Reasoning in the South Pacific
The way we (all) argue

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Your new job as a label checker

All labels made at Pica’s custom label factory have either an A or an E printed on the front of the label, and have either the number 2 or 3 printed on the back of the label.

As part of your job as a label checker at Pica’s you must make sure that if a label has a E on the front, it has a 2 on the back.

Which of the labels would you need to turn over to make sure that the rule had been followed?

A 3 2 E

Your new job as receipt checker

As part of your job at Sears, you have the task of checking sales receipts. The amount of the sale is written on the front of the form. The manager’s approval is initialed on the back.

You must make sure that any sale over $50 has been approved by the manager.

Which of the forms would you need to turn over to make sure that the rule had been followed?

Lamp $20
App... App.. Chair $70

Do people in other cultures think the way we do?

- An old question. The Greeks asked it.
- A cognitive science question.
- A question with political implications
  - The end of the colonial era
  - Are “primitive” peoples mentally competent to govern themselves?

Islands of the Western Pacific

Trobiand Islands
Papua New Guinea

1
Boyowa from the Air
Yams at harvest time
Shelter
Douglas DC-3
Tukwaukwa village fishing fleet
Socializing
Child bearing and child care

Death and Grieving

Preparing for Sagali

Exchange Ritual

A Chief’s yam house (*liku*)

Do the Trobriand Islanders Think the same way we do?
- What do you think?
- Why?
- How could we find out?
Ways to answer the question

- Folk beliefs
- Formal measures of intellectual ability
- Examination of culturally meaningful behavior

Folk beliefs about technologically primitive people

- Technology is a reflection of mind
- Primitive technology implies primitive mind
- This was a popular view into the 1970s, even in scientific writing

Cross-cultural psychology

- Taking IQ tests into the field
- Language-free tests
- Culture-free tests

Papua New Guinea

Some measurement instruments

- Raven Progressive Matrices
- Inducing a rule in a card game
- Constructing narratives about simple images
- Rorschach ink blots

Raven Progressive Matrices
Inducing a rule in a card game

3 5 K 2
A A J Q
4 4 6 8

Constructing narratives about simple images

- A matrix of drawings of familiar objects
- House, bicycle, guitar, fish, canoe, flower, etc.
- Choose N items and tell a story about them.

Rorschach ink blots

Replicable results of IQ tests on non-literate people

- Adult non-literate subsistence fishermen and farmers in the third world score about like 5th grade students in the developed nations.

Why?

- Is it a “brain” thing?
- The children of these same people who are in school perform at grade level.
- Maybe it’s a culture thing.
- Perhaps school teaches logical thinking.

Typology of logical inferences

- modus ponens
  \[ P \implies Q \quad \text{premise} \]
  \[ P \quad \text{observation} \]
  \[ \therefore Q \quad \text{conclusion} \]

- affirmation of the consequent
  \[ P \implies Q \quad \text{premise} \]
  \[ Q \quad \text{observation} \]
  \[ \therefore P \quad \text{conclusion} \]
Typology of logical inferences

- **denial of the antecedent**
  - $P \Rightarrow Q$ premise
  - $\neg P$ observation
  - $\therefore \neg Q$ conclusion

- **modus tollens**
  - $P \Rightarrow Q$ premise
  - $\neg Q$ observation
  - $\therefore \neg P$ conclusion

Alexander Luria in the Central Soviet Republics (1930s)

- Testing logical inference in an interview setting.
- Comparing unschooled (uncollectivized) peasants with schooled (collectivised) peasants.
- Two kinds of problems:
  - Those that are about everyday experience and
  - Those that should be understood, but are not related to everyday experience.

An example of a meaningful problem NOT from everyday experience

- **Probe:** “In the far north, all bears are white. Novaya Zemlya is in the far north. What color are the bears in Novaya Zemlya?”
- **Response:** “I don’t know, you should ask the people who have been there and seen them.”

Luria’s results

- Collectivised peasants can reason logically.
- Uncollectivised peasants cannot disregard context.
- Uncollectivised subjects refused to accept the system of logical assumptions and to draw conclusions from them.

Cole et al. Liberian study

- Flumo and Yakpolo always drink palm wine together in town. One day Flumo stayed home sick. Did Yakpolo drink palm wine that day?
- Unschooled subjects attempt to handle the problem on a factual basis.
- They reject experimenter given premises and substitute more socially appropriate premises in their place.
- (See also: L. Bohannon “Shakespeare in the bush.” Or my telling of Jack and the Beanstalk to a Trobriand audience).

Scribner’s reanalysis

- Scribner looked again at the behavior in reasoning tests.
- Not just the answers, but the ways the answers were reached.
- She noted that when it was possible to determine what premises the subject was actually reasoning from, the reasoning followed logically from the evidence used by the subject.
Imagine Luria’s White Bear Case

- Assume the subject holds these two premises
  - 1) To know the color of something one must see it.
  - 2) To see something, one needs to be near it.
- Now, the reasoning could go:
  - I’ve never been in the north, so I’ve not been near the bear, therefore by 2 I haven’t seen it.
  - And then by 1, I don’t know the color of the bear.
- That is two instances of correct modus tollens reasoning.
- But it is scored as an incorrect response to the task.

My results in this room

- The abstract “Pica’s label factory” problem.
- The culturally meaningful “Sears” problem.

Decontextualization

- To consider something without respect to its context
- In a test situation:
  - to confine yourself to the information given and to suppress your other knowledge
  - This is not a natural human behavior
  - It must be learned (schools teach it)

Formal tests can be used, but…

- Understanding what the researcher says
- Understanding the material in the task
- Understanding the relations among elements of the task
- Understanding the context of “artificial” or “pretend” tasks

Studying Thinking in Context

- Every culture poses thinking tasks for its members
- But, how can we discover the cognitive organization of those tasks?

Land litigation

- Arguments about the rights to garden plots
- A cognitive task
  - constructing a logical account of transfers of rights
- It really matters
  - unlike a test created by a foreigner, if you fail this one you lose your most precious possession
- It is public
  - available to the researcher for observation and recording
Premises of Trobriand Land Litigation

- An idealized narrative (schema)
  - Person A holds rights in garden X (tupwa)
  - Person B gives something (kaivatam) to person A
  - Person A transfers (kasesila) the rights in garden X to person B
  - Person B holds rights in garden X

A case in progress

Transcript

Mesinaku, baleku makwena…
E olo..olopoula kidamwa tupwa, e bogwa kukwatetasi
Kumukwala kaivatam makaina tupwa.
E mitaga, makekwa baleku galu tupwa.
Bogwa kaivatam.
E besa usi anamama usi lilelega wala makekwa baleku bogwa kasesila
Kidamwa tupwa, galu avela hinaivatam, Motabasi, mitaga m baleku.
Pela tupwa, e, besa m baleku.
E mitaga, pela kasesila bogwa ivilevogwa
Ela besa Oyveyova…

Translation

However, with respect to this garden
With, within, if it had been tupwa, you already understand,
You know how it is with kaivatam and tupwa gardens.
But this garden was not tupwa
It was already allocated.
And from this cause, I think, it's just how I heard things, this garden was already allocated
If it had been tupwa, no one would worry, Motabasi, it would be your garden
Because of tupwa it would be your garden.
But, because it had already been allocated and transferred
It went to Oyveyova…

Inferences

- Going beyond the information given
- Need two parts
  - Abstract inference types (m. ponens, m. tollens)
  - Specific cultural premises
    - Person A holds rights in garden X (tupwa)
    - Person B gives something (kaivatam) to person A
    - Person A transfers (kasesila) the rights in garden X to person B
    - Person B holds rights in garden X

Modus tollens inference

- Transfer \(\Rightarrow (kaivatam \text{ and } tupwa)\) premise
- \(\neg tupwa\) observation
- \(\neg (kaivatam \text{ and } tupwa)\)
- \(\therefore \neg\) Transfer conclusion
Finding

• When reasoning about meaningful material in a meaningful context, non-literate, third-world people use the same inference types as you and I use.
• We still do not know what is happening inside their heads (or our heads either) when logical inferences are performed.

Ethnographic resources that are needed to support the analysis

• Language of the Trobriand Islands
• Principles of social organization in general and land tenure in specific
• Gardening practices
• The individual people, their social relations and personal biographies
• Local geography - where the villages and gardens are located.
• All of these are needed to understand the cognitive import of the events.

If their minds are like ours, why is their technology NOT like ours?

Technology and Mind

• We are stone-age people living space-age lives.
• How do we do it?
• Cultural Practices
Boeing 787 Dreamliner

• Launch customers in Japan and China
• Should anything be done to make the airplane fit Japanese or Chinese culture?
  – Cockpit design
  – Training
  – Operating Procedures
• How could we find out?