

WS 1.5  
New Frontiers of  
Discrete Choice  
Analysis

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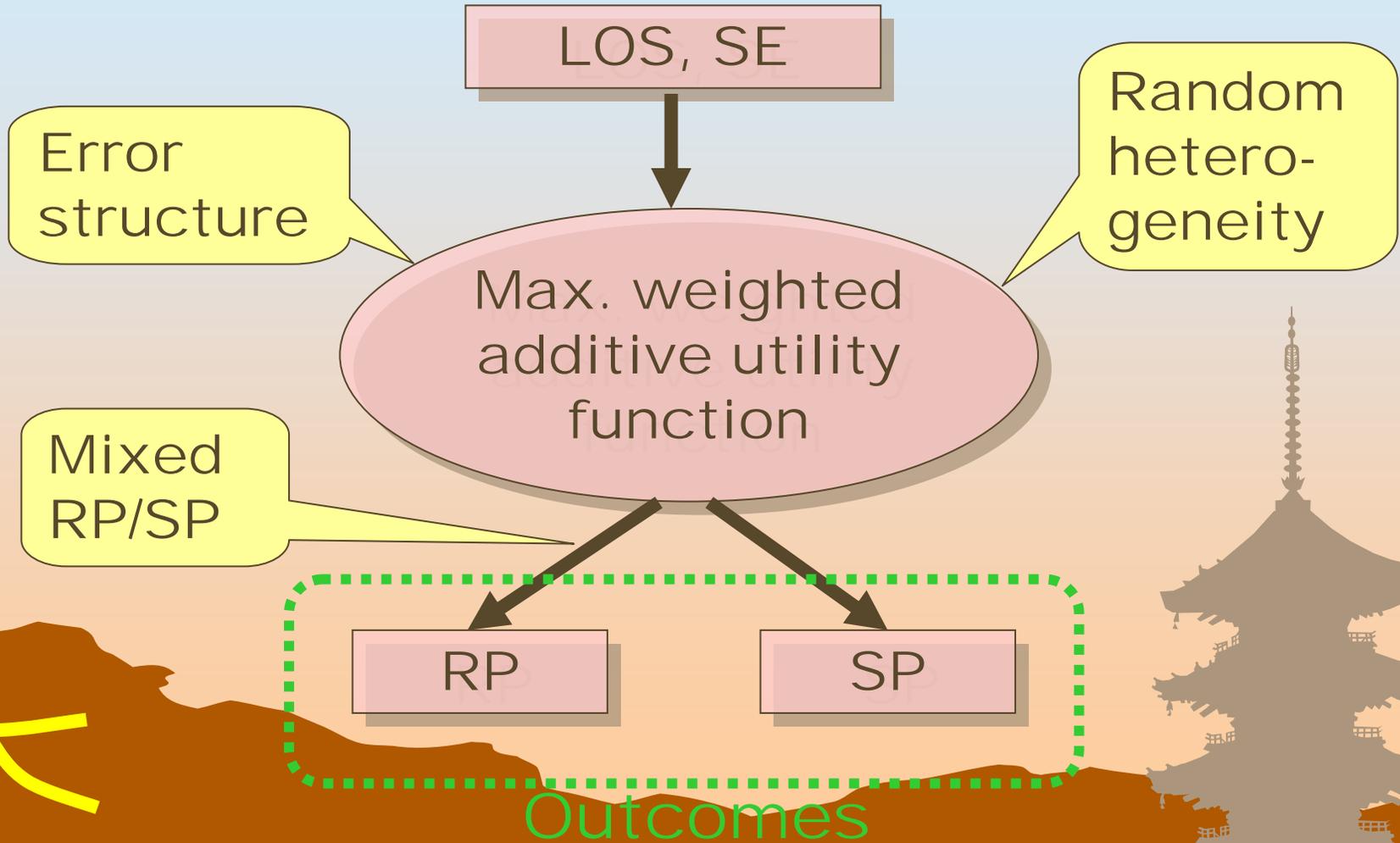


# Papers Presented

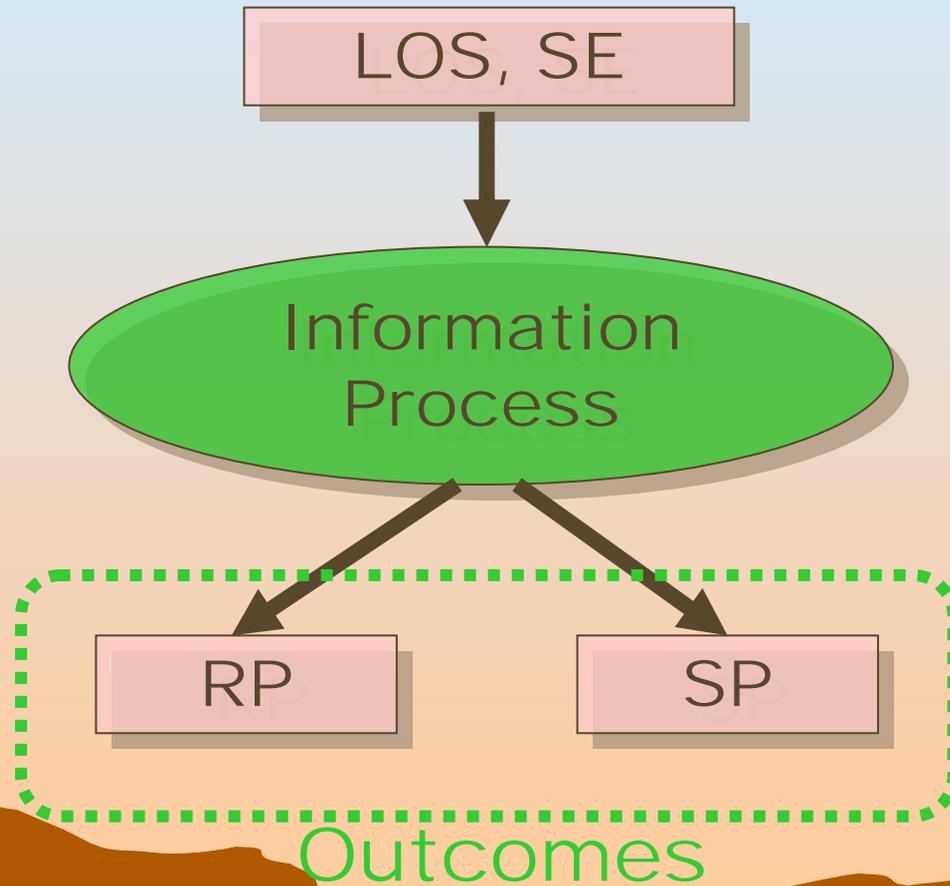
- David Hensher, John Rose, Sean Puckett (The University of Sydney)
  - Selective Developments in Choice Analysis and a Reminder about the Dimensionality of Behavioural Analysis (Resource Paper)
- Elisabetta Cherchi (Università di Cagliari), Juan de Dios Ortúzar (Universidad Católica de Chile)
  - On the use of mixed RP/SP models in prediction: accounting for random taste heterogeneity
- Quentin K. WAN, Hong K. LO (Hong Kong University of Science and Technology)
  - Discrete Choice Model Estimation with Missing Information on Perceived Characteristics
- Michiel C.J. Bliemer (Delft University of Technology), John Rose (The University of Sydney)
  - Designing Stated Choice Experiments: State-of-the-Art

# Discrete choice modeling

- status quo -



# Need more insights on "Process" for better reproduction of "Outcomes"



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# Investigation on “Process” needs...

1. Sound hypotheses and model structures on Information Processing Strategies (IPS)
2. Data for statistical inference
3. Estimation techniques

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# IPS (Hensher et al.)

- ❁ Attribute Processing Strategy (APS)
  - processes used in real market and those for SC task
  - Incomplete use of available information
- ❁ Heterogeneity in APS
  - “passive bounded rationality” vs. “rationally-adaptive”
  - “attribute-based” vs. “alternative-based”

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# APS in SC

- ❁ Design dimensionality
  - # of alt., # of attrb., # of levels, choice sets, and range of attrb.
- ❁ Complexity vs. Relevancy
  - “Relevance” of information is important
- ❁ Event-splitting and re-packaging
- ❁ Reference dependency and past similarity

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# Measurement errors in RP

- ❁ Missing values and/or perceived values in attributes (Wang and Lo)
  - Surrogation by network values for missing information may cause biases when perceived values significantly vary between users and non-users.
  - Developed an estimation method by assuming distribution of attribute values conditioned on the choice



# Data

## ❁ RP by RC

- Reliable but problems in investigating the process
  - Measurement errors especially for unchosen alt.
  - Multicollinearity among attrib.
  - Vague choice set

## ❁ SP by SC

- Designing issues

## ❁ Combined RP/SP

- ❁ Other auxiliary data (e.g., What attributes did you ignore?)

# SC Experiment Design

- ✿ Efficient design (Bliemer and Rose)
  - Parsimonious (in terms of experimental load) but efficient (in terms of parameter estimator) designing methods are proposed

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# RP/SP Models with Random Taste Heterogeneity

- ❁ Partial data enrichment approach (Cherchi and Ortuzar)
  - Mixed RP/SP models are applicable when systematic and random taste heterogeneity is significant only in the SP model



# Discussions and Research Agenda

## ❁ IPS in RC and SC

- What IPS are common in RC and SC, and specific to either RC or SC ?
- Asymmetries and nonlinearity in response are often observed
- Mixed logit type models are often abused. The underlying mechanism needs to be detailed by investigating the process.



# Discussions and Research Agenda (cont'd)

- ❁ Designing SC experiments
  - There is interdependency of SC design and IPS employed there. IPS for real market behavior should be investigated through parsimonious SC experiments.
- ❁ Agency interdependency (Hensher et al.)
  - Applied game theory can be employed to represent agents interaction
  - Cooperation and power are investigated in SC experiments



Thank you

