

# Expertise In The Professional Pressure Cooker

## *Perspectives on Professionals' Judgment and Decision Making*

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It is a great pleasure, as an accounting professor in a business school, to be speaking to colleagues in agricultural education. The point of departure for this paper is that we are all attempting to educate students who will become professionals and managers, and who will want to be good at their jobs, and therefore we may all find it interesting to consider the nature of expertise in professional settings. The ideas below are taken from research in many fields, especially cognitive psychology but also business, medicine and other applied fields. They should be as significant in the agricultural profession as they are in my field, accounting, and in many other applied fields.

The paper will outline how judgment expertise is thought to work and then examine some of the factors in the professional environment that shape, and complicate, such expertise. Some implications for teaching professionalism and therefore for the Conference theme of developing agricultural leaders for the 21st Century are pointed out, and at the end is an annotated list of references for further reading.

Judgmental expertise, which is usually defined as something like "knowledge-based readiness to perform a task successfully", develops in the interplay between basic human judgment processes and the incentives and complications of the environment in which the person works. If that environment features time pressure, unclear performance standards, social pressures and other such influences (as most professional settings do), then the expertise becomes to a large extent a function of those influences. Humans are marvelously adaptable creatures, and expertise tends to be quite specific to the setting. (Whether it is transferrable to different setting is a subject of debate.) On the other hand, there are basic human judgment processes and abilities, and certain errors and shortcomings in human judgment seem almost impervious to change, so we can predict some problems almost regardless of setting. Experience in a setting appears to be essential to the development of judgment expertise, but it is no guarantee of expertise -- some people have lots of experience but seem to have little expertise!

### Memory

Memory is at the center of judgment. Problem-solving is knowledge-based. Perception, intention and much of the data processing involved in making a decision are held in, or happen in, working memory, often called short-term memory. This working memory is quite limited in capacity,

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leading easily to perceptual overload and promoting sequential processing of data. It is sensitive to interruption, distortion and other sensory difficulties.

Knowledge-based expertise resides largely in long-term memory, which has an essentially unlimited capacity and works very quickly when cued by perceptual or other short-term memory processes but which is slow in storing new chunks of information and is fallible, being subject to forgetting and misremembering. The elementary processes of memory recognition, recall and judgment are very fast, taking only fractions of a second, and are done largely automatically, without conscious intervention.

Developing expertise therefore involves developing memory, or what is stored in there from education or experience. People, students included, do not have a lot of conscious control over what goes into their memories, but as educators we can offer a rich set of classroom, laboratory and other experiences out of which students can build their knowledge. Experiential learning is especially powerful -- often experts cannot recall the basis of their expertise because knowledge is built upon itself as experience happens and the originally learned knowledge may eventually be submerged, as it were, like a ship hull under layers of barnacles.

### Mental Structures

Knowledge is structured in the mind. Knowledge structures (which have many names, including schemas, scripts, templates, and mental models) are the basis of expertise. They provide pre-existing processing methods and even answers to problems that have been experienced (or taught). Several such structures appear important in professional expertise. One is the perceptual selector/switcher that defines what the problem is and calls up knowledge from long-term memory to deal with that problem, as defined. Problem-solving thus works on the problem as the person sees it, not as someone else sees it -- judgment expertise is a highly, necessarily, subjective thing. A second structure is the data processing structure, which applies reasoning (deductive, inductive or apparently intuitive) to the problem, based on data. The data may be perceived or already in memory in a sort of filing system structure. Because long-term memory is very fast, a large amount of remembered data can be applied to a problem very quickly and unconsciously, so what looks like "seat of the pants" judgment may actually be sophisticated processing of a large amount of information.

Expertise is dependent on the knowledge structures available in the mind. Therefore it can be self-limiting: the person

may solve the problem he/she knows how to solve, whether or not that is the problem someone else identifies. If the learning environment does not particularly distinguish among different solutions, as happens in many professional environments where the expert is given latitude in determining problems and solutions and much time may elapse before quality of solutions is evaluated (if ever), and as happens in many student settings where the students' efforts are not evaluated clearly, a fairly well-entrenched way of solving problems may develop that can produce biased judgment and insufficient adaptability if conditions change.

### Risk and Uncertainty

Conditions do change -- they may be quite uncertain if one is looking very far ahead at all. Handling risk and uncertainty is at the heart of judgment expertise, especially in professional settings. The problem is that people are generally not good at handling uncertainty, and research indicates that professionals are about as subject to difficulties here as anyone else. People are poorly calibrated probability assessors, usually having inconsistent and inaccurate perceptions of what the probabilities and risks are that they face. Weather forecasters are better than most here, perhaps because they know that what they deal with is largely unpredictable, whereas many other professionals think they know the world better than they do. Overconfidence in judgment tasks under uncertainty is a very common finding. People are also poor statisticians -- it is fairly easy to construct a regression, correlation or other statistical model that will outperform all but the very best experts.

People do not view gains and losses symmetrically -- often showing an avoidance of risk when potential gains are involved but seeming willing to take on risk when potential losses are involved. This is not a shortcoming, it is human nature, but it does tend to tangle people up when they are trying to decide about things like hail insurance, large capital expenditures or prevention of disease. There is difficulty especially at the extremes -- very large gains or losses, or outcomes that are very likely or very unlikely. Many professionals deal with such extremes all the time -- for example, auditors are on the lookout for fraud, but serious fraud is rare and auditors appear to overestimate its probability, perhaps doing more routine audit work than might be otherwise necessary.

To educate future professionals, time should be taken to develop ability to recognize and analyze uncertain situations. Many classroom examples are given under fairly certain or deterministic circumstances, and therefore fail to help students learn to cope with and judge uncertainty. In many sectors of society, risk and uncertainty seem to be increasing if anything, so educators should perhaps give this more attention if they wish students to become effective professionals.

### Social Setting

The social setting within which judgment occurs is very important to the nature and quality of the expertise applied in that setting. Some examples follow of social influences that have received considerable study. First is "framing", which is the presentation of the problem to the decision maker in a way that will influence the decision. This happens all the time, but it is important to recognize that its influence can be very powerful indeed and that the decision maker is likely to be unaware of its influence. If a problem is stated in terms of saving 9 lives in 10 instead of in terms of causing 1 death in 10, nearly everyone responds to it in those terms.

A second example is that there are often social pressures to justify or otherwise explain judgments, and people often

are, or feel they are, accountable to others for the quality of the results. Such social expectations and pressures are powerful in shaping the judgment processes, to the point where often more time is spent being sure a judgment can be justified than is spent making the judgment!

Social settings may contain implied, or explicit, definitions

of performance that influence how people see their tasks and themselves. If the group defines a certain kind of outcome as being "just an accident of nature" but another as negligence by the decision maker, the person's judgment processes will be bent toward those social definitions.

Many social settings exert very powerful forces on the development and exercise of judgment expertise. It is important that students be shown these, that they not develop their judgment skills in a social vacuum (as many texts seem to imply), because such skills will be quickly overwhelmed by the social setting. The implication is that messy, socially realistic problems should be presented to students and their performance evaluations should mimic some of the pressures they will encounter. This is not to condone the improper pressures that a real setting may provide, rather it is to get the students to understand and work within those pressures so they will not be overwhelmed by them later.

### The Professional Pressure Cooker

Professionals often have to operate in the worst sorts of judgment circumstances. There is usually significant risk and uncertainty, significant social pressures, time pressure, rewards and other incentives (and penalties) that favor certain methods or outcomes, and cloudy learning situations. Many professionals do not find out for months or years if their judgments were sound, and often there are several people involved in a significant judgment, so the learning feedback for each individual can be quite indistinct. Professionals are also expected to adhere to external standards of ethics, service, analysis, prudence, skepticism, independence, consultation, justification and responsibility. Professional tasks may be defined by such expectations.

*"Good judgment comes from experience, and experience, well, that comes from bad judgment."*

*Anonymous*

Preparing students to be professionals and leaders in the next century involves many activities and issues not included in this short review. Such central features of professionalism as ethics and personal responsibility have only been mentioned, for example. But the implications of the review are severe nonetheless. In summary, here are some:

1. If the learning environment does not have the incentives and complications of the professional setting, the learning will have limited value in developing expertise relevant to that setting;
2. Professional expertise (competence) is task-dependent. While professionals may be able to transfer some parts of expertise among tasks, development of professional competence requires exposure to professional tasks;
3. Professionals are valued in our society partly for their ability to deal with messy, ill-defined problems. Bringing such problems into the classroom may create discomfort for instructors and students, but it is necessary if students are to be prepared to become professionals.
4. Part of professionalism is awareness of the limits of one's own competence. Presenting students with situations involving risk and uncertainty not only helps accustom them to such situations but also can be used to help them recognize their and others' limitations as decision makers under uncertainty and perhaps inoculate them against common errors;
5. Many students, inexperienced in the ways of the world, and instructors, used to rational scientific analysis, do not recognize the enormous impact of the social setting on performance and learning. For many, if not most, professions, performance standards are socially determined, not absolute. This permeates the issues raised in the preceding four points: the professional setting is a social one, tasks and performance (competence) standards are often specified by professional bodies and society at large, professionals are often expected to perform well especially when things are least straightforward, and professionals are expected to have built-in defenses against common judgment biases and errors.

Thank you for the opportunity to present these ideas. I hope they are helpful to colleagues interested in preparing students for professional careers and that they might even be provocative about the professional settings in which we work ourselves!

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