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Panel mixed-mode effects: does switching modes in probability-based online panels influence measurement error?

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The content of this presentation

- The background
- The aim of our study
- Data and data items used in this paper
- Types of mode effects
- Methods for identifying mode effects
- Panel data analysis models
- Results
- Key findings
- Recommendations



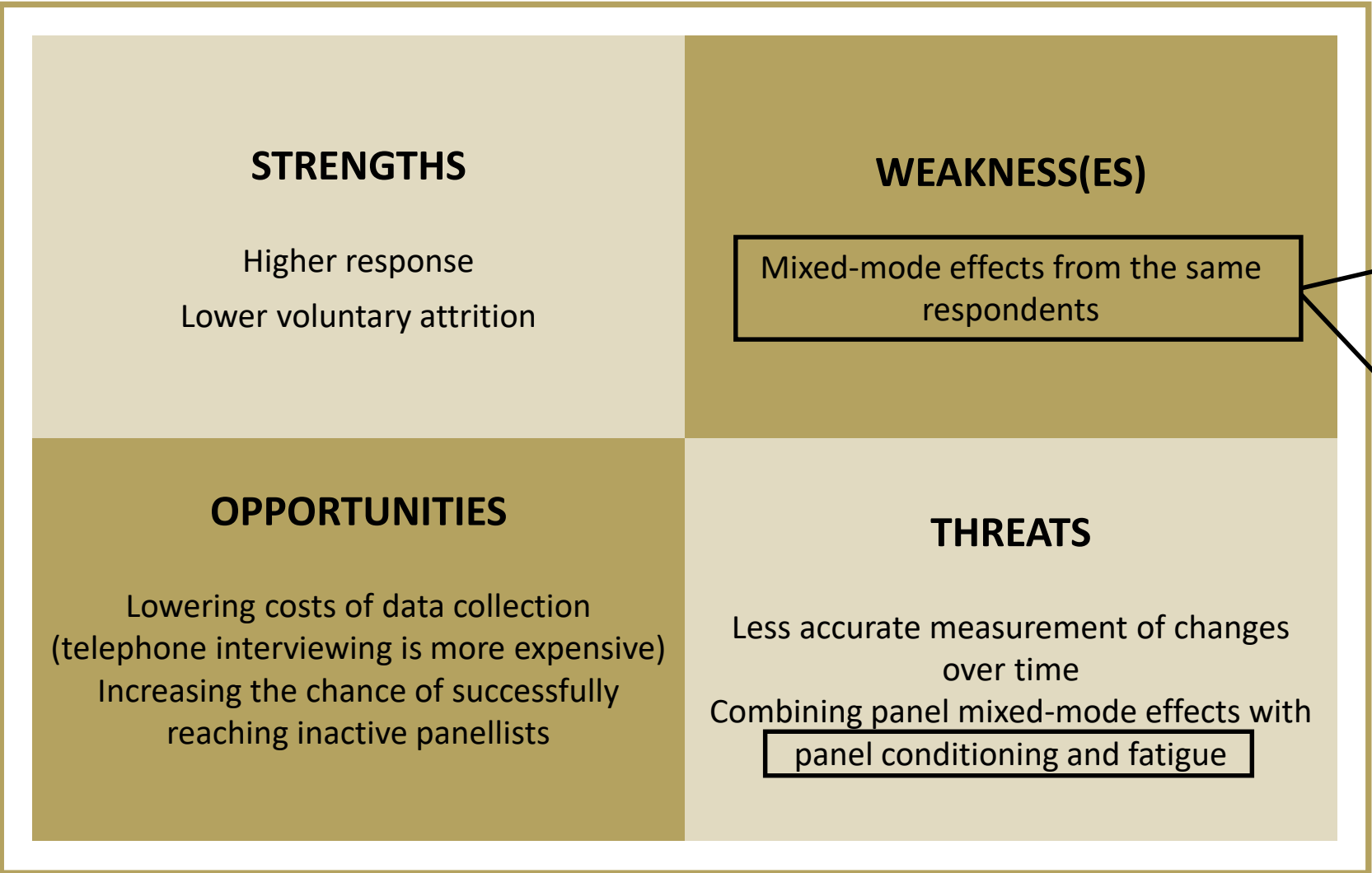
The background

- Life in Australia™, a probability-based online panel
- Offliners (13%) are encouraged to provide their email addresses
- Onliners can switch to the telephone mode (permanently)
- Onliners who don't respond in a particular time frame are reminded via different channels
- Onliners can be then interviewed over the phone (ad-hoc)



To allow switching or not to allow switching, that is the question...

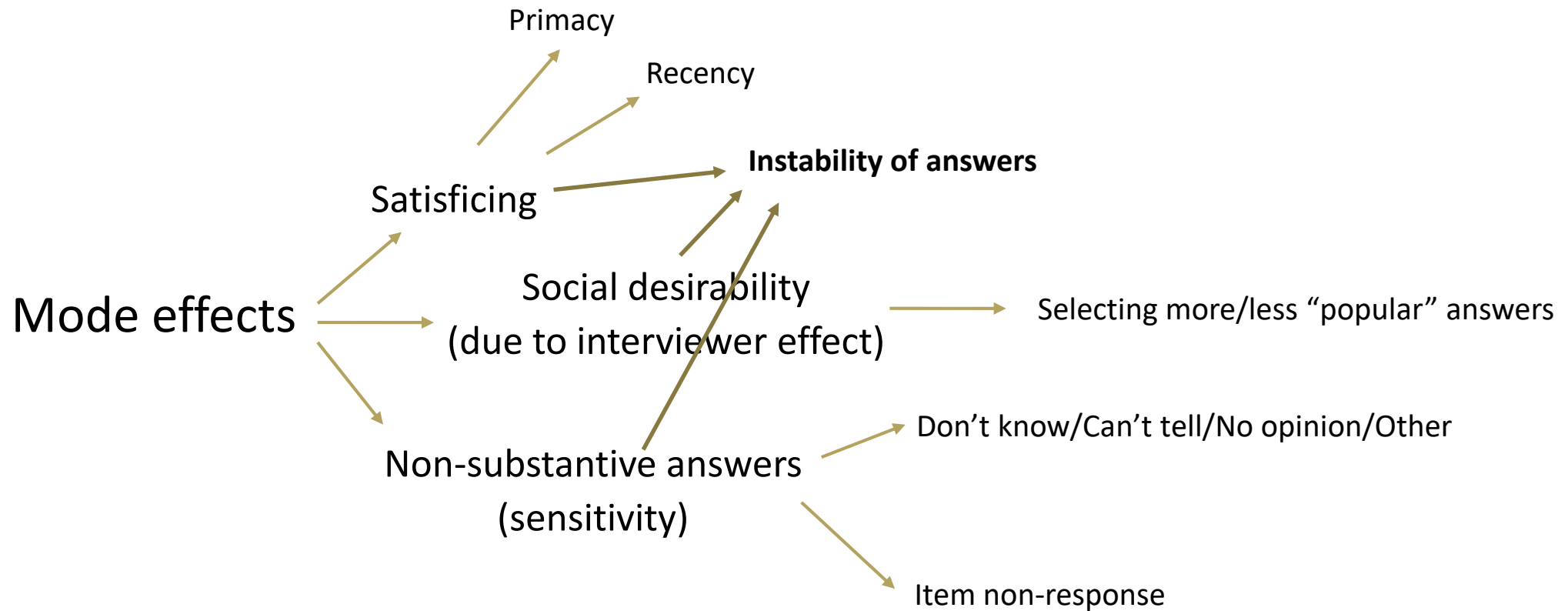
SWOT analysis (if switching is allowed/encouraged)



Is switching from interviewer-administered mode (telephone, offline) to self-administered mode (online) associated with changes of answers over time?

Does this switching influence:
- satisficing,
- social desirability,
- non-substantive answering?

Types of mode effects (in this paper)



Data

Title of Life in Australia™ survey	Month and year	Wave	Subsample size	
Australian Personas Survey, 2016	December 2016	1	n=2,603	3% mode switchers
ANU Poll 2017: Housing	March 2017	3	n=2,513	
ANU Poll 2017: Job Security	October 2017	10	n=2,270	
ANU Poll 2018: Populism	August 2018	19	n=2,220	
ANU Poll 2018: Data Governance	October 2018	21	n=2,150	1% mode switchers
ANU Poll 2018: Population	November 2018	22	n=2,167	



Survey items and derived items

Substantive survey items

- Satisfaction with the way Australia is heading (“satisfaction”)
- The most important problem facing Australia (“1st problem”)
- The second most important problem facing Australia (“2nd problem”)
- Party support in federal election for the House of Representatives (“party support”)



Derived response variables

- Any change of answers [(in)stability]
- Change from substantive to non-substantive answers and vice versa [sensitivity]
- Change from any substantive answer to the first listed answer and vice versa, satisfaction and party support items [primacy effect]
- Change from any substantive answer to the last listed answer and vice versa, satisfaction [recency effect]
- Change from less popular answers to more popular answers [social desirability]

Derived regressors

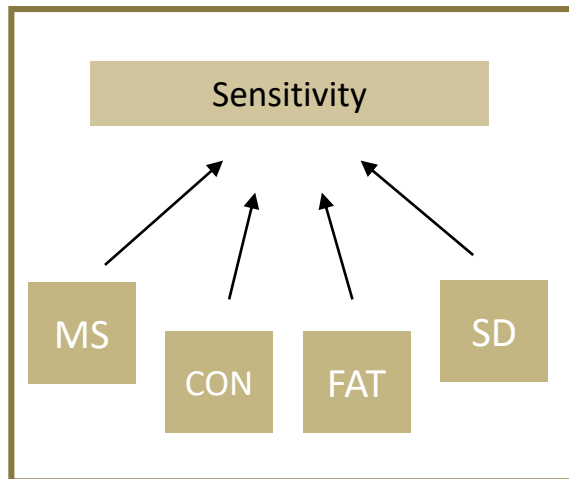
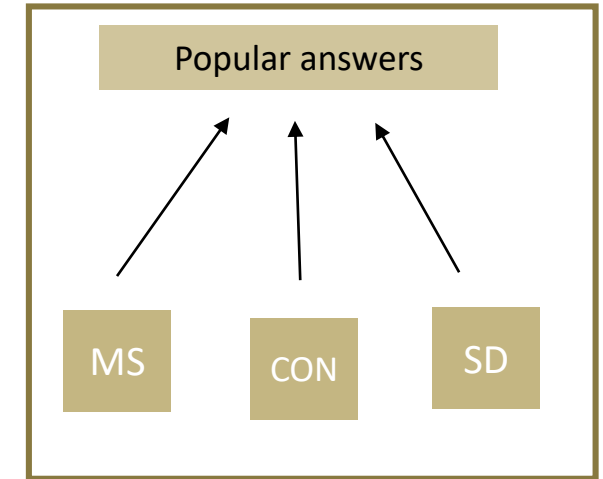
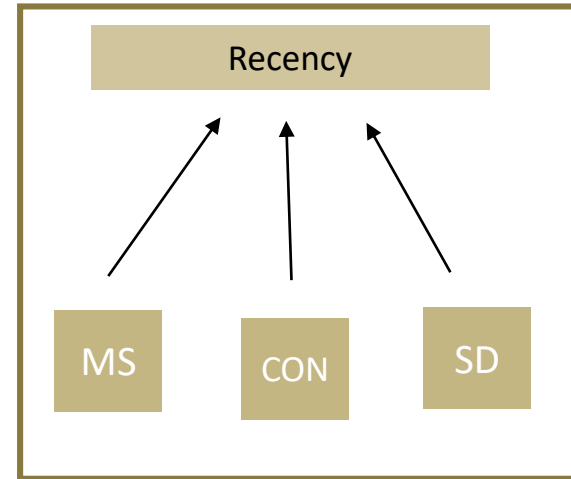
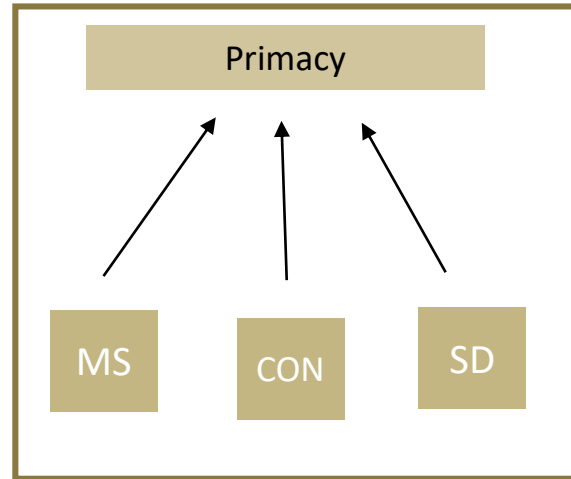
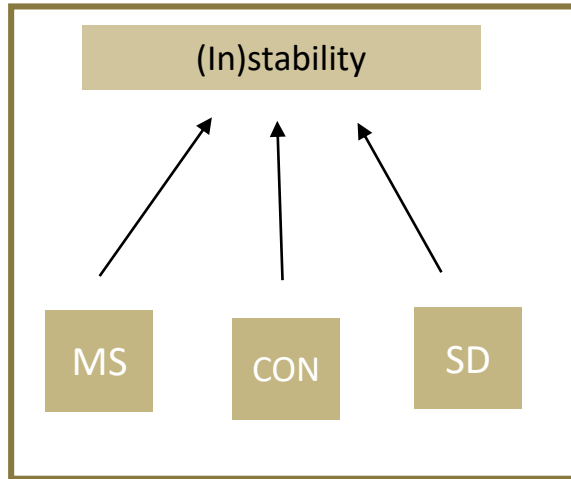
- Mode effects: change of mode
- Panel conditioning: no. of times a respondent was asked the same question, time in months since previously asked the question
- Panel fatigue: the total number of waves participated



Methods for identifying mode effects

- binary logit regression (pooled)
- multinomial logistic regression (pooled)
- multiple linear regression (pooled)
- fixed- and random-effect panel logit regression (+Hausman test)
- fixed- and random-effect panel OLS regression (+Hausman test)

(Panel) data analysis models



Pooled, fixed-effect and random-effect logit and OLS models

MS=mode switching

CON=panel conditioning

FAT=panel fatigue

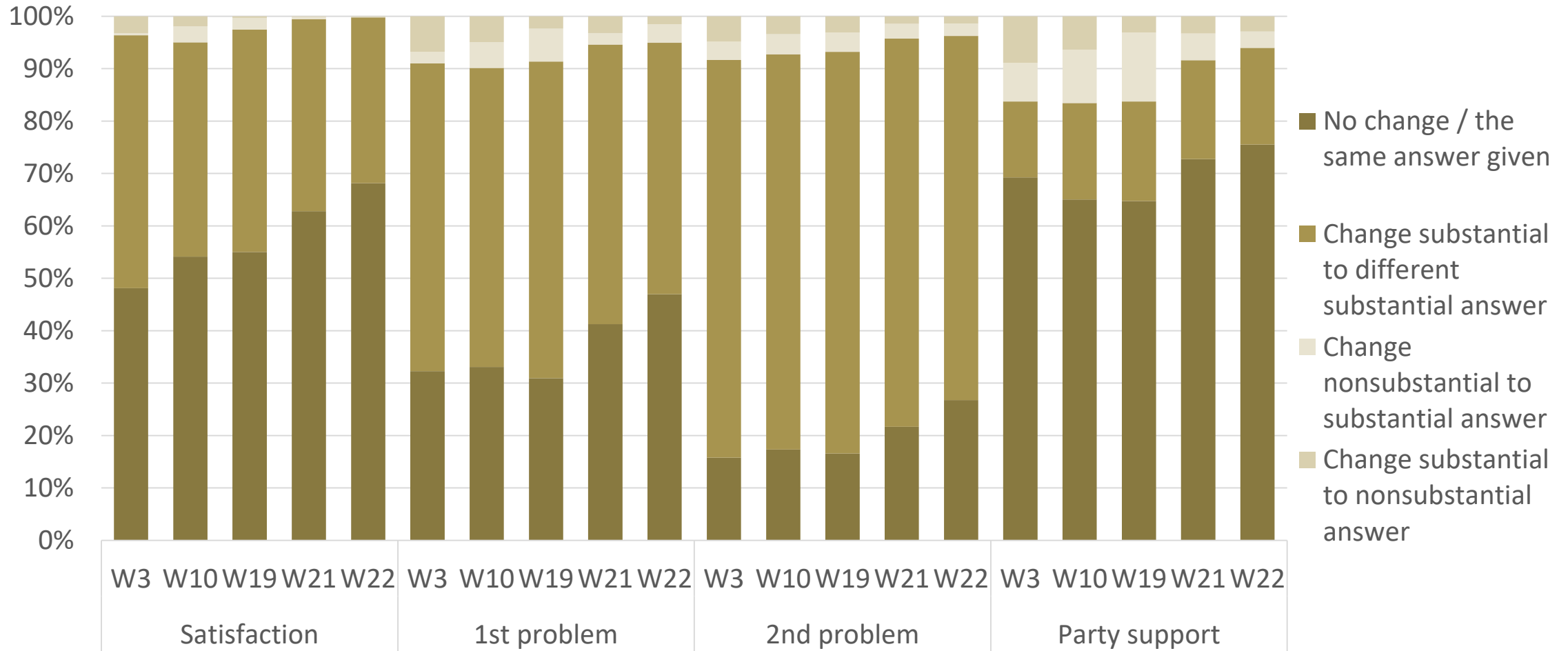
SD=socio-demographics



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Results – changes of answers over time



Results – (in)consistency of answers 1



Substantive repeated item	Predictor of any change in answers over time	Logit regression model (pooled)				Fixed-effect logit regression model			
		Coef	L 95% CI	U 95% CI	p value	Coef	L 95% CI	U 95% CI	p value
Satisfaction	Mode change (any)	0.28	-0.03	0.58	0.073	0.19	-0.28	0.67	0.430
	No. times question asked	-0.15	-0.18	-0.12	<0.001**	-0.23	-0.26	-0.19	<0.001**
	Months since question asked	0.03	0.02	0.04	<0.001**	0.03	0.01	0.04	<0.001**
1st problem	Mode change (any)	0.14	-0.19	0.46	0.416	-0.19	-0.67	0.29	0.430
	No. times question asked	-0.09	-0.12	-0.06	<0.001**	-0.16	-0.19	-0.12	<0.001**
	Months since question asked	0.05	0.03	0.06	<0.001**	0.05	0.04	0.07	<0.001**
2nd problem	Mode change (any)	-0.08	-0.48	0.32	0.696	-0.23	-0.81	0.35	0.440
	No. times question asked	-0.11	-0.15	-0.08	<0.001**	-0.17	-0.21	-0.12	<0.001**
	Months since question asked	0.04	0.03	0.05	<0.001**	0.04	0.02	0.05	<0.001**
Party support	Mode change (any)	0.26	-0.06	0.57	0.108	0.21	-0.21	0.63	0.325
	No. times question asked	-0.06	-0.09	-0.03	<0.001**	-0.09	-0.12	-0.05	<0.001**
	Months since question asked	0.05	0.04	0.06	<0.001**	0.06	0.05	0.08	<0.001**

Results – (in)consistency of answers 2



Derived variable	Predictor of <u>no. of changes in answers over time</u>	Multiple linear regression model (pooled)				Fixed-effect regression model			
		Coef	L 95% CI	U 95% CI	p value	Coef	L 95% CI	U 95% CI	p value
No. of any changes in answers in a wave (range 0-4)	Mode change (any)	0.15	0.01	0.30	0.039*	-0.01	-0.19	0.16	0.881
	No. times questions asked	-0.08	-0.09	-0.06	<0.001**	-0.10	-0.12	-0.09	<0.001**
	Months since questions asked	0.03	0.03	0.04	<0.001**	0.03	0.03	0.04	<0.001**
	Constant	2.06	1.96	2.16	<0.001**	2.22	2.17	2.27	<0.001**

Results – sensitivity



Derived variable	Predictor of <u>changes between substantive and non-substantive answers</u>	Multiple linear regression model (pooled)				Fixed-effect regression model			
		Coef	L 95% CI	U 95% CI	p value	Coef	L 95% CI	U 95% CI	p value
No. of changes between substantive and non-substantive answers in particular wave (range [-4,4], negative=non-substantive)	Mode change: online to telephone	0.06	-0.06	0.17	0.336	0.10	-0.09	0.29	0.309
	Mode change: telephone to online	0.01	-0.10	0.12	0.872	0.06	-0.09	0.21	0.448
	No. times questions asked	-0.01	-0.02	0.00	0.088	0.01	-0.02	0.04	0.414
	Months since questions asked	0.02	0.01	0.02	<0.001**	0.02	0.02	0.02	<0.001**
	Panel fatigue indicator	0.010	0.007	0.013	<0.001**	0.01	0.00	0.01	0.026*
	Constant	-0.11	-0.16	-0.05	<0.001**	-0.17	-0.20	-0.13	<0.001**

Results – recency



Substantive repeated survey item	Type of change	Predictor of <u>recency change over time</u>	Logit regression model (pooled)				Random-effect logit regression model			
			Coef	L 95% CI	U 95% CI	p value	Coef	L 95% CI	U 95% CI	p value
Satisfaction	Substantive answer to last offered answer	Mode change: online to telephone	1.06	0.35	1.78	0.004**	1.05	0.17	1.92	0.019*
		Mode change: telephone to online	-0.60	-2.01	0.82	0.408	-0.78	-2.30	0.75	0.319
		No. times question asked	-0.13	-0.20	-0.06	<0.001**	-0.13	-0.21	-0.06	0.001**
		Months since question asked	0.02	0.00	0.05	0.086	0.03	0.00	0.06	0.033*
	Last offered answer to other substantive answer	Mode change: online to telephone	0.33	-0.70	1.35	0.533	0.26	-0.88	1.40	0.659
		Mode change: telephone to online	0.72	-0.06	1.51	0.072	0.75	-0.13	1.64	0.096
		No. times question asked	0.04	-0.03	0.11	0.278	0.04	-0.03	0.12	0.288
		Months since question asked	0.06	0.04	0.09	<0.001**	0.07	0.04	0.10	<0.001**

Results – primacy and social desirability

Primacy

- Satisfaction item
- No mode effects
- “No. times question asked” with a positive effect on any change
- “Time in months since question asked” with primacy related changes (or lack of changes)
- No major differences between pooled and random-effect models

Social desirability

- Satisfaction (higher satisfaction), party support (the main 2 political parties), 1st problem in Australia (most popular opinion answers, environment) items
- Mode change “telephone to online” with positive effect on decreased satisfaction (pooled only)
- “No. times question asked” with negative effect on any change (satisfaction, party support), mixed evidence for 1st problem
- “Time in months since question asked” with a social desirability related changes
- Some differences between pooled and random-effect models



Key findings

- **answers** from the same respondents **vary greatly over time**
- **switching decreased the stability of answers**, had a positive effect on recency when switching to interviewer administered telephone mode (interviewer effect), and some negative effect on social desirability when switching to self-administered online mode
- several other coefficients **indicated an impact of switching modes** on changing answers consistent with the mode effect literature (but at **p=0.1**, not p=0.05 or p=0.01) – some evidence that switching modes can affect accuracy (we need a bigger sample)
- **a lot more panel conditioning**: the more times the same question is asked over time, the lower the probability for changes; the longer the gap in months between questions are asked, the lower stability of answers (particular changes normally attributed to mode effects)
- controlling for panel conditioning and fatigue was a smart decision to make

Recommendations

- switching modes might influence more measurement error due to satisficing and social desirability if the proportion of mode-switchers was higher – **mode switching should be controlled if measuring changes over time**
- researchers should pay extra attention if the same questions are asked **several times in a short period of time**, which might prevent respondents from reporting naturally changed attitudes over time (but annual or biennial longitudinal data collection should be less affected by panel conditioning)
- **online panels might not be the best solution** for measuring change over time (if frequently asking the same question)
- in panel data collection settings, there are **additional sources of measurement errors** - once you combine mode switching effects with panel conditioning and fatigue, accuracy might suffer
- the results also make us think if single-mode approaches (e.g. providing tablets) would control for measurement errors better

Thank you for your attention!

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