Expressing Uncertainty

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Why look at Uncertainty?

Uncertainty and wargames are linked. Whether this is expressed through rolling dice or using ‘event cards’ or requires human negotiation.

These types of uncertainty we can calculate. Where we can calculate we can make assessments, and factor these into analyses.

But how can human uncertainty be considered in a game context? And Why does it matter?

Consider a matrix game, where players are assigning probabilities to their actions or even evaluating pro/con arguments. Both of these dynamics are affected by how well the players identify uncertainty of others but also how well they express or hide their own uncertainties.

Thinking about how players, adjudicators, and analysts express uncertainty could be useful in evaluating the validity of insights generated, or things to research further.

Let’s start with a quiz …

DAVID SPIEGELHALTER, 2024, THE ART OF UNCERTAINTY: HOW TO NAVIGATE CHANGE, IGNORANCE, RISK AND LUCK, PENGUIN BOOKS.

SEE ALSO HTTPS://WWW.YOUTUBE.COM/WATCH?V=CYBNIP2KYW0

Quiz structure

I will ask you 3 questions

I want you to write down two things

1. What is your answer

2. On a scale from 5 to 10 express how certain you are in your answer.
   - A score of 5 means you are totally uncertain – it could be the answer but you feel it could equally be totally wrong.
   - A score of 10 means you are absolutely certain you've got this right.

After you've answered the questions and assigned your certainty scores, we will have the next stage.

This activity (with different questions) is taken from: David Spiegelhalter, 2024, The Art of Uncertainty: How to navigate change, ignorance, risk and luck, Penguin Books. Pp.39-45 and he uses this example in numerous presentations some of which can be found on youtube.

Q1. Car number plates in the UK used to have a single letter before three numbers. The letter indicated the year the car was registered. What year was the M ‘prefix’?

A. August 1994-July 1995
B. August 1995-July 1996
C. January 1995-Dec1995
D. January 1994-Dec 1994

Q2. What period was Lee Kuan Yew Prime Minister of Singapore

A. 1957-1988
B. 1959-1990
C. 1958-1997
D. 1960-1988

Q3. What is the longest two digit A road in the UK?

A. A46
B. A30
C. A9
D. A38

Now partner with 1, 2, 3 people near you and come to a collective set of answers and probabilities

PLEASE KEEP YOUR OWN INDIVIDUAL ORIGINAL ANSWERS

THIS ACTIVITY IS TAKEN FROM: DAVID SPIEGELHALTER, 2024, THE ART OF UNCERTAINTY: HOW TO NAVIGATE CHANGE, IGNORANCE, RISK AND LUCK, PENGUIN BOOKS. PP.39-45

Marking

Q1 – A – August 1994-July 1995

Q2 – B – 1959-1990

Q3 – D – 292miles from Cornwall to Nottinghamshire

Scoring – right answers

This activity is taken from: David Spiegelhalter, 2024, The Art of Uncertainty: How to navigate change, ignorance, risk and luck, Penguin Books. Pp.42

with a confidence of	5	6	7	8	9	10
Score	0	9	16	21	24	25

Scoring wrong answers

This activity is taken from: David Spiegelhalter, 2024, The Art of Uncertainty: How to navigate change, ignorance, risk and luck, Penguin Books. Pp.42

Confidence	5	6	7	8	9	10
Score	0	-11	-24	-39	-56	-75

Why this scoring system?

This system works for thinking about not just the answer to the question but also how accurate you are at knowing your ‘rightness’.

“This is not an arbitrary punishment but a consequence of designing a scoring rule that encourages honesty.” (Spiegelhalter, 2024:41)

“This simple quiz therefore has deep lessons. It shows that epistemic uncertainties can be quantified as probabilities, which are necessarily subjective and expressed by an individual on the basis of their available knowledge.” ((Spiegelhalter, 2024:43)

Now think about a team in a wargame as an ‘epistemic community’, where we know some of their available knowledge (briefing packs, scenarios, injects) we now have a new avenue to explore, of the difference between the decisions made and the available provided knowledge.

Did you do better or worse as an individual or a group?

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Group dynamics and uncertainty

Group dynamics can play an important role in *how* games are played.

Lots of factors can affect the way people play – is it before or after lunch? Did your players sleep well or have jet lag, did they know each other before, is there an (implicit or explicit) hierarchy between players, are there gender dynamics, age dynamics, different educational backgrounds, extroverted, introverted, extro-introverts … (this is not an exhaustive list).

Possibly understanding uncertainty and how your players or analysts express it might be helpful in understanding some of these dynamics.

Did you follow the insights of the outlier or the dominant view?

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Uncertainty

To be sure, there are considerations of confidence in analysis produced.

There are also many games are ‘by design’ engaging in evaluating uncertainty, certainty, likelihood, chance and so forth.

I am yet to see ways that games consider or capture ‘uncertainty’ of players or how and when considering ‘uncertainty’ might contribute to analysis. Or when the ‘wisdom’ of crowds is helpful or unhelpful.

Mark Jones Jr. 2017, Communicating uncertainty in #Wargame outcomes

The strategy Bridge, published 30 March 2017, https://thestrategybridge.org/the-bridge/2017/3/30/communicating-uncertainty-in-wargaming-outcomes

See also Georgetown University Wargaming Society https://www.youtube.com/watch?v=BDZaHpXyVmU

3Q method

1. **Express the outcome both qualitatively and quantitatively**.
2. **Describe the range of possible outcomes**.
3. **Assess the frequency of potential outcomes**.

“should use them like painted outlines of the practice pitch, boundary markers on the playing field,”

Analysis of games

To date considerations about how to analyse games have considered a number of questions:

Facsimile: to what degree should games reflect 'reality'?
- Should they reflect material realities, or realities in decision making teams? The pressures under which decisions are made? The incomplete information space?

Diversity : what should be the composition of players, designers and analysts?
- What if you have players who are very good or very poor at expressing their uncertainty?

Verification and Validation: how can game play or outcomes be verified and validated?
- This might be where Mark Jones's expression of uncertainty is most useful.

Data: what data do you need to collect and in what form?

Immersion: what level of immersion of players is required for valid outcomes?
- What type of immersion is useful? Does it help or hinder the ability to capture uncertainty?

Analysis: once you've collected the data what analytical processes do you apply to it.

Research design: what and when can games be useful as research or in research.

References – and my thanks to …

This presentation was inspired by being introduced to the statistics and discussion of uncertainty in: The Art of Uncertainty.

But, this has been complemented by Spiegelhalter's presentations of this book and a previous book:

Spiegelhalter, The Art of Statistics. Penguin (2020)

Uncertainty and Wargames has also been considered by:

Mark Jones Jr. 2017, Communicating uncertainty in Wargame outcomes *The strategy Bridge*, published 30 March 2017, https://thestrategybridge.org/the-bridge/2017/3/30/communicating-uncertainty-in-wargaming-outcomes

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