

Supplement of Geosci. Commun., 2, 101–116, 2019
<https://doi.org/10.5194/gc-2-101-2019-supplement>
© Author(s) 2019. This work is distributed under
the Creative Commons Attribution 4.0 License.



Supplement of

The Met Office Weather Game: investigating how different methods for presenting probabilistic weather forecasts influence decision-making

Elisabeth M. Stephens et al.

Correspondence to: Elisabeth M. Stephens (elisabeth.stephens@reading.ac.uk)

The copyright of individual parts of the supplement might differ from the CC BY 4.0 License.

Supplementary Information

S1. Preliminary / Socio-Demographic Questions

Age – The exact age of the participant asked for, and for UK Data Protection reasons this was banded into one of 6 groups; Under 16, 16-25, 26-35, 36-45, 46-55, or Over 55.

First 3 characters of post / zip code: For Data Protection reasons this was limited to the first half of the post code, and was asked so as to identify the geographical location of participants.

Gender (Male / Female)

Have you played the game before? (Yes / No) – so as to enable us to eliminate repeat players from the analysis. This will rely on participant honesty.

Educational Attainment – The participant was asked to select all qualifications that applied to them. For the analysis we took the highest level of attainment, and assumed that professional qualifications were at a level higher than a degree. This of course is not necessarily the case. A list of the options is shown below, for comparison with the US system, the first is a secondary school level qualification, the second are vocational qualifications, and the third contains qualifications (largely) for university entry.

- O levels / CSEs / GCSEs (any grade) / Foundation Level Diploma
- NVQ Level / GNVQ (any level) / City & Guilds Equivalent / BTEC or RSA Diploma
- A Level / AS Level / VCES
- Degree (for example BA BSC) or higher degree (for example MA, Ph.D, PGCE)
- Professional qualifications (for example accountancy) other vocational / work related qualifications
- Foreign qualifications
- No formal qualifications

Have you ever been taught or learnt about how scientists use computers to model the environment? (Yes, No, I'm not sure) – Asked to separate experts from non-experts.

Do you often make decisions or judgements based on risk, chance or probability? (Yes, No, I'm not sure) – Asked as a potential indication of risk awareness.

S2. ANOVA Test

For statistical testing the Presentation Types have been coded by their information content and their format:

Content: 1= deterministic, 2=rating, 3=probability

Format: 1=text only, 2=graphic, 3=graphic and text

Our intention was to use a mixed model of within and between factors, but we were heavily limited by computational power due to the size of the matrix created. We were therefore limited to a more simple ANOVA with main-effects and all 2-way interactions, carried out in 'R' using the following script:

anova=aov(squareerror~(age*qualifications+age*content+age*format+age*week_order+age*gender+age*week+qualifications*content+qualifications*format+qualifications*week+qualifications*week_order+qualifications*gender+content*format+content*week+content*week_order+content*gender+format*week+format*week_order+format*gender+week*week_order+week*gender+week*week_order*gender),data=results)

	Df	Sum Sq	Mean Sq	F value	P Value
Age	5	32.7	6.5321	217.1215	< 2.2e-16
Qualifications	6	17	2.8332	94.174	< 2.2e-16
Content	1	5.4	5.4033	179.5995	< 2.2e-16
Format	1	0.2	0.1812	6.0214	0.014135
week_order	3	42.3	14.1116	469.0572	< 2.2e-16
Gender	1	2	1.9698	65.4739	5.94E-16
Week	3	22.4	7.4617	248.0209	< 2.2e-16
age:qualifications	30	6.5	0.215	7.148	< 2.2e-16
age:content	5	0.2	0.0364	1.2089	0.301918
age:format	5	0.9	0.1734	5.7621	2.53E-05
age:week_order	15	0.6	0.0426	1.4143	0.13012
age:gender	5	0.6	0.1172	3.8956	0.001566
age:week	15	2.6	0.1708	5.678	7.90E-12
qualifications:content	6	0.5	0.0868	2.8864	0.008184
qualifications:format	6	0.6	0.1063	3.5346	0.001685
qualifications:week	18	1.2	0.0676	2.2463	0.001824
qualifications:week_order	18	0.8	0.0464	1.5408	0.066241
qualifications:gender	6	1.5	0.2451	8.1477	7.89E-09
content:format	1	0.1	0.0862	2.8661	0.090466
content:week	3	0.9	0.2984	9.9184	1.56E-06
content:week_order	3	0.5	0.1603	5.3278	0.001143
content:gender	1	0	0.0447	1.4873	0.22264
format:week	3	0.2	0.068	2.2604	0.07921
format:week_order	3	0.3	0.0854	2.8376	0.036526
format:gender	1	0.1	0.0564	1.8763	0.170756
week_order:week	9	1.3	0.1423	4.7294	2.60E-06
gender:week	3	0.2	0.0826	2.7443	0.041442
week_order:gender	3	0.2	0.0607	2.0169	0.109176
week_order:gender:week	9	0.6	0.0718	2.385	0.010742

Figure S1: ANOVA Summary Table

S3. Example Screenshots

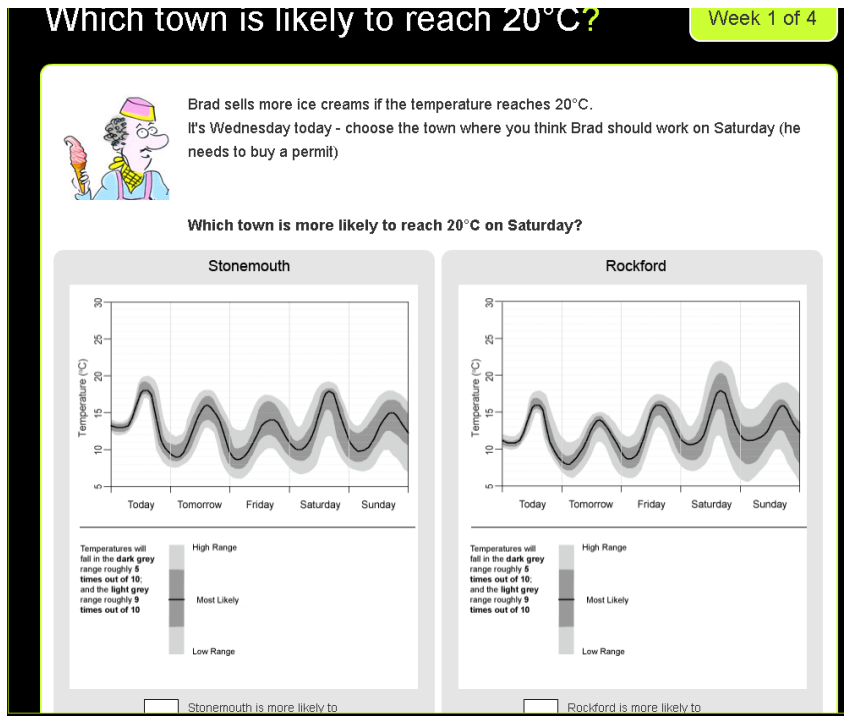


Figure S1: Temperature question - location choice

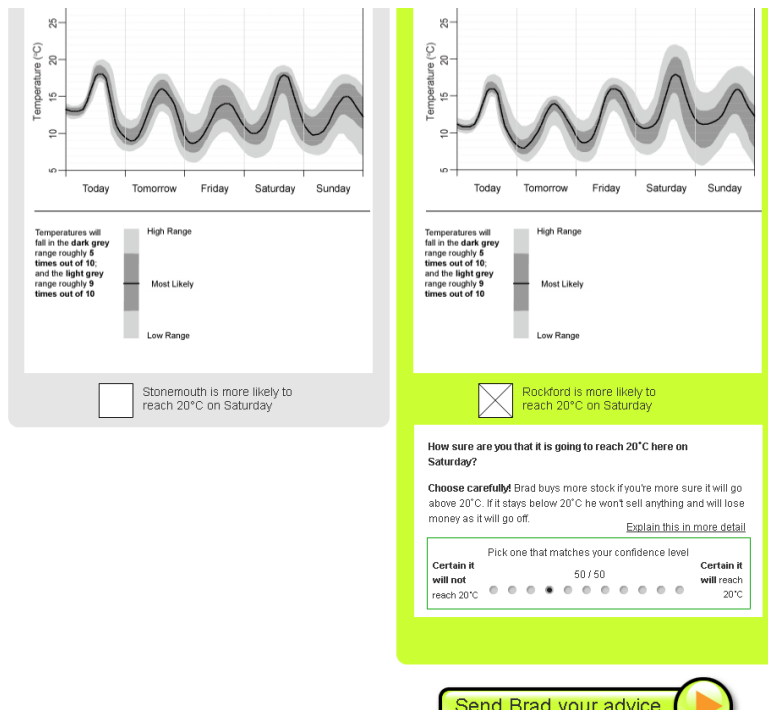


Figure S3: Temperature question - confidence choice

The shift choice

The interface displays four weather forecast options, each with a corresponding icon and a feedback message:

- light rain showers**: Chance of any rain **HIGH**. Feedback: "You provided good advice, but on this occasion it rained".
- sunny intervals**: Chance of any rain **MED**. Feedback: "Well done - it didn't rain".
- sun**: Chance of any rain **LOW**. Feedback: "Well done - it didn't rain".
- sun**: Chance of any rain **LOW**. Feedback: "Well done - it didn't rain".

Below each forecast is a "Rain confidence" scale from "No Rain" to "Rain", represented by a row of 10 dots. The first scale (for "light rain showers") has the 4th dot from the left filled, indicating a confidence level of approximately 40%. The other three scales have the 1st dot from the left filled, indicating a confidence level of approximately 10%.

A summary box at the bottom states: "Brad bought extra stock and made: £37 because it all sold out".

Figure S6: Example of feedback provided to participants at the end of each 'week'

Thank you for helping us!

Brad followed your advice. How well did he do in total?

Overall, your advice gained him

£ 245

Brad thinks you're about as good as a
'Red Hot Meteorologist'



What now?

If you have any comments on this game that you think might help, please contact us on: enquiries@metoffice.gov.uk.

Please note we will not be replying individually to this feedback.

* **Play again** - remember that the outcomes will be different next time round

See if different ways of displaying the temperature and rainfall forecasts help improve your score

* **Share with others** - help us collect data from more people by spreading the word

I scored 245 pounds on the Met Office weather game and was ranked as a 'Red Hot Meteorologist'



Figure S7: Feedback at end of game

S4. Impact of modelling question

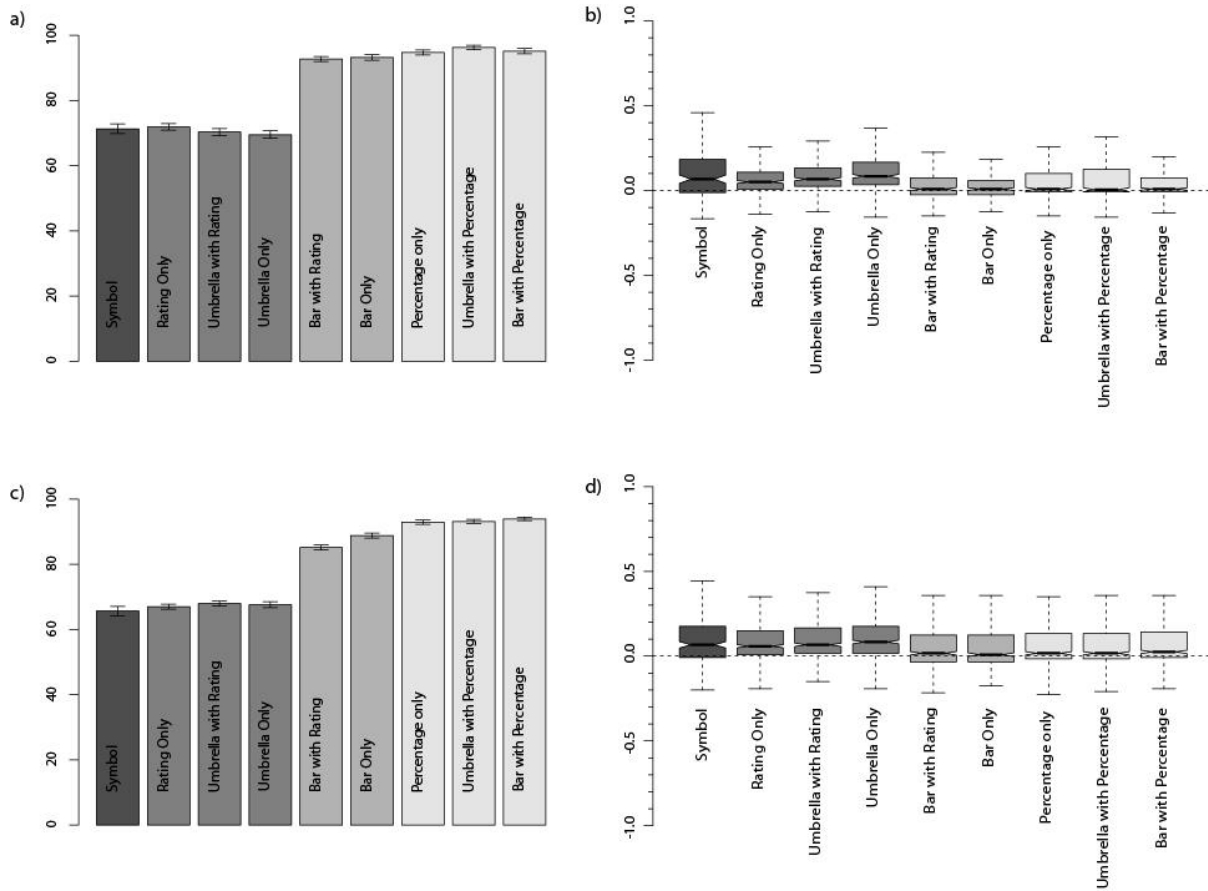


Figure 2: Differences in outcomes for all rainfall questions depending on if participant answered yes (n=2753, shown in a&b) or no (n=4686, shown in c&d) to "Have you ever been taught or learnt about how scientists use computers to model the environment"?