Research Methods & Design

Definitions

What is Research?

The systematic investigation into and study of materials and sources in order to establish facts and reach new conclusions.

What are methods?

A particular procedure for accomplishing or approaching something, esp. a systematic or established one.

What is design?

It is a logical structure of the inquiry (research)

Types Of Research

1. Descriptive
2. Explanatory
3. Ethnographic
4. Experimental
5. Action research
6. Case study
7. Longitudinal vs. cross-sectional

Quantitative vs. Qualitative

Quantitative: you collect data through some tools and you quantify them

Qualitative: you collect data through some tools and you explain and discuss, argue, hypothesis and philosophy them.

Classical Report of Research

1. Abstract
2. Introduction
3. Literature Review
4. Methods
5. Data Analysis
6. Results
7. Discussion
8. Conclusion
9. Bibliography
10. Appendices

What is an Abstract?

- a summary of the whole thing

An abstract is a short summary of your completed research. If done well, it makes the reader want to learn more about your research.

It is important to note that the weight accorded to the different components can vary by discipline. For models, try to find abstracts of research that is similar to your research.

Components of an Abstract

1) Motivation/problem statement: Why do we care about the problem? What practical, scientific, theoretical or artistic gap is your research filling?
2) Methods/procedure/approach: What did you actually do to get your results? (e.g. analyzed 3 novels, completed a series of 5 oil paintings, interviewed 17 students)
3) Results/findings/product: As a result of completing the above procedure, what did you learn/invent/create?
4) Conclusion/implications: What are the larger implications of your findings, especially for the problem/gap identified in step 1?

The poor example is incomplete

1. does not provide the same level of detail found in the good example.
2. does not grab the attention of the reader.
3. no good description of the need
4. not well defined
5. no basic details of the program are provided.

How to choose a topic?

- Research to demonstrate not only research expertise in the relevant field but an appropriate level of originality.
- One way to achieve this is by a piece of work which applies existing ideas (e.g. previous findings, theories, research methods) to a new domain (e.g. provides a competent analysis of new data in terms of an existing theory or approach).
- Another way is by a piece of work which proposes a new and interesting account (maybe a new theory) of existing data. Clearly, the highest attainable level of originality would be to propose a novel theoretical account of novel data (a goal all academics strive for but few attain!).
- Clearly, your chosen topic should be one which excites and stimulates your intellectual curiosity, and which is going to retain your interest throughout the period you work on it.
- It may also be a topic which has some direct relevance to your future career aspirations, or special importance in the context where you normally work (esp. if you are a teacher)
- It should be a topic which you personally feel confident that you are able to master within the time available for your research. For this reason, it is important not to be too wide-ranging in your choice of topic.

Introduction chapter

what the topic is, in brief?

- You start telling us a lot of detail about the method and your results at this point
- Detailed research questions and hypotheses… premature to give them here reasons for doing the work, e.g.
- importance as a research topic in itself, in the context of current knowledge in the relevant field. This entails saying a bit about what general areas of ELT, linguistics or whatever the study relates
- outline of what will come in the chapters/sections that follow
- maybe brief definitions of some key terms to be used later

Plagiarism

Representing other authors' language and ideas as your own original work

- Plagiarism is the act of copying someone else's work and publishing it as your own. This includes text, media, and even ideas. Whenever another person's work is copied and republished without an appropriate reference or citation, it is considered plagiarism. Examples of plagiarism range from small infractions such as not putting quotes around a quotation to blatant violations such as copying an entire website. Even if the original content has been modified, such as an altered image or a reworded article, it is still considered plagiarism if no credit is given to the original source.
- Avoiding plagiarism is easy. It comes down to doing what's right. If you use someone else's information, make sure you cite the source. When writing a paper, this means adding APA or MLA citations when you reference other publications.

Literature review

REVIEW OF LITERATURE covering these things but not necessarily in this order:

- review and critique of previous research in the same general area (shortcomings of methods or argumentation previously used, new areas to look at suggested by previous results). Their findings, esp. with respect to variables you are interested in. This should at every point be explicitly connected to your specific project.
- The background review reads like an MA survey essay on some area of investigation, cataloguing other people's studies, with no comparison of them with each other, or critique, and no use explicitly made of them to connect to your own work by showing what they suggested for it.
- Too broad… need to focus rapidly on just what bits of articles and books are relevant to your study.
- You report previous work as 'important' when actually it has no relevance to your own research (though it may be highly regarded in the field generally).
- You retail other people's criticisms of each other's research but do not resolve opposing views, argue your own view, or draw implications for your research.
- Review feels like the literature got on top of you, rather than that you are on top of the literature, and is too long (more than a third of the writeup)
- You mention the results of your own later research in your review
- theoretical background(s) or 'models' from which the ideas come (both pure and applied linguistic, and maybe in psychology, sociology...), or which you hope to shed light on.
- Ostrich: you stick with one model you have learnt about and don't cover the rival theories or look in other disciplines that have something to say.
- Discussion of definitions of key terms… esp, vague ones (e.g. in ELT 'communicative', 'function', 'strategy', 'task' etc….) where you disentangle different opinions of scholars
- You catalogue a lot of people's definitions of X but fail to show where they agree/differ or which one you are adopting for your work and why.
- a review of methods used previously to gather relevant data, justifying yours (e.g. merits of interviews versus questionnaires etc.). Better here than in Method chapter/section if it is substantial.

Refining Research Ideas and Beginning to Design your Study

Agenda

So I have a good idea….now what?

Research design elements:

1. Sample selection
2. Comparison/control groups
3. One time versus Many times
4. Reducing Confounds and Bias

a) Variables and Operational Definitions

b) Turning your research question into a research hypothesis

Recap

- So….you have a good idea
- You realize that you could gather information to test that idea in some way
- You did a literature search to confirm it is a good idea (i.e., that it hasn't been done *well* before)
- Now what should I do to make it scientifically rigorous?
- Research Design & Methods is what makes a good idea into a great research study

Elements of Research Design: Sample

"Sample" versus "Population"

Sample determination:

- What group (population) is your research idea about?
- If it is about people in general – then it doesn't matter who you sample
- Is it about a particular type of person, age group,
- culture, sex/gender, clinical group, occupation?
- Inclusion and Exclusion Criteria specified

Sample/Recruitment

- Where will you get the data from that group?
- Own organization versus other organization
- Do they have enough people there? (i.e.,sample size)
- Will the people be interested or motivated to
- participate in your research?
- How long will it take? Are you willing to wait that long?
- Will you need to compensate them?

Elements of Research Design: Data Format

- What format will the data be in?
- Questionnaire? Standardized versus survey?
- Interview? (individual versus focus group)
- Interviewer/observer rating scale?
- Retrospective chart reviews?
- Continuous versus categorical data (means versus frequencies)

- Data format affects statistics/interpretive methods you use (e.g., qualitative versus quantitative methods)

Elements of Research Design:Comparison/Control Groups

Selecting a comparison group:

1) Between Groups Designs

Compare it to another group (that is similar to research group except with respect to the treatment/construct you are measuring)

2) Within Group Designs

Can compare one group to itself over time (before treatment and after treatment)

Elements of Research Design: One time vs. over time research

1.Cross-sectional method :

Same group of people are observed at one point in time

2.Longitudinal method:

Same group of people are observed at different points in time as they grow older

Elements of Research Design: Defining your terms

1. Independent variable : variable that is manipulated by the researcher (or the variable that is thought to affect the outcome/dependent variable)
2. Dependent variable : variable that is measured to assess the effects of the independent variable
3. "Operational definition" : procedure for measuring and defining a construct

Turning your research question into a Research Hypothesis

- It is the test of your idea or theory
- A hypothesis is a statement that describes or explains a relationship among variables
- It is a prediction that is derived from your research question

RH & RQ

Formulating questions and hypotheses about differences and relationships

The key to the success of an entire classical investigation is to state clearly the research questions and/or hypotheses (RQs and RHs) for the specific topic of interest .

Defining your terms

1. Words:

- Counting things in spoken or written products can be harder than you think.
- Yet one cannot count words without a definition!
- In this text, how many words are there?
- What problems arise in deciding on the answer?
- How would you prefer to resolve them in your definition of a word?
- How do you think a computer would resolve them if asked to count words?

2. T units:

- Often one wants to quantify the length of text or spoken utterances.
- One can do this in words or in sentences, but quite popular in child and learner research are also T-units.
- A T-unit ('terminable unit') is essentially a main clause with a non-elliptical subject, including any dependent clauses

3. Errors:

- Categorising and then counting errors in more or less naturally
- produced written or spoken material used to be common.
- But in order to constitute a proper variable a good categorization / classification system should : be exhaustive, have mutually exclusive categories, not mix categories of different types in one set, have unambiguously defined categories.

How to improve the classification system?

- Grammar errors
- Vocab errors
- L1-induced errors

Questionnaires

- Data elicited in the form of people's reports about language or something related.
- Data of this sort is most used in ELT, applied linguistics and sociolinguistics.
- essentially subjects report about what they or others do, or on beliefs about or attitudes to language, language learning etc., or on non-linguistic variables you need to record
- One type, the grammaticality judgment task, is popular in acquisition research.
- Reporting ranges from

(a) 'think aloud' reporting, immediate retrospective reporting after a task, open interviews, or diary type of reports to.
(b) structured interviews, closed questionnaires or attitude rating inventories and judgment tests. The former are heavy on Data Analysis transcribing what people say, and often contain material suitable for purely qualitative analysis.

Conventional closed questionnaires

- Spot as many unsatisfactory features as you can in the following start of a sociolinguistic research questionnaire given to people.

Your research Variables

1) How many variables are centrally involved?

We are not counting here the variables you might want to exclude the effects of… see later, just those that are central to a RQ or RH. So is this a one variable design, two variable, three variable etc. design? In the jargon: univariate, bivariate or beyond two variables it may be either factorial or multivariate (As a rough guide, it would be called factorial only where there are two or more explanatory variables in categories, see below for explanation, otherwise it would be called multivariate).
In this course we stick to two-variable designs, since understanding them properly is the key to understanding more complicated ones. In fact often a study with many variables can be broken down into a whole lot of RQs each dealt with as a two variable design.

2) What roles do the central variables each play?

Often we think of one or more variables as potentially 'explaining' or 'causing' or 'affecting' or 'predicting' one or more of the others. For instance gender would be regarded as 'explaining' any differences in use of strategies we find. It would be odd to regard strategy use as somehow affecting people's gender! In the jargon, the 'explaining' variable (or variables) is perhaps most neutrally labelled the 'explanatory variable' (EV, as I prefer), but many call it the 'independent variable' (IV), or in some special design circumstances 'factor' or 'predictor'. The other variables are then 'dependent variables' (DV) or sometimes called 'response variables' etc. Sometimes there is no obvious EV - DV distinction among variables, e.g. if you are interested in the relationship between learners' grammatical proficiency and vocabulary size it is not obvious that either one is potentially affecting the other. Then regard the design as having DVs only.
There is a reason for talking in weaker terms and saying that one variable 'explains' another, or just 'is related to' it, rather than more strongly saying it 'causes' it or 'affects' it. Much language research is not experimental in the true sense, and the conventional wisdom is that it is only in a proper experiment that cause and effect can definitely be demonstrated.

3) Is this an experiment, in the strict sense?

4) What variables are or should be considered additionally to the central EVs and DVs?
These are variables that you might need to control, in the sense of 'exclude the effects of' (which I call CVs!). They may well not be mentioned in the research question/hypothesis, but are nevertheless crucial. They are things that may otherwise interfere with the results and make it hard to interpret what you discover about the central variables in the design.
You can 'control' or eliminate such variables in various ways.
In much language research ideal control is not possible. In theory, it is only in experiments that it could be fully achieved.

RESULTS IN GENERAL: THREE STATISTICAL THINGS TO DO WITH RESULTS

1. Presentation :

Mainly presentation consists of making easy to understand tables, and especially graphs of various sorts, to go in the main text and show the key features of the results (e.g. histograms, bar charts, scatterplots, line graphs of various sorts).

2. Descriptive statistics :

These are figures you (get the computer to) calculate from a lot of specific figures which arise from data. Essentially they summarise certain facts just about the specific cases you studied. Hence they are referred to as 'statistical measures' based on 'observed' data, sometimes referred to as O (=observed) figures for short (cf. 'statistical tests' in c which go beyond just what has been observed about samples). Mainly they are of one of the following types, depending on what kind of thing about your people/words/etc. they measure:

- -Measures of centrality :

These in some way indicate the one score or category that you might choose to represent a whole set of scores or categorisations for one group of cases on one variable. These are mostly familiar measures from everyday life. One example is the "average" score of a set of interval scores (technically the Mean). Another, where you have cases that have been put in categories, is the category that the greatest proportion of people chose or fell in

- -Measures of variation :

These summarise how far the individual scores were closely spread round some central measure, how far they were widely spread. In a way they measure how closely the scores (or people who scored the scores) "agreed" within a group, on a scale running upwards from 0. The higher the figure, the greater the variation. Examples of such measures are the Standard Deviation (and related notions Variance and Error) for scores, Index of Commonality for categories.

❖ -Measures of difference :

These summarise the amount of difference between pairs of samples or groups measured, or between scores the same group obtained in different conditions, usually by a figure that is the 'difference between two means', or the 'difference between two percentages' (percentage difference). Again such figures normally run upwards from 0 (= no difference) to any size.

❖ -Measures of relationship :

These quantify the amount of relationship between two (or more) variables as measured in the same group of people or whatever. They are usually on a scale 0-1 (in some instances they run from -1 through 0 to +1). I.e.

3.Inferential statistics :

These in some way enable you to generalise from the specific sample(s) you measured, and the descriptive measures of them (O's), to a wider 'population' that you sampled (if that is of interest to you, of course). Most descriptive statistical measures have associated inferential statistics.

In effect then, the input to inferential

- the level of certainty is about what inferential stats tells you that you will be satisfied with. No inferential stats give you 100% certainty of anything. I.e. statistics can never tell you that, based on the difference between 3rd graders and 4th graders you found in your samples, it is 100% certain that there is a difference between 3rd and 4th graders in the populations your samples represent

Revision & Final Exam

1. A hypothesis is:

- ❖ A hypothesis is a statement that describes or explains a relationship among variables
- ❖ A hypothesis is a statement about your research
- ❖ A hypothesis is a statement about the problems in your research
- ❖ A hypothesis is a statement about the outcome of your research

2. The independent variable is:

- ❖ the variable that is thought to affect the dependent variable
- ❖ the variable that is thought to affect the hypothesis
- ❖ the variable that is thought to affect the results
- ❖ the variable that is thought to affect the abstract

3.Research is:

- ❖ Looking for knowledge only
- ❖ Looking for data only
- ❖ Looking for new ideas and findings
- ❖ Looking for previous studies

4. An Abstract is:

- ❖ A summary of the whole thing
- ❖ A summary of the whole results
- ❖ A summary of the whole literature review
- ❖ A summary of the whole methodology

5.A good classical report will consist of:

- ❖ Abstract- methodology- results-introduction
- ❖ Abstract-literature review- results-introduction
- ❖ Abstract-introduction-literature review-methodology-results
- ❖ Abstract-results-introduction-literature review

6. In the introduction:

- You introduce the results
- You introduce the study and its significance
- You introduce all previous studies and a critique for them
- You introduce all the methods and instruments you used

7.In the literature review:

- You talk about the results
- You talk about the study and its significance
- You talk about all previous studies and a critique for them
- You talk about all the procedures used

8.Plagiarism is:

- Representing other authors' language and ideas as your own original work
- Representing your own language and ideas as your own original work
- Representing other authors' language and ideas as their own original work
- Representing other authors' language and ideas as a plagiarised work.

9.The dependent variable is

- The variable that is affected by the independent variable
- The variable that is dependent on the hypothesis
- The variable that is affected by the abstract
- The variable that is affected by the results

10.The significant difference has to be at the level of:

- P= 50
- P=.05
- P=.50
- P=0.50

11.If you have one variable in your research, then it is:

- Multivariate
- Univariate
- Bivariate
- factorial

12.We use questionnaires in research as a:

- tool to collect data
- tool to analyse data
- tool to generate results
- tool to design research