Design Tips For Scientific Figures

This guide is intended to provide a quick reference and thought process for researchers designing their own scientific figures. It is by no means an exhaustive or complete resource. Need help creating figures for grant proposals? Contact the Strategic Proposal Development Service team at **spds@missouri.edu**.

1. Know your audience and clarify your message

Knowing your target audience is the first step to designing a good scientific figure. It is also helpful to think about how your audience may view your figure. Figures should be accessible, legible, and understandable for any viewing mode.

>An NSF Program Officer prints grant applications to review on the plane while traveling to a conference. He has color blindness, so he always prints proposals in black and white.

>A journal editor reviews submissions on her iPad while watching her child at soccer practice.

>A student reviews PowerPoint slides while studying for a test. The TA was talking a little fast during the review session, so she's glad the figure is well-labeled on the slide.

Clarifying the purpose of your figure will make your message stronger. Trying to say too much in one figure is more likely to confuse your audience. Consider splitting content into multiple figures.

2. Simplify and declutter

The composition of your figure, or how the elements are placed on the page, can help guide your audience through your message. When there are too many elements or they are not laid out well, the message can be lost.

Look for ways to remove unnecessary elements that can distract the viewer's eye. Focus on the essentials; remember, making sure your message is received is more important than creating a flashy or fancy graphic.

3. Use color purposefully, or not at all

Color in graphics should be used with intention, to create emphasis or clarity, or not used at all. It is helpful to ask yourself WHY you want to use color in a figure: to highlight important information? To create contrast? To set the tone? If you don't have a good reason beyond adding something colorful to your paper, it may be best to create a grayscale figure.

4. Treat text with care

Type has the largest impact on readability and overall clarity of your figure message. Creating a functional text hierarchy (through smart font choices for headings, subheadings, labels, etc.) will guide your reader through the figure. Edit your text to be as succinct as possible. Use "action captions" and active voice. If possible, place labels near the object they are describing rather than creating a separate key.

Left justification of blocks of text is less work for the reader to interpret. Align text and labels where possible. Avoid hyphenation. Sans serif fonts are more legible at smaller font sizes; most grantors and journals will accept the Arial typeface, so that is a good default.

5. Accessible figures are the gold standard

Text size and colors should be chosen to make your figures accessible to all. Type smaller than 7 point will not be legible for most audiences when viewed at 100%. Avoid red/green color combinations, as they will not be accessible to color blind viewers. Ensure all text and figure elements have good contrast from their backgrounds.