

Discussion:

Experimental Tests of Rational Inattention

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Contributions

- **Summary**

- ▶ Uses *state-dependent stochastic choice data* from the lab to test:
 - Validity of stochastic choice models
 - Validity of Shannon's mutual information cost

- **Main findings**

- ▶ People adjust their attention in response to incentives...
... but **do not follow Shannon's model**
- ▶ Relationship between incentives and information **better explained by posterior separable model**
- ▶ There is substantial cross-sectional **heterogeneity** in info processing

Plan for discussion

- A) Highlights of the experimental design
- B) Rejection of Shannon's model
- C) Generalized costs
- D) Implications for macro models

A) Highlights of experimental design

① Use of choice data

- ▶ Traditional approach for applied economists
- ▶ vs. non-traditional approach (time, eye tracking, proxy for attention)

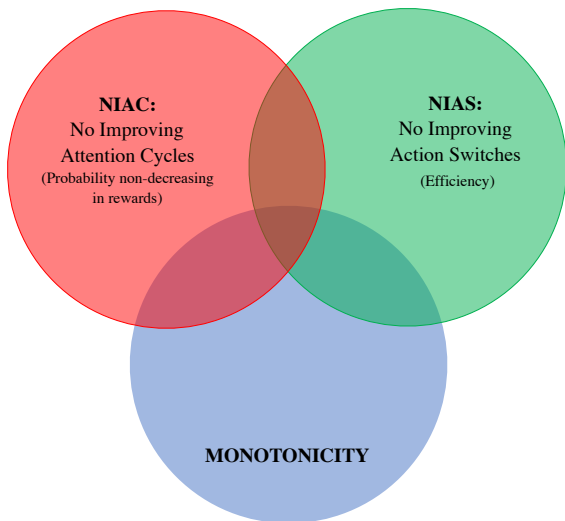
Experiments are done in a familiar context and are comparable

② Identification of behavioral restrictions

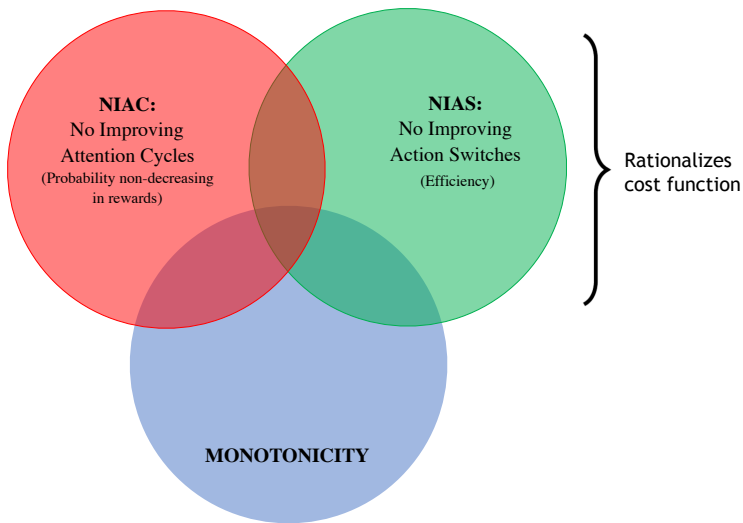
- ▶ Break down models in fundamental behavioral restrictions
 - Monotonicity, NIAS, NIAC, LIP, ILR
- ▶ Restrictions are analytically derived and can be directly tested

Experiments have a strong and direct connection to theory

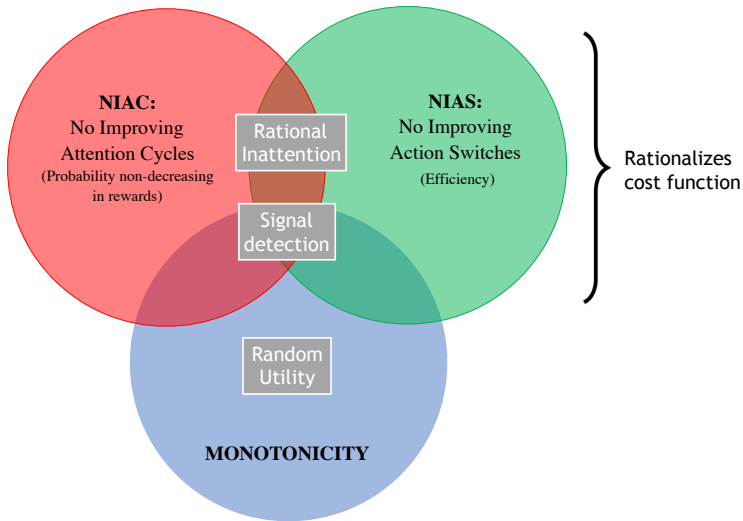
Stochastic Choice Models



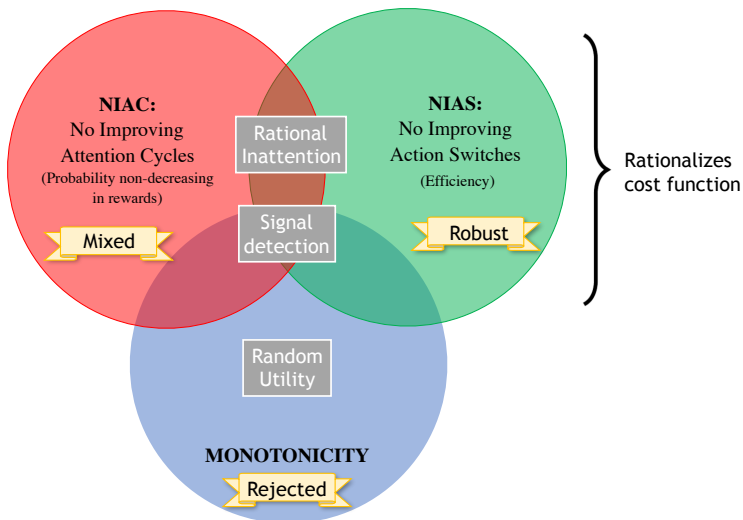
Stochastic Choice Models



Stochastic Choice Models



Stochastic Choice Models



B) Rejection of Shannon's Model

- **Shannon: Mutual Information Cost**

$$\log \left(\frac{P(\omega|a)}{P(\omega|b)} \right) = \frac{u(a, \omega) - u(b, \omega)}{\kappa} \quad [\text{Matejka and McKay, 2015}]$$

- **Linearity:** Accuracy increases linearly with rewards, at rate $1/\kappa$
 - ▶ Rejected in experiments, as accuracy is concave with rewards
- **Symmetry:** State distinction only depends on relative rewards
 - ▶ Rejected in baseline experiments, as accuracy falls around thresholds

B) Rejection of Shannon's Model

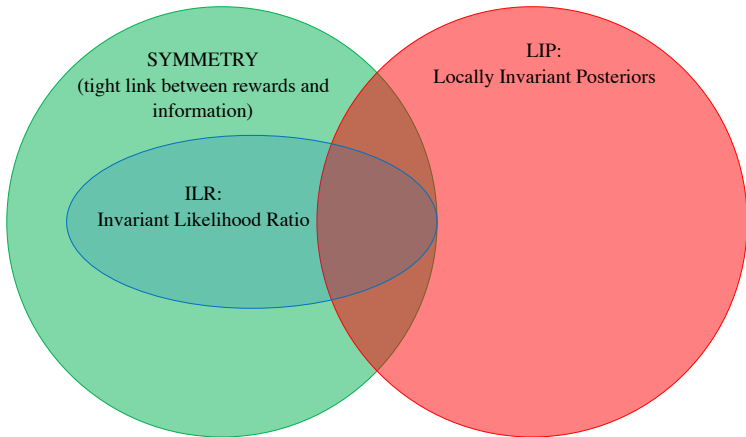
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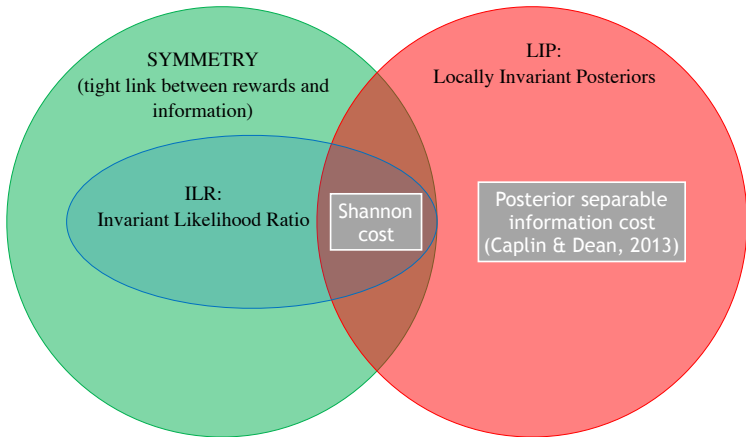
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Experiments question the validity of Shannon's canonical model

Cost Functions

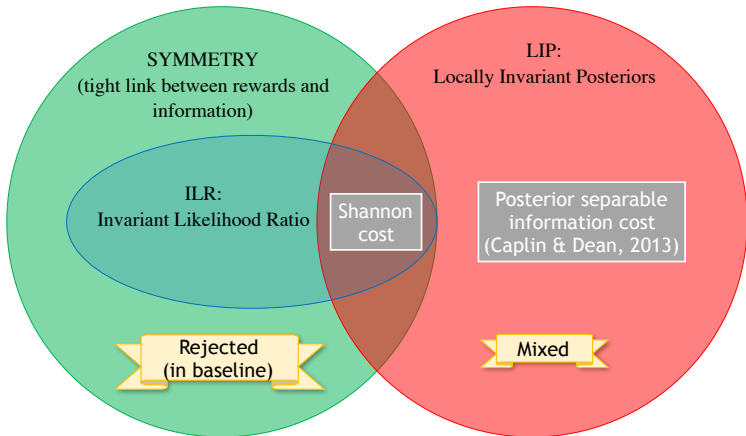


Cost Functions



Properties of Cost Functions

Cost Functions



C) Generalized costs

- **Missing in Shannon:** notion of perceptual distance
 - ▶ Some states are harder to disentangle than others
 - ▶ More realistic/convincing from a behavioral point of view
- **Posterior Separable Information Costs** [Caplin and Dean, 2013]
 - ▶ Relaxed symmetry, allows for perceptual distance
 - ▶ Keeps LIP (locally invariant posteriors), but obtains mixed evidence
- Further generalizations? Is LIP behaviorally desirable?

Would like further explanation of the behavioral appeal of LIP

D) Implications for macro models

- **Macro models:** focus on Shannon's model
 - ▶ Mackowiack and Wiederholt (2009) for pricing decisions
 - ▶ Van Nieuwerburgh and Veldkamp (2010) for portfolio choice
 - ▶ Many others....
- **Experimental data:** Posterior separable costs and heterogeneity
- **Consequences for macro outcomes?**
 - ▶ Tractable modeling: CRRA utility + CRRA attention cost
 - ▶ New exciting area of research!