Reflections on Day-to-Day Variability and Time Use

David Ory, WSP
12 Dec 2024

1. Where's the information?
2. Cosmetic v. Behavioral

Where's the information?

Current Practice

In practical models, we tend to include numerous proxy variables and variables with indirect effects.

Examples

- Female gender or sex as a proxy for caretaker responsibilities
- Income or presence of children as a proxy for time stress
- And on and on. It's fun to try variables and dream up plausible interpretations.

So on the one hand ...

I really like moving information out of mode choice, say, and into modal preference. Or out of the tactical and into the strategic.

On the other hand ...

Modal preference seems hopelessly complicated and we still need to locate the statistical information that motivates preference change.

My modal preference is to be chauffeured in a Rolls Royce.

Why not a series of much simpler models?

Modal Preferences

- Enjoyment of riding a bicycle in mixed traffic
- Comfort driving an automobile at night
- Comfort traveling on public transportation
- Ability to walk more than ¼ mile

Rather that form a latent preference, introduce as constraints. And nothing about relative quality, that's in mode choice.

Turtles all the way down

- To what degree does your job require or otherwise motivate on-time arrival?
- To what degree does your job accommodate a flexible work schedule?
- To what degree does your household living arrangement accommodate working from home?
- …

Big Idea: Constraints are what we are uncertain about, what we make probabilistic predictions about. The choices, once the constraints are known, can and should be simple, e.g., heuristics.

Cosmetic versus Behavioral

Cosmetic

Things that make the model's outcomes interesting, or expected, but lack behavioral utility.

Example

Running the same simulation five times, for each day of the week.

On the one hand …

Cosmetic improvements have the potential to be misleading: e.g., the model doesn't understand day of the week.

On the other hand …

These shortcomings can be explained, just as all the others. It's nice to have cosmetically attractive things.
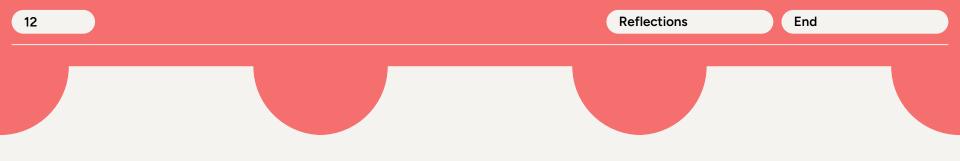
Or said another way: Bayesian

Priors

Cosmetic: a guess at how we think things should look.

Posteriors

Behavioral: updates to our priors based on evidence, information

Discussion