



Wrap up and consolidation

Roger Beecham
www.roger-beecham.com

Module content and philosophy

Spatial modelling

- Data mining
- Response modelling
- Microsimulation
- Agent-based modelling

to

simulate and predict
consumer behaviour

[content]

Research and industry
case studies

to

evaluate modelling
techniques in practice

[philosophy]

Outcomes

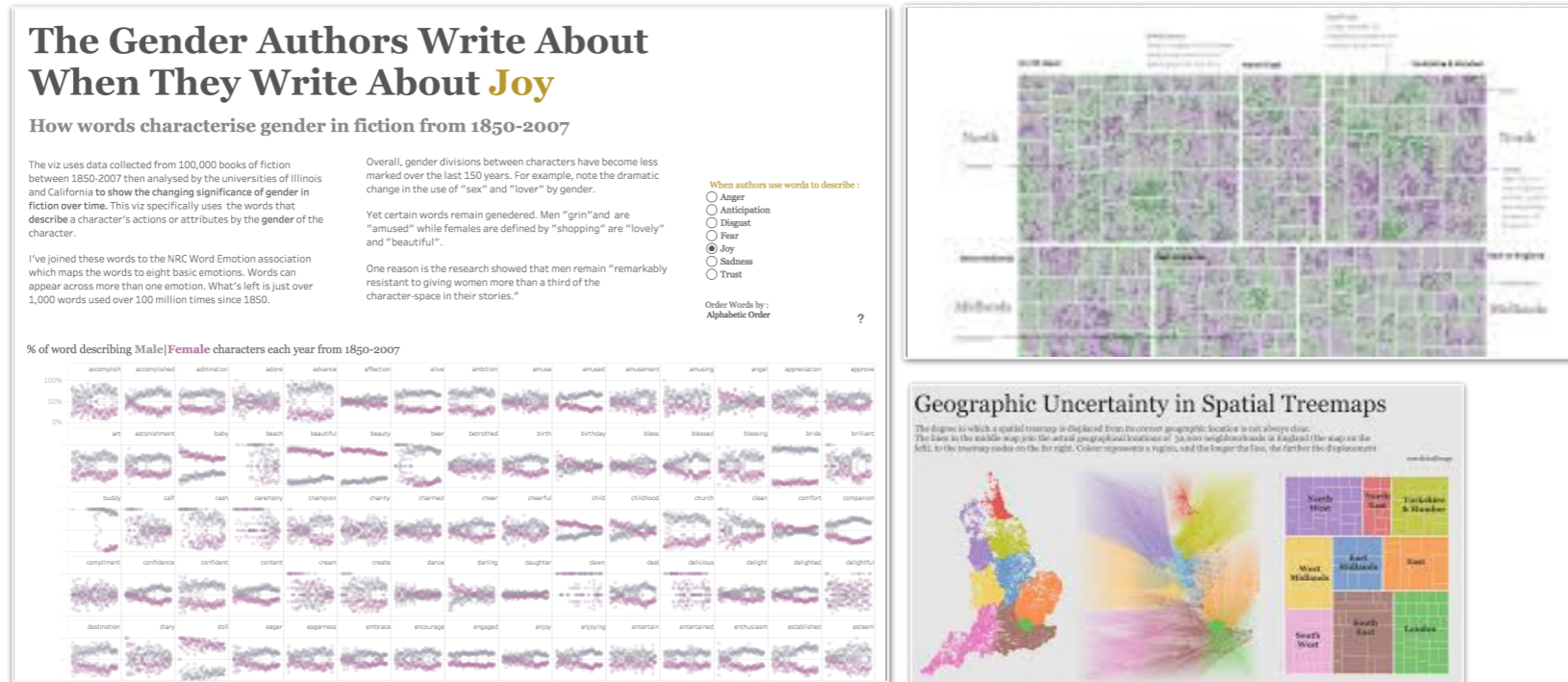
By the end of this module you should be able to

1. **explain** and **critically evaluate** the role of spatial analytics in simulating and predicting consumer behaviours

2. **apply** geocomputational modelling and simulation techniques on real data sets

3. **devise** and **employ** spatial modelling tools to address business problems, presenting and justifying recommendations in an appropriate context

Guest Lecture



Rob Radburn
Leicestershire County Council



What is (modern) data analysis?

DATA ANALYSIS
IS

- A careful thinking about evidence (data) in the context of a research problem

DATS ANALYSIS
INVOLVES

- Defining your problem
- Identifying relevant data
- Selecting aspects of your data and problem that can be reasonably



GEOG5927M: PREDICTIVE ANALYTICS

[SYLLABUS](#) [SCHEDULE](#) [R](#)

PREDICTIVE ANALYTICS

THIS SITE CONTAINS the syllabus, schedule, and assignments for GEOG5927M: Predictive Analytics, held during Autumn/Winter term 2019 at University of Leeds.



INSTRUCTOR

[Dr. Roger Beecham](#)
 10.139 Manton
 r.j.beecham@leeds.ac.uk
 [@rjbeecham](#)

COURSE

Mon (lec) & Weds (lab)
 November 11–December 11, 2019
 2:00pm-4:00pm (lec)
 Roger Stevens LT25 (12.25)



GEOG5927M: PREDICTIVE ANALYTICS

[SYLLABUS](#) [SCHEDULE](#) [R](#)

SYLLABUS

Combining theory and practical examples, this module introduces Predictive Analytics via two geocomputational techniques in which University of Leeds Geography specialises: spatial microsimulation and agent-based modelling. You will apply these techniques to data analyses highly relevant to consumer analytics domain and using modern data analysis environments.

By the end of this course you should be able to:

- explain and critically evaluate the role of spatial analytics and geocomputational modelling in simulating and predicting consumer behaviours
- apply geocomputational modelling and simulation techniques on real data sets
- devise an analysis strategy for the implementation of sophisticated modelling tools to address business problems, presenting and justifying recommendations in an appropriate context

INSTRUCTOR

[Dr. Roger Beecham](#)
 10.139 Manton
 r.j.beecham@leeds.ac.uk
 [@rjbeecham](#)

COURSE

Mon & Weds
 September 4–December 11, 2019
 2:00pm-4:00pm
 Roger Stevens | Manton



GEOG5927M: PREDICTIVE ANALYTICS

[SYLLABUS](#) [SCHEDULE](#) [R](#)

SCHEDULE

- Readings
- Practicals
- Lecture slides

Week 7	Simulating behaviours			
Week 8	Targeted marketing			
Week 9	Behavioural and agent-based models			
Week 10	Behavioural analytics (guest lecture)			
Week 11	Re-visit			

GEOG5927M: PREDICTIVE ANALYTICS (AUTUMN/WINTER 2019)
University of Leeds | School of Geography

[Dr. Roger Beecham](#) r.j.beecham@leeds.ac.uk Mon (lec) & Weds (lab) 2:00pm-4:00pm (lec) Roger Stevens LT25 (12.25)

All content licensed under a [Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License](#).
This site adapted from the [ath-tufte-hugo theme](#) (thanks to [Andrew Heiss](#)). Made with [blogdown](#) and [Hugo](#).



Assignment #1

You will take on the role of a customer segmentation expert for a travel company. Your task is to identify a **specific segment** of customers who could be targeted with a marketing strategy. You will use the 'synthetic' population produced through microsimulation during practical sessions 1 and 2 to identify the target customers. The **type of holiday destination** and **choice of customer sub-group(s)** to target is up to you. Note that your job is to identify the sub-population(s) to be targeted, explain your methods and clearly present your results. There is **no need** to discuss how you would reach the customers you identify. You are expected to incorporate at least some appropriate academic literature into your report.

An indicative structure for your report is below.

1. **Introduction:** Identify and justify the scope of your study -- the destinations, holiday type and customer groups of focus and why they are of interest.
2. **Data and methods:** Describe the data on which your study is based, the variables you have selected and any derived variables you have created. Be sure to justify these decisions with reference to your study's scope.
3. **Results and analysis:** A combination of charts, maps and tables – judiciously designed to address the area of focus outlined in the introduction.
4. **Conclusions:** Synthesise over the findings to identify the customers to which a marketing campaign could be targeted. Be sure to do so with reference to the evidence presented in your data analysis (section 3).

Assignment #1

You will take on the role of a customer segmentation expert for a travel company. Your task is to identify a **specific segment** of customers who could be targeted with a marketing strategy. You will use the 'synthetic' population produced through microsimulation during practical sessions 1 and 2 to **identify the populations to be targeted, explain your methods and clearly present your results.** Note that your job is to identify the sub-population(s) to be targeted, explain your methods and clearly present your results. There is **no need** to discuss how you would reach the customers you identify. You are expected to incorporate at least some appropriate academic literature in to your report.

An indicative structure for your report is below.

1. **Introduction:** Identify and justify the scope of your study -- the destinations, holiday type and customer groups of focus and why they are of interest.
2. **Data and methods:** Describe the data on which your study is based, the variables you have selected and any derived variables you have created. Be sure to justify these decisions with reference to your study's scope.
3. **Results and analysis:** A combination of charts, maps and tables – judiciously designed to address the area of focus outlined in the introduction.
4. **Conclusions:** Synthesise over the findings to identify the customers to which a marketing campaign could be targeted. Be sure to do so with reference to the evidence presented in your data analysis (section 3).

microdata.csv

15,189 records

Person_ID	OA_GRP	Sex	Ageband	NumberCh	Combined+	OverSeasAi	UKAirport	OverallHoli	AgeSex	Supergroup
11603	8c	F	a35to49	2	26-30K	LEI	MAN	Excellent	F35to49	Hard-Pressé
11285	8c	F	a25to34	0	0-10K	IBZ	MAN	Fair	F25to34	Hard-Pressé
13938	8c	M	a50to64	1	16-20K	LCA	BHX	Fair	M50to64	Hard-Pressé
10255	8c	F	a25to34	1	26-30K	ALC	LBA	Poor	F25to34	Hard-Pressé
831	8c	M	a50to64	0	26-30K	AGA	MAN	Good	M50to64	Hard-Pressé
1754	8c	M	a65over	0	Not Answered	DLM	MAN	Good	M65over	Hard-Pressé
2330	8c	F	a65over	0	Not Answered	DLM	MAN	Excellent	F65over	Hard-Pressé
10818	8c	M	a25to34	0	36-40K	KGS	MAN	Fair	M25to34	Hard-Pressé
8237	8c	M	a65over	2	16-20K	FUE	MAN	Good	M65over	Hard-Pressé
11508	8c	F	a35to49	2	71-80K	ZTH	LBA	Poor	F35to49	Hard-Pressé



Dataset

Person_ID	OA_GRP	Sex	Ageband	NumberCh	CombinedF	OverSeasAi	UKAirport	OverallHoli	AgeSex	Supergroup
11603	8c	F	a35to49	2	26-30K	LEI	MAN	Excellent	F35to49	Hard-Pressé
11285	8c	F	a25to34	0	0-10K	IBZ	MAN	Fair	F25to34	Hard-Pressé
13938	8c	M	a50to64	1	16-20K	LCA	BHX	Fair	M50to64	Hard-Pressé
10255	8c	F	a25to34	1	26-30K	ALC	LBA	Poor	F25to34	Hard-Pressé
831	8c	M	a50to64	0	26-30K	AGA	MAN	Good	M50to64	Hard-Pressé
1754	8c	M	a65over	0	Not Answer	DLM	MAN	Good	M65over	Hard-Pressé
2330	8c	F	a65over	0	Not Answer	DLM	MAN	Excellent	F65over	Hard-Pressé
10818	8c	M	a25to34	0	36-40K	KGS	MAN	Fair	M25to34	Hard-Pressé
8237	8c	M	a65over	2	16-20K	FUE	MAN	Good	M65over	Hard-Pressé
11508	8c	F	a35to49	2	71-80K	ZTH	LBA	Poor	F35to49	Hard-Pressé

microdata.csv
15,189 records

ZoneID	Person_ID	OA_GRP	Sex	Ageband	NumberCh	CombinedF	OverSeasAi	UKAirport	OverallHoli	AgeSex	Supergroup
E00056750	11603	8c	F	a35to49	2	26-30K	LEI	MAN	Excellent	F35to49	Hard-Pressed Living
E00056750	11285	8c	F	a25to34	0	0-10K	IBZ	MAN	Fair	F25to34	Hard-Pressed Living
E00056750	13938	8c	M	a50to64	1	16-20K	LCA	BHX	Fair	M50to64	Hard-Pressed Living
E00056750	10255	8c	F	a25to34	1	26-30K	ALC	LBA	Poor	F25to34	Hard-Pressed Living
E00056750	831	8c	M	a50to64	0	26-30K	AGA	MAN	Good	M50to64	Hard-Pressed Living
E00056750	1754	8c	M	a65over	0	Not Answer	DLM	MAN	Good	M65over	Hard-Pressed Living
E00056750	2330	8c	F	a65over	0	Not Answer	DLM	MAN	Excellent	F65over	Hard-Pressed Living
E00056750	10818	8c	M	a25to34	0	36-40K	KGS	MAN	Fair	M25to34	Hard-Pressed Living
E00056750	8237	8c	M	a65over	2	16-20K	FUE	MAN	Good	M65over	Hard-Pressed Living
E00056750	11508	8c	F	a35to49	2	71-80K	ZTH	LBA	Poor	F35to49	Hard-Pressed Living

simulated_population.csv
320,596 records

Targeting

Identify and profile a target market using:

Demographics –

income, age, household structure

Geography –

where and what types of areas they tend to live in

Psychographics –

their motivations and preferences

Targeting

microdata.csv

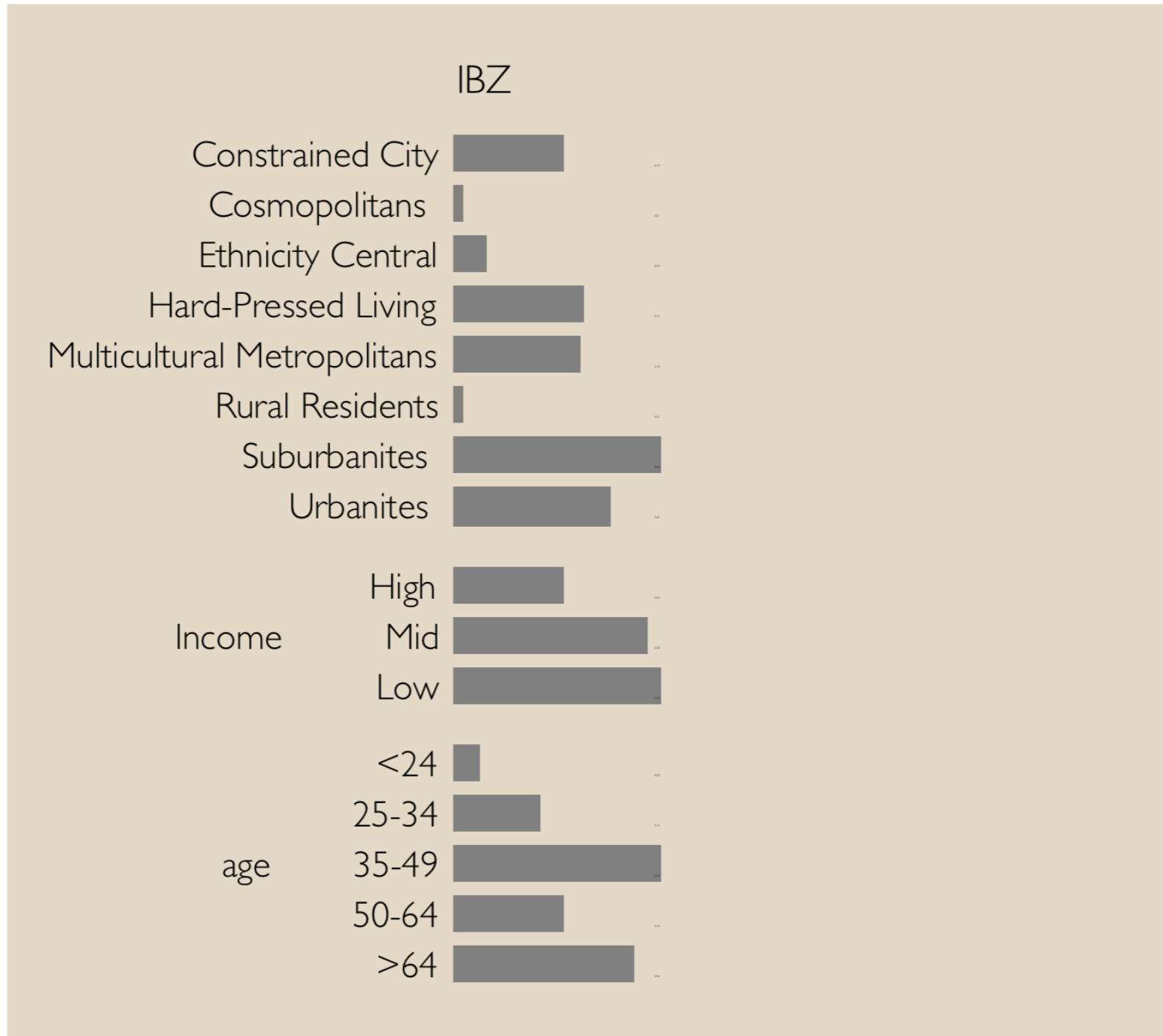
ageBand	demographics
incomeBand	demographics
numChildren	demographics
oac	geodemographics
originAirport	preference
destinationAirport	preference/attitude
satisfactionScore	preference/attitude

Targeting

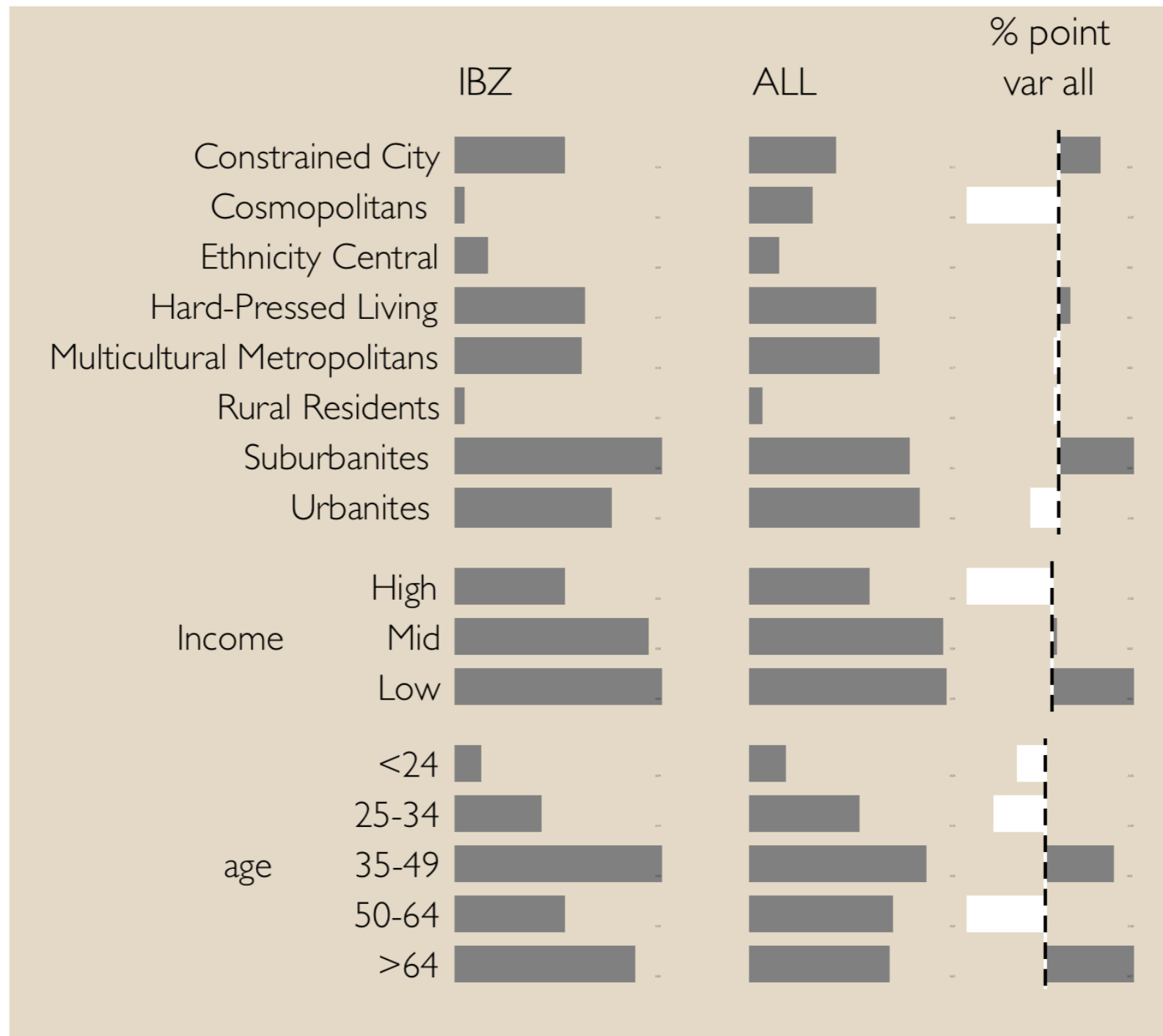
What makes your target market distinct when compared to the population as a whole?

ageBand	demographics
incomeBand	demographics
numChildren	demographics
oac	geodemographics
originAirport	preference
destinationAirport	preference/attitude
satisfactionScore	preference/attitude

Targeting

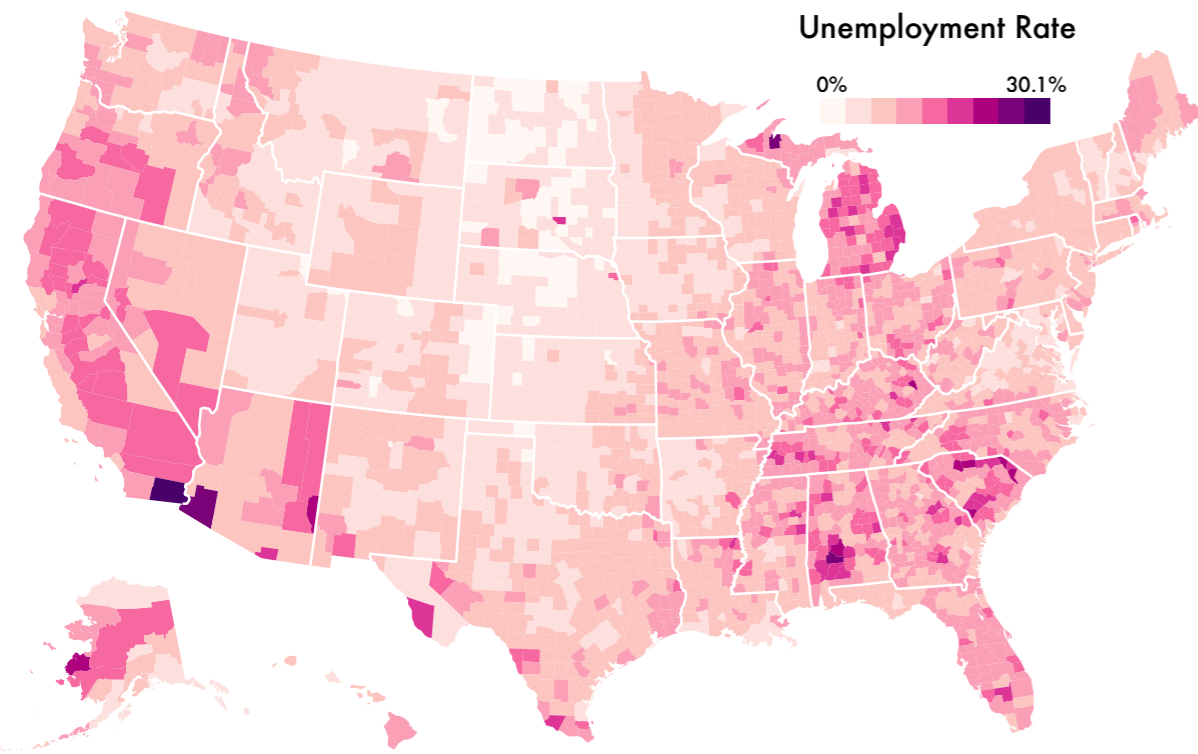


Targeting

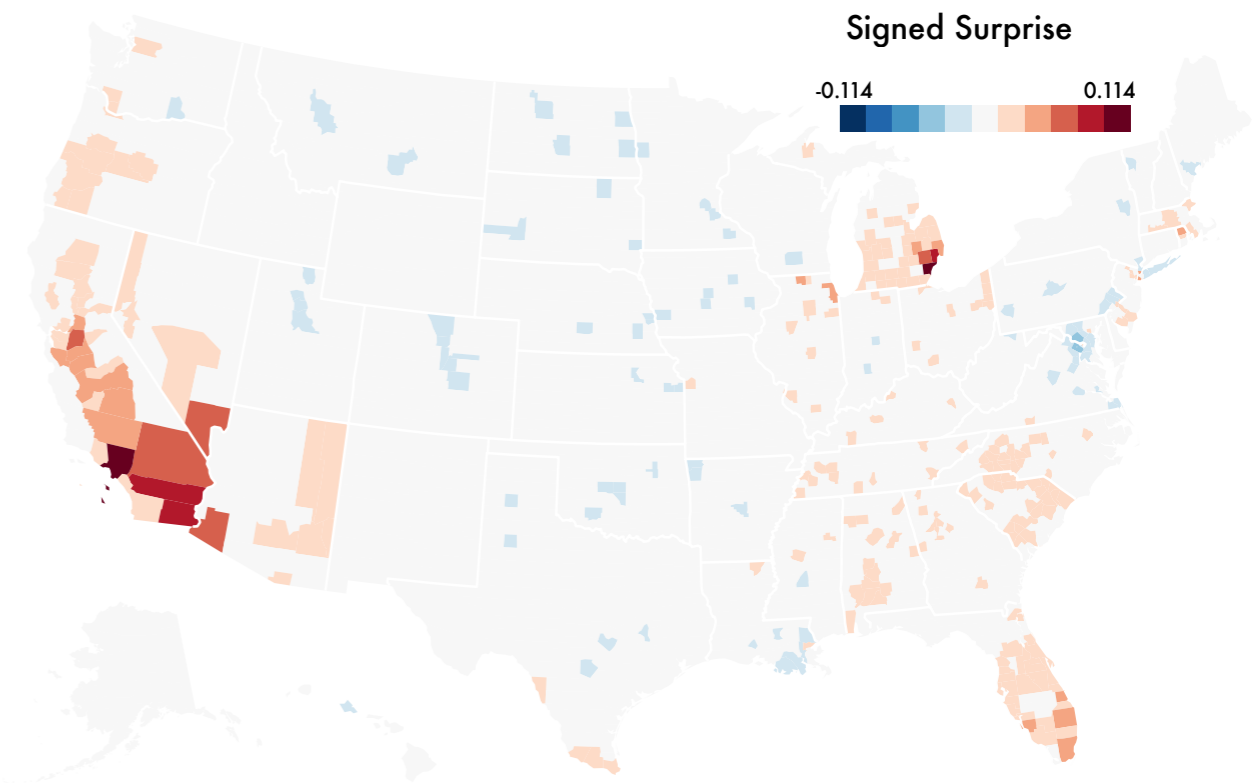


Deviation from Expectation

evidence model

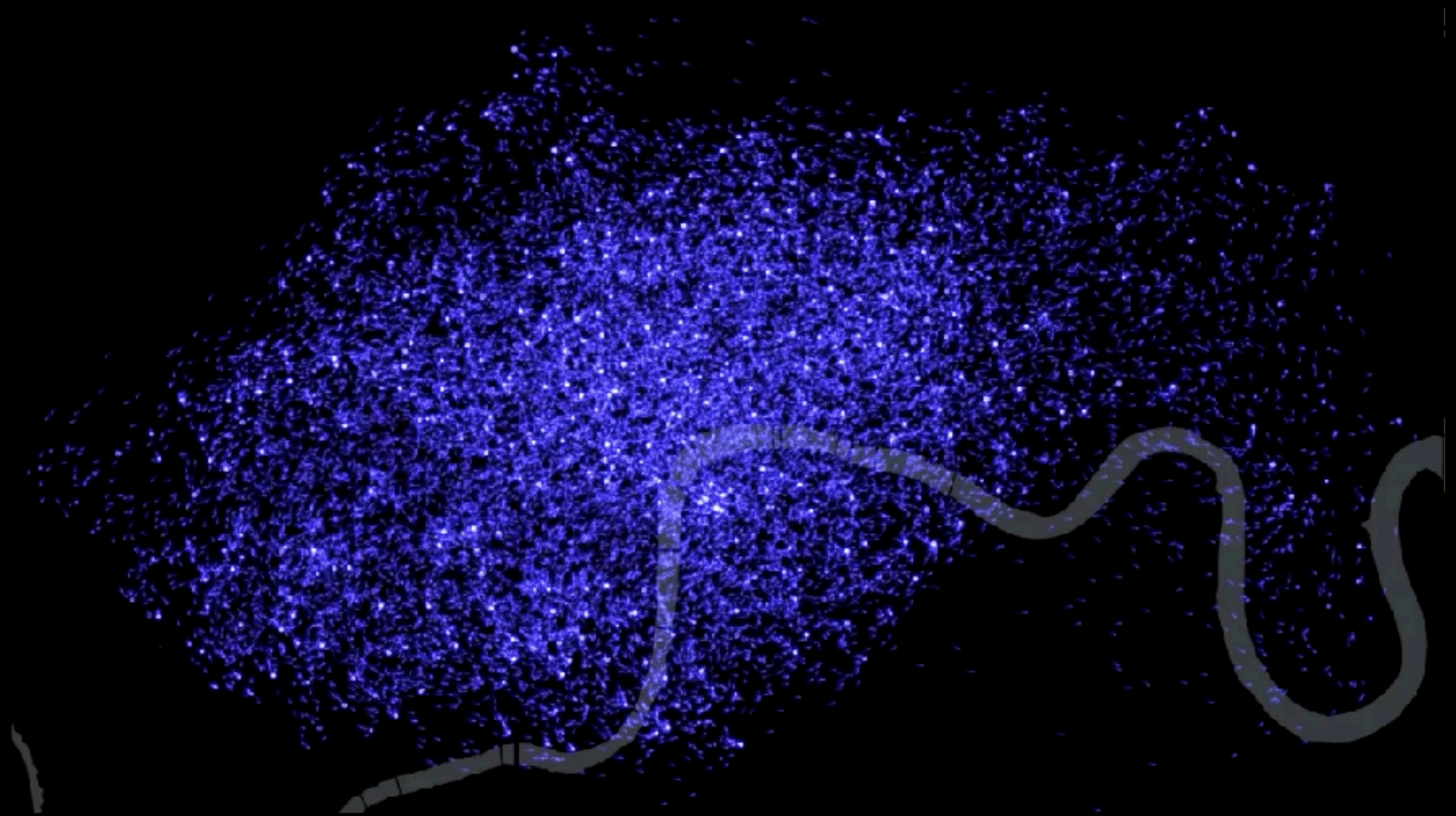


(a) Per capita event rate map.



(b) Signed Surprise Map.

Correll & Heer (2017) Surprise! Bayesian Weighting for De-Biasing Thematic Maps, IEEE TVCG



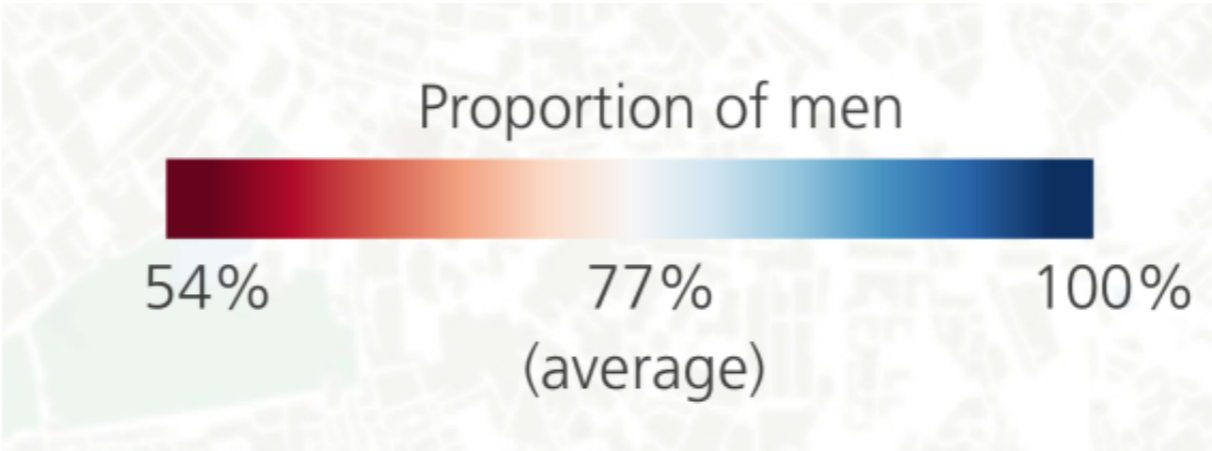
Jo Wood



women

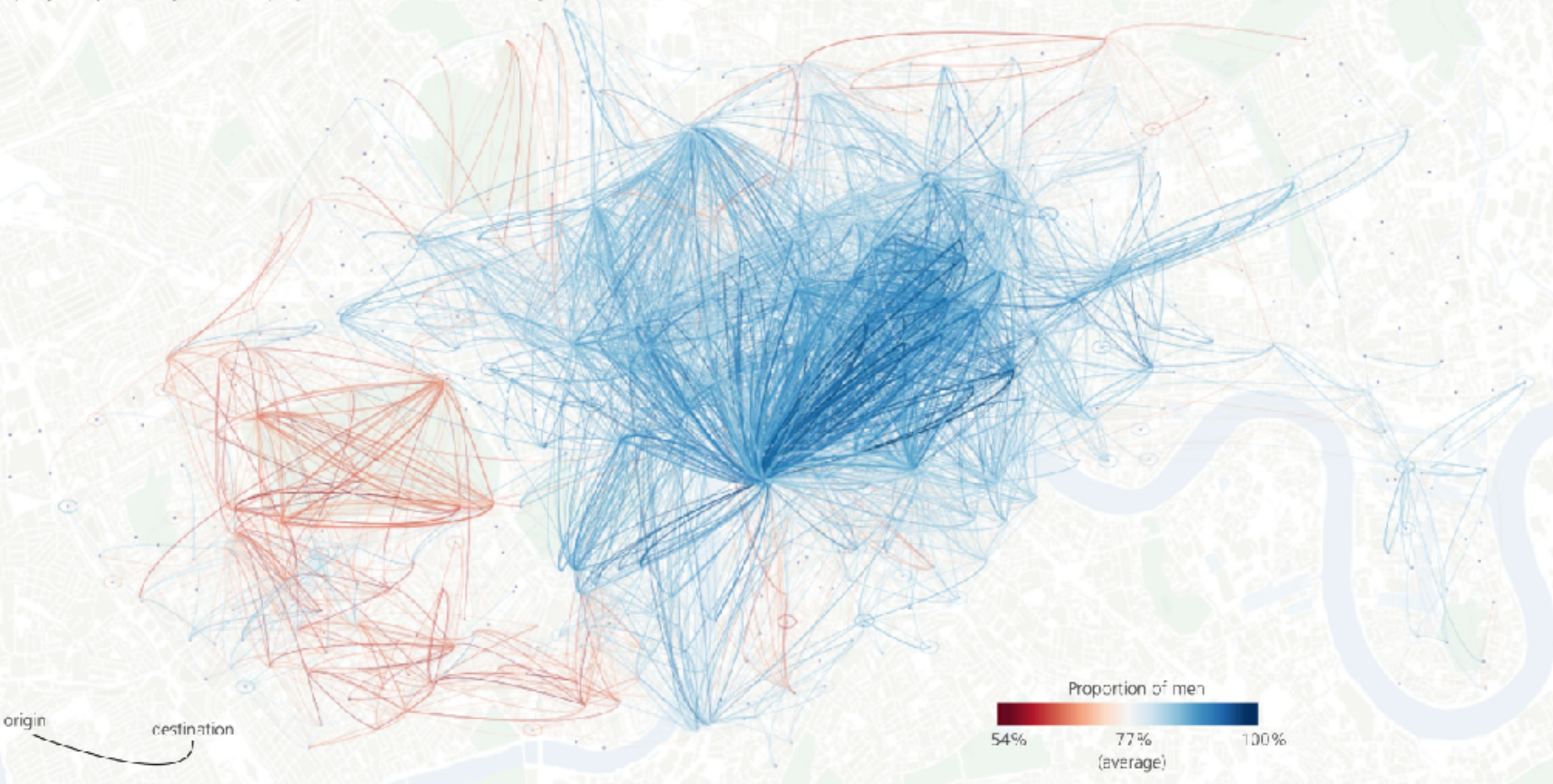


men



London Cycle Hire: Men's and women's journeys

Cycle journeys made by at least 50 people, Jan 2012-Feb 2013



Beecham and Wood, 2014

Group-based presentations

Wednesday 11th December

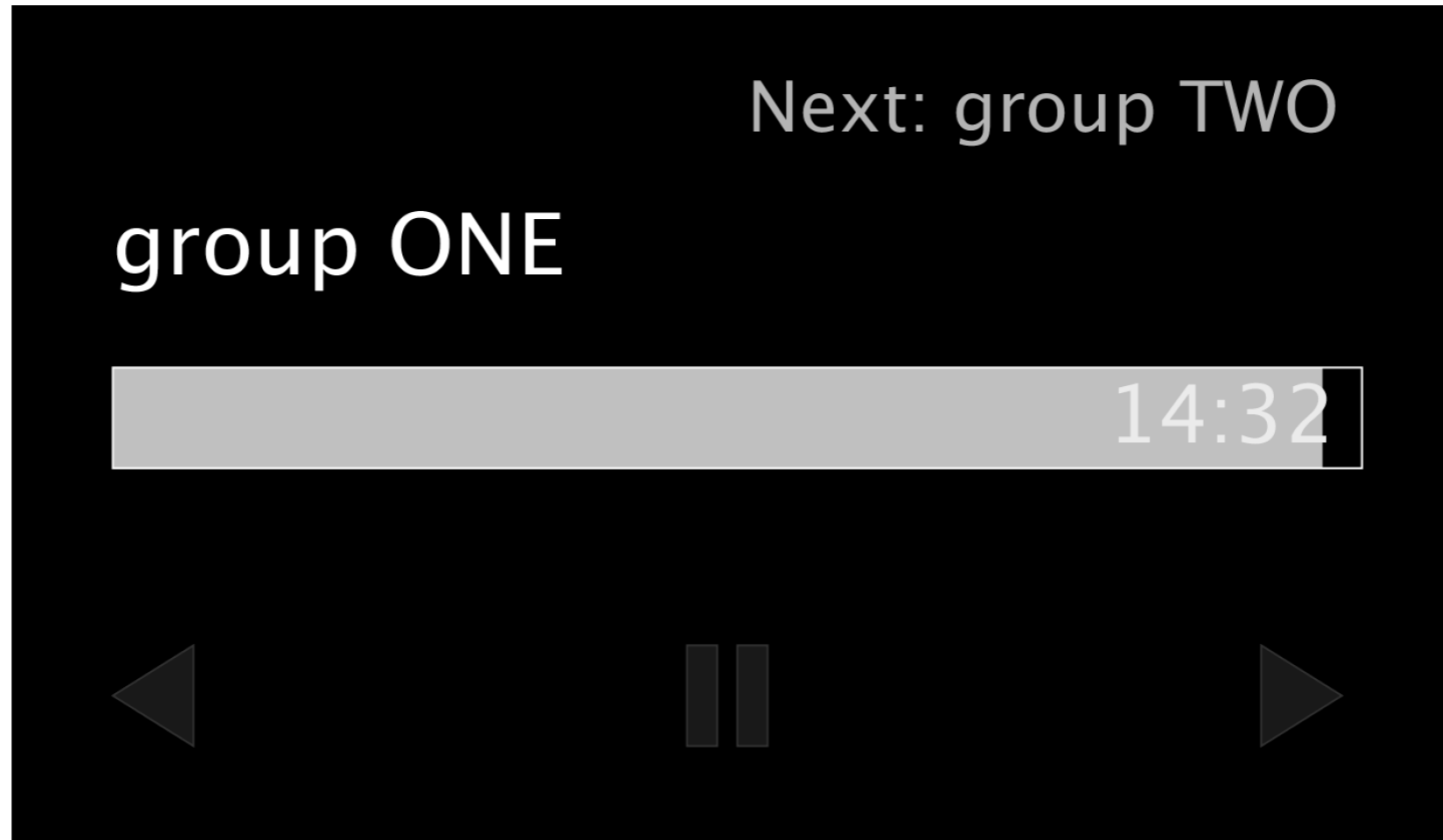
group	start	end	
1	09:30:00	09:45:00	
2	09:45:00	10:00:00	
3	10:00:00	10:15:00	session one
4	10:15:00	10:30:00	
5	10:30:00	10:45:00	
	coffee break	coffee break	
6	11:30:00	11:45:00	
7	11:45:00	12:00:00	session two
8	12:00:00	12:15:00	
9	12:15:00	12:30:00	
	lunch	lunch	
10	13:30:00	13:45:00	
11	13:45:00	14:00:00	
12	14:00:00	14:15:00	session three
13	14:15:00	14:30:00	
14	14:30:00	14:45:00	
	coffee break	coffee break	
15	15:30:00	15:45:00	
16	15:45:00	16:00:00	session four
17	16:00:00	16:15:00	
18	16:15:00	16:30:00	

Assessment

Assignment 2

Assignment 2 : Presentation schedule

Keeping to time

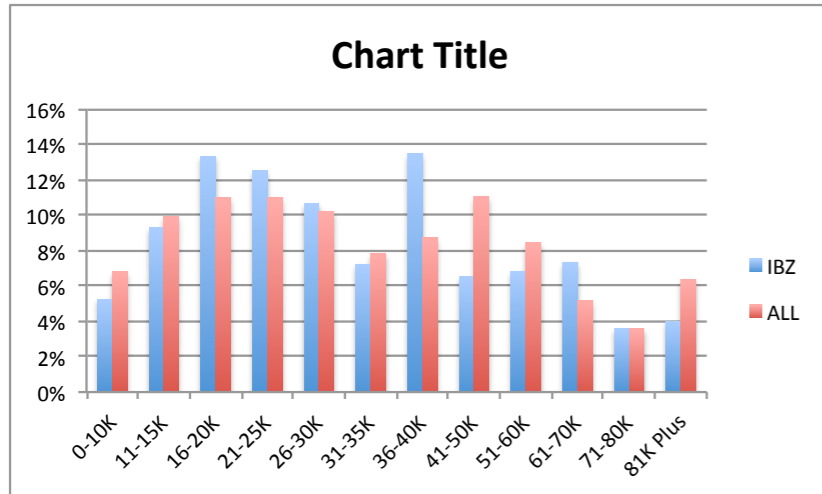


Delivering effective presentations

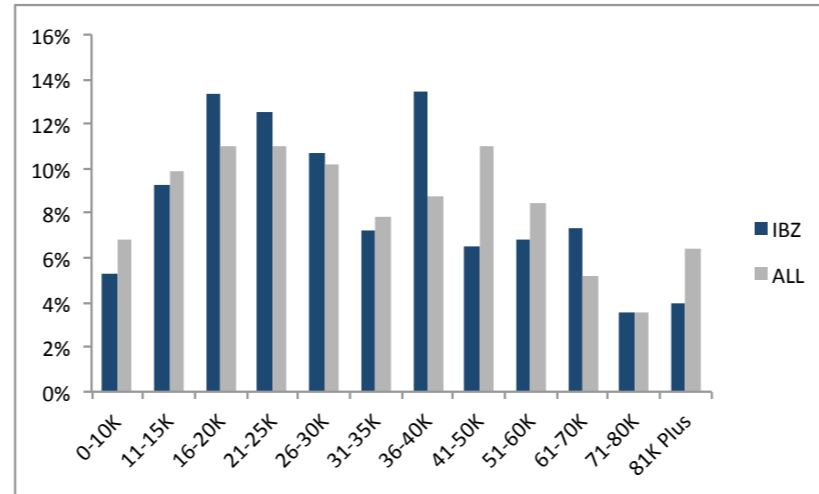
Maxim #1 : avoid noise

- Background colours
- Logos
- Overly small font
- Too much text
- Unnecessary transitions

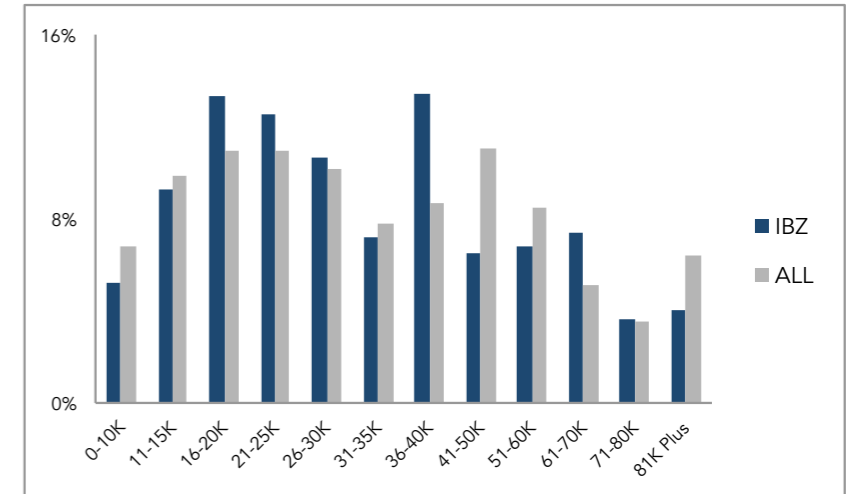
Maxim #1 : avoid noise



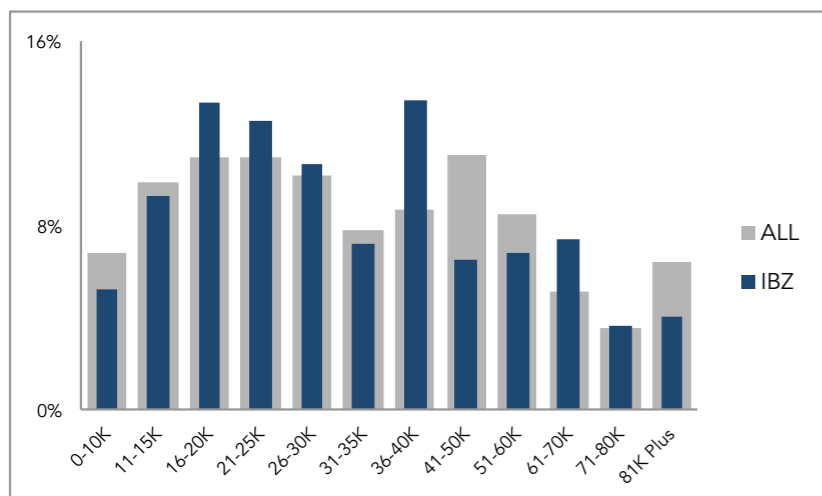
Excel default



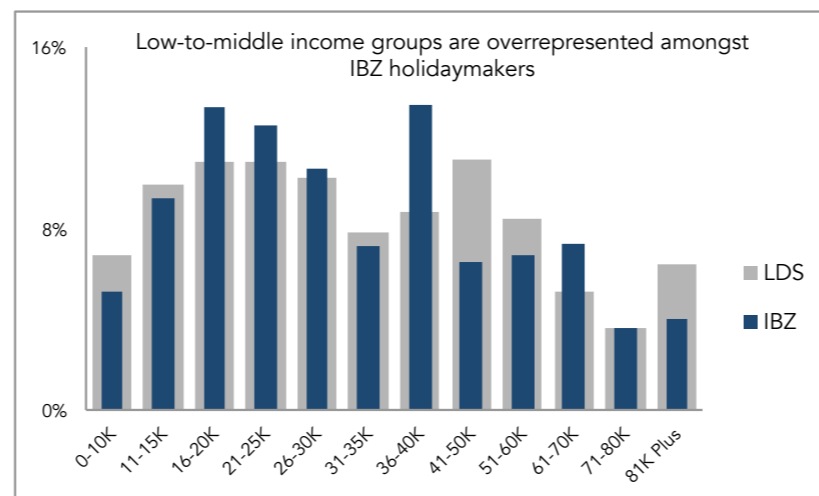
Remove bar shadow, grids and gradient



Emphasise data, de-emphasise axes (non-data)

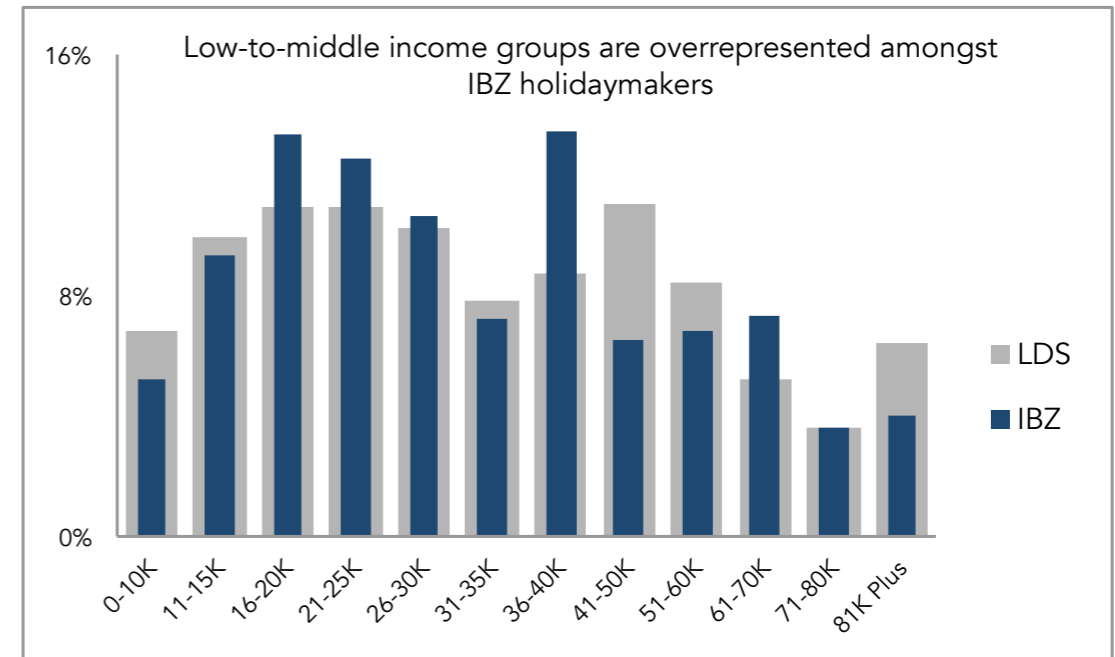
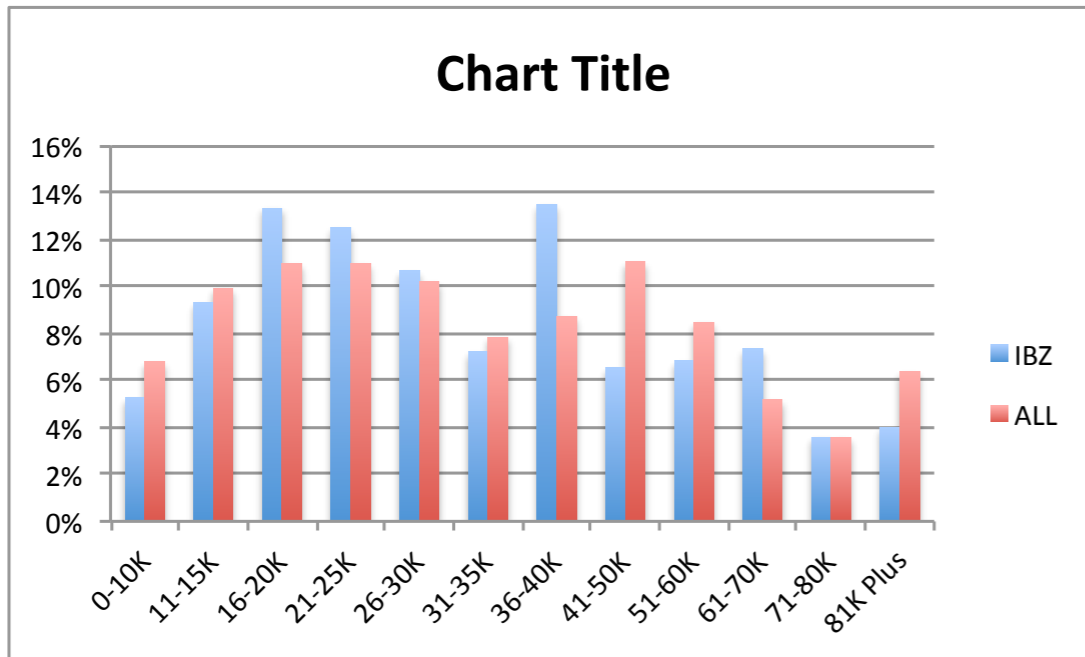


Affect design according to purpose [comparison]



Emphasise key patterns

Maxim #1 : avoid noise



Maxim #2 : refine

*With each slide, convey one
message (only)*

Maxim #3 : reduce

*Be concise,
both verbally and visually*

Maxim #4 : compliment

*Slides should display things that
can't be easily spoken*

Maxim #5 : layout

Maxim #5 : layout

Things

that
laid

out far

are

apart are
compare

more

difficult to

Maxim #5 : layout

Things

that
laid

out far

are

apart are
compare

more

difficult to

than things that are laid out close together.

Maxim #5 : layout

Things that overlap almost impossible to interpret.

Maxim #5 : layout - sequence

ORDER

We expect things to be displayed
in sequence.

If we wish to imply a sequence,
arrange things in that sequence.

This can be particularly useful when
'telling a story' in a presentation.

<http://bit.ly/2Ap1Ynn>



Jean-Luc Doumont



Module survey : Please

Take Survey

The screenshot displays the Minerva LMS interface. At the top, the 'Minerva' logo is on the left, and navigation links for 'Home', 'Teach', 'Discover', and 'Files' are on the right. Below the header, the course title '19/20(1) GEOG5927M Predictive Analytics (33841)' and 'Announcements' are visible. A sidebar on the left lists 'Module Management' options such as 'Control Panel', 'Minerva Files', and 'Module Tools'. The main content area features an announcement titled 'Concerns about cancelled teaching/strike action', posted by Jamie Mulen on Tuesday, 26 November 2019. The announcement text expresses understanding of student concerns and promises to address them once industrial action ends. It is signed off by Dr Clare Woods and Dr Duncan Quincey.

Minerva

Home Teach Discover Files

19/20(1) GEOG5927M Predictive Analytics (33841) Announcements

19/20(1) GEOG5927M Predictive Analytics (33841)

Module Management

- Control Panel
- Minerva Files
- Module Tools
 - Announcements
 - Blackboard Collaborate Ultra
 - Blogs
 - Discussion Board
 - Glossary
 - Journals
 - Module Media
 - Rubrics
 - Send Email
 - Staff Information
 - Tasks
 - Tests, Surveys, and Pools
 - Turnitin Assignments

Announcements

Concerns about cancelled teaching/strike action

Posted on: Tuesday, 26 November 2019 10:19:23 a/dtack GMT

Posted by: Jamie Mulen
Posted on: 19/20(1) GEOG5927M Predictive Analytics (33841)

Dear GEOG5927 Students

I understand your concerns about cancelled teaching this week. Thank you for bearing with us during this difficult period. We will be making every effort to ensure that students are not unfairly disadvantaged. The details of how that will be accomplished will be decided with module staff once the industrial action has finished. In the meantime I must kindly ask for your patience.

Regards,

Dr Clare Woods and Dr Duncan Quincey

Module survey : Please

[Take Survey](#)

- take your time
- remember that this is anonymous
- be as specific as possible - detail
- identify both positives and negatives
- use the full range of scores
- consider 'feedback' broadly

break