

# Guiding Novice Web Workers in Making Image Descriptions Using Templates

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Available as open-access TACCESS paper &  
[www.valeriemorash.com](http://www.valeriemorash.com)

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# STEM Images

## STEM Images:

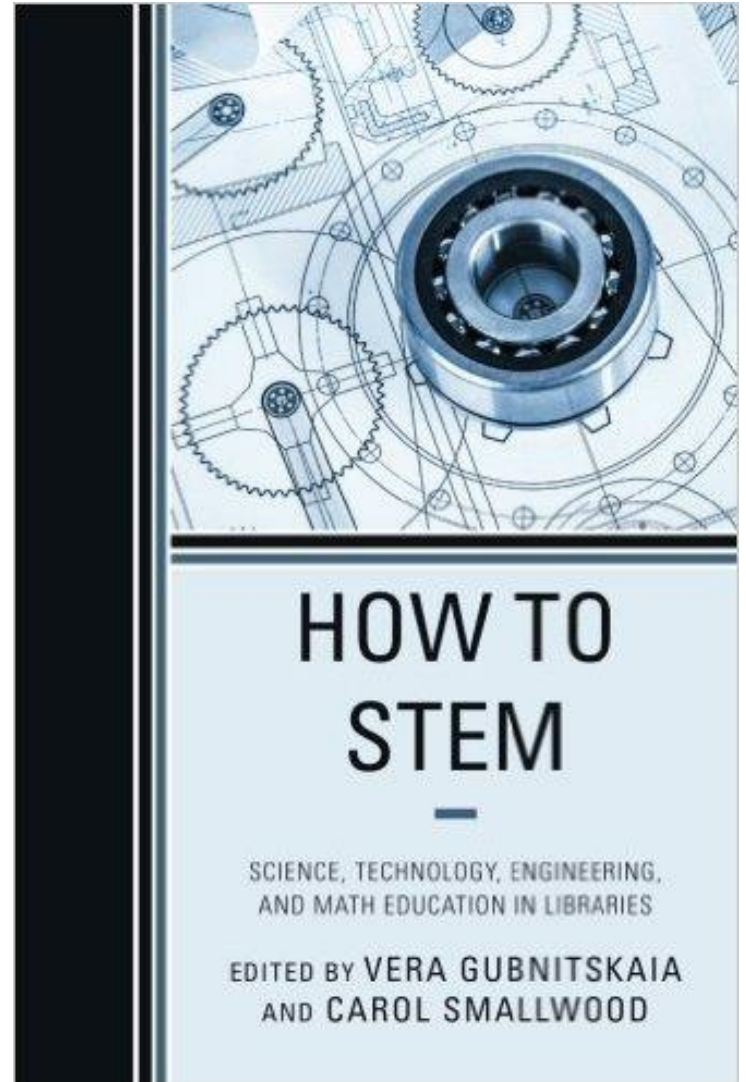
- Often critical material
- Material not in text
- Inaccessible to people who are blind

## Accessible Replacements:

- Tactile graphic
- Text image description

## Creation:

- Expert vs. novice web-workers
- Description Guidelines



# General Guidelines

[<< Previous section: Introduction](#) | [Main Table of Contents](#) | [Next section: Specific Guidelines >>](#)

## Table of Contents for General Guidelines Section

### [A. Style and Language](#)

- [1. Context is Key](#)
- [2. Consider Your Audience](#)
- [3. Be Concise](#)
- [4. Be Objective](#)
- [5. General to Specific](#)
- [6. Tone & Language](#)

### [B. Formatting and Layout](#)

- [1. Insets](#)
  - [1a. As Graphs](#)
  - [1b. As Images](#)

Gould, B., O'Connell, T., & Freed, G. 2008. Guidelines for describing STEM images.

<http://diagramcenter.org/>

(Spoken text:) The NCAM guidelines were based on a multi-study project, which involved two rounds of a web-based Delphi survey, taken by over 30 expert describers and individuals with vision loss, to establish approaches to the description of STEM images. A follow-up 60 person end-user study, with participants who had visual impairments, confirmed that description guidelines produce quality image descriptions.

Gould, B., O'Connell, T., & Freed, G. 2008. Guidelines for describing STEM images.

<http://diagramcenter.org/>

# Image Description Creation

The Poet image description tool for crowd sourcing image descriptions for electronic books.



CK-12 Algebra 1 Second Edition Volume 1

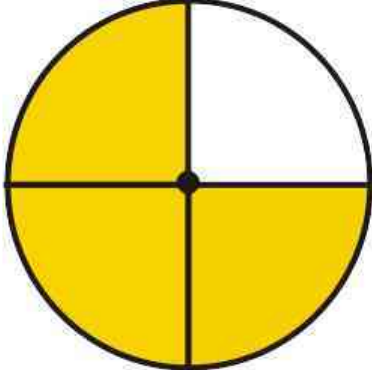











Image Number: 47915 ([view original size](#))

**Long Description**

[Edit](#) [Preview](#)

**B** **I** **U**  *Format* 

[Show/Hide Math Helper](#)

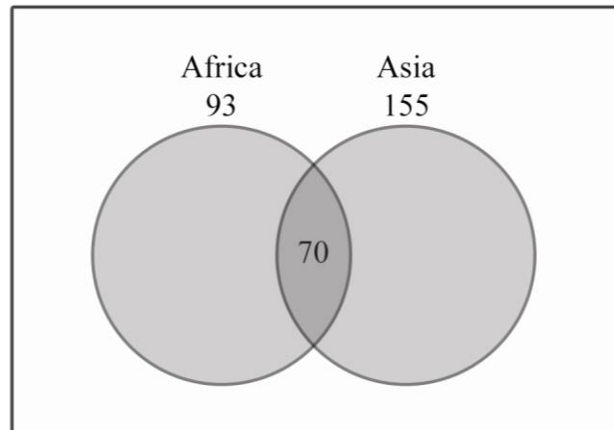
[Show/Hide Additional Fields](#)

[Save](#)

# Eliciting Image Descriptions

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## Survey of Travelers



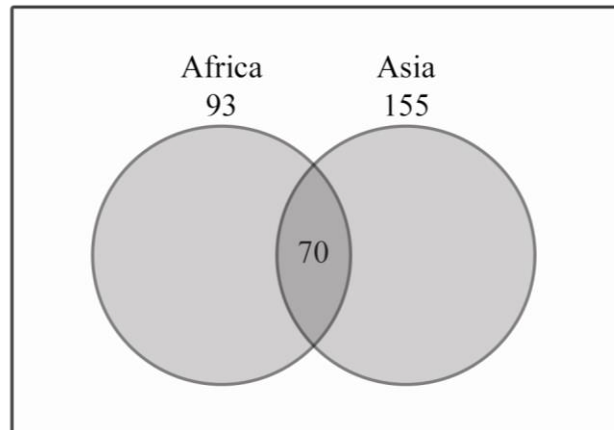
## Free Response Description

NCAM Guidelines...  
Describe image:

This is a Venn diagram with two circles. The left circle is labeled Africa...

# Eliciting Image Descriptions

Survey of Travelers



Queried Description

Title

Type

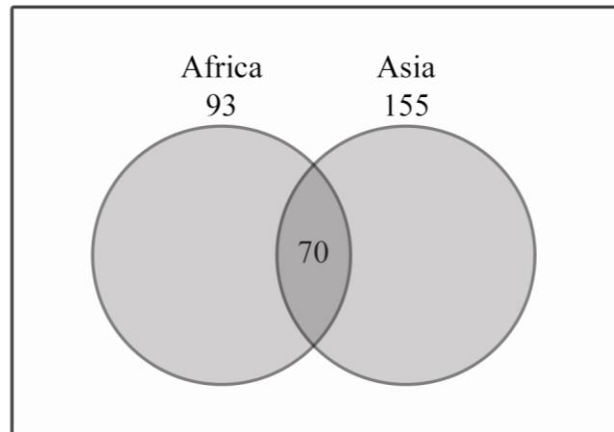
# Circles

1<sup>st</sup> Label

...

# Eliciting Image Descriptions

Survey of Travelers



Queried Description

Title

Type

# Circles

1<sup>st</sup> Label

...

## Template

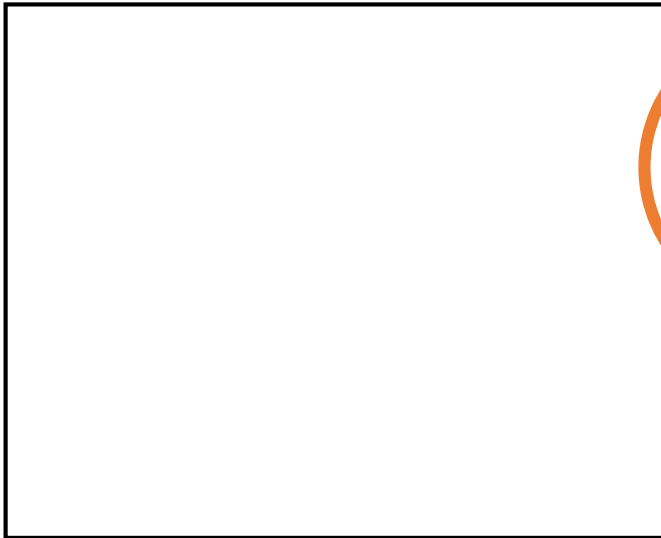
The title is "Survey of Travelers." This is a Venn Diagram with 2 circles. The first circle is labeled "Africa" ...



# Comparing Image Descriptions

## Free Response Description

NCAM Guidelines...  
Describe image:



vs.

## Queried Description

Title

Survey of  
Travelers

Type

Venn Diagram

# Circles

2

1<sup>st</sup> Label

Africa

...

# Comparing Image Descriptions - Design

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## **22 Participants**

Most had never described images before (59%)

20 were native English speakers, 1 competent, 1 fluent

## **Task: Describe 6 Images**

3 free and 3 queried description, in random order.

Images from NCAM STEM image description guidelines.

Free response images presented with guidelines.

## **Procedure**

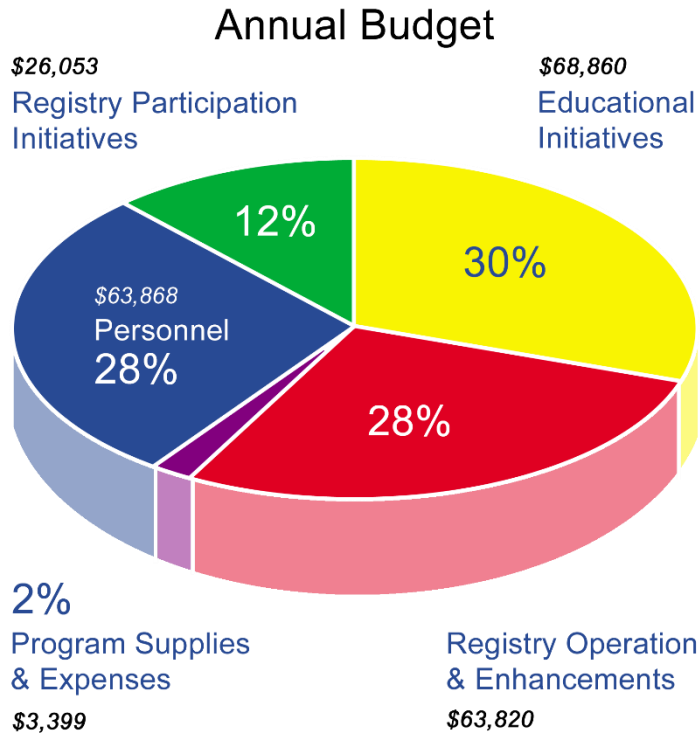
Email experimenter for code to access individual “survey:”

(1) Demographics, (2) image description, (3) difficulty/preference

Complete tasks on personal computer

# Image Description Example

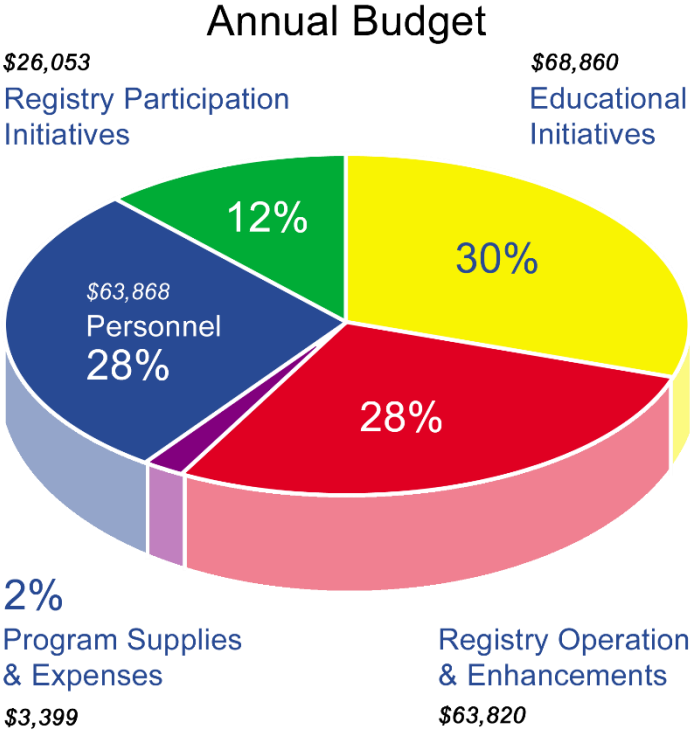
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## Pie-Chart Specific Guidelines:

- Pie charts should be converted into accessible tables.
- It is not necessary to describe the visual attributes of the charts, e.g., red wedge, blue lines, etc., unless there is an explicit need such as an exam question referring to these attributes.
- It is helpful to list the numbers from smallest to largest, regardless of how they are presented in the image.

# Image Description Example



**Description:**

This is a pie chart, titled Annual Budget. The pie chart has 5 wedges, which are labeled in dollars and percentages. The data are summarized in the following table.

Label	Dollar	Percent
Program Supplies & Expenses	\$3,399	2%
...	...	...

# Image Description Example: Lime Survey

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\* Please edit the text of your description to correct any incorrect grammar, spelling, punctuation, tense, pluralization, and/or capitalization. Please also correct any description inaccuracies or ambiguities. Data values will be entered in a following table.

This is a pie chart titled "Annual Budget." The pie chart has 5 wedges, which are labeled in dollars and percentages. The data are summarized in the following table. //

Please use this table to report data from the pie chart.

	Color	Wedge label	Dollars	Percentage of whole
Wedge 1	Red	Registry Operations & Enhanc	63,820	28
Wedge 2	Purple	Program Supplies & Expense	3,399	2
Wedge 3	Blue	Personnel	63,868	28
Wedge 4	Green	Registry Participation Initiativ	26,053	12
Wedge 5	Yellow	Education Initiatives	68,860	30

# Image Description Example: Lime Survey

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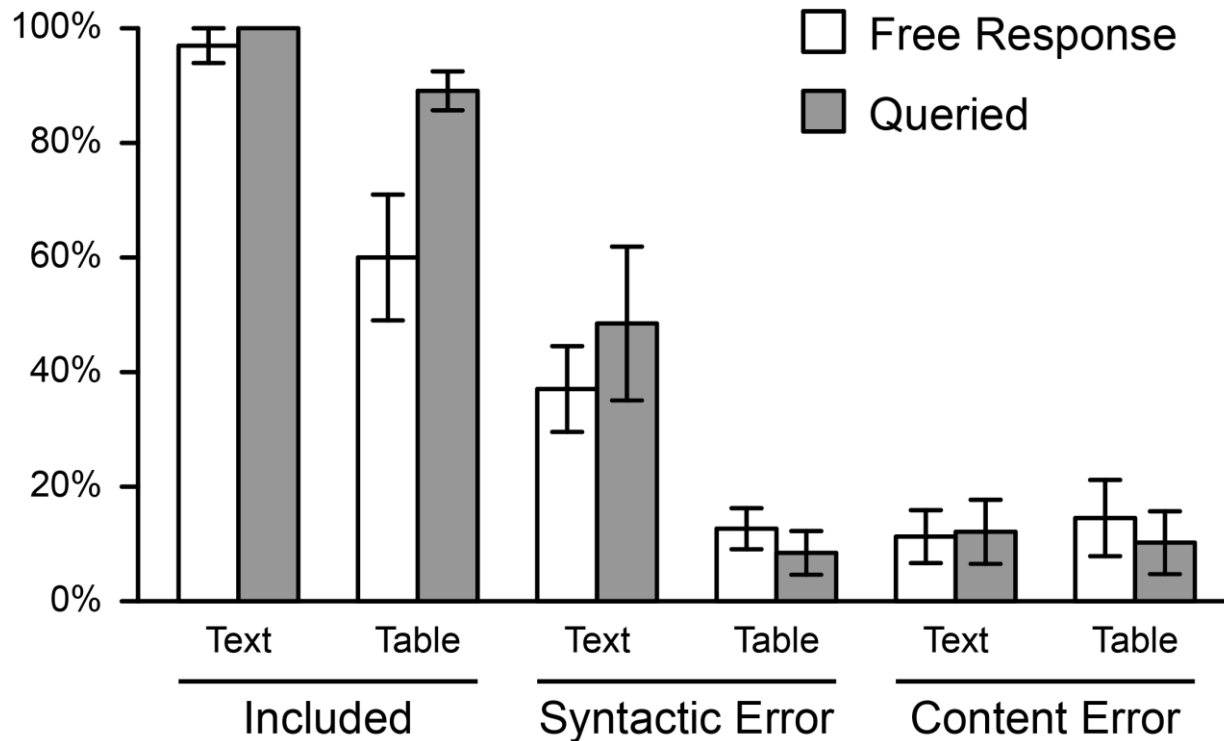
(Spoken text:) Participants provided responses using an online survey tool called LimeSurvey, which provides conditional scripting support, so that the appearance of questions could depend on previous questions. This screen shot shows the last step of a queried image description in which the participant is asked to check his/her work.



# Comparing Image Descriptions - Results

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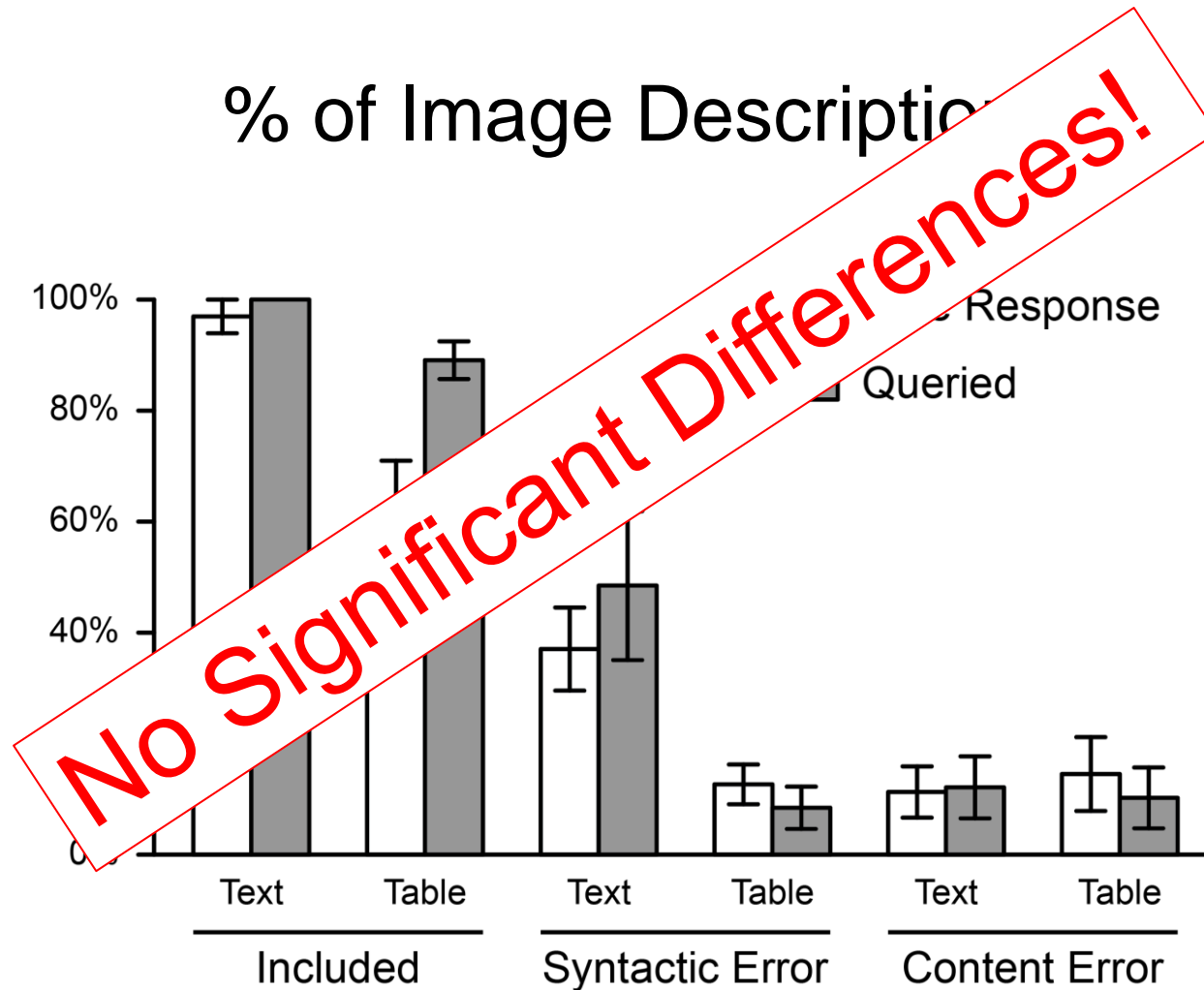
## % of Image Descriptions



Planned paired t-tests



# Comparing Image Descriptions - Results

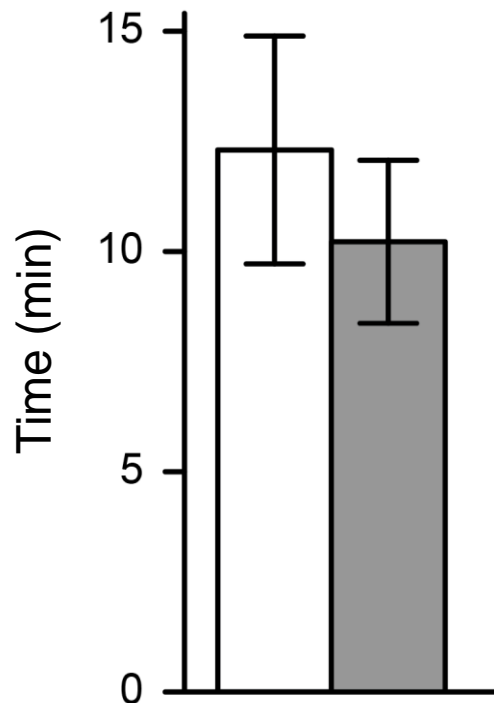


Planned paired t-tests

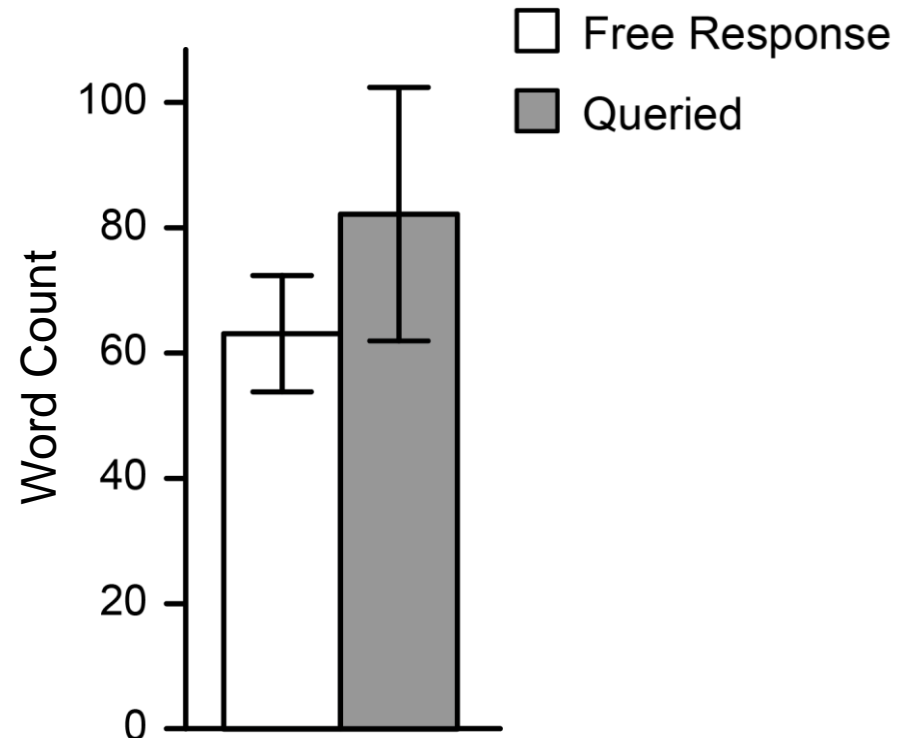
# Comparing Image Descriptions - Results

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## Time to Describe



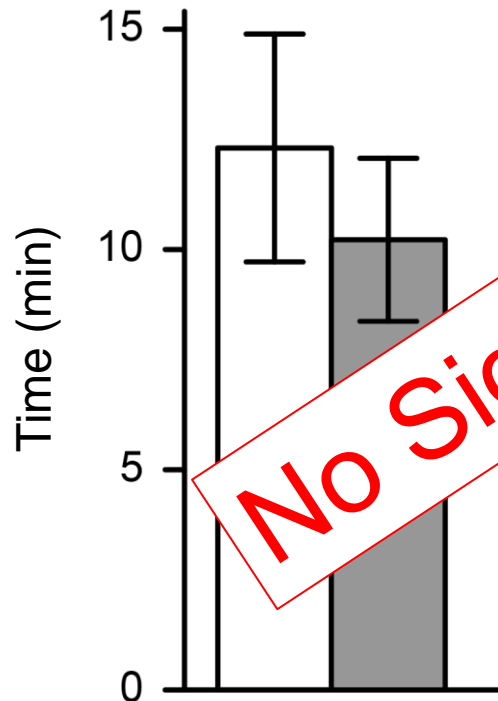
## Text Length



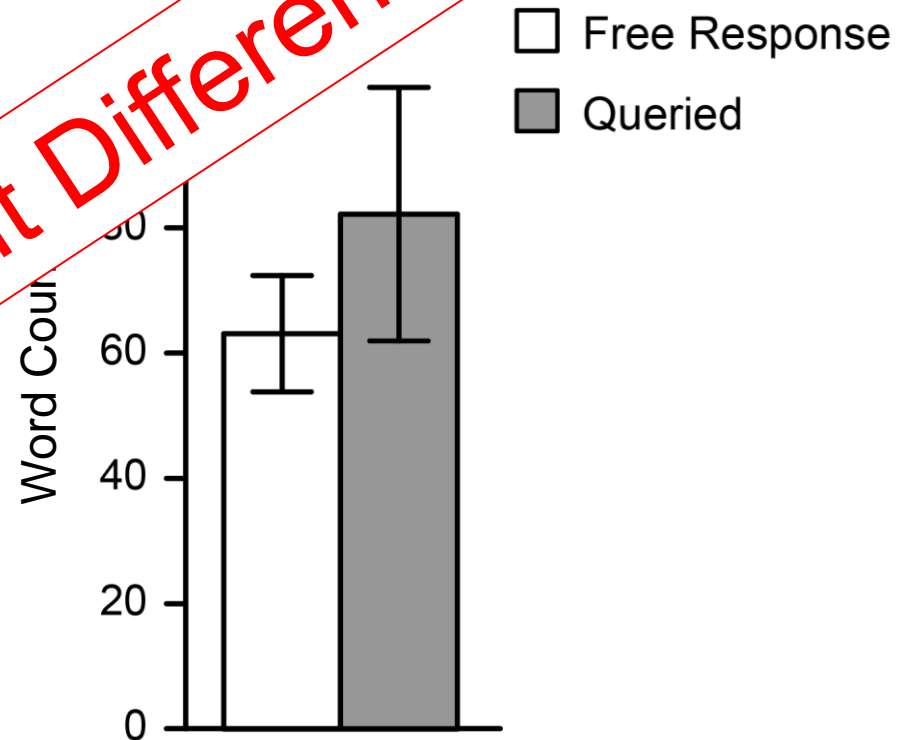
Planned paired t-tests

# Comparing Image Descriptions - Results

## Time to Describe



## Text Length



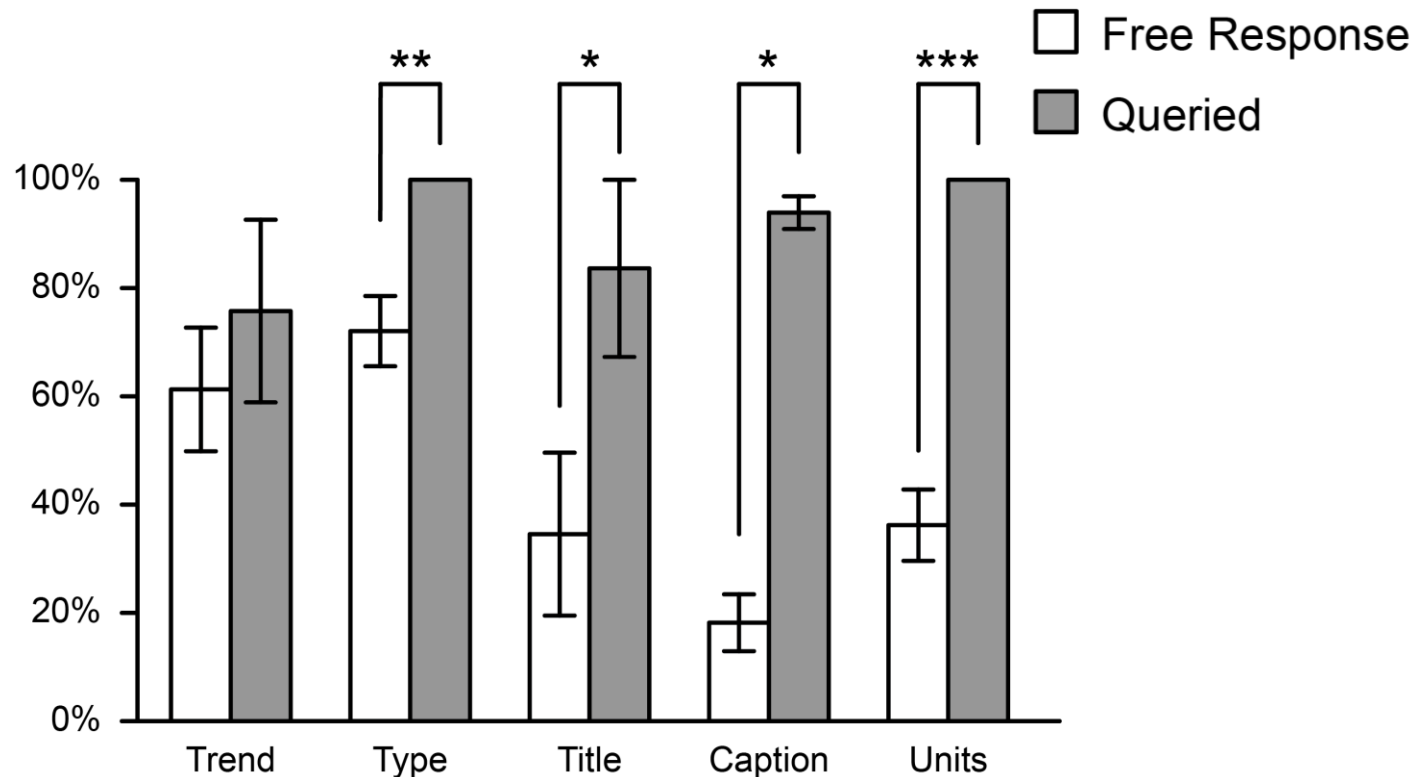
**No Significant Differences!**

Planned paired t-tests

# Comparing Image Descriptions - Results

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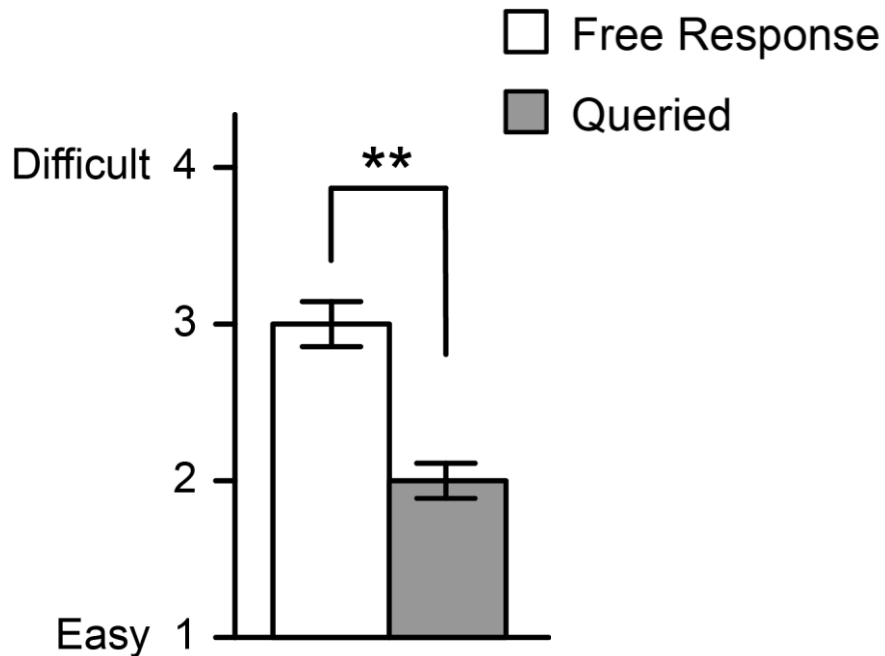
## % of Image Descriptions (in Text)



Planned paired t-tests

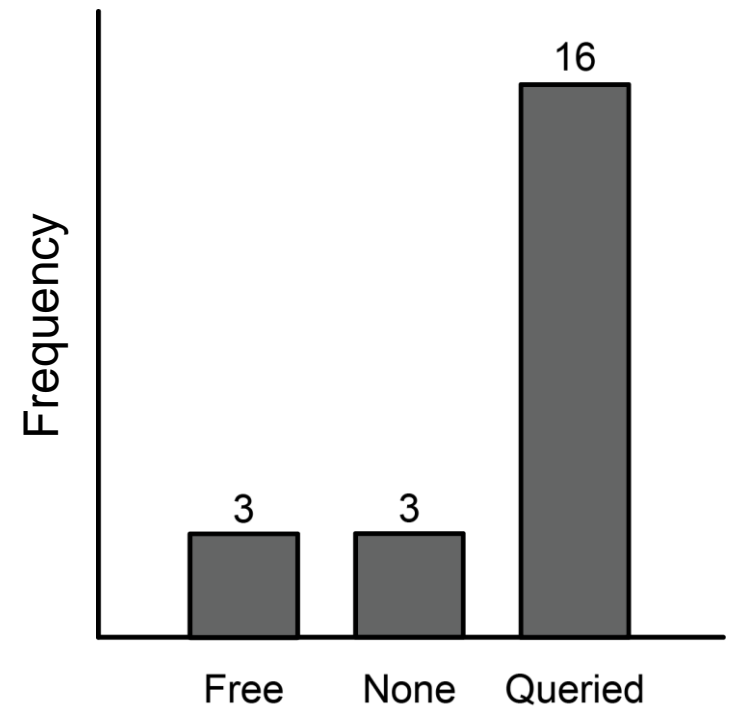
# Comparing Image Descriptions - Results

## Difficulty



\*\* Significant Mann-Whitney U

## Preference



\*\* Significant Thurstonian Model

# Comparing Image Descriptions - Conclusion

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## Not Different:

- Include text and table
- Syntactic and content errors
- Time to describe
- Length of text description

## Different:

- Include type, title, caption, units
- Text description similarity
- Participant-reported difficulty
- Participant preference

Favor Queried Description

Thank you!



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