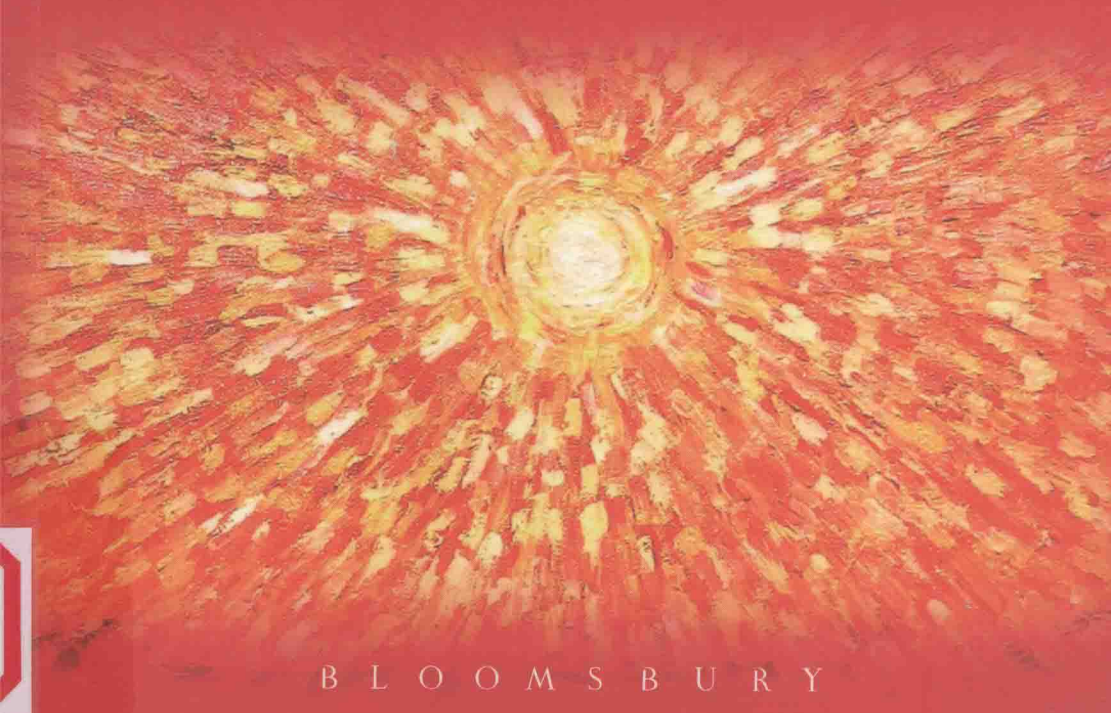


Research Methods in Linguistics

Experimental Research Methods in Language Learning

Aek Phakiti



B L O O M S B U R Y

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Experimental Research Methods in Language Learning

AEK PHAKITI

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PREFACE

Language learning research is a growing discipline. Systematic and well-designed research is needed in order for this field of study to progress. The past few decades have seen a variety of new research paradigms and methodological approaches in language learning research, including quantitative research methods (e.g. survey research and experimental research), qualitative research methods (e.g. case study and ethnography) and mixed-methods research methods. This book focuses on a type of quantitative research (i.e. experimental research) that requires statistical analysis in order to make inferences and draw conclusions about language learning.

Why a new book focusing on experimental research?

Several published research books on language learning have covered the broad areas of quantitative, qualitative and/or mixed-methods research. Generally speaking, they provide a good coverage of the nature, principles, and methodology of language learning research. These books include Hatch and Farhady (1982), Seliger and Shohamy (1989), Nunan (1992), Brown and Rogers (2002), Mackey and Gass (2005), Dörnyei (2007), Nunan and Bailey (2009), and Paltridge and Phakiti (2010). Other books have focused on second language classroom research for language teachers (e.g. Chaudron 1988; McDonough & McDonough 1997; McKay 2006). In applied linguistics, some books are more about strategies for understanding research reports in language learning (e.g. Allison 2002; Perry 2005; Porte 2002, 2010). Porte (2010), for example, aims to help students and new researchers to critically read and appraise quantitative research papers in the field of second language learning. Allison (2002) provides a research approach to English language studies and discusses major issues in English language research, including a discussion of project, dissertation and thesis research and writing. Perry (2005) consists of two parts: approaches to research with examples taken from applied linguistics research and the components of a typical research article. There is, however, only limited guidance of how to go about conducting an experimental study.

Other research books devote themselves entirely to quantitative research methods (e.g. Brown 1988; Hatch & Lazaraton 1991). Brown (1988) explains the nature of second language quantitative research, particularly aiming at clarifying issues in statistics in second language research. Hatch and Lazaraton (1991) discuss the conceptual and statistical topics that are essential for good quantitative research. Mackey and Gass (2005) and Dörnyei (2007) provide some coverage of experimental research methods with examples taken from second language acquisition research. However, an in-depth discussion of more specific examples and the issues relevant to experimental research in language learning are needed for the reader to understand how experimental research can be implemented in a real-world research context. Since the general research methods books mentioned above aim to cover other types of research, such as non-experimental, survey research, case study and ethnography, they do not necessarily provide a full picture of what is actually involved in conducting experimental research.

Recently, there have been books dealing with specific types of research in language learning and use, such as survey research (Brown 2001b), research using case studies (Duff 2008), and research using discourse analysis (Paltridge 2006, 2012). To date, there has been no single-volume, comprehensive, yet accessible book on experimental research methods in language learning. One of the key goals of this book is to help students and researchers develop the ability to design an experimental study that can be carried out within the available time and using the resources available in a given context.

An experimental research methods book especially written for language learning research is needed, given the importance of specific examples and cases to research areas unique to the field of language learning. It can be argued that people can make sense of experimental research only when they see how it is actually applied in a real language learning research context. This book uses examples of experimental studies published in several major international journals, such as *Applied Linguistics*, *Language Learning*, *Language Teaching Research*, *Studies in Second Language Acquisition*, *TESOL Quarterly* and *The Modern Language Journal*. It discusses the underlying principles behind experimental research in language learning, including epistemological considerations and provide step-by-step guidelines of experimental research methodology. It illustrates the interrelatedness of the parts of the whole experimental research process.

Unlike most books, this book directly integrates applications of IBM® SPSS® (Statistical Package for Social Sciences) for statistical analyses with step-by-step instructions and data files for hands-on practice. The book forms a *gateway* into the often intimidating world of statistics for experimental research, and provides an opportunity for readers to ground their knowledge of statistics in a working knowledge of SPSS. It highlights the

importance of a conceptual understanding of several statistical principles and the types of analysis necessary for successful experimental research, while minimizing the presentation of complex statistical formulas. The development of a working knowledge of SPSS will allow students to critically explore standard quantitative research and produce good research projects of their own. The book includes discussion on published studies and provides examples, guided questions and details of further suggested reading.

A distinctive feature of this book is its *companion website*, which houses online materials with up-to-date resources, lecture notes, data sets, and activities that cannot be made available in the print version. In particular, data files and samples will be provided that readers can analyze using SPSS in order for students to familiarize themselves with data analysis processes and gain insights into how to perform data analysis.

In summary, this book is introductory, yet in-depth in its treatment of the approaches to experimental research, and is comprehensive in the range of approaches it discusses. One important aim of the book is to make the subject of experimental research in language learning *accessible* and *meaningful* to readers without a background in this particular area. This book will also help readers develop their research literacy and their ability to not only critically evaluate, but also make use of the existing literature that utilizes experimental research as a means to understand a phenomenon of language learning.

Purpose and readership

Discussion on experimental research occurs in all the major journals and in many books in the area of language study and language learning. The intended audience for the book is third-year (or above) undergraduate and postgraduate students (e.g. Master of Arts [MA], Master of Education [Med], Master of Philosophy [MPhil], Doctor of Education [EdD], and Doctor of Philosophy [PhD]) in Applied Linguistics, TESOL (Teaching of English to Speakers of Other Languages) and Second Language Studies. The book is also suitable for experienced researchers wishing to expand their knowledge in experimental research in language learning. It is a comprehensive guide to conducting experimental research in the area of language learning.

Companion website of the book for instructors and students

A *companion website* hosted by the publisher is used to house online materials with up-to-date resources, lecture notes, data files, and useful activities that cannot be made available in the print version: <http://www.bloomsbury.com/experimental-research-methods-in-language-learning-9781441189110/>

Errata

Despite my best attempts, some errors may appear in this book. An up-to-date list of corrections will be kept.

Comments/suggestions

The author would be grateful if you could send him your comments or suggestions so that he can improve this book in future editions and update the companion website. You can contact him at: aek.phakiti@sydney.edu.au or aek.phakiti@gmail.com

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CONTENTS

Preface vi

Acknowledgments x

- 1 Introduction and Overview 1
- 2 Experimental Research Basics 21
- 3 Experimental Research Paradigms and Processes 39
- 4 Experimental Research Designs 55
- 5 Validity in Experimental Research 83
- 6 Ethical Considerations in Experimental Research 101
- 7 Quantitative Research Instruments and Techniques 115
- 8 A Hybrid Approach for Experimental Research 143
- 9 Descriptive Statistics 159
- 10 Inferential Statistics 193
- 11 Correlational Analysis 209
- 12 Reliability and Reliability Analysis 229
- 13 Paired-samples and Independent-samples T-tests 259
- 14 Analyses of Variance (ANOVAs) 275
- 15 Non-parametric Versions of t-tests and ANOVAs 303
- 16 Experimental Research Proposals 321

Glossary of Key Terms in Language Learning Research 341

Bibliography 351

Index 363

CHAPTER ONE

Introduction and Overview

Leading questions

- 1 What is research?
- 2 What do you think experimental researchers do in their research?
- 3 Do you think an experimental research design can provide an insight into language learning? Why or why not?

Introduction

This book aims to present a methodological framework of experimental research in language learning for people new to experimental research. This chapter introduces experimental research in language learning and the nature of academic and language learning research within applied linguistics. It aims to provide an overview of fundamental concepts of research in language learning in general (e.g. definitions of research, applied linguistics and language learning research). Such concepts are needed in an introductory chapter because they can be connected to associated concepts in experimental research introduced throughout this book. This chapter will also provide an overview of the contents of this book.

What is experimental research?

The first thing that comes to mind when you first hear or see the word “experiment” may be a scenario in which a group of scientists carefully examines subjects such as plants in a controlled environment. They, for instance, vary the amount of light and water available to their subjects,

and measure changes in their subjects' growth before and after varying these conditions so that they can systematically compare the results of their analysis and decide which conditions yield the best outcome. Experimental research methods in language learning are similar to methods employed in this example. They, however, deal with language learners and aim to understand aspects of their learning. In language learning, for example, we would like to see whether a particular teaching strategy or activity could enhance students' learning performance. We may investigate whether a particular linguistic condition results in some form of difficulty in language acquisition among learners. Experimental research in language learning, unlike the botanical example above, does not usually occur in a scientific laboratory where all conditions are strictly controlled. In particular, learner participants are not locked up and can interact with the outside world. It is unrealistic for a language learning researcher to think that it is possible to control the influence of such interactions, and to do so is potentially unethical.

A glance at some experimental studies in language learning

Experimental research in language learning is usually conducted within a language classroom, which can be viewed as a real-life laboratory. Furthermore, unlike most natural science researchers, language learning researchers do not have complete control over all the variables that could influence experimental research outcomes. This is because human beings and the nature of learning and context are highly complex. Experimental research in language learning has a tradition of adopting the experimental principles and procedures used in human psychological research, which aims to understand what goes on in human minds, including those processes associated with learning, cognition, emotion and affect. Cognitive psychological research has influenced the way language learning research deals with language learners' psychology (Dörnyei 2005; Doughty & Long 2003). The approach to experimental research in this book is largely influenced by the way an experiment is considered and conducted in cognitive and psychological research generally, and in applied linguistics specifically.

Let us look at two sample studies in language learning that employed an experimental design.

Chen and Truscott (2010) examined the effects of repetition and first language (L1) lexicalization on incidental vocabulary learning using a posttest and delayed posttest experimental design. Seventy-two Taiwanese university students were *randomly assigned* into three groups (N = 24 per group). Each group received a different number of exposures to the target words. There were three phases of testing in this experiment: a reading

comprehension task, an immediate posttest and a delayed posttest (two weeks later). It was found that the scores consistently increased with the number of input exposures.

Ammar and Spada (2006) investigated the effects of two corrective feedback techniques (recast and prompts) on students' language learning performance. The study focused on third-person possessive determiners (i.e. his and her). The study used a *quasi-experimental research design* because the study was conducted in three intact classes of English as a second language in Canada. The researchers used a pretest, immediate posttest and delayed posttest design to address the research aim. One class served as a *control group* for comparison purposes. There were 12 sessions (30–45 minutes each) over four weeks. There was one instruction session and 11 practice sessions, which included some semi-controlled and controlled practice. It was found that prompts were more effective than recasts.

According to these two examples, we can see that experimental studies compare research outcomes (e.g. learners' performance) according to the conditions that learners are exposed to. If an experimental study is conducted in an intact class, it is classified as *quasi-experimental*. This book will explore these types of research design.

Academic research

Research is a form of inquiry that involves questions and answers (Nunan 1992). We engage in some form of research activity on a daily basis, often without any formal recognition. For example, we may want to buy a new laptop, but we have some preferences and particular specifications we would like the laptop to have. We also have a limited budget. Perhaps with a computer-savvy friend, we then look up catalogs from different online stores. We eliminate many options as they are either beyond our budget or do not meet our specifications. We may end up with one laptop that is offered by two online stores (both of which we regard as trustworthy). Store A is more expensive, but offers an attractive deal including a free copy of Microsoft® Office® and anti-virus software. Store B is \$300 cheaper than store A, but does not offer any special deal. We may look up how much it would cost to buy a Microsoft Office for Windows® license and anti-virus software only to discover that it costs about \$300. We may then contact store A and inquire whether the store can offer a price matching the price offered by store B. Fortunately, store A accepts our proposal and we finally buy the laptop from store A and save \$300. We have a bargain.

In this scenario, we have a goal to achieve, and a problem to solve (i.e. to buy the best laptop that suits our needs, within a limited budget). We collect information about prices, special deals, stores and their locations, and we

eliminate choices and stores by means of comparison. Finally, we make an informed decision to buy a particular laptop. If we do not collect any information, we cannot be sure the price we pay is reasonable. Sometimes in academic research, we discover new significant findings that we did not anticipate. That would be a bargain as well. The processes involved in academic research are similar to those in this example.

Defining academic research

What is academic research? At the beginning of my first research methods class, I asked my students this question. While they came up with different ideas about its definition, some used the prefix *re-* (which means *again*) and *search* (which means to look for) to define academic research. They defined research as *searching again and again*. This seems to describe language learning research well – we want to make sure that our findings are replicable and generalizable to other groups of learners across different settings. Repetition and replication is likely to be necessary in many research areas, especially newly established ones. However, once the same issue/phenomenon (in different settings and groups of learners) is thoroughly understood by substantive previous research, we move on to new areas as new problems emerge and new methods become available. Hence *to search again and again* becomes a trivial activity.

Dörnyei (2007, p. 16) also notes that ‘it’s a waste of time ... to ... “reinvent the wheel” again and again.’ Therefore we need to be careful not to research a topic that has already been well understood. In reality, however, it is difficult to know exactly when research has become substantive. This is due to the complexity of language learning, coupled with a lack of shared resources (e.g. limited access to academic journals or books) and different concepts of what constitutes language learning.

In this book, academic research is defined as *an intellectual act to discover new facts or knowledge by attempting to go beyond existing knowledge*. Academic researchers aim to improve existing knowledge by observing, collecting, and analyzing evidence. They make inferences and draw conclusions from the evidence. Research can lead to a cumulative body of knowledge that will ultimately improve ways of living and our understanding of the world (e.g. how to learn and teach languages successfully). In order to achieve these aims, researchers need to examine a topic or problem systematically. To succeed, academic research requires planned and organized actions for collecting and analyzing data in order to make appropriate inferences and warranted conclusions about the topic or problem under examination.

Primary and secondary academic research

On the one hand, *primary research* concerns first-hand data (referred to as *empirical data*) from research participants or documents to answer research questions. Empirical data can derive from tests, questionnaires, interviews, observations or publicly available documents. In language learning research, empirical data may derive from *natural data*, which include utterances language learners produce. *Secondary research*, on the other hand, does not require researchers to collect new empirical data. The most common types of secondary research are *library research* and a *review of the research literature*. Through secondary research, we can understand the body of cumulative knowledge and the recent developments of a theory.

Primary and secondary research studies are equally important for scientific knowledge about language learning. Primary research usually needs secondary research prior to the gathering of empirical data (e.g. in the form of a review of the literature). As mentioned earlier, we do not want our research to be trivial or to repeat mistakes made in previous studies. We also need to address research questions that are relevant and worth answering. Even in the case of new research areas, while there may have been no prior study of a particular topic, we still need to consider whether there have been other studies in the same locations and whether there are research methods available that are suitable for the aim of the research.

Applied linguistics and language learning research

Language is a tool used by humans to express their thoughts and emotions. It is a tool for social communication, and it plays a central cultural role. Applied linguistics is an interdisciplinary field of research inquiry that is mainly concerned with language use in social contexts. Hence, topics that deal with problems in human language use in society (e.g. language learning, language teaching, and language policy) are of interest and relevant to applied linguists. This field of inquiry emerged in the late 1950s when linguistic research had previously been narrowly focused on linguistic systems (Davies & Elder 2004). However, several real-world problems involving language and language use required more than an understanding of the language system itself. There was also a need for a better understanding of language use and socialization (see Davies & Elder 2004 for further discussion). Key areas of applied linguistics closely related to language education include language acquisition, learning and pedagogy, language testing and assessment, discourse and conversation analysis, and bilingualism and multilingualism. It is beyond the scope of this book to

discuss in detail the different areas of language learning research. Macaro (2010) provides and discusses a comprehensive list of areas of research related to language learning. Lightbown and Spada (2013) also extensively cover topics in language learning.

In the applied linguistics literature, we see some discussion about the distinctions between first, second, third and foreign language learning (e.g. Macaro 2010; Ortega 2009). A first language (L1) is often referred to as the language that our parents and people in our society use in their daily conversations. A second language (L2) is generally referred to as a language second to the first language. English as a second language (ESL), for example, is discussed as English being learned and used by people whose first language is not English, but for whom English is the medium for daily communication (e.g. in the USA, UK, and Australia). English as a foreign language (EFL) is discussed as English being learned and used in a context in which the main language for communication is in learners' L1 (e.g. in China, Thailand, Brazil). You will notice that language learning can become complicated as people may learn more than two languages, and more and more people learn two or more languages simultaneously.

The distinction between second and foreign language learning can cause confusion in the field of second language acquisition (SLA), which is the sub-discipline of applied linguistics that aims to understand how people learn a second language and the factors that affect their language learning. SLA research not only examines second language learning, but also any foreign, third or fourth language learning. Due to the complexity of language learning, we see that the SLA literature often treats additional language and foreign language learning in the same second language acquisition framework. Of course, we know that learning a third language is not necessarily the same as learning a second language. A more solid theoretical framework for third or fourth language acquisition will eventually emerge as more research is conducted.

This book uses *language learning* as a broad umbrella term to cover these types of language learning. Furthermore, this book does not differentiate between language learning and language acquisition. There was an academic debate regarding the differences between acquisition and learning in the early years of SLA research (e.g. Krashen's hypotheses), but the issue has now been more or less resolved (Macaro 2010). Both terms refer to essentially the same thing and, therefore, can be used interchangeably. Furthermore, language learning and language use are inseparable because learners need to use their (limited) language knowledge in order to learn more, to improve and increase their proficiency, and to identify the mistakes they make through their interactions with other people.