Research. This is it!

Guidelines how to design, perform and evaluate quantitative and qualitative research

Ben Baarda

Second edition

Fully revised second edition

Noordhoff Uitgevers

Mistakes researchers often make

A synopsis of the contents of *Research. This is it!*

The research question has not been formulated clearly!

Chapter 1
What does the researcher want to find out?

The research is not feasible!

Section 1.6
Can the research be carried out?

Conclusions not possible with this form of research!

Sections 2.2 and 2.3
What type of research is indicated?

Research. This is it!

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Introduction

‘A life without research is unimaginable’

Research is a part of life and not a hobby of stuffy scientists. You come across research on a daily basis when you open up the daily newspaper. Policies implemented by many companies and governmental institutions are based on research. Decisions on how products and services need to be presented but also decisions on whether they should invest or not and the evaluation of services and trainings are based on research. Therefore in your future profession you will definitely use research results and possibly do research yourself. It is important that these research results are valid and reliable.

In *Research. This is it!* I will explain what valid and reliable research constitutes and how you can do research. To this end I will start with the assessment of the research and end with the report and an advice. To illustrate my story I mostly use examples from daily Life which can be found on the internet. The idea is that the research is done from behind a desk as much as possible. Research also needs to be possible when you do not have expensive software, for example when you are doing your internship in a small company or abroad. Therefore I will not only discuss SPSS, but also analysis procedures, data collection methods and statistical analyses which are available to everyone on the internet free of charge. When for instance using Excel quite a few statistical analyses can be performed and there is also software available for web surveys which are simple but quite good.

This book primarily focusses on applied research. So in essence research that contributes to practical solutions. The special focus of the book is that both quantitative and qualitative research are discussed. Quantitative research is performed so as to determine something by way of numbers that are analysed. Qualitative research is used for discovery e.g. what are the causes of the problem. To this end you mainly analyse texts like transcripts of interviews. Examples of both types of research will be given and for further reading websites will be referred to in most cases.

www.researchthisisit.noordhoff.nl contains a great deal of supporting material, including test questions, examples of research studies, Internet sites where additional information can be found, a short SPSS and Excel manual and an interactive program to help you write a research proposal.

Finally I want to thank all teachers for their remarks and advice in concerning the first edition which has led to the improved second edition. The most important changes are that the texts in the second edition have become more structured and the examples have been updated.

The Hague, spring 2014
Ben Baarda

Contents

Study guide

Research. This is it! discusses the theory and practice of quantitative and qualitative research with a with a practical approach. The structure of the book is such that it follows the steps when doing a research study. It starts with the research problem and ends with a report of the research study. In four chapters you will learn how to design, outsource and evaluate a research study as well as write a research proposal (see table below).

Table The four components of a research study/proposal

Chapter 1	What does the researcher want to study and why does he want to study this?
Chapter 2	Can the researcher's research proposal lead to answers to the research question? Has the researcher collected data from or over persons, institutions or objects which are representative for the persons, institutions or objects which are the units of analysis?
Chapter 3	Has the researcher collected the data in an appropriate way? Have the appropriate data collection methods been used and have they been applied correctly?
Chapter 4	Have the research data been processed and analysed by the researcher correctly? Have the results and conclusions been reported correctly and has a valid conclusion been drawn?

Index/glossary
Each chapter starts with a list of important terms and on which page the term is mentioned for the first time. In this way you can easily find these terms in the text.

Structuring the chapter
Each chapter starts with the title of the chapter and which paragraphs will be discussed.

1 What does the researcher want to study?

Blue and green lines
Research. This is it! discusses quantitative and qualitative research.
- A blue line indicates that it concerns quantitative research.
- A green line indicates that it concerns qualitative research.
- No line indicates that it concerns both quantitative as well as qualitative research.

Quantitative research

Ad b Quantitative research
If your research question has a narrow scope and you know what to expect when you interview or observe someone, then you can do quantitative research. In regard to aggressive behaviour of children much research has

Ad a Qualitative research
In case of an open research question qualitative research is best suited. In most cases the research question has a broad scope and there is relatively little prior knowledge. This implies that most often a structured questionnaire or checklist for observation will not be used. Your subjects can gener-

Examples
Most examples can be retrieved from the internet. In case of an example a short url will be provided. In the list of references at the end of the chapter you will find the detailed web links. For example:

Websites
- www.knmg.artsennet.nl
- www.esomar.org
- www.intraval.nl/nl/d/d01_hoofdstuk5a.html
- www.hyperdictionary.com/
- scholar.google.nl
- www.scirus.com/
- www.ncbi.nlm.nih.gov/pubmed
- www.narcis.nl/
- books.google.com/
- www.researchthisisit.noordhoff.nl

Tips
In *Research. This is it!* you will find many tips. For example:

TIP!!!: WHEN DOING RESEARCH FIRST MAKE A DATA MATRIX

By designing a data matrix it becomes clear what the units of analysis and what the constructs of the units of analysis are.

List of decisions and study guide
At the start of every (sub)paragraph you will find a list of decisions which summarizes the content of the next (sub)paragraphs.

1.1 What are the research objectives and research question(s)?

Checklist
At the end of every paragraph you will find a checklist. See example.

CHECKLIST 1.1 HOW DO YOU GET FROM A PROBLEM TO A RESEARCH QUESTION TAKING THE OBJECTIVES INTO ACCOUNT?
- What is the problem from which the research stems?
- Why is the research being done?
- Is the research ethically acceptable?
- What is the research question?

Further reading
At the end of each chapter you will find suggestions for further study on the topics which have been discussed in the chapter. This could be books, articles, websites but also videos you can find on the internet. See example.

Further reading

Books
- Robson discusses in detail the problem analysis and formulation of the research question in regard to applied research:
  Robson, C. (2011) Real world research (3rd edition). Malden: Blackwell.
- Malhotra and Birks also discuss in detail the problem analysis and the formulation of the research question but in the context of market research:
  Malhotra, N.K. & Birks, D. (2006) *Marketing Research: An Applied Approach*. Essex: Pearson.
- In regard to quantitative research more detailed information can be found in:
  Baarda, B. e.a. (2012) *Basisboek Methoden en Technieken* (5th edition). Groningen: Noordhoff Uitgevers.
- In regard to qualitative research more detailed information can be found in:
  Baarda, B. e.a. (2012) *Basisboek Kwalitatief Onderzoek* (3rd edition). Groningen: Noordhoff Uitgevers.

Websites
- *Literature*: You can find a list of specialized dictionaries at:
  www.alphadictionary.com/specialty.html
- *Qualitative research*: On the QualPage website (qualitative research.uga.edu/QualPage/) you can find an overview of all forms of qualitative research. The Dutch website for qualitative researchers is: www.kwalon.nl/
- *Analysis of a problem*: A handy tool to analyse problems is the Phoenix Checklist. A checklist originally designed by the CIA so as to determine the nature and size of a problem:
  hamelinterests.com/blog/best-practices-for-problem-solving-the-phoenix-checklist/

  When to use quantitative research and when to use qualitative research?
  See: www.youtube.com/watch?v=638W_s5tRq8

Website

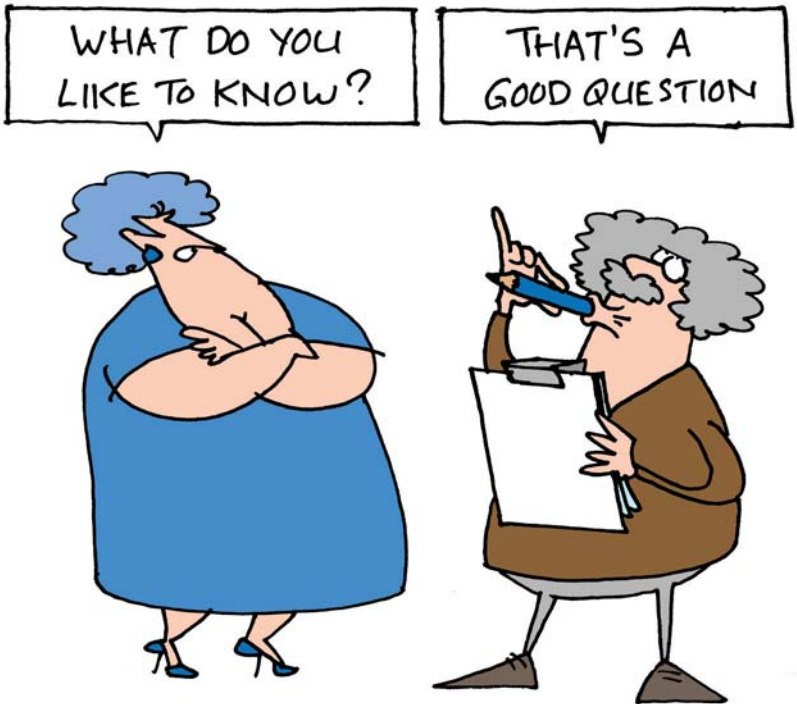
On the website www.researchthisisit.noordhoff.nl you will find:

- Tests. A test will consist of a set of interactive questions. After answering the questions you will get a test score, and receive study advice and related feedback per question.
- Budget form.
- Planning form.
- Examples of research proposals.
- A model for developing a research proposal.
- Short manual for SPSS and Excel including datasets which have been used as an example in the book.
- Further study into topics e.g. specific types of research.
- Links to useful websites.
- Interactive software to develop a research proposal. You work on the development of the research proposal in a structured way by answering questions and taking decisions.

1 What does the researcher want to study?

1.1 What are the research objectives and research questions?
1.2 Is it an open or closed research question? Is it qualitative or quantitative research?
1.3 What are units of analysis and constructs?
1.4 What is known about the research topic from prior research?
1.5 Is the goal of the research study descriptive, exploratory or model testing?
1.6 Is it possible to do the research?

In this chapter we discuss how a problem can be transformed into one or more research questions. In regard to research questions it is important to determine whether it concerns an open question (qualitative) or a closed question (quantitative). It is also important to determine to whom the research pertains (units of analysis) and about what constructs you want to draw a conclusion. Moreover it is sensible to use the existing information when answering the research question. You should also check if there are any ethical issues. For the research design it is essential to determine whether it concerns descriptive, exploratory or hypothetical-deductive research when developing a research proposal. Finally you have to check if the research study is feasible.



1.1 What are the research objectives and research question(s)?

Introduction

A research plan and a research report always starts with an introduction. In this section the context of the research is discussed. This implies the following:

- What is the reason for doing the research?
- What is the problem?
- How has this resulted in the research question(s)?

Especially in case of applied research a problem is the starting point. On the basis of the analysis of the problem you formulate the final research question(s). In general you start with a broad scope of the problem and the context of the problem. The introduction ends with a more focussed scope of the problem and the research question that needs to be answered.
The conversion of a problem into a research question implies that you have to think about the following issues:

1 Problem statement
2 Objectives of the research study

3 Research ethics
4 Research question(s)

1.1.1 Problem statement

In most cases you have a problem which you cannot solve. It can be a personal problem, a problem of a company, but it can also be a social problem. In order to solve this problem you need information. In the research proposal and the research report after you done the research you start with the problem statement.

The *problem statement* is the context from which the problem originated.

Examples of problems that can be researched:
- Problems of self-employed entrepreneurs (ZZP; see example 1.1)
- A company with decreasing sales figures
- Managers of a department of a Ministry coping with absenteeism
- The problem of student drop-out in higher vocational education

Information

In all cases *information* is needed to solve the problem. It is the task of the researcher to supply high quality information. On the basis of this information others come up with solutions and implement this. In example 1.1 of the research studies the societal problems of self employed entrepreneurs. were the reason for a research study. In practise the Chamber of Commerce often has to deal with problems of self employed entrepreneurs. It is unclear what the character of the problems for the whole group of self-employed entrepreneurs is and how serious these problems are. If the researcher can show that those entrepreneurs face problems which obstructs their functioning then measures can be taken to solve these problems. Self-employed entrepreneurs play an increasingly important role in our economy.

EXAMPLE 1.1

Self-employed entrepreneurs in focus

There are about 800.000 self-employed entrepreneurs in the Netherlands. Those entrepreneurs often have specific questions and needs in regard to housing, information and networking. In order to gain insight into the needs of the entrepreneurs the project 'Self-employed entrepreneurs in focus' has been initiated. The goals of this project are to map those entrepreneurs, retrieve their needs in regard to housing, networking and information and subsequently improve the services to the group.
Self-employed entrepreneurs are often an invisible group of entrepreneurs for municipalities because they do not reside on recognizable premises (often from their own home) and have not united by way of established networks of entrepreneurs. The project 'Self employed entrepreneurs in focus' consists of three phases:
1 On a local level (municipality) self-employed entrepreneurs are mapped in regard to their branch of industry and where they reside.

2 Questionnaires or interviews will be used to study the needs of the self-employed entrepreneurs.
3 On the basis of the needs of the entrepreneurs kick-off meetings will be organized and taskforces will be set up.

The entrepreneur is central to the realization of the project. The project is started by the kick-off meeting and will be developed in a taskforce. The most important steps for the future are determined by the entrepreneurs together with municipality, real estate parties and the Chamber of Commerce.

Source: research report 'Self-employed entrepreneurs in focus', research by the Chamber of Commerce Rotterdam, April 2012

It is important to describe the context of your research study in the research report and the research proposal. From what has your idea for the research originated? What is the basis for the research? The problem pertaining to the self-employed entrepreneurs in example 1.1 is found by the Chamber of Commerce who have encountered these problem in practice. When you include these problems in the introduction and mention examples it becomes clear that it is a serious problem which requires further research.

Analysing a problem

Analysing a problem is a complex task. Clients do know what they want, but find it hard to state what the problem is. For instance they want to reduce costs for production so as to reduce the selling price whereby a more favourable competitive position can be realized. But what is the problem: the cost for production, the selling price, or the competitive position? What does the client expect from you as a researcher? Therefore it is important to take time to analyse the problem. On the website www.researchthisisit.noordhoff.nl a list of focal points for the analysis of the problem can be found.

However beware: clients like government departments and companies want quick and easy answers from you as a researcher but this is not your task as a researcher. For example your client wants the solutions to the problem of student drop-out from you as a researcher. You cannot provide these solutions and it is not your task to provide them. On the basis of the results of the research study the institute in question is able to better decide which measures can reduce the student drop-out.

Advisor

Your task as a researcher is to provide information for others so as to find and solve problems. It is quite different when you are both researcher and *advisor*. However even then it is still important to separate those roles. It should be clear from your report where your research ends and your advice begins. The same holds true for market research. When a manufacturer asks a researcher how he can increase his market share it is not a research question but a *policy question*. The answer to a policy question is mostly an advice what you should do as an institute or company. Hereto you need information and that often necessitates research. In order to answer the question of the manufacturer in regard to how the market share can be increased, you should know to what extent consumers are familiar with the product. The question pertaining to brand awareness is a real research question. In table 1.1 examples of policy and research questions can be found.

Policy question

TABLE 1.1 Examples of research question and policy question

Type of question	Example of question	Role of researcher
Policy question	How can absenteeism be reduced?	No
Research question	What are the causes of absenteeism?	Yes

When stating the problem you should include available prior information. It is not sensible to do what others have done before your research study. Thus look for all available information. Has the problem been identified earlier, are there any research studies pertaining to this and what are the results? When exploring the problem literature research can play an important role. In paragraph 1.4 this will be discussed in detail.

1.1.2 The research objectives

When you do research you have a particular goal. The goal of the self-employed entrepreneur research study from paragraph 1.1.1 is obtaining information about problems experienced by those entrepreneurs and helping them solve these problems on the basis of the information obtained by the research study. So in essence the latter can be considered to be the goal of the research study.

The *research objective* is the answer to the questions why you do the research study and what you want to achieve by doing it.

Concerning the research objective there is a difference between basic scientific and applied scientific research. When the goal of the research is merely collecting information then it can be considered to be *basic scientific research*. This is not the same as doing research using the scientific method. This entails that you do research in a responsible way which can be checked as well as having reliable and valid research results (see paragraph 3.3).

Basic scientific research

When doing *applied scientific research* you also collect information but the knowledge is applied. It needs to contribute to a solution of the problem. The requirement of doing research in a scientific responsible way also holds true for applied scientific research.

Applied scientific research

Table 1.2 shows an overview of the difference between basic and applied scientific research.

TABLE 1.2 The difference between basic and applied scientific research

Two types of research	Description	Requirement
Applied scientific research	Research which results in knowledge that solves real problems	Research is done in a scientific and responsible way
Basic scientific research	Research that results in scientific knowledge and not necessarily solutions to a problem	Research is done in a scientific and responsible way

Especially when it concerns applied scientific research it is important to state the research objectives – so what the research should result in – clearly at the beginning of the research study. Moreover you should discuss the objectives of the research study with your client. You hereby prevent the client from having false expectations of the research and be disappointed by the results.

1.1.3 Research ethics

Research ethics

Before you do the research you should ask yourself the question whether it is ethical to do the research. Should you participate in a market research study which has the goal of collecting information so as to find out how to best sell new candy to toddlers? On most websites from associations of researchers you will find more information about *research ethics*. The ethical code for medical research is the most clear and extensive (knmg.artsennet.nl). However the association for market researchers also has a clear ethical code. These are laid down in the ethical code of the European association of market researchers (ESOMAR). So when doing research bear in mind the ethical code within the field the research is related to.
In short it implies that you can only do the research study if you can answer the following five questions affirmatively:

1 Do the subject participate voluntarily?
2 Have the subjects been told clearly what the goal and the procedure of the research is?
3 Is the data from the subjects being analysed confidentially and preferably anonymous?
4 Do the results of the research study not have negative consequences for the subjects?
5 Is the research study being done in a fair and objective way?

1.1.4 Research question

Research question

The research study is done to answer your research question(s). The *research question* is the thread which is central to the framework of the research. The question you should ask yourself during each phase of the research is whether the research question can be answered. The research question is mentioned as a kind of conclusion at the end of the introduction. Beware that the research question is a *real question*.

The *research question* is the question that needs to be answered by the research.

As the research study should answer the research question it is important to clearly indicate what the research question is. By clearly stating the research question you avoid disappointments and misunderstandings. The client knows what he can expect. Formulating the research question is an intensive process of trial and error. Different research questions will be thought up before formulating the final research question. It is important to confer with your client(s). The client needs to agree with the research question.

Experience has taught us that most research questions are too broad and that when it concerns several research questions too many research

questions need to be answered whereby the research study becomes infeasible. Therefore it is important to think long and hard about the formulation of the research question.
Sometimes is it sensible to do an open preliminary research first. In case of the research study pertaining to the self-employed entrepreneurs (example 1.1) it concerns 'problems'. However what kind of problems does it refer to? Does it refer to psychological, housing, support and/or other problems? It is difficult to focus on all these problems at the same time. It is therefore sensible to make an inventory of the problems before designing a questionnaire. You should first talk to the Chamber of Commerce and a number of self-employed entrepreneurs.

CHECKLIST 1.1 HOW DO YOU GET FROM A PROBLEM TO A RESEARCH QUESTION TAKING THE OBJECTIVES INTO ACCOUNT?
- What is the problem from which the research stems?
- Why is the research being done?
- Is the research ethically acceptable?
- What is the research question?

1.2 Is it an open or closed research question? Is it qualitative or quantitative research?

In order to make clear what types of research questions there are we will discuss the following in the following paragraphs:
1 Difference between open and closed research questions
2 Difference between qualitative and quantitative research

1.2.1 Open and closed research questions

In this subparagraph we will consecutively discuss examples of:
a Open research question
b Closed research questions

Ad a Open research question

In case of research into assembling furniture it concerns an open research question. The research question is what problems do consumers experience when assembling a cupboard?

Open research question

EXAMPLE 1.2

Assembling furniture

What problems occur when assembling furniture yourself? The manufacturer of self-assembling furniture has received many complaints. People find that the manual is unclear and therefore assembling the furniture is not easy and leads to much frustration.

The purpose of the research study into the problems in example 1.2 is clear. This is collecting relevant information so as to improve the manual. The researchers start with an open focus. They provide consumers with a package with the cupboard and the manual. They ask them to assemble the cupboard. This process is taped on video so as best observe this process. The researchers have not designed an observation scheme with options that can be ticked because the outcomes of the research are unknown. They also do not know how the manual is used by people. Do they start assembling the cupboard without the manual and do they use it when they get stuck? The researchers observe unbiased and with an open focus. They want to learn from the consumers what the problems are and how they deal with these problems.

Ad b Closed research question

Closed research question

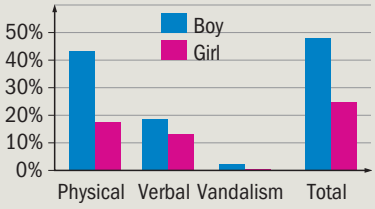
In case of the next research study in regard to aggressive behaviour of children it concerns a closed research question. The research question is, is there a difference between boys and girls in regard to aggressive behaviour?

www.intraval.nl

Inventory of aggression (part 1)

[…]
Primary school teachers and group leaders keep track of observed aggressive behaviour of children in their group during a week by way of an inventory of most common aggressive behaviour of children constructed by the researchers. The researchers collected information about 876 children in this way. The sample represented 38% of all children aged 3 to 12 years old in the borough North-Western Groningen.

Types of aggression by gender



Bron: http://www.intraval.nl/

In regard to the research study into aggressive behaviour of children the researchers do know what to expect. They know that there are different forms of aggression namely: physical, verbal and vandalism. Contrary to the researcher whom observed the assembly process of the cupboard the researcher for the research study into aggressive behaviour of children know what they want to observe which allows for working in a focussed way. Therefore the latter researchers construct a fixed observation scheme in which the scoring rubrics are laid down.

It is important to differentiate between the two forms of research question because they require different ways of doing research. This will be discussed in the next subparagraph.

1.2.2 Qualitative and quantitative research

In this subparagraph we will consecutively answer the questions:
a What is qualitative research?
b What is quantitative research?
c What is the difference between qualitative and quantitative research?

Ad a Qualitative research

Qualitative research

In case of an open research question qualitative research is best suited. In most cases the research question has a broad scope and there is relatively little prior knowledge. This implies that most often a structured questionnaire or checklist for observation will not be used. Your subjects can generate new ideas or evoke new insights which results in you posing questions or pay attention to aspects you would otherwise not have considered. Qualitative research is primarily about gaining new *insights* and less about numerical proven facts. Therefore in qualitative research reports you will mostly find descriptions and most probably no numerical tables or graphs. The basis for the analysis in qualitative research is written out versions of interviews and observations. Photos and videos may also be included.

Qualitative research is research whereby problems based on situations, events and persons are described and interpreted by way of qualitative data like experiences, assigning meaning which are collected by way of open interviews and/or participant observation and/or by using existing documents.

Being open to

There are multiple theories in regard to qualitative research which results in multiple forms of qualitative research. The predominant theory of qualitative research is what you encounter when you are doing research. In case of example 1.2 pertaining to assembly problems you observe in an unbiased way and do not use checklists for observation.
If you are open to what you encounter when doing research then you will learn from the research study. As a researcher you want to find out what problems people deal with when assembling the cupboard. You are open to anything whereby you will be surprised by what you observe. The criticism that you are never without prejudice or prior beliefs and unbiased is justified. Perhaps you have tried to assemble the cupboard as a researcher which implies that you have expectations in regard to the problems. This can lead to selective observation. In qualitative research you as a researcher are the most important research instrument and as a human being you are never without prejudice or prior beliefs. In subparagraph 4.2.3 the validity of qualitative research data is discussed in more detail.
The data you analyse in qualitative research is mostly texts. This could be a full version of an interview in writing, observation reports or fragments of a dairy. The data is reduced by labelling the data. The labels are subsequently ordered in rubrics and categorized. In this way you try to discover a pattern in the data.

Ad b Quantitative research

Quantitative research

If your research question has a narrow scope and you know what to expect when you interview or observe someone, then you can do quantitative research. In regard to aggressive behaviour of children much research has been done (see example in subparagraph 1.2.1). As you know what to expect quantitative research is most suited. Furthermore the research question in example 1.2.1 has a narrow scope as you would like to know if there are differences between boys and girls in regard to aggressive behaviour.

Same questions

When doing quantitative research you always pose the *same questions* to your subjects or observe the same behaviour according to guidelines set beforehand. This implies that you know prior to the data collection which questions you will ask or what the categories for observation are. In case of survey research you also know prior to data collection what answers the subjects will give. As can be derived from the name, quantitative research implies numeric data mostly in the form of a data matrix (see table 1.5) which is often analysed by using statistical software like Excel or SPSS.
In case of the example in regard to aggressive behaviour in primary school children (subparagraph 1.2.1) the numbers are represented by way of a bar chart (see subparagraph 4.1.2).

Quantitative research is research in which research data consists of numerical data which is analysed so as to answer the research question.

You might wonder what the relevance of quantitative research is given that you more or less know beforehand what the results will be. Quantitative research is not only interested in the question whether there is a relation between RSI symptoms and the amount of work people do behind a monitor, but also the strength of the relationship. If 80% of the RSI symptoms can be explained by the amount of work people done behind a monitor then this is an important starting point when reducing RSI symptoms. However if only 30% of the RSI symptoms can be explained by the amount of work people do behind a monitor, then you need look for other factors that can explain the RSI symptoms.

Ad c Differences between qualitative and quantitative research
The differences between qualitative and quantitative research have been summarized schematically in table 1.3. This table shows that the choice between qualitative and quantitative research is mostly determined by the research question.

TABLE 1.3 Overview of characteristics and differences of qualitative and quantitative research

Choice	Quantitative	Qualitative
Closed or open research question	Closed research question Example: 'How satisfied are the students with (parts of) the educational programme?'	Open research question, Example: 'How can the educational programme be improved according to the students?'
Research question is fixed or not	Research question is fixed.	Research question can be changed during the research process.
Goal	Goal is to describe and test ideas stated prior to the start of the research study.	Goal is to develop (new) ideas.
Data collection	You collect data in one particular way. For example by way of a questionnaire on student satisfaction.	The data collection is not standardized. You collect data in many different ways. For example: you talk to students as well as observing them (e.g. during a study group).
Results and data collection	Results of the data collection are numerical.	Results of data collection are reports of observations and interviews, existing data like fragments of diaries.
Analysing the data	Data is evaluated by using statistical analyses.	Reports of observation and interviews are reduced to labels and structured on the basis of these labels.

It does not matter whether it concerns qualitative or quantitative research in both cases it needs to be possible to check the basis for the conclusions drawn by the researcher.

Replicable

Quantitative research needs to be *replicable*. The research report needs to be written in such a way so as to enable someone else to reproduce your research. This implies that it is clear how you found your subjects and which research instruments you used.

In the case of qualitative research this is more difficult. Especially in case you are using open observations and interviews which are never the same. The qualitative researcher still has to indicate what data his conclusions

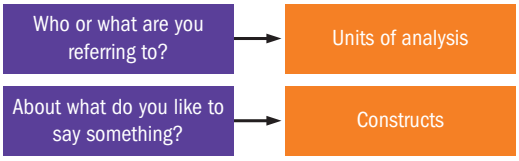
Verifiability criterion

are based on. These conclusions need to be plausible and your method needs to be transparent. This is called the *verifiability criterion*. Qualitative researchers often include as appendices the reports from the interviews and observations and indicate in the text by way of examples how the data in the appendices was analysed.

CHECKLIST 1.2 IS IT AN OPEN OR CLOSED RESEARCH QUESTION? IS IT QUALITATIVE OR QUANTITATIVE RESEARCH?

- Is it an open or closed research question?
- Does the research strategy suit a quantitative or qualitative approach given the characteristics of the research question?

1.3 What are units of analysis and constructs?



In case of a research study it is important to make clear to which group the conclusions of the research study are applicable. When doing research you want to know something about people, situations, companies, schools etcetera. If the research question is 'How many students suffer from symptoms of fatigue?' then the conclusions of the research study are applicable to students. If the research question is 'Is the absenteeism in governmental companies higher than in non-governmental companies?' then the conclusions of the research study are applicable to companies. The units to which the conclusions are applicable are called the *units of analysis*.

Population

All units as a whole are called the *population*. In this paragraph the following questions will be answered:

1 What are units of analysis?
2 What are the constructs?
3 How are the constructs and the units of analysis related to each other?

1.3.1 Units of analysis

Generalization

It is important to think about to whom the claims you want to state are applicable. The choice of units of analysis determines the *generalization* pretension in regard to your research study. In most cases researchers report in a sloppy way what the units of analysis are. If we look at the example at the beginning of the paragraph in regard to fatigue symptoms in students the term students will most likely refer to Dutch students. However the question is whether it concerns all students?

- Is it applicable to intermediate secondary vocational education, tertiary professional education, university students?
- Is it applicable to full-time or part-time students?
- Are there any restrictions in regard to age: is a sixteen year old student also considered to be a student?

This example shows how difficult it can be to clearly define the units of analysis and therefore your population.
If the units of analysis are students then it is not completely clear to whom the claims you want to state are applicable. This has consequences for the conclusions you want to draw. Suppose the units of analysis are part-time students then the question becomes whether the symptoms of fatigue from which the part-time students suffer are caused by their educational programme or by the combination of work and the educational programme.

Units of analysis are the persons, services or situations to which the conclusions that will be drawn in the research study are applicable.

Sometimes *the units of analysis are hidden within the research questio*n.
If the research question is "Are boys more aggressive than girls?" then the units of analysis are not boys or girls, but children or adolescents depending on the age of the target group to which the conclusions of the research study are applicable. Gender is the construct of the unit of analysis i.e. constructs of children or adolescents.

1.3.2 Constructs

It is important to indicate to whom the conclusions of the research study are applicable but also what the outcomes of the research study will be in regard to the units of analysis. The example in regard to aggression in subparagraph 1.2.1 shows that apart from units of analysis you also need to distinguish the *constructs* you are going to measure. In case of the research question pertaining to symptoms of fatigue of students, fatigue is the construct to be measured and to which the conclusion is applicable. The research question concerning the difference in absenteeism between governmental and non-governmental companies (see beginning of this paragraph) the units of analysis "companies" probably refers to Dutch companies. The constructs the researcher wants to measure are absenteeism and whether or not it is a governmental company.

Constructs

Constructs are the *characteristics* of the *units of analysis* to which the conclusions of the research study are applicable.

1.3.3 How are the constructs and the units of analysis related to each other?

In table 1.4 the examples of units of analysis and characteristics in relation to the research question are shown.

TABLE 1.4 Examples of units of analysis, population and characteristics

Research question	How many students suffer from symptoms of fatigue?	Is the absenteeism in governmental companies higher than in non-governmental companies?	Are boys more aggressive than girls?
Units of analysis and population	Tertiary professional education, university students	Dutch companies	Dutch children
Constructs	Symptoms of fatigue	Absenteeism and governmental companies or not	Gender and aggression

TIP!!!: WHEN DOING RESEARCH FIRST MAKE A DATA MATRIX

By designing a data matrix it becomes clear what the units of analysis and what the constructs of the units of analysis are.

Data matrix

A *data matrix* is a table in which the data is presented in a well-organized manner. The data matrix for the research into symptoms of fatigue in students is shown in table 1.5.

TABLE 1.5 Example of a data matrix

	Symptoms of mental fatigue	Symptoms physical fatigue	Age	Gender
Student 1	Yes	Yes	20	Male
Student 2	No	No	19	Female
Student 3	...			
...				

In the horizontal rows of table 1.5 the units of analysis are shown. In this case the units of analysis are the students.
In the vertical columns the constructs are shown. In this case the mental fatigue, physical fatigue, age and gender.

Sometimes the problem occurs that the characteristics do not apply to the same unit of analysis. This holds true for the research into absenteeism in companies. The units of analysis are companies and the characteristics are 'governmental companies or not' and 'absenteeism.'
Absenteeism is a characteristic of the employee. By taking the average of absenteeism in the company, absenteeism becomes a characteristic of the company and the problem is solved. This will most often become clear when you make a data matrix. Therefore the tip is to make a data matrix at the beginning of your research.

In qualitative research the units of analysis and the constructs are less clear in comparison to quantitative research. Sometimes it requires research so as to find out what the important constructs are. You never start with a clean slate. In the case of the research pertaining to the problems people experience when

assembling furniture (example 1.2) you know it pertains to cupboards. The researcher probably has a particular type of cupboard in mind. This holds true for this particular research study. The researcher focusses on cupboards for personal households and not on cupboards for companies. It also does not apply to kitchen cabinets Most probably he focusses on adult Dutchmen between age 20 and 60 and not on elderly people. The latter have specific problems like being bad at reading the small print of the instructions. In qualitative research it is also important that the researcher indicates to whom the conclusions of the research study are applicable. However this differs from quantitative research as the researcher can change his pretension during the research study. He may discover that it is sensible to limit the cabinets to cupboards.

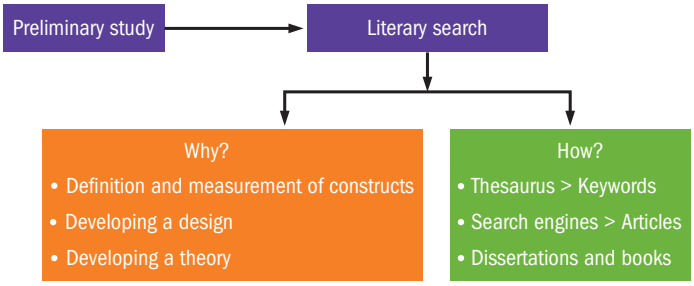
TIP!!! DO NOT START WITH A VERY BROAD SCOPE WHEN DOING QUALITATIVE RESEARCH

Prevent the problem of researching a problem which is too complex and/or the group whom you are researching is too heterogeneous. Even when you are doing qualitative research into what it means to an adult having been abused or battered as a child it is still sensible to restrict your research question. First start with sexual abuse in women aged 20 to 30. When you have a clear picture of what this means for those women then the next step is to include women over 30 in your research study. Subsequently you research whether the results from the research study involving women aged 20 to 30 who have been sexually abused also hold true for women over 30. Once you have researched what sexual abuse means to an adult then you expand your research to the meaning of assault to adults. This implies that you do not run the risk of having a pile of data which does not allow for easy detection of patterns or structures.

CHECKLIST 1.3 WHAT ARE THE UNITS OF ANALYSIS AND THE CONSTRUCTS?

- What are the units of analysis: to whom or what are the conclusions of the research study applicable?
- What are the constructs: what are the characteristics of the units of analysis to which the conclusions of the research study are applicable?

1.4 What is known about the research topic from prior research?



Orientation

A long thought process precedes formulating a good research question. At the beginning there is a vague global idea which becomes more specific and more detailed over time. This idea then becomes more concrete and therefore easier to execute. When you are approached to design a research study with a particular research question you mostly start with an *orientation*. You confer with your colleagues and your client as well as checking on the internet and in the literature what is known about the specific topic before you formulate your final version of the research question. Most often several versions of the research question will be formulated before coming to a final version. Even a seemingly simple research question is in most cases more complicated than you might have thought beforehand.
The research question 'How often do RSI symptoms occur in our company' shows this. What are RSI symptoms and how do you determine them? If you ask employees by way of a questionnaire whether they have ever had problems with using the mouse during which time they had difficulty with movement or experienced pain, many employees will remember such instances. However if the basis is absenteeism figures then the result will most likely be an underestimation as employees do not always report RSI symptoms. Furthermore the problem with RSI symptoms is that they cannot be observed. You have to ask people about RSI symptoms however then the subjective element in regard to the fact that some employees experience pain earlier than others becomes an issue.
To prepare yourself for doing research there are two possibilities:
1 Doing preliminary research
2 Doing literature search

1.4.1 Preliminary research

Qualitative preliminary research

Sometimes it is sensible to start with *qualitative preliminary research*. Suppose you are asked to do research into the low turnover of the multimedia department in an outlet of a department store. The question is why the turnover of this outlet is significantly lower than other outlets. In the case of such a research question it is advisable to look around on the multimedia department or even work at this department for a while. The employees at departments that do have a high turnover are more positive about their manager than those working at the department that is underperforming in terms of turnover. Thus you wonder whether there is a relation between the performance level and the management style of the manager. Therefore you design a quantitative research so as to test this.

1.4.2 Literature search

Aside from preliminary research it is also advisable to do a literature search before you start with your final research proposal. It might be that the research project you are about to do has been done by others. There is nothing more painful than after finishing your research discovering that others have done the same research. Even if you cannot find comparable research it is advisable to check the literature and on internet whether similar research has been done. First we address the question of why you should do a literature search. Then we discuss how to do a literature search.

Why should you do a literature search?

Three reasons to do a literature search are to obtain information on:

a the definition and measurement of constructs
b developing a research design
c developing a theory

Ad a Definition and measurement of constructs

From a literature search it becomes apparent how others have operationalized the characteristics you want to research and especially how they are *measured*. It is important to know for the researchers whom have done research into chronic fatigue of students that recently a research study has been done into chronic fatigue in students. In the research study the concept symptoms of fatigue has been operationalized well and the researchers used a measurement instrument to measure symptoms of fatigue. The measurement instrument has been used in many other studies. Furthermore the researcher indicate what the characteristics of the chronic fatigue are. This is relevant information if you are doing research into symptoms of fatigue in students.

Ad b Developing a research design

It is useful to read about how other people have gone about designing and doing their research study as well as what their experiences are. Do not just look at the operationalization and measurement instruments in the relevant publications which you have found, but also look at the research design they have used. In these articles you should especially read the discussion section at the end of the article. In this section the research methods are often evaluated and suggestions are made in regard to future research.

Ad c Developing a theory

When trying to find a theory that explains the phenomena that you will be researching it is important to research literature sources. The search into symptoms of fatigue in pupils shows that the symptoms of fatigue has no relation with style but with personality aspects like anxiety and depression. These results are important to the researchers doing research into symptoms of fatigue in students as they can be used in their research.

How to do a literature search?

To find relevant literature the following steps are important:

a Finding good keywords using a thesaurus
b Searching for relevant articles in search engines
c Searching for dissertations and books

Ad a Finding good keywords using a thesaurus

When you start your literature research it is important to use good keywords. Do not fix on certain terms but use alternatives. If you are doing research into symptoms of fatigue then also use the term tiredness. You should check associative terms in the dictionary and thesauri. Many dictionaries and thesauri can be consulted online.

Keywords

A *thesaurus* is a kind of dictionary in which you look up terms. Every term in the thesaurus gives you a list of related terms. In the *Thesaurus health and social work* the term overfatigue is mentioned. Apart from this there are also specialized dictionaries.

Thesaurus

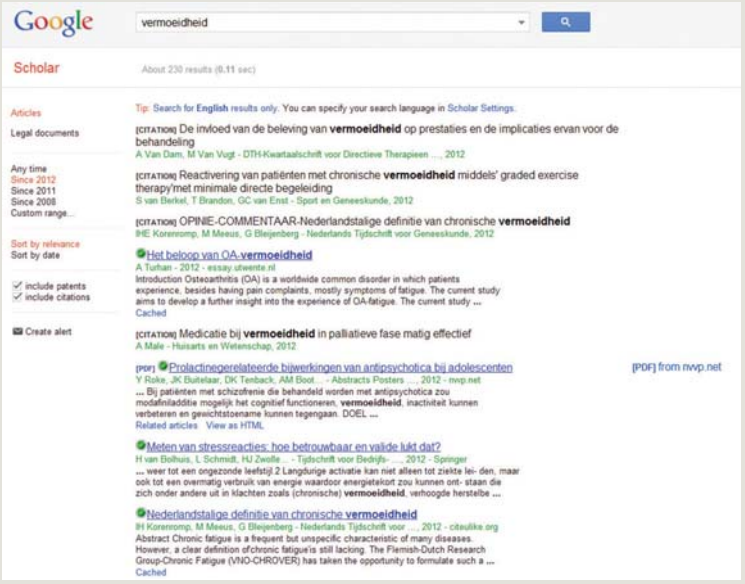
Moreover you need to look for translations of the search term. The right translation of 'vermoeidheid' is fatigue. When you type 'fatigue' in the thesaurus of *hyperdictionary* it becomes apparent that it is a frequently used search term. Moreover you also will find a list of related terms like 'burn-out' and 'exhaustion' in a thesaurus. If you feel like you have found the proper keyword then you can use this keyword to search on the internet.

Ad b Searching for relevant articles in search engines

Articles
Search engines

When starting your search on the internet then it is custom to start your search for relevant articles using the major general search engines like Google and Yahoo. If you use the search term 'fatigue' then you will get many non-relevant search references. For example you will find a reference to a website in regard to the promotion of peppermint oil as a remedy against fatigue. It is advisable to use sites where you can find scientific literature like Google Scholar, Scirus and Pubmed. If you indicate in *Google Scholar* as was done in the example that you only want publications from the last year i.e. 2012 then you will definitely find recent publications upon which basis you can search deeper. This search leads to many relevant publications (figure 1.1).

FIGURE 1.1 Search results: 'fatigue' using Google Scholar



Scholar does not only show the articles which have been found, but also the related articles as well, as whether it concerns a PDF which you can download. PDF's are mostly detailed reports. Thus you can also add PDF as a search term.

TIP! USE THE ADDITIONAL SEARCH TERMS RESEARCH AND REVIEW

If you only use the search term 'fatigue' in the search engine Google Scholar then your search will result in publications which are not relevant to your research. If you add the search term 'research' then this will lead to references to research studies. If you add the search term 'review' this will lead to review articles which discuss several research studies. In this order you can restrict the number of hits:

- The search term 'fatigue' in Google leads to almost 45.000.000 hits.
- After adding the search term 'research' this leads to 4.500.000 results.
- After adding the search term 'review' this leads to 2.000.000 results.
- By indicating in 'Advanced searching' that you want to restrict the search to sites that have been viewed in the last half year then the number of result is 1.000.000 among which are many relevant references.

Ad c Searching for dissertations and books

Dissertations

Especially dissertations are very interesting. In dissertations you will find a good list of references in regard to the topic of the dissertation in most cases. You can find Dutch dissertations on *DAREnet*. This is a part of *Narcis* which holds many more Dutch scientific publications. In most cases it is possible to download and view the dissertations. Figure 1.2 shows that 18 out of the 19 dissertations which are directly or indirectly related to fatigue can be downloaded. Moreover you can see that the search was not done by using 'vermoeidheid' as the search term but by using 'fatigue' as the search term. It is important to use English as well as Dutch search terms. Many dissertations have been written in English.

Google Books

A website specifically aimed at searching for books is *Google Books*. This site offers the possibility of viewing parts of books and allows for the evaluation of the relevance of the book in regard to your research (figure 1.3).

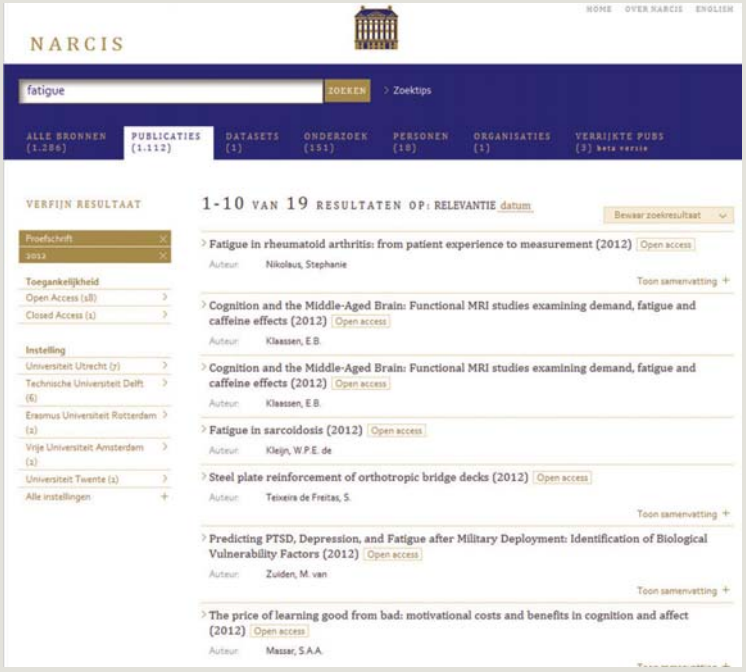
Do not restrict your search to the internet but also search in specialized libraries and book stores. They offer surprising and relevant books and periodicals for your research which are mostly organized by topic.

TIP !! DOCUMENT EVERYTHING IN A LOGBOOK

Document everything in a logbook during the search for information. For instance you could open a Word file in which you make notes in regard to the content and the exact reference as well as the relevant topic or part of your research every time you find something which is relevant. If you do not do this you cannot see the wood for the trees. Word offers the possibility of automatically generating a list of references according to the citation and referencing rules of your discipline. On the website we show how this can be done. See subparagraph 4.2.3.

● www.narcis.nl

FIGURE 1.2 Examples of searching for dissertations in Narcis

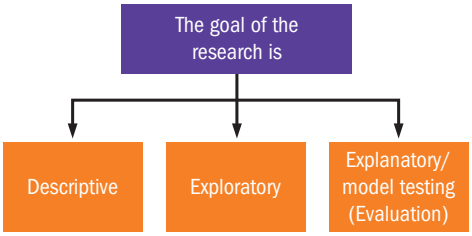


CHECKLIST 1.4 WHAT IS KNOWN ABOUT THE SUBJECT OF THE RESEARCH?

- Is preliminary research necessary?
- Has relevant and recently published literature been used so as to check whether:
  - Others have done comparable research studies?
  - How other researchers have designed comparable research?
  - How other researchers have measured and defined comparable constructs?
  - How other researchers have used theories to explain comparable phenomena?
- Have the correct keywords been used?
- Have you searched the correct databases? So not merely Google, Van Dale and Wikipedia.
- Have books, reports and periodicals been used alongside websites?
- Has the referencing to sources been done in the correct way?

FIGURE 1.3 Example of search results in Google Books

1.5 Is the goal of the research study descriptive, exploratory or model testing?



From the examples used you can infer that the goals of the research can be quite different. It is important to determine the nature of the research at the start of the research because this influences the choices in regard to the design of the research study and the data-analysis. In general we can make a distinction between:

1 Descriptive research
2 Exploratory research
3 Explanatory and hypothetical-deductive research

1.5.1 Descriptive research

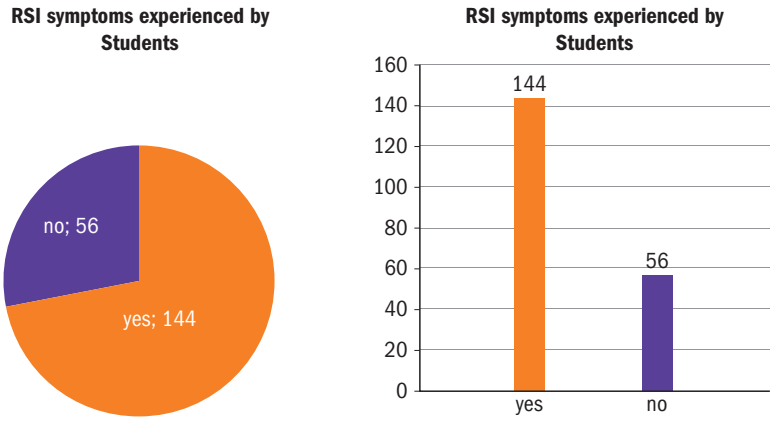
Quantitative descriptive research

In case of *quantitative descriptive research* it mainly concerns questions regarding frequencies. You might want to know how many students suffer from RSI symptoms. You call, write or email a number of students from tertiary professional educational institutes and universities and ask them whether they have ever experienced physical symptoms or pain when typing on a computer and if so indicate when they experienced them as well as indicating the severity of them. You add up the number of students who have experienced RSI symptoms or pain less or more. You present the results in a table or a graph (table 1.6 and figure 1.4). This could be a pie chart, bar chart or histogram (subparagraph 4.1.2).

TABLE 1.6 The number of students who state that they suffer from or have suffered from physical pain symptoms due to the use of computers (n = 200)

	Number of students	Percentage
Yes	144	72
No	56	28

FIGURE 1.4 Pie chart (on the left) and bar chart (on the right): number of students that have ever experienced RSI symptoms



Descriptive research is research which is aimed at registration and systematic structuring of what is happening in regard to a certain field however the aim is not to develop a theory or formulate a hypothesis.

The fact that 70% of the students has ever experienced RSI symptoms and 15% of them have experienced severe RSI symptoms indicates the severity and the frequency of the problem. However it does not tell us anything about the content and meaning of the problems. Meaning can best be researched by way of qualitative *case studies*. You conduct a number of in-depth interviews with students whom have experienced severe RSI symptoms.

Case studies

These interviews show what the consequences of these symptoms are and especially how the students have experienced these consequences but also how they cope with them. How do they solve the problem of not being able to write a paper and how do they cope with this pain? The stories of these students will provide a good picture of the content and the meaning of the problems. This cannot be deduced from a table.

1.5.2 Exploratory research

If you want to find out what causes the RSI symptoms you best do exploratory research.

If you do not know anything about the causes of RSI symptoms it is sensible to start with an *exploratory qualitative research*. For instance you start by observing students in computer rooms. This can possibly generate ideas. For instance it is striking that students hardly ever sit up straight behind the computer. This might be due to the fact that groups of two or three students sit behind a computer. Additionally you conduct open interviews with students. This will result in finding out that students hardly ever take a break when they are working on the computer and work on an assignment for hours straight. Furthermore you find out that students using a laptop have bad keyboards. The result of such an exploratory qualitative research is a theory which might explain what causes RSI symptoms in students. On the basis of the materials you collected during the exploratory qualitative research you will generate ideas which you can then test whether they hold true given a different situation with other students. This way you can check if your theory or ideas hold true.

Exploratory qualitative research

You continue in this manner till you have found a theory or explanation that fits. This way of doing research is a matter of trial and error as well as fitting. See subparagraph 4.2.1.

Exploratory research is research which explores frequencies, associations and differences so as to come to a theory.

Quantitative exploratory research

In case of a *quantitative exploratory research* you have some idea about influencing factors beforehand as you are posing specific question in this stage. Contrary to an open interview, when using a structured questionnaire about RSI symptoms the questions are determined beforehand as well as knowing beforehand what questions you will be asking. When using a structured observation you know beforehand which behaviour and which behavioural characteristics you will be observing. Prior to the observation you have an idea what the relevant factors are which cause RSI symptoms. The relevant aspects that have been mentioned are:

- consecutive time spent behind the computer by the students
- whether students use a laptop
- sitting with good posture of students behind the computer

By using quantitative research you determine whether:

- the relevant factors have any influence
- to what extent they have an influence
- the factors are associated with each other

This does require constructing a questionnaire or observation scheme in which everything is determined beforehand. The scores or responses on these lists will be used as research material so as to determine the aforementioned. After collecting all the data you will research by using statistical analyses whether you can discover associations and/or differences and especially what the strength of the associations is, as well as how large the differences are. For example how many differences in RSI symptoms can be explained by the average time that students spent behind a computer? It is impossible to change the research questions during the research study. This can only be done when doing qualitative research.

1.5.3 Explanatory/hypothetical-deductive research

Hypothetical-deductive research

When you have an idea and you want to know whether this is correct then we call this explanatory research or hypothetical-deductive research.

Deductive research is research in which you test whether your expectation formulated prior to the research study in most cases based on hypotheses of a theory are supported by the data.

Suppose you draw the conclusion that employees of a division with a relatively low turnover often complain to managers on the basis of the qualitative preliminary research in regard to the department store. The researcher hypothesizes that due to the authoritarian management style and most of the times not involving the employees, the motivation of the employees decreases.

Theory

The theory of the researcher will look like figure 1.5.

FIGURE 1.5 Example of a theory

Example of a theory			
Theory	Authoritarian management	→	less involvement employees
	less involvement employees	→	low motivation
	low motivation	→	less deployment
	less deployment	→	less turnover
Hypothesis	Authoritarian management	→	less turnover

Existing theories

It is also possible to use *existing theories*. There are many theories in regard to the effects of management whom have the same tenor as the aforementioned theory of the researcher. The researcher does not have to think up what has been thought up by others. The advantage is that existing theories are often based on prior research and therefore have been tested. The researcher then *tests* if the theory also holds true for the situation which he is researching. In this case it concerns the department store.

Hypothesis

A theory results in an expectation or also known as a hypothesis. In your research this *hypothesis* will be tested. If your hypothesis is supported by the data then it can be assumed that the theory is correct.

A *hypothesis* is an answer to a research question often based on a theory which you want to test in your research study.

A *theory* is a number of plausible statements which are connected in a logical way whom provide an explanation for a specific phenomenon.

In the next section we will discuss a few specific types of hypothetical-deductive research:

a Evaluation research
b Qualitative deductive research

Ad a Evaluation research

Evaluation research

Evaluation research is a special type of hypothetical-deductive research. Suppose a producer expects that using a newly developed mouse pen will result in a reduction of RSI symptoms. You evaluate the effect of the pen in your research by testing if the pen results in the expected effect. Using the mouse pen will result in a reduction of RSI symptoms will then become your hypothesis.

In research pertaining to information campaigns you are also testing the effect of the information campaign. This is also hypothetical-deductive research.
In both cases it can be considered to be *evaluation research*. Examples of evaluation research are:

- an ad campaign so as to increase the turnover
- educating managers by way of a personal skills training so as to make them less authoritarian
- reducing absenteeism by information about sitting with good posture behind the computer

Ad b Qualitative hypothetical deductive research

Causality

Qualitative hypothetical-deductive research is hardly ever used especially where it concerns determining causality. *Causality* implies that something can be considered to be the cause of something else. If you want to determine the effect of a mouse pen on RSI symptoms then it is possible to ask the users whether they have the feeling as though the mouse pen was effective, however this is not sufficient evidence for causality. It could well be suggestive evidence. As the mouse pen is expressly presented as an intervention for RSI symptoms the impression can grow that it works whereby people might react to this in positive way. Only by doing a true experiment (subparagraph 2.2.2) it can be determined whether the pen is effective.

Template approach

A kind of hypothetical-deductive research in qualitative research is the *template approach*. This approach implies testing whether a theory developed earlier also holds true for another situation.
For example a theory has been developed in regard to the motives of Americans to fill out a donor codicil or not, based on interviews with Americans. The question is whether this theory holds true for Dutchmen. In subparagraph 4.2.2 this issue will be discussed further.

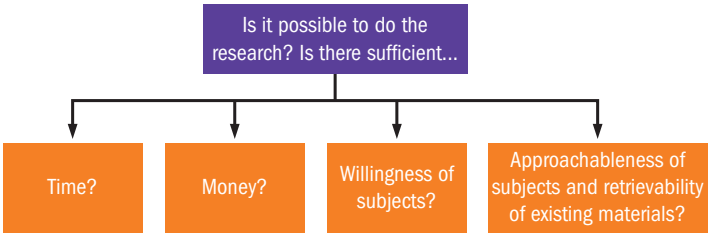
Action research

Another type of qualitative research which involves hypothetical-deductive research is *action research*. *Action research* implies that the researcher together with the respondents whom experience the problem think of actions to reduce the problem. In practice it is tested whether it is effective. More information can be found in paragraph 2.2.

CHECKLIST 1.5 IS THE GOAL OF THE RESEARCH STUDY DESCRIPTIVE, HYPOTHETICAL-DEDUCTIVE?

- What is the goal of the research: descriptive, exploratory or deductive research?
- In case of model testing: what theory has been used and what are the hypotheses?
- In case of causality: has it been researched correctly?

1.6 Is it possible to do the research?



It is important to carefully address the question whether the research can be done. There are four factors that determine whether a research study can be done:

a Time
b Money
c Willingness of subjects
d Approachableness of subjects and retrievability of existing materials

Ad a Time

Time
Planning

Whenever you are doing a research study it is always good to make a planning. This holds true for a thesis, extended essay, paper or doing a project. It can be useful to start with the deadline, for example the graduation date, and then *count back*. It is important to make a feasible time planning. This prevents you from becoming strapped for time when finishing the project, which results in the client as well as you becoming frustrated. At the beginning you have a global idea of the research study in your mind upon which you base your first preliminary planning.

Ad b Money

Budget

You make a global *personal and material planning* to investigate the feasibility of the research study. If at the start of the research study it becomes apparent that the research study is *not feasible* then it is a waste of energy to continue the research study. It goes without saying that you alter the planning when you have a final research proposal.

Ad c Willingness of subjects

Willingness of subjects

Apart from time and money the *willingness* of subjects is also an impeding factor. A research study is dependent on the willingness of subjects to participate in the research study or the possibility to collect the existing materials you need or require.

The willingness of subjects to participate in a research study depends on:

- the *institute* doing the research study (is it a commercial company or is it being done by a university or tertiary professional educational institute?)
- the *way* in which you approach the subjects for your research study
- the *time* the subjects have to spent on the research study
- the *attractiveness* of the research study
- *usefulness* of the research study
- a *(financial) incentive* for the participants of the research study

Check by using this list how difficult it is to find subjects for the research study you have in mind. Ask yourself whether enough people would be

Refusing

willing to participate in this research study. If many subjects refuse it does not make much sense to do the research study. Suppose you are doing a customer satisfaction research for a travel agency. There is high non-response: 90% of the people does not react to your request to participate in the research study. As the percentage of non-response is high the group that has reacted can be a selective group. They are probably very dissatisfied customers or very satisfied customers. You lack subjects who are satisfied about some matters and dissatisfied about other matters. Your research results are not representative of all customers of the travel agency. In regard to the possibilities for generalization it is important that your sample is representative. You can better have a small representative group then a large group with much *non-response*. More information can be found in subparagraph 2.4.2.

Non-response

Ad d Approachableness of subjects and retrievability of existing materials

Approachableness of subjects

Apart from the willingness of subjects to participate, the *approachability* of subjects can be a problem. In regard to many groups there is no database from which you can draw a sample. Where can you find people whom have bought a computer in the past year or unemployed fathers with children aged between six and twelve or even more difficult, immigrants who do illegal work? You will often underestimate the time it takes to find the people you need from the defined population for a representative sample. When a database of names and addresses is lacking, then you first have to determine how much time and money it will take to find enough people for your sample. Even when you are using existing material for example absenteeism data from employees of a company or test results of students, you investigate beforehand whether you can obtain these data. Especially companies but also governmental institutions are somewhat reluctant to provide existing material. Bear in mind that some governmental institutes like municipalities will charge fees for finding and providing the materials requested by you.

Finally based on time, money, willingness of subjects and approachableness of subjects and retrievability of existing materials you weigh the factors and you decide whether you continue with the research study. On the website www.researchthisisit.noordhoff.nl you will find examples to make your own budget and time planning.

CHECKLIST 1.6 IS IT POSSIBLE TO DO THE RESEARCH?

- Is there enough time to do the research study?
- Is there enough money to do the research study?
- Are people willing to participate in the research study?
- Won't there be too much non-response?
- If you are using existing materials: are they available?

Literature

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Websites
- www.knmg.artsennet.nl
- www.esomar.org
- www.intraval.nl/nl/d/d01_hoofdstuk5a.html
- www.hyperdictionary.com/
- scholar.google.nl
- www.scirus.com/
- www.ncbi.nlm.nih.gov/pubmed
- www.narcis.nl/
- books.google.com/
- www.researchthisisit.noordhoff.nl

Further reading

Books
- Robson discusses in detail the problem analysis and formulation of the research question in regard to applied research:
  Robson, C. (2011) Real world research (3rd edition). Malden: Blackwell.
- Malhotra and Birks also discuss in detail the problem analysis and the formulation of the research question but in the context of market research:
  Malhotra, N.K. & Birks, D. (2006) *Marketing Research: An Applied Approach*. Essex: Pearson.
- In regard to quantitative research more detailed information can be found in:
  Baarda, B. e.a. (2012) *Basisboek Methoden en Technieken* (5th edition). Groningen: Noordhoff Uitgevers.
- In regard to qualitative research more detailed information can be found in:
  Baarda, B. e.a. (2012) *Basisboek Kwalitatief Onderzoek* (3rd edition). Groningen: Noordhoff Uitgevers.

Websites
- *Literature*: You can find a list of specialized dictionaries at:
  www.alphadictionary.com/specialty.html
- *Qualitative research*: On the QualPage website (qualitative research.uga.edu/QualPage/) you can find an overview of all forms of qualitative research. The Dutch website for qualitative researchers is: www.kwalon.nl/
- *Analysis of a problem*: A handy tool to analyse problems is the Phoenix Checklist. A checklist originally designed by the CIA so as to determine the nature and size of a problem:
  hamelinterests.com/blog/best-practices-for-problem-solving-the-phoenix-checklist/

  When to use quantitative research and when to use qualitative research?
  See: www.youtube.com/watch?v=638W_s5tRq8