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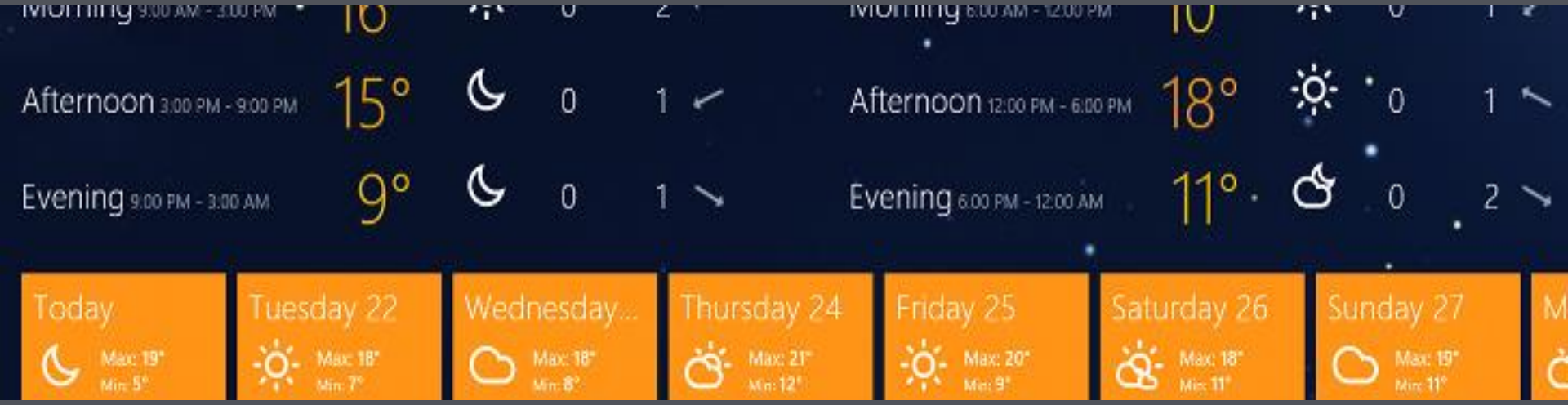
DO LOCATION SPECIFIC FORECASTS POSE A NEW PROBLEM FOR THE COMMUNICATION OF UNCERTAINTY?



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CHANGING FORECAST CONSUMPTION

- Weather forecast consumption changing in common with changes in media in general from ‘broad’ (e.g. TV) to ‘narrow’ (e.g. smartphone) methods
- What impact has and will this have on understanding and communicating uncertainty?
- A street interception study of 274 adults in Reading and surroundings

SURVEY DESIGN

- Surveys took place in a variety of public locations around Reading, and took 5-10 minutes to complete
- Participants were anonymous, gave informed consent and were free to withdraw at any time
- 144 females, 128 males and 2 participants who preferred not to record their gender
- Mean age 40.6 years
- 237 participants identified as British with 37 from elsewhere

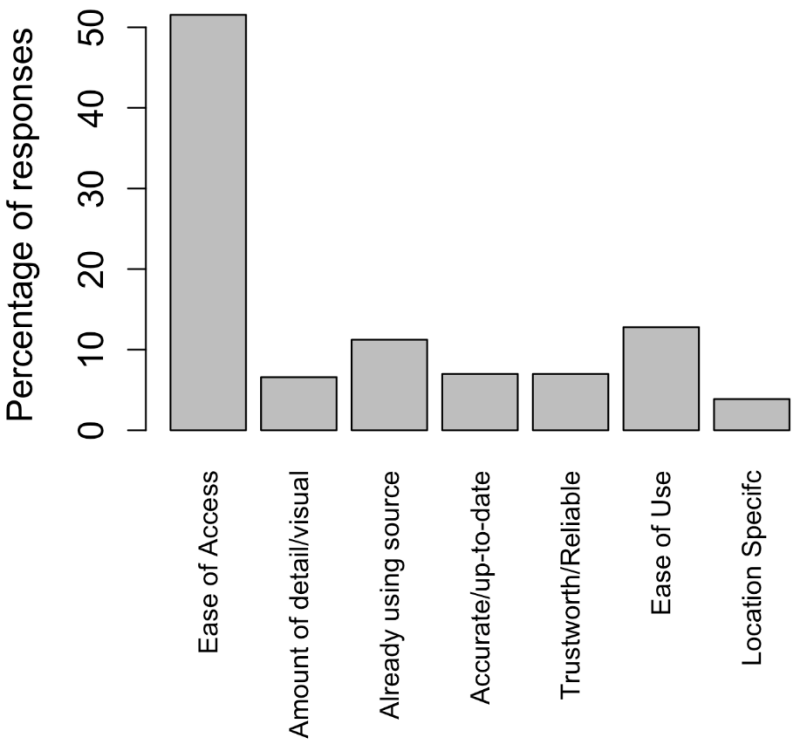
PREFERRED SOURCE OF WEATHER FORECASTS

	Mobile Telephone	Website	Television	Radio	Total
Age 40 or below	58% (77)	28% (37)	13% (17)	1% (1)	132
Age above 40	19% (25)	30% (40)	38% (51)	13% (17)	133
Total	38% (102)	29% (77)	26% (68)	7% (18)	265

Significant difference (p=0.00) between two groups using a chi-squared test

REASONS FOR PREFERRED SOURCE

- Ease of access dominates weather forecast choice
- 79% of respondents satisfied or very satisfied with forecasts but only 44% had high or very high confidence in them
- 50% of those who prefer phone/web forecasts still use TV forecasts at least twice per week
- 65% of those who prefer TV forecasts never use phone forecasts

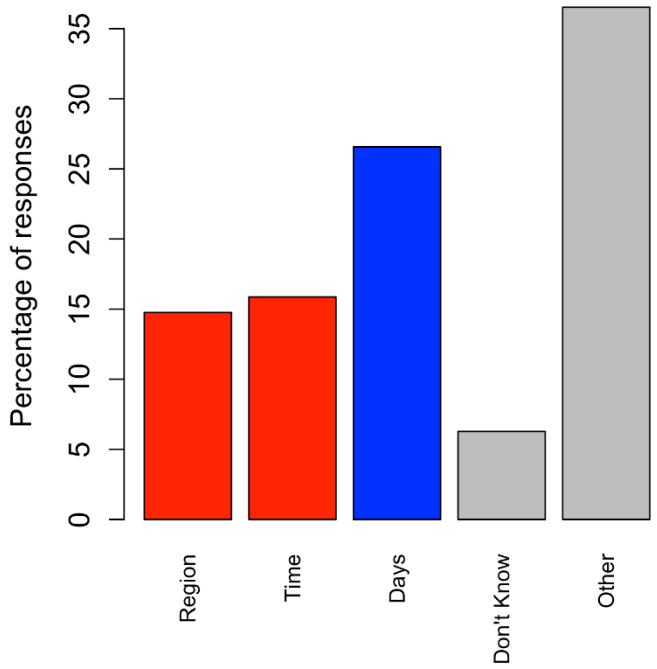


UNDERSTANDING OF UNCERTAINTY

"Imagine that the weather forecast predicts 'There is a 30% chance of rain tomorrow'. Please indicate which of the following is the most appropriate interpretation of the forecast?"

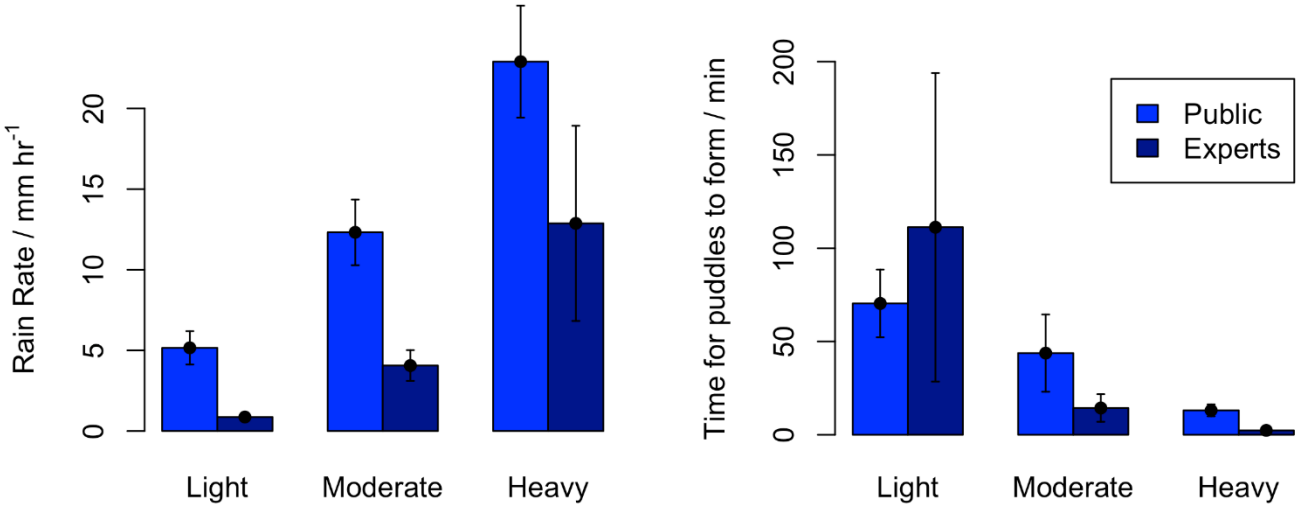
1. It will rain in 30% of the region
2. It will rain for 30% of the time
3. It will rain on 30% of days like tomorrow
4. I don't know
5. Other

Consistent with Gigerenzer et al. (2005), Morss et al. (2008) and Peachey et al. (2013)

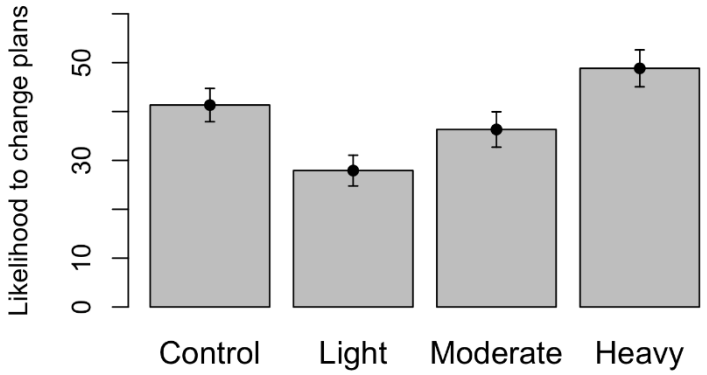


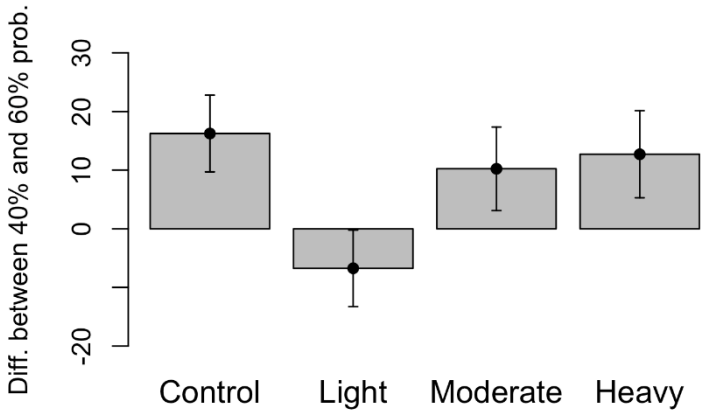
INTERPRETATION OF INTENSITY

- Compare interpretation of general public sample with smaller sample (n=7) of professional meteorologists



COMBINING INTENSITY AND LIKELIHOOD





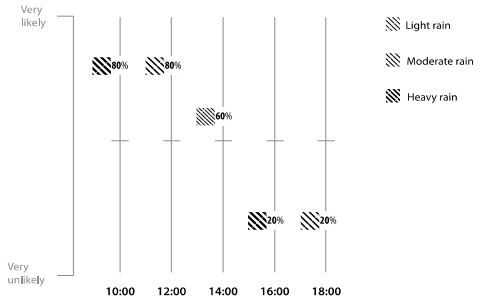
- If no intensity information is given, likelihood to change plans is 40%
- Likelihood reduced for ‘Light’ rain
- For ‘Moderate’ and ‘Heavy’ rain a change in probability from 40 to 60% results in a small increase (10%) in the likelihood to change plans.

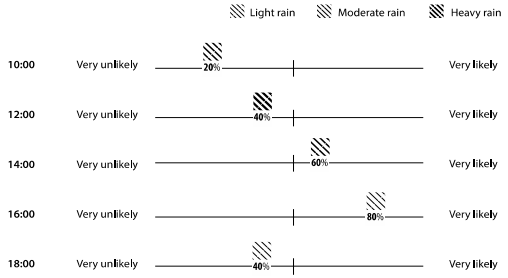
VERBAL VS. GRAPHIC PRESENTATION

- Respondents asked to make decisions based on forecasts presented in different formats
- After using all four formats 86% of respondents preferred the non-graphical presentation and 50% preferred the verbal only method (top left)

Time	Likelihood of rain	Intensity of rain
10:00	High	Heavy
12:00	High	Moderate
14:00	Medium	Light
16:00	Low	Heavy
18:00	Low	Moderate

Time	Likelihood of rain	Intensity of rain
10:00	20%	Moderate
12:00	40%	Heavy
14:00	60%	Moderate
16:00	80%	Light
18:00	40%	Light





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USER INTERPRETATION

Format	80% Heavy	80% Moderate	60% Light	20% Heavy	20% Moderate
Mean likelihood to change plans	68%	52%	25%	30%	21%
Verbal	9	13	147	20	74
Graphical	11	7	120	49	75

- Using information from previous question we can estimate how likely respondents would be to change their plans
- Significant difference in distribution between the two communication methods (p=0.002, chi-squared test)

FUTURE WORK

- We are about to begin a new project with a broader remit to investigate the psychological and design dimensions of communication of uncertainty for natural hazards
- Our focus will initially be on hazard maps – clear link to much discussed this week
- We are looking both for collaborators on this work and test subjects for our experiments
- Please do get in touch if you are interested in getting involved

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CONCLUSIONS

- The way weather forecasts are consumed is changing rapidly, particularly for those under 40
- There is significant misunderstanding amongst the general public about the interpretation of the probability of precipitation and descriptions of precipitation intensity
- As users increasingly use location based and narrow-cast methods of communication, there is a huge challenge in providing user friendly means of accessing increasingly complex forecasts

This work appears in Met. Apps. (doi: 10.1002/met.1487)

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