WRITING THE RESEARCH REPORT

APA Style

Evaluation

Credits

- 6 points

Evaluation

- **20% - Active participation in lectures and labs**
    - Tutorials, exercises, quizzes
- **40% - Experimental work**
    - Experimental design
    - Collection of data
    - Working together as a research team
- **40% - Final research report**
    - Max 3000 words (including tables and figures)

→ **APA format, double-spaced, 1" margins, 11 pt. Times New Roman**

Final Research Report

Summarize course experiment in a complete APA-style research report

Situate the research question, experimental variables, and the results within the previous literature, including:

1. Van Berkum et al. (2008)
2. Last semester's final paper
3. Find at least one other relevant article

→ Although we have been working together on the design and analysis, the ***write up should be done individually***

→ Due on 31 March

- Post to Piazza as a PDF
- To Maria and Les (not the entire class)

Misconceptions about scientific writing

1. Writing the paper is just a routine (and last) step of the process
2. It provides only "the facts"
3. What is important is *what* you say, not *how* you say it

Instead

1. Writing the paper usually:
   - Starts well before the research is complete
   - Requires reading and re-reading the literature multiple times
   - Helps you to better understand the issues, the original research question, the previous literature, and your results
   - Forces you to commit to your evidence and conclusions
2. The facts are used to provide evidence in support of a (persuasive) argument that is based on combination of logical reasoning and the data
3. Good writing (saying it well) leads to better chance of accomplishing your goals

Goals of a research article

Scientific document for public communication of *What was done and why*

- Situate the research within the previous literature
- Report (objectively) the methods and findings
- Provide a (subjective) interpretation of the results
- (Persuade the reader of a particular theoretical position)

Allow for critical evaluation (peer review)

- Provide enough information to enable peers to evaluate methods and procedures, and to make reasonable judgment about validity of results

Allow for replication

- Fully describe the process so that it can be replicated and further tested

→ Read research reports with a critical eye

→ Write research reports with clarity in mind

Scientific writing style

Major goal: Clarity

- Write for the reader – assume they are familiar with your research area (psycholinguistics) but know little about your specific topic
- Provide enough information so they can understand what was done and why
- Provide concrete examples to illustrate key ideas
- Clearly define any technical terms you use

→ **Most common mistake**

What seems obvious to you, is probably NOT obvious to the reader!

Scientific writing style

Major goal: Parsimony

- Be **concise**
  - Give *complete* information but in as few words as possible
  - Explain things as simply as possible
    - Condense when you can
    - Break up long complex sentences into multiple simpler ones
    - Only use technical terms when they provide more clarity
  - Eliminate unnecessary redundancy

- Be **precise**
  - Be highly selective in the words you use
  - Explicitly explain any reasoning you use
    - e.g., how specifically does the previous literature lead to the hypothesis; how exactly does the data support the theory

Scientific writing style

Highly-structured organization (e.g., APA style)

- Standardization helps with clarity
  - Provides framework for presenting an argument based on logical reasoning and data
  - Forces inclusion of basic critical information
- Eases communication of what was done
  - Provides consistent format within a discipline
  - Writers don't have to "redesign the wheel" each time
  - Readers know what to expect and where to find the necessary information

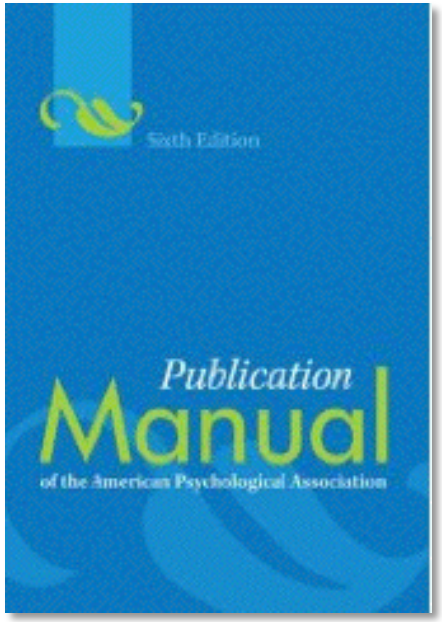
APA style (manuscript form)

Major Sections

- Title Page
- Abstract
- Text (body)
  - Introduction
  - Methods
    - Participants
    - Materials
    - Procedure
  - Results
  - Discussion
- References
- Appendices
- Footnotes
- Tables
- Figure captions
- Figures

→ See samples on Piazza

- *APA_sample_manuscript.pdf* (5th ed.)
- *APA-sample-1-experiment-paper.pdf* (6th ed.)

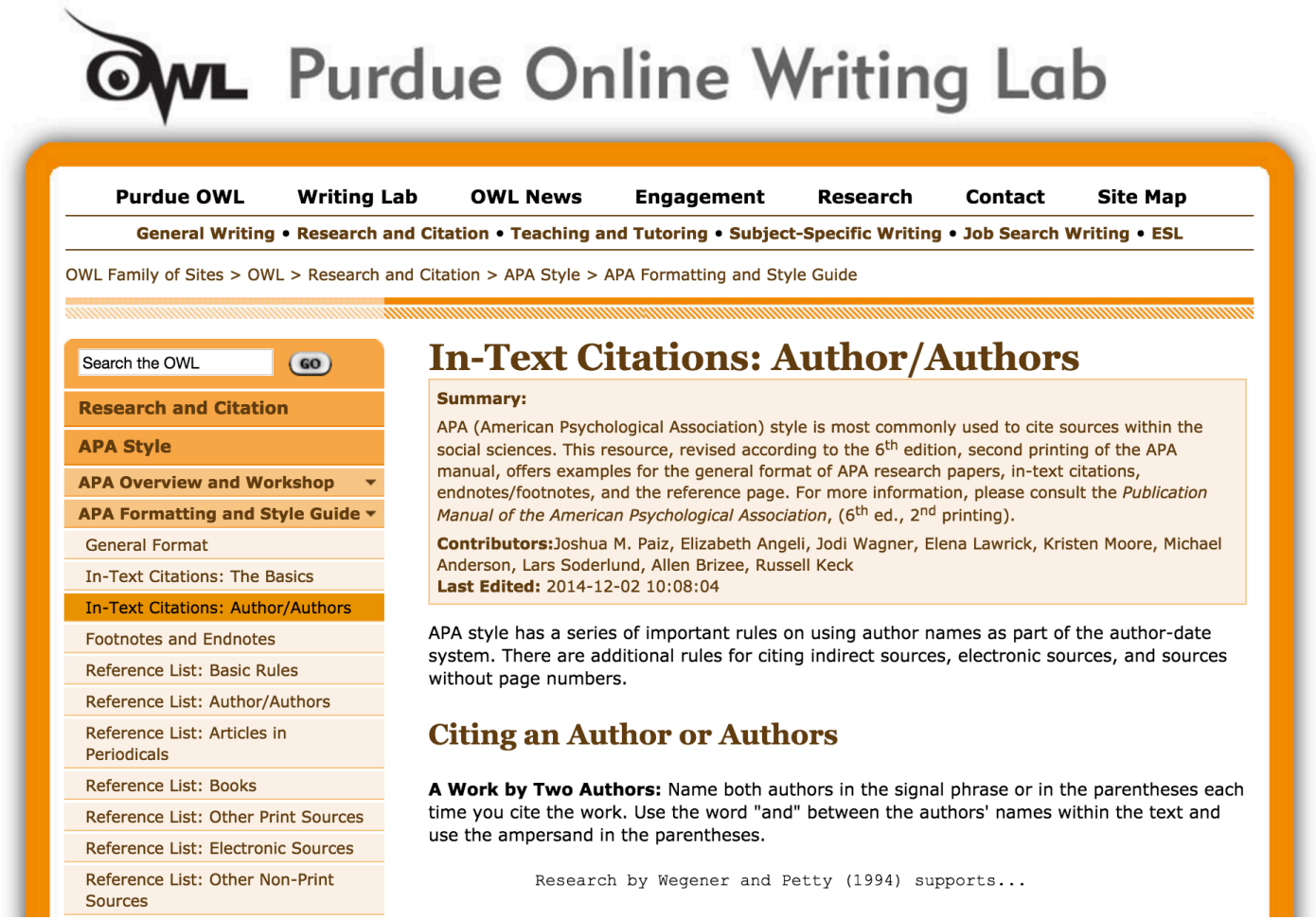


https://www.apastyle.org/learn/index

APA style (manuscript form)

Good APA Formatting and Style resource

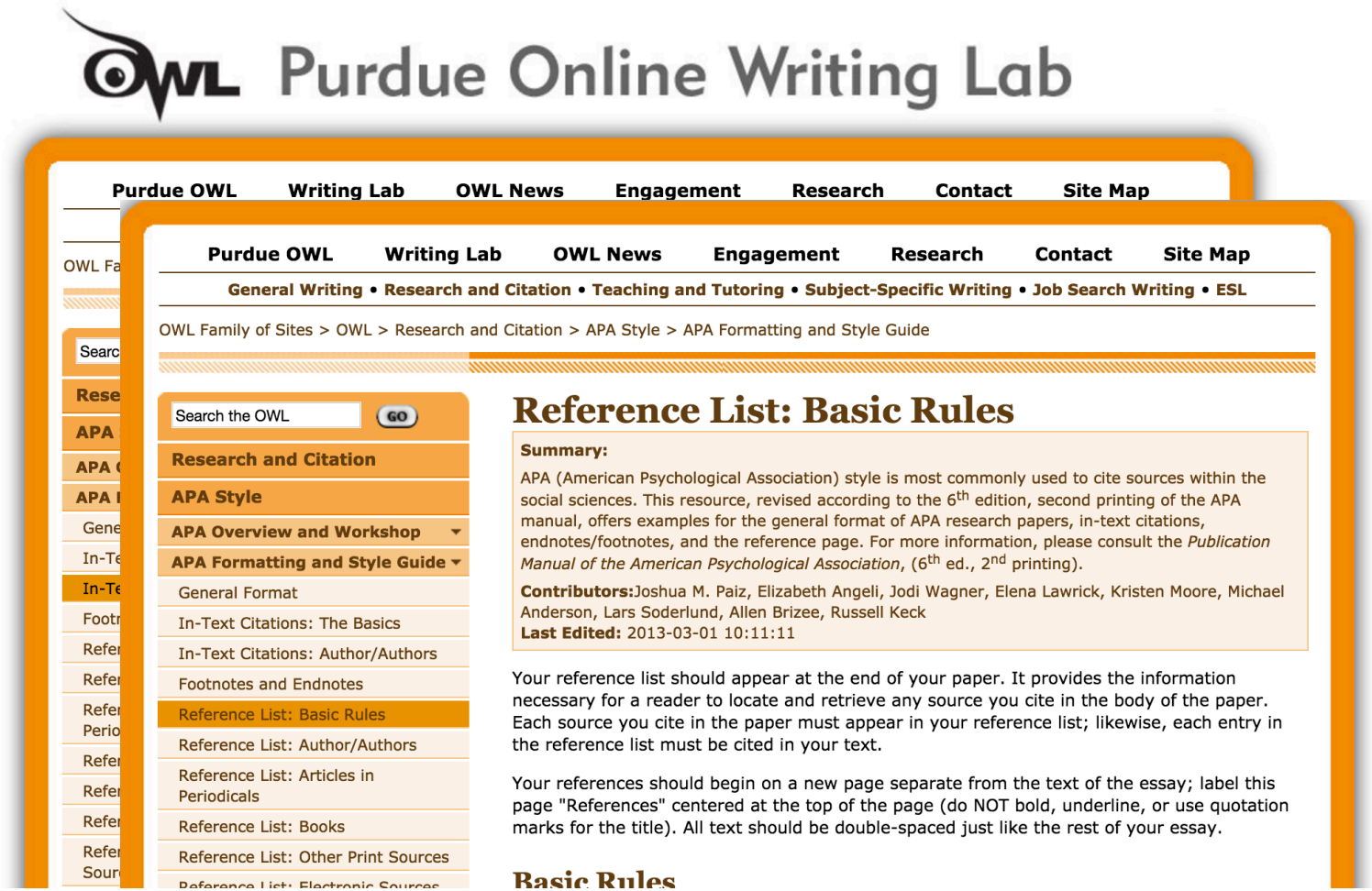
https://owl.english.purdue.edu/owl/resource/560/01/



APA style (manuscript form)

Good APA Formatting and Style resource

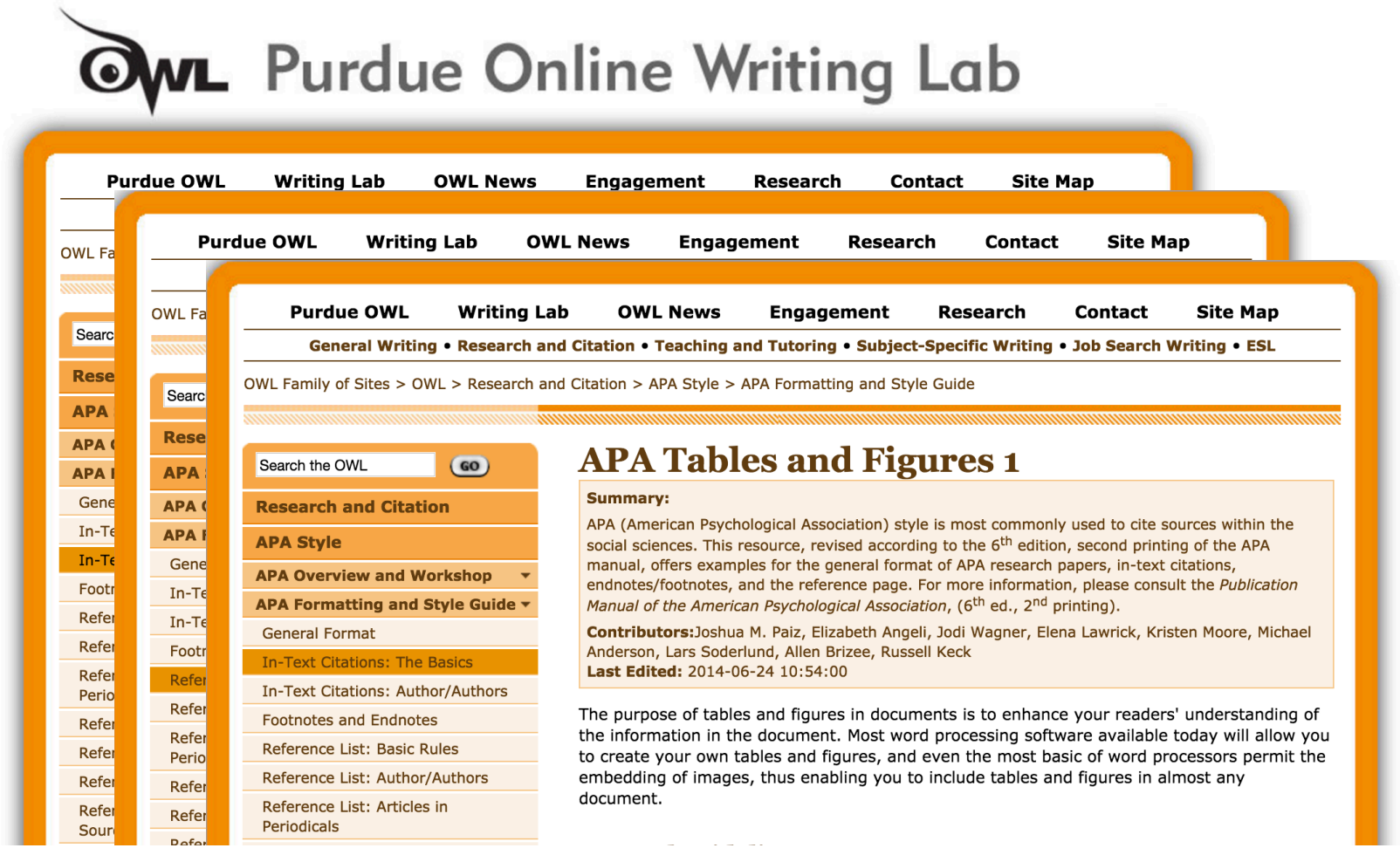
https://owl.english.purdue.edu/owl/resource/560/01/



APA style (manuscript form)

Good APA Formatting and Style resource

https://owl.english.purdue.edu/owl/resource/560/01/



Title Page

Title

- Maximally informative but concise
- Ideally 10 to 12 words max

Running Head

- No more than 50 characters
- Page number in upper right

Author Note

- Put on title page (since 6th ed.)

→ Use it to acknowledge your collaboration with your colleagues

Your Title

Your Name

Saarland University

Author note:

This research was conducted in collaboration

with Dr. Maria Staudte, Dr. Les Sikos and the students in

Experimental Methods in Psycholinguistic Research,

Saarland University, Winter 2016/17

Example Titles

Some titles of influential papers in psycholinguistics

"Integration of visual and linguistic information in spoken language comprehension" (Tanenhaus et al., 1995)

"The representation of verbs: Evidence from syntactic priming in language production" (Pickering & Branigan, 1998)

"Making and correcting errors during sentence comprehension: Eye movements in the analysis of structurally ambiguous sentences" (Frazier & Rayner, 1982)

"The control of eye fixation by the meaning of spoken language: A new methodology for the real-time investigation of speech perception, memory, and language processing" (Cooper, 1974)

→ **One strategy is to include IV and DV and relationship between them**

Example Titles

Some "catchy" titles

"Who are you talking about? Tracking discourse-level referential processing with event-related brain potentials" (Nieuwland et al., 2007)

"Who do you love, your mother or your horse? An event-related brain potential analysis of tone processing in Mandarin Chinese" (Brown-Schmidt & Canseco-Gonzalez, 2004)

"One frog, two frog, red frog, blue frog: Factors affecting children's syntactic choices in production and comprehension" (Hurewitz et al., 2000)

→ Don't sacrifice informativity for catchiness!

Abstract

Concise synopsis of entire paper (250 words max)

- Only part of paper visible in most databases
- Should be able to stand by itself
- All the main points of article are presented
  - Research question/issue
  - Methods
  - Results
  - Major conclusions
- Goal is to provide "first contact" with the paper, but without all the details

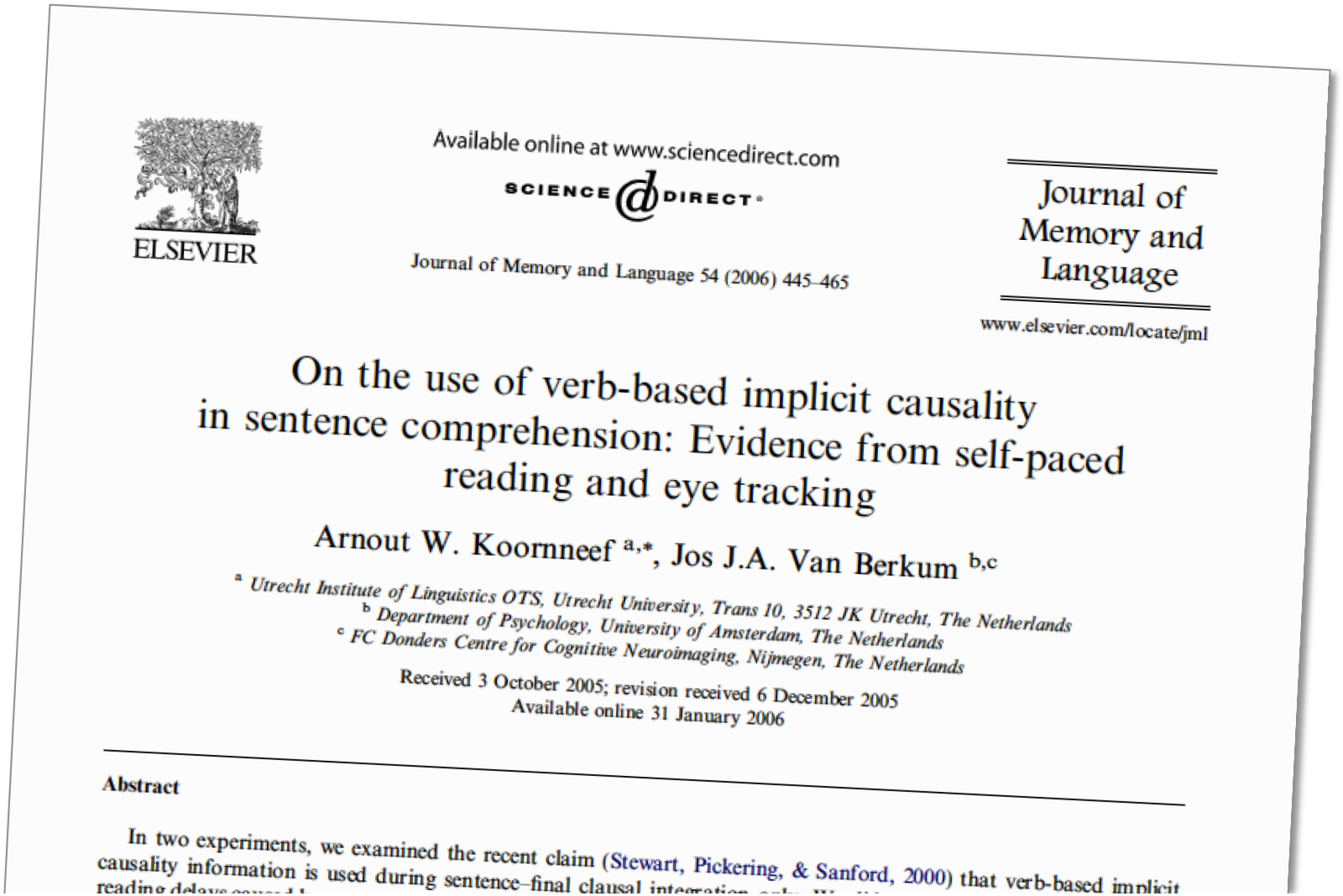
→ Recommendation: Write this last!

Keywords

- 3-6 words that would help researchers find your work in databases
- Placed below the abstract (since 6th ed.)

Examples

Koornneef & Van Berkum (2006)



ELSEVIER

Available online at www.sciencedirect.com

SCIENCE DIRECT®

Journal of Memory and Language 54 (2006) 445–465

Journal of Memory and Language

www.elsevier.com/locate/jml

On the use of verb-based implicit causality in sentence comprehension: Evidence from self-paced reading and eye tracking

Arnout W. Koornneef [a,*], Jos J.A. Van Berkum [b,c]

[a] Utrecht Institute of Linguistics OTS, Utrecht University, Trans 10, 3512 JK Utrecht, The Netherlands
[b] Department of Psychology, University of Amsterdam, The Netherlands
[c] FC Donders Centre for Cognitive Neuroimaging, Nijmegen, The Netherlands

Received 3 October 2005; revision received 6 December 2005
Available online 31 January 2006

Abstract

In two experiments, we examined the recent claim (Stewart, Pickering, & Sanford, 2000) that verb-based implicit causality information is used during sentence–final clausal integration

Research question

Abstract

In two experiments, we examined the recent claim (Stewart, Pickering, & Sanford, 2000) that verb-based implicit causality information is used during sentence–final clausal integration only. We did so by looking for mid-sentence reading delays caused by pronouns that are inconsistent with the bias of a preceding implicit causality verb (e.g., "*David praised Linda because he…*"). In a self-paced reading task, such pronouns immediately slowed down reading, at the two words immediately following the pronoun. In eye tracking, bias-inconsistent pronouns also immediately perturbed the reading process, as indexed by significant delays in various first pass measures at and shortly after the critical pronoun. Hence, readers can recruit verb-based implicit causality information in the service of comprehension rapidly enough to impact on the interpretation of a pronoun early in the subordinate clause. We take our results to suggest that implicit causality is used proactively, allowing readers to focus on, and perhaps even predict, who or what will be talked about next.

Koornneef & Van Berkum (2006)

Methods

Abstract

In two experiments, we examined the recent claim (Stewart, Pickering, & Sanford, 2000) that verb-based implicit causality information is used during sentence–final clausal integration only. We did so by looking for mid-sentence reading delays caused by pronouns that are inconsistent with the bias of a preceding implicit causality verb (e.g., "*David praised Linda because he…*"). In a self-paced reading task, such pronouns immediately slowed down reading, at the two words immediately following the pronoun. In eye tracking, bias-inconsistent pronouns also immediately perturbed the reading process, as indexed by significant delays in various first pass measures at and shortly after the critical pronoun. Hence, readers can recruit verb-based implicit causality information in the service of comprehension rapidly enough to impact on the interpretation of a pronoun early in the subordinate clause. We take our results to suggest that implicit causality is used proactively, allowing readers to focus on, and perhaps even predict, who or what will be talked about next.

Koornneef & Van Berkum (2006)

Results

Abstract

In two experiments, we examined the recent claim (Stewart, Pickering, & Sanford, 2000) that verb-based implicit causality information is used during sentence–final clausal integration only. We did so by looking for mid-sentence reading delays caused by pronouns that are inconsistent with the bias of a preceding implicit causality verb (e.g., "*David praised Linda because he…*"). In a self-paced reading task, such pronouns immediately slowed down reading, at the two words immediately following the pronoun. In eye tracking, bias-inconsistent pronouns also immediately perturbed the reading process, as indexed by significant delays in various first pass measures at and shortly after the critical pronoun. Hence, readers can recruit verb-based implicit causality information in the service of comprehension rapidly enough to impact on the interpretation of a pronoun early in the subordinate clause. We take our results to suggest that implicit causality is used proactively, allowing readers to focus on, and perhaps even predict, who or what will be talked about next.

Koornneef & Van Berkum (2006)

Conclusion

Abstract

In two experiments, we examined the recent claim (Stewart, Pickering, & Sanford, 2000) that verb-based implicit causality information is used during sentence–final clausal integration only. We did so by looking for mid-sentence reading delays caused by pronouns that are inconsistent with the bias of a preceding implicit causality verb (e.g., "*David praised Linda because he…*"). In a self-paced reading task, such pronouns immediately slowed down reading, at the two words immediately following the pronoun. In eye tracking, bias-inconsistent pronouns also immediately perturbed the reading process, as indexed by significant delays in various first pass measures at and shortly after the critical pronoun. Hence, readers can recruit verb-based implicit causality information in the service of comprehension rapidly enough to impact on the interpretation of a pronoun early in the subordinate clause. We take our results to suggest that implicit causality is used proactively, allowing readers to focus on, and perhaps even predict, who or what will be talked about next.

Koornneef & Van Berkum (2006)

Abstract

In two experiments, we examined the recent claim (Stewart, Pickering, & Sanford, 2000) that verb-based implicit causality information is used during sentence–final clausal integration only. We did so by looking for mid-sentence reading delays caused by pronouns that are inconsistent with the bias of a preceding implicit causality verb (e.g., "*David praised Linda because he…*"). In a self-paced reading task, such pronouns immediately slowed down reading, at the two words immediately following the pronoun. In eye tracking, bias-inconsistent pronouns also immediately perturbed the reading process, as indexed by significant delays in various first pass measures at and shortly after the critical pronoun. Hence, readers can recruit verb-based implicit causality information in the service of comprehension rapidly enough to impact on the interpretation of a pronoun early in the subordinate clause. We take our results to suggest that implicit causality is used proactively, allowing readers to focus on, and perhaps even predict, who or what will be talked about next.

Keywords

Language comprehension; Interpersonal verbs; Implicit causality; Pronoun resolution; Immediacy; Prediction

Koornneef & Van Berkum (2006)

Text

Four main sections

1. **Introduction**
   Review the literature and show reader how you arrived at your hypothesis and predictions

2. **Methods**
   Describe details of what you did

3. **Results**
   Present what you found

4. **Discussion**
   Pull everything together

Text

Hourglass shape

1. Introduction
2. Methods
   a. Participants
   b. Materials
   c. Procedure
3. Results
4. Discussion

Start broad and slowly narrow the focus

Highly focused

Slowly broaden and connect back to the "bigger picture"

Introduction

Start broad and slowly narrow the focus to what study is designed to answer

- Start with brief description of general topic area
- Then identify the specific question/problem
- Why is this question interesting/important?
- What does prior literature have to say about the question?
- What (precisely) is your hypothesis?
- What thinking led up to that hypothesis?
- How will this work clarify the problem?
- What is the overall plan for testing the hypothesis?
- How were key aspects of the study operationalized?
- What are the experimental variables?
- What are your specific predictions?

→ After reading the Intro, reader should be fully prepared for Methods

Introduction

General topic area

If you praise somebody, you will typically do so because of *his or her* behavior, not yours. If you apologize to somebody, however, the most likely relevant cause is *your* behavior, not theirs. These simple probabilistic asymmetries express part of our knowledge about when certain interpersonal transactions are appropriate, and as such help us deal with—and make sense of—the social world in which we live.

Perhaps not surprisingly, we also recruit this knowledge when particular interpersonal transactions are being described in language (Garvey & Caramazza, 1974). When asked to complete a sentence fragment such as "*David praised Linda because…*", for example, readers or listeners will be inclined to continue the *because*-clause with something about Linda, as in example (1) below.

(1) David praised Linda because she had done well.

Alternatively, after "*David apologized to Linda because…*", people tend to continue with something about David. In the above constructions, interpersonal verbs like *praise* and *apologize* thus supply information about whose behavior or state is the more likely immediate cause of the event at hand. Because it is conveyed implicitly as part of the meaning of the verb, this probabilistic cue is usually referred to as *implicit causality*.

Early research on the comprehension of sentences with implicit causality verbs (e.g., Au, 1986, Brown and Fish, 1983, Caramazza et al., 1977, Garvey and Caramazza, 1974 and Garvey et al., 1975) has shown that readers make use of this cue to arrive at the correct sentence interpretation. One consistent finding, for instance, is that if the . . .

Koornneef & Van Berkum (2006)

Introduction

More specific area

If you praise somebody, you will typically do so because of *his or her* behavior, not yours. If you apologize to somebody, however, the most likely relevant cause is *your* behavior, not theirs. These simple probabilistic asymmetries express part of our knowledge about when certain interpersonal transactions are appropriate, and as such help us deal with—and make sense of—the social world in which we live.

Perhaps not surprisingly, we also recruit this knowledge when particular interpersonal transactions are being described in language (Garvey & Caramazza, 1974). When asked to complete a sentence fragment such as "*David praised Linda because…*", for example, readers or listeners will be inclined to continue the *because*-clause with something about Linda, as in example (1) below.

Concrete examples

(1) David praised Linda because she had done well.

Define critical terms

Alternatively, after "*David apologized to Linda because…*", people tend to continue with something about David. In the above constructions, interpersonal verbs like *praise* and *apologize* thus supply information about whose behavior or state is the more likely immediate cause of the event at hand. Because it is conveyed implicitly as part of the meaning of the verb, this probabilistic cue is usually referred to as *implicit causality*.

Early research on the comprehension of sentences with implicit causality verbs (e.g., Au, 1986, Brown and Fish, 1983, Caramazza et al., 1977, Garvey and Caramazza, 1974 and Garvey et al., 1975) has shown that readers make use of this cue to arrive at the correct sentence interpretation. One consistent finding, for instance, is that if the . . .

Koornneef & Van Berkum (2006)

Introduction

If you praise somebody, you will typically do so because of *his or her* behavior, not yours. If you apologize to somebody, however, the most likely relevant cause is *your* behavior, not theirs. These simple probabilistic asymmetries express part of our knowledge about when certain interpersonal transactions are appropriate, and as such help us deal with—and make sense of—the social world in which we live.

Perhaps not surprisingly, we also recruit this knowledge when particular interpersonal transactions are being described in language (Garvey & Caramazza, 1974). When asked to complete a sentence fragment such as "*David praised Linda because…*", for example, readers or listeners will be inclined to continue the *because*-clause with something about Linda, as in example (1) below.

(1) David praised Linda because she had done well.

Prior work in this area

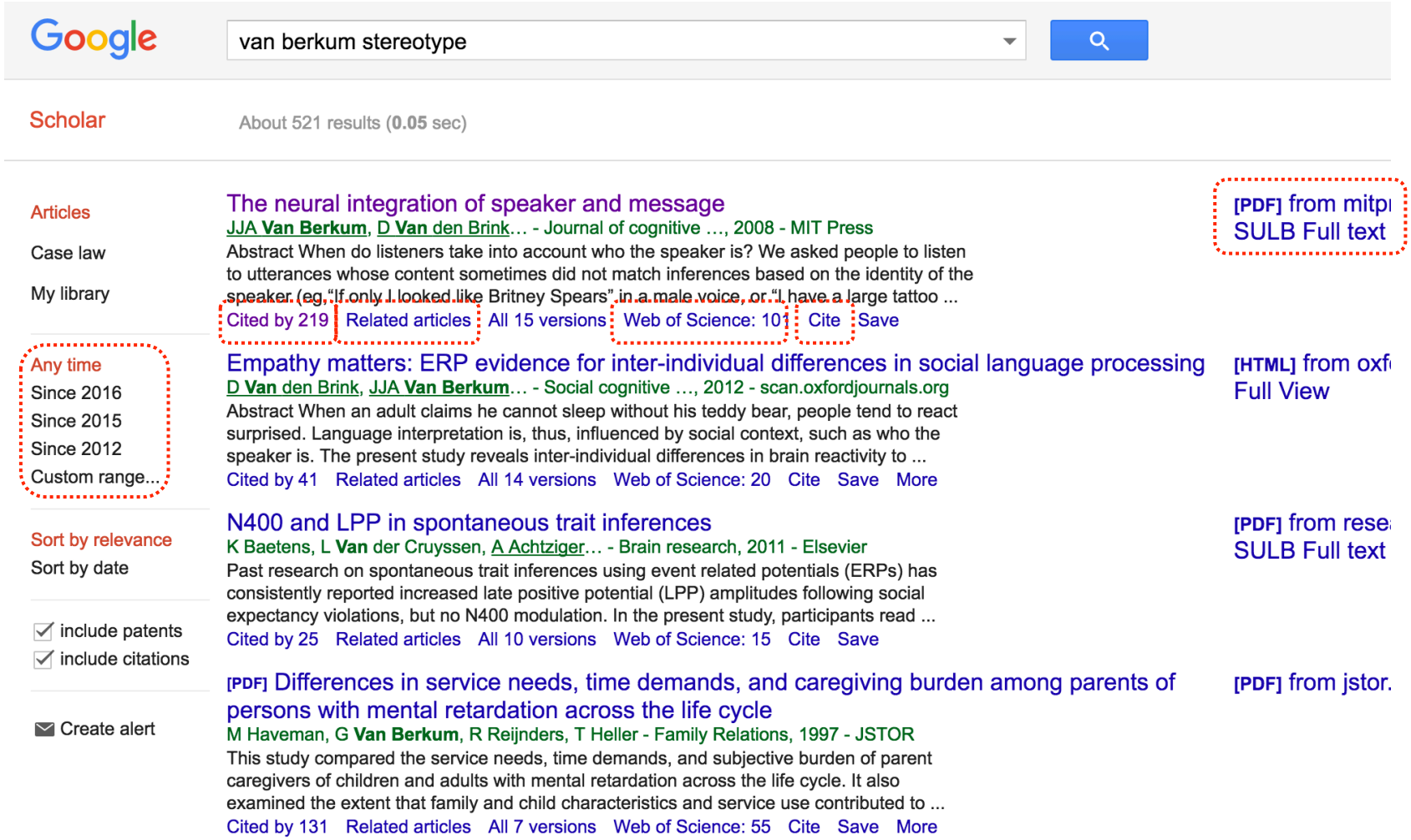
Alternatively, after "*David apologized to Linda because…*", people tend to continue with something about David. In the above constructions, interpersonal verbs like *praise* and *apologize* thus supply information about whose behavior or state is the more likely immediate cause of the event at hand. Because it is conveyed implicitly as part of the meaning of the verb, this probabilistic cue is usually referred to as *implicit causality*.

Early research on the comprehension of sentences with implicit causality verbs (e.g., Au, 1986, Brown and Fish, 1983, Caramazza et al., 1977, Garvey and Caramazza, 1974 and Garvey et al., 1975) has shown that readers make use of this cue to arrive at the correct sentence interpretation. One consistent finding, for instance, is that if the . . .

Koornneef & Van Berkum (2006)

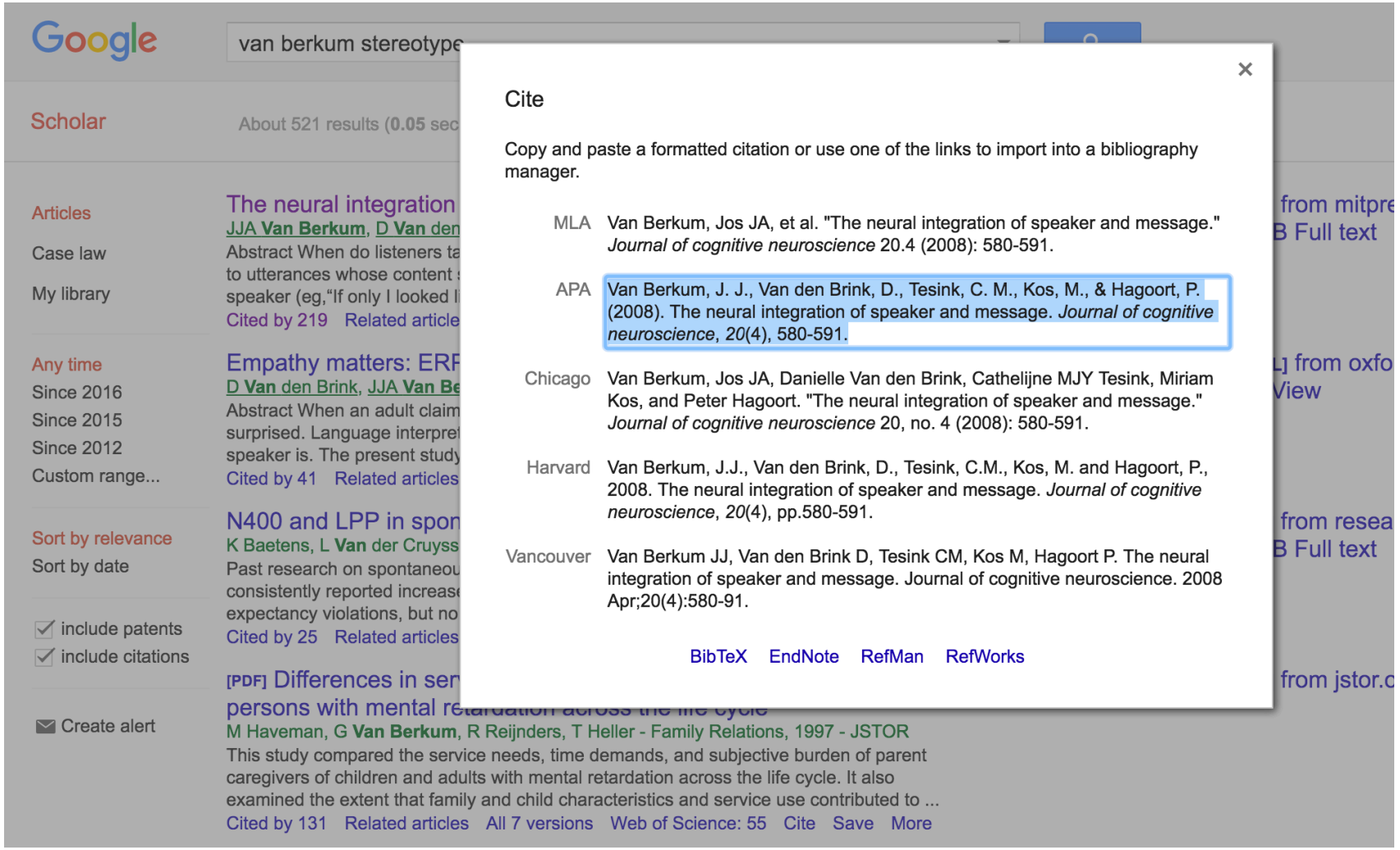
Introduction

Doing a Literature Review



Introduction

Doing a Literature Review



Introduction

Recommendations

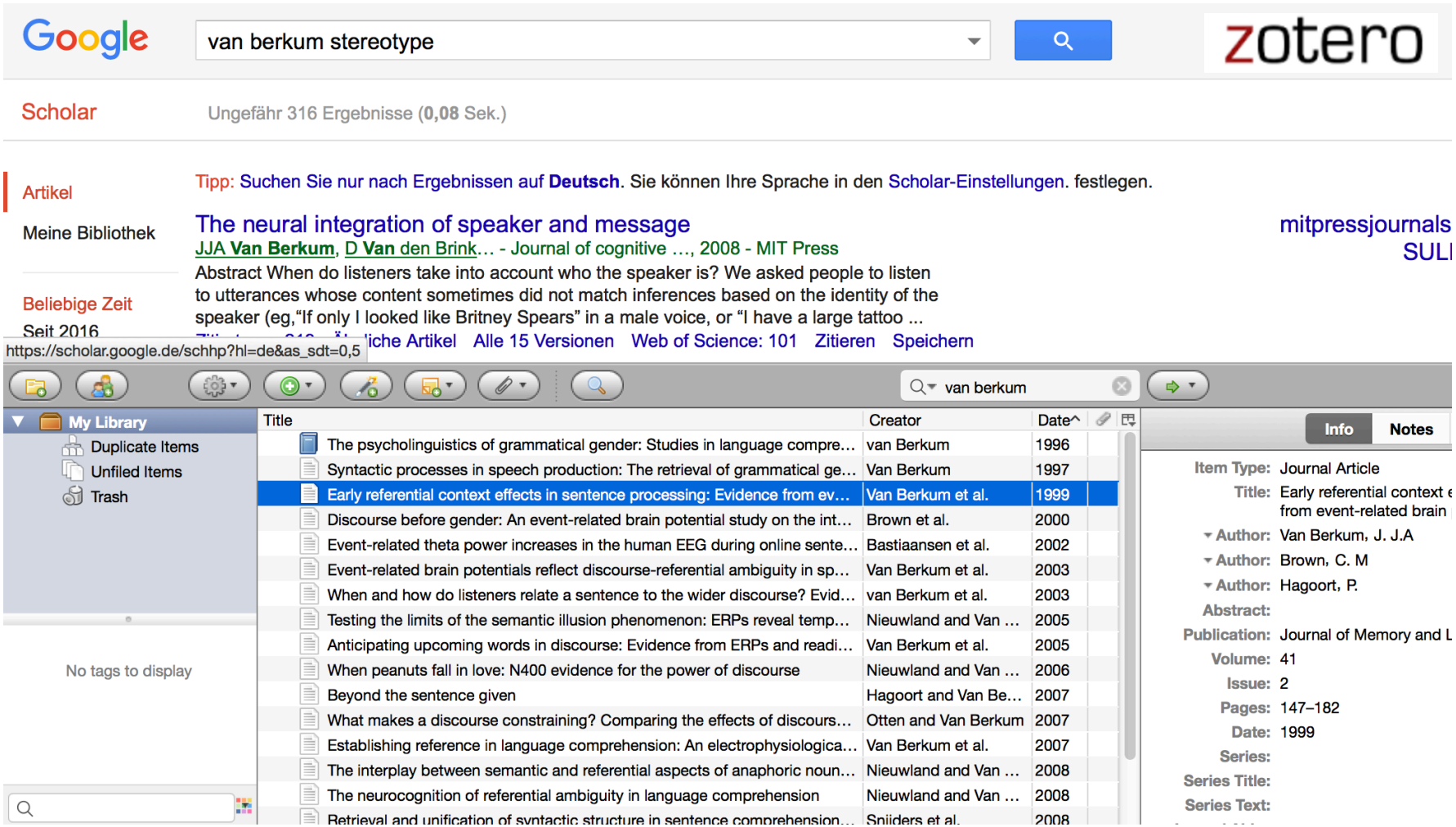
→ Write an annotated bibliography while reading the literature

- What were the author's goals?
- What were the hypotheses?
- What were the experimental variables?
- How were key aspects of the study operationalized?
- What were the key results?
- Do the results support the conclusions?
- What open questions remain?
- If you had designed the study, how would YOU have done it?

→ Consider using a Reference Manager (e.g., Zotero, Mendely, Endnote) to organize and manage your references

Introduction

Reference management software http://www.library.cornell.edu/resrch/citmanage/apa



Methods

Describes exactly what was done and with enough detail for replication

A. Participants
B. Materials (and Design)
C. (Apparatus and) Procedure

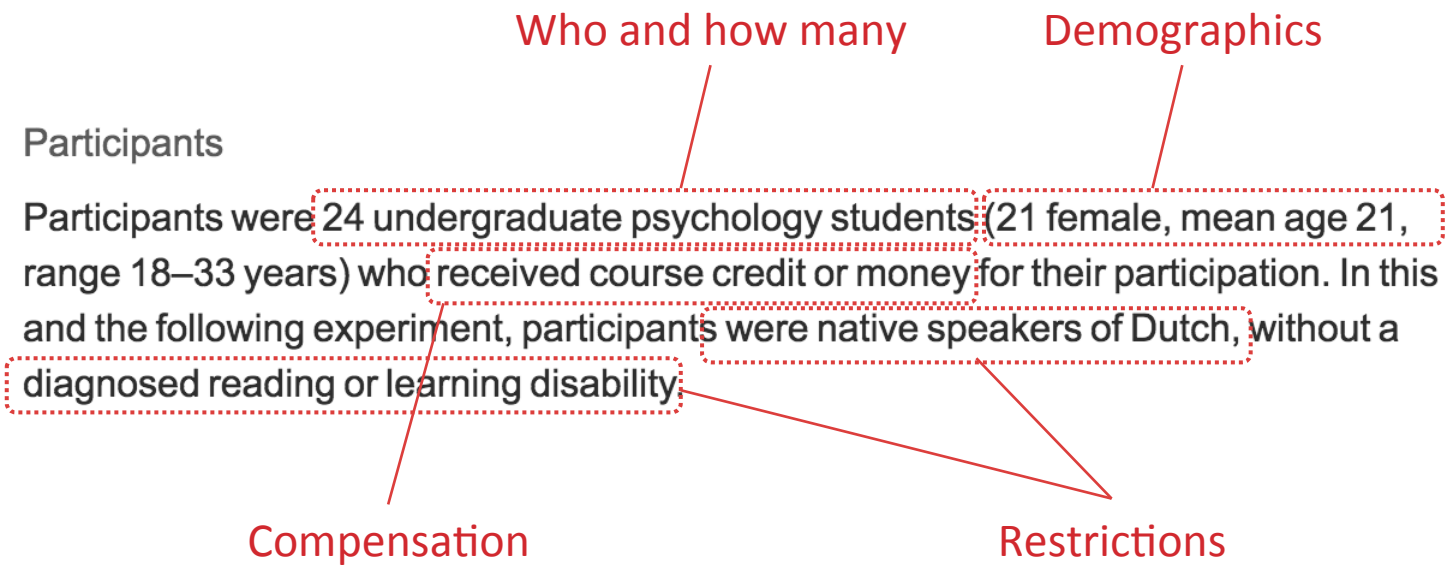
Methods

Describes exactly what was done and with enough detail for replication

A. Participants

- How many?
- What were their relevant characteristics (age, sex, native language, etc.)?
- How were they recruited or selected?
- Were they paid or given course credit?
- Any special selection requirements?
  - Vision (normal or corrected-to-normal)?
  - Whether or not they were previously exposed to the materials (e.g., by participating to the pre-tests)
- Details about exclusions or those who did not complete the experiment

→ Reader needs to know characteristics of your sample to assess external validity of your results


Who and how many
Demographics
Participants
Participants were 24 undergraduate psychology students (21 female, mean age 21, range 18–33 years) who received course credit or money for their participation. In this and the following experiment, participants were native speakers of Dutch, without a diagnosed reading or learning disability.
Compensation
Restrictions

Methods

Describes exactly what was done and with enough detail for replication

B. Materials (and Design)

- How were the stimuli constructed? What were the specific constraints?
- Provide complete and detailed description of experimental and filler conditions, with examples that illustrates the manipulations (table?)
- What kind of design was used?
- Was it between subjects, within subjects or mixed?
- What was the DV?
- What was the purpose of fillers?
- Provide details about control procedures (lists, counterbalancing, etc.)

→ Provide full set of stimuli, comprehension questions, and translations in Appendix

Source material

Materials

Based on translations of English verbs used in previous research, 116 Dutch verbs were selected, of which 57 were expected to have a strong implicit causality bias towards the second noun phrase (henceforth NP2, e.g., the verb *prijzen*, *to praise*) and 59 a strong . . .

Following McKoon et al. (1993), we constructed two different three-sentence stories for every verb for the main experiment, using scenarios that were expected to be of interest to the average participant. An example that involves an NP1 verb is given in (4), together with an approximate translation. In the first sentence a situation was sketched in which a man and a woman were introduced by name. For half of the texts, the first-mentioned character was the man, and for the other half, the woman (balanced across the NP1 and NP2 stories). In the second sentence a pronominal (usually *they*) was used to keep both characters in focus to an equal extent. The main clause of the third sentence contained the critical verb and felicitously repeated the names of the two characters. The subordinate clause contained the critical pronoun *he* and was always adjoined to the main clause by the connective *because*.

(4a) *NP1-biased verb*, *bias-consistent pronoun*

> David en Linda reden allebei behoorlijk hard. Bij een druk kruispunt botsten zij met hun auto's stevig op elkaar. David bood zijn excuses aan Linda aan omdat hij volgens de getuigen van het ongeluk alle schuld had.
>
> *(David and Linda were both driving pretty fast. At a busy intersection they crashed hard into each other. David apologized to Linda because he according to the witnesses was the one to blame.)*

Materials

Construction details

Based on translations of English verbs used in previous research, 116 Dutch verbs were selected, of which 57 were expected to have a strong implicit causality bias towards the second noun phrase (henceforth NP2, e.g., the verb *prijzen*, *to praise*) and 59 a strong

Following McKoon et al. (1993), we constructed two different three-sentence stories for every verb for the main experiment, using scenarios that were expected to be of interest to the average participant. An example that involves an NP1 verb is given in (4), together with an approximate translation. In the first sentence a situation was sketched in which a man and a woman were introduced by name. For half of the texts, the first-mentioned character was the man, and for the other half, the woman (balanced across the NP1 and NP2 stories). In the second sentence a pronominal (usually *they*) was used to keep both characters in focus to an equal extent. The main clause of the third sentence contained the critical verb and felicitously repeated the names of the two characters. The subordinate clause contained the critical pronoun *he* and was always adjoined to the main clause by the connective *because*.

(4a) *NP1-biased verb*, *bias-consistent pronoun*

David en Linda reden allebei behoorlijk hard. Bij een druk kruispunt botsten zij met hun auto's stevig op elkaar. David bood zijn excuses aan Linda aan omdat hij volgens de getuigen van het ongeluk alle schuld had.

(David and Linda were both driving pretty fast. At a busy intersection they crashed hard into each other. David apologized to Linda because he according to the witnesses was the one to blame.)

Example and translation

Materials

Based on translations of English verbs used in previous research, 116 Dutch verbs were selected, of which 57 were expected to have a strong implicit causality bias towards the second noun phrase (henceforth NP2, e.g., the verb *prijzen*, *to praise*) and 59 a strong

Following McKoon et al. (1993), we constructed two different three-sentence stories for every verb for the main experiment, using scenarios that were expected to be of interest to the average participant. An example that involves an NP1 verb is given in (4), together with an approximate translation. In the first sentence a situation was sketched in which a man and a woman were introduced by name. For half of the texts, the first-mentioned character was the man, and for the other half, the woman (balanced across the NP1 and NP2 stories). In the second sentence a pronominal (usually *they*) was used to keep both characters in focus to an equal extent. The main clause of the third sentence contained the critical verb and felicitously repeated the names of the two characters. The subordinate clause contained the critical pronoun *he* and was always adjoined to the main clause by the connective *because*.

(4a) *NP1-biased verb*, *bias-consistent pronoun*

David en Linda reden allebei behoorlijk hard. Bij een druk kruispunt botsten zij met hun auto's stevig op elkaar. David bood zijn excuses aan Linda aan omdat hij volgens de getuigen van het ongeluk alle schuld had.

(David and Linda were both driving pretty fast. At a busy intersection they crashed hard into each other. David apologized to Linda because he according to the witnesses was the one to blame.)

What was manipulated

Full set of materials

The critical manipulation was whether or not the pronoun *he* was consistent with the verb's implicit causality bias. For NP1-biased verbs, *he* is consistent if the male character occupies the NP1-position of the main clause, as in (4a), but inconsistent if the female character occupies that position, as in (4b). For NP2-biased verbs, the mapping is reversed, as in example (3) given before. To accommodate for spill-over, at least five words after *he* were held constant across conditions. After these five words the consistent and inconsistent versions diverged, and ended with explicit causal information that made the story coherent as a whole (see Appendix A for all Dutch originals).

. . .

Control procedures

Comprehension Qs

The critical manipulation was whether or not the pronoun *he* was consistent with the verb's implicit causality bias. For NP1-biased verbs, *he* is consistent if the male character occupies the NP1-position of the main clause, as in (4a), but inconsistent if the female character occupies that position, as in (4b). For NP2-biased verbs, the mapping is reversed, as in example (3) given before. To accommodate for spill-over, at least five words after *he* were held constant across conditions. After these five words the consistent and inconsistent versions diverged, and ended with explicit causal information that made the story coherent as a whole (see Appendix A for all Dutch originals).

. . .

The stimuli were divided into two lists, with each list containing 20 bias-consistent and 20 bias-inconsistent stories, and with only one version of each story in a particular list. To avoid strategic processing, we used as many NP1-verbs as NP2-verbs (10 each) within each condition in each list. Forty stories of an unrelated experiment were included as fillers (see Van Berkum et al., 2005b, Experiment 3). One pseudo-randomization was used for both lists. The original randomization order was used for one half of the participants, the reversed order for the other half. A set of 40 2-choice questions was included to encourage discourse comprehension. Half of the questions followed the experimental items and half followed the filler items. Furthermore, half of the correct answers appeared on the left of the screen and half on the right. The questions never directly probed the referent of the pronoun.

Methods

Describes exactly what was done and with enough detail for replication

C. (Apparatus and) Procedure

- How were participant assigned to different groups?
- What was the experimental setting?
- What was the task?
- What instructions were the participants given?
- Provide detailed description of an experimental trial
- How many trials did each participant see?
- What was the duration of the study (total time, time on task)?
- Refer to any specialized software by name and include citation
- Refer to any specialized equipment with name, manufacturer, model number, size, etc.

→ Reader should be able to replicate after reading this section

Procedure

Equipment

Paradigm

The stories were presented on a fast LCD screen (Iiyama TXA 3834 MT) and responses were collected with response boxes integrated in the armrests of the chair. The stories were presented in a standard non-cumulative moving-window self-paced reading paradigm, using a non-proportional Courier 14p font. Subjects read through each story word by word, with each button press disclosing the next word while replacing all other letters in the story by hyphens. As they pressed their way through a story, subjects could see its overall sentential and formatting layout (including punctuation), as well as the position of the currently visible word therein. To prevent 'edge effects' in reading times, the critical region, which included the pronoun and five subsequent words, was always separated from the left and right paragraph edges by at least one word. Subjects were asked to process each story for comprehension, and to adapt their speed to this. Participants progressed through a text by pressing a button with the index finger of their dominant hand.

Each session started with a written instruction. The actual self-paced reading experiment consisted of four blocks. Block one was a practice block in which 10 stories were presented, five followed by a question. This familiarized the participant with the procedure and in addition gave the experimenter the opportunity to monitor the reading speed of the participants. Participants who read extremely slowly were encouraged to speed up. The participant had an obligatory one-minute break between the different experimental blocks. Each experimental block started with two practice stories. After

Procedure

Instructions

Detailed description of trial

The stories were presented on a fast LCD screen (Iiyama TXA 3834 MT) and responses were collected with response boxes integrated in the armrests of the chair. The stories were presented in a standard non-cumulative moving-window self-paced reading paradigm, using a non-proportional Courier 14p font. Subjects read through each story word by word, with each button press disclosing the next word while replacing all other letters in the story by hyphens. As they pressed their way through a story, subjects could see its overall sentential and formatting layout (including punctuation), as well as the position of the currently visible word therein. To prevent 'edge effects' in reading times, the critical region, which included the pronoun and five subsequent words, was always separated from the left and right paragraph edges by at least one word. Subjects were asked to process each story for comprehension, and to adapt their speed to this. Participants progressed through a text by pressing a button with the index finger of their dominant hand.

Familarization

Breaks

Each session started with a written instruction. The actual self-paced reading experiment consisted of four blocks. Block one was a practice block in which 10 stories were presented, five followed by a question. This familiarized the participant with the procedure and in addition gave the experimenter the opportunity to monitor the reading speed of the participants. Participants who read extremely slowly were encouraged to speed up. The participant had an obligatory one-minute break between the different experimental blocks. Each experimental block started with two practice stories. After

Results

State the findings and statistical results but do not interpret them here

- Explain the analysis process
- Describe results in words and use quantitative measures as supporting evidence
- In general, report main effects before interactions
- Report all of the following:
  - The observed difference between conditions
  - Group means and standard deviations (table?)
  - The specific kind of test conducted
  - The computed test statistic, degrees of freedom, p-value, effect size, 95% confidence interval (table?)
- Use Tables and Figures to supplement and clarify
  - Should be integral part of presentation
  - Direct the reader to them in the text (e.g., “Figure 1 indicates …”)
  - However, they are placed in separate sections at end of manuscript

Results

Reporting Results

"The means and standard deviations for the sample are presented in Table 1. A two-factor (weight x fullness) analysis of variance showed no significant main effect for the weight factor, $F(1,76) = .28$, $p > .05$, GES = 0.03; no significant main effect for the fullness factor, $F(1,76) = 2.54$, $p > .05$, GES = 0.02; but the interaction between weight and fullness was significant, $F(1,76) = 4.51$, $p < .05$, GES = 0.14." Note: You must now go on to describe the interaction effect in words.

"A 2 (Factor A) x 2 (Factor B) ANOVA was conducted on the quiz scores. Neither Factor A, $F(1,8) = 0.49$, $p = .67$, GES = .00, nor Factor B, $F(1,8) = .75$, $p = .412$, GES = .09, had a statistically significant impact on quiz scores. However, the interaction was statistically significant, $F(1,8) = 6.75$, $p < .05$, GES = .46. The descriptive statistics for these analyses are presented in Table 1."

"A repeated-measures analysis of variance revealed that the response-cost technique produced a significant decrease in classroom disruptions over the course of the study, $F(3,9) = 21.04$, $p < .05$, GES = 0.12."

"We performed a one-way independent samples ANOVA with the fixed factor Group (three levels: females, males, children) and the random factor Subjects. There was a significant effect of Group, $F(2,9) = 172.98$, $p < .05$."

Exclusions

Analysis

Prior to all analyses, we evaluated the comprehension question performance of our participants. All participants scored above 75% correct (mean score 94%). Reading times more than 2 standard deviations from both the participant's mean and the item's mean in a particular condition were treated as missing data (2.1%). We report means and statistical analyses for the factor Consistency for the critical pronoun, each of the five words following the pronoun (spill-over region), and each of the four words preceding it (pre-critical region). We only discuss effects that are significant by subjects ($F1$) and by items ($F2$), and we report the associated minF' values in tables (Clark, 1973 and Raaijmakers et al., 1999).

Koornneef & Van Berkum (2006)

What will be reported

Analysis

Prior to all analyses, we evaluated the comprehension question performance of our participants. All participants scored above 75% correct (mean score 94%). Reading times more than 2 standard deviations from both the participant's mean and the item's mean in a particular condition were treated as missing data (2.1%). We report means and statistical analyses for the factor Consistency for the critical pronoun, each of the five words following the pronoun (spill-over region), and each of the four words preceding it (pre-critical region). We only discuss effects that are significant by subjects ($F1$) and by items ($F2$), and we report the associated minF' values in tables (Clark, 1973 and Raaijmakers et al., 1999).

Koornneef & Van Berkum (2006)

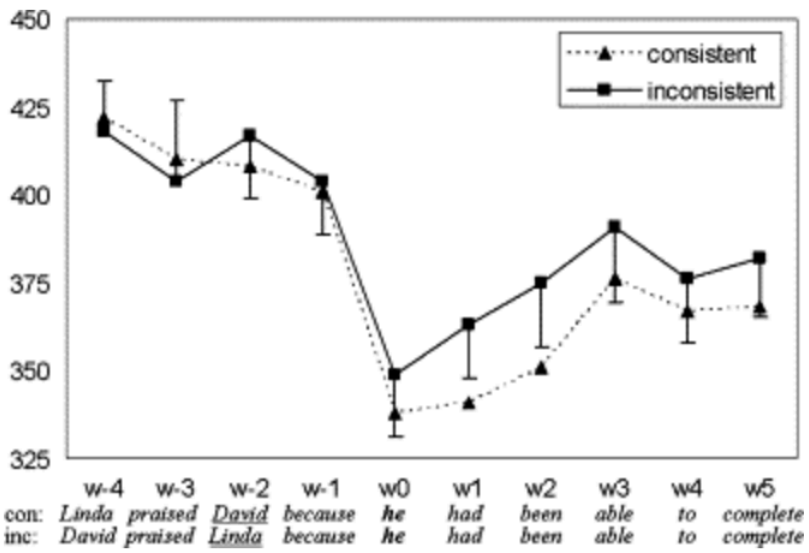
By subjects
and by items

Describe in words

Pointers to figures and tables

Results and discussion

As can be seen from the mean reading times (collapsed over Verb Bias) in Fig. 1 and the associated *F* tests displayed in Table 2, words in the pre-critical region were read equally fast across Consistency condition. However, readers began to slow down right at the bias-inconsistent pronoun, with a significant main effect of Consistency emerging at the first two words after this pronoun. This effect was not significantly modulated by whether the verb was biased towards NP1 or NP2.[2]



Captions should tell the story

Fig. 1

Mean reading times (in ms) for the consistent and inconsistent condition in Experiment 1 (error bars indicate one side of a 95% confidence interval based on the *MSE*-value; see Masson and Loftus, 2003).

Table 2.

Mean reading times and analysis of variance results for Experiment 1

	Wordposition									
	−4	−3	−2	−1	0	1	2	3	4	5
e.g.:										
Consistent:	*Linda*	*praised*	*David*	*because*	***he***	*had*	*been*	*able*	*to*	*complete*
Inconsistent:	*David*	*praised*	*Linda*	*because*	***he***	*had*	*been*	*able*	*to*	*complete*
Reading time (in ms)										
Total										
Consistent	422	410	408	401	338	341	351	376	367	368
Inconsistent	418	404	417	404	349	363	375	391	376	382
NP1-bias										
Consistent	420	403	409	403	347	350	340	388	373	371
Inconsistent	411	409	425	424	357	382	371	401	387	378
NP2-bias										
Consistent	425	417	408	400	329	333	362	364	361	365
Inconsistent	424	399	410	384	340	343	379	380	364	386
*F*1 (Consistency, *df* = *1*, *23*)										Inferential statistics
F	<1	<1	1.065	<1	1.452	9.107	7.477	1.993	1.015	3.187
MSE	1127	2992	1755	1290	1772	1241	1815	2561	1774	1540
p	.526	.623	.313	.720	.245	.006*	.012*	.171	.324	.087

Discussion

Tie everything together: Evaluate the experiment and interpret the results

- Begin with a clear summary sentence or two that restates purpose and results
- Explain whether the hypothesis was supported or not. If not, offer plausible explanation (but avoid making too much of null results)
- Are the findings consistent with the prior research you described in the Intro? If not, can any discrepancies be reconciled?
- Report any confounds or problems with the experiment that might have influenced the interpretation of the data
- What do the results *mean*? What are the implications? Can you generalize from the findings? How do the results add to our current knowledge?
- What are the limitations of the study?
- Do the results suggest further research directions? If so, what?
- End on positive note by reminding reader why study was important

→ Be conservative in your claims (results of a single study are rarely earth-shattering)

→ Explicitly describe how your conclusions follow from the results

Restate purpose and method

General discussion

In two comprehension experiments, we examined the recent claim (e.g., Garnham, 2001 and Stewart et al., 2000) that verb-based implicit causality information is only used during sentence-final clausal integration. We did so by looking for mid-sentence reading delays caused by pronouns that are inconsistent with the bias of a preceding implicit causality verb (e.g., "*David praised Linda because he…*"). In Experiment 1, we kept track of the impact of implicit causality by means of word-by-word self-paced reading. In Experiment 2, we used eye tracking, as participants freely read through the same materials.

In both experiments, we obtained evidence for such pronoun-induced delays. In self-paced reading (Experiment 1), pronouns that were inconsistent with the implicit causality bias of the verb reliably slowed down reading right after the pronoun. In unconstrained reading (Experiment 2) such pronouns also immediately perturbed the reading process, as indexed by significant delays, in various first pass measures, at and shortly after the critical pronoun. The eye tracking results confirm that the early use of implicit causality information in Experiment 1 is not a consequence of unnatural comprehension strategies induced by the word-by-word self-paced reading task. Furthermore, because we used identical critical words across bias-consistent and -inconsistent conditions, our results also unequivocally rule out the possibility [suggested by Oakhill et al., 1998 and Garnham, 2001] that the implicit causality effects observed in language comprehension are artifacts of 'low-level' differences between bias-consistent and -inconsistent critical fragments. Hence, across experiments and methodologies, we have evidence that readers can very rapidly recruit verb-based implicit causality information in . . .

Koornneef & Van Berkum (2006)

Summarize results

General discussion

In two comprehension experiments, we examined the recent claim (e.g., Garnham, 2001 and Stewart et al., 2000) that verb-based implicit causality information is only used during sentence-final clausal integration. We did so by looking for mid-sentence reading delays caused by pronouns that are inconsistent with the bias of a preceding implicit causality verb (e.g., "*David praised Linda because he…*"). In Experiment 1, we kept track of the impact of implicit causality by means of word-by-word self-paced reading. In Experiment 2, we used eye tracking, as participants freely read through the same materials.

In both experiments, we obtained evidence for such pronoun-induced delays. In self-paced reading (Experiment 1), pronouns that were inconsistent with the implicit causality bias of the verb reliably slowed down reading right after the pronoun. In unconstrained reading (Experiment 2) such pronouns also immediately perturbed the reading process, as indexed by significant delays, in various first pass measures, at and shortly after the critical pronoun. The eye tracking results confirm that the early use of implicit causality information in Experiment 1 is not a consequence of unnatural comprehension strategies induced by the word-by-word self-paced reading task. Furthermore, because we used identical critical words across bias-consistent and -inconsistent conditions, our results also unequivocally rule out the possibility [suggested by Oakhill et al., 1998 and Garnham, 2001] that the implicit causality effects observed in language comprehension are artifacts of 'low-level' differences between bias-consistent and -inconsistent critical fragments. Hence, across experiments and methodologies, we have evidence that readers can very rapidly recruit verb-based implicit causality information in . . .

Koornneef & Van Berkum (2006)

The Rest

Each section starts a new page

- References (https://owl.english.purdue.edu/owl/resource/560/05/)
- Appendices
- Footnotes
- Tables
- Figure Captions
- Figures

For the purposes of this class:

- Put figure captions directly below each figure
- Color is ok, but keep it simple

Tips and Suggestions

Avoid all of the following:

- Plagiarism – use citations to acknowledge the work and ideas of others
- Digressions and tangents – if it is not critical, do not include it
  - Footnotes (rare) are used to elaborate/clarify a point
  - Appendices (rare) are used for long elaborations (e.g., full set of stimuli, description of non-standard analyses)
- Direct quotes
  - These are an easy cop out if you don't really understand something
  - Put it into your own words (forces you to actually understand it)
- Vagueness – always be precise
- Overstatements – be conservative in your claims
- Jargon (when possible)
- Slang and colloquialisms
- Passives
- Flowery descriptions – use simple, descriptive adjectives

Tips and Suggestions

Double check your writing!!

- Re-read it (later) to ensure that what you wrote actually communicates what you meant to say
- Have someone else proofread it for content, logic, formatting, typos, etc.
- If in doubt of format or style, look it up

  https://owl.english.purdue.edu/owl/resource/560/01/