Scientific Poster Design

These opinions about poster design have been developed after years of assisting large organizations with both printed and electronic posters. They are not intended for art school, but for the poster hall.

The Purpose of the Poster

A printed poster should accomplish several things.

1. First and foremost, initiate communication — **get people talking.**

   a. Between the author and others in the field.

   b. Between more senior and more junior researchers (regardless of who is presenting the poster).

      1. Experienced presenters are often the **ambassadors** for the field.

2. Make clear the **subject matter** of the poster.

3. Make clear the **results** of the research or study.

   a. **Visual** representation is often better than text.

      i. Charts, graphs, and tables should be easy to understand at a glance.

      ii. If one or a couple graphic elements clearly summarize the presentation, **make them big.**

4. Provide a means to contact the author or get more information. (Note: show administration might have QR code or other electronic mechanisms to see additional published material)

Design Considerations

Headers and Titles

1. The **poster header** need not be the same as the **study title**. You have two potential visitors.

   a. People who have reviewed the conference catalogue material have determined exactly which studies/authors they want to visit.

      i. People who do this expect to see the study title and/or author. If your poster header is different from the study title, be sure to include the study title at the very beginning of the text. The visitor can then confirm that this is the study of interest.

      ii. This group can include the more senior researchers and presenters who are more interested in substance than aesthetics.

   b. There are those who are walking around the poster hall and stopping at what catches their interest. For those people:

     i.   Try to make the poster header concise. Can they read it quickly and easily at walking speed?

     ii.   The longer the title, the less likely anyone will read it.

     iii.   Consider using an eye-catching and large graphic if your ability to change the header or make the header concise might be constrained by the research itself.

     v.   If the study title is long, and the conclusion can be made very concise, use the conclusion as the poster header, and include the study title at the beginning of the explanatory text.

2. If you have multiple, similar studies to present, try to make the posters easily distinguishable.

   a.   "blah blah blah blah blah blah in women" vs
      "blah blah blah blah blah blah in men"
      Both might be too long to read easily … and until you get to the last word, you can't tell the difference between them (this is a big problem when printing and labeling posters).

   b.   Change the color scheme for the similar but distinct studies.

   c.   Please, note: some of these comments are about poster design, not experimental design. If the title is what you should be using from a research point of view, use it as it is.

3. Don't change the study title.

   a.   For many events, the study title is "locked in" once you have submitted the research for presentation. Changing the title printed on the poster can cause confusion with the title that is used by the organization and for subsequent publishing.

   b.   If you truncate or rephrase the research title for a header or Callout on the poster, **put the full, original title in the poster as well** (first line(s) of the left column). Otherwise there can be confusion about the title of the research in the organization database versus the title on the poster. And again, the study title and the poster header might be different.

Templates

1. Make sure you have permission — **obey copyright law!**

   a.   If you use a template supplied by PowerPoint, and you have a legal copy of PowerPoint, you can use it for whatever you want. You own it.

   b.   You can choose a template from the ScientificPosters Web site and have your poster printed by us.

   c.   If you go to a poster printing Web site and use one of their templates for your poster, and then get the poster printed somewhere else, you might be violating copyright laws.

Use of Color

1. Choose a color scheme and stick to it. You normally will be using three colors: a background color, a text color, and an accent color (for subtitles, call outs, etc.).

   a. An exception to this is the need to use multiple colors with charts and graphs.

2. Make sure the text and accent colors are very different from the background color. For example, black text on a dark blue background is unreadable.

Typographic Considerations

1. The biggest quality issue associated with printing is font substitution.

   a. It is impossible to tell whether a PowerPoint document was made on a Windows computer or a Macintosh computer. If you open a PowerPoint file on a Mac that was made on a Windows box, or vice versa, there can be problems with spacing, text wraps and font substitutions (please, complain to Microsoft).

      i. The special characters on a Mac do not map to the same special characters in Windows. Greek and Math characters (γ ϕ Δ $\sqrt{}$) aren't always the same in Windows and Mac (depending on how you create them). **We cannot tell if there has been a substitution** (please, complain to Microsoft).

      ii. Versions of fonts on Windows and Mac can differ. Helvetica can turn into gibbersish when a file is moved from one to the other platform. The name of the font you see it in the menu hasn't changed.

      iii. Helvetica (T1 PostScript), Helvetica (True Type) and Helvetica (OpenType) are not the same thing and are not interchangeable.

   c. If you use a font in PowerPoint that we don't have, substitution can occur without warning (please, complain to Microsoft). If that occurs in one subtitle in one small text block, we might not see it.

   d. **THE SOLUTION TO FONT ISSUES IS TO SEND YOUR DOCUMENT AS AN ACROBAT® FILE (*.PDF) !!!** Make sure that all fonts are included. Make sure the page size of the *.pdf reflects the page size of the poster.

      i. It is possible to make a *.pdf that is 11" X 8.5" with a lot of white space at the top and bottom for a 72" X 36". This can be avoided by choosing the correct size for the page in PowerPoint, and using the "save as" function or export function to make it a *.pdf. If you print to *.pdf, the file takes on the size of the paper chosen for printing.

      ii. **Look at the file**, preferrably on a machine different from the one on which you created it, before you send it.

2. Choose fonts that are easy to read. Helvetica (Arial) is one of the most readable fonts ever designed. This text is Helvetica Condensed, a san serif font that lends itself to narrower columns. This text is Times

ΣøπΔ√≤≥

These are all characters in the extended character set of most fonts.

∑ØΠΔ∨≦≧

These are from the "insert/insert symbol" menu of PowerPoint 16.26 on a Mac.

After the day is over

Above is the font Calibri in PowerPoint on a Mac.

Chgt"vj g"f c{ "ku"qxgt

Above is the font Helvetica in PowerPoint on a Mac (same exact phrase). Clearly, there is a font conflict which could be solved by closing conflicting fonts. However, if this is a small block of text or a single headline, it might be missed.

Roman, which has serifs (the little points at the ends of the letter forms). It is very readable in narrow columns of text, which is why it or fonts very much like it are used in newspapers. *This is Mistral. It is virtually unreadable in a paragraph of text – especially at a distance and when using multi-syllable words as in medical text.* Other fonts can be fun or cute (this is Curlz). Be sure that you want to be fun or cute. If you do use a decorative font, use it for a *word* or a TITLE — or even just a *L*etter — but not for paragraphs of text.

3. Column Width and justification:

   a. A good rule of thumb is that a column should be no more than two and one half alphabets wide (65 characters).

      i. If they are too wide, your eyes have trouble getting from the end of one line to the beginning of the next, which makes it more difficult to read.

      ii. If they are too narrow, especially if there are many multi-syllable words, either hyphenation will occur too often, or line length or word spacing will vary greatly.

   b. Justification (the left and right sides of a column of text align vertically) can be considered more visually appealing. However, if the column is too narrow, odd spacing or too much hyphenation will occur.

      Each condition makes the text less readable and the document less visually appealing.

Graphics

1. Consider making the poster more graphics intensive and less text intensive.

   a. A graph is always better than a table of numbers.

   b. A photograph is always better than a paragraph of description.

   b. Not all subject matter lends itself to graphics.

Charts, Graphs, and Tables

2. Charts and graphs copied to the clip board and pasted into PowerPoint retain a link. When the spread sheet is altered, the chart or graph in PowerPoint changes.

   a. Are you sure this is what you want? If you want the chart in the PowerPoint document to remain fixed at a particular file format or point in time, export it from Excel as *.png (right-click (Windows) or control-click (Mac) and save as)and insert it as a picture in PowerPoint.

   b. If the chart in PowerPoint is link to another file, and we don't have that file, we might have trouble printing it. Of course, if you **save your poster file as an Acrobat document**, this will not be a problem.

3. Save them in a vector format (*.png, *.eps).

This paragraph is intended to demonstrate problems with narrow columns and hyphenation, especially when complicated with medical text which might use terms like gastrointestinal or hypoglycemia.

(Too much hyphenation)

This paragraph is intended to demonstrate problems with justification, narrow columns and word spacing, especially when complicated by terms like gastrointestinal or hypoglycemia.
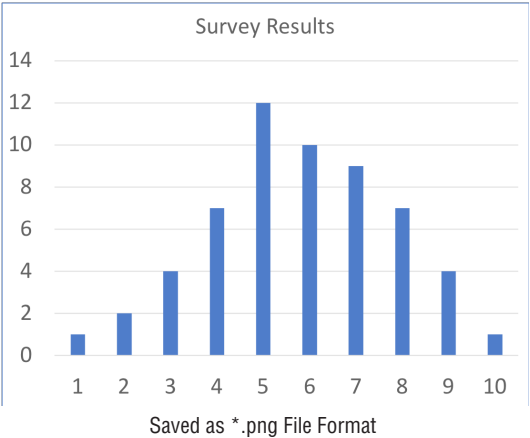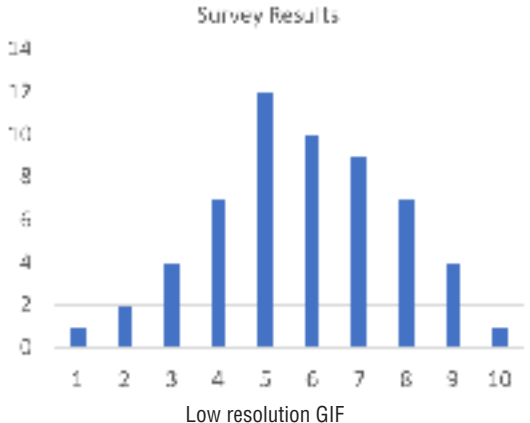
(odd word spacing)

Low resolution GIF

Saved as *.png File Format

a. Vector formats are resolution independent.

b. You can often edit the chart or graph in other programs (e.g., *.eps in Illustrator).

c. If you are making the chart or graph in something other than Excel, do not copy it to the clipboard and then paste it into PowerPoint. There is no telling what file format or resolution will be pasted. It is probable that you will be left with a screen-resolution image that is of too low a resolution to print.

Low resolution pixel-based file

Preparing Photographs or Pixel-Based Images

1. Make sure you have permission — **obey copyright law!**

    a. If you use a picture of Darth Vader® to represent a deadly virus on your poster, you are in violation of copyright law. If you then receive funding for your research after showing that picture of Darth Vader, and then create a multi-billion dollar drug, Lucasfilms can probably collect a few million dollars from you.

High resolution pixel-based file

    b. Ditto if you find an image on the Internet that you like — maybe a sunset to use as a background. Don't just copy it from the Web page and paste it into your poster. Somebody owns that image. Buy the rights to use a similar image from a stock photo house. It's not expensive (often less than $10).

2. Resolution should be high enough so that the photograph is **100 dots per inch (dpi) at the finished size**.

a. If you are using a PowerPoint page size that is half the size of the finished poster, you must place the photographs at 200 dpi.

b. If you place a 300 dpi image in PowerPoint, and then enlarge it 200%, it is now 150 dpi. If that PowerPoint document is at half scale, the photograph will be 75 dpi at the finished size. This image would be noticeably pixelated.

3. Color space considerations are different for wide-format, ink jet printers than for traditional offset printing.

    a. Red-Green-Blue (RGB) color space is additive projected color, like your computer screen or television. If you project green light and blue light, they add up to be Cyan. If you add Red to green you get Yellow. Red added to Blue yields Magenta. Digital cameras andcomputers tend to use RGB.

    b. Cyen-Magenta-Yellow-Black (CMYK) color space is subtractive, reflected color. It is the color of traditional lithographic printers and of most small-format digital printers. Print Cyan ink (which reflects cyan light and absorbs the rest) on top of Magenta ink, it looks Blue, the only frequency not absorbed by the cyan or magenta ink. If you add Cyan, Magent and Yellow, you absorb all frequncies of light, and it looks black (sort of ... it actually looks dark brown due to the inability to make "pure" colors of ink; you need to use black ink to make subtrative refled color actually look black).

c. Modern wide-format printers do not use traditional CMYK ink sets. They are often supplemented with Red or light Cyan of Light Magenta or Green or different "shades" of black. With these printers, it is most appropriate to provide RGB files and let the printer translate them into the proper screen builds for its ink set.

d. If your only use for the photographs is posters, work in the RGB color space. If your real intent for the use of photographs is traditional printing, work in the CMYK color space.

e. No matter what you do, color matching is a myth. You **cannot** "match" a printed piece to a computer screen. You **cannot** "match" a printed piece to a traditional, continuous tone photographs (modern digital photographic prints are actually not continuous tone ... they are screen builds of CMYK, with other colors added by some printers).

    i. However, since the CMYK color space is intended for printing (subtractive, reflected color), choose colors in that color space and you won't be disappointed by radical differences.The classic example is the color "Blue." The theoretical translation of "Blue" of RGB additive projected color to CMYK is 100% Cyan and 100% Magenta. No matter how you print this, it will look purple. If you don't want purplish blue, don't choose RGB "Blue." Choose a blue color from a CMYK color pallette. It will look blue when printed, even though its screen build will actually be something like 100% Cyan and 85% Magenta (throw in 5-10% Black and it will look a little richer).

4. Minimize Compression

a. "RAW" format from a digital camera is not compressed; files can be very large. *.tif is normally not compressed; files can be very large. Photoshop files with layers and effects can be extremely large, and the image data is not compressed. *.jpg or *.jpeg are compressed; they can be highly compressed or only somewhat compressed. Highly compressed *.jpeg files can be much smaller than uncompressed *.tif files.

b. Compression looses data. If you are trying to analyse the minucia of your photograph, do not compress it.

c. Extreme compression can create artifacts.

d. You cannot "uncompress." If you compress your photograph, the lost data is lost forever.

Use of logos

1. Make sure you have permission — **obey copyright law!**

2. **Do not simply copy your organization logo from the Web site**. The file you get is far too low in resolution to enlarge for a six foot poster.

3. Use a vector format file or a high resolution pixel-based file. Every organization has files available for marketing and printing purposes.

Off the Web site (RGB)
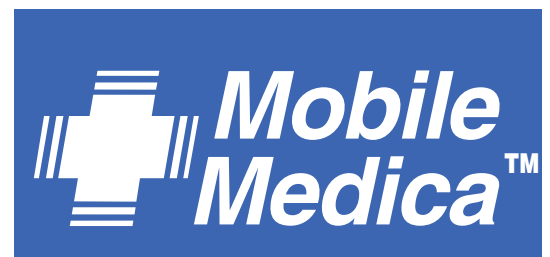
Vector Art (CMYK)

PowerPoint can "insert/picture/picture fro file" in many formats.

   i.   Vector format files: *.eps; *.png; *.pdf

   i.   Pixel-based formats: *.psd; *.jpg; *.tif

   iii.   Formats that can include both vector and pixel data: *.eps; *.psd; *.png; *.pdf

4. Be aware of white backgrounds. A *.jpg image is rectangular. If your logo is a circle, and you place it on a blue background, it will have a white rectangle around it. A vector file generally has a clear background. You want your logo to have a clear background, so you can place it on a colored background.


File Formats for Submission

1. **Always submit an Acrobat file** (*.pdf) for your printed poster.

   a.   It is impossible to tell whether a PowerPoint document was made on a Windows computer or a Macintosh computer. If you open a file on a Mac that was made on a Windows box, or vice versa, there can be problems with text wraps and font substitution.

      i.   See previous section about Typograhic Considerations.

   b.   You might (unknowingly) place a graphic within a PowerPoint document that is linked to a file on your computer. When the PowerPoint file is opened on a different computer, that graphic cannot be found.

   c.   Acrobat files embed the fonts and graphics within the document. Acrobat files are PostScript files. All of our printers are PostScript printers. What you see on your Acrobat document is what we will print ... **UNLESS:**

      i.   In some programs you can set your Acrobat export function to **not** include all the fonts. **This is bad**. When the file is opened on another machine which does not have the exact same fonts open, Acrobat will substitute generic serif or san serif fonts. It is difficult to tell if this has happened.

2. We can open PowerPoint, Word, Excel, and Acrobat files on either platform. We can also open Keynote, InDesign, QuarkXPress through version 9, Illustrator, Photoshop, *.jpeg, *.tiff, *.png, and other file formats on a Mac. You should still **send your poster file as an Acrobat document**. You should only send the source file if there is a need to troubleshoot a problem with the *.pdf.
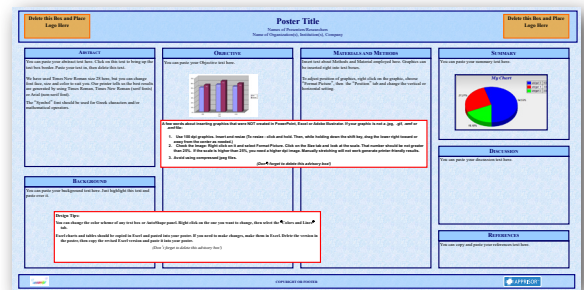
Saved or exported as *.pdf
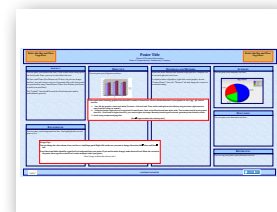
Printed to *.pdf with wrong paper size

Size Considerations

1. How many people will be looking at it at one time?

   a.   Only one or two, see other considerations below.

   b.   More than 3, make it as big as possible.

2. How much information is being presented?

   a. For one paragraph of text and one graph use a small poster. It might not look right to spread a small amount of information across a huge poster.

   b. When there are 6 or 8 different graphs or charts needed to convey the results, use a larger poster.

   c. If you must use a lot of text, use a larger poster, with larger type sizes, and clear subtitles.

3. How much money do you want to spend? The larger the poster, the more it costs.