Reading and Writing Foundations

LIGN 170, S123

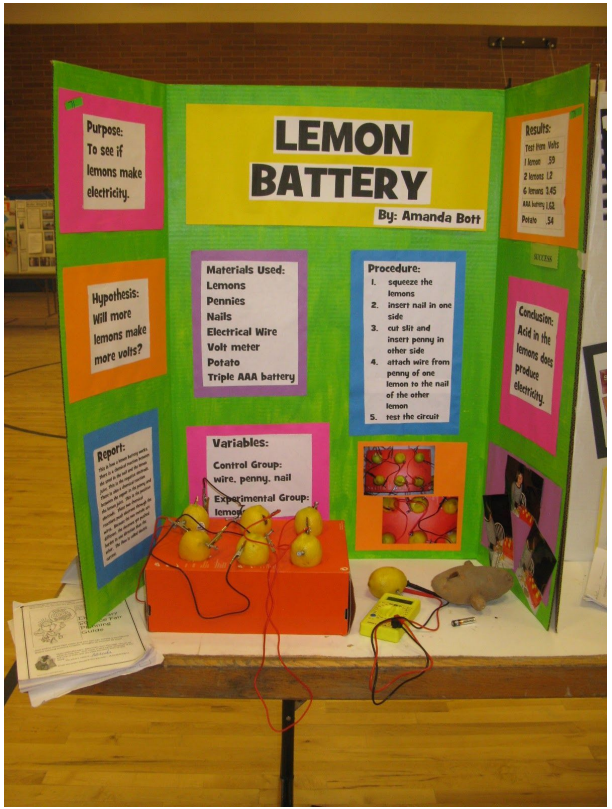
Roadmap

- QALMRI
- Structure of a Paragraph
- Tackling a Journal Article

QALMRI

Scientific Method

- A way to gather facts that will lead to the formulation and validation of a theory



Scientific Method

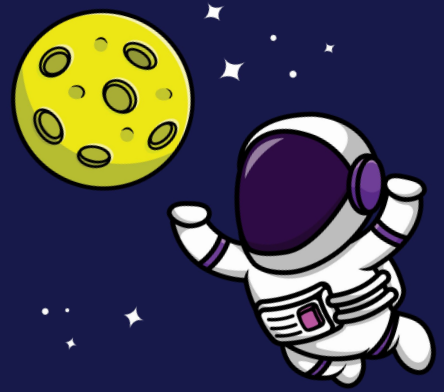
1. Specifying a problem
2. Systematically observing events
3. Forming a hypothesis of the relationship between variables
4. Collecting new observations to test the hypothesis
5. Using such evidence to formulate and support a theory
6. Testing the theory

Specifying a Problem

- Science aims to answer questions (problems)
- We need to specify our research question clearly

Example: International Space Station

- We ask what personal characteristics will lead someone to be effective in this job, why those characteristics will lead them to behave in certain ways in specific circumstances, and how those characteristics were acquired and can be further developed.

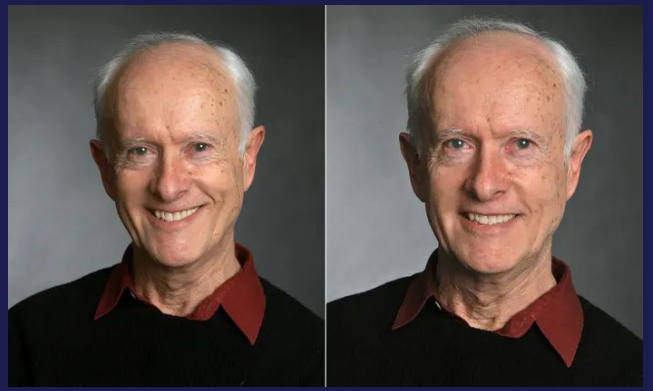


Observing Events

- Facts are established by collecting **data**, which are numerical measurements or careful observations of a phenomenon
  - Properly collected data can be **replicated**
  - Meaning someone else could use the same method to collect data and find the same result
- **Events** here means the occurrence of a particular phenomenon

Example: Fake Smiles

- Scientists study two kinds of events: those that are themselves directly observable (such as how many times in an hour a mother strokes her infant) and those that, like thoughts, motivations, or emotions, can only be inferred.
- When people smile without really meaning it (as many people do when posing for photographs), the muscles used are not the same ones that produce a sincere smile (Ekman, 1985).
- By studying what's observable (the muscles), researchers can learn about the unobservable (the mental state of the smiler)

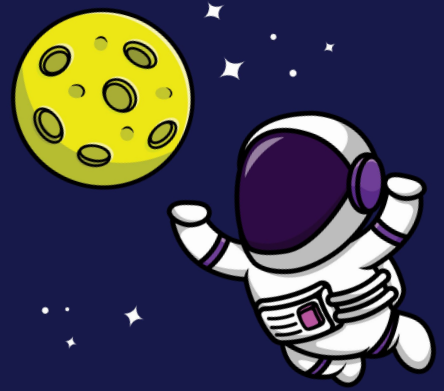


Forming a Hypothesis

- Concerned with the relationship between **variables**
  - A variable is an aspect of a situation that liable to change
  - A characteristic of a substance, quantity, or entity that can be measured
- A **hypothesis** is a tentative idea that might explain a set of observations

Example: International Space Station

- The ISS does not have normal patterns of “day” and “night,” and thus astronauts do not sleep when it gets dark outside. Rather, they may get wrapped up in what they are doing and forget how much time has passed since they last slept. Could losing sleep interfere with learning?
- This hypothesis comes down to the assertion that there’s a connection between two variables—not sleeping and learning.

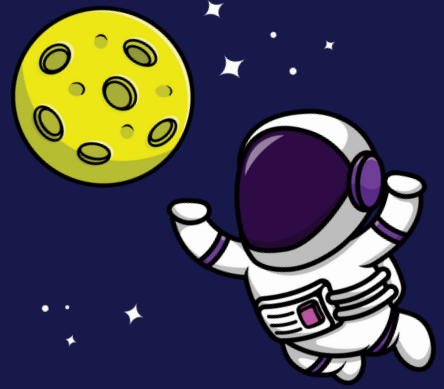


Testing the Hypothesis

- Create operational definitions of the key concepts which makes them concrete enough to test
  - An operational definition specifies a variable by indicating how it is measured or manipulated
- Collect new observations to test the hypothesis
  - A typical study has two groups in two different experimental conditions

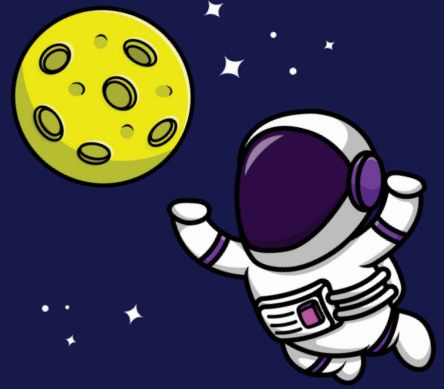
Example: International Space Station

- An operational definition of “not sleeping” might be having stayed continuously awake for 24 hours, and learning might be defined as retaining memory for material that was studied earlier in the day.
    - There are rigorous studies that bear on memory following a sleepless night, which have found that staying up all night does disrupt memory for information learned that day (Graves et al., 2001; Stickgold et al., 2000).



Example: International Space Station

- A typical study has two groups: In one, participants learn some information, such as a list of words. These people then sleep normally, and their memory is tested the next day. Participants in a second group learn the same material (and learn it as well) as the participants in the first group, but stay up all night and are tested the next day. The hypothesis is that the participants will have better memory if they were allowed to sleep.

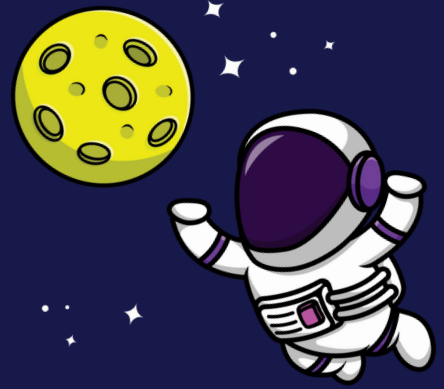


Formulating a Theory

- A **theory** consists of an interlocking set of concepts or principles that explains a set of observations
  - Unlike a hypothesis, a theory is not a tentative idea and doesn't focus on possible relationships among variables
  - Focus on the reasons or explanations for established relationships among variables
- Hypotheses and theories both produce predictions, expectations about specific events that should occur in particular circumstances if the hypothesis or theory is correct.

Example: International Space Station

- In our example, the notion that people will fail to store information in memory if they don't sleep is a hypothesis, not a theory. A theory might explain that sleep is necessary for learning because:
  a) Specific brain areas are activated when we learn during the day
  b) Those areas must continue to operate for a specific period of time while we sleep in order to store the information acquired during the day

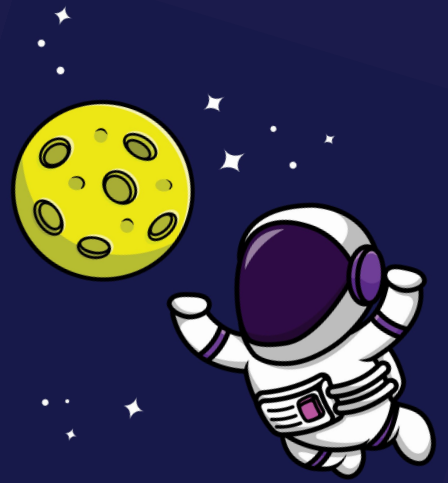


Testing a Theory

- Researchers evaluate a theory by testing its predictions
- Each time a theory makes a correct prediction, the theory is supported, and each time
- it fails to make a correct prediction, the theory is weakened.
- If enough of its predictions are unsupported, the theory must be rejected and the data explained in some other way.
- A good theory is falsifiable; that is, it makes predictions it cannot “squirm out of.” A falsifiable theory can be rejected if the predictions are not confirmed.

Example: International Space Station

- For example, in one study researchers scanned the brains of people as they learned sequences of responses, and then scanned their brains again while they slept that night. Brain areas that were active during learning continued to be active during sleep. Moreover, these areas were more active during sleep for the people who had learned the task that day than for others who had not learned it (Maquet et al., 2000).



Scientific Method and Journal Articles

- Journal articles are written using the scientific method, so when you read those articles, you should have this process in mind
- Papers are usually structured in a way that reflects the research process

QALMRI

- QALMRI is your tool to extract key information from an article and make sure you come away understanding what the article said
- Follows the scientific method format
    - Question
    - Alternatives
    - Logic
    - Methods
    - Results
    - Inferences

Question

- What is the research question?
- There are different levels of research questions ranging from very broad to very specific

Alternatives

- These are the different possible answers to the questions.

Logic

- Logic is how you make the connection between the different alternatives and a measurable behavior that you can use to answer your question

Methods

- This comprises the details of the experiment.
    - We will talk a lot about these details in this class

Results

- The results summarise only the raw results and statistical tests from the experiment
- These do not include any information relating to the alternatives or research question

Inferences

- Inferences are the conclusions you can draw from the results. These will often make reference back to the question and alternatives.

Example QALMRI

Semantic Radicals Contribute to the Visual Identification of Chinese Characters

Laurie Beth Feldman and Witina W. T. Siok

Background

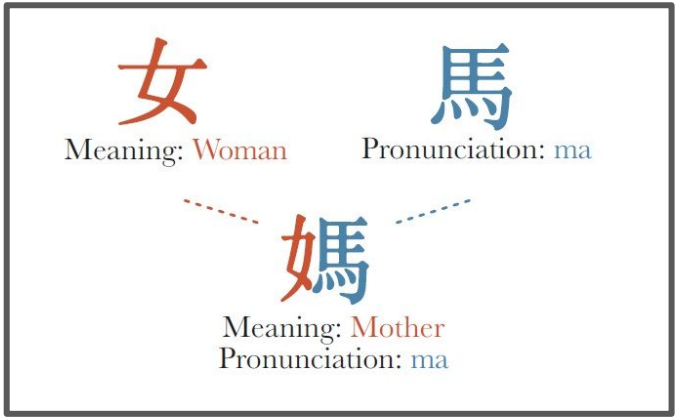
As some background, this paper is investigating **how people read**. An open question is when people read to what extent are they processing the subcomponents of a written word. In an alphabetic language, this might mean whether people are processing each individual letter, or whether they are recognizing each orthographic word as an atomic (non-decomposable) unit.

Background

In this paper, the authors ask this question with respect to Mandarin Chinese, which uses a **logographic** writing system. This means that each Chinese character represents a combination of phonetic/phonological and semantic information. Characters are a combination of **ideographs**, where each semantic concept is written by a different orthographic unit and **syllabary** units, where each possible syllable in the language is represented by a different orthographic unit. So each Chinese character more or less represents a different combination of syllable (sound) and concept (meaning).

Background

The building blocks of Chinese characters are called **radicals**. Most Chinese characters have two types of radicals. Usually on the left, **semantic radicals** are the ideographic component that represent something about the meaning. **Phonetic radicals** are usually on the right side of the character and represents some information about how the character is pronounced.



Question

How do people recognize Chinese characters during reading? More specifically, do readers use semantic radicals to recognize Chinese characters?

Alternatives

A1: The **full listing hypothesis** states that words are represented and accessed as atomic units, without access to their internal composition. Furthermore, each word has a separate lexical entry in the internal lexicon (Butterworth, 1983). Under this hypothesis, readers process Chinese characters as atomic units.

A2: The **decomposition hypothesis** states that morphemes are represented in the lexicon, and recognizing a word entails some type of analysis of its internal morphological structure. Therefore, morphologically complex word forms can be accessed only via morphemic access units (Taft and Forster, 1975). With respect to Chinese, this means that readers break down a character into its components (radicals) when reading. Specifically, readers will use semantic radicals to recognize characters.

Logic

R+S+: shared radical, semantically related

R+S-: shared radical, semantically unrelated

R-S+: different radical, semantically related

R-S-: different radical, semantically unrelated

Logic

A1: We do not expect R+S- responses to be different from R-S-, meaning we do not expect semantically unrelated words to have a faster or slower reaction time with a shared radical than without.

Logic

A2: We expect differences between R+S- responses and R-S responses-, meaning that for unrelated words, sharing a radical would either speed up or slow down recognition.

Method

- 64 native Mandarin Chinese speakers
- 64 critical items (half-high combinability radicals, half low-combinability radicals)
- Experimental paradigm: lexical decision task with priming
- Two independent variables: shared/different semantic radical, semantically related/unrelated word meaning
- Controls:
    - All primes had frequencies of no less than 4 occurrences per million.
    - Primes were rated on a 1-7 scale by 10 informants on the semantic transparency of the radicals.–
    - Prime-target pairs were rated for semantic relatedness on a 1-7 scale by 10 informants.
    - Items in target-primed pairs were matched for stroke number
- Procedure: Prime presented for 243ms, immediately followed by target (2000ms). Dominant
- hand button for character and non-dominant hand button for non-character.

Results

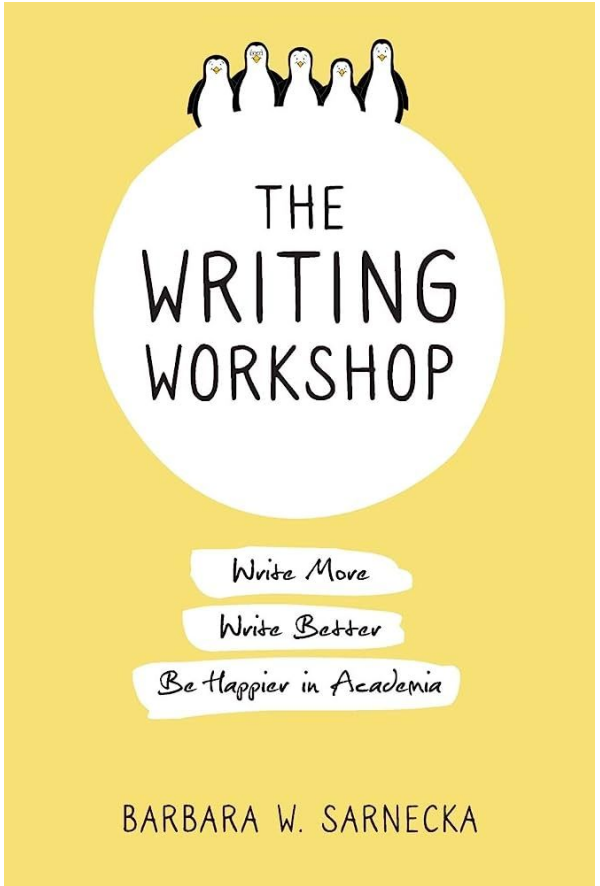
- Significant effect of shared radical (across R+S+ and R-S+ conditions)
- Reaction time increased for R+S- (inhibition) compared to R-S-

Inferences

- According to the results of Experiment 1, the semantic radical is processed during character recognition, which does not support the full-listing hypothesis (A1). The authors argue that these experiments present evidence that semantic radicals are analyzed during character recognition.
- Target inhibition following R+S- primes at short lags suggests a detrimental effect of orthographic similarity without semantic similarity. The authors argue this shows that the semantic radicals are being processed and influence the processing of the whole character.

Structure of a Paragraph

Best Book about Writing

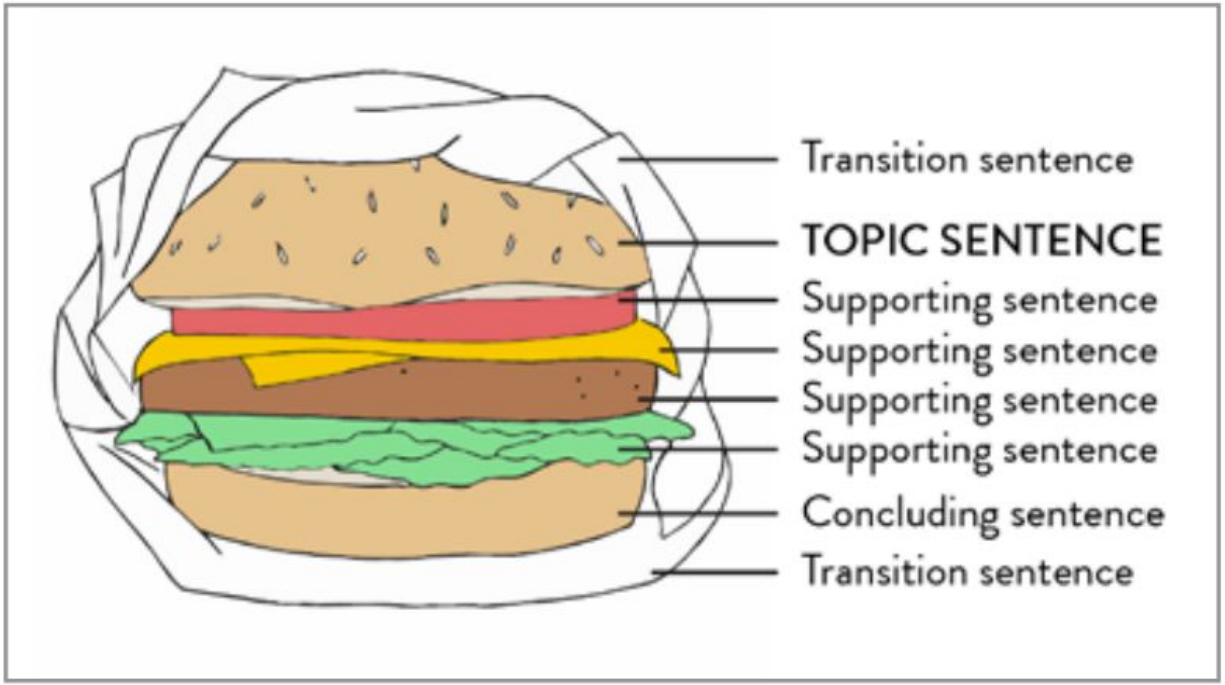


Paragraphs

“Many academic writers don’t pay enough attention to paragraphs. Writers tend to organize documents at the section level (introduction, method, etc.) and to edit individual sentences. They don’t think as much about paragraphs, which is a shame, because readers really notice paragraphs.” p.235

Paragraphs

“Writing that is organized as a series of tight, coherent paragraphs will strike readers as being clearer and easier to understand than writing that lacks such organization. The same clarity can help make the writing process easier, because organizing your writing into topic-sentence paragraphs allows you to switch back and forth between outlines and drafts, which is magic when you are developing a complicated argument.” p. 235


Transition sentence
TOPIC SENTENCE
Supporting sentence
Supporting sentence
Supporting sentence
Supporting sentence
Concluding sentence
Transition sentence

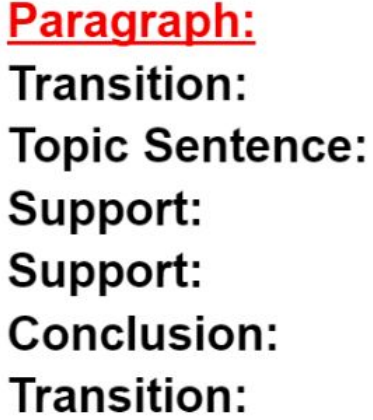
A new paper published in *Science* has concluded that no further research is needed.

The announcement, made in the discussion section of the paper, comes as a shock to millions of scientists across the world. Lead author Sara Jackson explains: "We were writing the discussion section of our paper and could think of no useful avenues for further research. We pretty much covered all bases. We then thought for a moment and concluded that this was probably the case for the rest of science as well. **So, we simply suggested that no further research is needed, at all, anywhere, ever."**

(Dr. Psyphago, 2013)

Hamburgers In Practice

- Use it during drafting and/or editing
- Help you get unstuck
- Help you figure out what's missing
- Hel you decide when to merge/break up paragraphs
- Help you focus on writing one sentence at a time
    - When you know what the topic of paragraph is
    - And what the function of the sentence you're writing is
    - Where the sentence is going to go in the paragraph



Before

The most conclusive results from this study are those relating to aspectual classes. The data show significant differences in participant responses between the two aspectual classes tested: activities and semelfactives. This validates our intuition that arose from a post-hoc analysis of pilot data as well as the intuition of Lu & Müller (2021), who also identified aspectual classes as an important dimension. [add in discussion after advising meeting] While these results do not definitively tell us specific information, such activity verbs are more likely than semelfactive verbs to be interpreted with diminishing semantics when participating in monosyllabic verbal reduplication, this is now the type of hypothesis that we can now begin to investigate.

Sometimes you know you don't like a paragraph or you know it needs something, but it's hard to tell what to do.

During

Transition: The most conclusive results from this study are those relating to aspectual classes.
Topic Sentence: The data show significant differences in participant responses between the two aspectual classes tested: activities and semelfactives.
Support: This validates our intuition that arose from a post-hoc analysis of pilot data as well as the intuition of Lu & Müller (2021), who also identified aspectual classes as an important dimension.The results of these experiments are compatible with the proposal in Lu & Müller (2021) in that they propose multiple lexical rules for reduplication. Perhaps there are different lexical rules for the different *Aktionsarten*, just as there are different lexical rules for the different forms of reduplication.
Support: In the MAB analysis, however, there is no mechanism by which to take into account the differences in aspectual classes. MAB assume an theory of event structure from (Ramchand, 2008), which accounts for aspectual classes within the *v*P; however, the reduplication mechanism in the MAB analysis would not have access to the internal composition of the *v*P, therefore their analysis does not currently account for the results found here.
Conclusion: These results inform the ongoing work of providing an analysis of Mandarin verbal reduplication by showing the importance of aspectual classes.

During

Flesh out support

Transition: The most conclusive results from this study are those relating to aspectual classes.
Topic Sentence: The data show significant differences in participant responses between the two aspectual classes tested: activities and semelfactives.
Support: This validates our intuition that arose from a post-hoc analysis of pilot data as well as the intuition of Lu & Müller (2021), who also identified aspectual classes as an important dimension.The results of these experiments are compatible with the proposal in Lu & Müller (2021) in that they propose multiple lexical rules for reduplication. Perhaps there are different lexical rules for the different *Aktionsarten*, just as there are different lexical rules for the different forms of reduplication.
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Fix redundancies in the concluding sentence

After

The most conclusive results from this study are those relating to aspectual classes. The data show significant differences in participant responses between the two aspectual classes tested: activities and semelfactives. This validates our intuition that arose from a post-hoc analysis of pilot data as well as the intuition of Lu & Müller (2021), who also identified aspectual classes as an important dimension.The results of these experiments are compatible with the proposal in Lu & Müller (2021) in that they propose multiple lexical rules for reduplication. Perhaps there are different lexical rules for the different *Aktionsarten*, just as there are different lexical rules for the different forms of reduplication. In the MAB analysis, however, there is no mechanism by which to take into account the differences in aspectual classes. MAB assume an theory of event structure from (Ramchand, 2008), which accounts for aspectual classes within the *v*P; however, the reduplication mechanism in the MAB analysis would not have access to the internal composition of the *v*P, therefore their analysis does not currently account for the results found here. These results inform the ongoing work of providing an analysis of Mandarin verbal reduplication by showing the importance of aspectual classes.

Non-Hamburger Paragraphs

- Introductory paragraphs that act as tables of contents
- Transitional paragraphs
- Serial paragraphs
    - All referring back to a single topic sentence
    - This happens when a claim, generalization, or abstraction requires only one sentence to express, but the evidence, examples, or details needed to support it require so much space that they have to be broken up into separate paragraphs just to give the reader's eye a break.

Other Tips

- Make it clear what you're referring to
  - 1 concept = 1 word
  - Don't use different words to refer to the same thing
  - Don't use the same word to refer to different things
  - Make it clear what pronouns are referring to
- Signposting

Tackling a Journal Article

Reading is reading

Reading is reading

WRONG!

We can read things at different levels

- Different levels of understanding
- Different levels of detail
- For different goals


5 Levels
Gravity
LEVEL 1
Child
LEVEL 2
Teen
LEVEL 3
College Student
LEVEL 4
Grad Student
LEVEL 5
Expert


5 Levels
Gravity
LEVEL 1
Child
LEVEL 2
Teen
LEVEL 3
College Student
LEVEL 4
Grad Student
LEVEL 5
Expert


5 Levels
Gravity
LEVEL 1
Child
LEVEL 2
Teen
LEVEL 3
College Student
LEVEL 4
Grad Student
LEVEL 5
Expert

Levels of Understanding a Journal Article

1. You just want to know what the paper is about
2. You want to know the main finding(s) of the paper
3. You want to understand the paper
4. You want to understand the paper well
5. You want to understand the paper *really* well

You just want to know what the paper is about

- Examples of when you might want to read a paper to this level:
  - You're trying to decide which paper(s) to read.
- What to do:
  - Read the title.
  - Read the abstract.
    - Make sure you understand what the paper is asking and how the question is addressed.
    - If something at this level is still unclear, try to read the introduction and conclusion (if there is one - if there isn't, you may need to read the discussion)

You want to know the main finding(s) of the paper

- Examples of when you might want to read a paper to this level:
  - You're trying to support a point or claim you're making by citing relevant background literature.
- What to do (in addition to what is previously mentioned):
  - Read through the paper
    - Focus on the introduction, the main figures and tables in results, and the discussion and conclusions.
    - Make sure you understand the main research question of the paper
    - If the paper has multiple experiments, make sure you understand the more specific research questions that each experiment is meant to address.
    - Make sure you understand what the important results are, and how they answer the research questions.

You want to understand the paper

- Examples of when you might want to read a paper to this level:
  - You're going to talk about the paper for more than one or two sentences (for a paper, quiz, or other assignment)
- What to do (in addition to what is previously mentioned):
  - Make sure you understand the background and results.
  - Make sure you understand how the research question is translated into the form of an experiment (you may hear this referred to as 'how the constructs are operationalized').
    - What are the dependent and independent variable(s), and how do they relate to the research question?
    - What are the control variables?
  - Make sure you've read the example stimuli (if provided) and understand how they allow the experiment to answer the research question.

You want to understand the paper well

- Examples of when you might want to read a paper to this level:
  - When writing a paper: you're going to talk about the paper for more than one or two paragraphs (for a paper, quiz, or other assignment)
- What to do (in addition to what is previously mentioned):
  - Make sure you understand the method and the results in depth.

You want to understand the paper *really* well

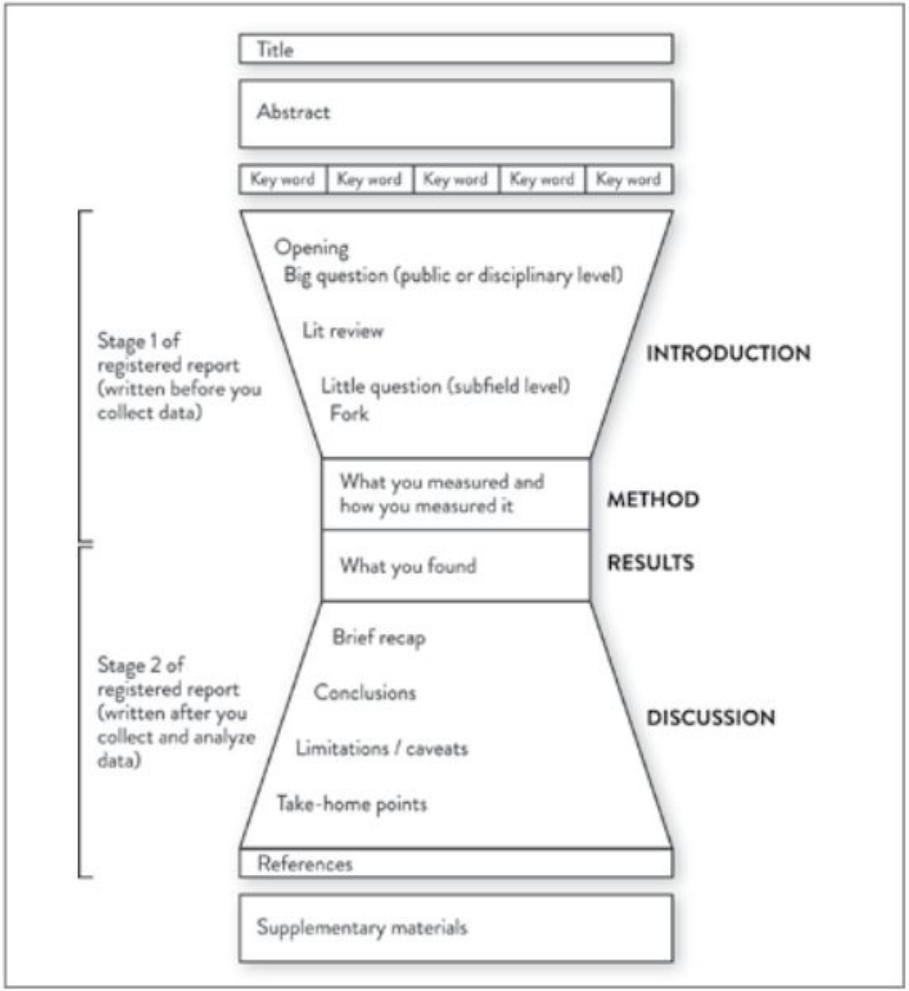
- Examples of when you might want to read a paper to this level:
  - You're writing a paper specifically about the paper, or you're trying to replicate it as a researcher.
- What to do (in addition to what is previously mentioned):
  - Find and read any appendices, supplementary materials, and other extra materials provided by the authors (e.g. stimuli or data posted online).

Breaking the Paper Down

Let’s look at the different sections of a paper so we can tackle them one by one

Structure of an Article

- IMRaD structure
  - Introduction
  - Method
  - Results
  - Discussion
- Funnel structure
  - Introduction brings you from the broadest point to the very narrow subject of the paper
  - Most of the paper is about the narrow focus
  - Discussion brings you back to the big picture and related topics


Title
Abstract
Key word
Key word
Key word
Key word
Key word
Opening
Big question (public or disciplinary level)
Lit review
Little question (subfield level)
Fork
INTRODUCTION
What you measured and how you measured it
METHOD
What you found
RESULTS
Brief recap
Conclusions
Limitations / caveats
Take-home points
DISCUSSION
References
Supplementary materials
Stage 1 of registered report (written before you collect data)
Stage 2 of registered report (written after you collect and analyze data)

Steps for Reading a Paper

1. Abstract
2. Discussion
3. Introduction
4. Results

Abstract

- Preview the text, get in the right headspace
- Tells you briefly what experiment was done and what was found.Tells you briefly what experiment was done and what was found.

Taboo, emotionally valenced, and emotionally neutral word norms

KRISTIN JANSCHEWITZ
University of California, Los Angeles, California

Although taboo words are used to study emotional memory and attention, no easily accessible normative data are available that compare taboo, emotionally valenced, and emotionally neutral words on the same scales. Frequency, inappropriateness, valence, arousal, and imageability ratings for taboo, emotionally valenced, and emotionally neutral words were made by 78 native-English-speaking college students from a large metropolitan university. The valenced set comprised both positive and negative words, and the emotionally neutral set comprised category-related and category-unrelated words. To account for influences of demand characteristics and personality factors on the ratings, frequency and inappropriateness measures were decomposed into raters' personal reactions to the words versus raters' perceptions of societal reactions to the words (personal use vs. familiarity and offensiveness vs. tabooness, respectively). Although all word sets were rated higher in familiarity and tabooness than in personal use and offensiveness, these differences were most pronounced for the taboo set. In terms of valence, the taboo set was most similar to the negative set, although it yielded higher arousal ratings than did either valenced set. Imageability for the taboo set was comparable to that of both valenced sets. The ratings of each word are presented for all participants as well as for single-sex groups. The inadequacies of the application of normative data to research that uses emotional words and the conceptualization of taboo words as a coherent category are discussed. Materials associated with this article may be accessed at the Psychonomic Society's Archive of Norms, Stimuli, and Data, www.psychonomic.org/archive.

What's in an abstract?

Although taboo words are used to study emotional memory and attention, no easily accessible normative data are available that compare taboo, emotionally valenced, and emotionally neutral words on the same scales. Frequency, inappropriateness, valence, arousal, and imageability ratings for taboo, emotionally valenced, and emotionally neutral words were made by 78 native-English-speaking college students from a large metropolitan university. The valenced set comprised both positive and negative words, and the emotionally neutral set comprised category-related and category-unrelated words. To account for influences of demand characteristics and personality factors on the ratings, frequency and inappropriateness measures were decomposed into raters' personal reactions to the words versus raters' perceptions of societal reactions to the words (personal use vs. familiarity and offensiveness vs. tabooness, respectively). Although all word sets were rated higher in familiarity and tabooness than in personal use and offensiveness, these differences were most pronounced for the taboo set. In terms of valence, the taboo set was most similar to the negative set, although it yielded higher arousal ratings than did either valenced set. Imageability for the taboo set was comparable to that of both valenced sets. The ratings of each word are presented for all participants as well as for single-sex groups. The inadequacies of the application of normative data to research that uses emotional words and the conceptualization of taboo words as a coherent category are discussed. Materials associated with this article may be accessed at the Psychonomic Society's Archive of Norms, Stimuli, and Data, www.psychonomic.org/archive.

Background/Motivation

Although taboo words are used to study emotional memory and attention, no easily accessible normative data are available that compare taboo, emotionally valenced, and emotionally neutral words on the same scales. Frequency, inappropriateness, valence, arousal, and imageability ratings for taboo, emotionally valenced, and emotionally neutral words were made by 78 native-English-speaking college students from a large metropolitan university. The valenced set comprised both positive and negative words, and the emotionally neutral set comprised category-related and category-unrelated words. To account for influences of demand characteristics and personality factors on the ratings, frequency and inappropriateness measures were decomposed into raters' personal reactions to the words versus raters' perceptions of societal reactions to the words (personal use vs. familiarity and offensiveness vs. tabooness, respectively). Although all word sets were rated higher in familiarity and tabooness than in personal use and offensiveness, these differences were most pronounced for the taboo set. In terms of valence, the taboo set was most similar to the negative set, although it yielded higher arousal ratings than did either valenced set. Imageability for the taboo set was comparable to that of both valenced sets. The ratings of each word are presented for all participants as well as for single-sex groups. The inadequacies of the application of normative data to research that uses emotional words and the conceptualization of taboo words as a coherent category are discussed. Materials associated with this article may be accessed at the Psychonomic Society's Archive of Norms, Stimuli, and Data, www.psychonomic.org/archive.

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Background/Motivation

Dependent variables

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Dependent variables
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Background/Motivation

Dependent variables

Independent variables

Research methods/ Methodology

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Background/Motivation

Dependent variables

Independent variables

Research methods/ methodology

Results

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Background/Motivation

Dependent variables

Independent variables

Research methods/ Methodology

Results

Discussion/ Implications

What's in an abstract?

Background/Motivation

Dependent variables

Independent variables

Research methods/
Methodology

Results

Discussion/
Implications

What's in an abstract?

- Background/Motivation
- Research Question
- Experimental Question
  - Dependent variables
  - Independent variables
- Research methods/Methodology
- Results
- Discussion/Implications

Motivation

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Independent variables

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What's in an abstract?

- **Background/Motivation**: What related research has already been carried out? Why run the study?
- **Research Question**: What does the author want to know?
  - ➢ Example: How do taboo words differ from other words?
- **Experimental Question**: What is the experiment testing specifically? How do/does the independent variable(s) affect the dependent variable(s)?
  - ➢ Example: How do taboo words differ (in terms of frequency, inappropriateness, valence, arousal, and imageability) from positively-valenced, negatively-valenced, and neutral words?
    - **Dependent variables**: What variable(s) is/are being measured?
    - **Independent variables**: What variables(s) is/are being manipulated by the researchers?
- **Research methods/methodology**: How did the the researcher(s) carry out their experiments? On whom? How did they design the experiment to test what they wanted to know? How did the researcher(s) account for the possible effect of other variables?
- **Results**: What were the results of the experimental question?
- **Discussion/ implications**: What do the results mean? How do they fit in with previous research? What is/are the most important aspect(s) of the results?

Discussion

- Summarizes important results, gives reasons for conclusions based on results.
- Do you agree with the logic of the conclusions? Are these results useful to you?

Introduction

- Explains motivation and importance of research, provides background information.
- Do you understand background info? Do you need to look up references for more info?
    - Do you need to look up terminology?

Results

- Provides the raw data you might need for your own research. Figures and tables provide the data in a compact format for easy viewing. (For me, I rarely understand the procedure until I see the results)
- For figures, do you understand what the axes mean? What units are used? Does the curve make sense?

More Tips

- Write questions as you read
- Look for links and connections between the text and your experiences, thoughts, ideas, and other texts.
- Check for understanding, reread

Materials

- Kosslyn (2004) The Brain, The Person, The World 2/e p. 36-39
- Sarnicka (2019) The Writing Workshop
- Discussion section 1 slides c/o James Michaelov
- How to Read a Scientific Article, Purdue (link)