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**UNDERSTANDING COMPLEX JUDGMENT PROCESSES:
MULTIPLE CUE JUDGMENT TASKS WITH THREE CUES**

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Descriptive Project Summary

Despite the interest in multi-attribute decision-making, the research on how people combine information that is present in the environment to form judgments has been limited (for exceptions see Olsson, Enkvist, & Juslin, 2006; Karlsson, Juslin, & Olsson, 2008). Most of the research on combining attributes looks at heuristics such as Take-The-Best heuristic (Gigerenzer et al., 1999) and the Priority Heuristic (Brandstaetter et al., 2006). These heuristics models are usually compared to the basic weighted additive model (WADD), while the work in categorization literature on cue integration by using exemplar models as well as multiplicative and mixed additive/multiplicative models has been largely ignored.

To be able to get a better understanding of how people form their judgments, it is important to compare WADD with exemplar models, multiplicative and mixed additive/multiplicative models. The research in categorization has shown that people use two different methods to make multiple cue judgments (Olsson et al., 2006; Juslin et al., 2008; Karlsson et al., 2008). Recent studies showed that people use cue abstraction or exemplar models to determine criterion values from presented cues suggesting a dual-process model of multiple cue probability judgment. In the cue abstraction model, weighted cues get added to come up with a criterion value just like in WADD, while in the exemplar memory model a comparison between a judgment probe and other similar instances that are stored in our memory is made (Juslin & Persson, 2002).

Given the limitation of studies that compare exemplar models with WADD in multiple continuous cue judgments, I propose three experiments to investigate (1) people's performance in complex multiple-cue judgment tasks where some cues interact with one another while others do not, (2) the different models people might be using while performing multiple-cue judgment tasks, and (3) the effects of providing familiar context to people while performing multiple-cue judgment tasks.

In all three experiments subjects will be given three-cue judgment tasks. Three-cue multiple judgment tasks are the best way to observe how well people perform when some cues interact with one another while others are independent in its simplest form, yet there is no research done that used three-cue multiple judgment tasks. Subjects' goal will be to come up with an estimate of criterion Y given cues X_1 , X_2 and X_3 in three different multiple-cue judgment tasks, where the underlying algorithms are given by the following:

- Additive: $Y = 3[(X_1 - 2) + (X_2 - 2) + (X_3 - 2)] + 8 + e$,
- Multiplicative: $Y = (X_1 - 2) * (X_2 - 2) * (X_3 - 2) + 8 + e$,
- Additive and multiplicative: $Y = (X_1 - 2) * (X_2 - 2) + 3(X_3 - 2) + 8 + e$, where e is an error component, with a mean of 0 and values $\{-1, 0, 1\}$.

The first two studies will investigate which of the two proposed cue-integration models people use in the three algorithms given above, and whether people are able to optimize their behavior as the underlying algorithms differ. I hypothesize that people will prefer the cue abstraction model as Mellers (1980) and Juslin et al. (2003, 2008) observed. If people do perform at an optimal level, for the additive task, they should use cue abstraction model; for the multiplicative task, they should use exemplar memory model; and in the additive and multiplicative task, they should use cue abstraction if the independent cue (X_3) is significantly larger than the interacting cues (X_1 and X_2), but they should use exemplar memory model if the independent cue (X_3) is much smaller than the interacting cues (X_1 and X_2).

The third experiment will focus on the effects of familiar context in multiple-cue judgment tasks since the previous studies involved abstracted cognitive psychology

tasks. Yet, in real life people's information processing is largely dependent on context. Cosmides and Tooby (1992, 2005) also showed that people's performance on a given task increases when the task is presented in a context people are more familiar with. Thus, the third proposed experiment is important in terms of providing us with a more accurate insight into how people make multi-attribute judgments in real life. Based on the results obtained by Cosmides and Tooby, I hypothesize that people will perform better in multiple-cue judgment tasks where they are given a familiar context.

I hope that the studies I plan to conduct will give us a better idea as to how we construct our judgments given the cues in the environment when we do not know what the underlying mechanisms are, and will help us come up with methods that will push people in the direction of optimal behavior while constructing their judgments.

Topic	Research Question	Relevant Papers	Description	# Subjects
Study 1: Cue abstraction vs. exemplar memory preference	Which cue-integration models do people use given different cue-integration tasks?	Juslin et al. 2003; Olsson et al., 2006	within-subject design IV: 3 different algorithms DV: root mean square error (RMSE)	100
Study 2: Pushing towards optimal performance	Can we make people switch from using one model to another?	Juslin et al., 2003, 2008	within-subject design IV: 3 different algorithms x distraction present/non-present DV: RMSE	100
Study 3: Familiar context effects	Do people make more accurate criterion judgments when task is presented in a familiar context?	Cosmides & Tooby, 1992, 2005	between-subject design IV: 3 different algorithms x familiar context/abstract DV: RMSE	200

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