

## Genesutra, or Dialectical Linguistics in a Nutshell

Linguistics is the *scientific study* of language.

What is *science* (knowledge)? What is *thinking*? What is ‘*understanding*’?

### Sutra 1: On Human Cognition, Knowledge & Understanding

#### 1.1 All intelligent animals have sensation. Sensation engenders memory:

ALL men by nature desire to know. An indication of this is the delight we take in our senses... above all others, the sense of sight. For ...we prefer seeing ... to everything else. The reason is that this, most of all the senses, makes us **know** and brings to light many **differences** between things.

By nature, animals are born with the faculty of sensation, and from sensation memory is produced in some of them, though not in others. And therefore the former are more intelligent and apt at learning than those which cannot remember ...

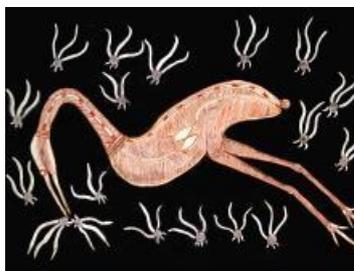
The animals other than man live by appearances and memories, and have but little of **connected experience**; ...from memory, experience is produced in men; for **several memories of the same thing produce finally the capacity for a single experience** (*Aristotle: Metaphysics, Book I*).

#### 1.2 Our physical senses perceive **concrete** physical things around us.

We see, hear, smell, touch, taste things all at once, in a sudden ‘unfolding’ of awareness:



Mona Lisa



Flamingo



Galaxy

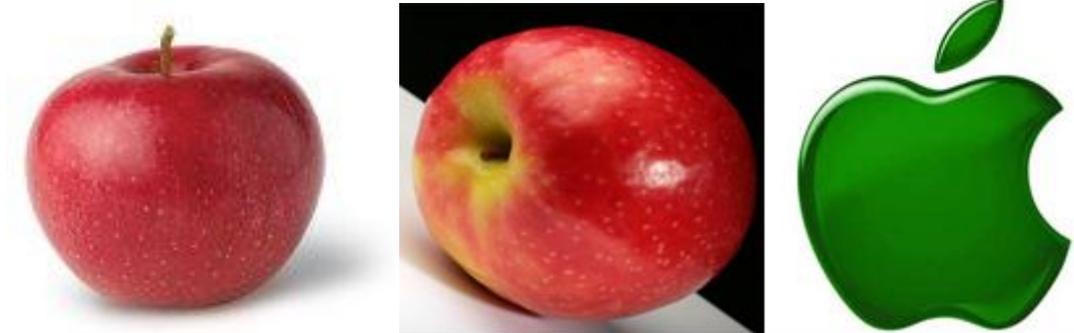
In a ‘flash’ of recognition, we *know* what we see (a girl’s face, flamingo, a galaxy, etc.). This is how all our physical senses work – we taste and smell the whole stew, not its ingredients separately.

**1.3 Each sensation is an experience – we look with our eyes, but we see with our mind.** If something catches our mind’s eye, then we focus on ‘parts’ of the whole impression, using the ‘close-up’ lens to see the details.

#### 1.4 Memory is 'connected experience'; it *engenders* knowledge:

...from memory, knowledge is produced in men; for **several memories of the same thing produce finally the capacity for a single experience** (Ibid.).

What *is* this *single* experience? **Generalization!**



Each 'experience' above is different from the others; yet, they all 'resemble' each other. Out of the '**several memories of the same thing**' we '**produce finally the capacity for a single experience**'; we have 'made sense' of them all – we have 'abstracted' their meaning – 'APPLE':

... **The world of experience must be greatly simplified and generalised before it can be translated into symbols.** Only in this way does communication become possible, for the individual's experience resides only in his own consciousness and is, strictly speaking, not communicable. To become communicable, it must be included in a certain category which, by tacit convention, human society regards as a unit (Vygotsky: 1934).

#### 1.5 To Know = To Understand the 'Causes' of Things.

We do not regard any of the senses as Wisdom; yet surely these give the most authoritative knowledge of particulars. But they do not tell us the '**why**' of anything - e.g., why fire is hot; they only say that it is hot. ... Wisdom is knowledge about certain principles and causes (Ibid.).

**Understanding** implies seeing how things relate to each other in terms of resemblance, contiguity in space and time, and cause/ effect. The **general idea** of how several concrete experiences relate to each other is the '**knowledge of universals**' (of the **principles** and **causes /relationships** between things).

Example: Most of us can dismantle a computer, but only few can put it together again (that requires knowledge of how the parts *relate* to each other).

**1.5 Thinking is the process of ‘abstracting’ meaning through connecting ideas.** We connect ideas in three ways:

1. By **Resemblance** – the picture of a friend reminds us of that friend
2. By **Contiguity in time/space** – personal belongings of a friend remind us of that friend; and
3. By **Cause/Effect** – when we see lightning, we expect to hear thunder, etc.

**1.6 We must be able to make these connections in order to create symbols:**

**Symbol:** a physical form that has (= is connected with) conventional meaning

**Iconic Symbols** are forms that resemble their meaning, i.e.:



**Arbitrary Symbols** are physical forms with **no** obvious link to their meaning:



Words of language (spoken or written) are the most important of all our symbols.

**1.7 Our ability to connect ideas by resemblance, contiguity, and cause/effect enabled us to ‘invent’ the symbols for speech – writing:**

Spoken words are the symbols of mental experience and written words are the symbols of spoken words. Just as all men have not the same writing, so all men have not the same speech sounds, but the mental experiences, which these directly symbolize, are the same for all, as also are those things of which our experiences are the images.

Aristotle: De Interpretatione

**1.8 The invention of writing gave us control over our memory.** Writing marked a qualitative change in the development of human memory – **from biological, internal memory to external, socio-historical /cultural memory:**

Everything that civilized humanity remembers and knows at present, all the accumulated experience in books, monuments and manuscripts – all this colossal expansion of the human memory, without which there could be no

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historical and cultural development, Is due precisely to **external human memorization based on symbols** (Vygotsky: 1930).

### **1.9 The better our system of ‘externalized’ memory, the more we can remember; and, the better our memory, the greater is our (potential) knowledge:**

Memory is enhanced to the extent that systems of writing and of symbols, together with the methods for using those symbols, are enhanced (Ibid.).

#### **Did you know? We are living in *exponential* times:**

There are over 2.7 billion searches performed on Google each month... To whom were these questions addressed B.G.? (Before Google)

The number of text messages sent and received every day exceeds the population of the planet.

There are about 540,000 words in the English language . . . About 5 times as many as during Shakespeare’s time.

It’s estimated that a week’s worth of New York Times . . . Contains more information than a person was likely to come across in a *lifetime* in the 18th century.

It’s estimated that 40 exabytes<sup>1</sup> of unique new information was generated worldwide in 2006 - more than in the previous 5,000 years. Total of approx. 161 exabytes of data were created in 2006; this is 3 million times the amount of information contained in all the books ever written; the amount of data generated in 2010 is expected to hit 988 exabytes.

### **1.10 Ability to *connect* ideas → generalization/ understanding:**

What looks like a duck, walks like a duck, and quacks like a duck, *is* a duck! ☺

### **1.11 Meaning is relative: we ‘make sense’ of things on several levels:**

- 1. Individually, in our own heads** (based on our personal experience) and
- 2. Collectively** (based on the connected experience of our family/ society).

**There is nothing either good or bad, but *thinking* makes it so.**

Shakespeare, *Hamlet*

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<sup>1</sup> **1 EB** = 1,000,000,000,000,000,000 B = 10<sup>18</sup> bytes = 1 billion gigabytes = 1 million terabytes

**1.12 There is nothing in the mind, unless it is first in the senses.<sup>2</sup>**

Knowledge begins with sense perception – an impression of something as a whole; to gain a deeper understanding, we must get to know *parts* of that whole:

Example: Our first impression of a person is superficial; we know immediately, if that person is male or female, their age, ethnicity, etc.; to get to know somebody, however, we must learn how they *think* and *behave* ('A friend in need is a friend indeed').

**1.13 When *learning*, our minds first 'perceive' things as a whole, and then, wanting to learn more, they focus on *parts* of the 'whole':**

In order to form a concept, we must be able not only to *connect*, but also to *abstract*, to *single out* characteristic elements, and to view them separately from the 'totality of the concrete experience in which they are embedded' (Vygotsky: 1934).

In other words, "making sense" of something (learning) is a complex process of both connecting and contrasting ideas, of ***synthesis*** and ***analysis***. Synthesis and Analysis are the backbone of all human understanding. Example:



The Earth seen from Apollo 17  
<http://en.wikipedia.org/wiki/Holism>



Parched earth resulting from a drought  
<http://dampwater.tripod.com/id4.html>

Both images above are of the same planet Earth; the wide-angle, holistic view of it is different from the close-up image of a tiny part of it on the right. When learning, our 'mind's eye' shifts from wide-angle to zoom; what we see will depend on the kind of lens (perspective/ view /mode of reasoning) that we use.

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<sup>2</sup> **Aquinas** (c. 1226–1274 AD), an Italian monk

**1.14 *Synthesis* and *analysis* are the ‘opposite’ parts of learning, just as inhalation and exhalation are the ‘opposite’ parts of breathing.**

Awareness of something (as a whole) ≠ Knowledge of **how** or **why** it is what it is – we must zoom in, before panning out again, to get a better picture.

**(a) *Synthesis (Dialectics)* is the **Wide-Angle** lens of our mind’s eye.**

Dialectics views things as a whole – in their essential interconnectedness, motion, development and change.

**The three basic laws of Dialectics are:**

1. **Everything is a ‘struggle of opposites’:** day/night; knowledge/ ignorance; joy/ grief, life/ death, etc.
2. **Quantity changes the Quality:** larvae→caterpillar→butterfly; childhood→youth →adulthood→old age; ice→water→steam (gas), etc.
3. **Change moves in spirals:** every morning is a new morning, not the same as another day’s, etc.

**You could not step twice into the same river, for other waters are ever flowing on to you.**

Heraclitus, *On the Universe*

**(b) *Analysis (Metaphysics)* is the ‘**ZOOM**’ mode of our mind’s eye.** It focuses on **parts** of the whole, and examines them ***in isolation from it***. What are the continents in the photo of the Earth below? You must look closely:



When studying, trying to *understand* things, we constantly shift focus from the ‘whole’ (the *wide-angle/ synthesis* approach), to the zoom (*analysis*).

**1.15 The Truth of our ideas is measured by the Physical World** (by whether our ideas correspond to reality); this is how **Science** differs from **Art**:

**(a) Science seeks to discover the physical world the way it is.**

The **Scientific Method** is based on inductive logic (generalization); it involves

- Observation of similarities/ differences between several particular events,
- Looking for the 'causes' - the **hows** and **whys** (hypothesis making),
- Experimentation, and
- Validation/ rejection of hypotheses on the basis of experimental results.

**(b) Art represents the artist's perceptions, opinions, attitudes, imagination, and view of the world.** An artist's view may or may not reflect reality.

Example: Pa Grass and his buddy through the eyes of the artist: ☺



Source: Calendar 2008

Let us now take a wide-angle view of human Language (the object of our study) ... What *Is* Language?

