WEEK 8

1. At this point, we return to cognition to ask: In a computerized world, how do we describe the human skills that the market still values?

2. We start with two already established facts:

   a. While computers dominate humans in the execution of rules, humans dominate computers in the recognition of complex patterns.

   b. Complex pattern recognition takes place at both the low end of the wage distribution (e.g. the optical recognition and hand/eye coordination of a janitor) and at the high end in complex cognitive tasks.

3. Based on what we have seen of the occupational distribution, we can divide complex cognitive tasks into two broad areas:

   a. Expert Thinking – How one solves problems (including creative problems) for which there are no rules – judges, chefs doctors, engineers, auto technicians, etc. when they confront new problems.

   b. Complex Communication – how one conveys not just information but a particular interpretation of information – salespeople, teachers, managers, etc.

4. With respect to expert thinking, the chapter from the NRC report outlines a number of psychological dimensions in which an expert differs from a novice in approaching a problem.

   a. An expert can perceive patterns in data that a novice will miss (by this time, the course has already covered many examples that make this point).

   b. The expert has significant amounts of knowledge stored in the memory in schema – organizations that both contain facts and the relationship among facts (note that the dual emphasis on facts and their organization cuts through the some of the debate as to whether children should learn facts (back to basics) or concepts – they need to learn both.

c. In approaching a problem, the expert is able to practice metacognitition – the ability to step back, assess how a particular approach is working, and choose another approach if it appears that the current approach is not working well. This is important in terms of labor demand because it is extremely difficult to program a computer to do this kind of analysis.

5. With respect to Complex Communication, we begin with the basic problem described earlier – because information is interpreted in context, it is possible for a piece of information to be understood in multiple ways (e.g. not knowing whether a colleague who e-mails that they are "going to jump out the window" is venting or sending a suicide note. The job is to communicate a particular understanding of a set of information. There are several ideas associated with this process.

   a. The first, emphasized in Norreestranders, all but the simplest messages involve a selection problem – i.e. what parts of a complex idea do you choose to convey in words, images, etc.

   b. In face to face conversation, we can think of these messages as having four components arranged in a two-by-two table: verbal versus non-verbal and substantive versus emotional.

   c. This leads to a discussion of what cognitive psychologists know about emotions. One excellent source on this is Joesph LeDoux's book, *The Emotional Brain*. In the context of the course, emotions make communication potentially more complex in two ways. First, an event can trigger an emotion via an emotional memory that has little to do with the situation at hand (you yell at your kids not because they were so bad but because your boss yelled at you; you find yourself liking a saleswoman because she looks and sounds like a favorite aunt, etc.) Second, when emotions are stimulated, they can lead directly to physical reactions without mediation by conscious consideration. "Flying off the handle" is an example of this kind of emotional short circuit.

   d. It also leads to a discussion of non-verbal behavior which, like emotions, help form the context in which we interpret information. We review various kinds of non-verbal behavior (why the car salesman in Beamish et. al. always sets up his temporary desk with a picture of his wife and children so it faces the customers) and we spend more time talking about body language – how, in particular, people believe body

language, facial expressions, etc., are harder to manipulate than words and so offer a more accurate insight into what someone feels about what they are saying.

e. As in Expert Thinking, Complex Communication involves metacognition – the ability to step back, see if a particular idea is getting across and, if not, do something else. This kind of interaction – seeing how another person interprets what you are saying, attempting to correct it ("No, that's not what I mean…) is central to communication.

f. The Friedman/Currall paper shows how e-mail can create problems because it sharply diminishes the possibility for non-verbal communication (instant messaging is something of an exception) and cuts off the possibility of non-verbal communication.