

# Learning Disjunction from Prosody and Consistency

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## Abstract

The abstract should be one paragraph, indented 1/8 inch on both sides, in 9 point font with single spacing. The heading Abstract should be 10 point, bold, centered, with one line space below it. This one-paragraph abstract section is required only for standard spoken papers and standard posters (i.e., those presentations that will be represented by six page papers in the Proceedings).

**Keywords:** Add your choice of indexing terms or keywords; kindly use a semi-colon; between each term.

## Introduction

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For standard spoken papers and standard posters, the entire contribution (including figures, references, everything) can be no longer than six pages. For abstract posters, the entire contribution can be no longer than one page. For symposia, the entire contribution can be no longer than two pages.

The text of the paper should be formatted in two columns with an overall width of 7 inches (17.8 cm) and length of 9.25 inches (23.5 cm), with 0.25 inches between the columns. Leave two line spaces between the last author listed and the text of the paper. The left margin should be 0.75 inches and the top margin should be 1 inch. **The right and bottom margins will depend on whether you use U.S. letter or A4 paper, so you must be sure to measure the width of the printed text.** Use 10 point Times Roman with 12 point vertical spacing, unless otherwise specified.

The title should be in 14 point, bold, and centered. The title should be formatted with initial caps (the first letter of content words capitalized and the rest lower case). Each author's name should appear on a separate line, 11 point bold, and centered, with the author's email address in parentheses. Under each author's name list the author's affiliation and postal address in ordinary 10 point type.

Indent the first line of each paragraph by 1/8~inch (except for the first paragraph of a new section). Do not add extra vertical space between paragraphs.

## Study 1

First level headings should be in 12 point, initial caps, bold and centered. Leave one line space above the heading and 1/4~line space below the heading.

## Methods

chldes + chldes-db

Only considered data between the ages of 1 and 6 because this is the age range that had substantial amount of data for parents and children's speech.

## Results

### Summary

And is a lot more frequent than or in child directed speech.

In the first six years, it appears that children reach the adult production rate for and but not or.

This is at least partly because or is more frequent in questions and children produce fewer questions than parents.

Considering this asymmetry in speech act production, it is likely that or is learned relatively quickly and before the age of 4.

## Study 2 (Akshay)

### Methods

Children acquire adult-like production of the word "or" by the age of 4 despite having 13x less occurrences than "and" in CDS. To develop a specific model for how children might learn the exclusivity interpretation of or using such little data, the Providence database was analyzed. Utterances extracted containing the word "or" and 2 utterances before/after it were extracted to provide examples of "or" use along with surrounding context. Utterances were annotated for four major categories. Exclusivity Interpretation: This category represents the goal task: understanding the intended form of disjunction. Intonation: This category was divided into three main intonation patterns over the disjuncts. Intonation could be flat, rising overall, or rise-fall. These three categories were selected because rise-fall in particular has been shown to lead to an exclusive interpretation of the disjunction. Consistency: This category tracked the logical consistency of the disjuncts. Two disjuncts were marked as inconsistent if replacing the word "or" with "and" produced a logical conflict. For example in "Are your feet clean or dirty?", the disjuncts are inconsistent: the addressee's feet cannot be both clean and dirty. Syntactic Level: This category marked the structure of the disjuncts of the utterance. Disjuncts could be sentential or subsentential. Two raters annotated the same 240 utterances to develop a reliability score. The interrater reliability was calculated over 8 iterations of 30 examples. Training only completed after 3 consecutive iterations with reliability over 0.7 for all categories.

### Results

First, similar to Morris (2008), we found that the majority of *or* examples in CDS receive an exclusive interpretation (~%65). However, the rate of exclusive interpretations change systematically when we break the data down by

prosody and consistency (figure below). A mixed-effects binomial logistic regression with the fixed effects of intonation and consistency, and random effects for children found both factors significant in interpreting disjunctions. Disjunctions were more likely to be interpreted as exclusive if they received a rise-fall intonation ( $\beta=-3.79$ ,  $z=1.66$ ,  $p < 0.001$ ) or if they were inconsistent( $\beta=-2.2$ ,  $z=2.08$ ,  $p < 0.001$ ). Disjunctions were more likely to be interpreted as inclusive if they were consistent and received a rising intonation ( $\beta=0.58$ ,  $z=0.24$ ,  $p < 0.001$ ) or flat intonation ( $\beta=0.38$ ,  $z=0.27$ ,  $p < 0.001$ ).

Use standard APA citation format. Citations within the text should include the author’s last name and year. If the authors’ names are included in the sentence, place only the year in parentheses, as in (1972), but otherwise place the entire reference in parentheses with the authors and year separated by a comma (Newell & Simon, 1972). List multiple references alphabetically and separate them by semicolons (Chalnick & Billman, 1988; Newell & Simon, 1972). Use the et. al. construction only after listing all the authors to a publication in an earlier reference and for citations with four or more authors.

For more information on citations in R Markdown, see [here](#).

Footnotes

Indicate footnotes with a number<sup>1</sup> in the text. Place the footnotes in 9 point type at the bottom of the page on which they appear. Precede the footnote with a horizontal rule.<sup>2</sup>

Figures

All artwork must be very dark for purposes of reproduction and should not be hand drawn. Number figures sequentially, placing the figure number and caption, in 10 point, after the figure with one line space above the caption and one line space below it. If necessary, leave extra white space at the bottom of the page to avoid splitting the figure and figure caption. You may float figures to the top or bottom of a column, or set wide figures across both columns.

Two-column images

You can read local images using png package for example and plot it like a regular plot using grid.raster from the grid package. With this method you have full control of the size of your image. **Note: Image must be in .png file format for the readPNG function to work.**

You might want to display a wide figure across both columns. To do this, you change the fig.env chunk option to figure\*. To align the image in the center of the page, set fig.align option to center. To format the width of your caption text, you set the num.cols.cap option to 2.

One-column images

Single column is the default option, but if you want set it explicitly, set fig.env to figure. Notice that the num.cols

option for the caption width is set to 1.

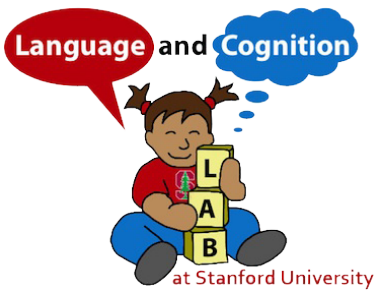


Figure 2: One column image.

R Plots

You can use R chunks directly to plot graphs. And you can use latex floats in the fig.pos chunk option to have more control over the location of your plot on the page. For more information on latex placement specifiers see [here](#)

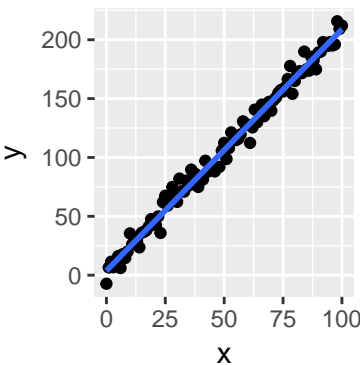


Figure 3: R plot

Tables

Number tables consecutively; place the table number and title (in 10 point) above the table with one line space above the caption and one line space below it, as in Table 1. You may float tables to the top or bottom of a column, set wide tables across both columns.

You can use the xtable function in the xtable package.

	Estimate	Std. Error	t value	Pr(> t )
(Intercept)	-0.13	0.10	-1.3	0.20
x	2.13	0.10	22.4	0.00

Table 1: This table prints across one column.

Conclusion (Masoud)

Acknowledgements

Place acknowledgments (including funding information) in a section at the end of the paper.

<sup>1</sup>Sample of the first footnote.  
<sup>2</sup>Sample of the second footnote.

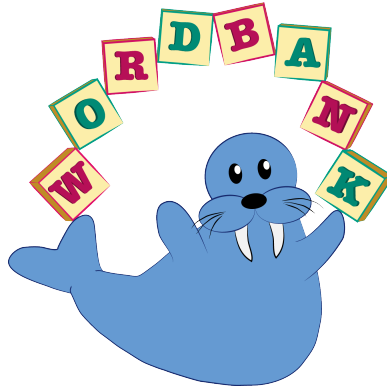


Figure 1: This image spans both columns. And the caption text is limited to 0.8 of the width of the document.

### References

- Chalnick, A., & Billman, D. (1988). Unsupervised learning of correlational structure. In *Proceedings of the tenth annual conference of the cognitive science society* (pp. 510–516). Hillsdale, NJ: Lawrence Erlbaum Associates.
- Newell, A., & Simon, H. A. (1972). *Human problem solving*. Englewood Cliffs, NJ: Prentice-Hall.