

Experimental Methods in Language Acquisition Research

Edited by
Elma Blom
Sharon Unsworth

John Benjamins Publishing Company

Experimental Methods in Language Acquisition Research

Edited by

Elma Blom

University of Amsterdam

Sharon Unsworth

Utrecht University



John Benjamins Publishing Company

Amsterdam / Philadelphia



™ The paper used in this publication meets the minimum requirements of American National Standard for Information Sciences – Permanence of Paper for Printed Library Materials, ANSI Z39.48-1984.

Library of Congress Cataloging-in-Publication Data

Experimental methods in language acquisition research / edited by Elma Blom, Sharon Unsworth.

p. cm. (Language Learning & Language Teaching, ISSN 1569-9471 ; v. 27)

Includes bibliographical references and index.

1. Language acquisition--Research--Methodology. 2. Second language acquisition--Research--Methodology. 3. Bilingualism in children--Research--Methodology. I. Blom, Wilhelmina Bernardina Theodora, 1972- II. Unsworth, Sharon.

P118.E87 2010

401'93--dc22

2010021314

ISBN 978 90 272 1996 1 (Hb ; alk. paper)

ISBN 978 90 272 1997 8 (Pb ; alk. paper)

ISBN 978 90 272 8795 3 (Eb)

© 2010 – John Benjamins B.V.

No part of this book may be reproduced in any form, by print, photoprint, microfilm, or any other means, without written permission from the publisher.

John Benjamins Publishing Co. · P.O. Box 36224 · 1020 ME Amsterdam · The Netherlands

John Benjamins North America · P.O. Box 27519 · Philadelphia PA 19118-0519 · USA

Preface

This book stems from the Experimental Methods in Language Acquisition Research workshop, a yearly event which has been held at Utrecht University under the auspices of the Netherlands Graduate School of Linguistics (LOT) since 2003. Many of the chapters in this book are based on the lectures given at this workshop. From the onset, the workshop was a success, which indicated to us that there was a substantial group of students and researchers who were genuinely interested in thinking about and solving methodological issues. It also showed that there was a need for information, and that, although there are various excellent books on the market that deal with the method of language acquisition research, there were still gaps that need to be filled.

The EMLAR workshops could not have started without the encouragement and support of Martin Everaert and financial support from the Netherlands Graduate School of Linguistics and Utrecht institute of Linguistics (UiL OTS). We would like to thank the many presenters, students and researchers who attended the workshop and who have over the years provided us with inspiration and feedback. Finally, we would like to thank Kees Vaes at Benjamins for his support for this project, as well as the authors and reviewers for their contributions.

Table of contents

Preface	vii
Introduction	1
1 Production methods in language acquisition research <i>Sonja Eisenbeiss</i>	11
2 Using comprehension methods in language acquisition research <i>Cristina Schmitt & Karen Miller</i>	35
3 Using Magnitude Estimation in developmental linguistic research <i>Antonella Sorace</i>	57
4 Using infant and toddler testing methods in language acquisition research <i>Elizabeth Johnson & Tania Zamuner</i>	73
5 Using Event-Related Potentials in language acquisition research <i>Judith Rispens & Evelien Krikhaar</i>	95
6 Using eyetracking in language acquisition research <i>Julie C. Sedivy</i>	115
7 Using on-line processing methods in language acquisition research <i>Theodoros Marinis</i>	139
8 Using computational modeling in language acquisition research <i>Lisa Pearl</i>	163
9 Measuring second language proficiency <i>Jan H. Hulstijn</i>	185

10	Comparing L1 children, L2 children and L2 adults <i>Sharon Unsworth & Elma Blom</i>	201
11	Comparing typically-developing children and children with specific language impairment <i>Johanne Paradis</i>	223
12	Measuring the linguistic development of deaf learners <i>Anne Baker & Beppie van den Bogaerde</i>	245
13	How to design and analyze language acquisition studies <i>Hugo Quené</i>	269
	Contributors	285
	Index	289

Introduction

The goal of this book is to provide students and researchers who are interested in language acquisition research with comprehensible and practical information on some of the most frequently used methods in language acquisition research. The scope of the book is wide. It includes contributions on first and second language-learning children and second language-learning adults, children diagnosed with language impairment and on the acquisition of both spoken and signed language.

Most chapters in this book discuss either a certain method or experimental procedure (Part I) or focus on comparisons across groups (Part II). In addition, there is a final chapter in which design and data-analysis are discussed from a statistical point of view. The format across chapters is homogeneous in order to help readers to quickly find the information they are looking for. The methods in Part I all begin by explaining the rationale of the method. This is followed by sections that discuss which linguistic variables can be tested, which type of subjects a given method can be used with and how to deal with analysis and outcomes. These chapters conclude with the advantages and disadvantages of the method in question and some dos and don'ts which researchers should follow. The chapters in Part II deal with the theoretical issues and questions that can be addressed with a particular comparison and highlight the relevant applied issues that may follow from cross-group comparisons. These chapters conclude with a list of dos and don'ts which are important to bear in mind when comparing certain groups of learners.

This book is intended for anyone interested in conducting experimental research in first or second language acquisition, typical or atypical. This includes not only students (advanced undergraduates as well as postgraduates) but also more senior researchers who may wish to brush up their knowledge on a given technique or explore opportunities to use new methods or investigate new populations. It can be used as primary reading material for courses focusing on one or more of the methods covered as well as providing useful additional material for anyone who might not use these methods directly but seeks the wherewithal to evaluate research which employs them. The second part of the book will furthermore be useful to those wishing to make comparisons across different learner populations.

Chapters 1 to 9 focus on a particular method or various closely-related methods. Chapter 1, by Sonja Eisenbeiss, deals with the three most important methods that are

used for collecting speech production data: naturalistic studies, semi-structured speech and production experiments. Chapter 2, by Cristina Schmitt and Karen Miller, follows with three of the most common methods used to collect off-line comprehension data, namely the truth value judgment task, the act-out task and the picture selection task. In Chapter 3, Antonella Sorace writes about magnitude estimation, a task used to collect off-line judgment data. In Chapter 4, Elizabeth Johnson and Tania Zamuner discuss three techniques that make use of typical infant and toddler behavior in order to test the receptive language abilities of young children: the visual fixation procedure, the headturn preference procedure and the preferential looking procedure. Aspects of the use of event-related potentials as a means to collect data on language acquisition are explained in Chapter 5 by Judith Rispens and Evelien Krikhaar. In Chapters 6 and 7, we continue with on-line methods. Chapter 6, by Julie Sedivy, deals with the use of eyetracking in language acquisition research. Although research using eyetracking with children and in language acquisition in general is still relatively new, the insights from non-language acquisition studies outlined in this chapter will provide useful reading for those seeking to use this method. Chapter 7, by Theodoros Marinis, details a number of on-line sentence processing tasks: three widely used tasks, namely word monitoring, self-paced reading/listening and cross-modal priming, and one new task developed by the author himself, namely the self-paced listening and picture verification task. The final two chapters in part I deal with quite different topics, namely computational modeling and second language proficiency. In Chapter 8, Lisa Pearl, outlines how and why computational models are used to simulate the language acquisition process. Finally, in Chapter 9, Jan Hulstijn discusses how researchers in second language acquisition can best measure language proficiency.

The chapters in Part II concern cross-group comparisons. In Chapter 10, by Sharon Unsworth and Elma Blom, we continue to focus on second language acquisition. The authors address the comparison between children learning a second language, adults learning a second language and children learning their first language. In Chapter 11, the focus moves to language impairment as Johanne Paradis discusses how to make comparisons between typically-developing children and children with specific language impairment, both monolingual and bilingual. Finally, in Chapter 12, Anne Baker and Beppie van den Bogaerde point out the most important issues related to working with deaf learners and explain how to compare deaf learners with other groups. The last chapter of the book, by Hugo Quené, provides a general introduction to methodology and statistics with specific reference to language acquisition research. It covers important concepts and terminology and points out some of the most common pitfalls when it comes to language acquisition studies. The chapter concludes with a review of frequently asked questions, such as “How many participants and items are required?” and “What if only a small number of participants are available?”

An inevitable consequence of the broad scope of this book is that the information it contains is not exhaustive. Anyone seeking more detailed information about a certain method or cross-group comparison should check the references given at the end of a chapter. Authors often explicitly mention useful literature that deals with those issues that they themselves are not able to discuss at full length. In putting together this book we deliberately opted for a wide range of topics. Since other books tend to single out certain methodologies, particular groups or discuss only one linguistic domain, we decided to focus on new experimental procedures that are not discussed in-depth elsewhere, include various chapters on the merits and limitations of comparisons across groups of language learners and we welcomed contributions and examples across linguistic domains.

We strive to both complement and supplement existing books. There are hundreds of books on the market which deal with statistics and research methodology, and here we name just a few with which we and/or colleagues have had positive experiences. The introductory text book of Devore & Peck (2004) provides a comprehensive overview of the most important statistical methods. Two useful introductory books on statistics and statistical packages are Field (2009), which deals with SPSS, and Baayen (2008), which makes use of the programming language R. Baayen (2008) provides step-by-step instructions using examples from corpus linguistics and processing experiments. Rietveld & Van Hout (1993) focuses specifically on statistics in linguistics, and deals with many of the basic concepts using examples from linguistic research (albeit not necessarily relating to acquisition). Of particular interest in Rietveld & Van Hout (2005), is Chapter 9, which deals rather elaborately with missing data, a common problem in language acquisition research. Johnson's (2008) R-based book also deals specifically with the use of statistical methods in linguistics, with chapters on psycholinguistics, sociolinguistics and syntax, and Larson-Hall's 2009 volume provides a guide to using statistics with particular reference to second language acquisition and applied linguistic research.

There already exist a number of excellent books which deal with the off-line comprehension and production methods which are most commonly used in (first) language acquisition research. For example, McDaniel, McKee & Smith Cairns' (1996) book contains 14 chapters in which production data, comprehension data and judgment data are discussed, with special reference to syntactic issues. Thornton & Crain's (1998) volume goes into quite some detail on how to set up elicited production and truth value judgment tasks in order to test children's knowledge of semantics and syntax. Without wanting to duplicate the content of these books but still wanting to include some information of these important methods, we decided to restrict our coverage of the most frequently used off-line production and comprehension methods to just two chapters, choosing instead to expand the scope to include magnitude estimation, a method which has recently started to gain ground, particularly in the

field of second language acquisition research. This chapter includes a comparison between magnitude estimation and regular acceptability/grammaticality judgment task, but there is no chapter which covers this latter task in detail. For more information on this topic, we refer the reader to the chapter by McDaniel & Cairns in McDaniel et al. (1996) and Schütze (1996). For more information concerning spontaneous speech production data and the use of corpora in language acquisition research the reader is referred to the chapters by Demuth and Stromswold in McDaniel et al. (1996) and to Behrens (2008).

The vast majority of the chapters in this volume take their examples from syntax, morphology and semantics. This is not to say that these chapters will not be relevant for researchers whose interests lie elsewhere, e.g., phonology, pragmatics, vocabulary, as the issues they cover are typically general enough to be relevant to any domain. More detailed information on methods for assessing children's knowledge of phonology can be found in Botma, Kula & Nasukawa (forthcoming), and in particular in the chapter written by Zamuner & Johnson.

Many of the chapters in Part I deal with on-line processing methods. This reflects recent moves in both the first and second language acquisition literature towards using such methods, and we felt it was important to reflect this trend in our selection for the current volume. Since the inception of this book, another volume entirely dedicated to testing language processing in children has also been published (Sekerina, Fernández & Clahsen 2008). This volume includes chapters on eyetracking, event-related brain potentials and syntactic priming, as well as other on-line methods used to investigate children's acquisition of syntax and morphology and a brief historical overview of the use of such methods in the field.

Wherever possible, we have strived to make the chapters in the first part of the book relevant to all language acquisition researchers, irrespective of the specific population they are interested in. Although some methods are more commonly used with certain populations, and hence the examples used are generally taken from work on these populations, this of course does not mean to say that they cannot be used with others; wherever relevant, any limitations in terms of the types of subjects with which a given method can be used are highlighted in the section on subjects. Inevitably, however, certain chapters are by definition restricted to a specific population, e.g., Chapter 9 on second language proficiency.

Part II focuses on different populations and the comparisons between them. Making cross-group comparisons is an important method for collecting information on language acquisition in general, and is almost a prerequisite for studies that aim to say more about the language development of a particular group. Here, we have singled out those cross-group comparisons which feature prominently in current research, but there are of course many more groups, each with their particular features (e.g. children diagnosed dyslexia, with Down or Williams Syndrome, ADHD or autism). Two

of these three chapters deal with second language and bilingual learners. The focus lies on the nitty gritty of why and how to carry out comparisons between different groups rather than issues relating to these groups in general, although these are mentioned in passing in several places. The reader interested in methodological aspects of research on second language acquisition and multilingualism may wish to consult one of the various books on the market on this topic, such as Larsen-Freeman & Long (1991), Tarone, Gass & Cohen (1994) and more recently, Wei & Moyer (2008). The latter volume, which is broad in its scope, is divided into three sections entitled 'Researching bilingualism and multilingualism', 'Procedures, methods and tools' and 'Project ideas, dissemination and resources', thereby covering every step in the research process from start to finish. Oller & Eilers' (2002) volume, though not specifically on methodology, contains 12 chapters (written by various authors) that discuss useful information on methodological issues concerning bilingual children. The scope is broad (e.g. standardized tests, probe studies, oral data, written production, judgment data, lexicon, morphology, syntax, phonology), although the information is inevitably spread throughout the book. For a comprehensive overview of qualitative data collection and mixed methods research, the reader is referred to Dörnyei (2007).

Everyone who has done some language acquisition research knows that it involves many practical problems. Most chapters in this book provide very useful, practical advice. However, given that they are each restricted both in size and in topic, many, more general practical tips have inevitably been omitted. For this reason, we have chosen to complete this introduction with a summary of some of these more practical tips, based on our own experience and that of many other researchers who shared their good and bad practices with us. Many of these are common sense but are sometimes forgotten in what is often a rush to design the test items, the fillers, test the equipment, etc. etc.. The list is of course by no means exhaustive and the reader will find many more of such practical tips scattered throughout the book.

Ethics

- In most countries, any research involving human subjects requires approval by the institution's research ethics committee. The rules and regulations concerning ethics vary from country to country and it is beyond the scope of this introduction to provide a complete overview. It goes without saying that researchers should ensure that they are well informed of their local and national procedures concerning human subject recruitment and protocols in the early stages of the development of a given experiment. Here we mention the most important issues which researchers should consider.

- **Informed consent.** Researchers are required (in many cases by law) to acquire informed consent from participants or in the case of minors, from those with a duty of care or what is referred to in some countries, e.g., Canada, as authorized third parties. Informed consent ‘entails giving as much information as possible about the research so that prospective participants can make an informed decision on their possible involvement’ (ESRC, 24). Participants should be told what the purpose of the research is, what procedures will be followed, how data will be used, how it will be managed and stored, how their anonymity will be preserved, what benefits may be reasonably expected, as well as being informed of any risks or discomfort participation may involve. It is important to include statements that the consent is given voluntarily and that participants may discontinue participation at any time without penalty. Researchers may need to inform participants about the procedures in case of incidental findings that may have significant welfare implications for the participant (European Commission, 23), and provide information on any costs, reimbursement for expenses or compensation for injury (TCPS, 2.7). Certain linguistic experiments, especially those that involve measuring the participants’ unconscious behavior, can only be carried out if the participants do not know in advance the true purpose of the research. Such cases may be treated as departures of the general principles of full disclosure (TCPS, 2.3). Researchers using partial disclosure or deception may need to add information about debriefing mechanisms.
- **Vulnerable groups.** Research involving vulnerable groups such as minors, members of certain ethnic or indigenous communities or individuals with cognitive disabilities are considered as involving risk and will almost always require approval from a research ethics committee. In the UK, researchers working with participants from vulnerable groups are usually required to obtain Criminal Records Bureau Disclosures (see <http://www.disclosure.gov.uk>). Similar requirements may be in place in other countries.
- **Applications for ethics approval.** Specific guidelines will of course vary from institution to institution and from country to country, but applications for ethics approval usually include the following elements: a description of the research goals, data collection and analysis, a summary of the ethical issues and how they will be addressed, an assessment of benefits and risks to the participants, information on how informed consent will be acquired and on privacy and how data will be protected.
- **Training.** Many institutions offer training programmes on ethics and some require participation before applications to ethics committees can be made. Again, check the local regulations carefully.

Planning

- Plan ahead. As well as factoring in time necessary to obtain ethics approval, think about (school) holidays, etc. and remember that in many countries, these may vary depending on the region. Remember that schools are often very busy with Christmas/end-of-year shows, exams, etc. directly before the holidays. Pilots are imperative and should not be overlooked (e.g. due to time constraints). No experiment works perfectly from the start! It is better to spend more time on the planning stage than trying to make sense of incomplete or problematic data as a result of an experiment which was not properly piloted.
- Once finalized, practise carrying out the experiment several times and train any student assistants and practise with them, especially if you will not be present during the actual experiment itself. It often helps to have one person play the role of the participant and act out any potentially problematic situations which you can foresee.
- If several people are collecting data, discuss how you will complete answer sheets, note down the various responses, etc. to ensure comparability afterwards.
- With this in mind, think carefully about everything that could go wrong and how you will deal with it. It is of course impossible to predict every possible mishap, but having already thought about possible solutions to problems will help you solve them more quickly if and when they do occur.
- Even if there is only one person doing the testing, write out a detailed protocol to ensure that all participants are tested in the same way.
- It is important to think about how to analyze the data before collection starts – this will help designing the experiments and (if applicable) the answer sheets, etc.

Recruitment

- Approach crèches and schools outside of big (university) towns and cities. These are often more enthusiastic about participating and there is less chance that they will be involved in another experiment already. It is always easier if you know someone associated with the school or crèche (e.g., a parent or teacher).
- If participants or parents of participants need to voluntarily sign up, try and minimize what is required of them in order to do so. Don't include too many questions in any initial registration form as this might put people off, but do of course make sure they include all questions required by the local ethics committee (see above).
- It is essential (and often obligatory) to obtain written consent from parents for minors, and often also for adult participants when using special equipment.
- When putting together a consent form, think carefully about what information you need, especially if this is to serve as a basis for excluding participants or to

find out more about potential confounds which might complicate analysis (e.g., SES). Make sure the criteria for participation (e.g., age, L1/L2 combination, proficiency level, clinical diagnosis, etc.) are clear before you start.

- State clearly how any recordings will be made, what they are for and how (if at all) they will be used in the future.
- Always recruit more participants than you will finally need, especially in longitudinal studies, where there is often a problem of attrition.

Materials and equipment

- When designing test materials, think about the vocabulary of your test subjects (age group, first or second language learners, instructed/non-instructed, etc.). Use wordlists e.g., the MacArthur-Bates Communicative Development Inventories (Fenson et al. 2007).
- Use Google Images to locate pictures, manipulating them with (often free) drawing software such as Paintshop, Freehand, Adobe illustrator, GIMP (GNU Image Manipulate Program), Paint.net, Inkscape.
- Consider using props to act out and/or photograph scenes instead of using drawings.
- Handpuppets. You can order everything from angels and raccoons to turtles and polar bears, all as handpuppets, at e.g., www.folkmanis.com, www.thepuppetstore.com and www.puppetuniverse.com. For those creatively inclined, tips and suggestions on how to make your own handpuppets are given at www.101handpuppets.com.
- In order to ensure that all test items are presented consistently, it is worth considering recording them in advance. These can then be presented via a laptop (with or without visual support, e.g. a monster, etc.) or simply using a CD player (perhaps disguised, e.g. as a robot, for young children) if a laptop is not available.
- The CHILDES site (childes.psy.cmu.edu/) has lots of invaluable information on recording equipment, how to record toddlers, digital video, digitizing video and audio. There is also a CHILDES Google group which has frequent discussions about the suitability of various types of recording equipment, etc., and where you can also post your own questions. Details on how to join are on the CHILDES site.

Test sessions

- When putting together a testing schedule, be sure to include breaks for the tester as well as the participants, and always add extra time for unforeseen eventualities. When recording children, start by asking their name and what day it is; this can

serve to break the ice and it makes it easier when it comes to listening back to the recordings (especially if they are audio only).

- Be sure to note down the order in which participants are tested.
- If children are flagging and there is still more than one task to be completed, you could ask the child to decide what he or she wants to do, e.g., do you want to listen to some words or look at pictures?. This sometimes helps to keep them motivated.
- To grab the child's attention when distracted, call the child by his or her first name.
- It might sometimes be necessary to shorten a test session, e.g., because time has run out, the participant is tired, etc.. Think beforehand about what you consider ok to skip and what is essentially. Decide in advance how flexible you are willing to be.
- Don't forget to thank participants! For children, stickers or small stationary items can be given as rewards. If a child has to complete several tasks, a small sticker card can be used, with as many sections as tasks and a sticker being rewarded after each task. This helps to keep children motivated and makes clear what is expected of them. Adults may be paid — check what the going rate is first. If there is no budget, think about providing refreshments or organizing a prize draw for cash or a book token.
- Don't forget to thank the teachers at any schools where you test (e.g. chocolates, cake, flowers, book on language development or bilingualism, perhaps for the staff library, etc.).
- Send any participating organizations (e.g., schools, parents) a short report (written in layperson's terms) about the results of the experiment. Use visuals and pictures to make this more fun! Be careful about giving a specific date as data analysis may take longer than first thought.

We believe that this volume provides an essential guide to the most important methods used in language acquisition research today. We hope that it will serve to both stimulate and inform, and ultimately to generate exciting new research on language acquisition. Enjoy!

Elma Blom (Edmonton, Canada) and Sharon Unsworth (Utrecht, The Netherlands)
September 2009

References

- Baayen, H.R. 2008. *Analyzing Linguistic Data. A Practical Introduction to Linguistics Using R*. Cambridge: CUP.
- Behrens, H. (ed.). 2008. *Corpora in Language Acquisition Research: History, Methods, Perspectives* [Trends in Language Acquisition Research 6]. Amsterdam: John Benjamins.

- Botma, B., Kula, N. & Nasukawa, K. (eds). Forthcoming. *The Continuum Companion to Phonology*. London: Continuum.
- Canadian Institutes of Health Research, Natural Sciences and Engineering Research Council of Canada, Social Sciences and Humanities Research Council of Canada. 1998. Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans (with 2000, 2002 and 2005 amendments) (TCPS). Available at <http://pre.ethics.gc.ca/eng/policy-politique/tcps-eptc/readtcps-lireeptc/>.
- Devore, J.L. & Peck, R. 2004. *Statistics: The Exploration and Analysis of Data*, 5th edn. Pacific Grove CA: Duxbury Press.
- Dörnyei, Z. 2007. *Research Methods in Applied Linguistics: Quantitative, Qualitative and Mixed Methodologies*. Oxford: OUP.
- Economic and Social Research Council (ESRC). 2005. Research Ethics Framework. Swindon: Economic and Social Research Council. Available at: http://www.esrcsocietytoday.ac.uk/ESRCInfoCentre/opportunities/research_ethics_framework/?data=%2fFrXHTl993rpKSBxlZB5fhwlZk%2fvD%2bN3M6aHvj8l4rm8VCYIZYVTae8N8jncf39HcBvbgOyvSTNz99UNfa0OUvTTRbn0j%2fQAFHMLJeHswvyTXPFl3dlb10DMj6ly9nZlVnhuaSilbgFb3xmAs3gMVGy%2b74JESyww%2blpaKlqNatFPPrq4hbS2G%2fQ%3d%3d&xu=0&isAwardHolder=&isProfiled=&AwardHolderID=&Sector.
- European Commission. 2007. Ethics for Researchers. Facilitating Research Excellence in FP7 (by E. Pauwels). Available at: http://cordis.europa.eu/fp7/ethics_en.html.
- Fenson, L., Marchman, V., Thal, D., Dale, P.S., Reznick, J.S. & Bates, E. 2007. *MacArthur-Bates Communicative Development Inventories*. (CDIs), 2nd edn. Baltimore MD: Brookes.
- Field, A. 2009. *Discovering Statistics using SPSS*, 3rd edn. London: Sage.
- Johnson, K. 2008. *Quantitative Methods in Linguistics*. Malden MA: Blackwell.
- Larsen-Freeman, D. & Long, M.H. 1991. *An Introduction to Second Language Acquisition Research*. London: Longman.
- Larson-Hall, J. 2009. *A Guide to Doing Statistical Analysis in Second Language Acquisition*. New York NY: Routledge.
- McDaniel, D., McKee, C. & Smith Cairns, H. (eds). 1996. *Methods for Assessing Children's Syntax*. Cambridge MA: The MIT Press.
- Oller, D.K. & Eilers, R.E. (eds). 2002. *Language and Literacy in Bilingual Children*. Clevedon: Multilingual Matters.
- Rietveld, T. & van Hout, R. 1993. *Statistical Techniques for the Study of Language and Language Behavior*. Berlin: Mouton de Gruyter.
- Rietveld, T. & van Hout, R. 2005. *Statistics in Language Research: Analysis of Variance*. Berlin: Mouton de Gruyter.
- Schütze, C.T. 1996. *The Empirical Base of Linguistics: Grammaticality Judgments and Linguistic Methodology*. Chicago IL: University of Chicago Press.
- Sekerina, I.A., Fernández, E. & Clahsen, H. (eds). 2008. *Developmental Psycholinguistics: On-line Methods in Children's Language Processing* [Language Acquisition and Language Disorders 44]. Amsterdam: John Benjamins.
- Tarone, E.E., Gass, S.M. & Cohen, A.D. (eds). 1994. *Research Methodology in Second-language Acquisition*. Hillsdale NJ: Lawrence Erlbaum Associates.
- Thornton, R. & Crain, S. 1998. *Investigations in Universal Grammar: A Guide to Experiments in the Acquisition of Syntax and Semantics*. Cambridge MA: The MIT Press.
- Wei, L. & Moyer, M. (eds). 2008. *Research Methods in Bilingualism and Multilingualism*. Oxford: Blackwell.

Chapter 1

Production methods in language acquisition research

Sonja Eisenbeiss

1. Introduction

Collecting and analyzing samples of spoken speech from learners has played a central role in acquisition research since its beginnings. Initially, such speech samples were mostly collected in naturalistic settings, where researchers recorded learners in spontaneous interactions with family members, friends or researchers. Many of these naturalistic or spontaneous speech samples are now freely available, typically in written form, i.e. as transcripts; and they continue to be used by (psycho)linguists with a wide range of research interests.

Since the 1950s, acquisition researchers have supplemented naturalistic speech samples with production experiments. In these experiments, researchers systematically manipulate one or more variables and measure whether any changes with respect to these variables affect speakers' behavior.

Other researchers have developed semi-structured elicitation techniques: they keep the communicative situation as natural as possible, but use interviewing techniques, videos or games to encourage the production of rich and comparable speech samples. In the following, I will discuss the rationale of naturalistic speech sampling, production experiments and semi-structured elicitation and show for which phenomena and learner types they are typically used. I will also give a brief overview of data collection and analysis procedures and discuss the advantages and disadvantages of different production methods.

2. Naturalistic studies

2.1 Rationale

In naturalistic studies, researchers only interfere by audio/video-recording learners and other participants – sometimes without them even knowing that they are being recorded. Thus, this type of production study is least likely to be affected by the