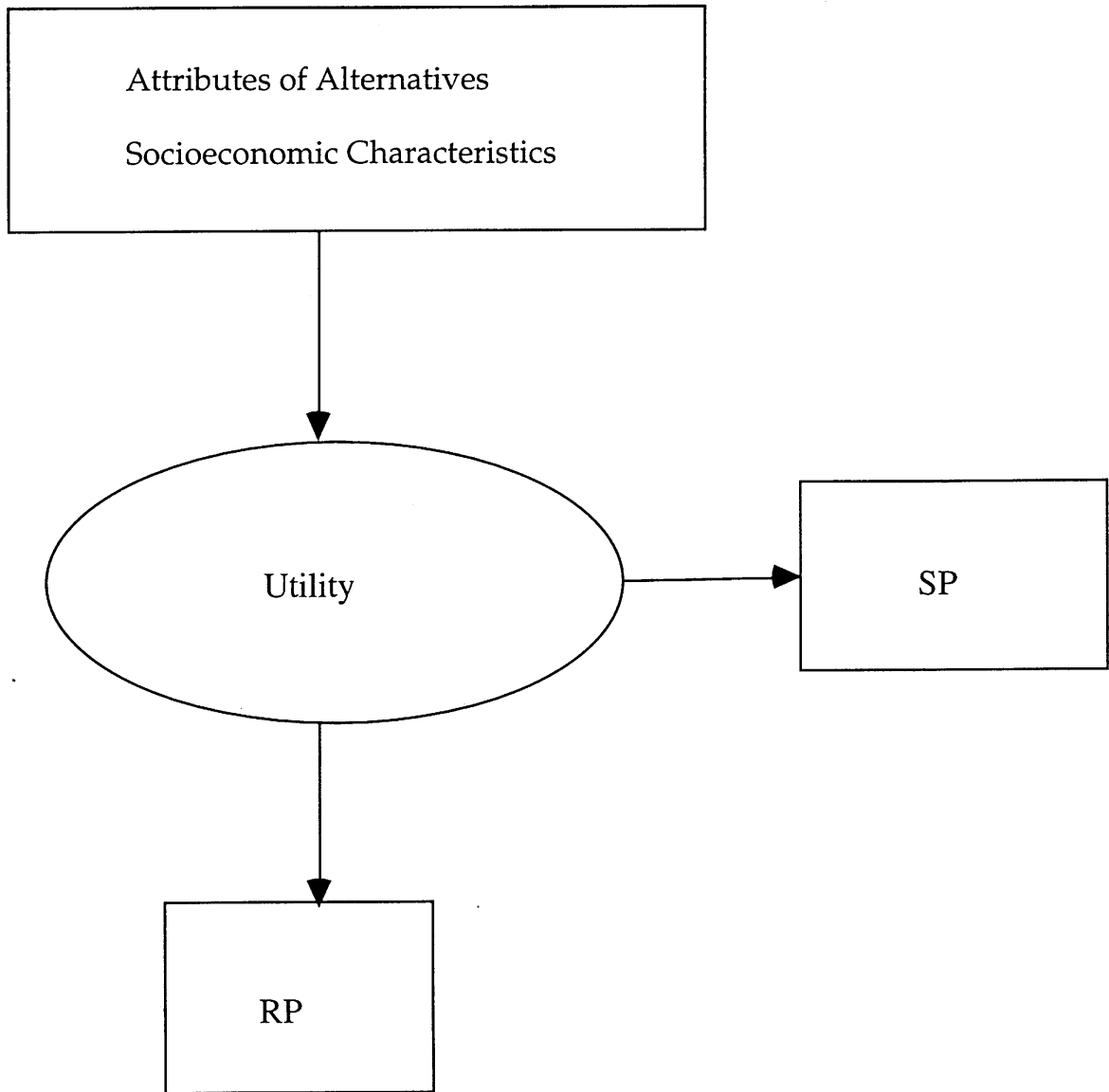


LECTURE / DISCUSSION

Combining Revealed and Stated Preference Data

Characteristics of Revealed versus Stated Preference Data

Revealed Preference Data	Stated Preference Data
Based on actual market behavior	Based on hypothetical scenarios
Attribute measurement error	Attribute framing error
Limited attribute range	Extended attribute range
Attributes correlated	Attributes uncorrelated by design
Hard to measure intangibles	Intangibles can be incorporated
Cannot directly predict response to new alternative	Can elicit preferences for new alternatives
Preference indicator is choice	Preference indicators can be rank, rating, or choice intention
Cognitively congruent with market demand behavior	May be cognitively non-congruent



Framework for Combining RP and SP Data

Method for Combining Revealed and Stated Preference Data

Revealed preference (RP) model:

$$U = \beta'x^{RP} + \alpha'w^{RP} + \varepsilon$$

Stated preference (SP) model:

$$\tilde{U} = \beta'x^{SP} + \gamma'z^{SP} + v$$

where x^{RP}, x^{SP} are variables in both the revealed preference and stated preference models;

w^{RP} are variables only in the revealed preference data and capture effects of situational constraints and other market conditions on actual choices; and

z^{SP} are variables only in the stated preference data and capture potential biases such as justification bias.

Variances in random terms may differ, reflecting different "noise levels" in the respective data sets. This is represented by:

Scale of RP model = 1

Scale of SP model = μ

(e.g., $\mu > 1 \Rightarrow$ variance of v is smaller than variance of ε).

Then RP choice model is:

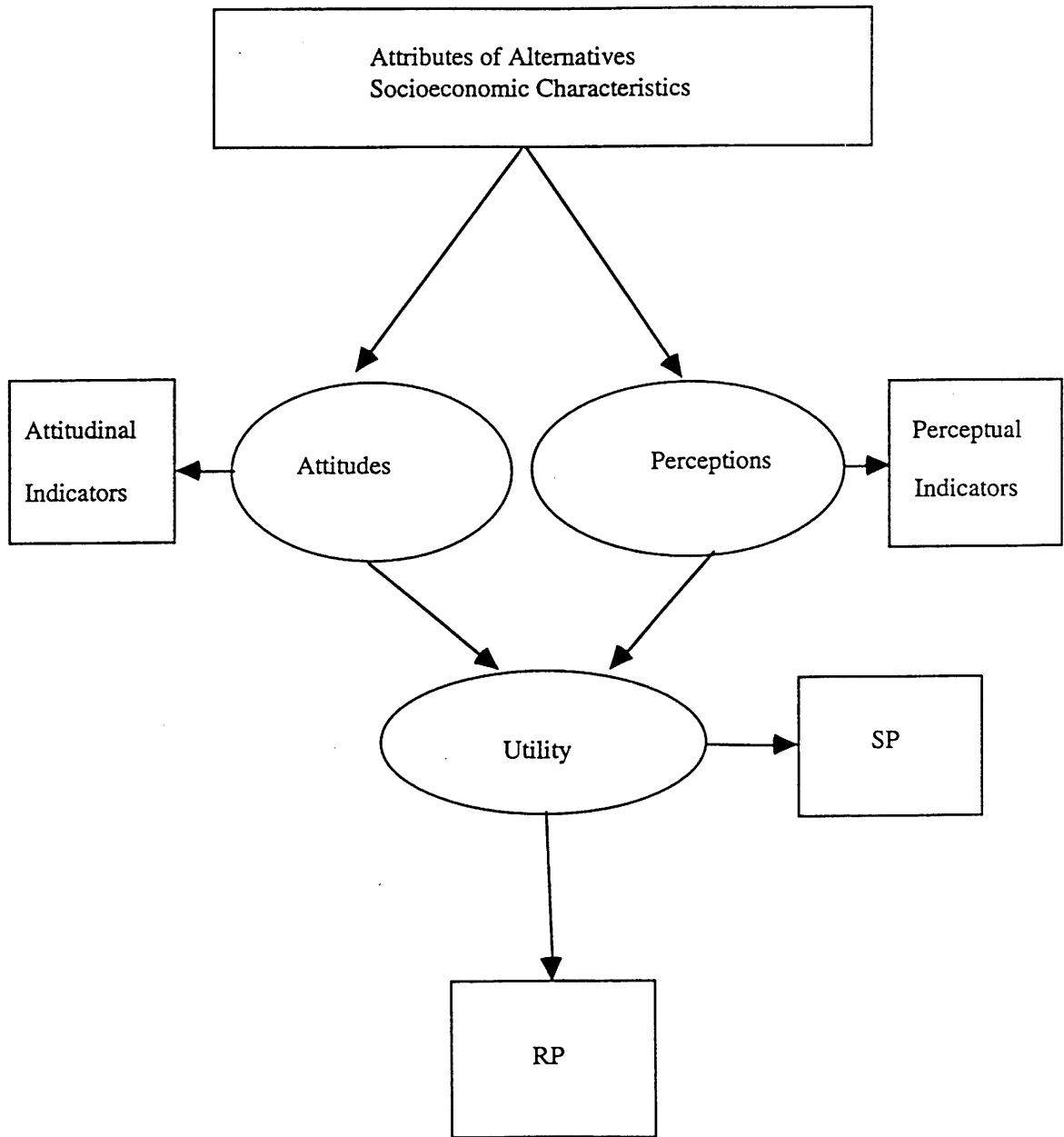
$$P^{RP}(i) = \frac{e^{\beta'x_i^{RP} + \alpha'w_i^{RP}}}{\sum_j e^{\beta'x_j^{RP} + \alpha'w_j^{RP}}}$$

and SP model is:

$$P^{SP}(i) = \frac{e^{\mu(\beta'x_i^{SP} + \gamma'z_i^{SP})}}{\sum_j e^{\mu(\beta'x_j^{SP} + \gamma'z_j^{SP})}}$$

Sequential estimation of β , α , γ , and μ parameters is accomplished in the following steps:

1. Fit SP data using MNL.
2. Construct a new variable in RP data by weighting estimated coefficients of x from SP fit in step 1.
3. Fit RP data using new variables (with new coefficients) and RP only variables, using MNL.
4. Estimate coefficient of new variable = $\frac{1}{\mu}$.
5. Pool RP and scaled SP data.



Incorporation of Psychometric Data in Choice Models