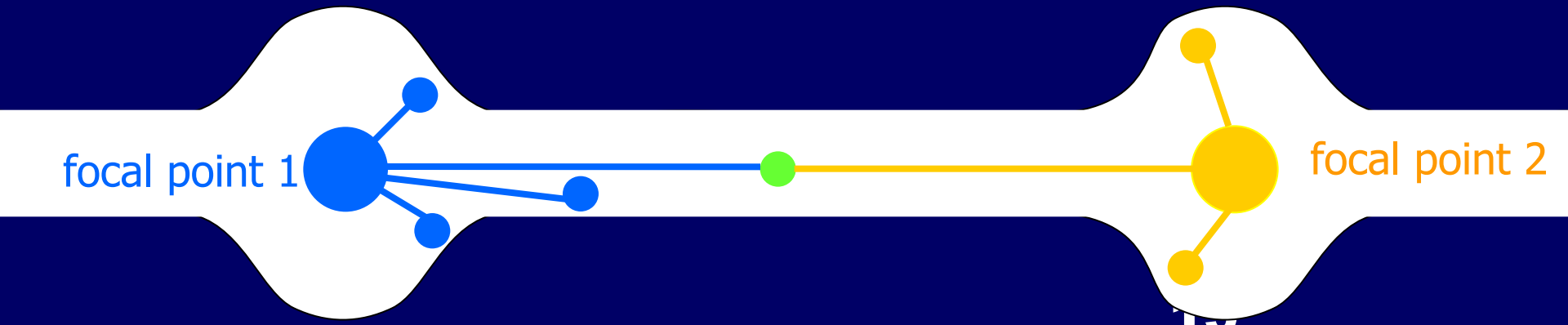




# Examples

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

etc., etc.



# 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

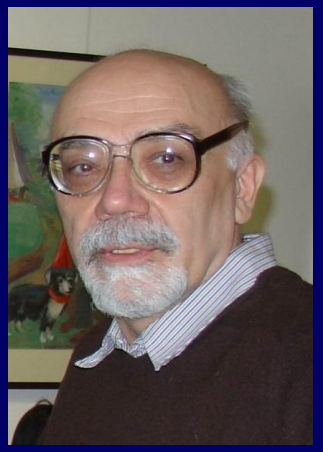
# Recapitulation: A paradoxical state of affairs

- 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

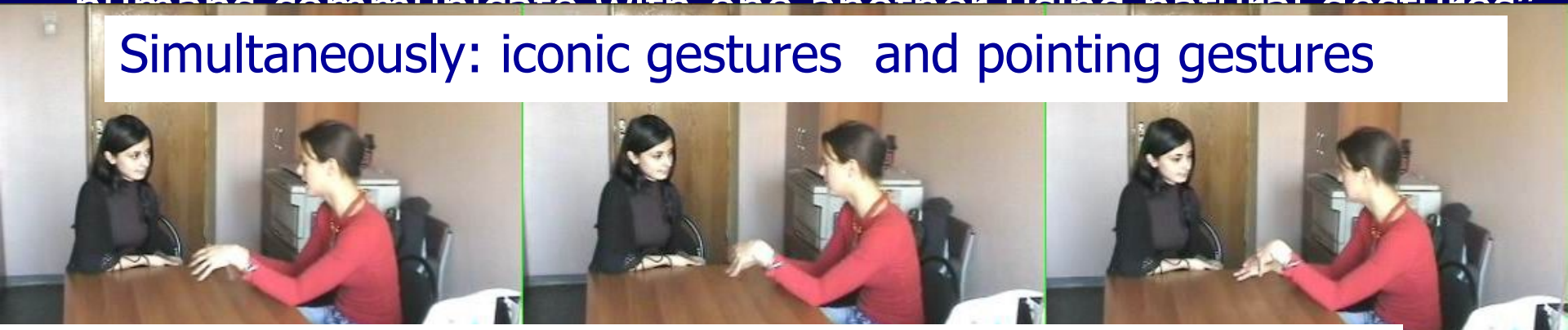


- Prosody is the aspect of sound code that is obviously non-discrete
- Example: Sandro V. Kodzasov's analysis of formal quantity iconically depicting mental quantity
- It was lo-ong ago. Oh, tha-at's the reason.
- He just left. That's clear.
- Develop new approaches on the basis of prosody, then apply 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 дéвочкой</u>,*

(From the materials of Julia Nikolaeva)

# 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

# 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