VIEWPOINTS

Scientific Posters: A Plea from a Conference Attendee

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Submitted December 16, 2016; accepted December 20, 2016; published December 25, 2016.

Conferences provide lots of opportunities to learn and poster sessions are supposed to be one of these venues. However, it seems most posters are not designed considering the reader or the venue; they are designed to reflect a potential manuscript. In this commentary, I provide a rationale why posters should be an illustrated abstract and provide some design tips to make the poster more reader friendly based on available research.

Keywords: posters, writing, presentation skills, communication skills, professional development

I have been to numerous conferences for a variety of disciplines: pharmacy, pharmacy education, higher education, sports medicine, and psychology. I have viewed a plethora of posters as a conference attendee and as the person who prints them for my school. My master's degree adviser taught me how to make posters. She said to do it her way until you get out on your own and figure out a better way. Maybe I have found a better way, or maybe I found one that is more evidence-based, or maybe this is still her way and I just rediscovered it.

First, we need to review the purpose of the scientific poster. The main purpose is to visually communicate research findings to a group of individuals with similar interests and to promote networking.¹ For the presenter, posters facilitate meaningful discussion among conference attendees.² For the conference organizers, posters make an efficient use of time and space for information exchange.² For the attendee, the purpose is to peruse the latest research and quickly grasp essential information. As such, posters are supposed to efficiently and effectively communicate recent research, highlighting the main findings. However, I challenge that idea as many posters do not allow the attendee to grasp the essentials quickly, and many times turn away visitors because they seem more like a large-font manuscript when they probably should look more like an illustrated abstract.³

People format posters like mini-manuscripts. I am not sure why, but maybe it is simply the scientific way of writing. Some individuals design posters because they

feel it helps turn posters into manuscripts.⁴ However, let us be honest: only a small fraction of posters get transformed into manuscripts – the majority end up as abstracts in the conference proceedings. Conferences have many posters for attendees to view. However, in the day and age of Twitter, when a 140-character tweet can literally end up on the world news, posters need to be more effective in communicating their findings. Research indicates that a viewer takes a strategic approach to acquiring visual information and fixates on those regions of their visual field where they perceive the most relevant information. Research also has provided some guidance on what the comfortable visual viewing area is. Poster makers also suggest keeping the 10-10 rule in mind, that is, attendees spend 10 seconds scanning a poster as they walk by from 10 feet away.⁵ If these are truths or even close to being truthful, I think many presenters are failing to address these conditions when creating their posters.

Let us start with the big picture item: the poster's message. The most common mistake of posters is overcommunication; posters are intended to convey the main message, not be a manuscript. The first step in creating a poster is deciding the message you want to share. This message should be conveyed in the title. Titles should be short and under 10 words. The title should tell the viewer something about the study in an alluring way and should be results-oriented. Once the presenter has a title that gets the message across, the rest of the poster should support that message through its content and presentation.

First, I will borrow some evidence from advertising and psychology. Contrasting colors, pictures, and faces visually lure the eye. Imagine an individual walking by the poster and they have 10 seconds or less to either learn something or decide on whether they want to read more or talk to the presenter. Their eyes quickly scan for visual

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information that seems important. They start at the top of the poster with the title, then track to the upper left corner. They then scan the rest of the poster for pictures, color or contrast; they will make a quick decision about whether or not they are interested. This will be based on if the poster conveys information they are interested in and whether the poster is legible.⁶ If people are looking to the upper left when they start scanning, the most important information should be there, and the most important information is the conclusions – what did you find and how may it impact the reader? Instead of conclusions, I will call these the “bottom line up front” points. These should be bullet points, short phrases emphasizing two or three main take-home points. Precision is key. We can read with fluency at 80 words per minute, which is a little over one word per second.⁷ If it takes 10 seconds to walk by a poster, the individual can read about 13 words – 10 from the title and the remainder from other places such as the “bottom line up front” points. So, be concise, and highlight the major take-home message. Do not put the conclusion at the bottom right; it is uncomfortable to view it from a standing position, and the viewer is usually trying to read between the other attendees walking by. The conference attendee will thank you for putting conclusions “front and center,” which is at the upper left.

After a viewer's eyes track to the title and the upper left, they will look for things that are important, such as photos, figures, or graphs. In poster speak, this is the results section. Use figures when possible with clear axis titles and legends. Tables also will draw the eye, as the viewer's eyes may track to text in table form more than in paragraph form.⁸ Importantly, add what the figure or data means near if not embedded in the figure. This recommendation is congruent with the spatial contiguity principle of multimedia learning, which states that humans learn more when the explanatory text of the figure is integrated with the visual information. The presenter also can use the cueing or signaling principles to highlight the important aspects of the data – usually this in the form of bolding, highlighting, or asterisks. Avoid images that are purely for decorative purposes; they are a distraction. If the presenter wants to “up” their game, they should make infographics, not logos, to express the results or even to describe their methods. For methods, these images could include flow charts or graphics. Remember, you do not need to include the details of the research methods used, just the basics – this is not a manuscript. Most of all, remember the KISS principles when it comes to design: Keep it simple, stupid. Do not add shadows or other elements that might complicate the image. Make sure your poster has sufficient white space, too. Now that your message is clear, let us make sure the text is clear, remembering that attendees will be walking toward your poster. You

need to lure them to within 10 feet of the poster, so make the title and all of the text legible.

I will borrow from the literature on sign making and designing classrooms to talk about text size but will not go into the math. Bottom line, there is a metric called the *legibility index*, and there are some standards for this value. Accordingly, you need a font size of at least 72 points for the text to be legible from 10 feet away; I use 80-point font. For primary text, I use 40 points, which is legible from 5 feet. People are not necessarily going to read the details of the poster from 10 feet away, and from 3 to 5 feet is considered a reasonable reading distance. I also use 50-point type for headers so that they stand out from the text. Moreover, for text, I use sans serif texts (eg, Arial) because they seem easier to read than serif fonts.^{9,10}

Finally, let us talk about the size of the poster. From 5 feet, a person can comfortably view or read 4 feet up and down and about 4.5 feet left to right based the visual sight angles without moving our head (20 degrees left and right, 25 up and 35 down).¹¹ Also, there are common proportions we often see, such as a 5x7-inch photo. With the various mathematical assumptions about angles and shapes we are comfortable viewing, posters should be around 42 inches tall and 56 inches wide; alternatively, 36x56 inches would provide an aspect ratio of 16:9, a size which is the dimension of most new television screens. Moreover, although the poster can be 56 inches wide, the text should not span the entire length of the poster, except the title, authors, and institutions. There is a reason why newspapers have columns; reading long distance left to right is not comfortable. Once you have a general size, then comes the rest of the poster details. The overall language of the poster should be a conversational style and not formal. This form increases the coherency of the poster. Use bullet points instead of paragraph text – bullet points make for faster reading than paragraph text. Write using the active voice and plain language, avoid jargon and acronyms, and use consistent wording and coloring, especially between text and visuals. Simplify language, reduce sentence complexity, and eliminate extraneous details.

Posters are a staple at most conferences. The format will change over time – it went from construction paper to rolled paper and now to fabric within 20 years. One day soon posters might all be presented electronically, but the purpose is the same – communicate your message efficiently and effectively. Be bold, and do not keep making the same old style of poster. Communication requires that participants make their words maximally understandable given the context of a poster session – lots of people, plenty of posters, and individuals who, if they want details, will ask the person presenting the poster. The rest of us want the big take-home points.

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