Impact of mode design on measurement errors and estimates of individual change

Alexandru Cernat

Mixed mode designs as the new standard

"Ryan's a late adopter."

Mixed modes may solve some of the current problems in surveys

It lowers costs
by using cheaper modes first

It lowers non-response
coverage, non-contact and refusals

Literature on mixing modes is still growing

Selection?

Measurement?

And their interaction?

Research on mixing modes in longitudinal data is even scarcer

Attrition
non-response in later waves

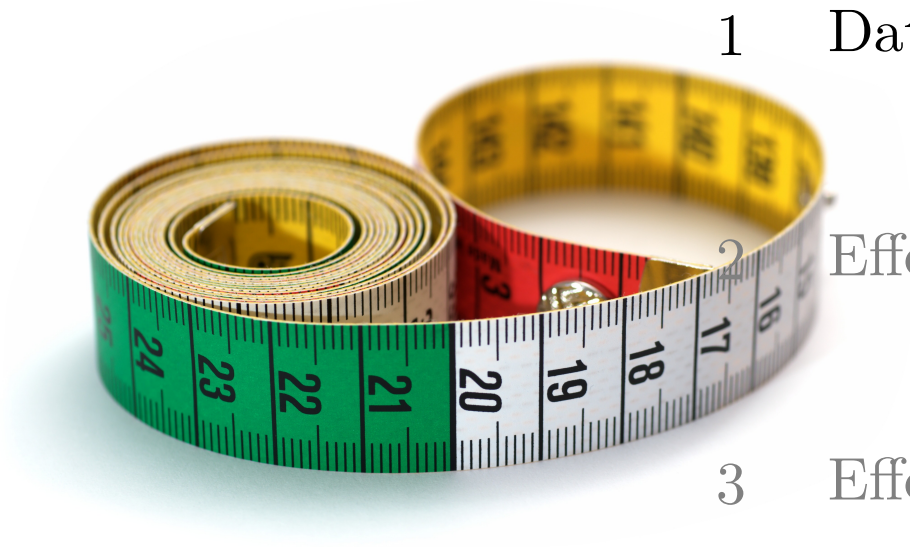
Panel conditioning
bias due to previous measures

Estimates of change
how people change in time

Mixed mode effects in longitudinal studies

Mode design effects on measurement:
are minimal.
The mixed mode design overestimates change
in **4 out 12 items**.

Mode effects in longitudinal data



1 Data and design

2 Effects on measurement error

3 Effects on estimates of change

Data used:
Understanding Society Innovation Panel

UK probability household panel
used mainly for methodological experiments.

Included a mixed mode experiment
in wave 2 (n ≈2500): CAPI vs. CATI-CAPI.

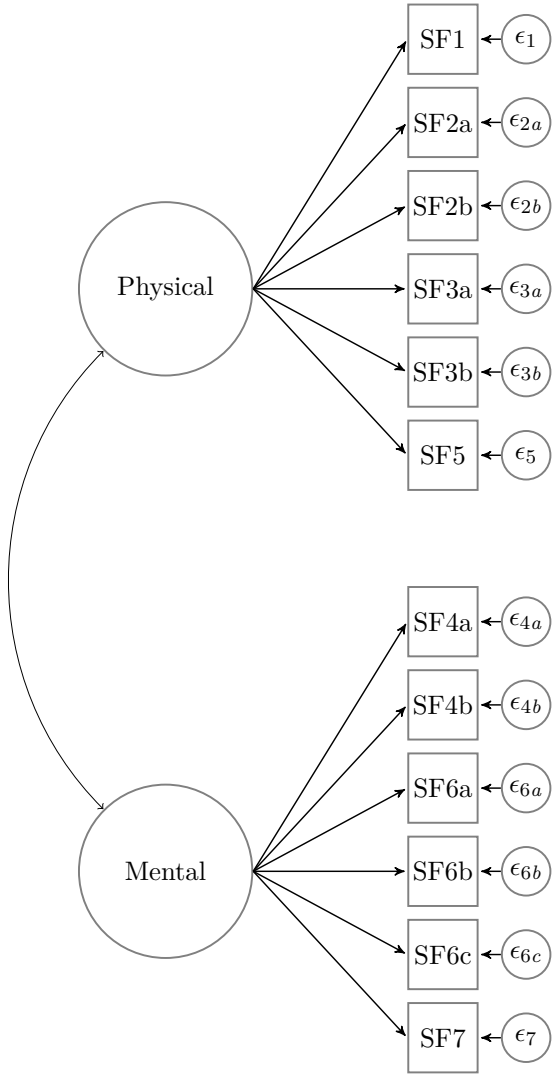
Experimental design

Group	**Wave 1**	**Wave 2**	**Wave 3**	**Wave 4**
R_{CAPI}	O_1	O_2	O_3	O_4
$R_{CATI-CAPI}$	O_1	XO_2	O_3	O_4

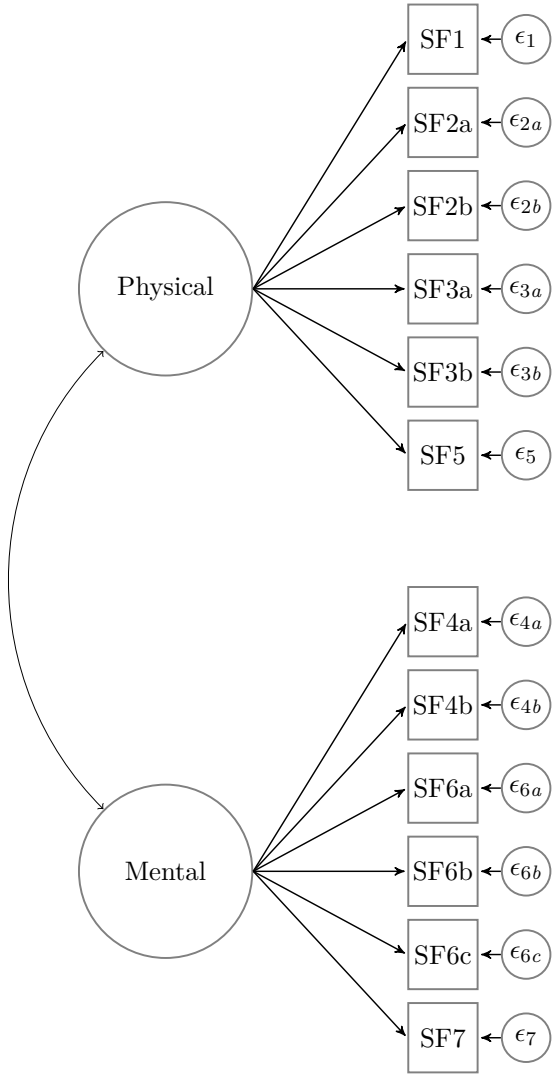
SF12 mental and physical health measure

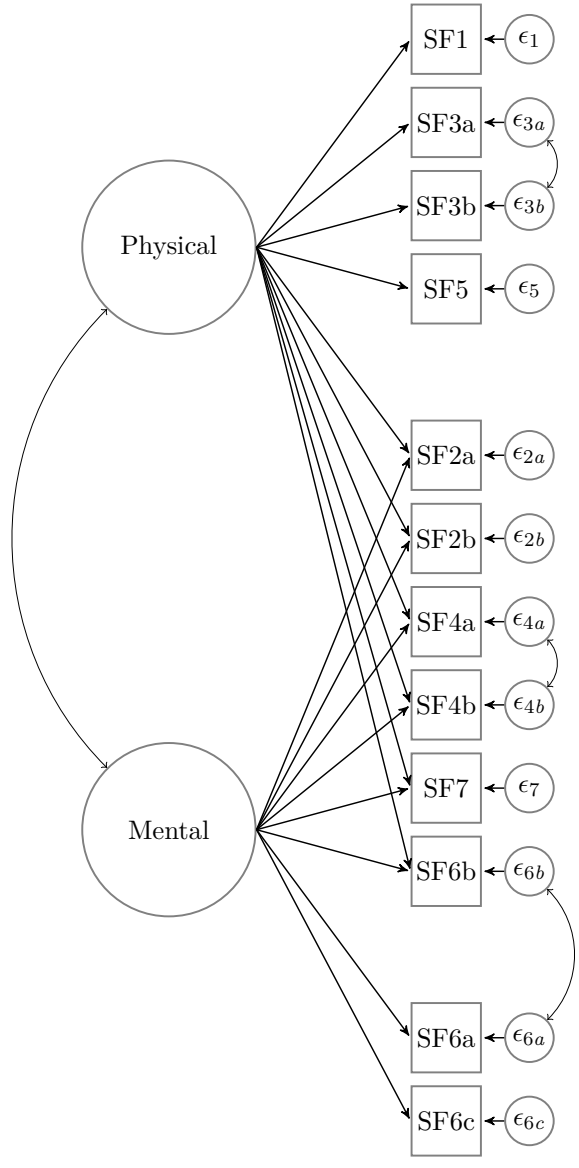
Dimension	Subdimension	Code	Abbreviated content
Physical	General health	SF1	Health in general
	Physical functioning	SF2a	Moderate activity
		SF2b	Climbing several flights
	Role physical	SF3a	Accomplished less
		SF3b	Limited in kind
	Bodily pain	SF5	Pain impact
Mental	Role emotional	SF4a	Accomplished less
		SF4b	Did work less carefully
	Mental health	SF6a	Felt calm and peaceful
		SF6c	Felt downhearted and depressed
	Vitality	SF6b	Lot of energy
	Social functioning	SF7	Social impact II

SF12 measurement model

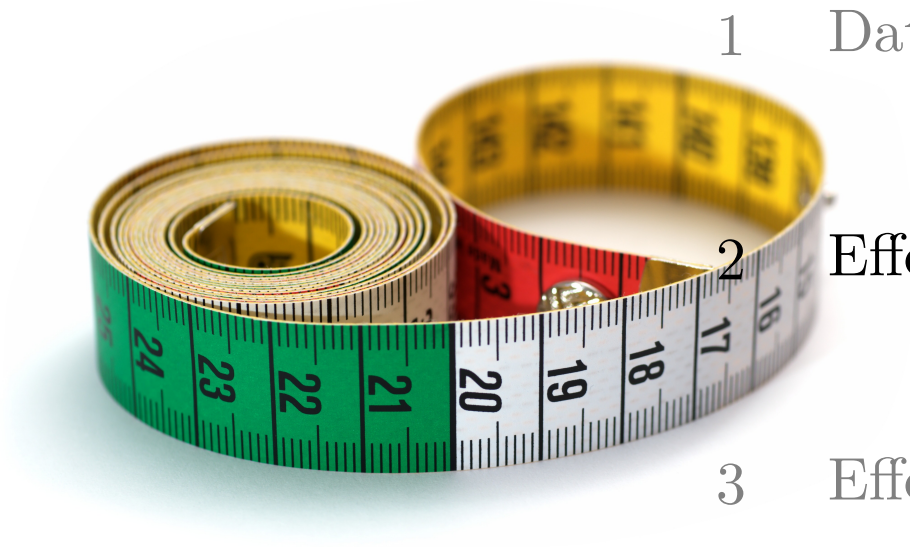


SF12 measurement model





Mode effects in longitudinal data



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Using MGCFA to estimate mode design effects on measurement

Compare across the 4 waves:
- random error;
- systematic error;
- substantive coefficients.

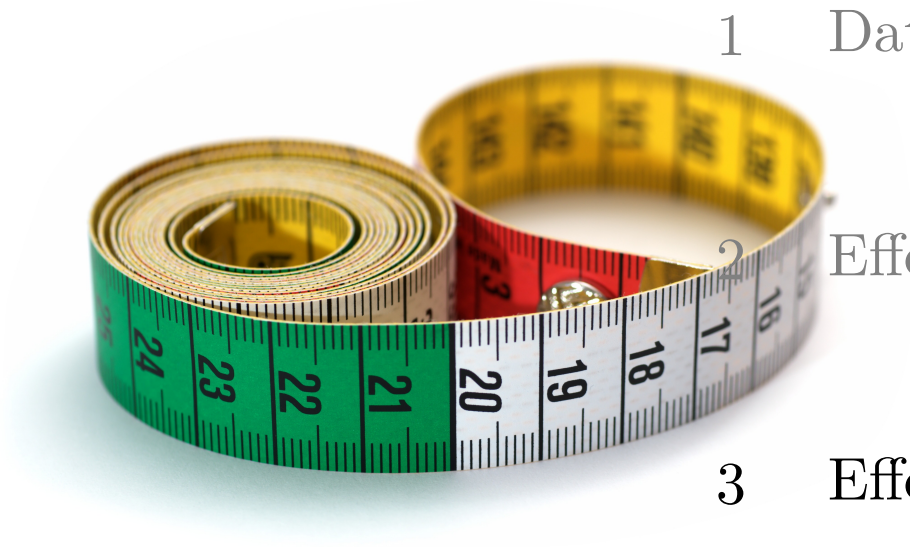
Investigate effects:
- in the wave in which MM was implemented
- in subsequent waves.

Findings of MGCFA

In wave 2 -> small differences (1 in 12):
Felt calm and peaceful.

Effects in subsequent waves -> 1 in wave 3:
Did work less carefully.

Mode effects in longitudinal data



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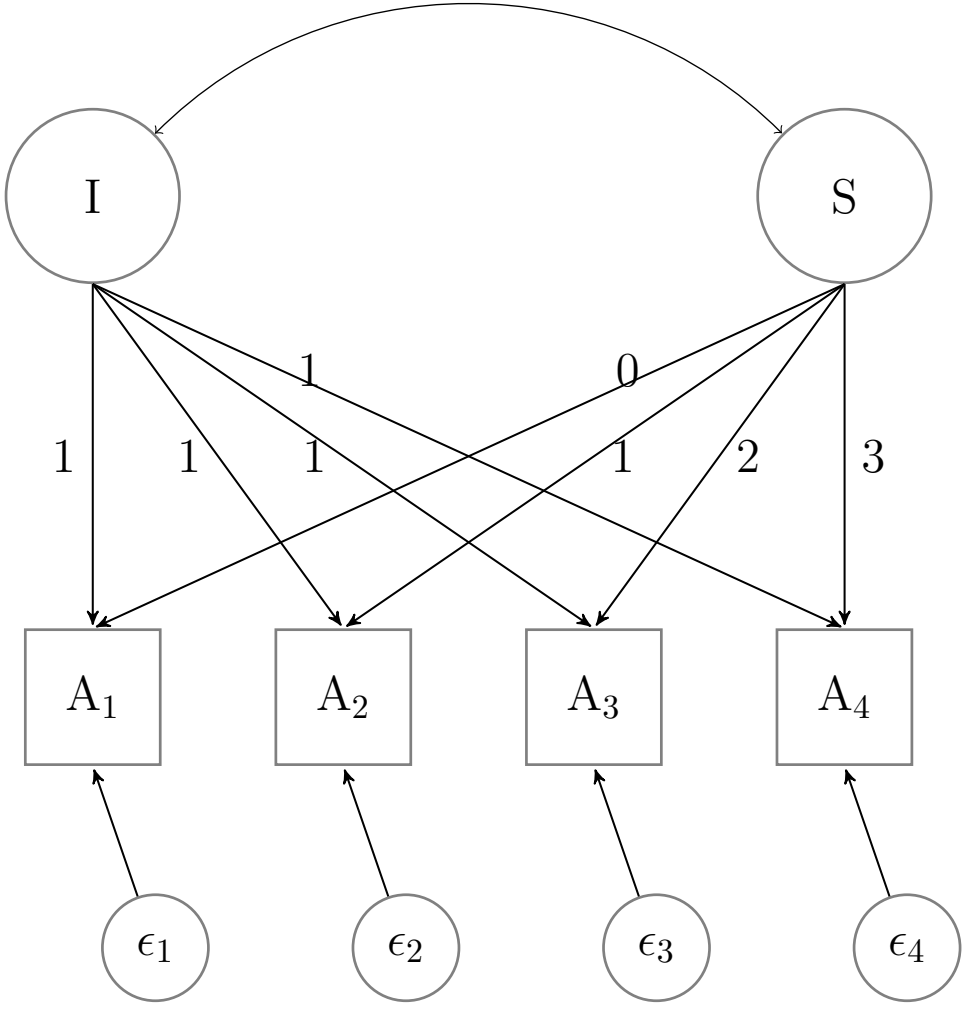
Calculating estimates of change
Latent Growth Models



Four out of 12 items overestimated change in the mixed mode design

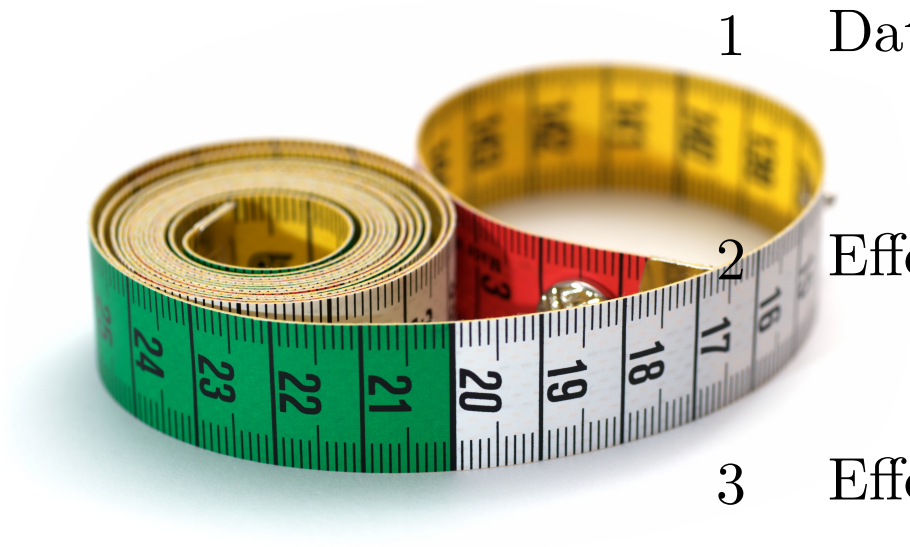
Felt calm and peaceful

Felt downhearted and depressed

Lot of energy

Heath interferes with social activities

Mode effects in longitudinal data



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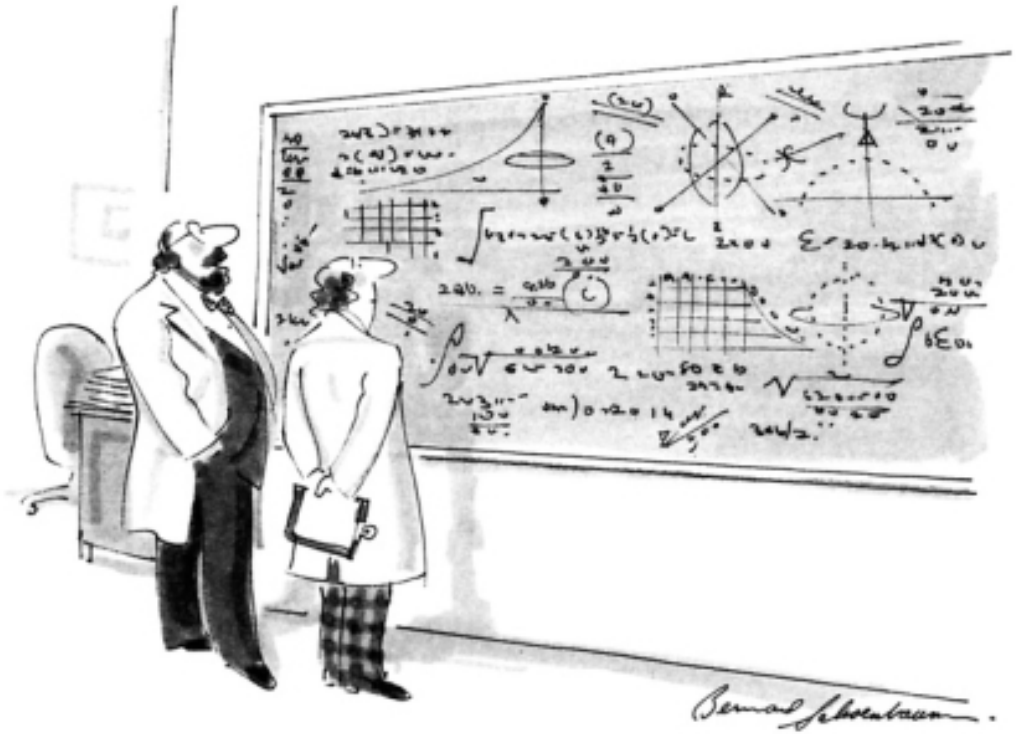

"Oh, if only it were so simple."

Published December 28, 1987 ©New Yorker

Mode effects in longitudinal data

Full paper: tinyurl.com/Cernat-AW

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