Effect of online processing on linguistic memories

by

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Preface

At University of British Columbia (UBC), a preface may be required. Be sure to check the Graduate and Postdoctoral Studies (GPS) guidelines as they may have specific content to be included.

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Glossary

This glossary uses the handy `acroynym` package to automatically maintain the glossary. It uses the package's `printonlyused` option to include only those acronyms explicitly referenced in the LaTeX source.

CTAN The Common TeX Archive Network

DOI Document Object Identifier (see http://doi.org)

GPS Graduate and Postdoctoral Studies

RCS Revision control system, a software tool for tracking changes to a set of files

URL Unique Resource Locator, used to describe a means for obtaining some resource on the world wide web

Acknowledgments

Thank those people who helped you.

  Don't forget your parents or loved ones.

  You may wish to acknowledge your funding sources.

Chapter 1

Introduction

> *If I have seen farther it is by standing on the shoulders of Giants.*
> — Sir Isaac Newton (1855)

This document provides a quick set of instructions for using the `ubcdiss` class to write a dissertation in LaTeX. Unfortunately this document cannot provide an introduction to using LaTeX. The classic reference for learning LaTeX is **?** 's book [**?**]. There are also many freely-available tutorials online; Andy Roberts' online LaTeX tutorials[1] seems to be excellent. The source code for this docment, however, is intended to serve as an example for creating a LaTeX version of your dissertation.

We start by discussing organizational issues, such as splitting your dissertation into multiple files, in Section 1.1. We then cover the ease of managing cross-references in LaTeX in Section 1.2. We cover managing and using bibliographies with BibTeX in Section 1.3. We briefly describe typesetting attractive tables in Section 1.4. We briefly describe including external figures in Section 1.5, and using special characters and symbols in Section 1.6. As it is often useful to track different versions of your dissertation, we discuss revision control further in Section 1.8. We conclude with pointers to additional sources of information in Section 1.10.

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[1] http://www.andy-roberts.net/misc/latex/

1.1 Suggested Thesis Organization

The UBC Graduate and Postdoctoral Studies (GPS) specifies a particular arrangement of the components forming a thesis.[2] This template reflects that arrangement.

In terms of writing your thesis, the recommended best practice for organizing large documents in LaTeX is to place each chapter in a separate file. These chapters are then included from the main file through the use of `\include{file}`. A thesis might be described as six files such as `intro.tex`, `relwork.tex`, `model.tex`, `eval.tex`, `discuss.tex`, and `concl.tex`.

We also encourage you to use macros for separating how something will be typeset (e.g., bold, or italics) from the meaning of that something. For example, if you look at `intro.tex`, you will see repeated uses of a macro `\file{}` to indicate file names. The `\file{}` macro is defined in the file `macros.tex`. The consistent use of `\file{}` throughout the text not only indicates that the argument to the macro represents a file (providing meaning or semantics), but also allows easily changing how file names are typeset simply by changing the definition of the `\file{}` macro. `macros.tex` contains other useful macros for properly typesetting things like the proper uses of the latinate *exempli gratiā* and *id est* (i.e., `\eg` and `\ie`), web references with a footnoted URL (`\webref{url}{text}`), as well as definitions specific to this documentation (`\latexpackage{}`).

1.2 Making Cross-References

LaTeX make managing cross-references easy, and the `hyperref` package's `\autoref{}` command[3] makes it easier still.

A thing to be cross-referenced, such as a section, figure, or equation, is *labelled* using a unique, user-provided identifier, defined using the `\label{}` command. The thing is referenced elsewhere using the `\autoref{}` command. For example, this section was defined using:

```
\section{Making Cross-References}
\label{sec:CrossReferences}
```

---

[2]See   http://www.grad.ubc.ca/current-students/dissertation-thesis-preparation/order-components

[3]The `hyperref` package is included by default in this template.

References to this section are made as follows:

```
We then cover the ease of managing cross-references in \LaTeX\
in \autoref{sec:CrossReferences}.
```

`\autoref{}` takes care of determining the *type* of the thing being referenced, so the example above is rendered as

> We then cover the ease of managing cross-references in LaTeX in Section 1.2.

The label is any simple sequence of characters, numbers, digits, and some punctuation marks such as ":" and "–"; there should be no spaces. Try to use a consistent key format: this simplifies remembering how to make references. This document uses a prefix to indicate the type of the thing being referenced, such as `sec` for sections, `fig` for figures, `tbl` for tables, and `eqn` for equations.

For details on defining the text used to describe the type of *thing*, search `diss.tex` and the `hyperref` documentation for `autorefname`.

1.3 Managing Bibliographies with BibTEX

One of the primary benefits of using LaTeX is its companion program, BibTEX, for managing bibliographies and citations. Managing bibliographies has three parts: (i) describing references, (ii) citing references, and (iii) formatting cited references.

1.3.1 Describing References

BibTEX defines a standard format for recording details about a reference. These references are recorded in a file with a `.bib` extension. BibTEX supports a broad range of references, such as books, articles, items in a conference proceedings, chapters, technical reports, manuals, dissertations, and unpublished manuscripts. A reference may include attributes such as the authors, the title, the page numbers, the Document Object Identifier (DOI), or a Unique Resource Locator (URL). A reference can also be augmented with personal attributes, such as a rating, notes, or keywords.

Each reference must be described by a unique *key*.[4] A key is a simple sequence

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[4]Note that the citation keys are different from the reference identifiers as described in Section 1.2.

of characters, numbers, digits, and some punctuation marks such as ":" and "–"; there should be no spaces. A consistent key format simiplifies remembering how to make references. For example:

| last-name |–| year |–| contracted-title |

where *last-name* represents the last name for the first author, and *contracted-title* is some meaningful contraction of the title. Then **?** 's seminal article on aspect-oriented programming [**?**] (published in **?**) might be given the key `kiczales-1997-aop`.

An example of a BibTEX `.bib` file is included as `biblio.bib`. A description of the format a `.bib` file is beyond the scope of this document. We instead encourage you to use one of the several reference managers that support the BibTEX format such as JabRef[5] (multiple platforms) or BibDesk[6] (MacOS X only). These front ends are similar to reference manages such as EndNote or RefWorks.

1.3.2   Citing References

Having described some references, we then need to cite them. We do this using a form of the `\cite` command. For example:

```
\citet{kiczales-1997-aop} present examples of crosscutting
from programs written in several languages.
```

When processed, the `\citet` will cause the paper's authors and a standardized reference to the paper to be inserted in the document, and will also include a formatted citation for the paper in the bibliography. For example:

> **?**] present examples of crosscutting from programs written in several languages.

There are several forms of the `\cite` command (provided by the `natbib` package), as demonstrated in Table 1.1. Note that the form of the citation (numeric or author-year) depends on the bibliography style (described in the next section). The `\citet` variant is used when the author names form an object in the sentence, whereas the `\citep` variant is used for parenthetic references, more like an end-note.

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[5]http://jabref.sourceforge.net
[6]http://bibdesk.sourceforge.net

Table 1.1: Available `cite` variants; the exact citation style depends on whether the bibliography style is numeric or author-year.

Variant	Result
`\cite`	Parenthetical citation (e.g., "[?]" or "(? ?)")
`\citet`	Textual citation: includes author (e.g., "?]" or or "? (?)")
`\citet*`	Textual citation with unabbreviated author list
`\citealt`	Like `\citet` but without parentheses
`\citep`	Parenthetical citation (e.g., "[?]" or "(? ?)")
`\citep*`	Parenthetical citation with unabbreviated author list
`\citealp`	Like `\citep` but without parentheses
`\citeauthor`	Author only (e.g., "? ")
`\citeauthor*`	Unabbreviated authors list (e.g., "? ")
`\citeyear`	Year of citation (e.g., "? ")

1.3.3 Formatting Cited References

BibTEX separates the citing of a reference from how the cited reference is formatted for a bibliography, specified with the `\bibliographystyle` command. There are many varieties, such as `plainnat`, `abbrvnat`, `unsrtnat`, and `vancouver`. This document was formatted with `abbrvnat`. Look through your TEX distribution for `.bst` files. Note that use of some `.bst` files do not emit all the information necessary to properly use `\citet{}`, `\citep{}`, `\citeyear{}`, and `\citeauthor{}`.

There are also packages available to place citations on a per-chapter basis (`bibunits`), as footnotes (`footbib`), and inline (`bibentry`). Those who wish to exert maximum control over their bibliography style should see the amazing `custom-bib` package.

1.4 Typesetting Tables

?] made one grievous mistake in LATEX: his suggested manner for typesetting tables produces typographic abominations. These suggestions have unfortunately been replicated in most LATEX tutorials. These abominations are easily avoided simply by ignoring his examples illustrating the use of horizontal and vertical rules

(specifically the use of `\hline` and `|`) and using the `booktabs` package instead.

The `booktabs` package helps produce tables in the form used by most professionally-edited journals through the use of three new types of dividing lines, or *rules*. Tables 1.1 and 1.2 are two examples of tables typeset with the `booktabs` package. The `booktabs` package provides three new commands for producing rules: `\toprule` for the rule to appear at the top of the table, `\midrule` for the middle rule following the table header, and `\bottomrule` for the bottom-most at the end of the table. These rules differ by their weight (thickness) and the spacing before and after. A table is typeset in the following manner:

```
\begin{table}
\caption{The caption for the table}
\label{tbl:label}
\centering
\begin{tabular}{cc}
\toprule
Header & Elements \\
\midrule
Row 1 & Row 1 \\
Row 2 & Row 2 \\
% ... and on and on ...
Row N & Row N \\
\bottomrule
\end{tabular}
\end{table}
```

See the `booktabs` documentation for advice in dealing with special cases, such as subheading rules, introducing extra space for divisions, and interior rules.

1.5   Figures, Graphics, and Special Characters

Most LATEX beginners find figures to be one of the more challenging topics. In LATEX, a figure is a *floating element*, to be placed where it best fits. The user is not expected to concern him/herself with the placement of the figure. The figure should instead be labelled, and where the figure is used, the text should use `\autoref` to reference the figure's label. Figure 1.1 is an example of a figure. A figure is generally included as follows:

```
\begin{figure}
\centering
\includegraphics[width=3in]{file}
```

LaTeX Rocks!

Figure 1.1: Proof of LaTeX's amazing abilities

```
\caption{A useful caption}
\label{fig:fig-label}   % label should change
\end{figure}
```

There are three items of note:

1. External files are included using the `\includegraphics` command. This command is defined by the `graphicx` package and can often natively import graphics from a variety of formats. The set of formats supported depends on your TeX command processor. Both `pdflatex` and `xelatex`, for example, can import GIF, JPG, and PDF. The plain version of `latex` only supports EPS files.

2. The `\caption` provides a caption to the figure. This caption is normally listed in the List of Figures; you can provide an alternative caption for the LoF by providing an optional argument to the `\caption` like so:

   ```
   \caption[nice shortened caption for LoF]{%
       longer detailed caption used for the figure}
   ```

   GPS generally prefers shortened single-line captions in the LoF: multiple-line captions are a bit unwieldy.

3. The `\label` command provides for associating a unique, user-defined, and descriptive identifier to the figure. The figure can be can be referenced elsewhere in the text with this identifier as described in Section 1.2.

See Keith Reckdahls excellent guide for more details, *Using imported graphics in LaTeX2e*[7].

1.6   Special Characters and Symbols

LaTeX appropriates many common symbols for its own purposes, with some used for commands (i.e., `\ { } & %`) and mathematics (i.e., `$ ^ _`), and others are automagi-

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[7] http://www.ctan.org/tex-archive/info/epslatex.pdf

Table 1.2: Useful LaTeX symbols

LaTeX	Result	LaTeX	Result
`\texttrademark`	™	`\&`	&
`\textcopyright`	©	`\{ \}`	{ }
`\textregistered`	®	`\%`	%
`\textsection`	§	`\verb!~!`	~
`\textdagger`	†	`\$`	$
`\textdaggerdbl`	‡	`\^{}`	^
`\textless`	<	`\_`	_
`\textgreater`	>		

cally transformed into typographically-preferred forms (i.e., – '') or to completely different forms (i.e., <>). Table 1.2 presents a list of common symbols and their corresponding LaTeX commands. A much more comprehensive list of symbols and accented characters is available at: http://www.ctan.org/tex-archive/info/symbols/ comprehensive/

1.7   Changing Page Widths and Heights

The `ubcdiss` class is based on the standard LaTeX `book` class that selects a line-width to carry approximately 66 characters per line. This character density is claimed to have a pleasing appearance and also supports more rapid reading [**?**]. I would recommend that you not change the line-widths!

1.7.1   The `geometry` Package

Some students are unfortunately saddled with misguided supervisors or committee members whom believe that documents should have the narrowest margins possible. The `geometry` package is helpful in such cases. Using this package is as simple as:

```
\usepackage[margin=1.25in,top=1.25in,bottom=1.25in]{geometry}
```

You should check the package's documentation for more complex uses.

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1.7.2 Changing Page Layout Values By Hand

There are some miserable students with requirements for page layouts that vary throughout the document. Unfortunately the `geometry` can only be specified once, in the document's preamble. Such miserable students must set LaTeX's layout parameters by hand:

```
\setlength{\topmargin}{-.75in}
\setlength{\headsep}{0.25in}
\setlength{\headheight}{15pt}
\setlength{\textheight}{9in}
\setlength{\footskip}{0.25in}
\setlength{\footheight}{15pt}

% The *sidemargin values are relative to 1in; so the following
% results in a 0.75 inch margin
\setlength{\oddsidemargin}{-0.25in}
\setlength{\evensidemargin}{-0.25in}
\setlength{\textwidth}{7in}        % 1.1in margins (8.5-2*0.75)
```

These settings necessarily require assuming a particular page height and width; in the above, the setting for `\textwidth` assumes a US Letter with an 8.5" width. The `geometry` package simply uses the page height and other specified values to derive the other layout values. The `layout` package provides a handy `\layout` command to show the current page layout parameters.

1.7.3 Making Temporary Changes to Page Layout

There are occasions where it becomes necessary to make temporary changes to the page width, such as to accomodate a larger formula. The `chngpage` package provides an `adjustwidth` environment that does just this. For example:

```
% Expand left and right margins by 0.75in
\begin{adjustwidth}{-0.75in}{-0.75in}
% Must adjust the perceived column width for LaTeX to get with it.
\addtolength{\columnwidth}{1.5in}
\[ an extra long math formula \]
\end{adjustwidth}
```

1.8 Keeping Track of Versions with Revision Control

Software engineers have used Revision control system (RCS) to track changes to their software systems for decades. These systems record the changes to the source code along with context as to why the change was required. These systems also support examining and reverting to particular revisions from their system's past.

An RCS can be used to keep track of changes to things other than source code, such as your dissertation. For example, it can be useful to know exactly which revision of your dissertation was sent to a particular committee member. Or to recover an accidentally deleted file, or a badly modified image. With a revision control system, you can tag or annotate the revision of your dissertation that was sent to your committee, or when you incorporated changes from your supervisor.

Unfortunately current revision control packages are not yet targetted to non-developers. But the Subversion project's TortoiseSVN[8] has greatly simplified using the Subversion revision control system for Windows users. You should consult your local geek.

A simpler alternative strategy is to create a GoogleMail account and periodically mail yourself zipped copies of your dissertation.

1.9 Recommended Packages

The real strength to LaTeX is found in the myriad of free add-on packages available for handling special formatting requirements. In this section we list some helpful packages.

1.9.1 Typesetting

enumitem: Supports pausing and resuming enumerate environments.

ulem: Provides two new commands for striking out and crossing out text (`\sout{text}` and `\xout{text}` respectively) The package should likely be used as follows:

```
\usepackage[normalem,normalbf]{ulem}
```

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[8]http://tortoisesvn.net/docs/release/TortoiseSVN_en/

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to prevent the package from redefining the emphasis and bold fonts.

chngpage: Support changing the page widths on demand.

mhchem: Support for typesetting chemical formulae and reaction equations.

Although not a package, the `latexdiff`[9] command is very useful for creating changebar'd versions of your dissertation.

1.9.2   Figures, Tables, and Document Extracts

pdfpages: Insert pages from other PDF files. Allows referencing the extracted pages in the list of figures, adding labels to reference the page from elsewhere, and add borders to the pages.

subfig: Provides for including subfigures within a figure, and includes being able to separately reference the subfigures. This is a replacement for the older `subfigure` environment.

rotating: Provides two environments, sidewaystable and sidewaysfigure, for typesetting tables and figures in landscape mode.

longtable: Support for long tables that span multiple pages.

tabularx: Provides an enhanced tabular environment with auto-sizing columns.

ragged2e: Provides several new commands for setting ragged text (e.g., forms of centered or flushed text) that can be used in tabular environments and that support hyphenation.

1.9.3   Bibliography Related Packages

bibunits: Support having per-chapter bibliographies.

footbib: Cause cited works to be rendered using footnotes.

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[9]http://www.ctan.org/tex-archive/support/latexdiff/

bibentry: Support placing the details of a cited work in-line.

custom-bib: Generate a custom style for your bibliography.

1.10 Moving On

At this point, you should be ready to go. Other handy web resources:

- Common TeX Archive Network (CTAN)[10] is *the* comprehensive archive site for all things related to TeX and LaTeX. Should you have some particular requirement, somebody else is almost certainly to have had the same requirement before you, and the solution will be found on CTAN. The links to various packages in this document are all to CTAN.

- An online reference to LaTeX commands[11] provides a handy quick-reference to the standard LaTeX commands.

- The list of Frequently Asked Questions about TeX and LaTeX[12] can save you a huge amount of time in finding solutions to common problems.

- The teTeX documentation guide[13] features a very handy list of the most useful packages for LaTeX as found in CTAN.

- The `color`[14] package, part of the graphics bundle, provides handy commands for changing text and background colours. Simply changing text to various levels of grey can have a very dramatic effect.

- If you're really keen, you might want to join the TeX Users Group[15].

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[10] http://www.ctan.org

[11] http://www.ctan.org/get/info/latex2e-help-texinfo/latex2e.html

[12] http://www.tex.ac.uk/cgi-bin/texfaq2html?label=interruptlist

[13] http://www.tug.org/tetex/tetex-texmfdist/doc/

[14] http://www.ctan.org/tex-archive/macros/latex/required/graphics/grfguide.pdf

[15] http://www.tug.org

Chapter 2

Background

Stuff I have researched

Chapter 3

Lexical decision

This chapter reports on two experiments done using a lexical decision paradigm to induce auditory perceptual learning in participants. This paradigm has been most used in the previous literature (Reinisch line of work, McQueen line of work, some kraljic? but I think some other kraljic uses shapes - maybe just for unlearning phase).

3.1 Pre-test experiment

3.2 Methodology

3.2.1 Participants

Twenty participants completed two pretest tasks. Participants were compensated with $10 CAD, and were native North American English speakers with no reported speech, language or hearing disorders.

3.2.2 Procedure

Sentence completion

Participants first completed a sentence completion task. In this task, participants were presented with sentence fragments that were lacking in the final word. They

were instructed to type in the word that came to mind when reading the fragment, and to enter any additional words that came to mind that would also complete the sentence. There was no time limit for entry and participants were shown an example with the fragment "The boat sailed across the..." and the possible completions "bay, ocean, lake, river".

Auditory stimulus rating

3.3 Experiment 1

3.3.1 Methodology

Materials

Exposure

Participants were exposed to 200 stimulus items in the lexical decision task. All participants were exposed to the same 100 nonwords and the same 80 filler words, but half the participants were exposed to 20 critical words with /s/ in the onset of the initial syllable, and half were exposed to 20 critical words with /s/ in the onset of the final syllable. The nonwords contained no instances of sibilants (/s, z, sh, zh, ch, jh/). For the filler items, 60 tokens had no sibilants, 10 had /sh/ in the onset of the initial syllable, and 10 had /sh/ in the onset of the final syllable. The critical words only had one instance of /s/ in the word and no other sibilants. Differences in log frequency from SUBTLEXUS (CITE) and number of syllables across the subgroups of stimuli were not significant (TABLE?). PUT IN APPENDIX

Categorization

The items for categorization were four pairs of words (*sack-shack*, *sigh-shy*, *sin-shin*, and *sock-shock*) which were monosyllabic and differed only in their initial sibilant. Two of the pairs had a higher log frequency from SUBTLEXUS for the /s/ word, and two had higher log frequency for the /sh/ word. *Sack-shack* had frequencies of 1.11 lfpm and 0.75 lfpm, *sigh-shy* had frequencies of 0.53 lfpm and 1.26 lfpm, *sin-shin* had frequencies of 1.20 lfpm and 0.48 lfpm, and *sock-shock* had frequencies of 0.95 lfpm and 1.46 lfpm. ¡¡tableize this?¿¿

Synthesis

All stimuli items were resynthesized using STRAIGHT (CITE). For the critical exposure tokens, a normal /s/ version of the word was produced and then a /sh/ version was produced with instructions for consistent prosody across the two tokens. An 11-step continuum from 100% /s/ to 100% /sh/ was synthesized using STRAIGHT and a pretest determined the stimulus to use.

Critical

Recorded s-version of word and sh-version of word

Morphed from 100% s-version to 100% sh-version over 11 steps

Pretest to determine optimal ambiguous stimuli

Follow Reinisch and Mitterer and use the continuum step where S-identification falls below 30% (to account for Ganong effect)

Filler

Synthesized using STRAIGHT to provide consistent quality across all stimuli

Participants

Two categorical between subject factors:

Position of SSH in word (initial syllable, final syllable) Attention (No attention, attention)

Power estimated 100 subjects

4 conditions

25 subjects per condition

Procedure

Participants in the experimental conditions completed two tasks, an exposure task and a categorization task. The exposure task was a lexical decision task, where participants heard auditory stimuli and were instructed to respond with either "word" if they thought what they heard was a word or "nonword" if they didn't think it was a word. The buttons corresponding to "word" and "nonword" were counterbalanced across participants.

In the categorization task, participants heard an auditory stimulus and had to categorize it as one of two words, differing only in the onset sibilant (s vs sh). The

buttons corresponding to the words were counterbalanced across participants.

Participants were instructed that there would two tasks in the experiment, and both tasks were explained at the beginning to remove experimenter interaction between exposure and categorization. Additionally, participants in the Attention condition received additional instructions that the speaker's "s" sounds were sometimes ambiguous, and to listen carefully to ensure correct responses in the lexical decision.

3.3.2 Results

3.3.3 Discussion

3.4 Experiment 2

3.4.1 Methodology

This experiment followed an identical methodology as experiment 1, except that the step along the /s/-/sh/ continua chosen as the ambiguous sound had a different threshold. For this experiment, 30% identification as the /s/ word was used the threshold, similar to Reinisch papers, which was meant to control for the Ganong effect.

3.4.2 Results

3.4.3 Discussion

Chapter 4

Cross-modal word identification

4.1 Pre-test sentence completion experiment

4.2 Methodology

4.2.1 Participants

Twenty participants completed a sentence predictability task before (following??) the s-sh categorization task described before. Participants were compensated with $10 CAD for both tasks, and were native North American English speakers with no reported speech, language or hearing disorders.

4.2.2 Materials

The sentences were written by me as either Predictive sentences or Unpredictive sentences. Predictive sentences were ones where the final word was predictable based on the preceding sentence context, but in Unpredictive sentences, the final word was less or not predictable from the context. Unlike previous studies using sentence or semantic predictability, Unpredictive sentences were written with the final word in mind with a variety of sentence structures, and the final words were plausible objects of lexical verbs and prepositions, unlike in previous work where verbs tended to be discussion words ("talk", "discuss", etc). A full list of words

and their contexts can be found in the SOMEWHERE.

4.2.3 Procedure

Participants first completed a sentence completion task. In this task, participants were presented with sentence fragments that were lacking in the final word. They were instructed to type in the word that came to mind when reading the fragment, and to enter any additional words that came to mind that would also complete the sentence. There was no time limit for entry and participants were shown an example with the fragment "The boat sailed across the..." and the possible completions "bay, ocean, lake, river".

4.2.4 Results

4.3 Experiment 3

4.4 Methodology

4.4.1 Materials

Exposure

Participants were exposed to 100 sentences in the task. All participants were exposed to the same 80 filler sentences, and differed in the 20 critical sentences they heard. Sixty of the filler sentences had a final word that contained no sibilants (/s, z, sh, zh, ch, jh/). These final words were identical to the filler words used in experiments 1 and 2. Twenty of the filler sentences ended in a word with a single /sh/ in the onset position of the final syllable, which matched the /sh/-words used in the Final-targets treatment in experiments 1 and 2. Similarly, the critical sentences all ended in a word with a /s/ in the onset position of the final syllable, matching the /s/ words used in the Final-targets treatment in experiments.

Half of the filler items were classified as Unpredictive and half as Predictive. Half of the participants were exposed to the target /s/ words in Predictive sentences, and half were exposed to target /s/ words in Unpredictive sentences.

Pictures for the final words and pictures for distractors were selected by me from five candidates gathered by research assistants. ¡TALK about impending picture naming task?¿

Categorization

The categorization materials were identical to those used in Experiments 1 and 2.

Synthesis

All filler sentences were resynthesized using STRAIGHT. For the critical /s/ tokens, a version of the sentence with a normal production of the final word, such as "At the carnival, the girl rode a unicorn around the carousel", was produced first, and then a version with /sh/ was produced, such as "At the carnival, the girl rode a unicorn around the caroushel", with the instructions that they be as similar in prosody and speech rate as possible.

To minimize any artifacts of the morphing procedure across the sentence, the sentence frame was kept as the first production with the natural /s/, and only the final word containing the sibilant was morphed. The same step of the 11-step continuum that was identified as the 30% point in the categorization pretesting for the individual words was used as the step for the ambiguous sentences as well.

4.4.2 Participants

Participants were assigned to one of four groups of 25 participants. In the exposure phase, half of the participants were exposed to a modified /s/ sound only in Predictive sentences and half were exposed to it only in Unpredictive sentences. Half of all participants were told that the speaker's production of "s" was somtimes ambiguous, and to listen carefully to ensure correct responses. Participants were native North American English speakers with no reported speech or hearing disorders.

4.4.3 Procedure

For the exposure task, participants heard a sentence via headphones for each trial. Immediately following the auditory presentation, they were presented with two

pictures on the screen. Their task was to select the picture on the screen that corresponded to the final word in the sentence they heard.

Following the exposure task, participants completed the same categorization task described in experiments 1 and 2.

Chapter 5

Conclusions

Stuff I have concluded