Lecture 2: "Natural" Thinking vs. Critical Thinking

Last week, we discussed the general principles of human understanding, as identified by David Hume: we perceive (experience) the world around us through our physical senses, and then explain and categorize it using three types of association: ***Resemblance***, ***Contiguity***, and ***Cause and Effect***. Today we are going to distinguish between the ordinary, 'natural' way of thinking and critical thinking, and examine the process of learning to think critically.

Today's Objectives:
1. To gain a clear understanding of how critical thinking differs from untrained, 'natural' thinking processes, and
2. To examine critical thinking in the context of general cognitive development (Piaget's 4 stages of cognitive development).

Our *natural* way of thinking is
- ✓ ***Spontaneous***: caused by an impulse, not planned, for example, if you are hungry and you smell roasted chicken, your thoughts will follow that 'irritant';
- ✓ ***Undisciplined***: not consciously directed, jumping from one thing to another;
- ✓ ***Unreflective***: unquestioning, accepting; and
- ✓ ***Habitual***: habit-forming, characterized by mindless following the 'familiar rut.'

The ***natural way of thinking*** does not ***question*** itself, its operation, or its results. No doubt it ***feels*** right – have you noticed that the less people know, the more they *think* they know? People generally ignore, avoid or dismiss anything that feels uncomfortable and conflicts with their sense of self-sufficiency. ... Uncritical thinking is ***ethnocentric*** (focused solely on own, familiar cultural ways) and ***egocentric*** (self-centered). The natural way of thinking is usually a product of ***social/ cultural conditioning***, personal quirks and prejudice. 'Uncritical' thinkers cannot distinguish between ungrounded opinion, reasonable belief, and genuine knowledge. They tend to develop beliefs, which are simple, comfortable, personally satisfying, and ***socially acceptable*** … ***Conformism***, in turn, perpetuates biases, prejudices, half-truths, distortions, and fallacies.

On the other hand, ***critical thinking*** is characterized first and foremost by its questioning, and 'not-taking-anything-for-granted' attitude. Critical thinkers ***train*** the mind in a self-reflective and self-directed manner. Critical thinking is
- ✓ *clear,*
- ✓ *precise,*
- ✓ *accurate,*
- ✓ *relevant,*
- ✓ *consistent, and*
- ✓ *fair*

Critical thinking questions everything, and demands logical, reasoned answers; is open-minded, yet skeptical. No claim is accepted or rejected out of hand. If sufficient evidence or rational support is lacking, we are required to suspend judgment. The term "critical" refers to performing a critique, which evaluates both strengths and weaknesses in a claim, position, argument, etc. ... A critical thinker rigorously applies intellectual standards to both sides of an issue, irrespective of personal preference. A critical thinker assesses everything impartially, and makes conclusions based on sound and valid reasoning. Nobody is born thinking (talk less of thinking ***critically***! ☺) We learn to

think naturally in the process of learning language, and interacting with others in our environment. However, just as we need to consciously learn how to read and write, we must also consciously learn how to think critically (logically).

"It is the mark of an educated mind to be able to entertain a thought without accepting it."
Aristotle, an *Ancient Greek philosopher (384 BC - 322 BC)*
http://www.quotationspage.com/quotes/Aristotle

Critical thinking constantly questions the status quo. Just because something has been believed for years to be true does not necessarily mean that it is so. Just because something has been done a certain way for years does not mean it is the only or best way to do it. And just because someone 'important' or authoritative says something is right, does not make it is right. A critical mind maintains the *"maybe – maybe not"* stance, and looks for convincing evidence, before drawing any conclusions.

Critical thinking requires
- A good foundation in formal and informal logic,
- The willingness to ask questions, and
- The ability to see facts, even if they don't coincide with our pre-existing beliefs.

It is difficult to precisely define critical thinking, because our thinking operates on our different perceptions and experiences, and thus is relative and non-measurable. Two people may come to different conclusions about the same issue, and both of them may have their own logic (reasoning). This, of course, involves the discussion of the connection between critical thinking and the morality (ethics). And here I would like to remind you of Hamlet's words, which we considered in our first class:

"There is nothing that is either good or bad, but thinking makes it so"
Shakespeare, *Hamlet*

Critical Thinking in the Framework of Cognitive Development
It is helpful to examine critical thinking in the context of cognitive development. It is generally believed that concrete logic is not possible until at least age 6 or 7, and that only in the highest levels of cognitive development can critical thinking take place.

Jean Piaget (1896-1980), a Swiss psychologist, distinguished 4 stages of cognitive development:

1. The **Sensorimotor Stage** occurs between birth and age 2. Babies are born with no thinking structures (the so-called schemas) and develop them through exploring their environment through their senses. At his stage, humans are incapable of coherent logical thought.
2. The **Pre-Operational Stage** (approx. 2 to 7 years of age). Children rapidly develop language skills and, concurrently, the underlying thinking structures. They develop personal traits and characters, but are yet incapable of mature reasoning. For example, the concept of **conservation** is above the average toddler (**conservation** implies the understanding that actual amounts of any substance may remain constant, even if the shape or form of it may change). When water is poured from a tall, narrow glass to a short, wide bowl, the preoperational child will think that there is now less water. They are also incapable of de-

centering (the ability to see things from another's perspective). When pre-operational children are asked to sit at a table but draw the view from the other end of the table from the perspective of someone looking at them, they cannot do it. Both *conservation* and *de-centering* are basic requirements for logical thinking.

3. The *Concrete* **Operational Stage:** ages approximately 7 to adolescence. Children begin to grasp *conservation* and *de-centering*. They can now reason logically, but only on a concrete level, not hypothetically or abstractly. When a Concrete Operational child is shown a blue block and asked "Is the block green or not green?" he or she will probably answer "Neither, it's blue!" - that blue is not green is too abstract. They solve problems logically, but not systematically / consistently.

4. The *Formal* **Operations Stage:** adolescence or above. The mind is now capable of sophisticated logical thought. It can think abstractly, hypothetically and can solve problems using the logic of combinations. Research shows, however, that only about 25% of all adults use formal operations on a regular basis (it requires significant training and cognitive discipline).

Some believe, there is a 5th stage, the so-called **Dialectical Reasoning** (Riegel, 1973). This, they believe, is a stage *beyond* logic, where "*real critical thinking lies*." They call it "the ability to perceive the frequent paradoxes in life and to question and analyze the assumptions that underlie the logic" (http://faculty.uophx.edu/Joehe/Past/thinking.htm). They say, "A *logical* thinker can recognize and analyze the relationships between premises and conclusions. A *critical* thinker is able to extract and examine the assumptions that underlie the premises" (Ibid.).

I (personally) believe that the assumptions we tend to make are the result of our prior individual experiences, and, therefore, they may be different for each one of us. This difference of perspective usually leads to a difference in our conclusions. That, indeed, is the greatest dilemma for humanity to solve: we need to try and convince people to see the world through the perspective of *common human interest.*

Summary
        Critical thinking is what helps us tackle all Life's problems. Critical thinkers have a persuasive power that gives them influence over other people. **Strength Is in Numbers**, therefore, our ultimate power is our ability to influence the behavior of others through persuasion.
        Critical thinking is a way of living Life. Critical thought often meets with resistance from those individuals /power groups who want to maintain their influence without any awkward questioning of their authority. Critical thinking is not being negative or disrespectful – it is intelligent questioning and logical analysis of issues and values in pursuit of Truth. It is a readiness to ask why things are the way they are and how they can be changed for the better. It implies an ability to hypothesize, speculate imaginatively on alternative possibilities, and arrive at sound and valid conclusions.
        The ability to think is not inborn – we learn how to think symbolically through learning Language. The ability to *think **critically*** is relatively rare: it is characteristic of the highest stage of cognitive development (Formal Operational), which only one out of four adults, on average, ever attains.

Olga Temple

Linguistics & Modern Languages, SHSS, UPNG

References

Encyclopedia of Educational Technology: Piaget's Developmental Stages. Retrieved 14 March 2006 from http://coe.sdsu.edu/eet/Articles/piaget/index.htm

Kirby, G.R. and Goodpaster, J.R.: *Thinking*. Prentic-Hall, Inc., 1999

Riegel, K.F. (1973). Dialectical operations: the final period of cognitive development. Human Development, 16: 346–370.

Practical Assignment 1 (10% of your continuous assessment)

(Based on a project example retrieved 17th of March 2006 from http://www.pierce.ctc.edu/tlink/general/projects/cognitive_devel/cognitive_devel.html).

Do kids think differently from adults? What does "*more*"/"*less*" mean to different children? Get some young kids together and **test Piaget's *concept of conservation***. According to his theory of cognitive development, children develop this ability at one of the first 3 stages of cognitive development (you figure out which one). You need to test kids between the ages of 3 and 12 years old to see if they have developed this ability.

Conservation of Mass
Use some clay or ordinary flour (to make dough). Roll equal amounts of clay (or dough) into two balls. Ask the child, "Which ball has more clay (dough), or are they both the same?" If the child doesn't understand the question, try "If I take this one and you take that one, who has more clay (dough), or do we both have the same amount?" Ask them to make them equal.
Then flatten one of the balls into a pancake and repeat the question. What reasons do they give for their answer?

Conservation of Volume
Show two identical bottles (or cups) filled with equal amounts of water to the child and ask, "Which has more water, or are they both the same?" If they think one has more than the other, help them make them equal.
Then pour the contents of one bottle (cup) into a bowl, and repeat the question. What reasons do they give for their answer?

Conservation of Number
Lay out two identical rows of seven 2 toea coins (closely spaced together). Point to the rows and ask the child, "Which row has more toeas, or are they both the same?"
Next, rearrange one row, spreading the coins out so that the row appears longer. Repeat the question. What reasons do they give for their answer?

For all three of these types of conservation, try to get the child to say "yes" to the first question (agree that the amounts are the same). If the kid hassles you about the clay balls being slightly different sizes, have the kid add a little clay to one ball to make them even (or add a little water for volume). <u>Then</u> go on to question 2.

Class Inclusion
Piaget's idea of classification is that some classes (groups of things) are fully contained within other classes. It's easier to describe with an example, so here goes. Get eight candies, 5 wrapped in red, 3 wrapped in green. Show the child all the candies. The first question is, "Are there more red candies or more green candies?" The child should answer "red". Then ask, "Are there more red candies or more candies?" If the child says "red", s/he does not understand "Class Inclusion". The child who answers "candies" understands "Class Inclusion" because s/he realizes that red candies are red candies and candies at the same time. The child cannot compare a set with its subset.

Discuss your findings and observations with your team members, and submit a short summary of your group discussion to me in 2 weeks' time (26th March 2008) – Olga Temple.