Why Look Beyond The Given Information The Effect Of Evidentiality

Smita Sirker

Department of Philosophy

Jadavpur University

Plan…

In this presentation, I would like to give a historical backdrop of the kinds of experimental studies performed with people with little or no formal education.

The studies proved interesting in more ways than one.

- The treatment of the problems by the subjects are interesting.

- Ways in which they rationalise their responses give a picture about their world-views; their perception of the problems and in general whether the problems demand the same pattern of response.

- The studies also give us a reason why we need alternate theories about how cognitive tasks are performed.

Introduction

3 broad directions of research in reasoning…

1. Researchers for more than fifty years have been involved with experimental studies concerning human reasoning and have strongly endorsed alternative approaches to study human reasoning – looking beyond the normative framework of human reasoning.

- (Wason, Nick & Charter, Johnson-Laird, Rips…)

[Qs. Does logicality ensure rationality and vice versa?]

2. Whether there is any difference in reasoning between schooled and unschooled people?

- (Luria, Cole & Scribner, Tulviste, Haan and Lambalgen…)

3. Whether there is any difference in reasoning patterns/ response across cultures?

- (Nisbett, Norenzayan, …)

Experimental Studies on Illiterate Reasoning

A Historical Backdrop

- Alexander Luria (1930s)   -   Soviet Russia

- Cole (1971) & Scribner (1997)   -   Liberia

- Hamill (1990)   -   North America

- Tulviste (1991)   -   Soviet Russia

- Kurvers (2000)   -   Netherlands

- Willemsen (2001)   -   Zambia

- ...

Alexandar Luria

Effect of Literacy Level on Cognition: Luria

Aim: Verify the social-psychological thesis

"All fundamental human cognitive activities take shape in a matrix of social history and form the products of sociohistorical development."

- Luria (1976, *Cognitive Development: Its Cultural and Social Foundations, Preface, p.v*)

Perception

(i) Naming and Classification of Geometric Figures

(ii)Designation and Classification of Colour Hues

Generalisation & Abstraction

Deduction & Inference

Perception...Naming and Classification of Geometric Figures

If the perception of geometrical figures involves a process of isolating key features, a choice among many alternatives, and an appropriate "decision", this process should depend to a considerable extent on the nature of practical experience of the subject.

A person whose daily activity has been shaped mainly under concrete, graphic-functional (activity guided by the physical features of objects that the individual works with in practical situations), practical conditions will obviously distinguish features and perceive geometrical features differently from one who can draw on theoretical training and a system of well-differentiated geometrical concepts.

Study

➤ Subjects were presented with geometrical figures belonging to the same category but having different forms. The figures where complete or incomplete, "light" (outlined) or "dark" (solid-coloured); they were formed of solid lines or made up of discrete elements (points, crosses, …).

Subjects

➤ Ichkari women: Lived in remote villages. Illiterate and not involved in any modern social activities.

➤ Peasants: Lived in remote villages. Continued to maintain an individualistic economy, illiterate and did not involve themselves with any socialised labour.

➤ Active *kolkhoz* (collective farm) workers and young people who had taken short courses: Participated as – chairmen, holders of Kolkhoz offices, or brigade leaders. Had a wider outlook than the peasants who worked individually. They attended school only briefly and many were barely literate.

➤ Women who attended short-term courses in the teaching of kindergarteners. ("As a rule, they still had no formal education and almost no literacy training." – Luria)

➤ Women students admitted to a teachers' school after two or three years of study. Their educational qualifications were low.
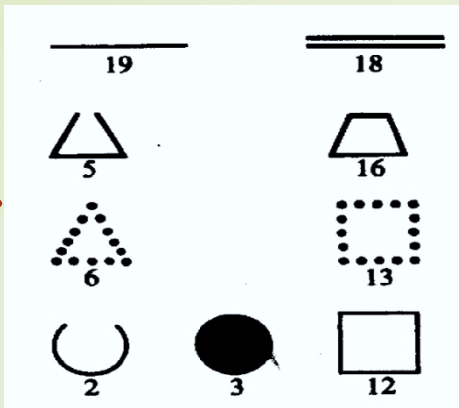
"That's a road, and that's an *aryk* [irrigation ditch]."

"Window-frame."

"Watches."

"They're all separate, they aren't alike."

A l i e v a , 2 6 , w o m e n f r o m a r e m o t e v i l l a g e , i l l i t e r a t e

E: Could they be arranged differently?
S: "These are watches, so they can't be, because how can watches be like anything else? And these window-frames, they can't be put together with the road or the water. But this map, it could be put with the frames."

E: And could 12 and 18 be put together?
S: "No, not at all."

E: Why? Aren't they alike?
S: "No this is map (12) and this is water in an aryk, they do not go together."

E: And what about 13 and 12?
S: "No they can't … this is a watch (13) and this is a map (12). What would you have if you put them together? How can a watch and a map be put together?"

E: Is there nothing alike in these drawings?
S: "The lines are alike; this one (13) is made up of dots, and this one (12) of lines, but the things are different – a watch (13) and a map (12)"

- **The Teachers' School students:** Named geometrical figures by categorical names like, circles, triangles, squares. Designated figures made of discrete elements as circles, triangles, and squares. Categorised the incomplete figures as "something like a circle". The subjects gave concrete object names like ruler, meter, only in some isolated cases.

- **Ichkari Women:** Assigned no categorical, geometrical names for the figures. Identified each figure with the name of an object. Called a *circle* a plate, sieve, bucket, watch, moon. Called a *triangle* a *tumar* (an Uzbek amulet). A *square* with a mirror, door, house, or apricot drying board. Identified a triangle made of crosses as crosswork embroidery, a basket, or stars. Judged a triangle made of little half-circles to be a gold tumar, fingernails, etc. Never called an incomplete circle a circle, but a bracelet or an earring. Their naming of geometrical figures was concrete and object-oriented.

- **Women in preschool courses and kolkhoz activists:** Responses were predominantly specific object-oriented names rather than categorical names.

Perception…Designation and Classification of Colour Hues:

Luria's Observation:

In less developed cultures, colour of practical significance are named by greater number of terms than are colour which are of less practical importance.

In modern cultures, colour naming is fairly uniform.

Study:

Subjects presented with skeins of wool/ silk of different hues:

1. bright pink,
2. red,
3. claret,
4. dark yellow,
5. light yellow,
6. pale yellow,
7. lemon yellow,
8. yellow-green,
9. straw-coloured,
10 -13 colours with shades of green,
14. black,
15 – 17 3 colours of shades of blue,
18. sky blue,
19. light azure,
20. violet,
21. orange,
22. brown,
23 – 25 shades of pink,
26. grey,
27. chestnut

Task: Name the colours

Male collective farmers and female students:

Response Pattern:

Response patterns were with categorical names (blue, yellow, red) with occasional refinements (light yellow, dark yellow). Some colours were difficult to name (16, sky blue, light azure, pale pink, dark pink, grey) and they said that they lacked adequate vocabulary. Response indicating object names, like pomegranate-coloured, were less.

Ichkari Women:

Response Patterns:

Object category dependent. Gave richer and more diversified colour names.

Subjects presented with skeins of wool/ silk of different hues:

1. **bright pink**,

2. **red**,

3. **claret**,

4. **dark yellow**,

5. **light yellow**,

6. **pale yellow**,

7. **lemon yellow**,

8. **yellow-green**,

9. **straw-coloured**,

10 -13 **colours with shades of green**,

14. **black**,

15 – 17 3 **colours of shades of blue**,

18. **sky blue**,

19. **light azure**,

20. **violet**,

21. **orange**,

22. **brown**,

23 – 25 **shades of pink**,

26. **grey**,

27. **chestnut**

Male collective farmers :

Response Pattern:

They had no difficulty in classifying colours by partitioning them into colour groups.

Luria: "They inspected the skeins of wool or silk and divided them up into groups, which they sometimes denoted with appropriate categorical names and about which they sometimes simply said, "This is the same, but a little lighter." They usually arranged all the colours into seven or eight groups."

Ichkari Women:

Response Patterns:

Luria: "As a rule, the instruction to divide the colours into groups created complete confusion. The women began by putting different skeins together and then attempted to explain their colour group. But they were perplexed and could not complete the task."

Generalisation and Abstraction…

Study: Drawings of Glass, Saucepan, Spectacles, Bottle

Rakmat, 39, illiterate peasant

"These three go together, but why have you put the spectacles here, I don't know. Then again, they also fit in. If a person does not see too good, he has to put them to eat dinner."

Experimenter: But one fellow told me one of these things did not belong in this group.

"Probably that kind of thinking runs in his blood. But I say they all belong here. You can't cook in the glass, you have to fill it. For cooking, you need the saucepan, and to see better, you need the spectacles. We need all four of these things, that's why they were put here."

Luria's Observation: The subject replaces initial attempt to group together "cooking vessels" with search for practical schema in which objects are interrelated.

Mirzanb, 33, illiterate, worker

"I do not know which of the things does not fit here. Maybe it's the bottle? You can drink tea out of the glass – that's useful. The spectacles are also useful. But there's vodka in the bottle – that's bad."

Luria : employs principle of "utility" to classify objects.

Experimenter: Could you say that the spectacles don't belong in this group?

"No, spectacles are also a useful thing."

Subject is given a complete explanation of how the three of the objects refer to the category of "cooking vessels."

Experimenter: So wouldn't it be right to say the spectacles don't fit in this group?

"No, I think the bottle does not belong here. Its harmful!"

Experimenter: But you can use one word – vessels – for these three, right?

"I think that there vodka in the bottle, that's why I didn't take it… **Still, if you want me to** … But, you know, the fourth thing [spectacles] is also useful."

Luria: Disregards generic term.

"If you are cooking something you have to see what you are doing, and if a person's eye is bothering him, he's got to wear a pair of glasses."

Experimenter: But you can't call spectacles a vessel, can you?

"If you are cooking something on the fire, you have got to use the eye glasses or you won't be able to cook."

Deduction and Inference...

- Luria tested their subjects on a range of cognitive tasks but within reasoning focussed on syllogistic-type tasks with a quantified or generalized 'major' premise and a particular statement as the 'minor' premise, followed by a question. This is typically called a pseudo-syllogistic problems (henceforth, PSP):

All bears in the far north are white.   **- major premise**

Novaya Zemlaya is in the far north.   **- minor premise**

What colour are the bears there?   **- question**

E: In the Far North, where there is snow, all the bears are white. Novaya Zemlya is in the Far North and there is always snow there. What colour are the bears there?

S: I don't know what colour the bears are there, **I never saw them**.

E: But what do you think?

S: Once I saw a bear in a museum, that's all.

E: But on the basis of what I said, what colour do you think the bears are there?

S: Either one-coloured or two-coloured … [ponders for a long time]. To judge from the place, they should be white. **You say that there is a lot of snow there, but we have never been there!**

- Khamark, 40 yrs, miller from a remote village, illiterate

1. There is an apparent discrepancy - **what the experimenter intends for the subject to understand is different from what the subject understands is required from him**.

2. The subject accidentally gives the 'right' answer the experimenter is looking for – 'they should be white'.

3. Is it that the subject **infers** for himself that because there is snow, the bears should be white; or does the subject relies on the experimenter's relating of the snowy environment and the colour of the bears?

4. Common response was the refusal to give a positive answer because of the lack of personal knowledge of the premises **("I don't know what colour the bears are there. I never saw them."**).

- Cole & Scribner performed much of their experimental studies in Liberia amongst the Kpelle and Vai communities in the 70s and 80s. Scribner in particular focused her investigations on reasoning skills.

- Scribner had categorised the response patterns by classifying the justifications given to (initial) yes/no answers:

Theoretic: statements explicitly relating the conclusion to the information contained in the premises

Empiric: statements justifying the conclusion on the basis of what the subject know or believe to be true

Arbitrary: covers irrelevant, idiosyncratic and "don't know" responses

All Kpelle men are rice farmers,

Mr. Smith is not a rice farmer,

Is he a Kpelle man?

S: I don't know the man in person. I have not laid eyes on the man himself.

E: Just think about the statement.

S: If I know him in person, I can answer that question, but since I do not know him

in person I cannot answer that question.

- **Refusal to answer** is the initial response for the majority of subjects.

- A second type of response was an **engagement with the premises, on the subject's own terms, i.e. by expanding and/or fitting it to (presumably) known and accepted conventional situations.** Subjects are often found to construct logical argumentation with a combination of the given premises and their own additions to the existing ones.

Cotton can only grow where it is hot and dry.

In England it is cold and damp.

Can cotton be grown there?

Abdurakhm, age: 37, illiterate, responded:

S: I've only been in Kashgar country; I don't know beyond that.

E: But on the basis of what I said to you, can cotton be grown there?

S: If the land is good, cotton will grow there, but if it is damp and poor, it won't grow. If it's like the Kashgar country, it will grow there too. If the soil is loose, it can grow there too, of course.

Abdurakhm appears to realise that the experimenter is expecting him to draw conclusions beyond his personal knowledge, and does so, but by introduction of adapted conditional premises, which presumably can be accepted on the basis of personal experience (If it's country like Kashgar...).

Recent Findings

Gustaf Haan and Michiel van Lambalgen

2007

Haan and van Lambalgen (2007):

Haan and van Lambalgen (2007) conducted some reasoning experiments on subjects (23) from literacy courses at the Regionaal Opleidingen Centrum in Amsterdam and Zadkine in Rotterdam.

They were keen on explaining why there was a difference between literates and illiterates in PSPs at a different level and tried to understand how the phenomenon can be explained at the individual level, searching for **cognitive** or **psychological factors**.

"is not a lack of (learnt) reasoning skills but the unfamiliarity with certain problem types, and the conventions that they bring along. These conventions mainly regard the way the task and the problem is to be interpreted. In other words: problems arise already before the actual process of deduction takes place. This predicts that a boundary between answer types (cl versus noncl) coincides with a difference in *task types*, even when presented to *one and the same subject*."

- Haan and van Lambalgen (2007)

Cognitive Factors:

Some of the factors that Haan and van Lambalgen enumerate that are supposed to cause the seemingly illogical answer patterns in illiterates:

Intelligence-factor: presence of logical ability of subjects;

Memory-factor: whether subjects can remember the premises or the *information given*;

Closed-system-factor: this factor blocks the 'empirical mode' of the subject in which they use their world knowledge and personal experience. The subjects use only the information given in the premises;

Reliability-factor: the unschooled subject may not be familiar with PSPs and may decide that the information in the premises is just not good enough to answer the question. This ignorance of the convention of PSP's is called the reliability-factor.

Most of the factors above are treated with questions of *how does the subject understand the premises and do subjects know what answer is requested?*

Haan and van Lambalgen presented the subjects with tasks of the PSP form:

All A are B

A certain x is an A

followed by the question:

Is this certain x a B?

(or a WH-question, such as "What about this certain x?)

Cl-answer: "this x is a B";

Noncl-answer: includes all responses that do not convincingly show that the subject has *inferred* the cl-answer from the premises. The responses may typically be:

nescio: refers for both a refusal to answer the question, as well as all answers that amounts to "I don't know";

cl-os (classical open system): refers to a cl-answer, but the subject justifies it with reference to world knowledge;

cl-g (classical guess): refers to a cl-answer, but it appears to be just a lucky guess;

false: this answer plainly contradicts the cl-answer; and

Noise: For example, subjects not familiar with a given concept in the given problem (syllogism); as we have seen in the example of bear from the Far North where the subjects were not familiar with the concept of a bear.

- The reliability factor says that unschooled ***cannot reason about hypothetical situations as they cannot rely on the information that is given to them***.

- In a PSP, the questioner gives information (in the form of premises) that is related to the question. For a schooled, this is a *clue* that one is supposed to take this information as a given and then use it to infer an answer.

- The unschooled subject however may not be familiar with this convention, and may decide that the information in the premises is just not good enough to answer the question. Haan calls this ignorance of the conventions of PSP's the *reliability-factor*.

Basket Task:

Suppose I have a basket.
First, I put two bottles of water in it.
After that, I put one bottle of wine in it.
How many bottles are there in the basket?

Tram Task:

A tram is driving through Rotterdam.
Two horses enter the tram.
A little later, two elephants enter the tram.
How many animals are there in the tram?

Results:

	%CL	%nescio	%false	%cl-os	%cl-g	% noise
Basket Task	94	0	0	6	0	0
Tram Task	57	0	17	8	0	0

➡ The high cl-score for the two story sums, the confidence with which correct answers were given shows that noncl'ers do not have trouble taking (purely) hypothetical premises as a given and reasoning on their basis.

➡ Haan holds that we cannot attribute the whole phenomenon of noncl-answer patterns to this factor.

Closed System Factor

- Many researchers treat the reliability-factor with a strict requirement that the subject use *only* the information given in the premises.

- Scribner (1977) calls this the 'theoretical mode [of thinking]', as opposed to the 'empirical mode'.

- *It is obvious from transcripts that noncl'ers often employ this empirical mode, using their world knowledge, personal experience with objects and situations mentioned in the premises, and even pure imagination.*

Scribner quotes the following conversation:

E: All Kpelle men are rice farmers.

Mr Smith is not a rice farmer.

Is he a Kpelle man?

S: I don't know the man in person. I have not laid eyes on the man himself.

E: Just think about the statement.

S: If I know him in person, I can answer that question, but since I do not know him in person I cannot answer that question.

Haan and van Lambalgen tested both the reliability and the closed system factors. They asked the subjects to justify cl-answers to check whether subjects responded from world knowledge or from premises. This task is a PSP with nonsense words to *avoid complete confusion* and *to assure that subjects do not associate any world objects with the words.*

Do you know what a knufknuf is? No wonder, because it is a fantasy word that we have made up ourselves. All you have to remember is that all knufknufs have a rattler.

All knuknufs have a rattler.

Molly is a knufknuf.

Does Molly have a rattler?

Results:

	%CL	%nescio	%false	%cl-os	%cl-g	% noise
Knufknuf Task	8	58	25	0	0	8

- Even though noncl-answers often contain a lot of world knowledge of imagined information, this cannot explain the non cl-answer itself. It leaves unexplained how world knowledge could enforce a nescio answer.

- It is even unsure whether world knowledge influences reasoning at all. According to experimenters, it is very hard to determine the stage in reasoning where world knowledge interferes.

- Experimental evidences fail to show whether world knowledge plays a role in the whole process of interpretation and reasoning, or world knowledge comes in only *after* reasoning based on premises also has failed.

A Sample Study on Indian Subjects

Naskar and Sirker (2009)

- 24 illiterate subjects were selected for this study. 2 were female and 22 were male.

- Majority of the subjects were illiterate and did not have any form of formal/school training.

- Only 5 subjects were school drop-outs and had very little school education.

- All the subjects were from the labour class (daily-wage earners). The mother tongue of all the subjects was Bengali.

- The age-group ranged from 17 to 65 years. The subjects did not have any past experience of participating in such experimental tasks.

- The subjects were chosen keeping two particular things in mind:

  - almost all were illiterate;

  - the subjects had the desired level of maturity and mental setup to understand the questions and respond.

Materials:

- The experiments consisted of different tasks. This study was conducted in a kind of demonstration format. Some were verbal questions and the subjects were required to respond verbally; while others contained some kind of demonstration to which the subjects also had to respond verbally. The total number of experimental tasks was eight. The tasks were classified based on certain (to be tested) factors, such as *intelligence factor, memory factor, reliability factor,* etc. The same tasks were repeated for all the subjects. All the tasks were in Bengali and the subjects did not have any problem in language comprehension.

Location:

- The study was conducted on illiterate males and females from semi-urban locality in South 24 Parganas and Howrah district of West Bengal. The study mainly focused on Parbangla and Barkantala villages of 24 Parganas and Saranga and Rampur villages from Howrah district.

Closed System Factor

The closed-system-factor says that illiterates give noncl-answers because *they include world knowledge in their reasoning and they fail to focus on the information from a given premise*.

We used two tasks in an attempt to block their world knowledge (as the terms that were used in the task do not correspond to any worldly object) whereby they could answer from the given premises.

Jounga Task:

We asked the subjects: Do you know what a Jounga is? No wonder, you do not know it because it is a fantasy word that we have made up ourselves. All you have to remember is that all Jounga men have a stick.

All Jounga men have a stick.

Narayan is a Jounga man.

**Does Narayan have a stick?**

It seemed from the answers that some subjects were misguided by the task, because they imagined 'Narayan' as a god. Some transcripts:

E: Does Narayan have a stick?

S10:   No, he has 'chakra', 'goda', and lotus.

S03:   'Narayan' is a god, he is above man. He never has a stick.

	Frequency	Percent	Valid Percent	Cumm Percent
Valid cl-answer	13	54.2	54.2	54.2
false	6	25	25	79.2
cl-g	1	4.2	4.2	83.3
nescio	2	8.3	8.3	91.7
noise	2	8.3	8.3	100.0
Total	24	100	100	
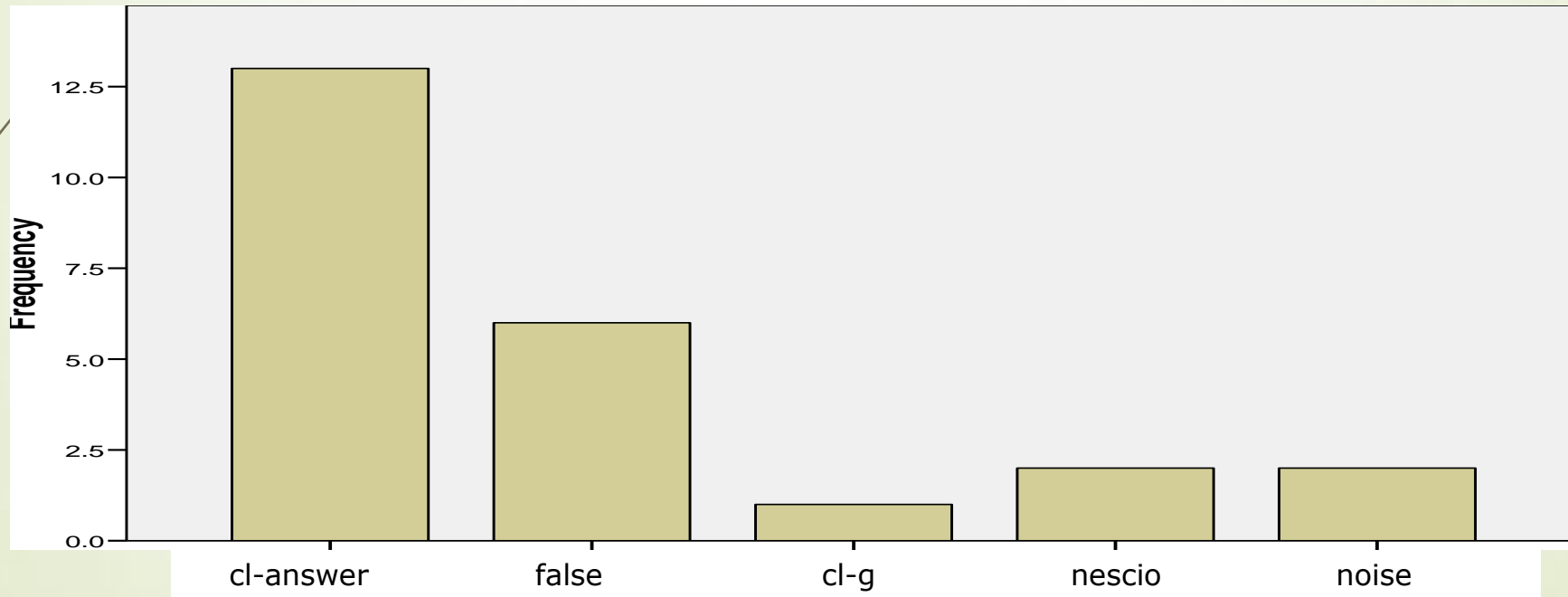
Findings:

- 13 (54.2 %) subjects gave the cl-answers - selecting their answer from the premises and were not guided by their world knowledge.

- 6 (25.0 %) subjects answered false; 2 (8.3 %) subjects did not answer (nescio); 2 (8.3%) subjects said that they did not understand the premises or were misguided by the concept of 'Jounga'; and only 1(4.2 %) subject answered by guessing.

- Some subjects used their world knowledge or imagination and some answered by lucky guess and few did not answer at all.

- The requirement for the close-system factor is that subjects must use *only* the information given in the premises. The results show a 50-50 distribution (since almost 50% of the subjects also gave noncl-answers) which at least indicate that some were not restricted to the *information given*.

Comparative Analysis:

Indian Subjects	%CL	%nescio	%false	%cl-os	%cl-g	% noise
Jounga Task	54.2	8.3	25	0	4.2	8.3

Netherlanders	%CL	%nescio	%false	%cl-os	%cl-g	% noise
Knufknuf Task	8	58	25	0	0	8

- Indian subjects gave high percentage of cl-ans.
  - 58% Netherlanders gave nescio answers.
  - 8.3% of Indian subjects gave nescio answers.

- Closed-system factor means that the subjects were tested whether they could restrict their responses only to the given information. The tasks were such that the subjects did not have prior world knowledge about the new terms. Hence the possibility of arousing corresponding, relevant world knowledge was curtailed.

- A high percentage of nescio answers does not give support to the closed-system factor, i.e. the subject's failure to give response based on the information from the premises. Only 8% of Haan's subjects gave cl-answers.

- In case of the Indian subjects, more than 50% of the subjects gave cl-answer. This lends support that most of the subjects were successful in inferring the conclusion from the given information (i.e. they were restricted to the information given in the premises). Thus closed-system factor may have worked in the context of Indian subjects.

- The reliability-factor hypothesis holds that *illiterates cannot reason about hypothetical situations.*

- Schooled people are trained to give response from certain given information (like a Comprehension task at school). In the comprehension task, the passage acts as a clue from which the subjects can answer the given questions.

- However, unschooled people are devoid of such training and hence may fail to see connections between what is said prior to the asked questions. We used the basket task and tram task to test this factor.

We used a story where a tram driving through a place and few kinds of animals board the tram. Subjects were asked to sum up the total number of the animals that entered the tram.

A tram is driving through Dharmatala.

Two horses enter the tram.

A little later, two elephants enter the tram.

How many animals are there in the tram?

Some answer transcripts:
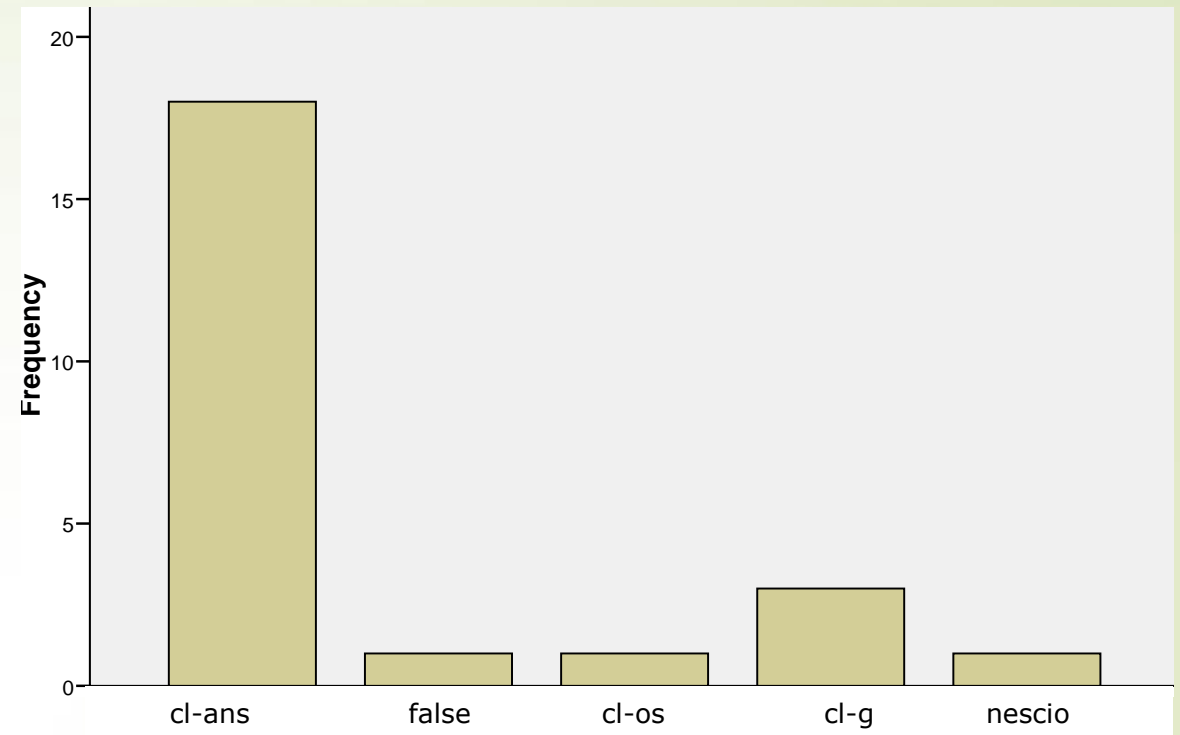
E: How many animals are there in the tram?

S12:   Elephants cannot fit inside a tram.

S22:   Elephants and horses cannot fit in tram.

Findings:

	Frequency	Percent	Valid Percent	Cumm Percent
Valid cl-ans	18	75.0	75.0	75.0
false	1	4.2	4.2	79.2
cl-os	1	4.2	4.2	83.3
cl-g	3	12.5	12.5	95.8
nescio	1	4.2	4.2	100
Total	24	100	100	

Though the reliability-factor can play a role in interpreting a PSP these answers show that it always does not work in all cases. Apart from the high cl-score for the story sums, the confidence with which correct answers were given shows that noncl'ers did not have trouble taking (purely) hypothetical premises as a given and reasoning on that basis.

Comparative Analysis:

Indian Subjects	%CL	%nescio	%false	%cl-os	%cl-g	% noise
Tram Task	91.7	0	4.2	0	4.2	0

Netherlanders	%CL	%nescio	%false	%cl-os	%cl-g	% noise
Box II Task	69	25	6	0	0	0

- The results indicate that illiterate subjects can reasonably do well with hypothetical situations.

- One may question why all the subjects were not successful in dealing with the hypothetical situation. However, it may be said that interviews with the subjects who gave the cl-answers showed confidence in what they were inferring.

- The noncl-answer justifications pointed more towards the believability of the hypothetical situation itself. Hence they questioned the very possibility of the hypothetical situation which did not corroborate with their world knowledge (for example, they could not think of a hypothetical situation where an elephant could enter a tram because of it size).

Summary

- The results show that 'intelligence-factor' was seen in most of the subjects and hence one cannot doubt whether they can infer properly from given information. However, the deviations may be explained by the fact that they are unaccustomed with syllogistic-form of reasoning which may be sharpened through formal training.

- Further, one must also note in this context that, people are not completely driven by the information that is provided to them. They are also influenced by their own world knowledge and they are not always successful in bracketing their world knowledge in answering the questions.

- Consideration of exceptions also cannot be ruled out, though results have shown that only 37% (approx.) gave their answers considering world knowledge, exceptions and guesses.

- Interestingly, closed-system and reliability factors did play a role and subjects were successful in restricting their answers to the information that was given in the premises and took clues from the information that was provided.

Evidentiality…

- Evidentiality is the coding of the source of information.

- Traditionally it is divided in two main categories:

  - **direct evidentiality**, which shows that the speaker has directly witnessed the action

  Typical direct evidential categories are visual and auditory evidence, stating that the speaker has respectively seen and heard the action

  - **indirect evidentiality**, which shows that the speaker has no direct evidence for his/her statement, but has other sources for making the statement.

Cues:

It is not unusual to think of these two categories as representing different degrees of commitment to the truth of the action: indirect evidentials show that the speaker is not as committed to the truth of what s/he is saying than when a direct evidential is used.

- Ways in which questions are posed…

- Indications from the response of the subjects…

- What careful measures do we need to take in order to avoid such interference, if any?

References:

- Luria, A. R., *Cognitive Development: Its Cultural and Social Foundations*. Cambridge, Mass: Harvard University Press, 1976.

- Cole, M., Gay, J., Glick, J. A., and Sharp, D. W., *The cultural context of learning and thinking: An exploration in experimental anthropology*, New York: Basic Books, 1971.

- Scribner, Sylvia, and Cole, *The Psychology of Literacy*, Cambridge, Mass: Harvard University Press, 1981.

- Scribner, S., "Modes of thinking and ways of speaking", in P. N. Johnson-Laird & P. Wason (eds.), *Thinking: Readings in Cognitive Science*, Cambridge, Mass: Cambridge University Press, 1977.

- Bruner, *Beyond the information given*, London: George Allen & Unwin, 1973.

References:

- Byrne, R., "Suppressing valid inferences with conditionals" in *Cognition* 31, 1989, pp. 61-83.

- Johnson-Laird, P. N., *How we reason*, Oxford: Oxford University Press, 2006.

- Lambalgen, M. van, and Stenning, K., *Human Reasoning and Cognitive Science*. Cambridge, Mass: MIT Press, 2008.

- Haan, G. N. J., *How illiterates interpret syllogistic problems* (M. Sc. Thesis), Universitiet van Amsterdam, Institute for Logic, Language and Computation, 2007. *www.illc.uva.nl/Publications/ResearchReports/MoL-2007-20.text.pdf* (date: 02.07.2008)

Thank You...