



Aalto University

Quantitative Methods - Surveys

About completed theses –
quantitative methods used

ISM-E5001 Master's thesis seminar

Questionnaire objectives

- Starting point: the research questions and the theoretical framework
- Translate the info needed into survey questions
- Make the respondent involved and finish the interview - motivation
- Minimize the response error

Questionnaire questions must be based on previous research

- Do not design a questionnaire before defining your theoretical framework, and exploring the literature. You probably can utilize existing surveys and existing scales

Important points in questionnaire planning 1/2

- Think what is being studied and why and how
- What are particular sets of questions you ask

Important points in questionnaire planning 2/2

- Form and layout
- Thorough **pre-testing**
- How to overcome inability and unwillingness to respond – rewards?

Your questions in a survey are typically related to

Traditional descriptors (demographics, socio-economic variables etc.)

Multi-item measures (constructs, scale)

Preference measurement

Measurement and scaling

PRIMARY SCALES OF MEASUREMENT

Nominal

Ordinal

Interval

Ratio

Different scales require different statistical methods

Multi-item measures (constructs)

- Several related questions, typically on a Likert scale are asked (responses to certain questions are expected to be correlated)

Example of multi-item questions

- PONDE When I am studying the course materials, I usually stop once in a while to think if I have actually understood the contents of the material
- REPEA When I am preparing for the exams, I often repeat in my mind the things to be studied again and again
- CONCE When studying, I often concentrate only on the content that I expect to find in the exam
- SCHED I often find it difficult to stick to the schedule during the course
- ARGUM When I am reading the course materials, I usually carefully ponder if the author's hypotheses are correct and argumentation strong
- FOCUS On a course, I often skip the most difficult tasks and only focus on the easiest ones

- THESE QUESTIONS ARE PART OF THE SCALE OF STUDY ORIENTATIONS AND THEY ARE USED IN SEVERAL COUNTRIES

Multi-item measures –why?

- RELIABILITY – with a single item (question) people are less likely to give consistent answers over time.
- VALIDITY – more holistic picture is received if multiple questions are asked
- When questions are asked there is an expectation which question responses are correlated

Multi-item measures – how?

- Multi-item measures can be formed e.g. using *exploratory factor analysis*. Known structures can be tested by *confirmatory factor analysis*

Use already tested questions if possible

- Can be found in literature
- E.g. Handbooks of Marketing Scales
- There exist many standardized scales, e.g. the Schwartz scale for inner values

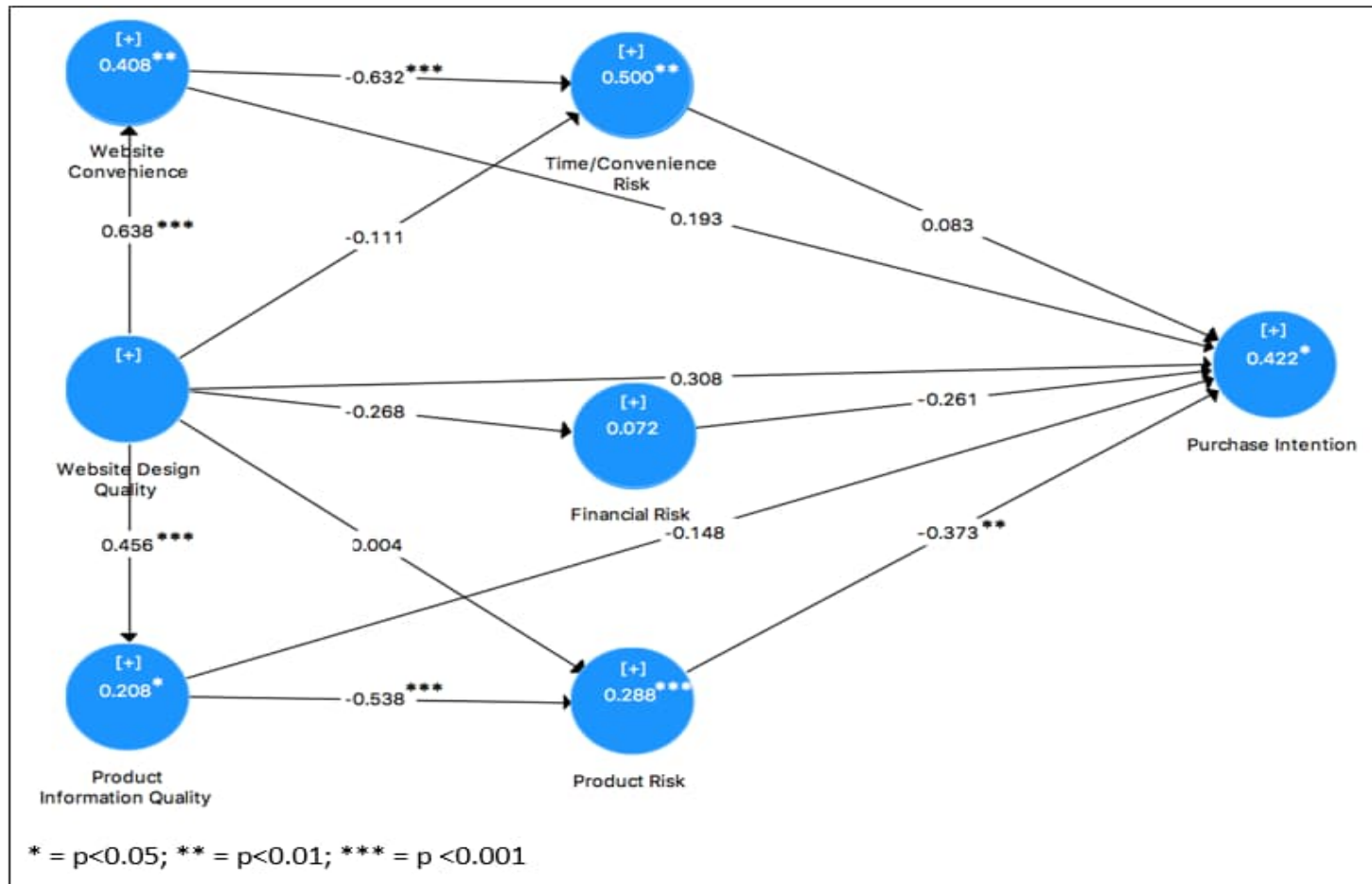
RANDOMIZE THE ORDER

- You need to take care of the bias a certain order of the questions may create!!

Analysis of the data of surveys

- Typically with traditional statistical methods :
multivariate methods (e.g. factor analysis,
discriminant analysis),
parametric/nonparametric tests, regression
- Also with confirmatory factor analysis and
SEM (structural equation modeling)

SEM assesses and tests the relationship of constructs – often with survey data



Choice based conjoint analysis (CBC) for preference measurement

- Can be embedded in addition to other questions in questionnaire
- Enables to see what respondents' valuations are with respect to some product/service
- Is not restricted to marketing purposes, is employed everywhere in business
- Is able to study the heterogeneity of the respondents' valuations

CBC – example

Imagine you are ordering, for example, a mobile phone from an e-store. You have three options that differ only in aspects that are described below. Please choose the best alternative.

Webshop	JD	Tmall	Tmall
Delivery	Delivery within 1 day to a pick-up point	Delivery in three days after order, time chosen among time slots	Delivery same day evening (morning order) or in three days after order, time chosen among time slots
Payment	Pay online at the same time as the order is done OR pay when you receive the product	Pay online at the same time as the order is done	Pay online at the same time as the order is done OR pay when you receive the product
Return policy	Return accepted only if quality problem	Return accepted within 7 days with unopened package	Return accepted within 7 days with unopened package

Best-worst scaling – a related method

Assess which kind of information you would like to see when browsing the book information in the e-store.
Which of the next four features is most important and which is least important for you?

Most important		Least important
<input type="radio"/>	<i>Recommendations to other books</i>	<input type="radio"/>
<input type="radio"/>	<i>Sample of the text</i>	<input type="radio"/>
<input type="radio"/>	<i>Evaluation using stars basing on more than 100 opinions.</i>	<input type="radio"/>
<input type="radio"/>	<i>5% discount</i> of the books that I buy in the e-store.	<input type="radio"/>



Survey software

- Lighthouse Studio (conjoint analysis and best-worst scaling)
- Discover, a simpler web-based version of Lighthouse Studio
- Webropol
- Qualtrics

Statistical software in Aalto BIZ

- Such as SAS EG or SPSS or R are a convenient way to do data analyses
- For conjoint analysis Lighthouse Studio/Discover
- SPSS Amos for SEM and confirmatory factor analysis

Recent completed theses

Many of the theses originate from a company project. Sometimes students are paid but not always. If you are paid then tell the company about the possibility to deal with the payment as a scholarship via Helsinki School of Economics Foundation.

Other topics are more or less results of a brainstorming session with a student. It is not rare that a thesis forms a basis for a journal article with the professor.

Methods: Predictions, forecasts

- Typically several methods compared from traditional statistics to deep learning
- Example: Adding weather data into sales forecasting for upstream demand

Methods: Decision analysis, optimization, simulation, text analytics

- Facilitating public procurement processes with **multi-criteria decision analysis**
- Enhancing transit project decisions with a **scenario approach**
- Portfolio Approach to Counterparty Credit Risk (**simulation**)

Topics: games

- Measuring playability of players and its relation to perceived enjoyment (scale development, factor analysis, regression)
- Players' preferences and main motivational factors in online roleplaying games: case Vietnam (conjoint analysis)
- Price experimentation – optimizing revenues in a casual mobile game (experiments)

Topics: sustainability

- Environmental Responsibility of Publicly Listed Companies in Finland (regression)
- The effect of perceived quality and perceived sustainability on customer loyalty (SEM)

Topics: digitalization

- Developing a scale for patient experience in teledermatology (scale development)
- The relationship of value priorities and attitudes towards influencer marketing (questionnaire, basic statistical analysis)
- Is remote work here to stay? A Choice based conjoint analysis study of employee preferences in the post-pandemic era (conjoint analysis)

Where to get data?

- If you are looking for data (and not gathering that yourself) consider

<https://datahub.aalto.fi/en>

Thank you!