

Tips for accessible and inclusive design practices



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**Presented as part of the ARO
Science Communication
Workshop**

(along with Dr. Matt Winn)

January 2022

Inclusive design



Inclusive design

Disability is a spectrum of experiences!

Inclusive design

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Good science communication =
Making sure your **audience** understands the message

Inclusive design

Disability is a spectrum of experiences!

Good science communication =
Making sure your **audience** understands the message

... That includes everyone 😊

Inclusive design

Tips for **accessible** and **inclusive** design practices

Great online resources:

- <https://www.betterment.com/design/accessible-data-visualization>
- <https://towardsdatascience.com/an-incomplete-guide-to-accessible-data-visualization-33f15bfcc400>
- <http://www.inclusivedesigntoolkit.com/UCvision/vision.html#nogo>

Tools:

- Check your color palettes: <https://colors.co>
- Color blindness simulator: <http://www.color-blindness.com/coblis-color-blindness-simulator/>

ARO Accessibility committee:

- **Brad Buran**, Ray Goldsworthy, Lina Reiss, Shaum Bhagat, John Brigande, Julia Huyck, Samson Jamesdaniel, Erin O'Neill, Brandon Paul, Moaz Sinan, Viral Tejani, Jun Yang, Marisa Zallocchi

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Tools: ***We will share these resources after the workshop!***

- Check your color palettes: <https://colors.co>
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Tips for **accessible** and **inclusive** design practices

Focus on
strategies that
will be helpful for
those with
**hearing and/or
vision difficulties**

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Spotlight!

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Spotlight!

Supporting Equity and Inclusion of Deaf and Hard-of-Hearing Individuals in Professional Organizations

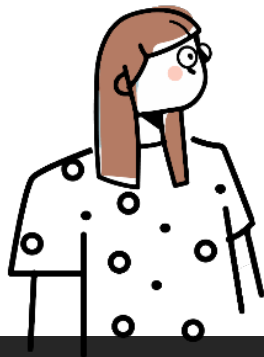
Julia Jones Huyck^{1†}, Kelsey L. Anbuhl^{2†}, Brad N. Buran^{3†}, Henry J. Adler⁴, Samuel R. Atcherson⁵, Ozan Cakmak⁶, Robert T. Dwyer⁷, Morgan Eddolls³, Fadhel El May⁸, Juergen-Theodor Fraenzer⁹, Rebekah Funkhouser¹⁰, Mathilde Gagliardini¹¹, Frederick J. Gallun³, Raymond L. Goldsworthy¹², Samir Gouin¹³, Joseph Heng¹⁴, Ariel Edward Hight¹⁵, Zina Jawadi¹⁶, Damir Kovacic¹⁷, Rachit Kumar¹⁸, Santosh Kumar¹⁹, Stacey R. Lim²⁰, Chengeng Mo²¹, Lisa S. Nolan²², Alexandra Parbery-Clark²³, Dominic V. Pisano²⁴, Valluri R. Rao²⁵, Robert M. Raphael²⁶, Lina A. J. Reiss³, Nathaniel J. Spencer²⁷, Stephen J. Tang²⁸, Viral D. Tejani^{29,30}, Emma D. Tran³¹, Mikael Valli³², Greg D. Watkins³³, Rachel V. Wayne³⁴, Lindsey R. Wheeler⁷, Stephanie L. White³⁵, Victor Wong³⁶, M. Caroline Yuk³⁷, J. Tilak Ratnanather^{38‡} and Peter S. Steyger^{39‡}*

Inclusive design

Tips for **accessible** and **inclusive** design practices

What does it mean to be **accessible**?

Having access to information

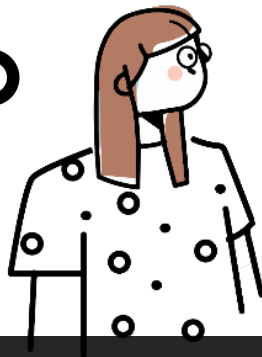


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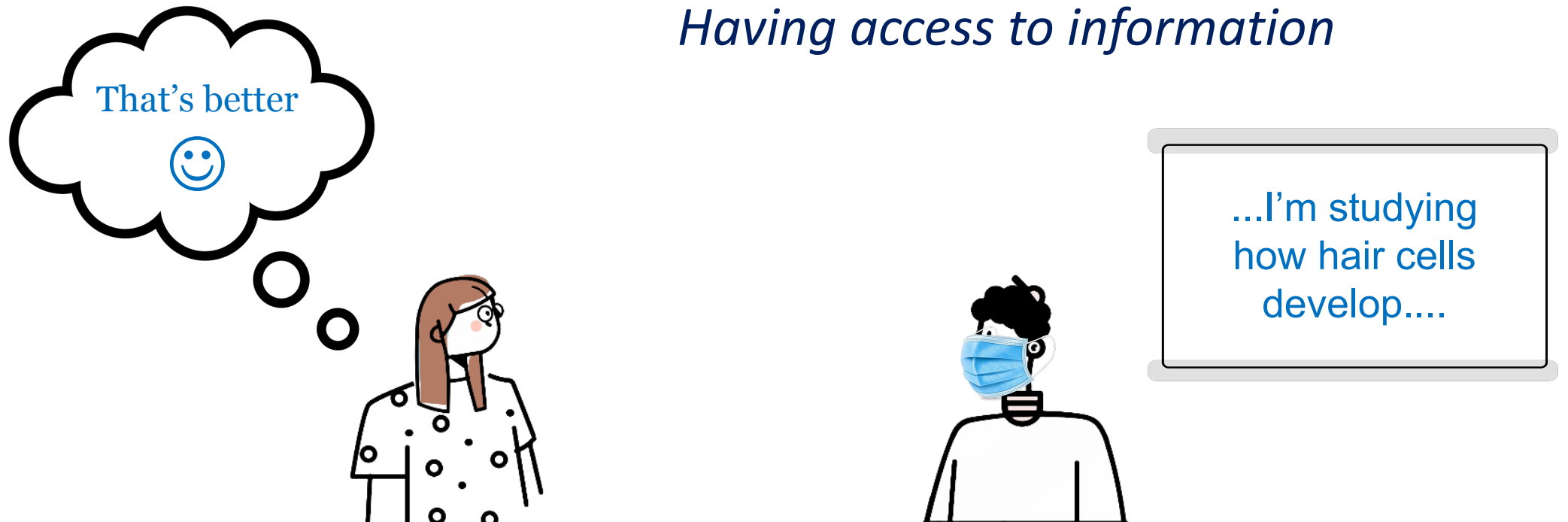


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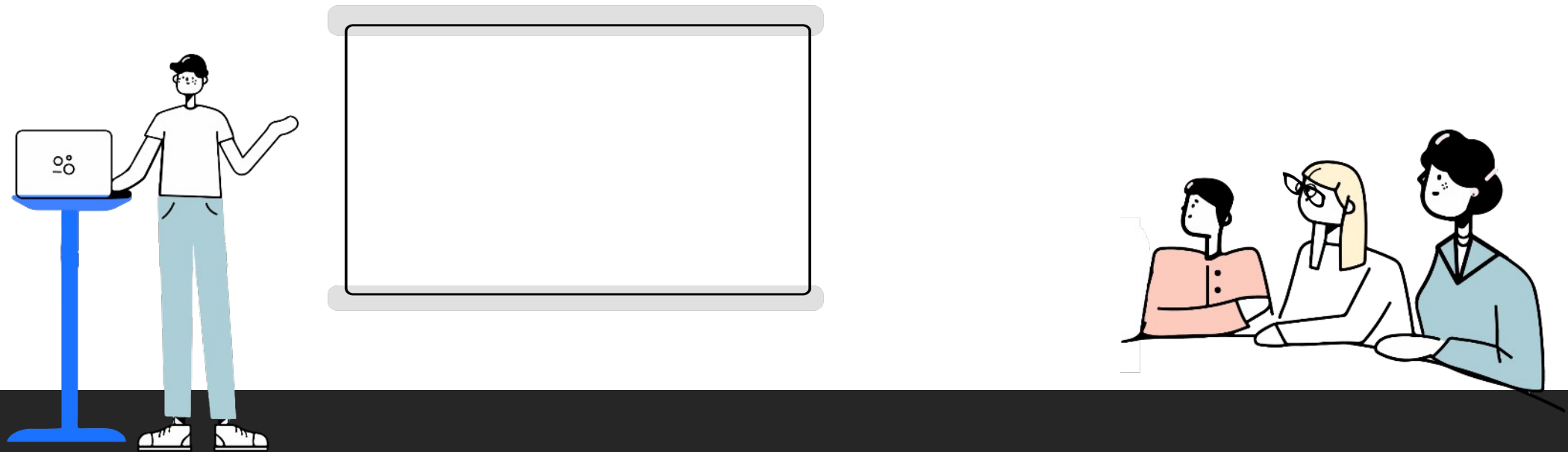


Inclusive design

Tips for **accessible** and **inclusive** design practices

What does it mean to be **inclusive**?

Making intentional design choices that make it easier to understand



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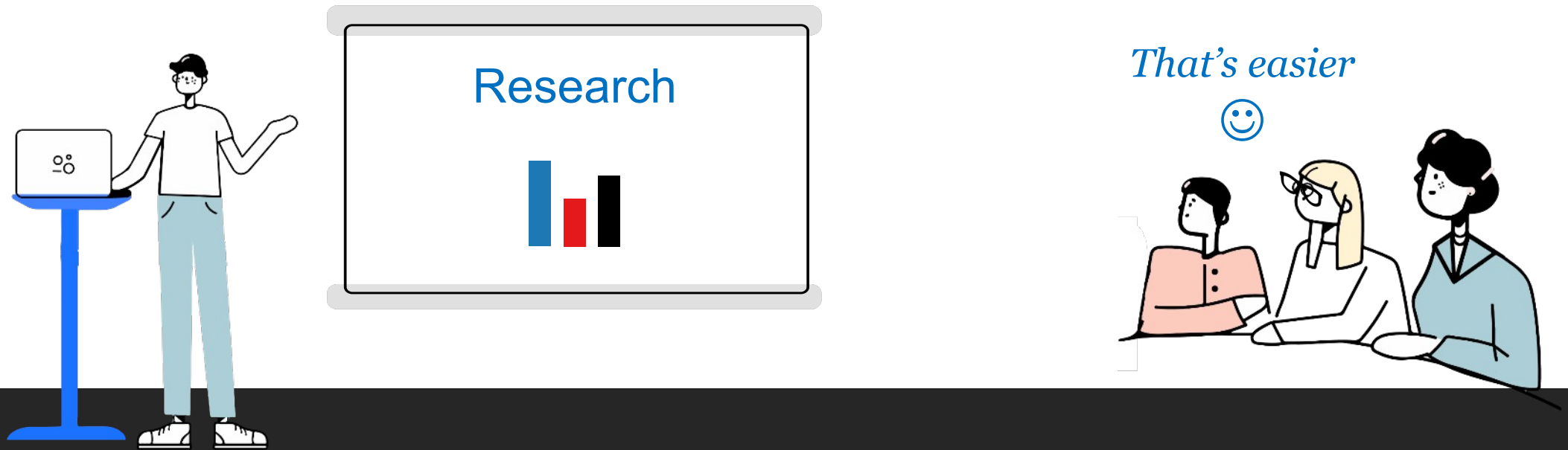


Inclusive design

Tips for **accessible** and **inclusive** design practices

What does it mean to be **inclusive**?

Making intentional design choices that make it easier to understand



Making your figures accessible

Tip 1: **Be redundant** in how you present information

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For example:

"I presented 4 or 12 Hz amplitude modulation (AM)..."

On poster/slide, you put:

4 or 12 Hz AM

Making your figures accessible

Tip 1: Be redundant in how you present information

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"I presented 4 or 12 Hz amplitude modulation (AM)..."

**Better:
Visualize audio stimuli**

On poster/slide, you put:

4 or 12 Hz AM

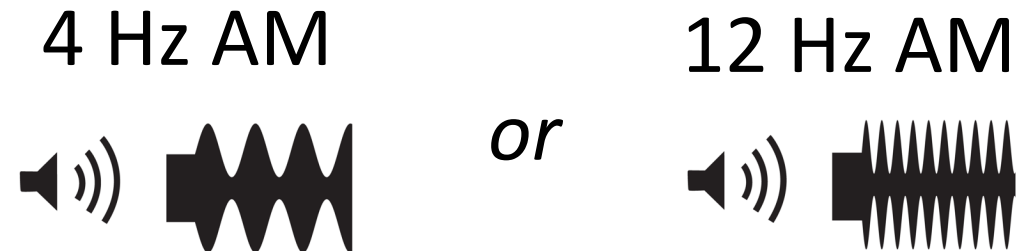
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For example:

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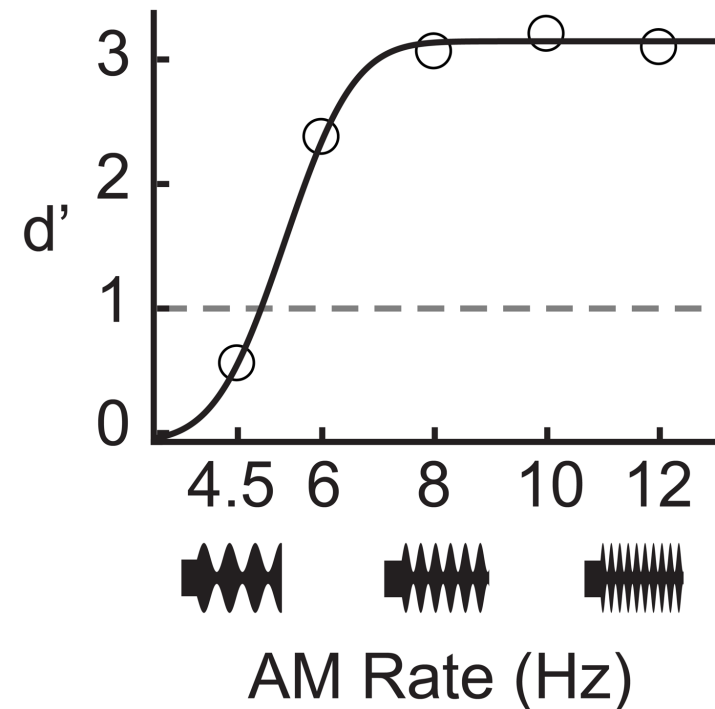
**Better:
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Better:
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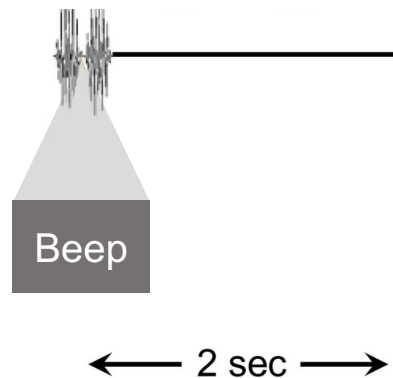
Tip 1: **Be redundant** in how you present information

Use **essential labels / text** to understand the figure without having to rely 100% on what you are saying

Making your figures accessible

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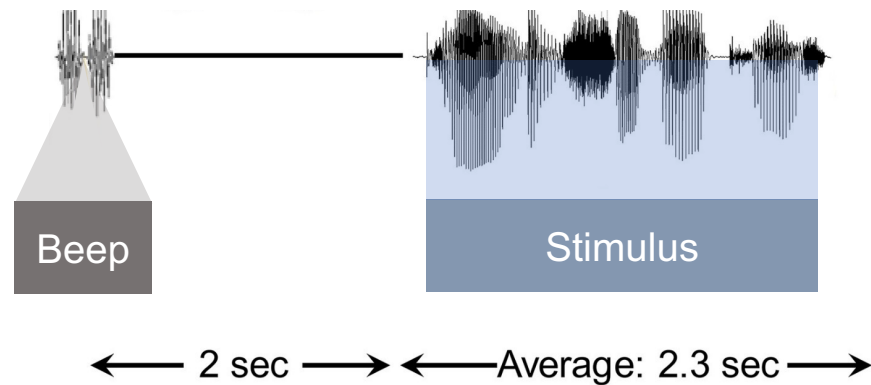
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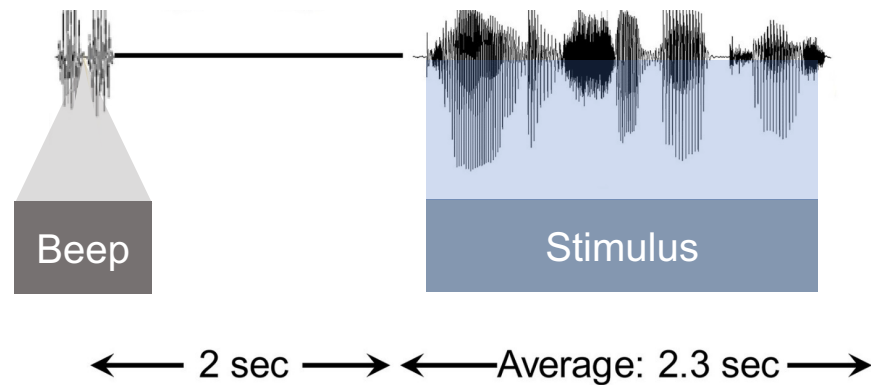
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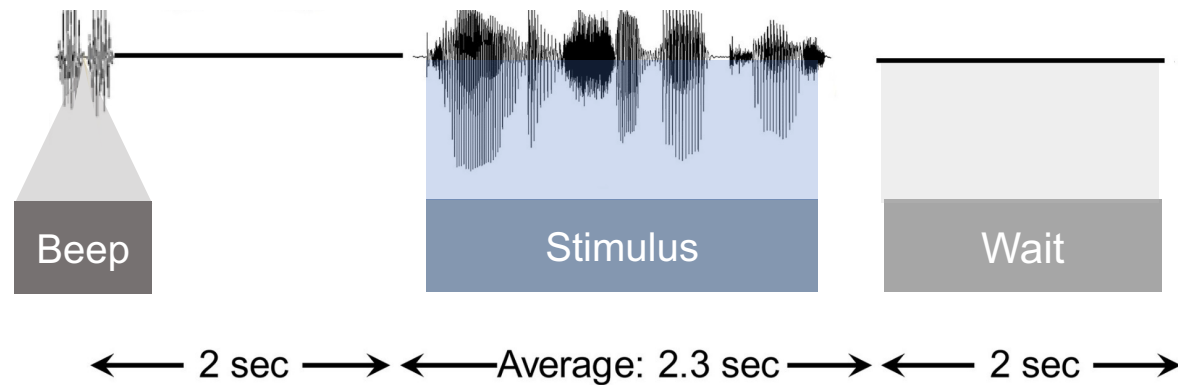
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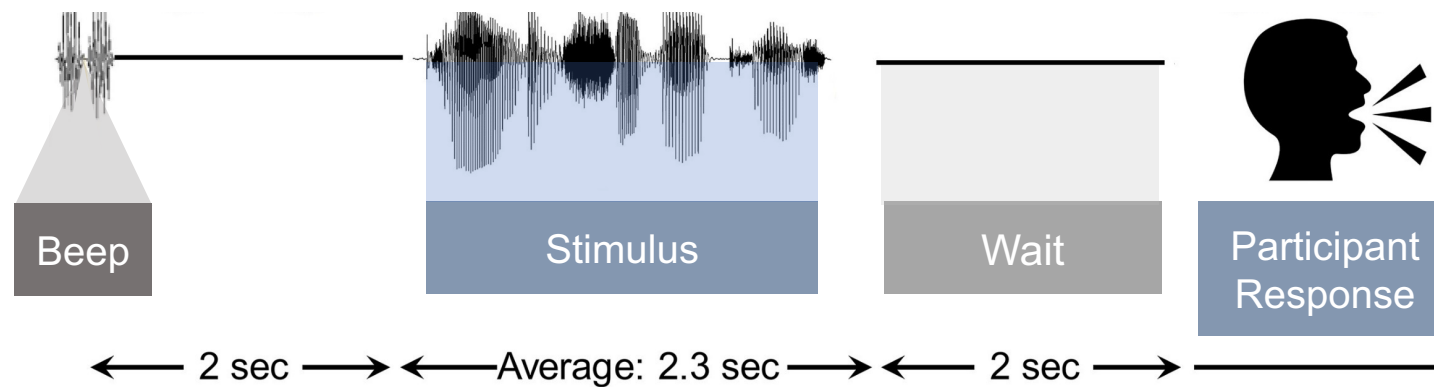
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Making your figures accessible

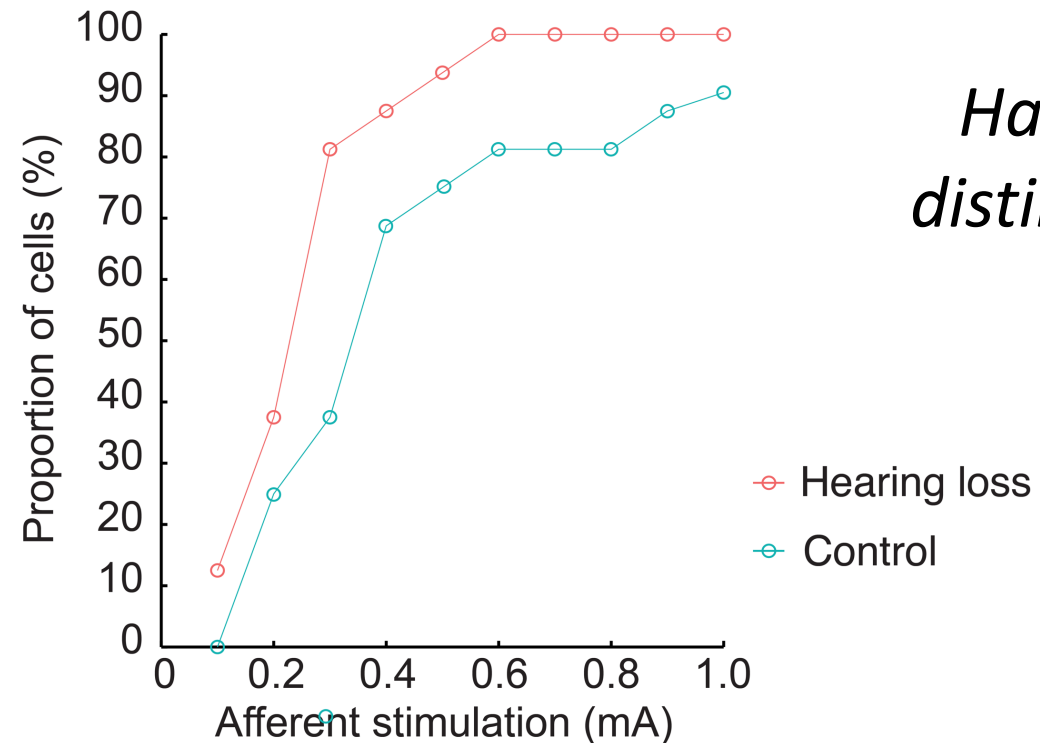
Tip 1: **Be redundant** in how you present information

Use **different
line textures or
shapes** for each
condition/group

Making your figures accessible

Tip 1: Be redundant in how you present information

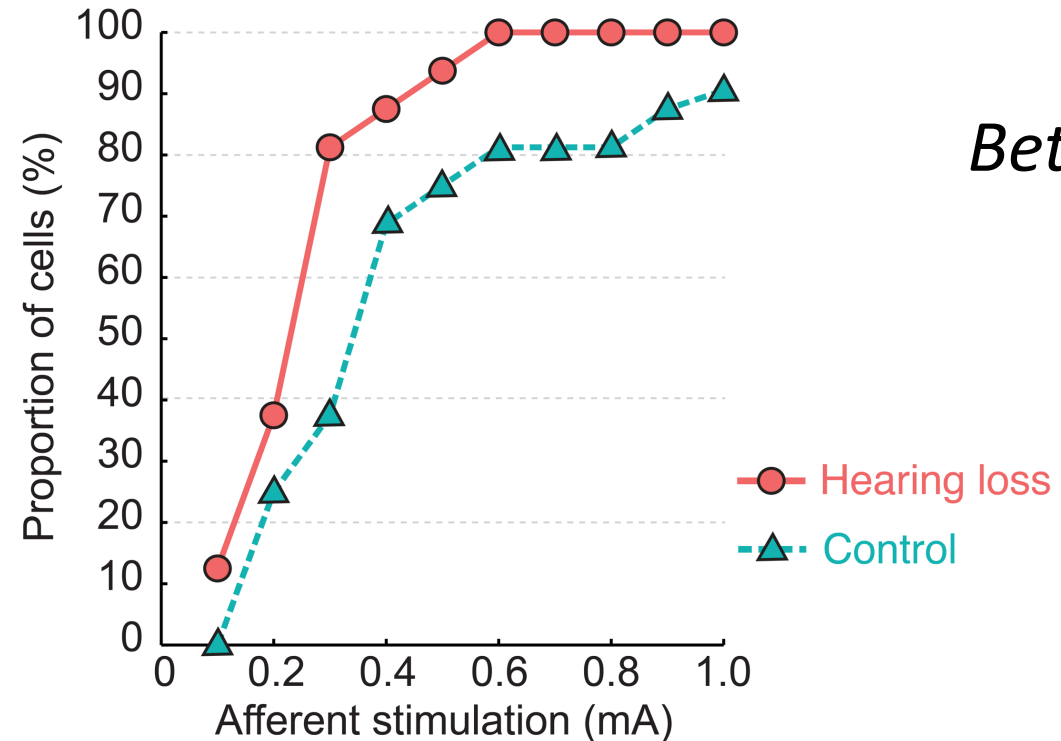
Use **different line textures or shapes** for each condition/group



Making your figures accessible

Tip 1: **Be redundant** in how you present information

Use **different line textures or shapes** for each condition/group

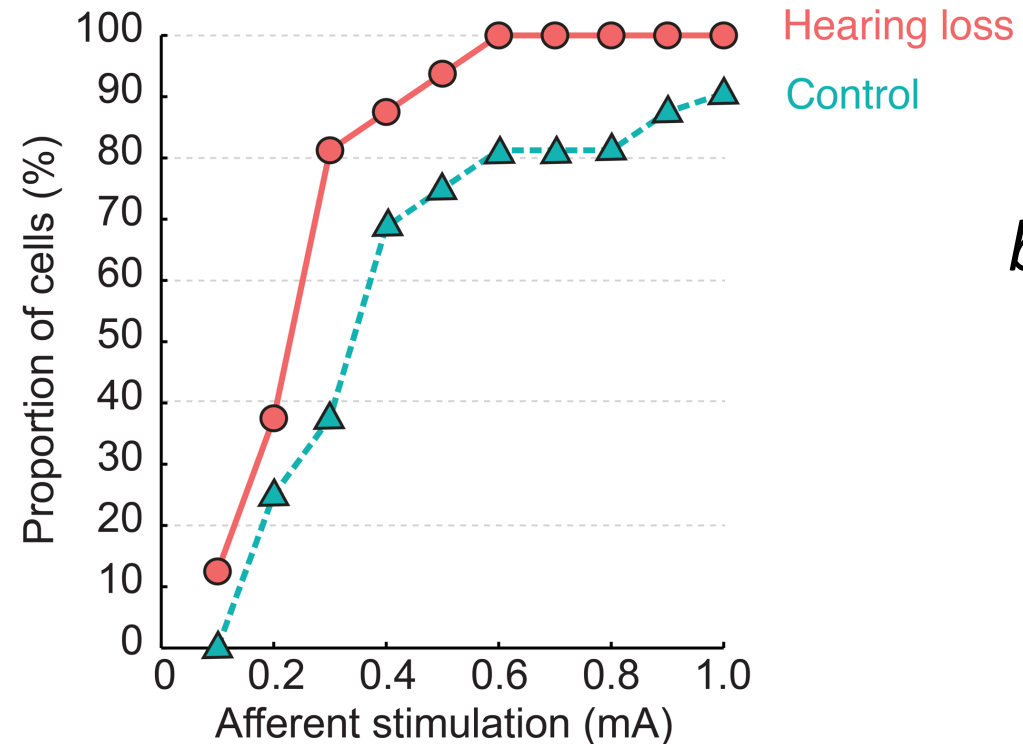


Better!

Making your figures accessible

Tip 1: Be redundant in how you present information

Use **different line textures or shapes** for each condition/group



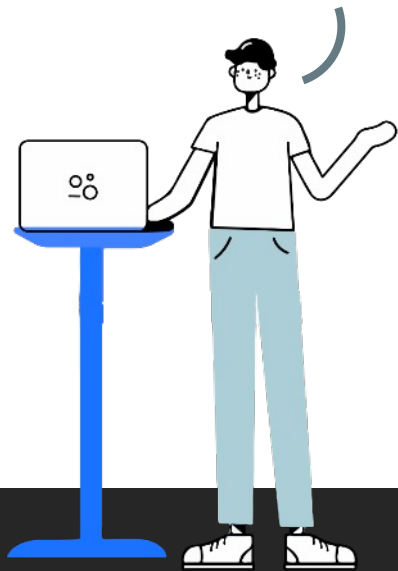
Even better!

Making your figures accessible

Tip 2: **Slow down** and **pause** after important points

Allows for **time to process** what you are saying

I recorded auditory brainstem responses to see whether there were changes to thresholds...

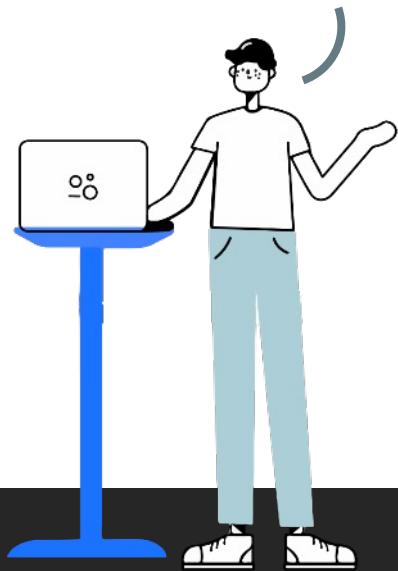


Making your figures accessible

Tip 2: **Slow down** and **pause** after important points

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I recorded auditory brainstem responses [pause]



Making your figures accessible

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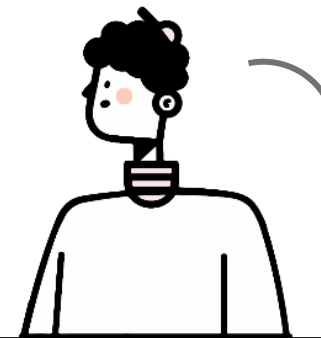
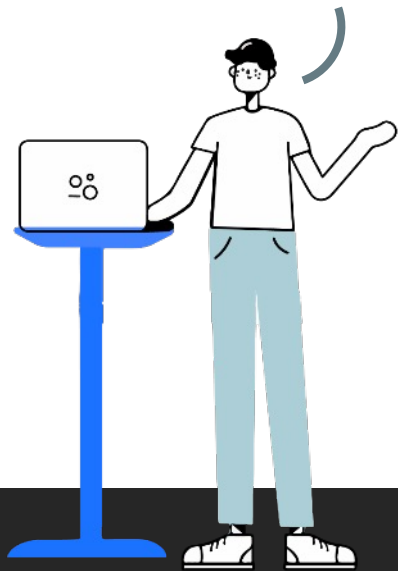
Allows for **time to process** what you are saying

I recorded auditory brainstem responses [pause]

...to see whether there were changes to thresholds

[pause]

Got it 😊



Making your figures accessible

Tip 2: **Slow down** and **pause** after important points

Allows for **time to process** what you are saying

Allows for automatic captioning to *align with what you're saying*

Making your figures accessible

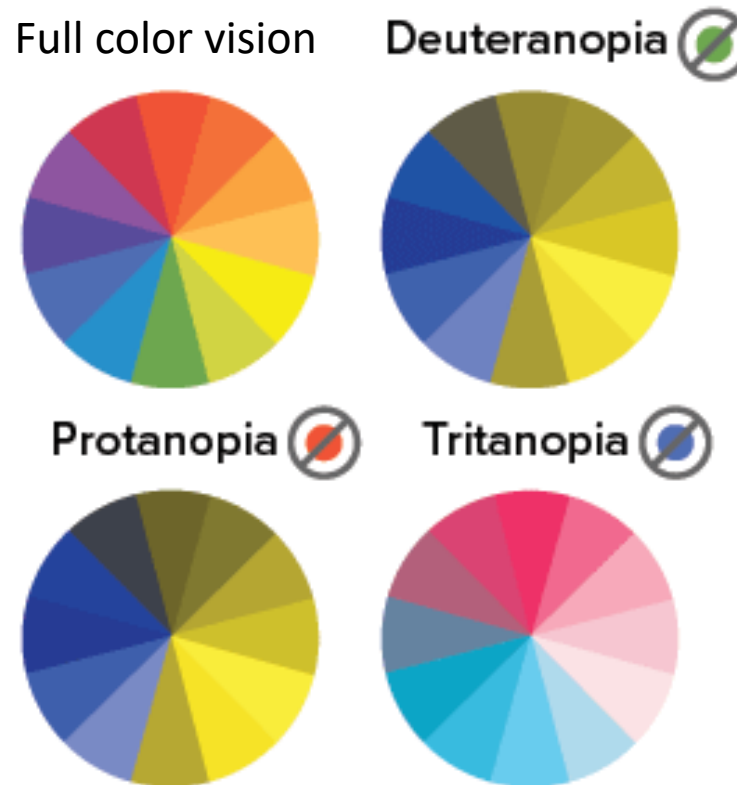
Tip 3: Choose your **color palettes** carefully

*Different types of
colorblindness*

Making your figures accessible

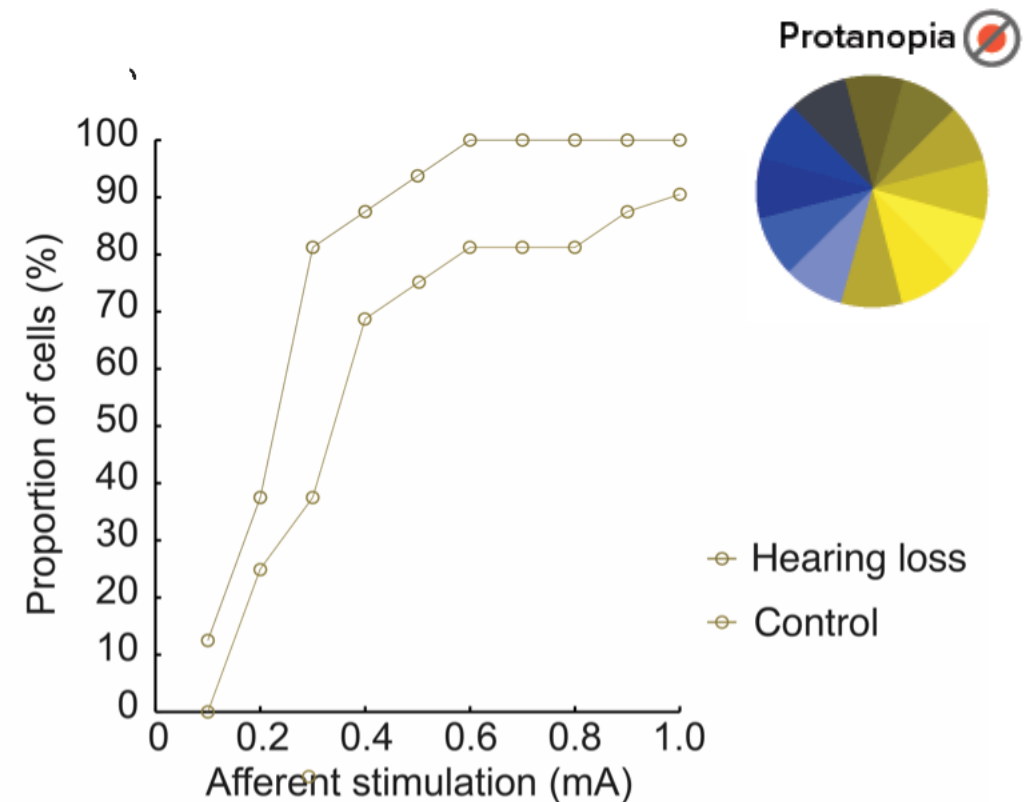
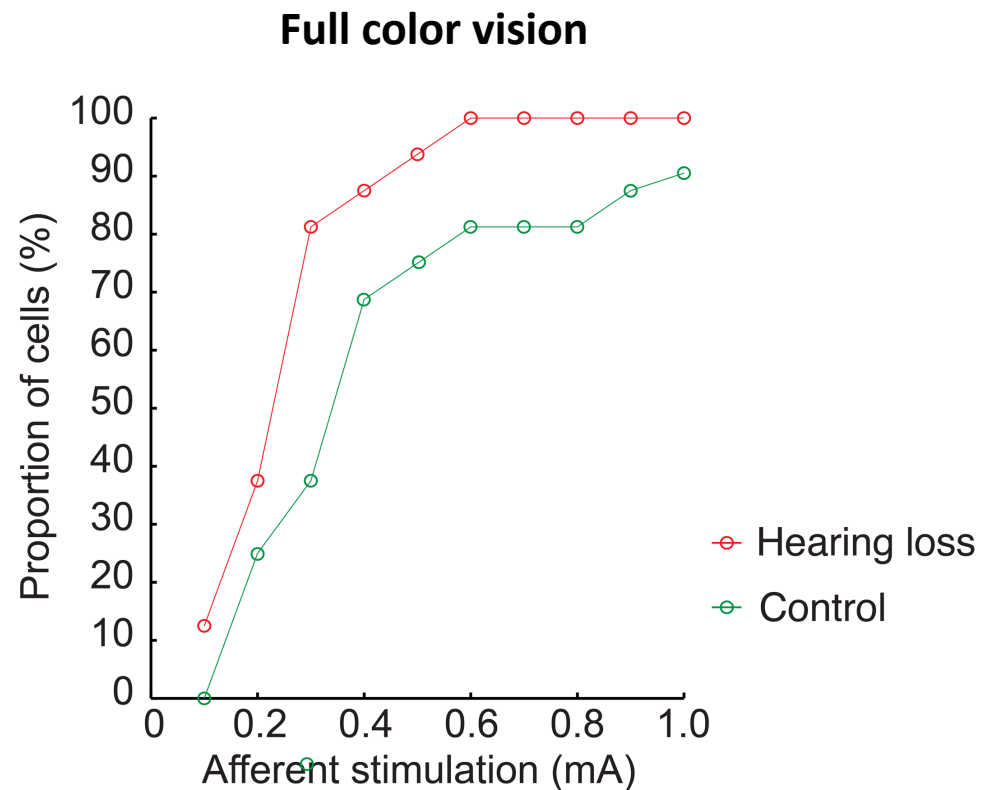
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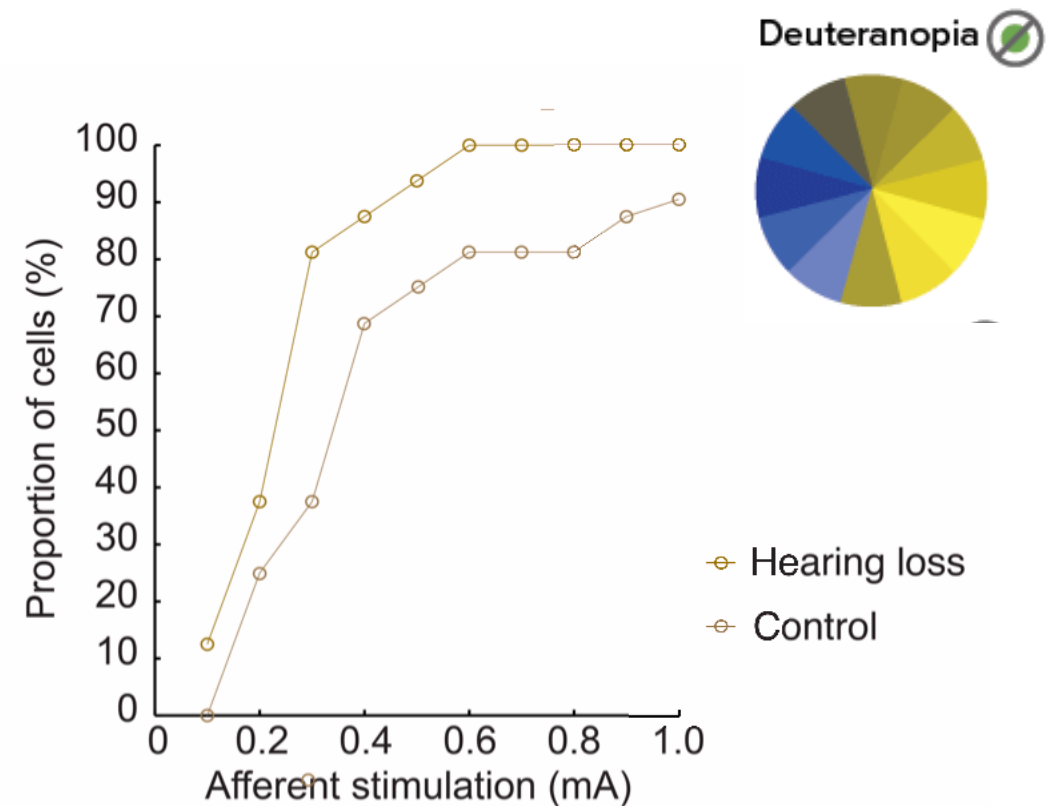
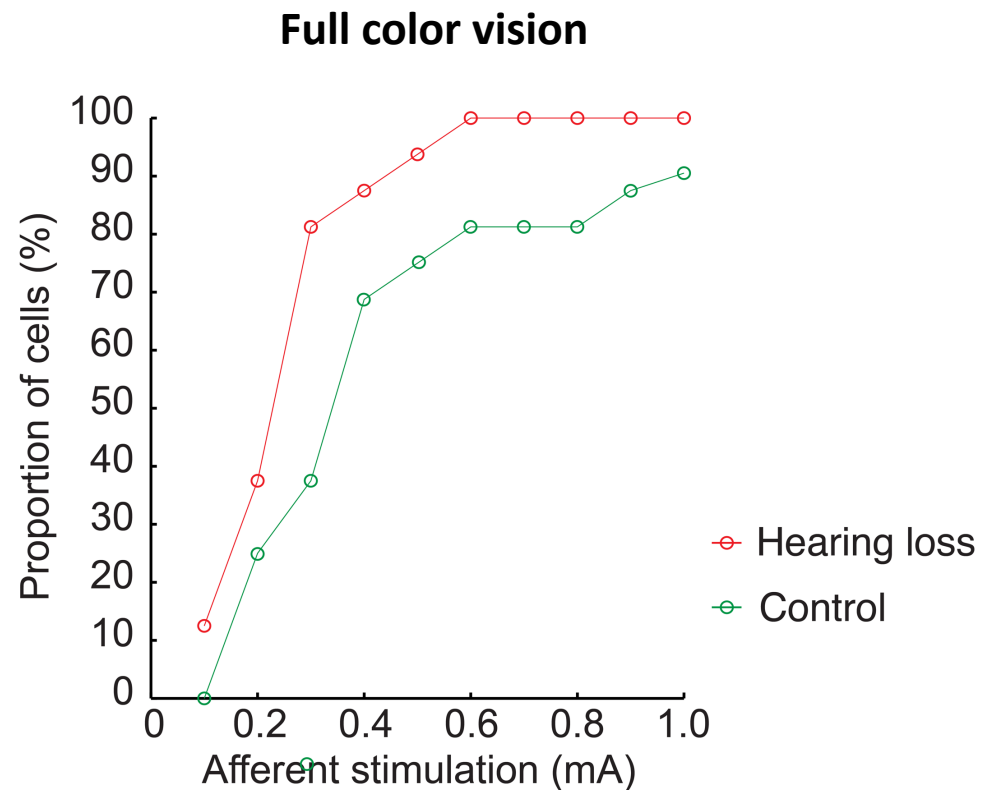
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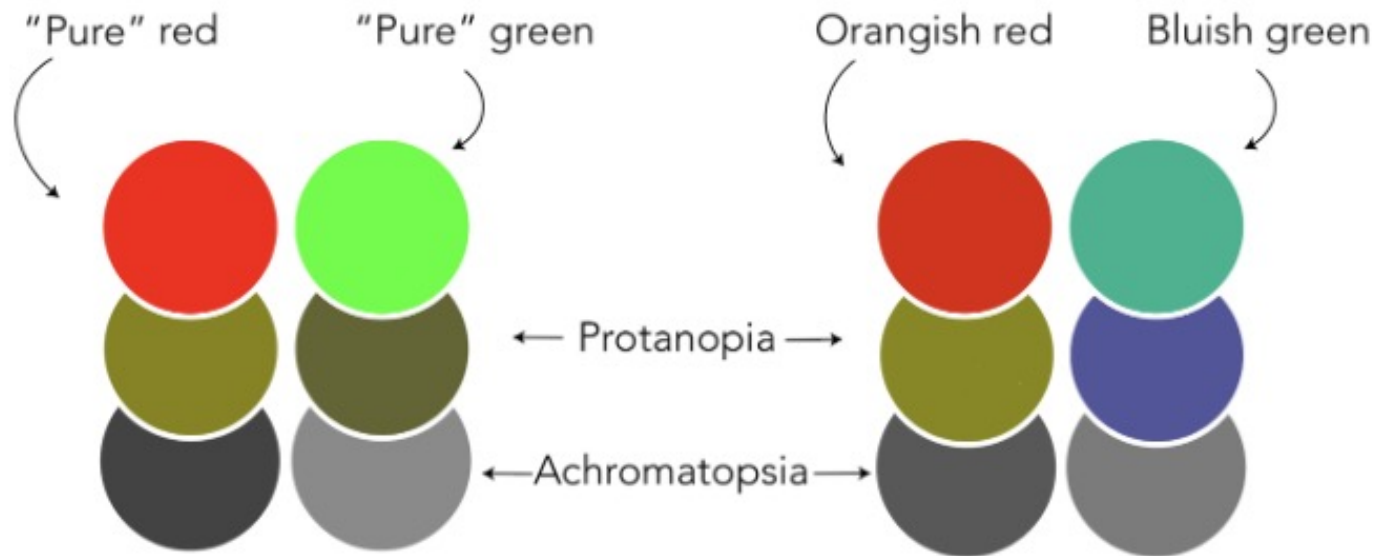
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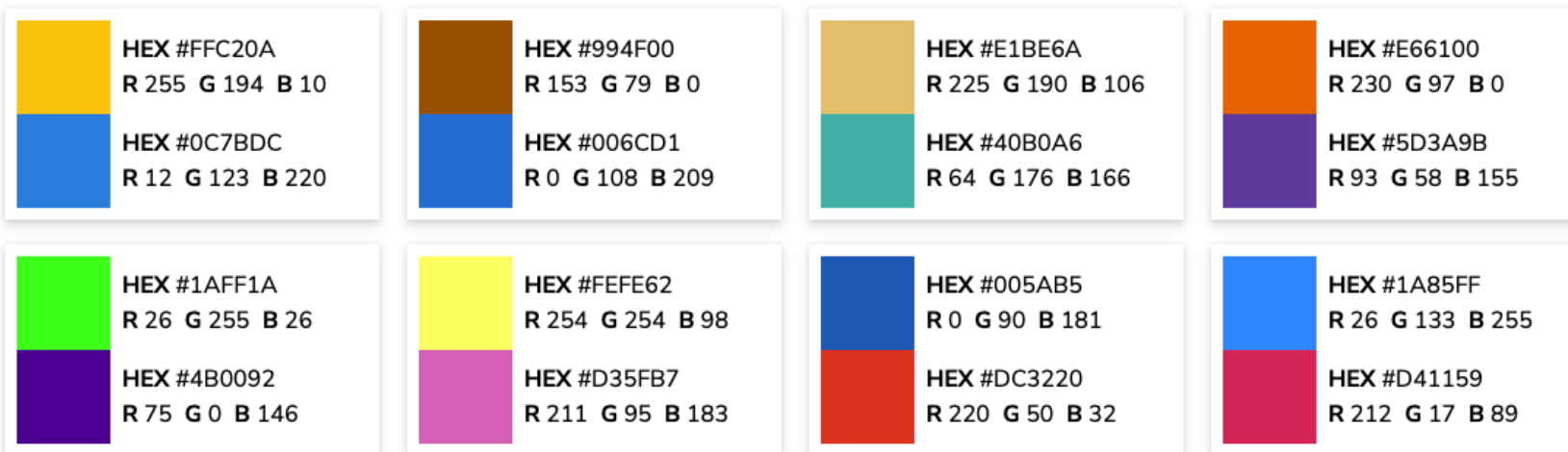
Small changes to the color go a long way!



Making your figures accessible

Tip 3: Choose your **color palettes** carefully

Examples of accessible palettes



Making your figures accessible

Tip 3: Choose your **color palettes** carefully

There are many great **online tools**!

Making your figures accessible

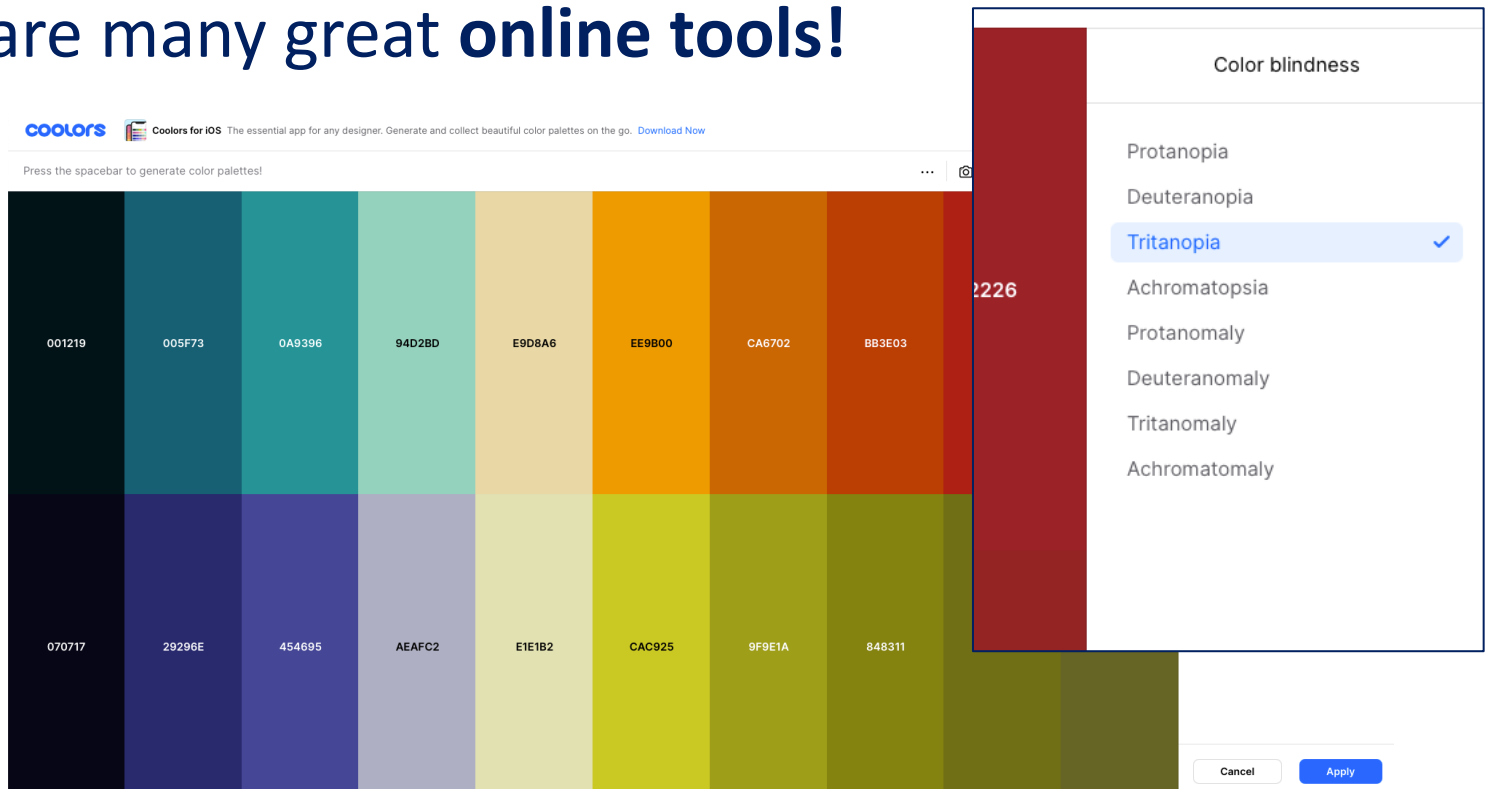
Tip 3: Choose your **color palettes** carefully

There are many great **online tools!**

Coolers.co

Create your own
color palettes

View them through
different colorblind filters



Making your figures accessible

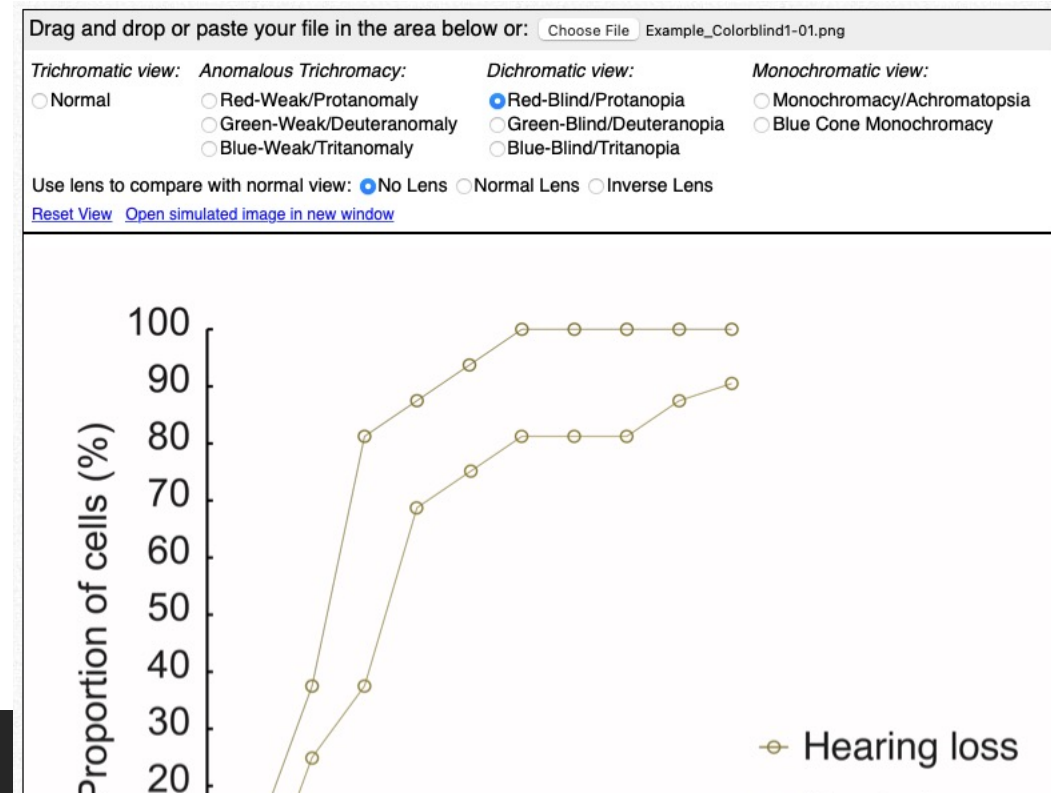
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Coblis- Color Blindness Simulator

Upload existing figure

View it through
different colorblind filters



Making your figures accessible

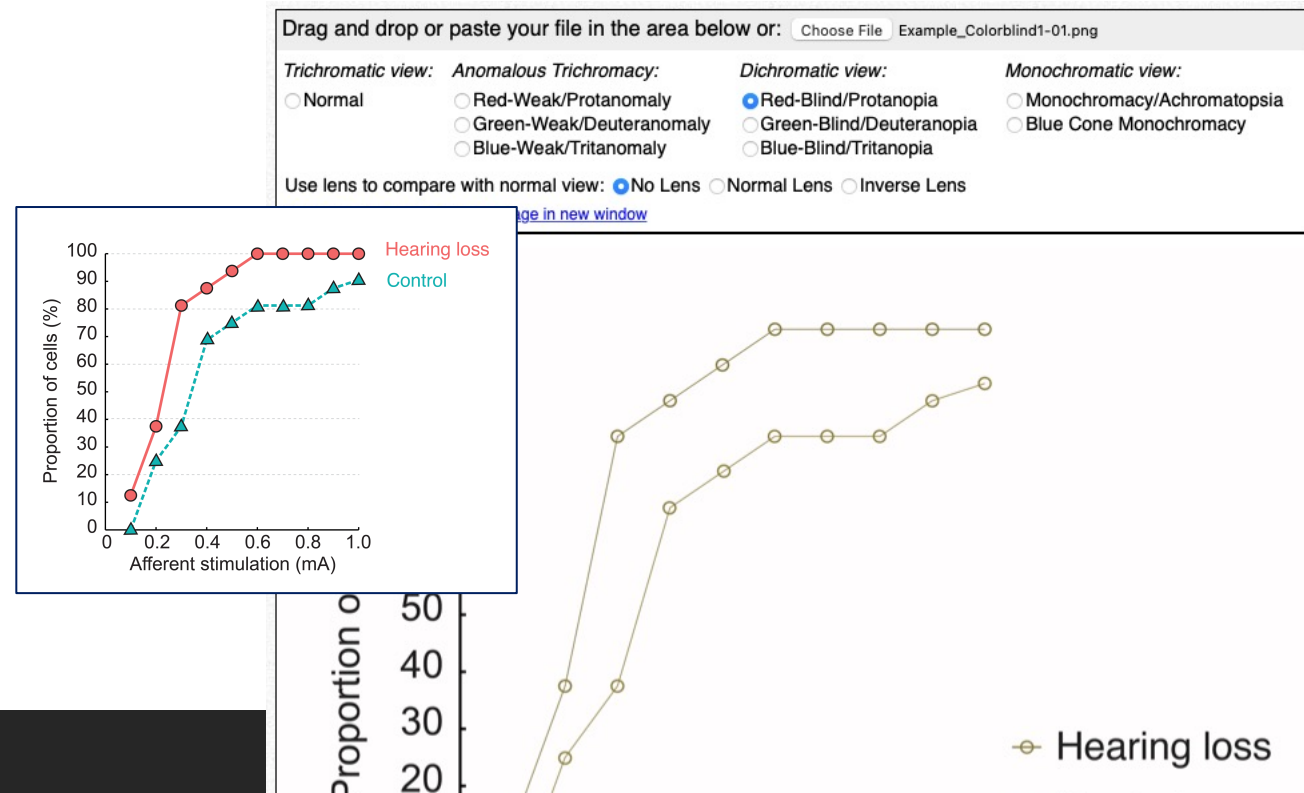
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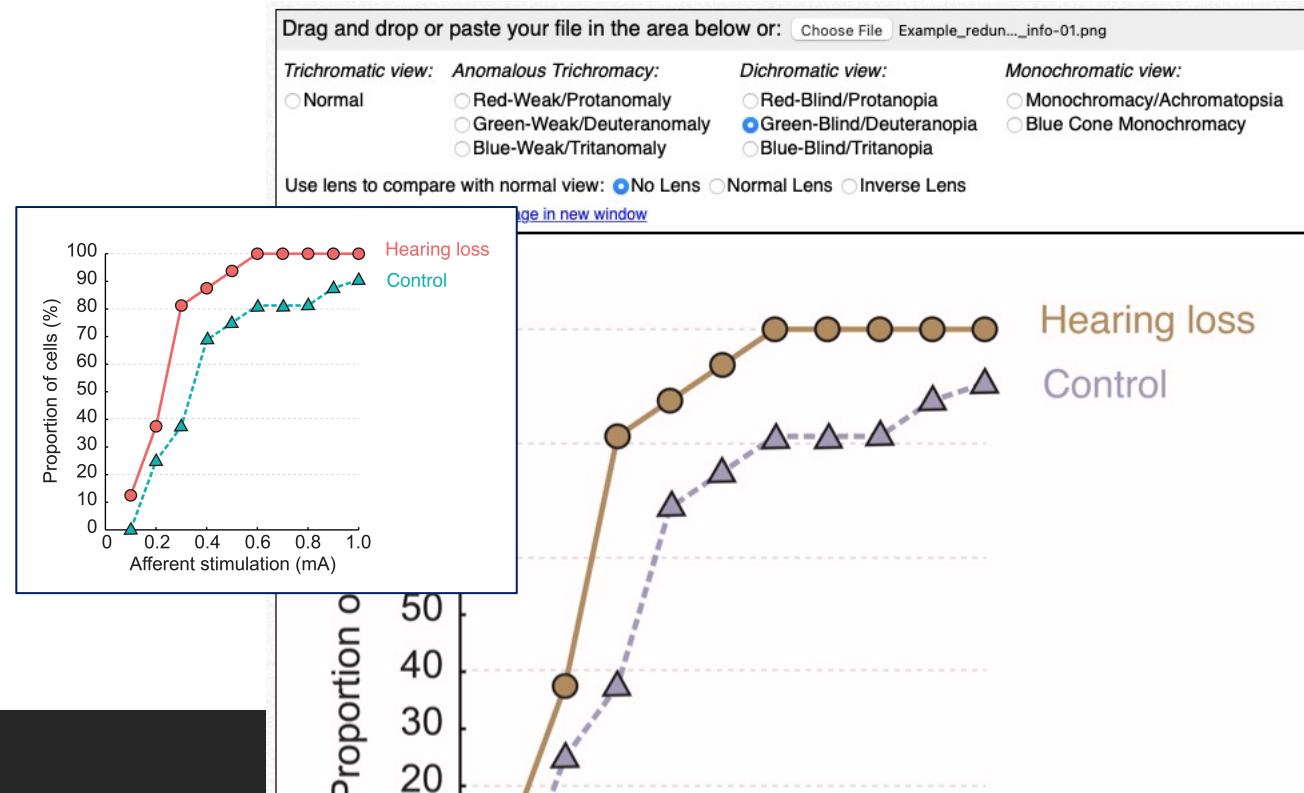
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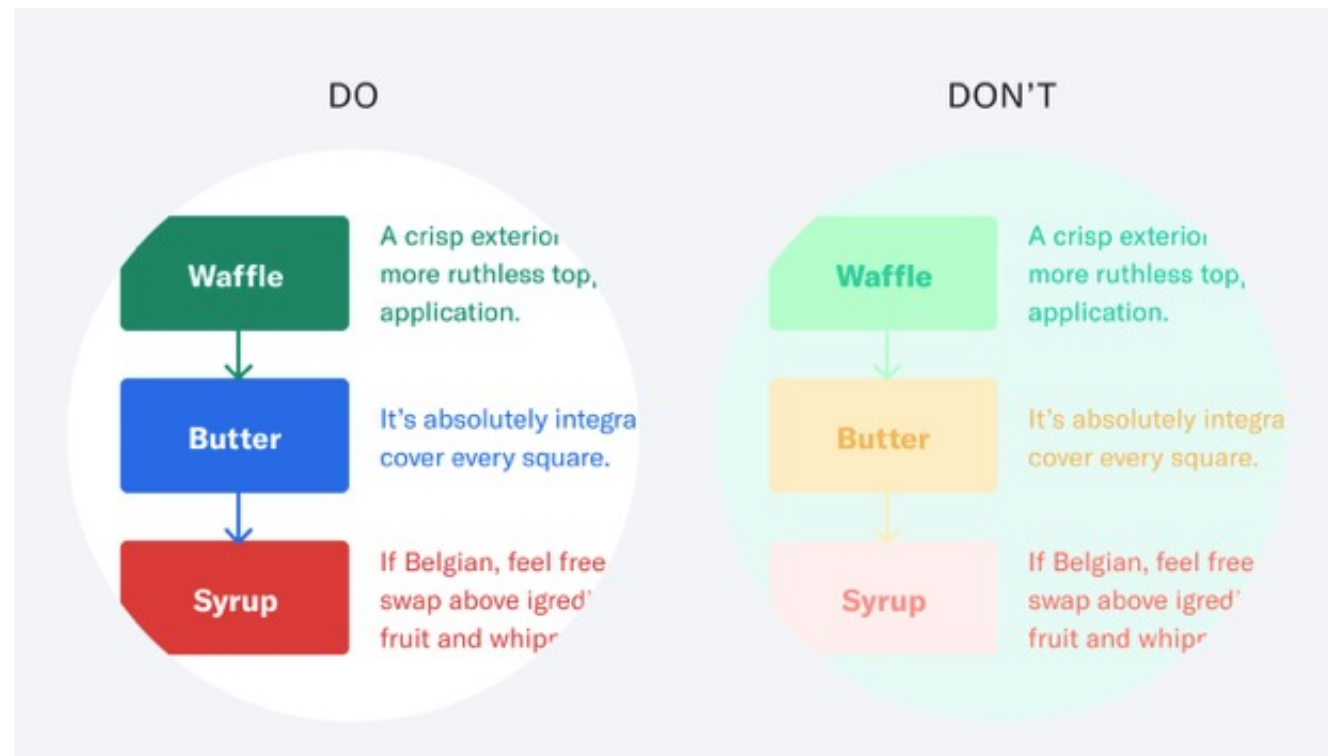


Making your figures accessible

Tip 4: Incorporate **high contrast** elements

Making your figures accessible

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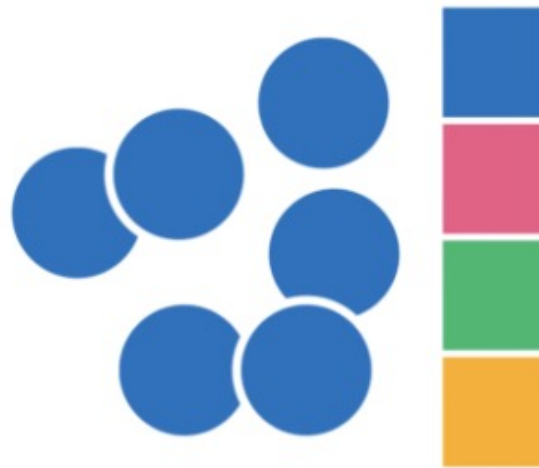
Making your figures accessible

Tip 4: Incorporate **high contrast** elements

Increase contrast by
adding a white border

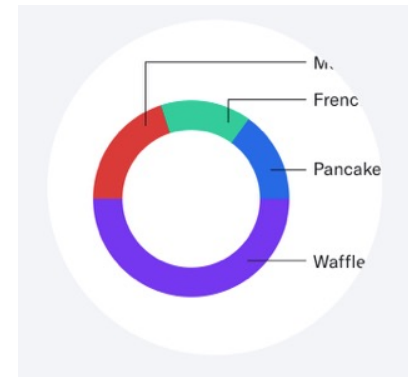


Without a border

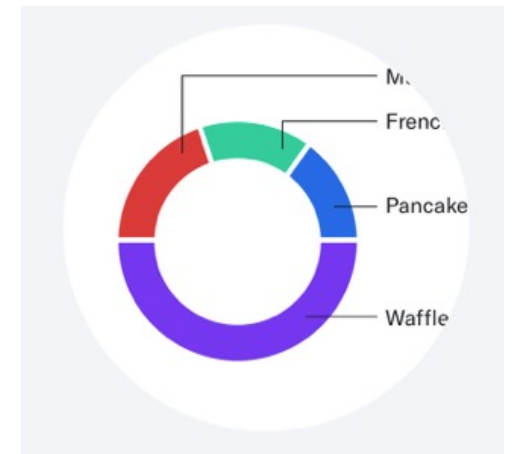


With a border

Without a border



With a border



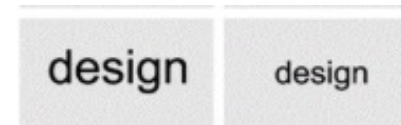
Making your figures accessible

Tip 5: Increase clarity of text and data

Aim for:

- Larger text and data points

Original text



Reduced visual clarity



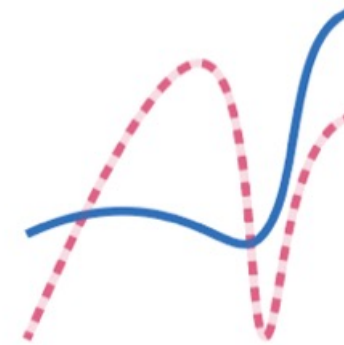
↑
*Larger text =
easier to see*

Making your figures accessible

Tip 5: Increase clarity of text and data

Aim for:

- Larger text and data points
- Use distinctive data point shapes



With line texture



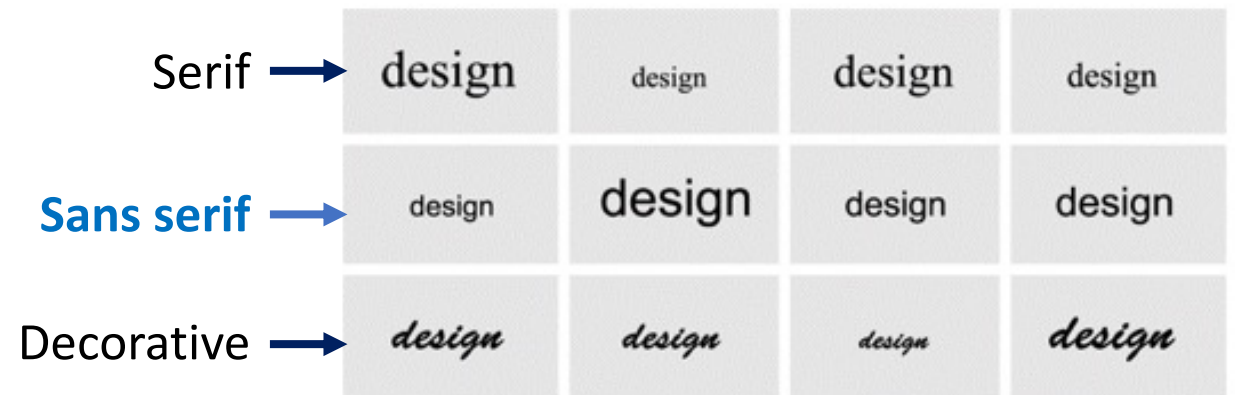
With shape variability

Making your figures accessible

Tip 5: Increase clarity of text and data

Aim for:

- Larger text and data points
- Use distinctive data point shapes
- Use sans serif font



Making your figures accessible

Tip 5: Increase clarity of text and data

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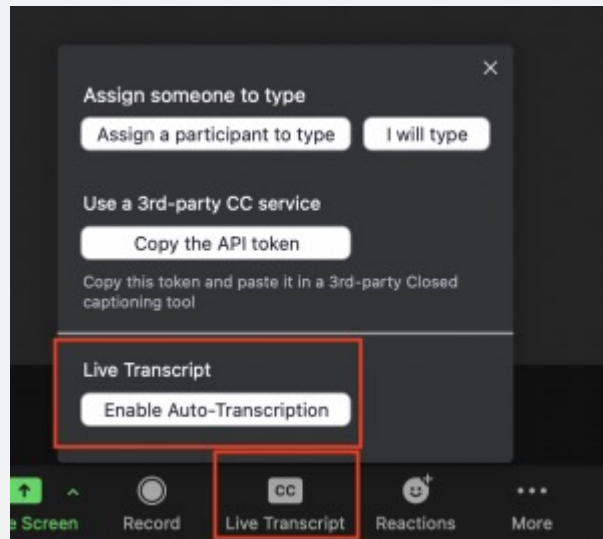
Reduced visual clarity



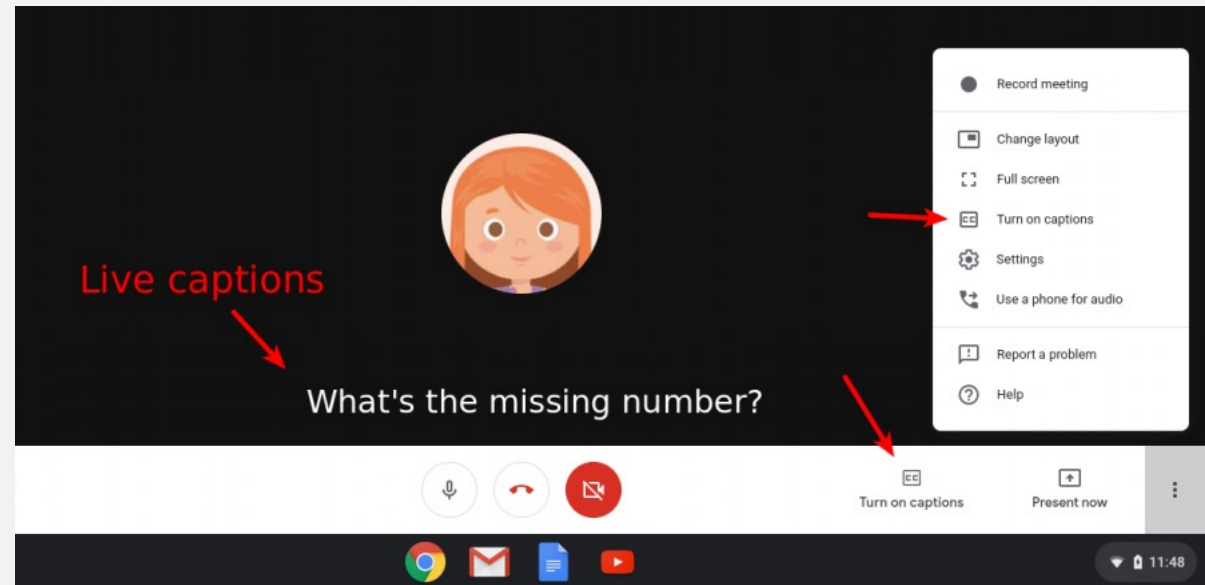
Things to keep in mind for presenting virtually

1. Make sure **automatic captioning** is enabled

Zoom



Google Meet



Things to keep in mind for presenting virtually

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2. **Clear view** of your face



Things to keep in mind for presenting virtually

1. Make sure **automatic captioning** is enabled
2. **Clear view** of your face
3. Make sure your **audio has good quality**
4. Use the **chat feature** to ask / answer questions (if needed)

Things to keep in mind for in-person ARO



Things to keep in mind for in-person ARO

Communicating in **noisy conference rooms**
with masks will be **hard!**



Things to keep in mind for in-person ARO

Communicating in **noisy conference rooms**
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Tips to make it **easier:**



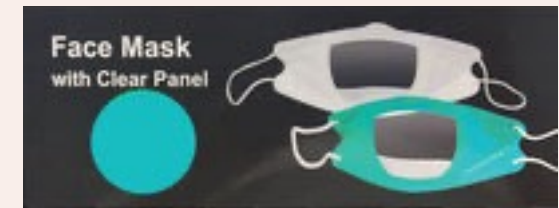
Things to keep in mind for in-person ARO

Communicating in **noisy conference rooms**
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Tips to make it **easier:**

1. Wear a clear mask

*ARO will provide **1 free mask** at check-in*



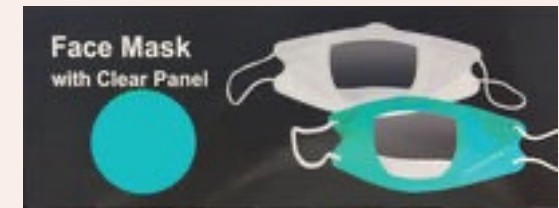
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Other vendors:

Safe n'Clear

<https://safenclear.com/>

FaceView Mask

<https://faceviewmask.com/>



Things to keep in mind for in-person ARO

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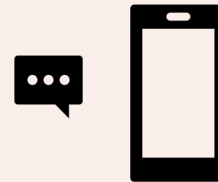
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2. Download automatic captioning apps

Otter, Google Live Transcribe



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Communicating in **noisy conference rooms**
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Tips to make it **easier:**

1. Wear a clear mask

*ARO will provide **1 free mask** at check-in*

3. Bring notepad and pen

Write down your question(s)!

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