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# Deep Processing and Expertise: Etiology and Applicability

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Recent reviews of the expertise literature have concluded that expertise can be defined as domain-specific skill based on a capability for deep processing of efficiently chunked knowledge of a domain, derived from extensive experience in that domain. However, this conclusion still leaves some fundamental questions unanswered: 1) does extensive experience in a domain guarantee deep processing capability -- if not, what does?; 2) does deep processing capability always result in deep processing?; 3) does deep processing always yield results?; and 4) is deep processing limited to those with domain-specific experience?

This research aims to address these four questions. I argue that: 1) extensive experience does not always lead to deep processing capability, it does so only if the experience has varied in theoretically meaningful ways; 2) deep processing capability does not always result in deep processing, it does so only when the relevant deep/causal concepts are shared with past experience; 3) when used, deep processing is generally effective; and 4) deep processing is not limited to those with domain-specific experience, but may be present in the reasoning of individuals with no specialized experience, in the traditional sense, but who are trained to think causally/at a deep level about similar types of problems in other domains. However, some base level of domain-knowledge may be required to effectively apply such deep reasoning.

## Method

In a one-on-one interview, four groups of subjects (restaurant managers, general business consultants, philosophy/social science professors, and non-business undergraduates) were posed open-ended, what-if type questions concerning managing a hypothetical restaurant through a number of business challenges. Responses were coded for the presence of optimal solutions to the problems posed, as well for various reasoning process measures designed to capture evidence of deep processing/causal reasoning. Questions varied in familiarity and complexity, in order to explore hypotheses concerning the impact of these variables on group differences.

## Results and Discussion

### Etiology of Deep Processing Capability

Both restaurant managers and general business consultants have extensive domain-specific experience, however they

performed significantly differently on virtually all measures. On problems devised to represent typical major challenges that a restaurant might face, the business consultants displayed significantly more deep/causal processing than the restaurant managers, yielding better answers, despite a lack of direct restaurant experience.

It is hypothesized that this is because the business consultants' wider range of experience across a variety of business situations exposed them to problems varying in more theoretically relevant ways, yielding a better understanding of business at a deep/causal level, and therefore, better equipping them to reason about problems in the deep/causal manner required to solve them well.

### Applicability of Deep Processing Capability

The business consultant's deep processing capability does not, however, apply as well to questions about rare situations from the domain, e.g., the impact of the outbreak of war, unlikely to be within the business consultants' realm of experience. Consultants show a larger drop in deep processing for such questions, in comparison with the other groups. This interaction with question familiarity argues against an interpretation based solely on differences in global traits, such as intelligence.

### Value of Deep Processing

Interestingly, even for the 'rare situations' questions, deep processing, when used, does appear to yield better answers.

### Deep Processing Without Specialized Experience

Social-science and philosophy professors, with no business experience, nevertheless used more deep processing than undergraduate novices, and also provided better answers. It is suggested that this is primarily because their problem solving experience, though from a different domain in the traditional sense of the term, is still relevant to the problems, as they are all in the greater domain of 'ill-structured, hypothetical, cause-and-effect reasoning problems'. Also, as these are real world problems, unlike, say, physics problems, their general life experience may have provided them with the necessary minimum level of domain knowledge.

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