

Mode Effects in an Embedded Experiment

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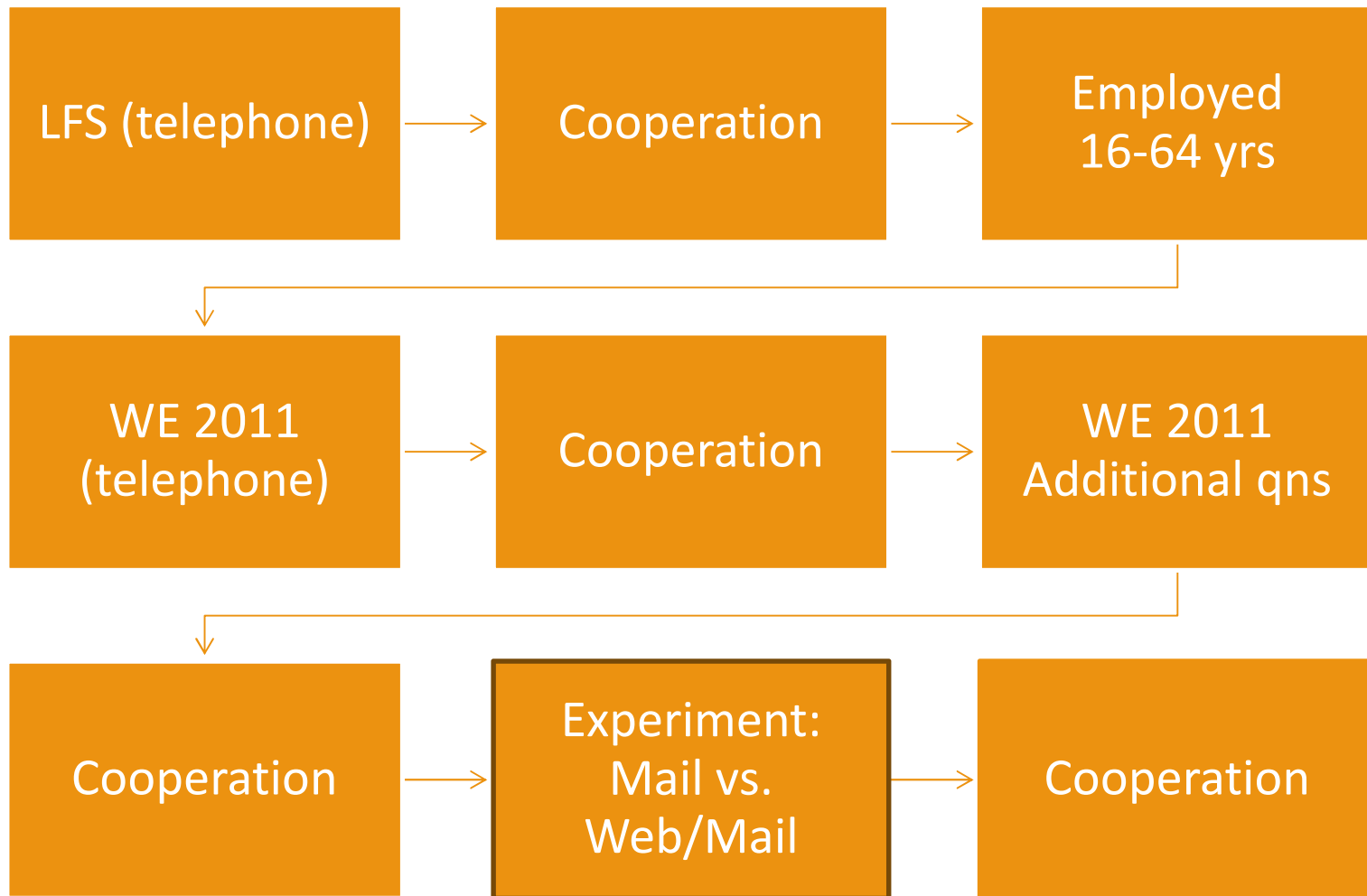


Introduction

- The survey: The Work Environment 2011
- Task: From Mail to Web/Mail
- Embedded Experiment
 - What to Include in the Publication?
- Mode Evaluation
 - Who Chooses Mail?
 - Test of mode effects
 - Is Mixed Mode Better?



The Survey: The Work Environment 2011





Task: From Mail to Web/Mail

Goal to go from mail to web/mail

- Secure statistical production
 - Two random subsamples, power calculations*) →
 - **MAIL**: 60% of sample
 - **WEB/MAIL**: 40% of sample
 - Test, and if OK use both samples

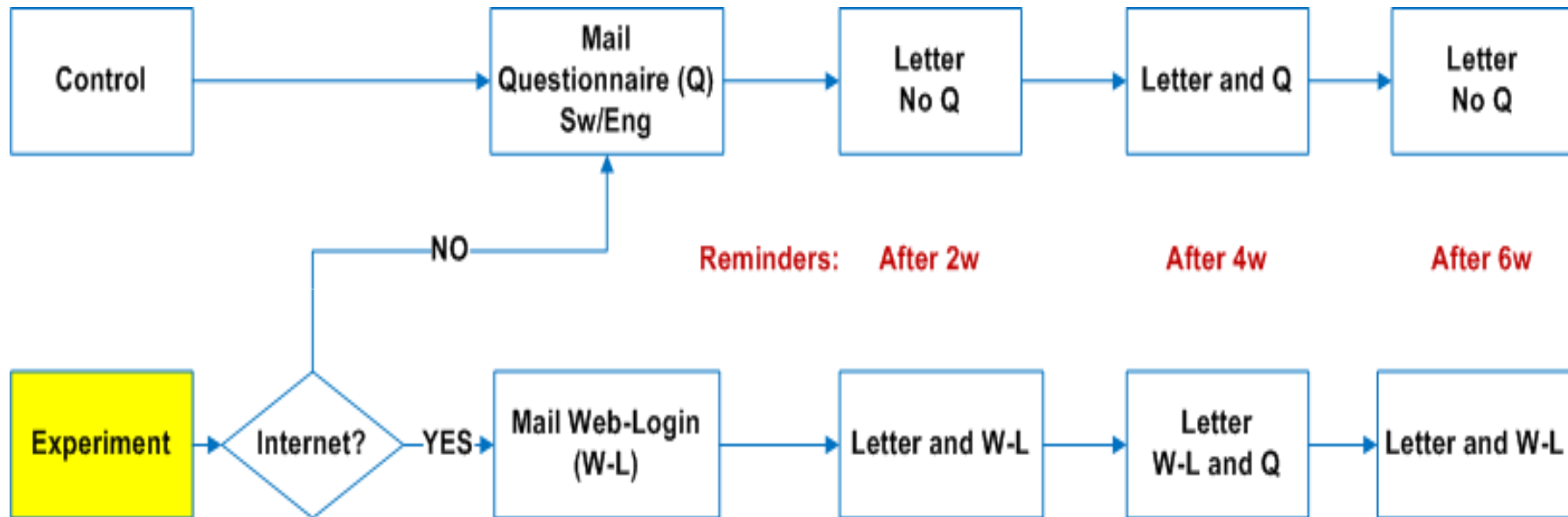
and

- Investigate mode effects



*) See *Sample Size Calculations in Clinical Research* by Chow, Shao and Wang (2003)

Embedded Experiment: Treatments





Embedded Experiment

Cognitive work: Translating the mail questionnaire to a web questionnaire.

Investigated central variables:

- Access to occupational **Health Service**?
- **Pain in Back or Neck**, during the last three months?
- Frequently, every day, **Lifting Heavy Things**?
- **Exposed to Noise** during work?
- In charge of own **Working Pace**?
- Own experience of **Workload**?

A rough translation ...



Indicators: Use both samples

Sample	Sample size	Response	BI_1	$dist_{r/nr}$
Control: MAIL	7458	0.64	0.704	0.616
Experiment: WEB/MAIL	4930	0.56	0.708	0.589

The indicators depend on a given \mathbf{x} -vector.

[\mathbf{x} -vector: Gender, Age, Origin, Education, Civil status, Children, Type of Employment, Trade-union, Public sector]

BI_1 belongs to the R-Indicator family and $dist_{r/nr}$ measures the distance between the respondents and nonrespondents.

The indicators are found in Lundquist and Särndal (2012) *Aspects of Responsive Design for the Swedish Living Conditions Survey, R&D report, Statistics Sweden*



Estimation: Use both Subsamples

Some minor differences in subsamples when comparing $\bar{y}_{CONT+EXP}$ with \bar{y}_{CONT} for gender and three age-groups.

It was decided to use both subsamples in the production.

[\bar{y}_{\bullet} refers to the selected central variables]



New estimation: mode in auxiliary vector

The auxiliary vector is enlarged with the dummy-variable **Web-access**. Multiple phases with auxiliary information on higher phases forced us to use an estimated population marginal instead of information on sample level^{*)}.

The auxiliary information is in this case estimated from: Use of Computers and the Internet by Private Persons in 2011, UCIPP(2011).

With new auxiliary variable: No significant changes in point estimates, the variance decreased in some groups.

^{*)} Särndal and Lundström (2005) *Estimations in Surveys with Nonresponse*, demonstrates the use of calibration information on sample level.





Evaluation: Who Chooses Mail?

- UCIPP(2011) estimated the access to Internet to 97%
- In WE(2011) the internet access in the experimental sample was about 87% *[An interviewer effect?]*.
- Those who *chose* mail in the experimental sample are:
 - Older [50+], born outside the Nordic countries, part time workers, low educated



Evaluation: Test of Homogeneity

Variables	Cont _{Mail} vs. Exp _{Web/Mail}	Exp _{Mail} vs. Exp _{Web}	Cont _{Mail} vs. Exp _{Mail}	Cont _{Mail} vs. Exp _{Web}
Health Service ^{a)}	Sign ^{*)}	-	-	Sign ^{*)}
Pain in Back or Neck ^{b)}	-	-	-	-
Lifting Heavy Things ^{b)}	-	Sign ^{*)}	Sign ^{*)}	-
Exposed to Noise ^{b)}	-	Sign ^{*)}	Sign ^{*)}	-
Working Pace ^{b)}	-	Sign ^{*)}	Sign ^{*)}	-
Workload ^{b)}	-	-	-	-

Proc Logistic in SAS, factors in **x**-vector included in models

^{*)} Significant at the 5% level

^{a)} Logistic regression (yes/no)

^{b)} Multinomial logistic regression (ordinal variables, four or five alternatives)



Evaluation: Is Mixed-mode better?

Difficult to say

- Lower response rate but same representativity,
- Both *selection effect* and *mode effect*,
- Mixed-mode design [*change to uncontrolled?*],
- Improve access to web response,
- How to include mode in estimator?,
- Minor savings to use mixed-mode...

