

The Risky Business of Asking for Help

An ABM of Unmet Need in Older Adults

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Outline

1. Motivation

2. Conjecture

3. Data & Model

4. Results

Motivation

~25% of over 65s need help washing or dressing

~47.5% of that 25% actually get help
(Vlachantoni et al, 2011)

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Conjecture

Not everybody asks for help,
because asking feels risky.

Conjecture

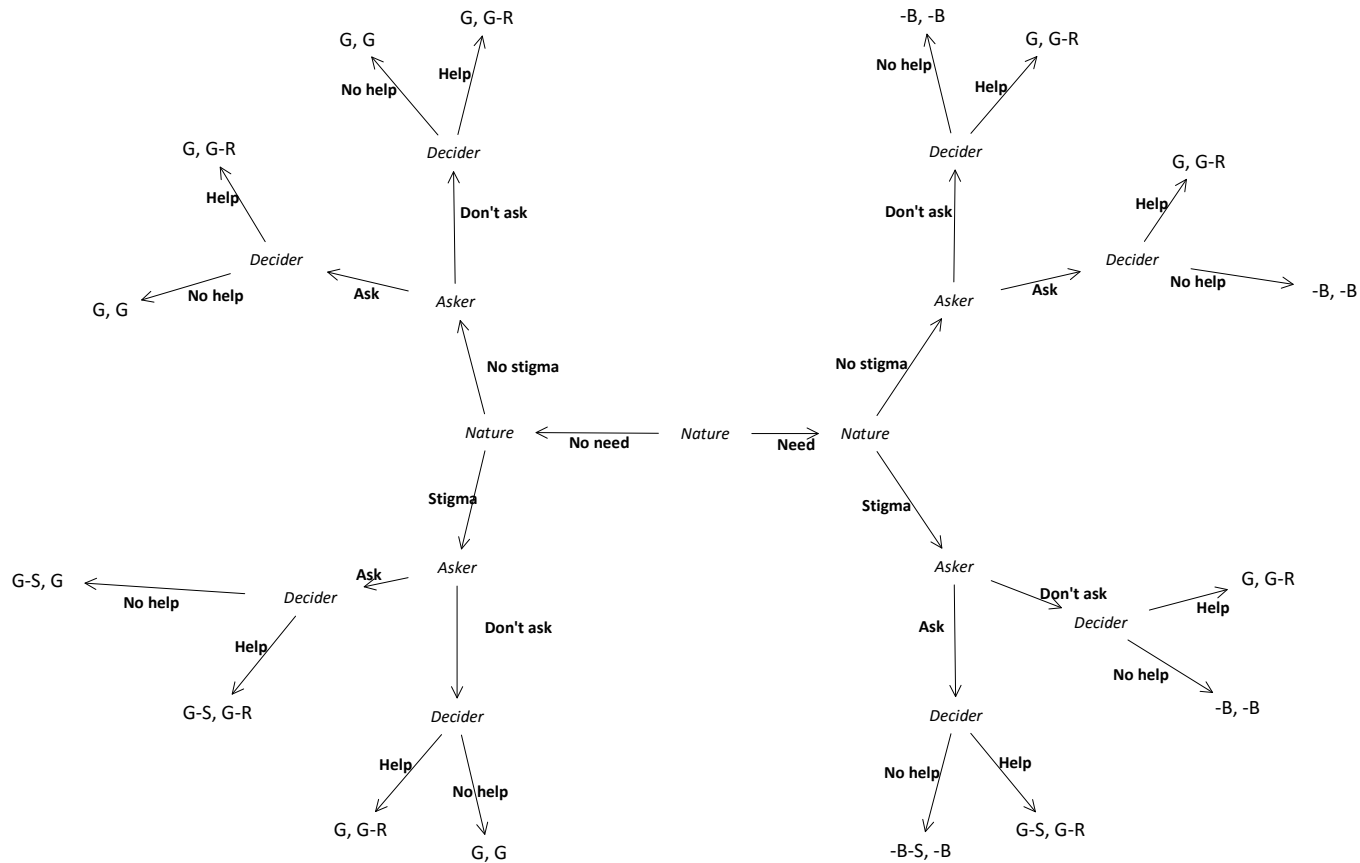
Not everybody asks for help,
because asking feels risky.

People's decisions are based
on risk.

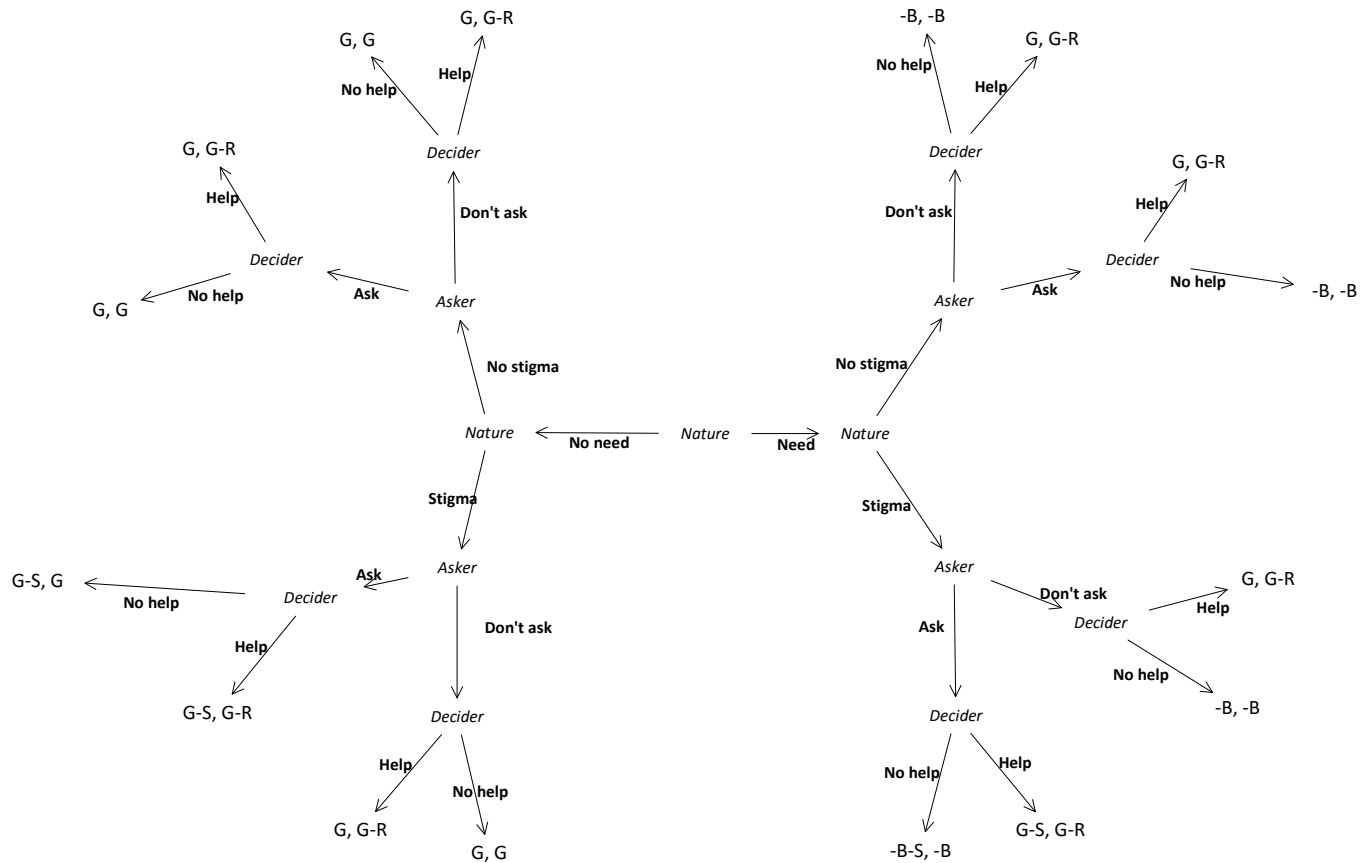
Testing the Conjecture

- Need a few things to test that:
 - A formal representation of our conjectured process
 - A synthetic population to test it in
 - Synthetic psychologies for that population
 - Something to test against
-

A Process



A Process



Synthetic Psychology

- Using learning decision rule agents – actions are based on costs/payoffs & beliefs
 - Two kinds of learning
 - Experiential
 - Social
 - Two kinds of belief
 - What kind of player is the other guy?
 - What will the other player do next?
 - Use opinion surveys to generate distributions of these beliefs
-

Signaller Psychology

- Is the decider going to make me feel bad if I ask for help?
 - ESS 2008
 - Latent trait analysis on 8 likert type items
 - Fitted a logistic distribution to the underlying trait
 - Will I get help?
 - EuroBarometer 67.3 asks exactly that
 - Multinomial distribution over definitely, yes, etc.
-

Decider Psychology

- Should I believe what this guy is saying?
 - ESS 2008 again
 - Latent trait on 3 likert type items
 - Fitted a normal distribution

Decision Rules

Briefly..

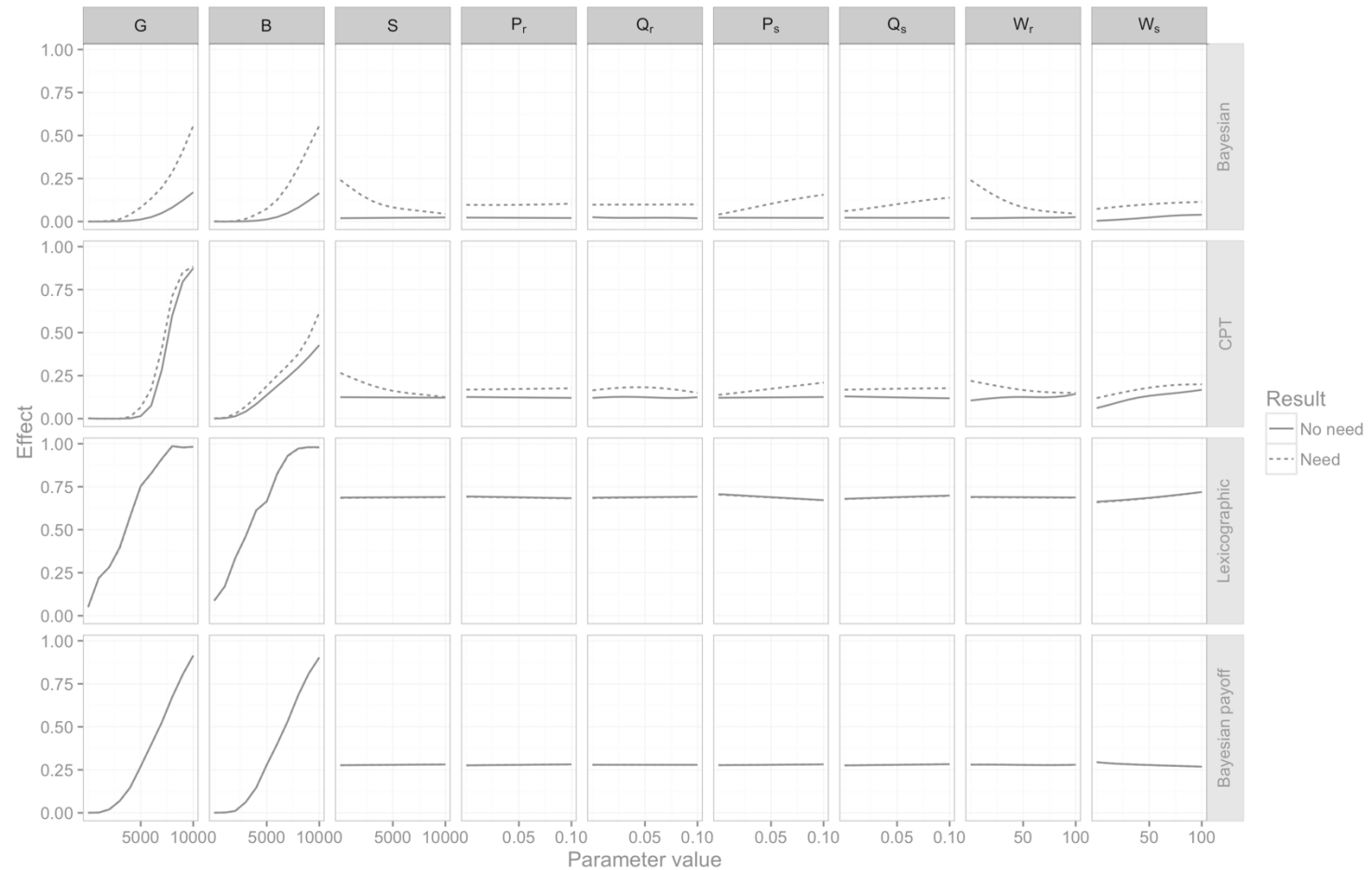
Four rules:

Model free	Model based
Lexicographic	Bayesian
Bayesian	Cumulative Prospect

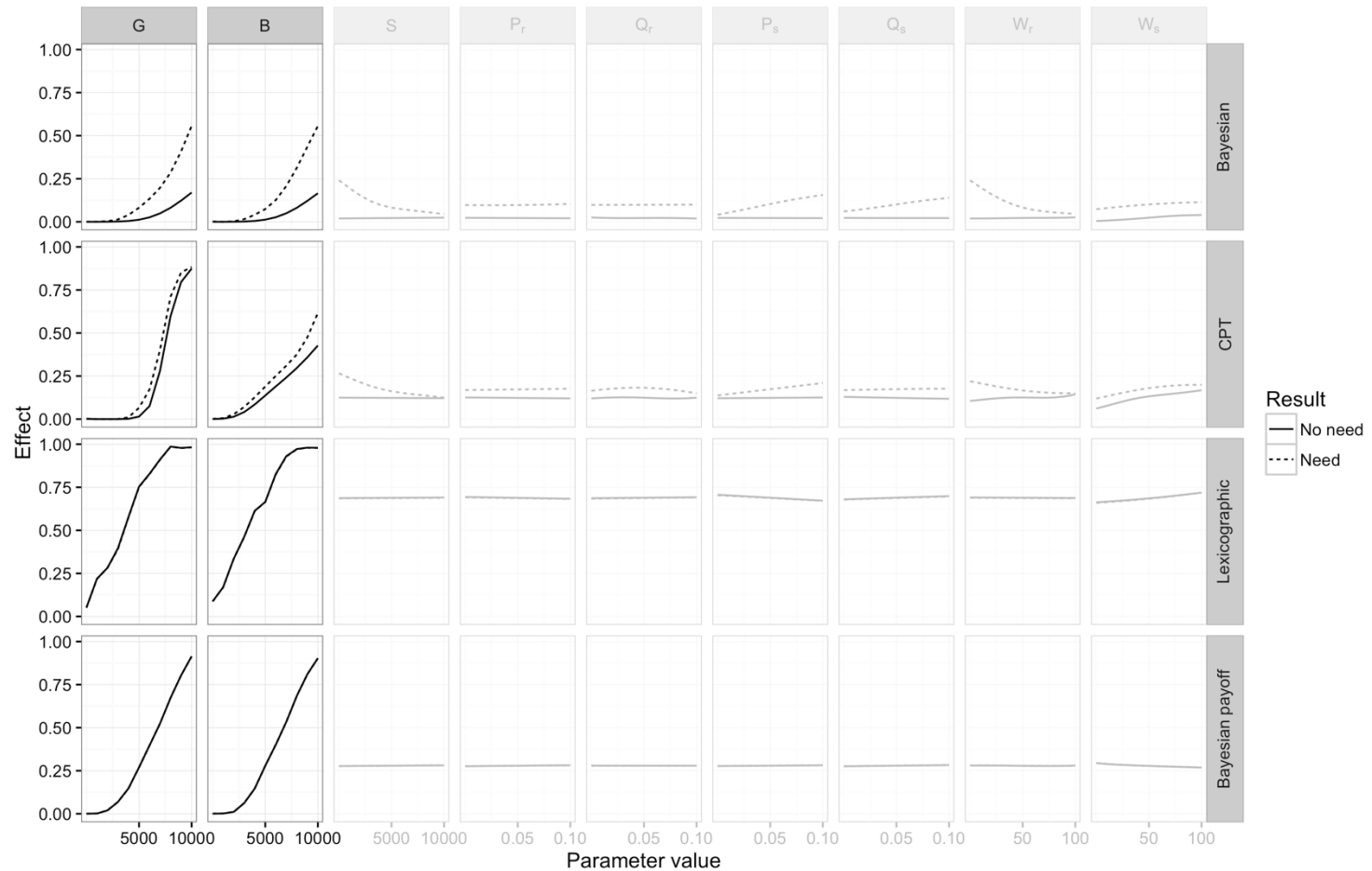
Model

- Draw populations
 - Have them play the game
 - Beliefs based on social surveys
 - Cost for giving help as the mean LA cost of providing care for 1 year, in 2008 (£7881)
 - Quite a few free parameters..
 - Payoffs, learning, magnitude of beliefs, decision models
 - Build a statistical emulator of the simulation
 - Look at sensitivity
 - Use to fit the model
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Sensitivity



Sensitivity

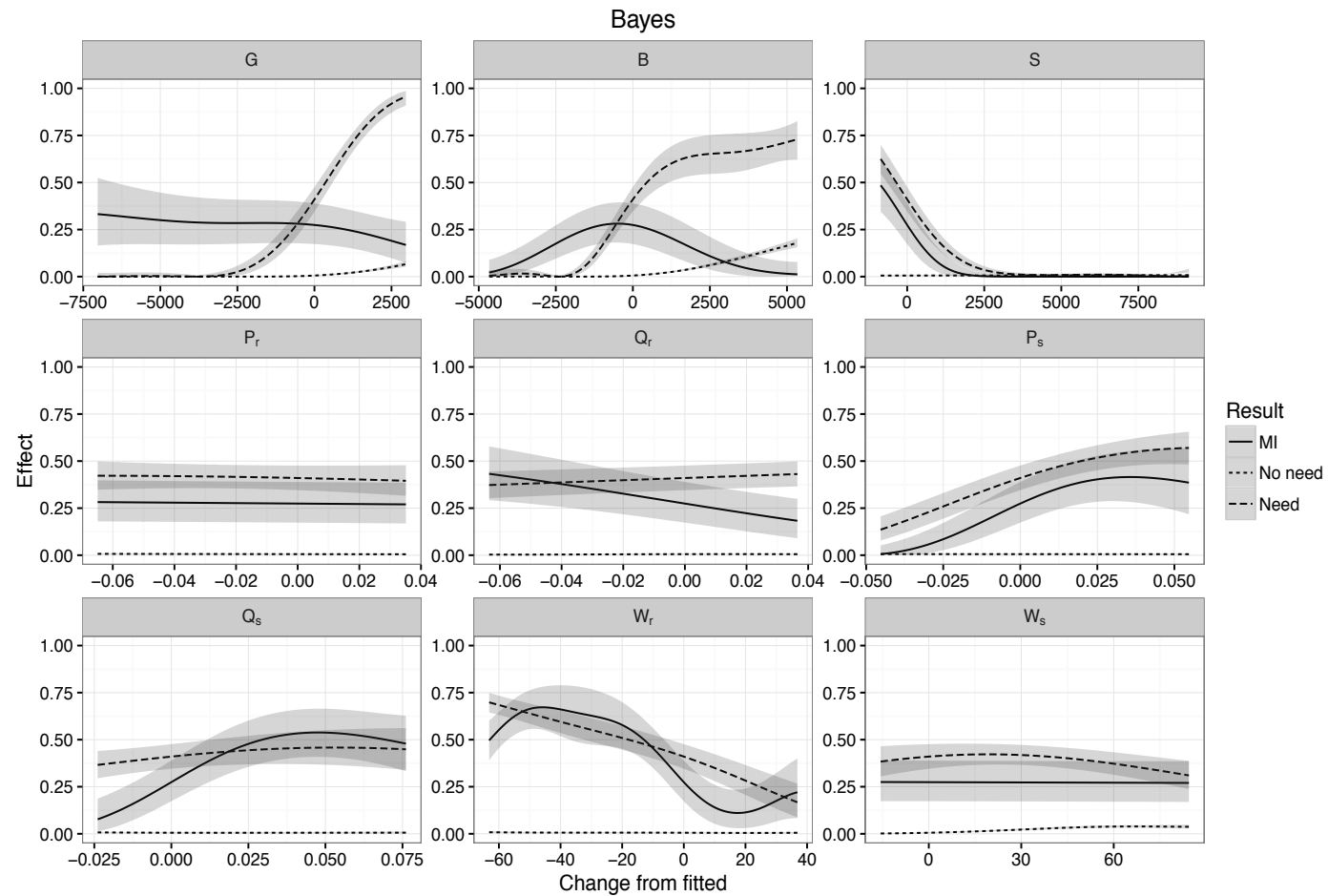


Fitting

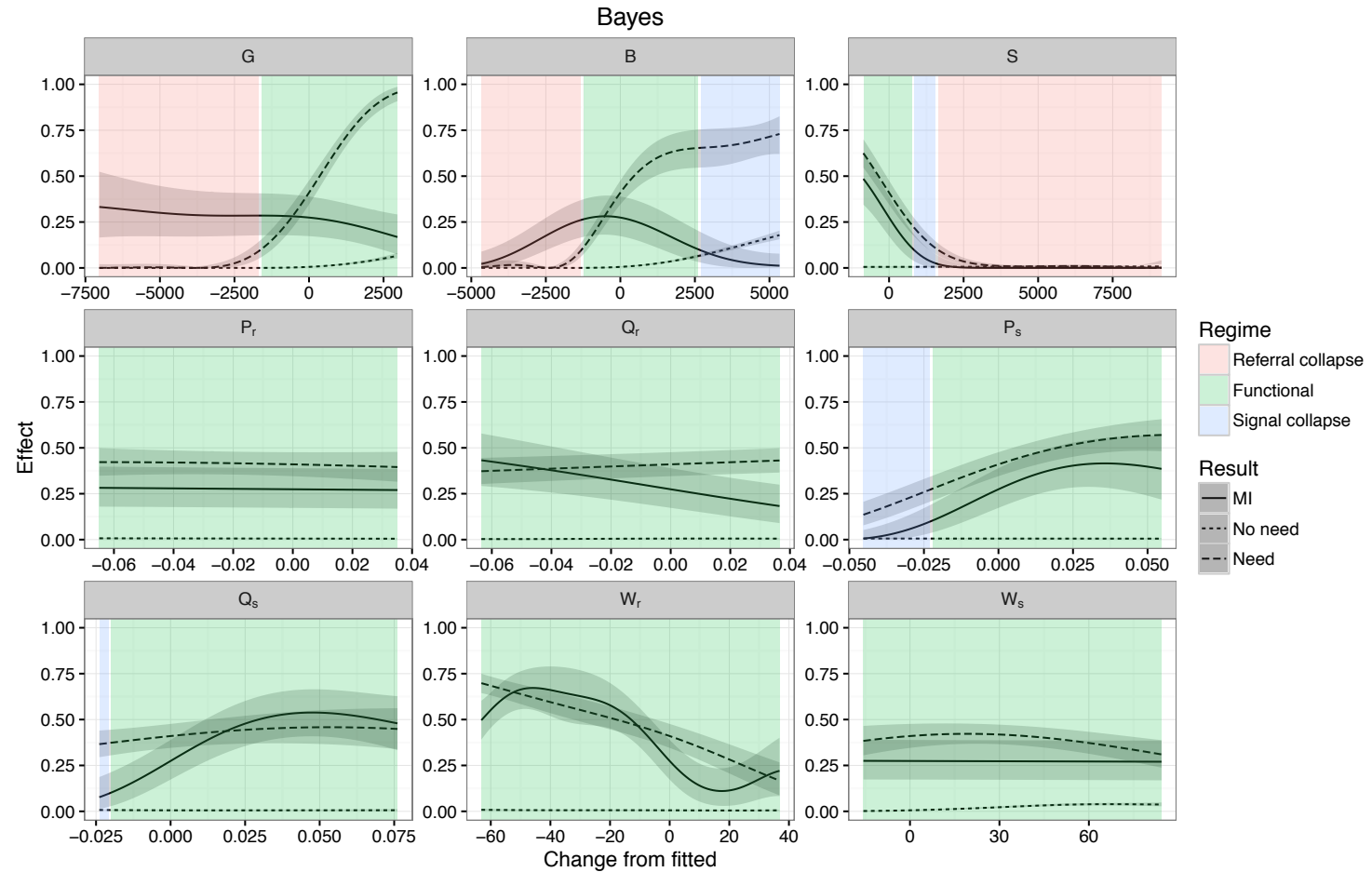
- Can't fit the heuristics!
 - Need more than cardinality
 - Need a mental model

	G	B	S	P_r	Q_r	P_s	Q_s	W_r	W_s	H_h	N_h
Bayes	7032	4662	860	0.06	0.06	0.05	0.02	63	16	45%	0.1%
CPT	4886	6978	3500	0.09	0.02	0.07	0.06	18	28	44%	0.1%

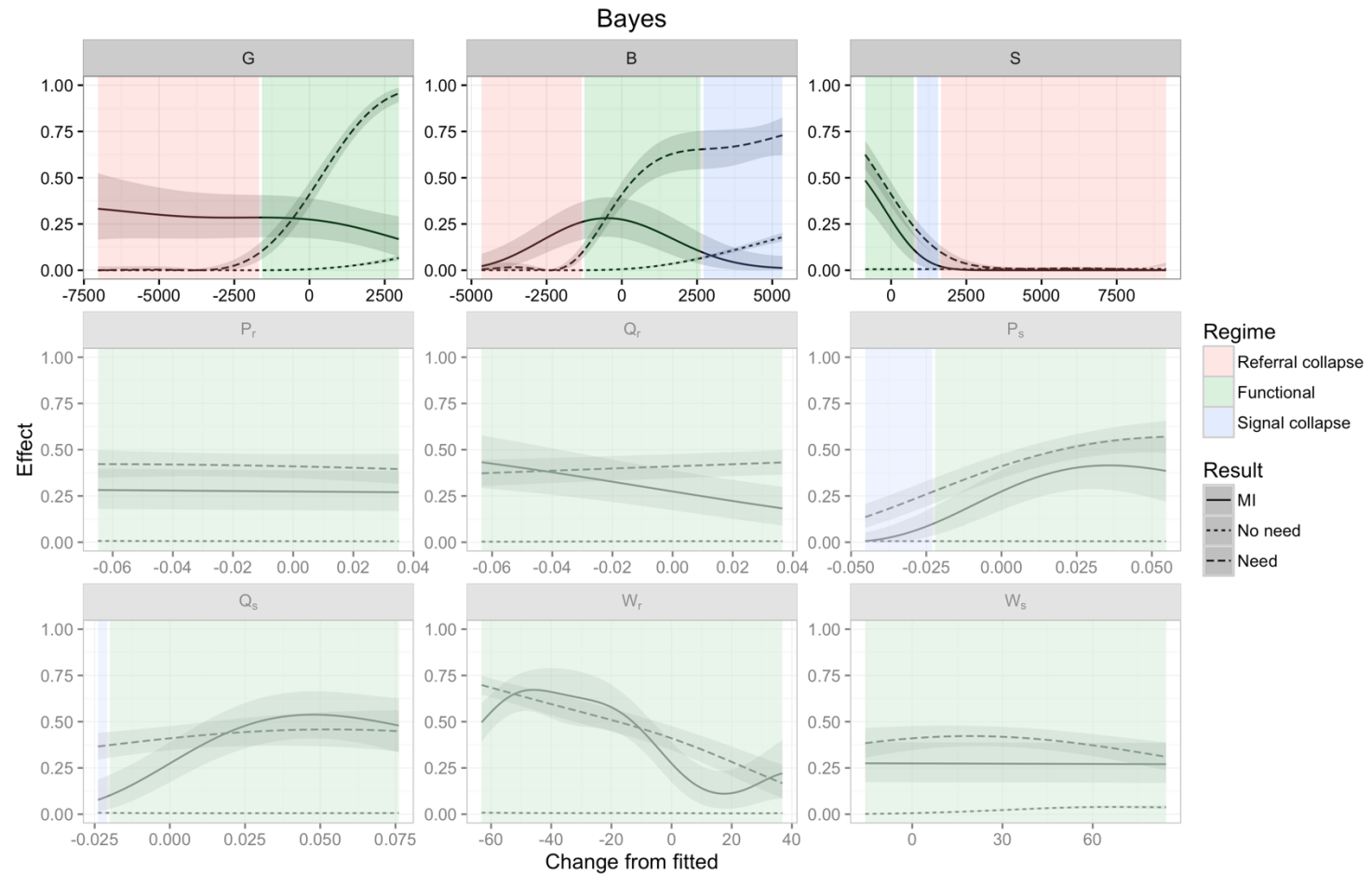
Interventions



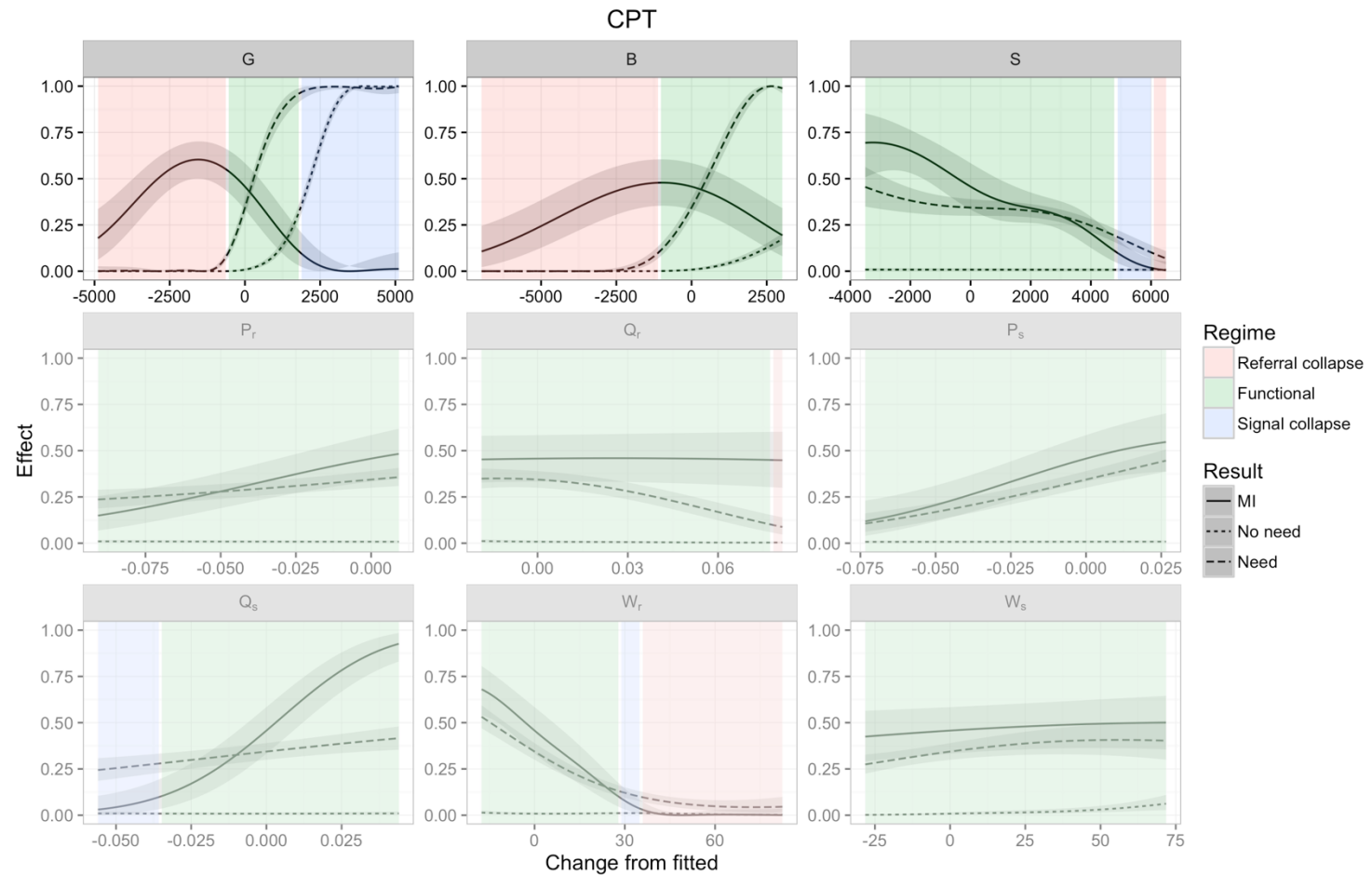
Interventions



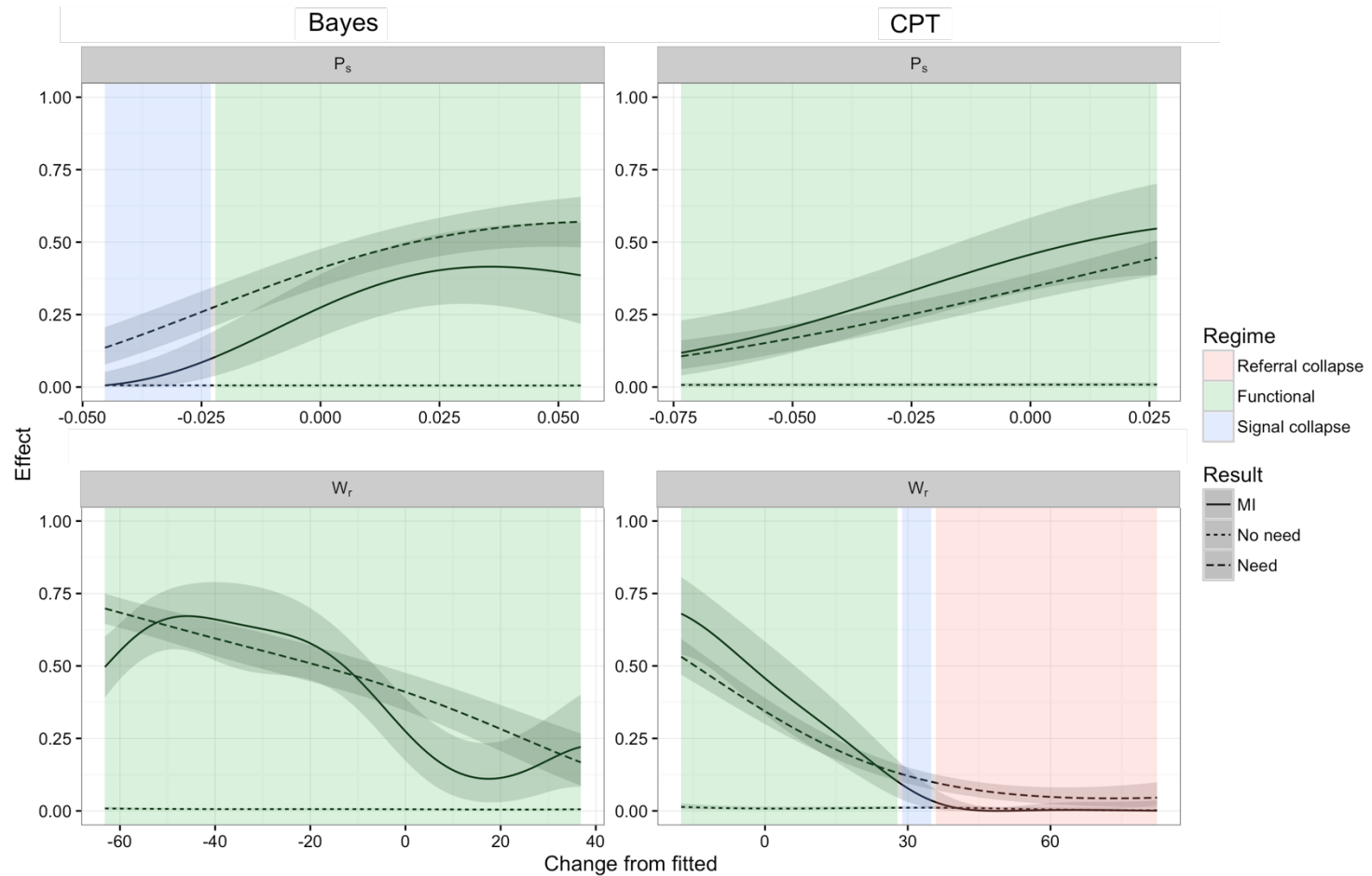
Interventions



Interventions



Commonalities



Take Away

- Not the complete data generating process, but can't reject outright
 - Simple heuristics are insufficient
 - Biggest impact on referrals is from payoffs...
 - But! Better to target
 - Information sharing
 - Prior beliefs
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References

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Thank you!

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<https://github.com/greenape/risky-aging-model>