Adapting to Time Constraints

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Introduction

Consider the plight of an air-traffic controller choosing an altitude and course for an incoming flight, or a parent selecting a breakfast cereal during a hurried shopping trip accompanied by a cranky child. Although the consequences of these two decisions may vary, both decision makers face two potentially conflicting goals: (1) to make a good choice and (2) to reach a decision within a limited amount of time. Such choices illustrate the central topic of this chapter, the influence of time pressure upon decision making.

Under time pressure, decision makers often cannot simply employ a strategy that would select the best alternative because choices must be made within a reasonable amount of time. Normative analysis usually focuses on utility maximizations, but with time constraints, accuracy may have to be traded off for time savings. Thus, at a theoretical level, time constraints are of special interest because heuristics, under time constraints, may be even more accurate than a "normative strategy."

In this chapter we summarize some of the results of our program of research that examines how decision makers cope with this tradeoff. Our work has had two major components. First, we would like to characterize how decision makers could respond to time pressure. To do this, we analyze the performance of...
several strategies when faced with time constraints. Our primary tool in this portion of our work is the use of computer simulations using production system representations of the various decision strategies. Second, we examine how decision makers do respond to time pressure. Here our primary tool is using process-tracing methodology to examine how decision makers access information in a choice task with time pressure, allowing us to infer the strategy that was used to make a choice.

Our final aim is to integrate these two analyses. To what extent do decision makers respond to time pressure by changing strategies? If they do change strategies, are those strategies better under time pressure than those they have abandoned? The answer to this question provides evidence to answer a broader question: Do decision makers change strategies in ways that are adaptive? Elsewhere we have been concerned with this broader question, and we see responses to time pressure as an important source of evidence concerning the ability of decision makers to select heuristic strategies that are adaptive to responses to different choice environments (see Payne, Bettman, & Johnson, 1993, for a further review of research relevant to this question).

The structure of this chapter is as follows: We first examine the performance of a variety of decision strategies under time pressure and identify those strategies that produce good choices under deadlines. We then discuss our empirical work, which examines how decision makers actually react to similar time constraints. Finally, we discuss how these reactions correspond to the predictions of the simulation.

Decision Making and Time Pressure: A Computer Simulation Analysis

Researchers have described a sizable number of potential decision strategies (see Svenson, 1979). Many of these strategies simplify the problem space (Newell & Simon, 1972) by (1) ignoring some potentially relevant information about the alternatives, and/or (2) by simplifying how that information is combined. We have examined a large number of these heuristics, but for the purpose of this chapter we will limit our examination to a set of rules commonly discussed in other simulations and empirical research (see Table 1). These heuristics vary substantially in the amount of information used and in the way that information is combined in order to make a choice. In addition, we examined two combined or "phased" decision strategies, because there is substantial evidence supporting their use in decision making (Payne, 1976). Both of these employed elimination-by-aspects (EBA) as a screening rule, followed by either an Additive Weighting or a Majority of Confirming Dimensions rule (Russo & Dosher, 1983). Both rules changed from EBA to the other heuristic when three alternatives were left.