ENG423A:
Current Issues in Linguistics

GENERATIVE LINGUISTICS II

Challenging the intellectual climate

1. Empiricism in Philosophy
2. Behaviourism in Psychology
3. Logical positivism in scientific theory construction
4. Corpus based linguistics: Unpredictable differences between languages

1. Rationalism in Philosophy
2. Cognitivism in Psychology
3. Three levels of adequacy in scientific theory construction
4. Generative linguistics: An invariant core underlying all languages

Knowledge is justified belief

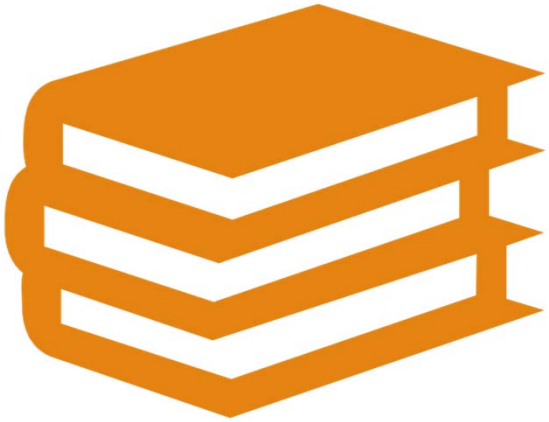
Knowledge involves possessing the truth – the *knower,* as against a *believer,* has an adequate justification for claiming truth.

Nature of justification: either rational or empirical.

Rational justification: the human mind is endowed with a set of a priori truths; other truths are derived from these [Rationalism].

Empirical justification: truth is based upon our experience of reality [Empiricism]

Empiricism: Realism/Relativism – we have an objective perception of reality or each perceives reality his/her own way].



Epistemological question

How do we know what we know?

How do we know so much despite such little experience?

Fragmentary and impoverished experience Vs. rich system of knowledge.

In the domain of language. . .

Translated into the domain of language, the epistemological questions are questions about the nature of linguistic knowledge and its acquisition by humans.

What is linguistic knowledge?

How do we acquire the knowledge of language?

Aristotle's answer

The world is structured in a certain way and the human mind is able to perceive this structure – moving from particulars to species to genus to further generalization.

Knowledge of universals from particulars

A knowledge out there is a prerequisite to knowledge acquisition.

Another possible answer

Shifts the burden of explanation from structures of the world to the structures of the mind.

Plato: innate cognoscitive powers

Rationalism: the human mind is preordained to acquire knowledge

Platonic view

Sense perception vs. reason as two approaches to knowledge.

Sense perception cannot be adequate because objects are subject to decay and change.

Sense perception can lead only to beliefs about particular objects.

Knowledge goes beyond the particular and grasps universal Ideas or Forms.

Platonic view

All knowing is the knowing of these Ideas which pre-exist any empirical experience.

All knowledge is a priori, acquired independently of sense experience - as opposed to a posteriori, contingent, empirical knowledge which comes from experience through the senses.

Platonic view

Ordinary empirical beliefs, unless they are related to ideas, are not knowledge but simply unstable appearances.

An example of a priori knowledge – 5+7 = 12 – to know that the equation is true, you don't have to appeal to experience.

Continental rationalism and British empiricism

Two 17th C answers to the epistemological question of problem of knowledge

17th C – a very important time for epistemology driven by the intellectual climate of the time

Impact of modern science on epistemology

Nicolaus Copernicus (1473-1543) , a cleric [On the Revolutions of Celestial Spheres] advocating a heliocentric view

An epistemological shock because the view is contrary to both human experience and religious diktat.

Continental rationalism and British empiricism

Scientific and non-scientific reasoning

Galileo’s celestial adventures with the telescope

Mathematical formulation of physical phenomenon

Indications that most sensory information may contribute nothing to knowledge

These developments triggered a debate on the origin of knowledge.

Cartesian Rationalism

Rene Descartes: A prominent role in shaping the agenda of modern philosophy

In a day when philosophy and science were not distinguished – science was, in fact, natural philosophy - he is a philosopher, a physicist and mathematician rolled into one.

His physics was overthrown eventually by Newton, his analytic geometry (algebra given geometric expression) - the Cartesian coordinates - remains one of the more attractive possibilities of conceptualizing physical geometry.

Cartesian Rationalism

Reason as the fundamental source of knowledge as against senses which differ from reason not only in degree but also in kind

An important group of fundamental concepts are known intuitively through reason - innate ideas.

Cartesian Innate Ideas

1. Independent thinking substance (God)
2. Created thinking substance (Beings)
3. Corporeal substance (Matter)
4. Duration, order, number, size, extension (length, breadth, depth), shape, motion, position

Cartesian Innate Principles

Identity: Each thing is the same as itself and different from another. (A is A and not ~A)

Excluded Middle: Either a proposition P is true or its negation is.

Nothing comes from nothing.

What is done cannot be undone.

He who thinks cannot but exist while he thinks. (*cogito ergo sum:* I think. Therefore, I am.)

Things that are equal to a third thing are equal to each other.

British Empiricism

All knowledge is derived from experience (Gk. Empeiria: experience)

Staunchly rejects the rationalist view – ideas are ultimately traced back to experience.

John Locke, an arch-empiricist – "An Essay Concerning Human Understanding"

A comprehensive theory of knowledge in which the mind is viewed as *tabula rasa* - a wax slate

Human mind an empty receptacle for whatever imprint the sensory experience leaves on it.

Chomskyan Critique

Empiricism dominated the intellectual climate for nearly two centuries after the British Empiricism surfaced, and the descriptive linguistics like every other social science saw the doctrine as THE theory of knowledge.

Chomsky – rejects empiricism outright, conforms to the rationalist view, and indeed resurrects it from the Cartesian times.

He credits humans with a rich *a priori* cognitive structure, with various kinds of knowledge built into it, linguistic knowledge included.

Chomsky's argument for *a priori* linguistic knowledge comes from the domain of whatever is known about language acquisition.

Arguments from language acquisition

1) Only humans acquire language – **species specificity of language acquisition.**
2) Humans acquire any language they are exposed to - **inevitability of acquisition.**
3) Pathological cases apart, there is a striking uniformity in the developmental order of acquisition of language across the species - **Uniformity of intermediate stages of acquisition.**
4) Language is acquired despite a limited exposure - **poverty of stimulus.**

Poverty of Stimulus

Brief time span

The exponential growth over a brief span of time is a miraculous feat

Unparalleled in the ontogenetic growth and development of the organism

Exposure to very sparse data

- Defective and degenerate data
- Unstructured data
- No negative evidence – no corrective intervention

Argument from poverty of Stimulus

Sparseness of the input data as against the richness of the system that is acquired

The logical problem of language acquisition – input-output mismatch – mismatch between the experiential input and the attained state of knowledge.

A rich initial state with *a priori* knowledge

The linguist's task:

1) Give a specification of the inbuilt, *a priori* knowledge structures that accounts for the universal and undeniable facts of language acquisition

2) Show how the initial state is mapped to the steady state.

A movement away from both prescriptivist and descriptivist traditions

Behaviourism vs. Cognitivism

Behaviourism is a learning theory that assumes that all behaviour is responses to certain stimuli in the environment

Or a consequence of that individual's history, including positive and negative reinforcement.

Although behaviourists generally accept the important role of inheritance in determining behaviour, they focus primarily on environmental factors.

All behaviour is learnt through stimulus-response associations

Stimulus-response pairing is stregthened over time - learning

Behaviourism

A doctrine resulting from the extension of results of experiments on animals to human behaviour

Pavlovian experiments on dogs – physiological states of dogs salivating

Food – unconditioned stimulus

Food + buzzer paired to elicit the response

Buzzer alone elicits the response

The response elicited through the buzzer alone is the conditioned response learnt over time through the pairing of the buzzer with food.

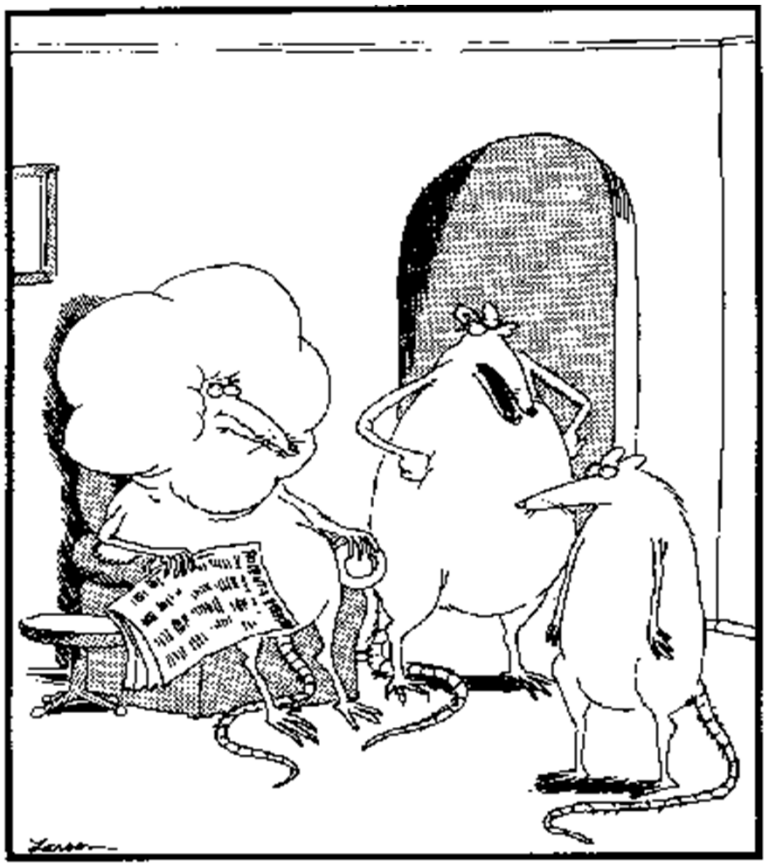
Behaviourism

Human behaviour can be controlled by being conditioned

American psychologists extended the experiment to voluntary behaviour of the cat pressing the buzzer.

Positive result reinforces the behaviour, quickens the learning, negative reinforcement for unlearning.

Gary Larson



"Quit school? *Quit school?* You wanna end up like your father? A career lab rat?"

Verbal behaviour

Language is behaviour and like all behaviour is learnt through S-R pairing

S – language around us

R – our reproduction

+ reinforcement fixing the pattern

Negative reinforcement – we abandon a faulty behaviour pattern.

Reinforced associations form habits.

Language learning - a habit formation process.

B.F.Skinner – Verbal Behaviour

Rejecting behaviourism

Chomsky's Review of Skinner's Verbal Behaviour

That human behaviour can be explained without reference to mental activity: an oversimplication

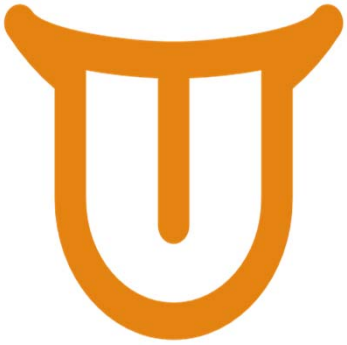
1) A simple human behviour such as recognising situations – picking up good apples and leaving out bad ones – involves a conceptual sorting, drawing upon information processing activities which take place inside the mind.

2) Memory states – internal representations.

3) Feels or qualia – subjective mental states that resist behavioural analysis – feel of pain

4) Rapid acquisition and lexical explosion – linguistic capacities that go beyond our learning histories – history of reinforcement is too impoverished to determine our verbal behaviour.

Linguistic Creativity



Creative use of language

Underdetermined by external stimuli

- We speak and understand sentences we have never heard before.

Unbounded use or Recursion

- Length of a sentence: no finite limit to the length of a sentence in NL
- Number of sentences: no finite limit to the number of sentences

Actual vs. potential utterances – a possible sentence of the language