Transferable skills training: how to make a poster

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Preamble

Disclaimer: these are just my views, and hopefully will make you think about ways to present your work.

Why give a poster?

- Posters are often regarded as second prize for presenting your work at a conference.
- Conference organizers need many attendees; people come normally to present their work. Don't assume acceptance of your poster means it has undergone standard peer review process.
- Posters give more opportunity for interaction, and longer time to talk. (e.g. SFN talks are 10 minutes; posters are one hour).
- Good forum to show your ideas and meet people.
- Think of it as an advert. (Display one too if you are looking for a job, or if your group is hiring).

Examples: old style

Examples: current style

Mechanisms underlying the formation of beta retinal ganglion cell mosaics

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Introduction

Beta retinal ganglion cells (RGCs) are labelled ON-centre or OFF-centre, depending on their response to light (Fig. 1). Cell bodies of each type form a semi-regular pattern, termed "retinal mosaics". We do not yet know how the mosaics of ON- and OFF-centre cells emerge during development:

- A population of undifferentiated beta cells may divide into two types during development through heterotypic interactions, possibly mediated by activity.
- The two types of cell may develop independently of each other.

Previous statistical approaches are based on testing for *statistical independence* between ON and OFF cells. This is not scientifically relevant when both types of neuron are located in the same layer, since the constraint that two neurons cannot then occupy the same (x,y) location rules out independence *a priori*.

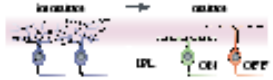


Figure 1: *Development of stratification in beta RGCs (drawing from Wong & Ghosh, 2002). Stratification reflects functional class.*

Approach: we fit models of the joint spatial pattern which respect the constraint that no two neurons can be separated by less than their soma diameter. If model replicates real maps without requiring heterotypic interactions, this might suggest heterotypic interactions do not occur during development.

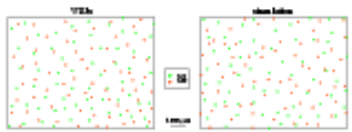


Figure 2: *Real (W81s; Wässle et al., 1981) and simulated RGC mosaics.*

Methods

- d_{min} model (Galli-Resta et al., 1997) adapted to bivariate case (Fig. 3). Size of homotypic exclusion zone drawn from a Normal distribution (mean ± s.d.); heterotypic exclusion zone fixed at soma diameter.
- Model parameters varied to find best fit to real maps (M623 and W81s) for:
  1. $L(r)$ — mean (scaled) number of cells within distance r of a cell. L functions are cumulative versions of DRP (Rodieck, 1991).
  2. regularity index — mean/s.d. of the distance to nearest-neighbour.
  3. fraction of 1^{st}, 2^{nd}, 3^{rd}, or all, nearest neighbours of opposite type.

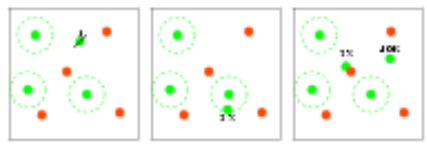
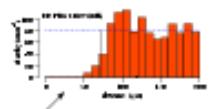


Figure 3: *Bivariate d_{min} model. On and off-centre cells are initially located randomly throughout the array. All cells are then moved within the array according to the following procedure. A cell is selected (1) and repositioned randomly (e.g. at 4) avoiding homotypic exclusion zones (dotted circles; 2) and smaller heterotypic zones (solid red circles, which are cell bodies of opposite type; 3). One sweep consists of moving all cells in the array once. Cells are moved for many sweeps to allow the patterns to stabilize.*

Results

Both fields could be replicated by bivariate d_{min} model (Table 1; Fig. 2, 4, 5). DRP to right shows equivalent DRP for an L function.



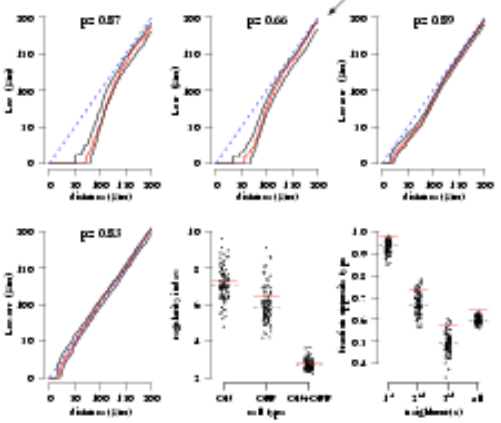


Figure 4: *Results for field M623. Red lines indicate experimental data; black lines indicate envelope from 99 simulations. Dashed blue lines indicate the expectation of L for a Poisson pattern. In strip charts, each black dot indicates one simulation, and dotted black line indicates median.*

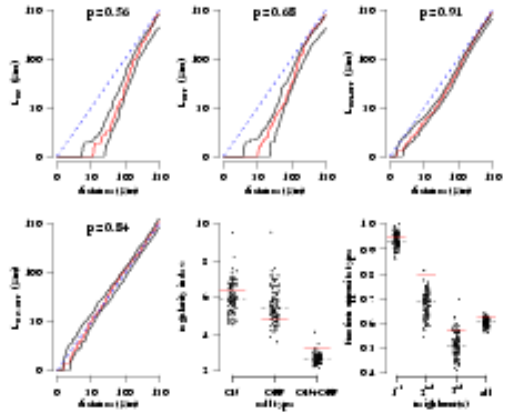


Figure 5: *Results for field W81s (same format as Fig. 4).*

field	#ON	#OFF	d_{ON}	d_{OFF}	soma
W81s	65	70	116 ± 20 µm	130 ± 25 µm	9 µm
M623	74	82	100 ± 13 µm	90 ± 15 µm	15 µm

Table 1: *Best-fit parameters of the d_{min} model to the two datasets. d_{ON} and d_{OFF}: mean ± s.d. of homotypic exclusion zones; soma: diameter of heterotypic exclusion zone.*

Conclusions

- Beta RGC maps can be simulated with limited interactions between the two mosaics. Heterotypic interactions are limited to preventing neural overlap.
- Confirms general principle that mosaics are *functionally independent* of each other (Rockhill et al., 2000).
- Previous model suggested fixed dependency between two mosaics (Zhan & Troy, 2000); may be by-product of model implementation.
- Functional implications of independence in arrays?
- Caveats: model works with adult maps (ignoring developmental processes, such as cell death). Limited data sets (n=2). Interactions between dendritic arborisation and soma positioning unknown.

Acknowledgements: Wellcome Trust (SJE) and NIH EY06669 (JBT). Thanks to Heinz Wässle for providing map W81s.


POSTER SESSIONS

Preparation before the day

1. Make sure you know the poster board size and orientation (portrait/landscape).
2. Aim to finish a few days before you depart for the meeting. Poster making takes time. For your first poster, I suggest allowing three days.
3. Do a dry-run with your supervisor (e.g. the "3–5 minute talk") before printing final version.
4. Check what materials will be available for hanging poster (pins/velcro).
5. Beware of relying on using a laptop to show multimedia; power sockets and tables are rare.
6. At large meetings, check what other posters will be shown in the same session as yours, and arrange cover.
7. Find a poster tube and **label it!**

Planning the content

- A poster is not a journal article; focus on core figures and results.
- Use an A4 version of poster as a handout; use separate handouts for details of method.
- Posters full of text are ignored!
- Layout:

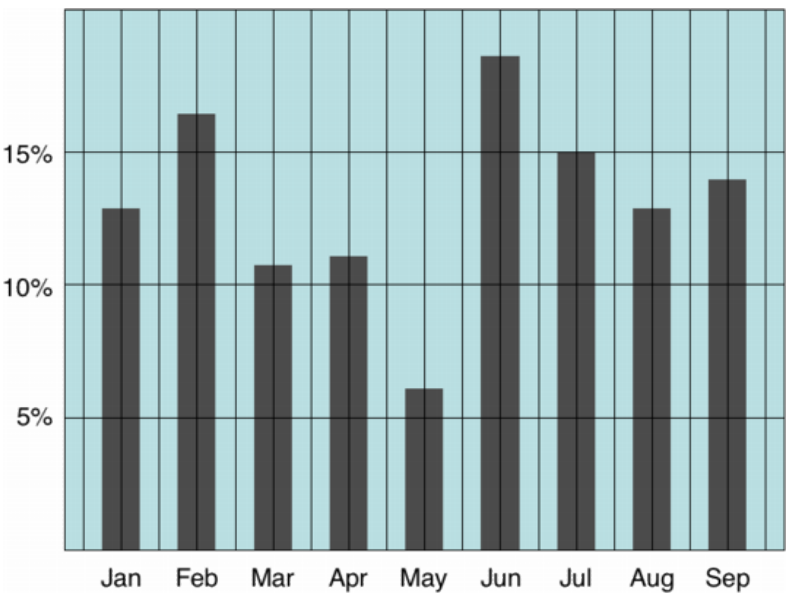
Top-left	Problem and aims of the poster.
Bottom-right	Summary of what you've shown.
In-between	Method, results, FIGURES.

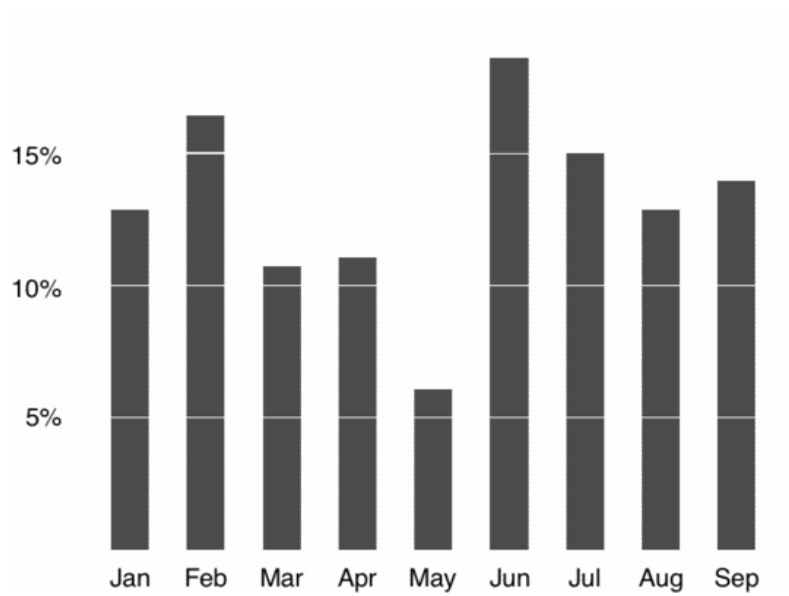
- Figures are the key: design them first (with good legends) and give minimal supporting text.
- Do not include abstract (submitted previously to the conference) or references. People will find them.
- Provide acknowledgements and contact info, but keep them small!

Effective figures: Edward Tufte

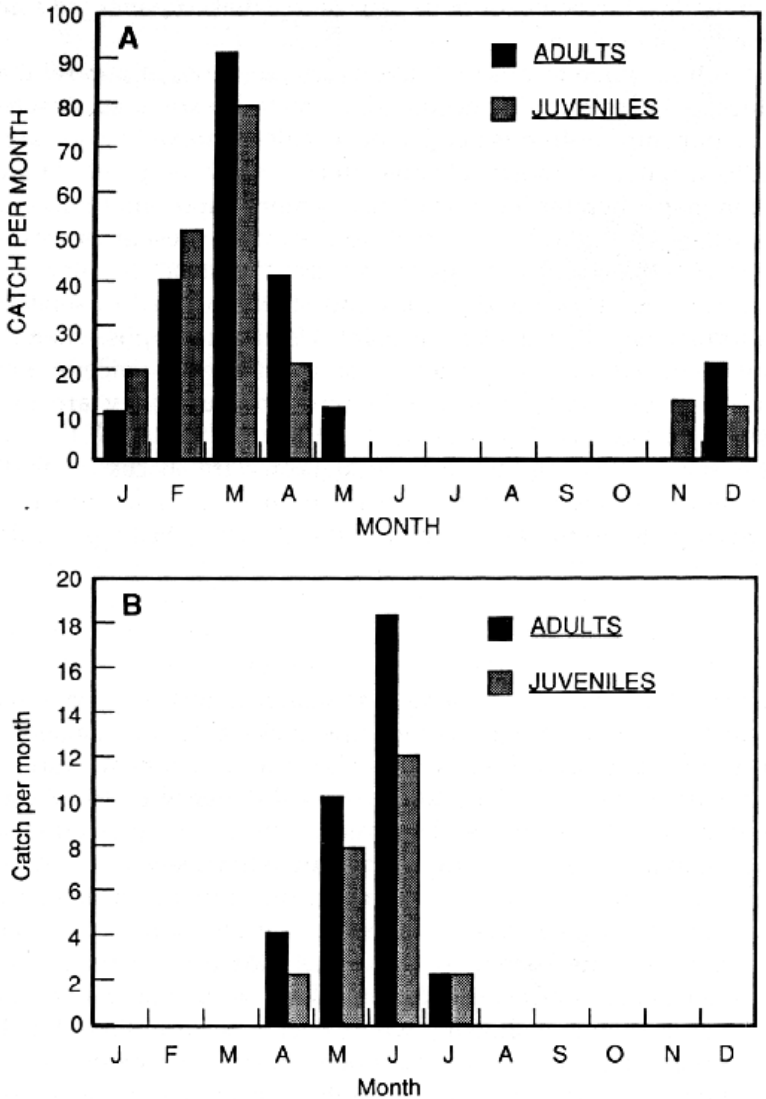
Keep the "Data to ink ratio" high. Remove chartjunk.
`http://www.edwardtufte.com/tufte/`

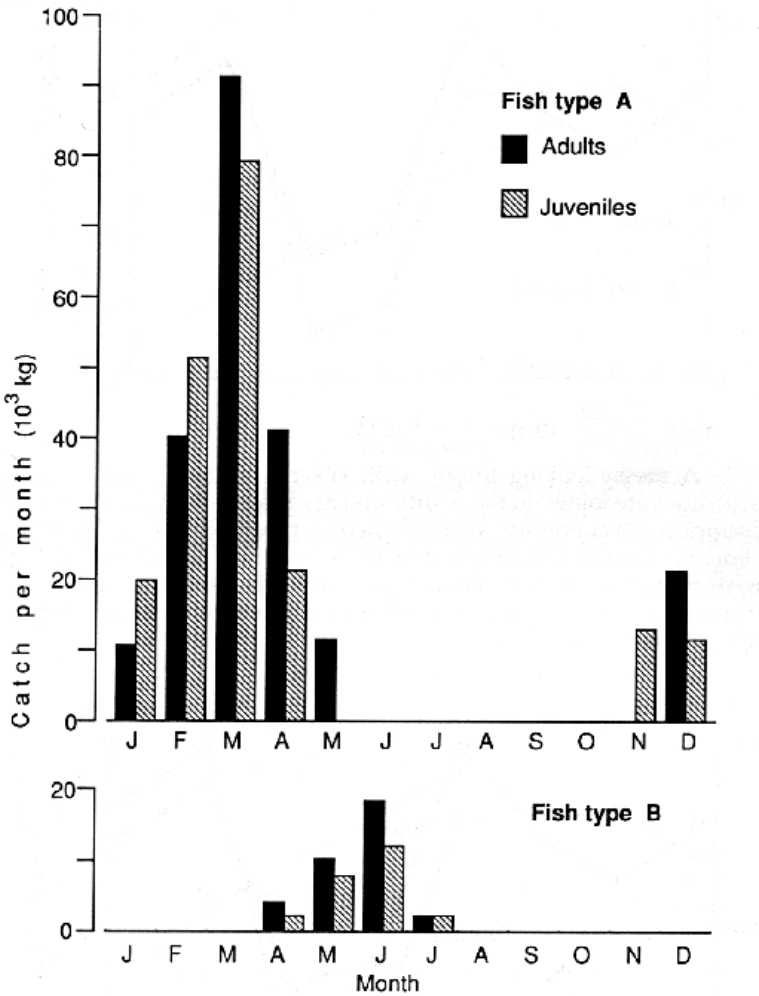
Sequence: `http://www.tbray.org/ongoing/data-ink/di1`





Improving figures: another example (O'Connor)





Source: Maeve O'Connor (1996). Writing successfully in science. Chapman & Hall. (Figure 4.1, 4.2)

Top ten worst graphs

See `http://www.biostat.wisc.edu/~kbroman/topten_worstgraphs/`
"What's worse than one piechart?"

What happens on the day

- Hang your poster up early (you *might* get a good spot):

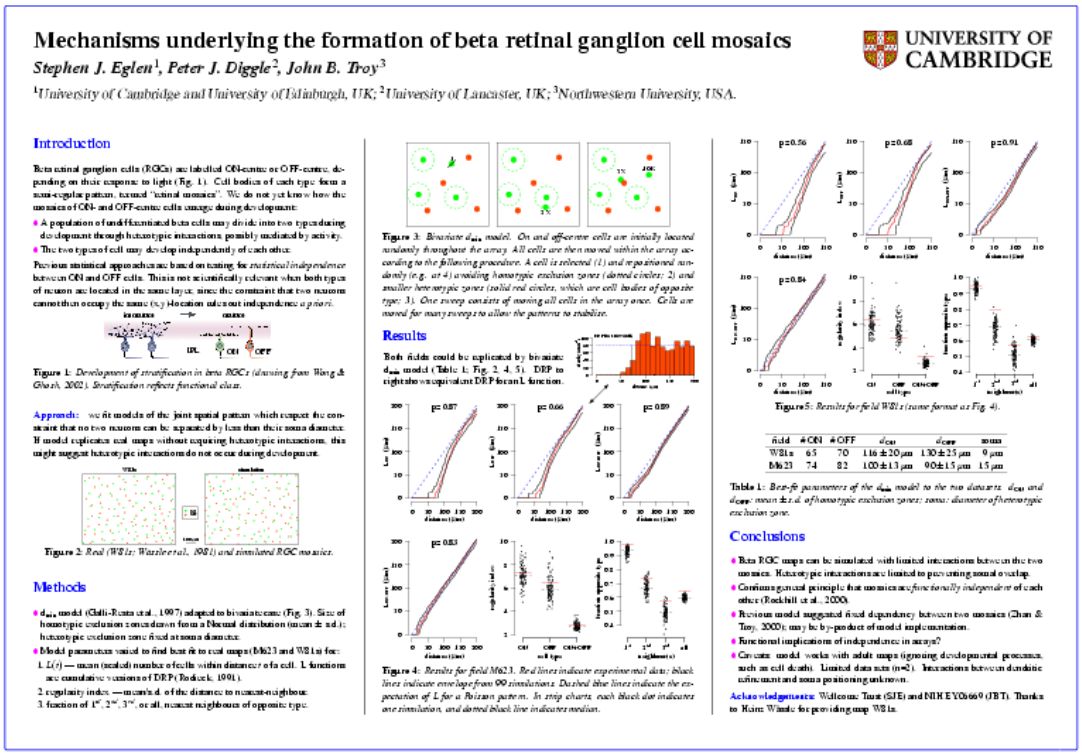
- Find out how long you are expected to be at your poster: don't miss the allotted session.
- Offer to talk people through your work.
- Prepare a 3–5 min. summary of your poster. Don't just read the poster.
- Hang envelope for handouts (+ to collect business cards).

Mechanics of poster making

- Mount several A4 sheets; easy to carry.
- Use A0/A1 poster. Nicer, but hard to carry, and requires specific printing.
- Print shops: PANDIS, Anatomy, Engineering. (DAMTP students can get P/O from John Turner, to avoid VAT.)
- Since Summer 2010 CMS has an A0 printer: `http://www.damtp.cam.ac.uk/internal/computing/printing/poster.html`
- Most print shops can handle rescaling, but ensure your aspect ratio is the same as the poster board.
- What software?
  1. Illustrator / Inkscape
  2. Powerpoint (?)
  3. LaTeX ...
- Note: I am a fan of LaTeX but posters require much re-arrangement of material, so you might find GUIs more suitable.

Using LaTeX for making posters

`http://www.damtp.cam.ac.uk/user/eglen/damtp/cuposter` allows you to make poster in a simple 3 col format.



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Introduction

Results

Methods

Conclusions

But I recommend you now try the Beamer poster style:

`http://www-i6.informatik.rwth-aachen.de/~dreuw/latexbeamerposter.php`

Summary

- Leave lots of time to prepare.
- Work on figures first.
- Prepare an effective 3–5 minute summary.
- Questions?

Further reading

- Edward Tufte. The visual display of quantitative information.
- Maeve O'Connor. Writing successfully in science.
- "Poster perfect"
  `http://the-scientist.com/2011/09/01/poster-perfect/`
- `http://colinpurrington.com/tips/academic/posterdesign`

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