



# Methods for measuring preferences

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# Aims

- Discuss with you various ways to measure preferences.
- Discuss the benefits and limitations of each way.
- To link these ways to possible research questions and theories.
- Acquaint you with various quantitative methods to measure preferences.



# Content for the rest of the day

- Discussion about methods
- Fill in a small questionnaire
- Lecture about quantitative surveys to measure preferences
- Exercise with own questionnaire data



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# Some questions to ask yourself

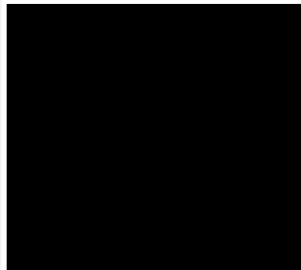
- Which **research context**?
  - Look at your research question and theories
  - Part of selection or variety creation
- What do you want to **achieve**?
  - Generalization to population
  - Understand heterogeneity
  - Inventory of things that important
  - Etc.
- How do you **measure** preferences?
  - Informants vs. direct measurement
  - Qualitative vs. quantitative
  - Stated vs. revealed



Supply side

**Variety creation:**

***Heterogeneous actors supply technological alternatives during the innovation process :***



treated here as a 'black box'

Supply side provides technological variety for selection

User-producer interaction

Demand side provides legitimacy as feedback

Demand side

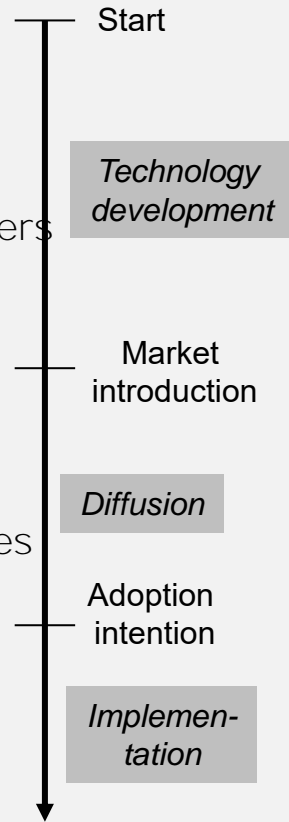
**Selection processes:**

***Heterogeneous actors can provide social acceptance (legitimacy) during the innovation process:***

- Socio-political acceptance
  - Public preferences
  - Politics
  - Government & policy makers
  - Media & opinion makers
  - NGO's

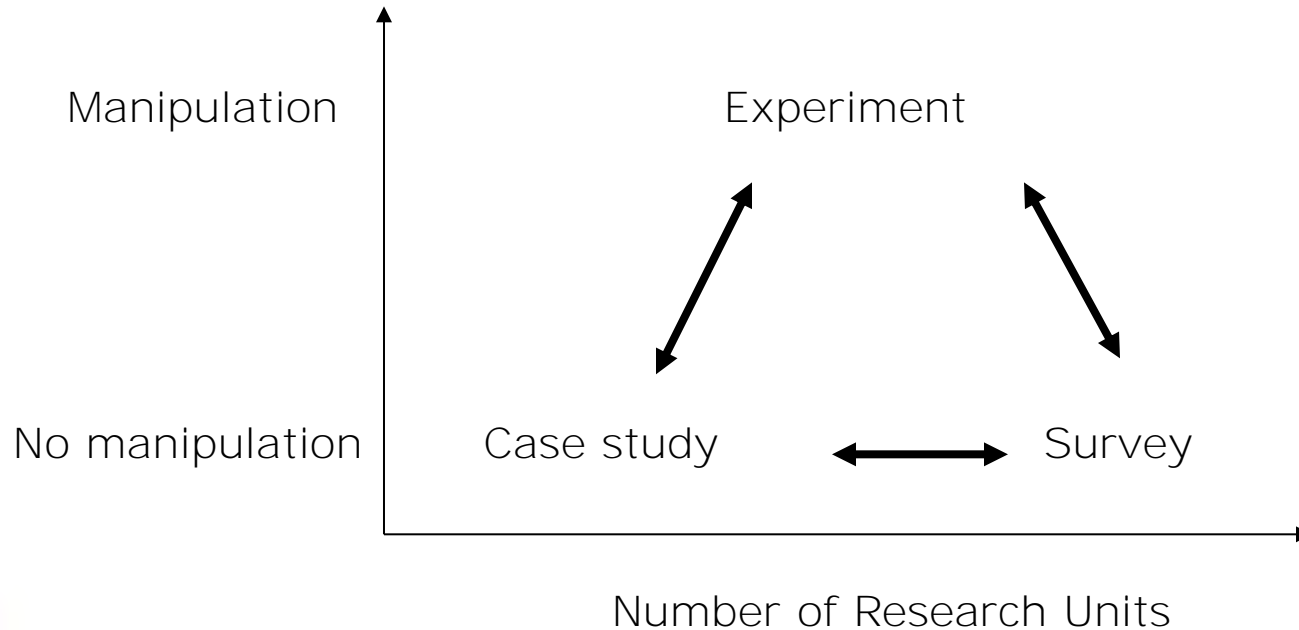
- Market acceptance
  - Adopters
  - Disposers
  - Supply chain intermediaries

- Community acceptance
  - Users
  - Local stakeholders





# Different research designs



- The difference between **survey** and **case study** depends on the number of research units in the sample.
- The difference between an **experiment** and a **survey** or **case study** depends on whether the **independent variable is systematically manipulated** by the researcher.



# Discussion frame

		Response	
		Through informants	Direct measurement
Research strategy	Qualitative	<ul style="list-style-type: none"><li>• Research question</li><li>• Possible methods</li><li>• Advantage</li><li>• Downsides</li></ul>	
	Quantitative		

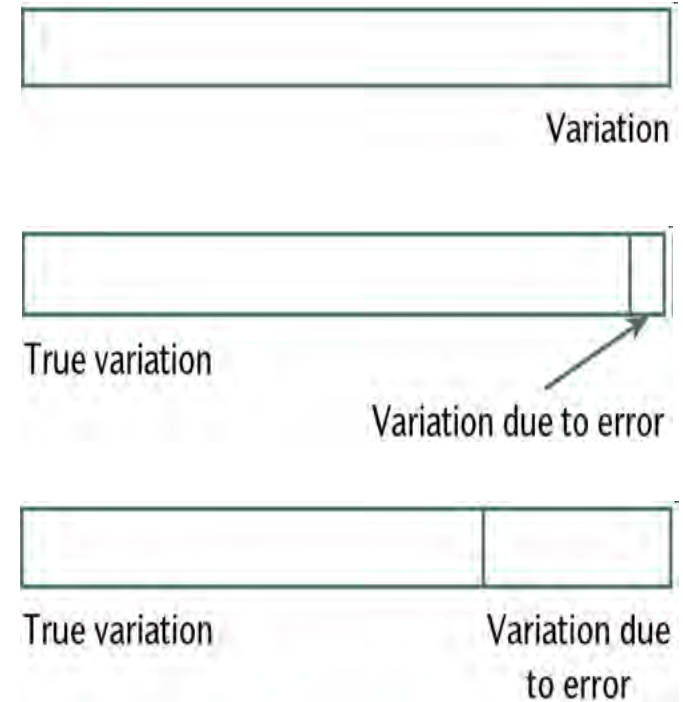




# General stuff about measurement

## Preoccupation in quantitative research

- Delineate fine differences between people/cases
  - Consistent and reliable
  - More precise estimates of the degree of relatedness between concepts
- 
- Measure vs indicator?

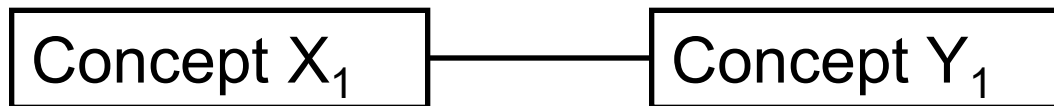






# Where do questions come from?

## *Indicators of concepts!!*





# Example (Huang, 2005)

Concept	Dimensions	Indicator (all on five point scale)	Variable
Website performance	Utilitarian (Functionality)	<i>It is easy to search this webpage</i> <i>It was easy to navigate on this webpage</i> [...]	Add all scores together
	Hedonic (Enjoyability)	<i>The appearance of this webpage is attractive</i> <i>The use of colours on this website is good</i>	Add all scores together



## **Tip: use existing questions**

- Common practice in survey research
  - questions have already been piloted
  - known properties of reliability and validity
  - helps you to draw comparisons with other studies
  - see peer reviewed literature and cite them in report!

**Use these if available!**



# Levels of measurement

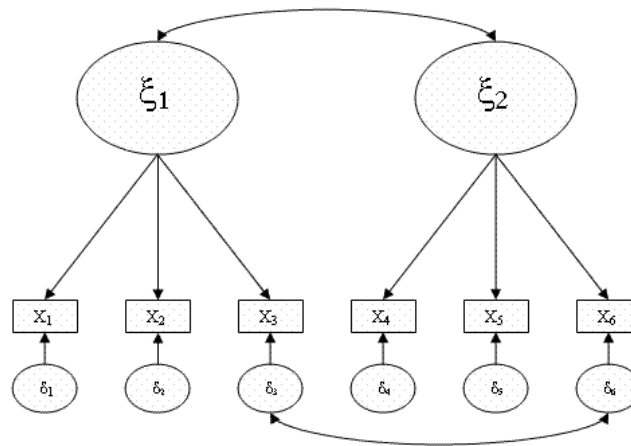
- Different measurement methods lead to different levels of measurement
- These determine the appropriate statistical analysis

		<b>Ratio</b>	
		<b>Interval</b>	
		<b>Ordinal</b>	
<b>Nominal</b>			
	Ordered	Ordered	Ordered
Differences	Differences	Differences	Differences
Gender Nationality	Level of education 5-point scales	Celcius	Age Hours of sports Glasses of beer
<b>Categorical</b>		<b>Continuous</b>	



# Indicators (of concepts)

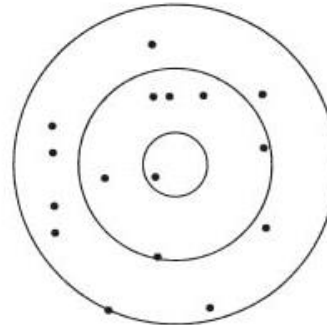
- Produced by the *operational definition* of a concept
- Common sense understandings of the form a concept might take
- Sometimes: multiple-indicator measures
  - concept may have **different dimensions**
  - latent construct





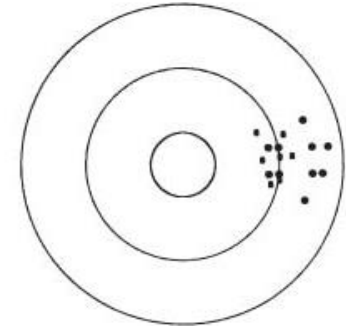
# Reliability of a measure

- Internal reliability
  - Cronbach's alpha
- Validity requires reliability (but not vice versa)



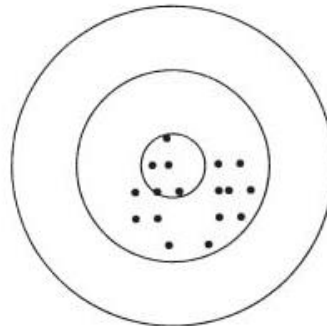
**Neither valid nor reliable**

The research methods do not hit the heart of the research aim (not 'valid') and repeated attempts are unfocussed



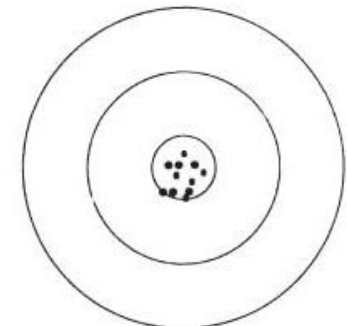
**Reliable but not valid**

The research methods do not hit the heart of the research aim, but repeated attempts get almost the same (but wrong) results



**Fairly valid but not very reliable**

The research methods hit the aim of the study fairly closely, but repeated attempts have very scattered results (not reliable)



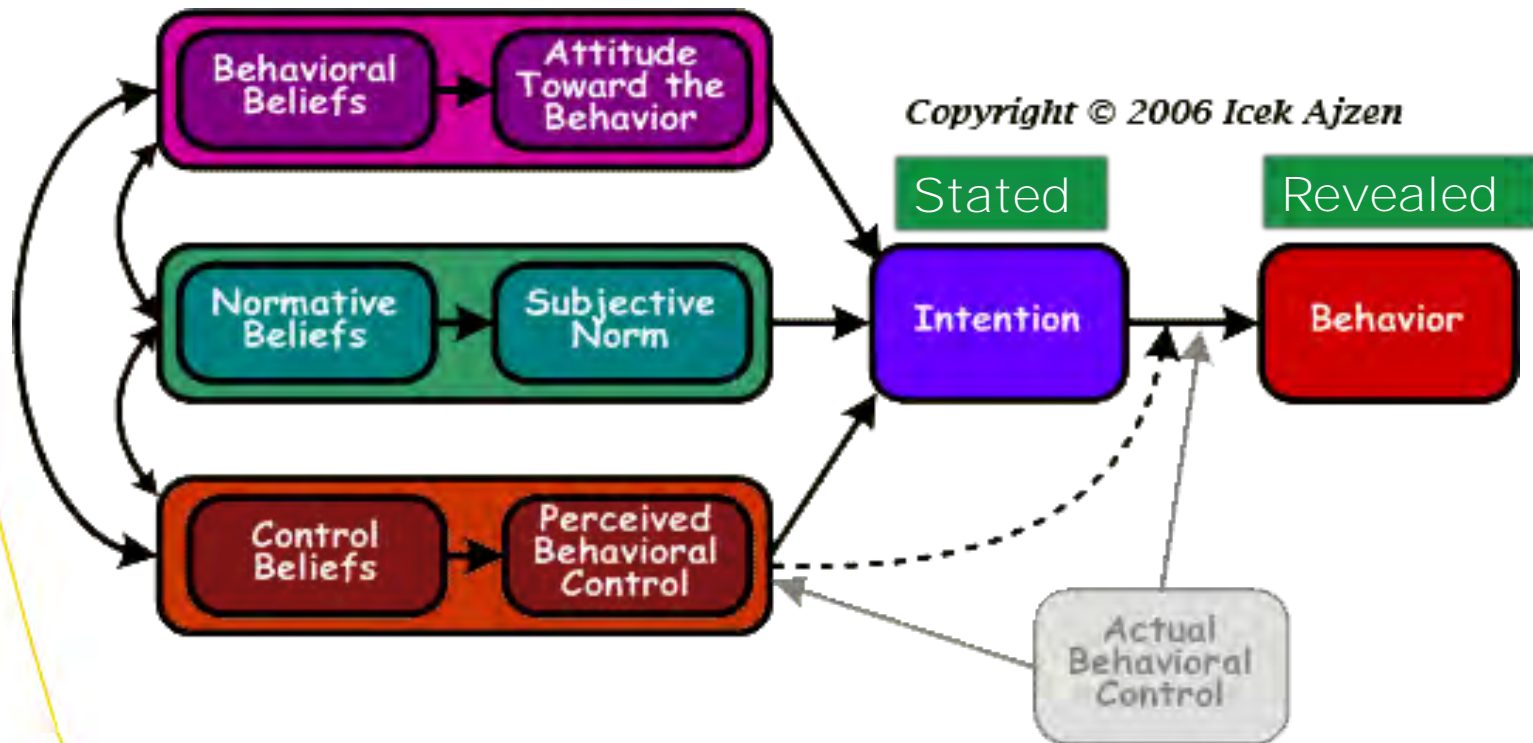
**Valid and reliable**

The research methods hit the heart of the research aim, and repeated attempts all hit in the heart (similar results)



# Stated vs revealed: preferences

- Theory of planned behavior (Ajzen, 1991)







# Revealed preferences

- Look at **behavior**:
  - The best you can have!
  - Relevance:
    - Used in diffusion models
    - Generic explanation of sales
    - Habits of prevent a switch to alternative behaviors
  - Sales data, observed behavior,
    - Good data is hard to obtain
  - Drawbacks
    - Innovation is new and uncertain, data often lacks
    - Not all preferences are about behavior
    - Uncontrolled



# Stated preferences

- Look at **intentions** or **attitudes**:
  - Next best thing!
  - More control by researcher
  - Relevance:
    - Forecast demand for unknown products
    - Discover latent needs
    - Systematically explain preferences
  - Survey data, focus groups
  - Drawbacks
    - It is no real behavior
    - Choices often lack realism
    - “Constructed” preferences



# Views on preferences

- **Neo-classical assumptions**
  - Pre-existing, stable, coherent, well- defined and known
  - The trick is to measure correctly
- **Constructive preferences** (Payne et al., 1999)
  - Constructed at the time of valuation
  - “Interaction of human information processing system and choice task”

## Faults at Stages of the Preference Construction Process and Proposed Remedies

Stage	Fault	Remedies
Problem Representation	Myopic decision frames	<ul style="list-style-type: none"><li>• Explicitly encourage consideration of multiple options, events, and objectives<ul style="list-style-type: none"><li>• Expand set of options, use value ladders</li><li>• Encourage consideration of multiple futures</li><li>• Construct a value tree</li><li>• Clarify the distinction between fundamental and proxy values</li></ul></li></ul>
	Using an inappropriate problem representation	<ul style="list-style-type: none"><li>• Use extensive pretesting, focus groups</li><li>• Use manipulation checks</li></ul>
Information Acquisition and Interpretation	Inappropriate selectivity and the focusing illusion	<ul style="list-style-type: none"><li>• Provide important information using formats which make it salient and easy to process</li></ul>
	Lack of comprehension of the information provided	<ul style="list-style-type: none"><li>• Use manipulation checks</li><li>• Use common, anchored scale formats</li><li>• Explicitly present range information</li></ul>



Information combination

Avoidance of tradeoffs

- Provide time and thinking tools such as multiattribute utility analysis or judgment policy analysis
- Assess swing weights
- Decompose complex judgments
- Use tools to help improve attribute weighting

Expression or Mapping of Preferences

Influences of scale compatibility

- Triangulation (ask questions in multiple ways)
- Use liability as an asset – ask for reconciliation of inconsistencies

Biases in scale usage

- Use explicit scale anchors, e.g., behaviorally anchored scales
- Use less sensitive, more robust scales

All Stages

- Increased use of sensitivity analysis



# Ratings tasks

## Example Rating Task:

Please rate the following in terms of importance to you when eating at a fast food restaurant. Use a 10-point scale, where “0” means “not important at all” and “10” means “extremely important”

- Clean bathrooms
- Healthy food choices
- Good taste
- Reasonable prices
- Has a play area
- Restaurant is socially responsible
- Courteous staff



# Ranking tasks

## Example Ranking Task:

Please rank (from most important to least important) the following in terms of importance to you when eating at a fast food restaurant. Put a “1” next to the most important item, a “2” next to the next most important item, etc.

- Clean bathrooms
- Healthy food choices
- Good taste
- Reasonable prices
- Has a play area
- Restaurant is socially responsible
- Courteous staff





# Allocation tasks

## Example Allocation Task:

Please tell us how important the following are to you when eating at a fast food restaurant. Show the importance by assigning points to each attribute. The more important the attribute, the more points you should give it. You can use up to 100 total points. Your answers must sum to 100.

- Clean bathrooms
- Healthy food choices
- Good taste
- Reasonable prices
- Has a play area
- Restaurant is socially responsible
- Courteous staff

Total: \_\_\_\_\_



# Choice experiments

Imagine that you are planning to eat at a fast-food restaurant. You have three alternatives that vary on a number of aspects. Please tick which restaurant you prefer most and which the least?

	<b>Restaurant 1</b>	<b>Restaurant 2</b>
<b>Bathrooms</b>	Clean	Dirty
<b>Healthy food</b>	Yes	No
<b>Good taste</b>	Yes	Yes
<b>Price</b>	4 € burger	2 € burger
<b>Play area</b>	Yes	No
<b>Socially responsible</b>	Yes	No
<b>Staff</b>	Friendly	Unfriendly
<b>Most preferred</b>	<input type="radio"/>	<input type="radio"/>



# Choice experiments

Imagine that you are planning to eat at a fast-food restaurant. You have three alternatives that vary on a number of aspects. Please tick which restaurant you prefer most and which the least?

	<b>Restaurant 1</b>	<b>Restaurant 2</b>	<b>Restaurant 3</b>
<b>Bathrooms</b>	Clean	Dirty	Clean
<b>Healthy food</b>	Yes	No	Yes
<b>Good taste</b>	Yes	Yes	No
<b>Price</b>	4 € burger	2 € burger	2 € burger
<b>Play area</b>	Yes	No	Yes
<b>Socially responsible</b>	Yes	No	No
<b>Staff</b>	Friendly	Unfriendly	Friendly
<b>Most preferred</b>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<b>Least preferred</b>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



# Experimental combinations

Staff
0
1

Play area	Staff
0	0
0	1
1	0
1	1

Good food	Play area	Staff
0	0	0
0	0	1
0	1	0
0	1	1
1	0	0
1	0	1
1	1	0
1	1	1

5 attributes with 2 levels

1 attribute with 3 levels

- $2^5 * 3 = 96$  combinations
- 3 combinations per task:  $96/3 = 32$  tasks minimum
- **But you need more for a full factorial design**
  - $96^3 = 884736$



Imagine that you are planning to eat at a fast-food restaurant. You have three alternatives that vary on a number of aspects. Please tick which restaurant you prefer most and which the least?

	<b>Burger King</b>	<b>Krusty Krab</b>	<b>Krusty Burger</b>
			
<b>Bathrooms</b>	Clean	Dirty	Clean
<b>Healthy food</b>	Yes	No	Yes
<b>Good taste</b>	Yes	Yes	No
<b>Price</b>	4 € burger	2 € burger	2 € burger
<b>Play area</b>	Yes	No	Yes
<b>Socially responsible</b>	Yes	No	No
<b>Staff</b>	Friendly	Unfriendly	Friendly
<b>Most preferred</b>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<b>Least preferred</b>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



# Random Utility Theory

- $U_{ij} = V_{ij} + \epsilon_{ij}$
- $U_{ij}$  : Utility provided to individual  $i$  by product  $j$
- $V_{ij}$  : Utility based on observed characteristics
  - Attributes
- $\epsilon_{ij}$  : Utility based on unobserved characteristics
  - Not used today
- Assuming we are all equal (drop  $i$ ), then:
- $V_j = \beta_1 X_{1j} + \beta_2 X_{2j} \dots \beta_{kj} X_{kj}$
- [See: https://wiki.ece.cmu.edu/ddl/index.php/Discrete\\_choice\\_analysis](https://wiki.ece.cmu.edu/ddl/index.php/Discrete_choice_analysis)



# How to analyse this?

- More after the break!

