

Revealed and stated preference data



Key concepts
& study plan



Experimental
design



Data collection
& processing



Model specification
& estimation



Interpretation
& application

Revealed and stated preference data

Outline

- ❑ Types of choice data
- ❑ Revealed preference data
- ❑ Stated preference data

Types of choice data



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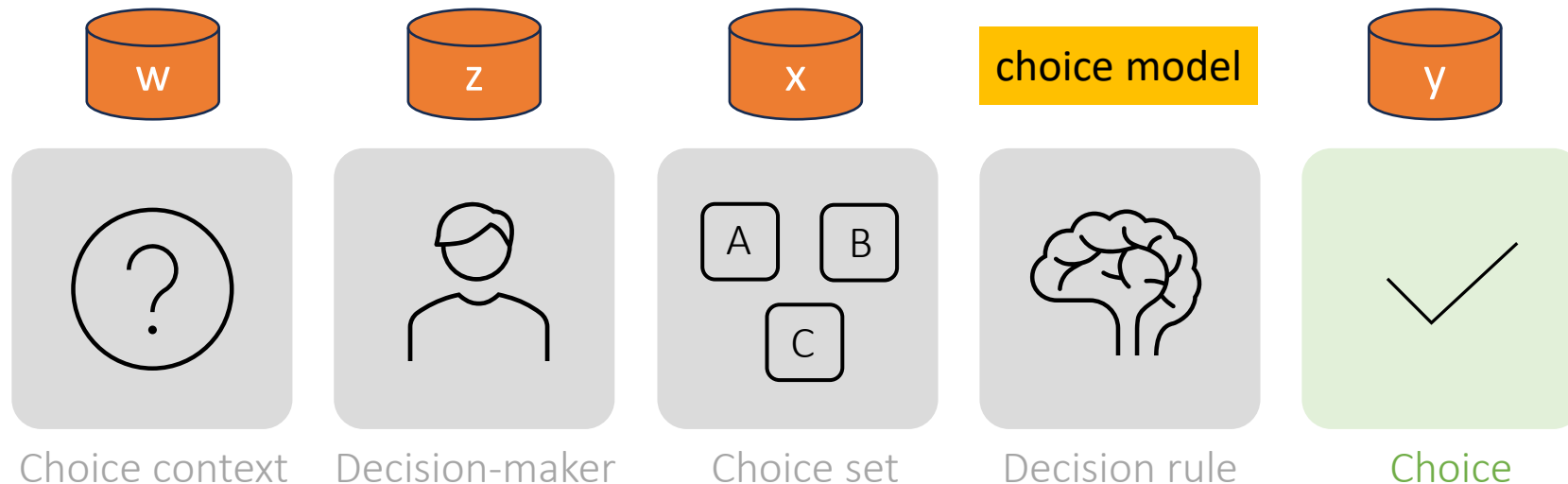


Interpretation
& application

Types of choice data

Data for choice models

- ❑ Characteristics of choice contexts (scenario variables \mathbf{w})
- ❑ Characteristics of decision-makers (socio-demographic/economic variables \mathbf{z})
- ❑ Characteristics of alternatives in a choice set (attribute variables \mathbf{x})
- ❑ Chosen alternatives (choice indicators \mathbf{y})



Types of choice data

RP vs SP

- ❑ Revealed preference data
 - Real-world choice context
 - Real-world alternatives
 - Real-world attributes and levels
 - Revealed choices
- ❑ Stated preference data
 - Hypothetical choice context
 - Hypothetical alternatives
 - Hypothetical attributes and levels
 - Stated choices

Types of choice data

Revealed preference data

- ❑ “What means of transport did you use to travel to work today? And what travel time and cost did you experience?”

- ❑ Advantages
 - Actual choices in real markets
 - Real consequences, accounting for time and budget constraints

- ❑ Disadvantages
 - Only chosen alternative is captured, obtaining information about non-chosen alternatives requires effort
 - Cannot ask about alternatives, attributes, or attribute levels that do not (yet) exist
 - Attribute levels may not vary much or may be highly correlated

Types of choice data

Stated preference data

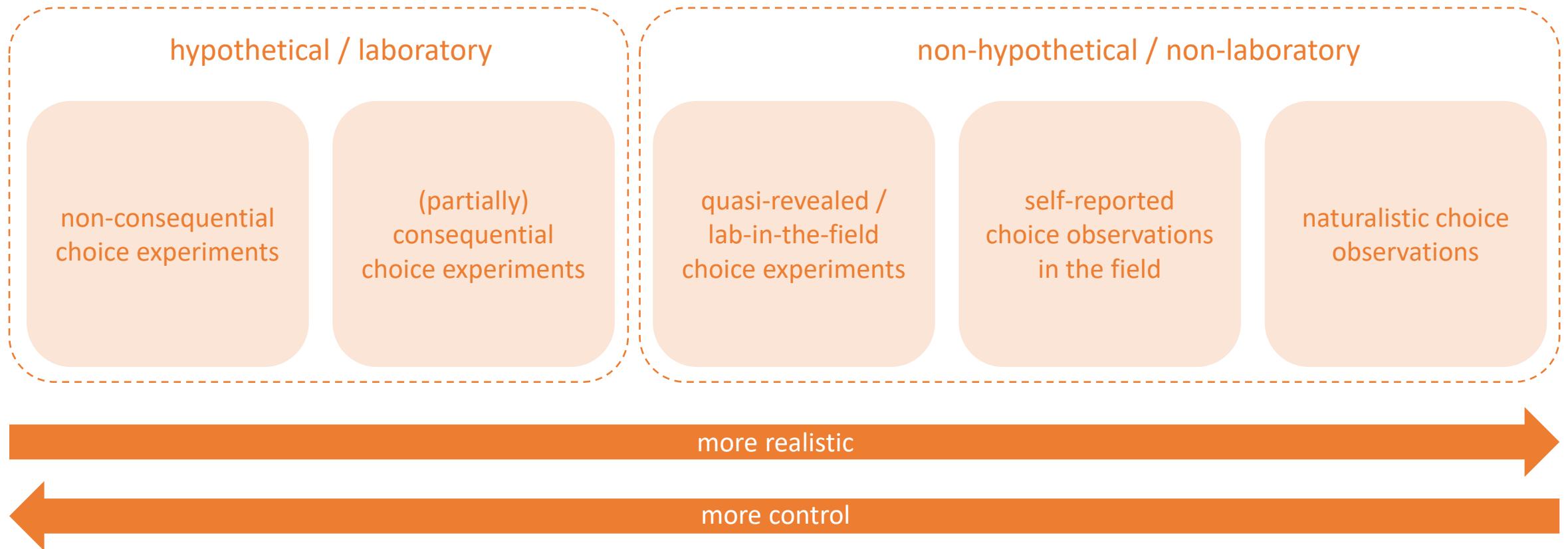
- ❑ “Suppose that you would like to travel from Sydney to Melbourne for leisure. Would you take the plane for two hours at a cost of \$200, or a high-speed train for 4 hours at a cost of \$150?”

- ❑ **Advantages**
 - Full control of analyst over alternatives, attributes, and attribute levels
 - Data about all alternatives is available
 - Easy to give multiple choice tasks to decision-makers

- ❑ **Disadvantages**
 - Stated choices in hypothetical scenarios
 - No consequences, not accounting for time or budget constraints

Types of choice data

Range of data types



Revealed preference data



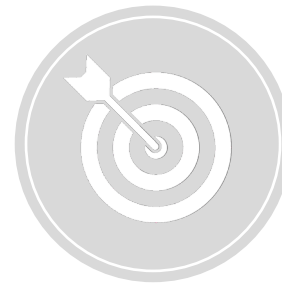
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Revealed preference data

Example 1

- Chocolate bar choice in supermarket



Revealed preference data

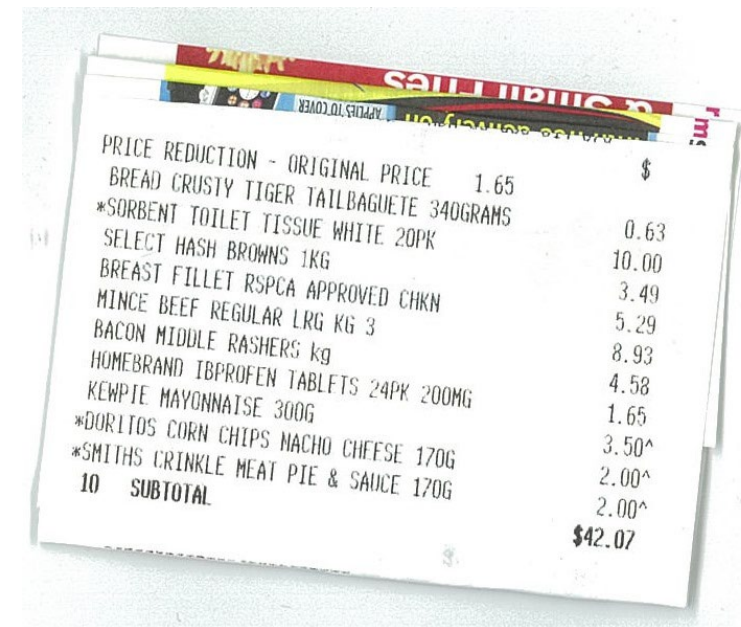
Example 1 – Chocolate bar choice in supermarket

- ❑ Characteristics of choice context (**w**)
 - Unknown (Was it to eat themselves? Was it a gift)

Revealed preference data

Example 1 – Chocolate bar choice in supermarket

- Choice sets and chosen alternatives (y)
 - Direct observation
 - Purchase records



Revealed preference data

Example 1 – Chocolate bar choice in supermarket

- Characteristics of alternatives (x)
 - Desk research



Coles

Revealed preference data

Example 1 – Chocolate bar choice in supermarket

- ❑ Characteristics of decision-makers (z)
 - Loyalty/membership cards



Coles

Revealed preference data

Example 2

- ❑ Travel mode choice



Revealed preference data

Example 2 – Travel mode choice

- Characteristics of choice context (**w**)
 - Questionnaire

What was the purpose of your trip?

- ☐ Work
- ☐ Education
- ☐ Business
- ☐ Shopping
- ☐ Leisure

What was the origin of your trip?

(postal code)

What was the destination of your trip?

(postal code)

Revealed preference data

Example 2 – Travel mode choice

- Choice sets and chosen alternatives (**y**)
 - Questionnaire

Do you own a bicycle?

- ☐ Yes
☐ No

Do you have a driver's licence?

- ☐ Yes
☐ No

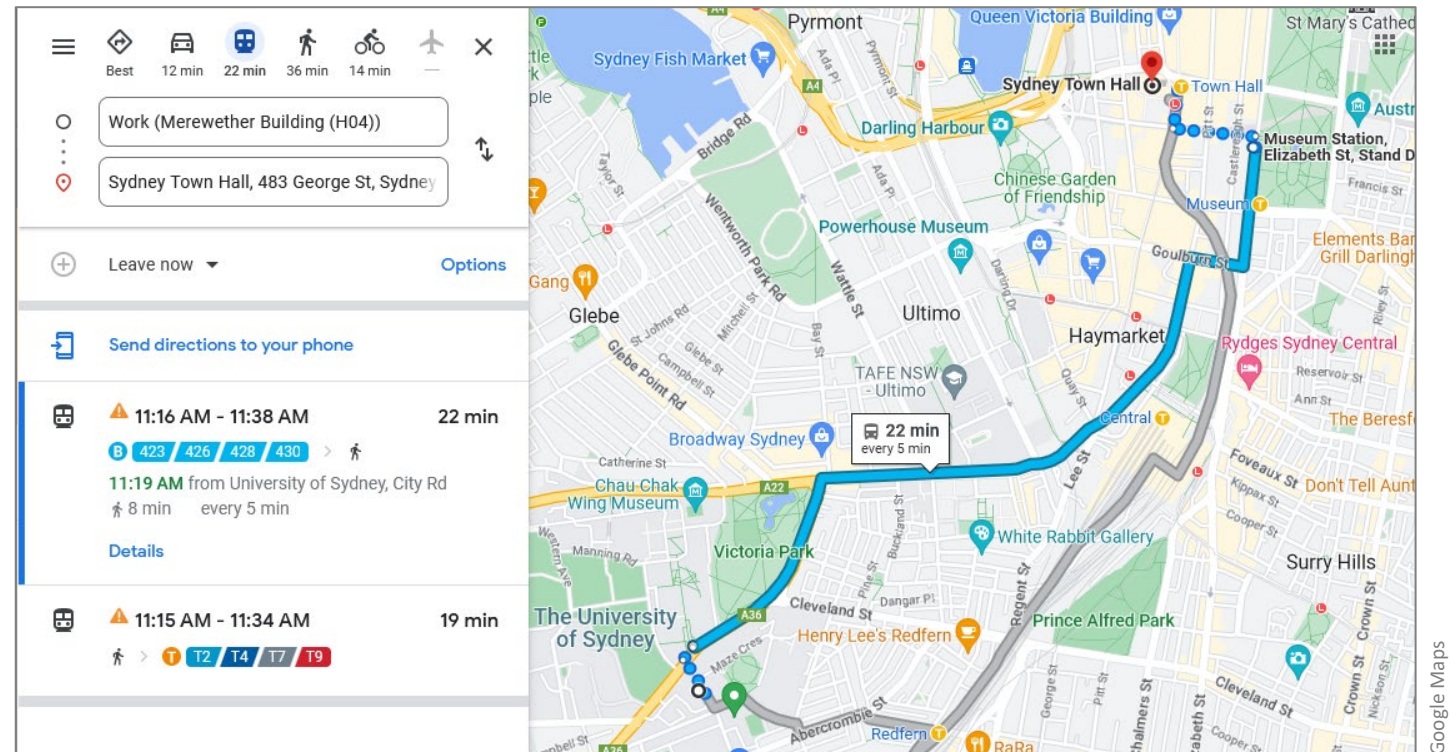
What was your main mode of transport yesterday?

- ☐ walk
☐ bicycle
☐ car
☐ train
☐ bus

Revealed preference data

Example 2 – Travel mode choice

- Characteristics of alternatives (\mathbf{x})
 - Imputation



Google Maps

Revealed preference data

Example 2 – Travel mode choice

- Characteristics of decision-makers (z)
 - Questionnaire

What is your gender?

- ☐ Male
- ☐ Female
- ☐ Other

What is your annual household income?

- ☐ Less than \$25,000
- ☐ Between \$25,000 and \$50,000
- ☐ Between \$50,000 and \$100,000
- ☐ Between \$100,000 and \$150,000
- ☐ Between \$150,000 and \$250,000
- ☐ More than \$250,000
- ☐ Rather not say

Stated preference data



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Stated preference data

Example in environmental economics

- Characteristics of choice context (**w**), choice sets and chosen alternatives (**y**), characteristics of alternatives (**x**), characteristics of decision-maker (**z**)
 - Questionnaire with choice experiment

QUESTION 10: Suppose Options A, B and C were the ONLY management options available for the River Murray and the Coorong. Which one would you realistically choose? *Tick one box only.*

Features		Option A Maintain Current Situation	Option B Improve quality of the River Murray and Coorong	Option C Improve quality of the River Murray and Coorong
Waterbird breeding along the River Murray		Every 10 years	Every 10 years	Every year
Native fish in the River Murray		30% of original population	60% of original population	50% of original population
Healthy vegetation along the River Murray		50% of original area	60% of original area	70% of original area
Waterbird habitat in the Coorong		Poor quality	Good quality	Poor quality
Household cost per year for 10 years	\$	\$0	\$200	\$125
I would choose				

Stated preference data

Example in environmental economics




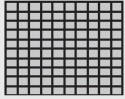


- Characteristics of choice context (**w**), choice sets and chosen alternatives (**y**), characteristics of alternatives (**x**), characteristics of decision-maker (**z**)
 - Questionnaire with choice experiment

	Option A	Option B	Option C	None
Conservation requirements	Total exclusion of cattle + managing for biodiversity outcomes	Cattle exclusion for <u>short</u> periods of time; zero loss of cattle production	Cattle exclusion for <u>prolonged</u> periods; 50% loss of cattle production	
Annual payment (\$/ha)	\$ 12 / ha	\$ 4 / ha	\$ 4 / ha	
Contract length (years)	20 years	10 years	5 years	
Flexibility of conditions	Flexibility	No flexibility	No flexibility	
Monitoring conducted	External	Self (25% random spot-checks)	Self (25% random spot-checks)	
Q1: Which option would you choose?	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Q2: Which do you rate as the second best option?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Q3: Which is your <u>least preferred</u> option?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Q4: <u>How certain</u> are you of the choice you made in Q1? Please indicate % certainty on the scale.	0% 10 20 30 40 50 60 70 80 90 100% Level of certainty			

Stated preference data

Example in health

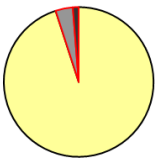

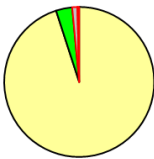
- Characteristics of choice context (**w**), choice sets and chosen alternatives (**y**), characteristics of alternatives (**x**), characteristics of decision-maker (**z**)
 - Questionnaire with choice experiment

	Active Surveillance	Radiotherapy	Surgery
Risk of permanent urinary incontinence due to treatment	 Nobody (0%)	 5 out of 100 (5%)	 20 out of 100 (20%)
Risk of permanent erectile dysfunction due to treatment	 Nobody (0%)	 25 out of 100 (25%)	 45 out of 100 (45%)
Risk of other permanent side-effects due to treatment	No	Yes, substantial risk of <ul style="list-style-type: none">Bowel problemsFrequent urge to urinate	Yes, small risk of mortality within 6 weeks
Main aim is cure	No, the tumour remains in the body	Yes, but the disease may return	Yes, but the disease may return
Frequency of PSA testing with a risk of new prostate biopsies	Four times in a year and at least one biopsy per year	Once in a year	Once in a year
Which alternative do you prefer?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Stated preference data

Example in health

- Characteristics of choice context (**w**), choice sets and chosen alternatives (**y**), characteristics of alternatives (**x**), characteristics of decision-maker (**z**)
 - Questionnaire with choice experiment

	Option 1: No vaccination	Option 2: Vaccination A	Option 3: Vaccination B
Effectiveness of the vaccine	<p>n.a.</p> <p>This means:</p> <p>50 out of 1.000 people will get sick</p>  <p>25% of these sick people will get severe symptoms</p>	<p>Effectiveness: 30%</p> <p>This means:</p> <p>15 out of 1.000 people <u>will not</u> get sick, due to vaccination</p> <p>35 out of 1.000 people <u>will get</u> sick, despite the vaccination</p>  <p>25% of these sick people will get severe symptoms</p>	<p>Effectiveness: 70%</p> <p>This means:</p> <p>35 out of 1.000 people <u>will not</u> get sick, due to vaccination</p> <p>15 out of 1.000 people <u>will get</u> sick, despite the vaccination</p>  <p>25% of these sick people will get severe symptoms</p>
Safety of the vaccine (long term severe side effects)	No side effects	Unknown, but expected to be safe	Unknown, no experience yet
Advice about the vaccine	n.a.	Recommended by your doctor	Recommended by family and friends
Media coverage about the vaccine	n.a.	Radio, newspapers and television positive	Radio, newspapers and television negative
Out-of-pocket costs	0 euro	50 euros	50 euros
What do you choose for yourself? (please tick one box only)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>









Stated preference data

Example in marketing

- Characteristics of choice context (**w**), choice sets and chosen alternatives (**y**), characteristics of alternatives (**x**), characteristics of decision-maker (**z**)
 - Questionnaire with choice experiment

Meat choice scenario 4 of 4

Looking at each of the meat products shown, we want you to tell us how much of each meat product you would purchase, assuming that you were shopping under similar circumstances to your last grocery shopping trip when you purchased meat (that is, if you were buying for a BBQ, then please pretend that you are buying for one now. If it were for a normal week, then pretend that it is a normal week now).

Diced	Roast	Mince	Diced
			
			
Country of Origin New Zealand	Country of Origin China	Country of Origin New Zealand	Country of Origin United States
100% Grass fed 100% Free of antibiotics 100% Free of hormones 100% Free of steroids 100% Free range	100% Grass fed 100% Free of antibiotics 100% Free of hormones 100% Free of steroids 100% Free range	100% Grass fed 100% Free of hormones 100% Traceable 100% Free range	100% Free of antibiotics 100% Free of hormones 100% Traceable 100% Free of steroids
Average per 100g	Average per 100g	Average per 100g	Average per 100g
Energy: 596 KJ Protein: 19 g Fat: 9 g Omega 3: 0.28 g Iron: 5 mg Zinc: 9 mg	Energy: 526 KJ Protein: 27 g Fat: 16 g Omega 3: 0.28 g Iron: 5 mg Zinc: 11 mg	Energy: 545 KJ Protein: 26 g Fat: 11 g Omega 3: 0.28 g Iron: 3 mg Zinc: 16 mg	Energy: 616 KJ Protein: 33 g Fat: 13 g Omega 3: 0.28 g Iron: 4 mg Zinc: 14 mg
Best Before: 3 days to expiry \$K/G \$13.00 Net KG 0.35 kg Total Price \$4.50	Best Before: 1 week to expiry \$K/G \$19.00 Net KG 0.5 kg Total Price \$9.50	Best Before: 1 week to expiry \$K/G \$18.00 Net KG 0.5 kg Total Price \$9.00	Best Before: 2 weeks to expiry \$K/G \$14.00 Net KG 1 kg Total Price \$14.00

Given the meat products as described, how many of each (including none) would you most likely purchase assuming these were the only meats available on the shelf?







<input type="radio"/> None	<input type="radio"/> None	<input type="radio"/> None	<input type="radio"/> None
<input type="radio"/> One	<input type="radio"/> One	<input type="radio"/> One	<input type="radio"/> One
<input type="radio"/> Two	<input type="radio"/> Two	<input type="radio"/> Two	<input type="radio"/> Two
<input type="radio"/> Three	<input type="radio"/> Three	<input type="radio"/> Three	<input type="radio"/> Three
<input type="radio"/> More than three	<input type="radio"/> More than three	<input type="radio"/> More than three	<input type="radio"/> More than three

Stated preference data

Example in marketing

- Characteristics of choice context (**w**),
choice sets and chosen alternatives (**y**),
characteristics of alternatives (**x**),
characteristics of decision-maker (**z**)
 - Questionnaire with choice experiment

Set 1 of 16:

 	 	 	
Which one would you be MOST likely to buy?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Which one would you be LEAST likely to buy?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

If the above three products are actually available on shelf, which of the following three statements best describes your opinions about the three products?

☐ I will buy ALL of these products

☐ I will buy SOME but not other products

☐ I will buy NONE of these products

Stated preference data

Example in marketing

- Characteristics of choice context (\mathbf{w}), choice sets and chosen alternatives (\mathbf{y}), characteristics of alternatives (\mathbf{x}), characteristics of decision-maker (\mathbf{z})
 - Virtual reality choice experiment



VirtualSoft Studios

Stated preference data

Example in transport

- Characteristics of choice context (**w**), choice sets and chosen alternatives (**y**), characteristics of alternatives (**x**), characteristics of decision-maker (**z**)
 - Questionnaire with choice experiment

Sydney Road System

Practice Game

Make your choice given the route features presented in this table, thank you.

	Details of Your Recent Trip	Road A	Road B
Time in free-flow traffic (mins)	50	25	40
Time slowed down by other traffic (mins)	10	12	12
Travel time variability (mins)	+/- 10	+/- 12	+/- 9
Running costs	\$ 3.00	\$ 4.20	\$ 1.50
Toll costs	\$ 0.00	\$ 4.80	\$ 5.60

If you make the same trip again, which road would you choose? ☐ Current Road ☐ Road A ☒ Road B

If you could only choose between the 2 new roads, which road would you choose? ☐ Road A ☒ Road B

For the chosen A or B road, HOW MUCH EARLIER OR LATER WOULD YOU BEGIN YOUR TRIP to arrive at your destination at the same time as for the recent trip: (note 0 means leave at same time) min(s) ☐ earlier ☒ later

How would you PRIMARILY spend the time that you have saved travelling?

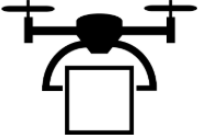
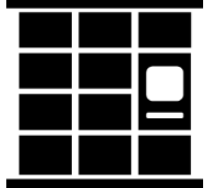

☐ Stay at home ☐ Shopping ☐ Social-recreational ☐ Visiting friends/relatives
☐ Got to work earlier ☐ Education ☐ Personal business ☐ Other

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Stated preference data

Example in transport

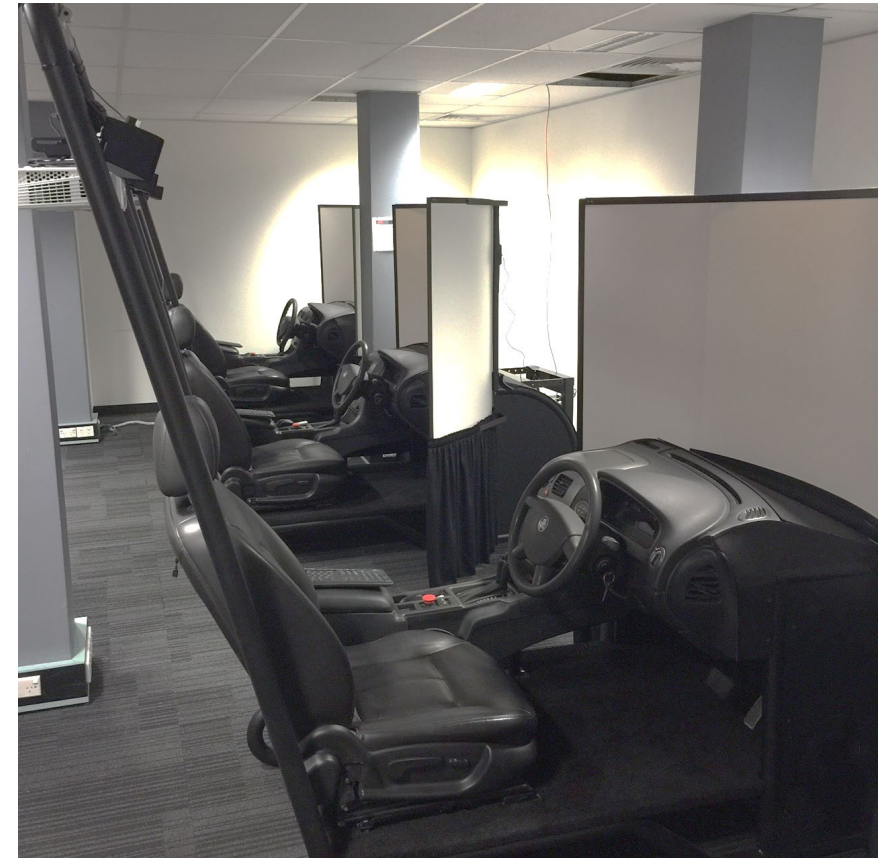
- Characteristics of choice context (**w**), choice sets and chosen alternatives (**y**), characteristics of alternatives (**x**), characteristics of decision-maker (**z**)
 - Questionnaire with choice experiment

	Drone	Locker	Postie
			
Speed	2 business days	3 business days	5 business days
Delivery method	Leave in a safe place	Secure in locker	Leave at front door
Time window	9am - 5pm (30 minutes)	24/7 (kept for two days)	6pm - 9pm (no choice)
Cost	\$2	\$6	\$8
Which would you choose?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Stated preference data

Example in transport

- ❑ Characteristics of choice context (\mathbf{w}), choice sets and chosen alternatives (\mathbf{y}), characteristics of alternatives (\mathbf{x}), characteristics of decision-maker (\mathbf{z})
 - Laboratory choice experiment



Stated preference data

Example in transport

- Characteristics of choice context (\mathbf{w}), choice sets and chosen alternatives (\mathbf{y}), characteristics of alternatives (\mathbf{x}), characteristics of decision-maker (\mathbf{z})
 - Laboratory choice experiment

