A Test of Knowledge Representations and Widening the Frame in Strategy Decision Making
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Abstract
Cases are often used when teaching strategy, yet little is known about how to improve strategy decisions other than through repetition. We tested 392 graduate business students, working in teams of two, on their ability to arrive at the correct case solution prior to and after use of a brief series of strategy questions. We posit these questions form a "representation," and are one way to improve students' ability to decide how best to grow the business described in the case. We tested four variations of our representation heuristics, noting the best results with focused questions and a frame broadening prompt. These two approaches appeared to help participants select underlying structural relationships important in this case. We contribute to the psychological underpinnings of strategy by proposing how to assist graduate business school students in making better decisions on how to grow a business.

Introduction
We model "strategy" as an abstract problem, and posit that individuals represent the problem of strategy by visualizing several different factors, among them the company’s product, its competitors, technologies, and markets. Our claim is that by using a "strategy representation," consisting of three, four, or five questions, business school students will be able to organize these factors and make inferences allowing them to answer how best to grow the company under study. We use the term "representation" in the narrow sense as developed in the AI literature, rather than the broader sense of "everything known" to the decision maker as discussed in some psychology literature.

Hypotheses
The representations used in these experiments are designed to be sets of obvious and non-case-specific questions which allow students to solve the case as an expert might. We provide a set of constructs with which we built our representations and hypothesize that design of the representation is key (Hypothesis One).

The first variation of our representation was developed with four general questions, without a frame broadening prompt. The questions were developed from basic and common strategy principles presented in undergraduate or graduate introductory strategy courses. In the second set of experiments, we modified the representation by focusing the questions as an attempt to aid participants in finding the underlying structural relationships that point to a solution. We hypothesize that focusing on key elements (although not issues specific to this case) will aid in solution of the case (Hypothesis Two).

The second set of experiments also reflected the idea that "broadening the decision frame" can help individuals reason thoughtfully and explore options they had not initially
considered. To test this concept, we hypothesize that use of a frame broadening question will increase the effectiveness of the representation (Hypothesis Three).

For two of our four series of experiments, we compared teams who completed answers both before and after obtaining our set of representation questions with teams who complete answers only once, that is, directly after obtaining our set of representation questions. For these additional tests, we selected the most and least statistically significant outcomes. Because we feel the use of a proper representation is the key to arriving at the correct answer, we hypothesize that the additional time spent with the case will not provide a significant effect (Hypothesis Four).

**Experiments**

We provide evidence that a representation which does not effectively focus attention on key elements and does not contain a frame broadening prompt is of no help in solving the strategy question (46 students; n = 23 teams; P = .6831). When focus is added to the questions along with a frame broadening prompt, the representation becomes an effective aid in solving the case (90 students; n = 45 teams; P < .0001). There is no significant difference in scores between the teams that work on the case twice and those who solve the case once directly after receiving the representation questions, for both the first representation variant (32 students; n = 16 teams; P = .9212) or the second variant (48 students; n = 24 teams; P = .7491).

For the third variation, we matched the general questions of the first representation with a frame broadening question. The outcome was improved over the first test, but not statistically significant (70 students; n = 35 teams; P = .1138). The fourth variation tested the focused questions without a frame broadening prompt and provided a statistically significant result (66 students; n = 33 teams; P = .0044).

Understanding the method by which "insight" is derived when reading a case is central to gaining expertise in strategy, a key goal of most strategy courses. We propose that the use of a representation, if properly constructed, appears to heighten students’ ability to visualize important structural connections among the various factors of strategy and improve decisions.