

# The Risky Business of Asking for Help

## An ABM of Unmet Need in Older Adults

Jonathan Gray, Jakub Bijak and Seth Bullock

Department of Social Statistics and Demography  
University of Southampton, UK

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# Outline

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1. Motivation

2. Conjecture

3. Data & Model

4. Results

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# Motivation

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~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

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Not everybody asks for help,  
because asking feels risky.

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People's decisions are based  
on risk.

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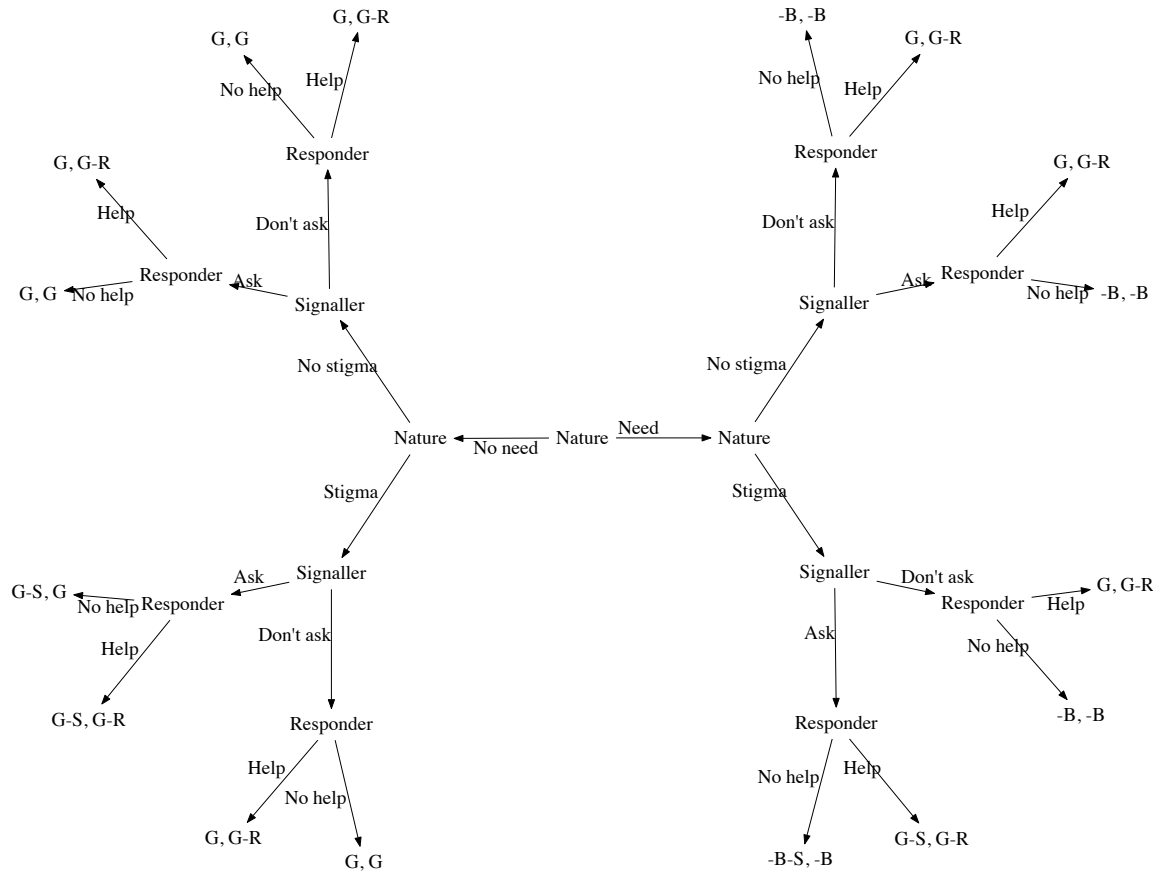
# Testing the Conjecture

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- 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
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# A Process



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# Synthetic Psychology

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- 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
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# Signaller Psychology

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- 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.
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# Decider Psychology

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

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# Decision Rules

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*Briefly..*

Four rules:

Model free	Model based
Lexicographic	Bayesian
Bayesian	Cumulative Prospect

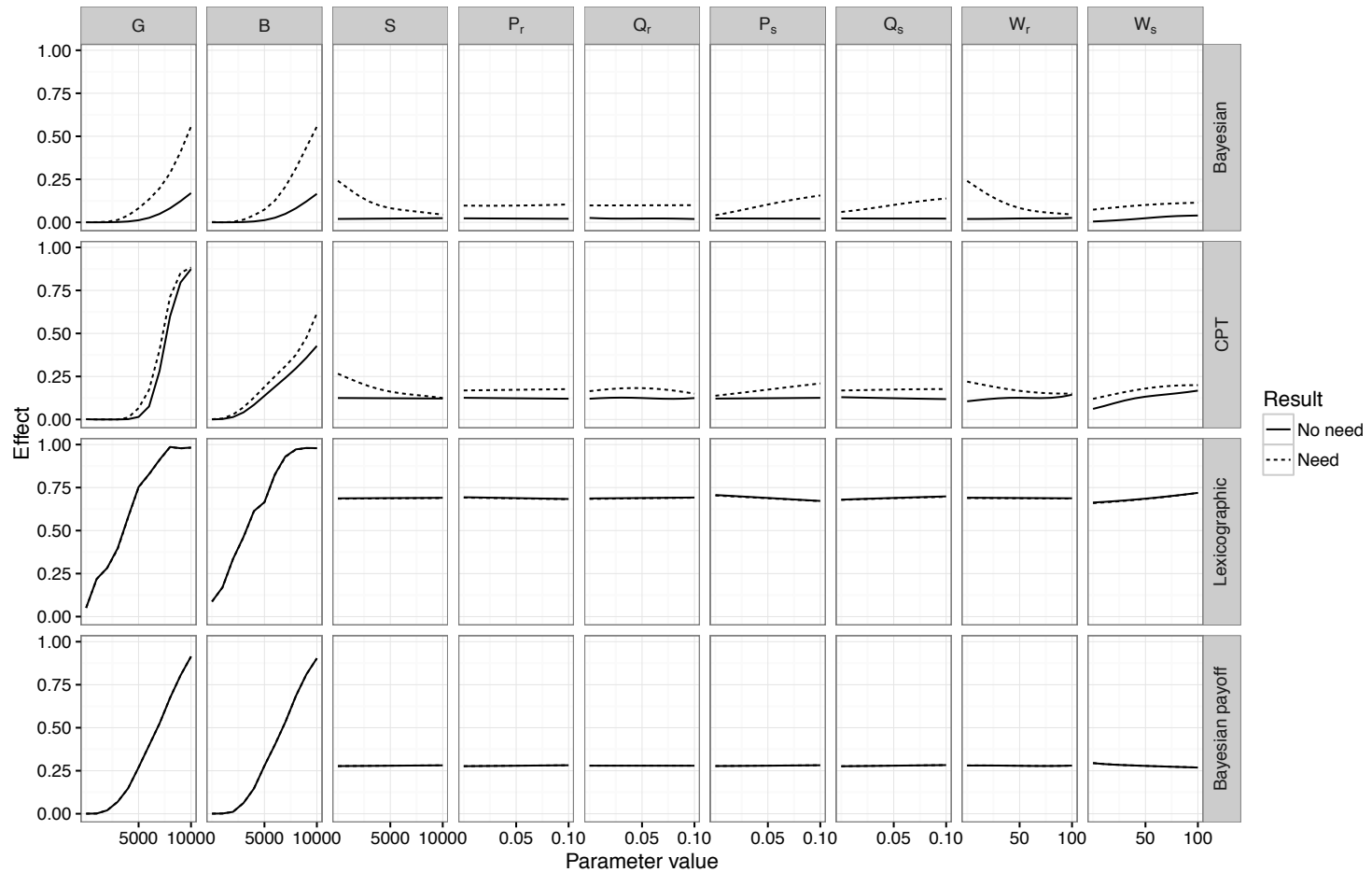
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# Model

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- 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



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# Fitting

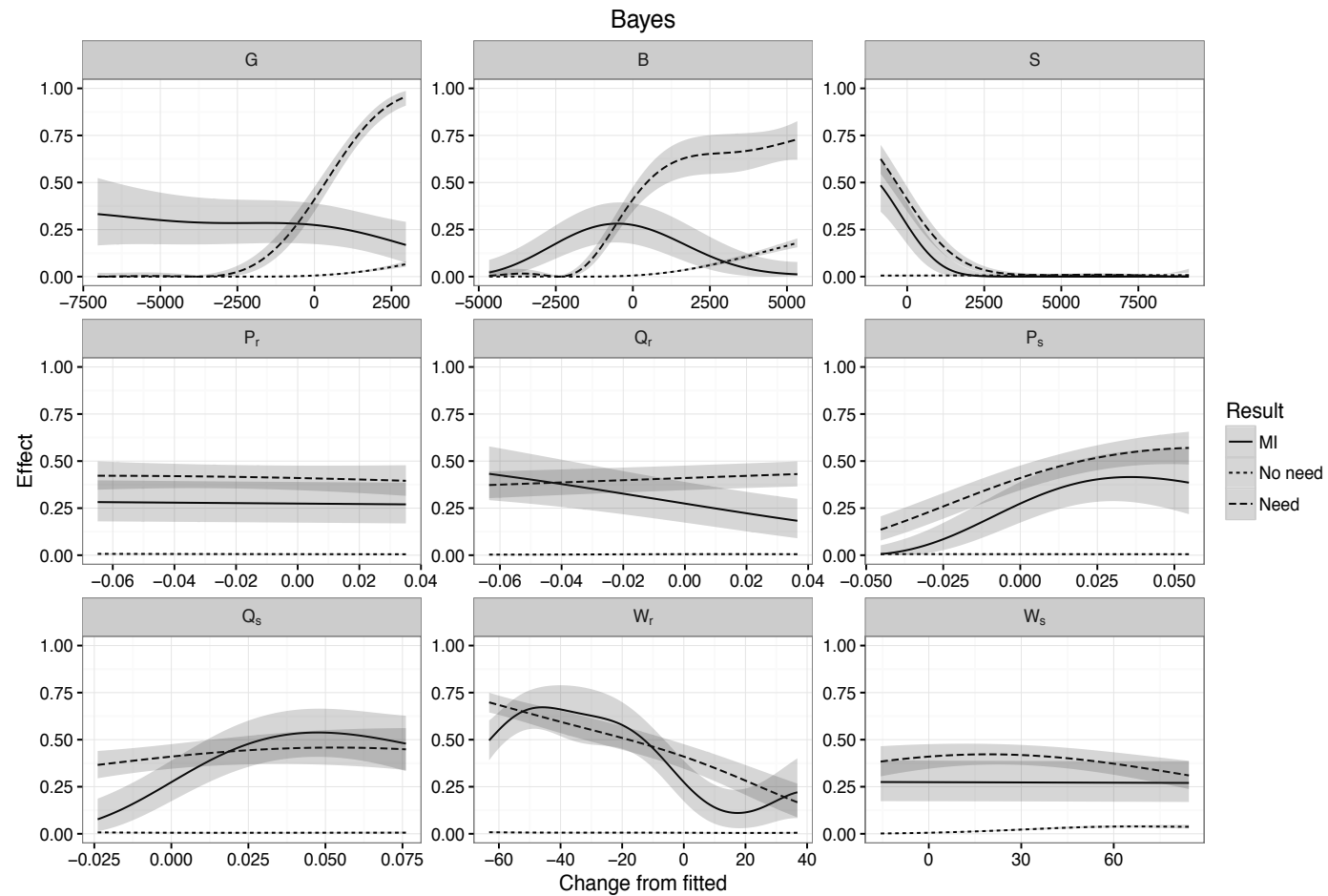
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- Can't fit the heuristics!
  - Need more than cardinality
  - Need a mental model

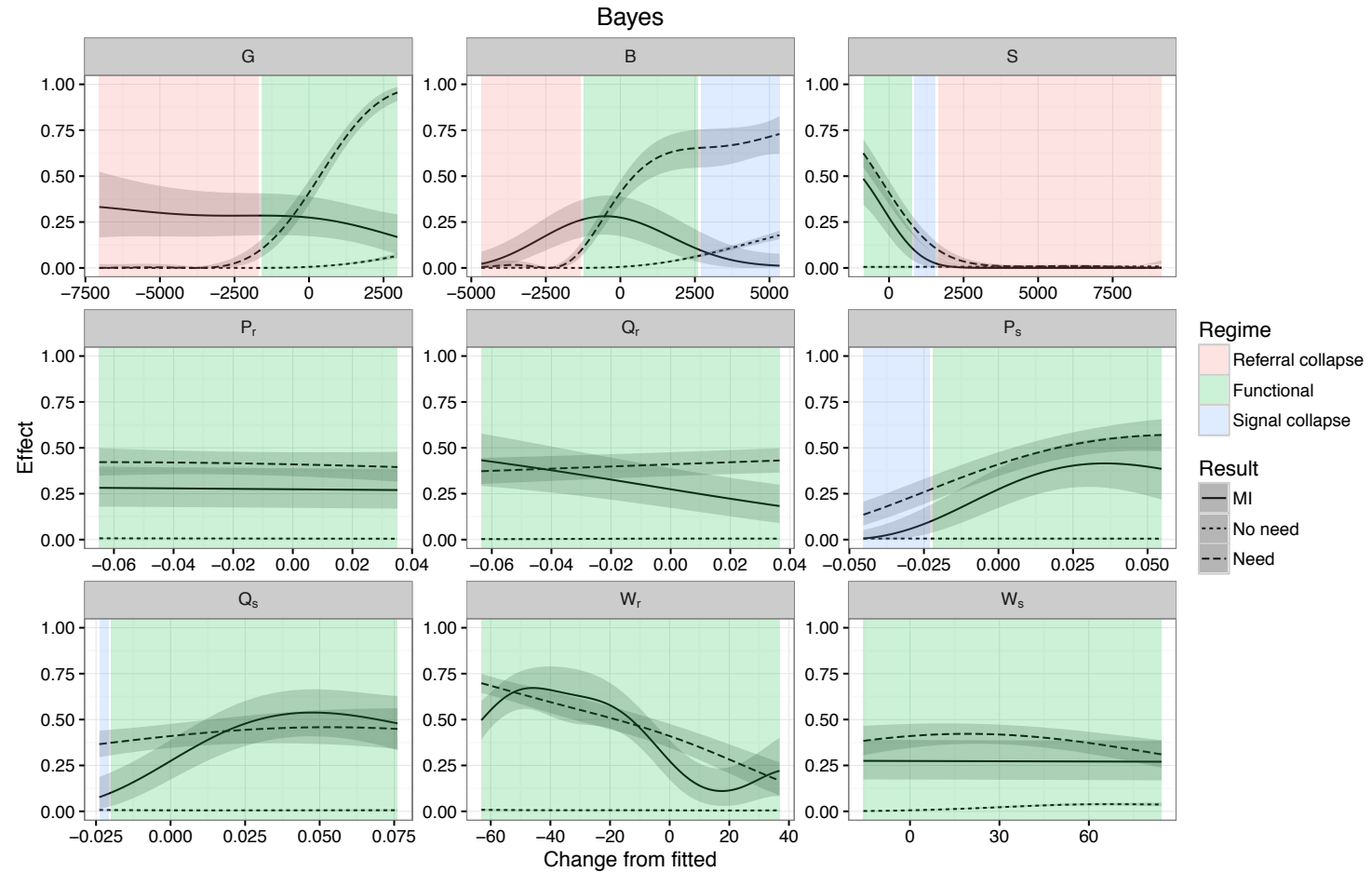
	G	B	S	$P_r$	$Q_r$	$P_s$	$Q_s$	$W_r$	$W_s$	$H_h$	$N_h$
Bayes	7032	4662	860	0.06	0.06	0.05	0.02	63	16	45%	0.1%
CPT	4886	6978	3500	0.09	0.02	0.07	0.06	18	28	44%	0.1%



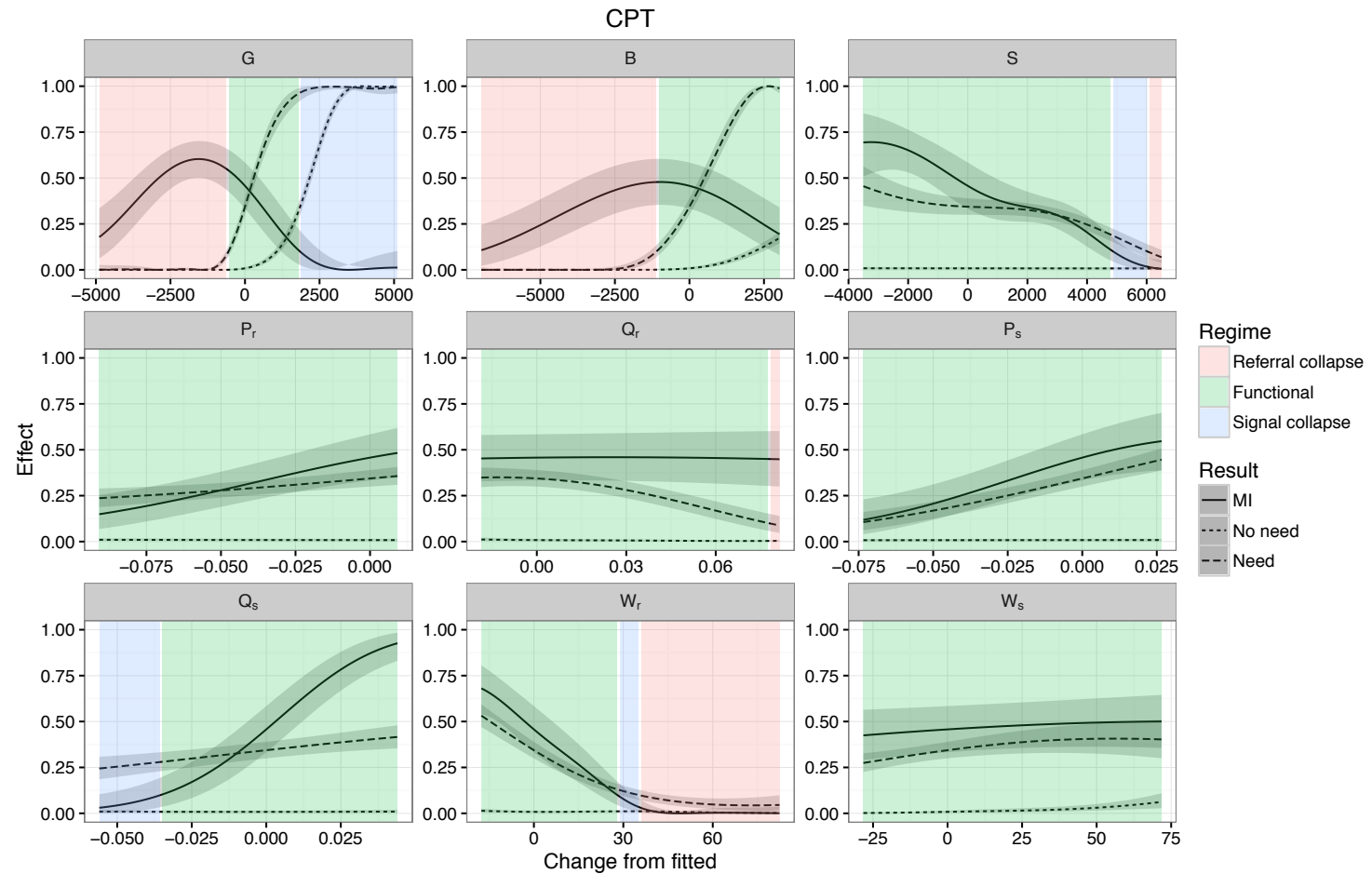
# Interventions



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# Take Away

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- 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!

Jonathan Gray

[j.gray@soton.ac.uk](mailto:j.gray@soton.ac.uk)

@lime\_ape

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