Concreteness and Abstraction in Everyday Explanation

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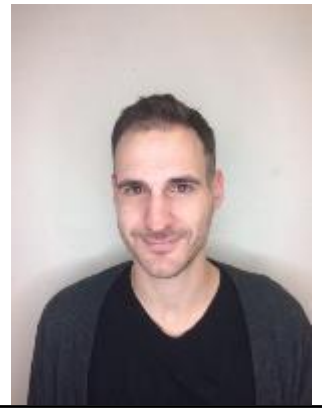

What goes into a good explanation?

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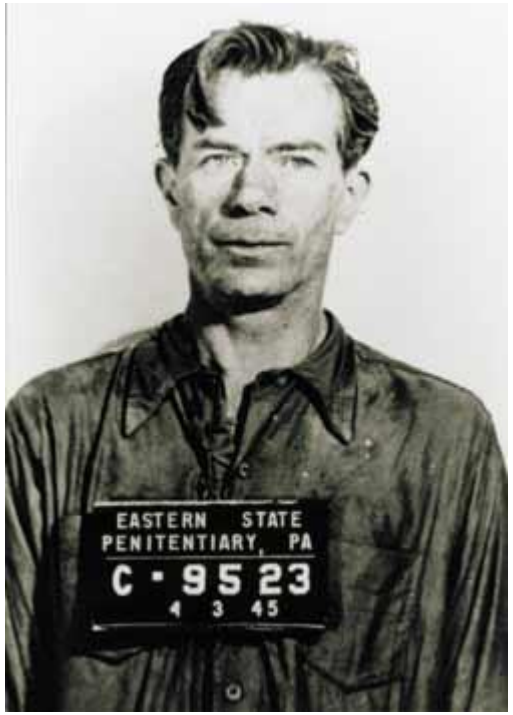
- Why there was an accident rather than no accident at all?
- Why there was an accident at 16:02:34.726 rather than 16:02:35.123?

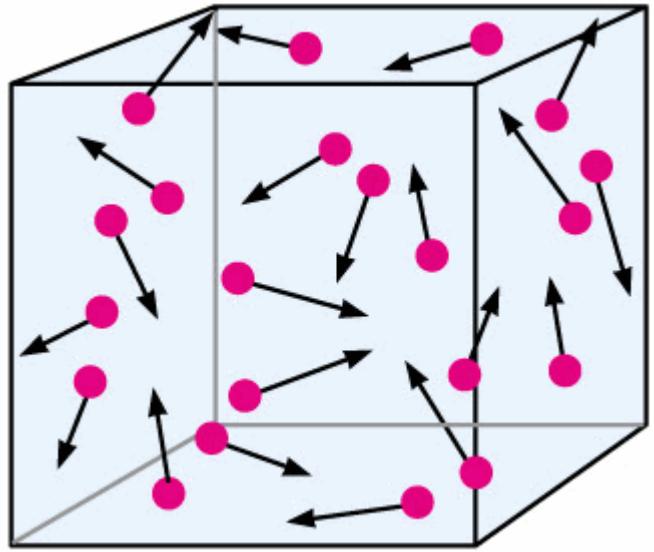
- For Garfinkel (1981), every why question implies a contrast class:

- Reporter: Why you robbed banks?
- Willie Sutton (v1): Because that's where the money is.
- Willie Sutton (v2): Because I enjoyed it. I loved it. I was more alive when I was inside a bank, robbing it, than at any other time in my life.



What goes into a good explanation?

- For some philosophers including everything that has a causal role is ideal but unattainable.
  - Railton (1981): Abstraction is a compromise
  - Nowak (1992): Science works through concretization: We start from a vague description and keep adding information until we get "the true causal story"



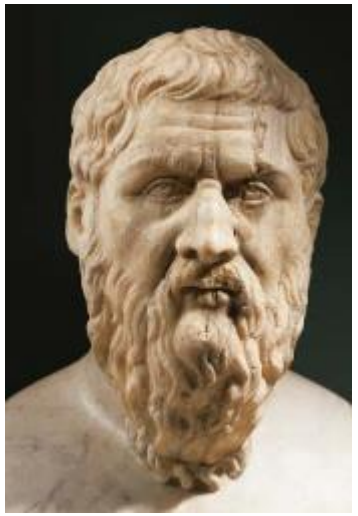
What goes into a good explanation?

- Garfinkel (1981): Hyperconcrete explanations are not merely too good to be true (impractical) but are actually "too true to be good"
- Strevens (2007): Good explanations must lie
  - In his Kairetic account, Strevens describes that in order to generate the optimal explanation
    1. we include every imaginable event
    2. we remove and abstract everything that makes no difference to whether or not the explanandum occurred.

- Garfinkel, Strevens, Woodward, Hitchcock , Weslake: **What matters is counterfactual dependence not causal influence**

What is a good explanation?

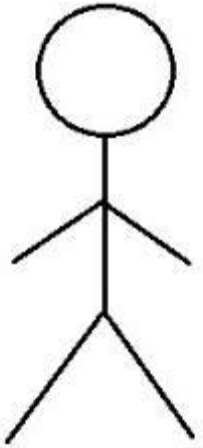
What goes into a good explanation?



Philosophical view
What should be included in a good explanation?

Only factors that made a difference to the explanandum

Everyday view
How people evaluate explanations varying on what is included?



Empirical Findings

- Weisberg et al (2008, 2016): The Seductive Allure of Neuroscience
  - People have a bias towards reductionism, lower level details in explanations
- Adding irrelevant neuroscientific information increased the judged quality of explanations for both naïve adults and neuroscience students (not experts though).
- Explain the curse of knowledge:

The researchers claim that this "curse" happens because subjects have trouble switching their point of view to consider what someone else might know, mistakenly projecting their own knowledge onto others.

vs.

Brain scans indicate that this "curse" happens because **of the frontal lobe brain circuitry known to be involved in self-knowledge**. Subjects have trouble switching their point of view to consider what someone else might know, mistakenly projecting their own knowledge onto others.

Experiments: Overview

- Present the description of an event
- Ask participants to evaluate 3 explanations

Concrete	Abstract	Irrelevant
Only causally relevant events with high precision	Only counterfactually relevant events	Same as concrete but includes irrelevant information

- Ask participants to evaluate the causal relevance of each factor mentioned in the description and the explanations.

Experiment 1

Times & Citizen

WEDNESDAY, APRIL 15, 2015

LANDSLIDE IN ROCHESTER

In a village outside Rochester, New York, a landslide caused the destruction of one home and the evacuation of 35 others. The destroyed house was built in 2012.

Nobody has been injured. According to statement from the governor's office, state officials are working with local municipalities in the affected areas. County road crews have already begun the cleanup effort.

Here's what is currently known about the landslide:

The hill, situated 5 miles north of the premises of the annual Lilac festival, had a 37 degree slope.

The hill consisted mainly of light brown sandy particles with diameter 2/64 of an inch.

The vegetation was non-edible and covered 13% of the hill.

Times & Citizen

WEDNESDAY, MAY 15, 2015

POOR WEATHER AND BUGS AFFECT STRAWBERRY CROPS

The strawberry market is growing 10-15% a year, and fresh berries are now consumers' most popular fresh fruit. However, British strawberry growers in some parts of the country are having their worst season in years.

Strawberry grower Sandy Booth, from Hampshire's New Forest says his crop usually produces more than 2000 tonnes. But he says he's probably lost between 50-100 grams of berries per plant in recent months.

Here are some facts about this year's strawberries:

The mean temperature when the white strawberry flowers started to grow was 2 degrees Celsius.

There has been a 27% increase in the frequency of attacks by the strawberry bug (phytonemus pallidus) which is only about 0.25mm is size.

77mph winds were blowing from the east just as the fruit was starting to ripen.

Experiments: Landslide

Concrete

The fact that the hill, consisted mainly of sandy particles with diameter 2/64 of an inch meant that the soil was unstable. The vegetation covering 13% of the hill did not withhold the rainwater causing soil erosion. Finally, the force of gravity acting down the 37 degree slope overcame the resistance of friction thus triggering the landslide.

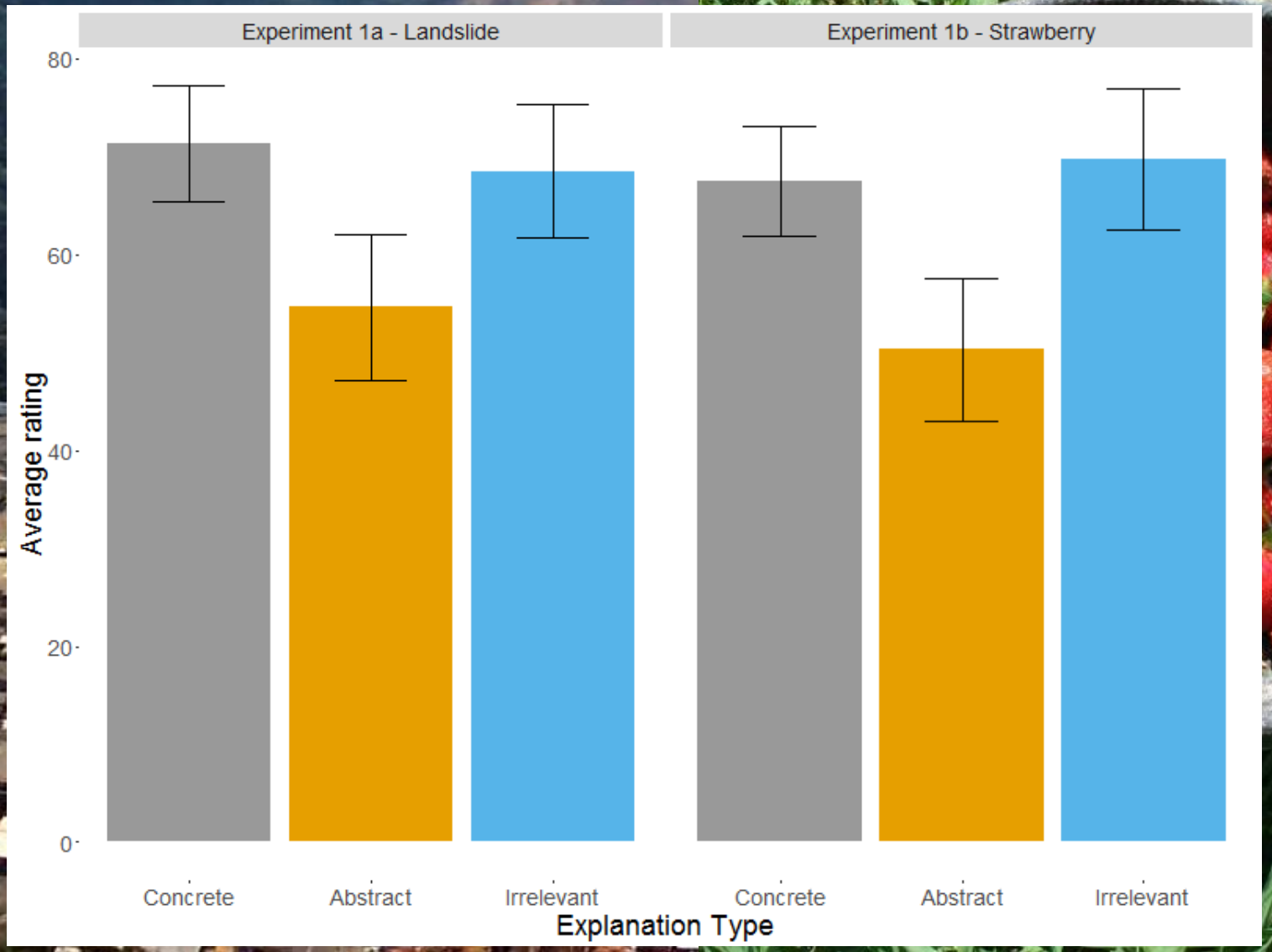
Abstract

The fact that the hill, consisted mainly of fine sandy particles meant that the soil was unstable. The sparse vegetation did not withhold the rainwater causing soil erosion. Finally, the force of gravity acting down the steep slope overcame the resistance of friction thus triggering the landslide.

Irrelevant

The fact that the hill which was 5 miles north of the premises of the annual Lilac festival, consisted mainly of light brown sandy particles with diameter 2/64 of an inch meant that the soil was unstable. The non-edible vegetation covering 13% of the hill did not withhold the rainwater causing soil erosion. Finally, the force of gravity acting down the 37 degree slope overcame the resistance of friction thus triggering the landslide.

Explanation Ratings



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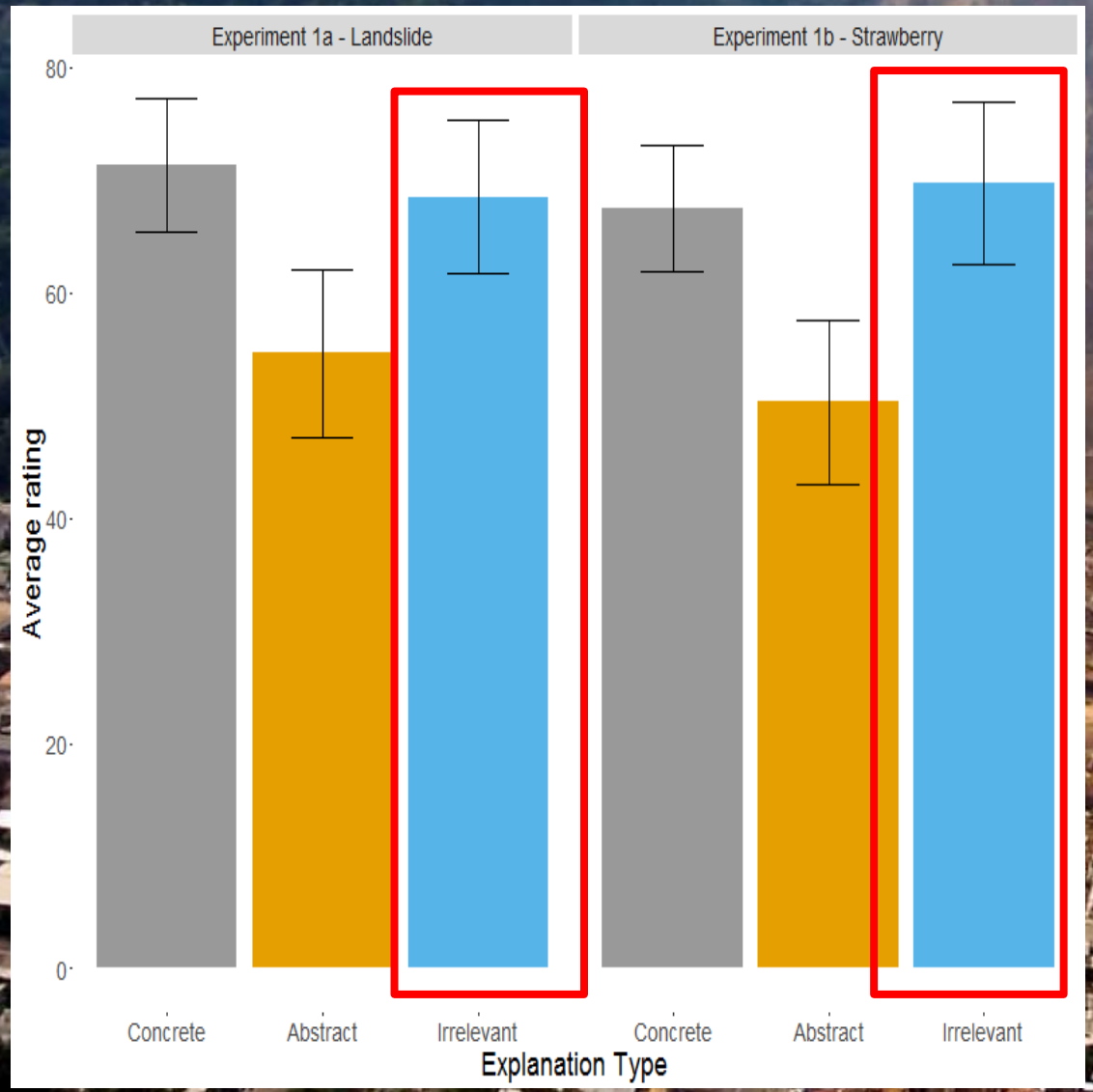
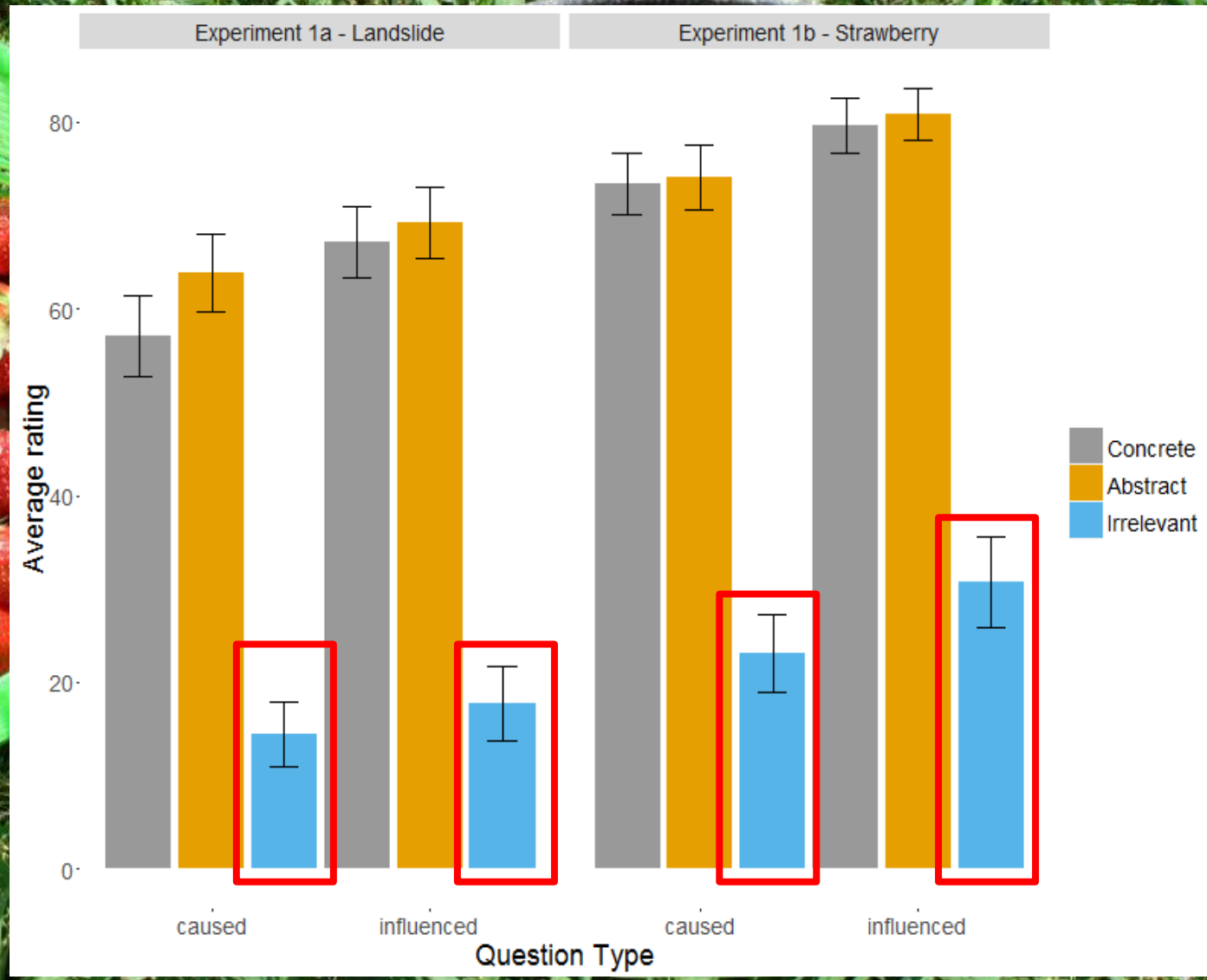
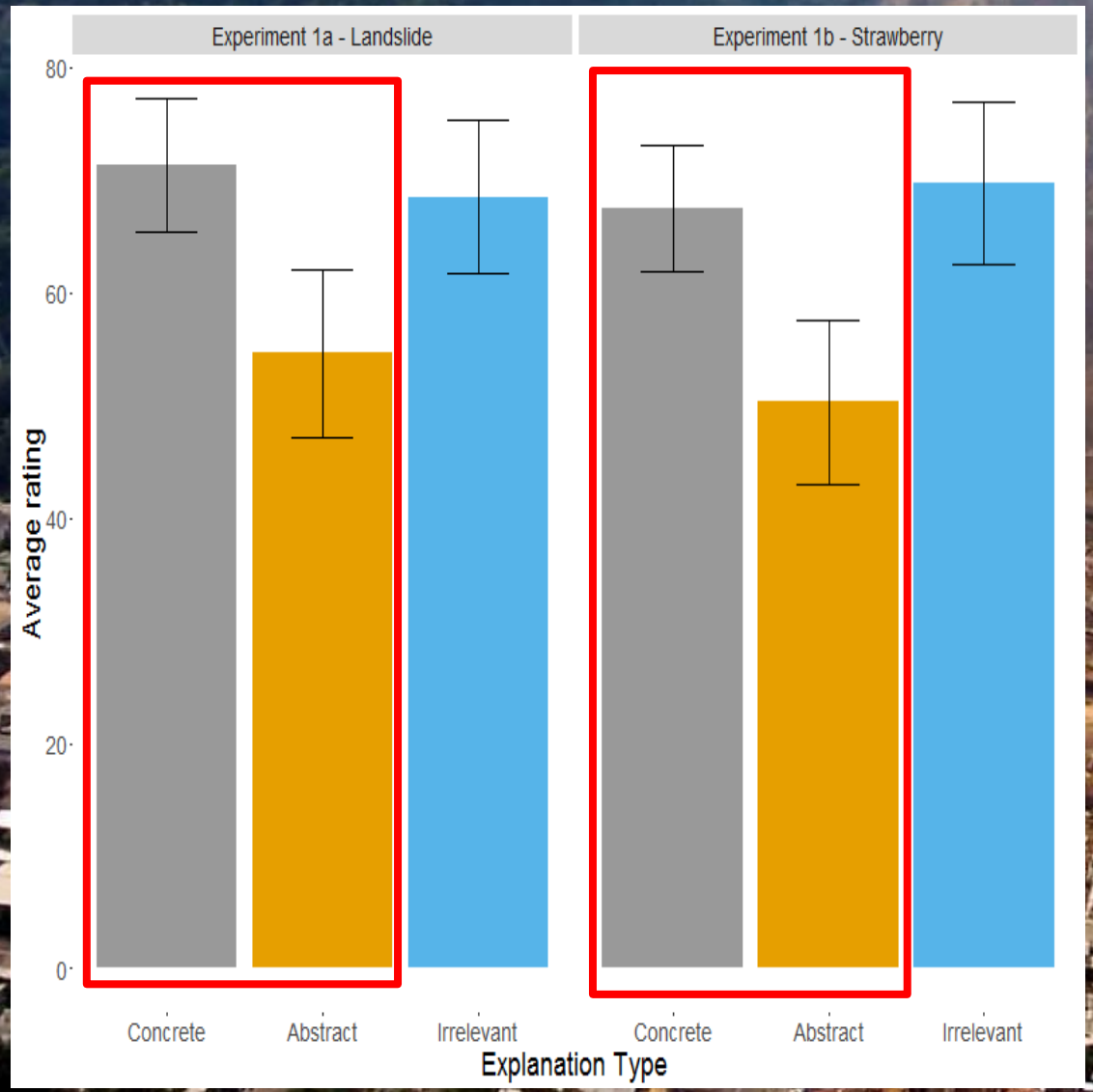


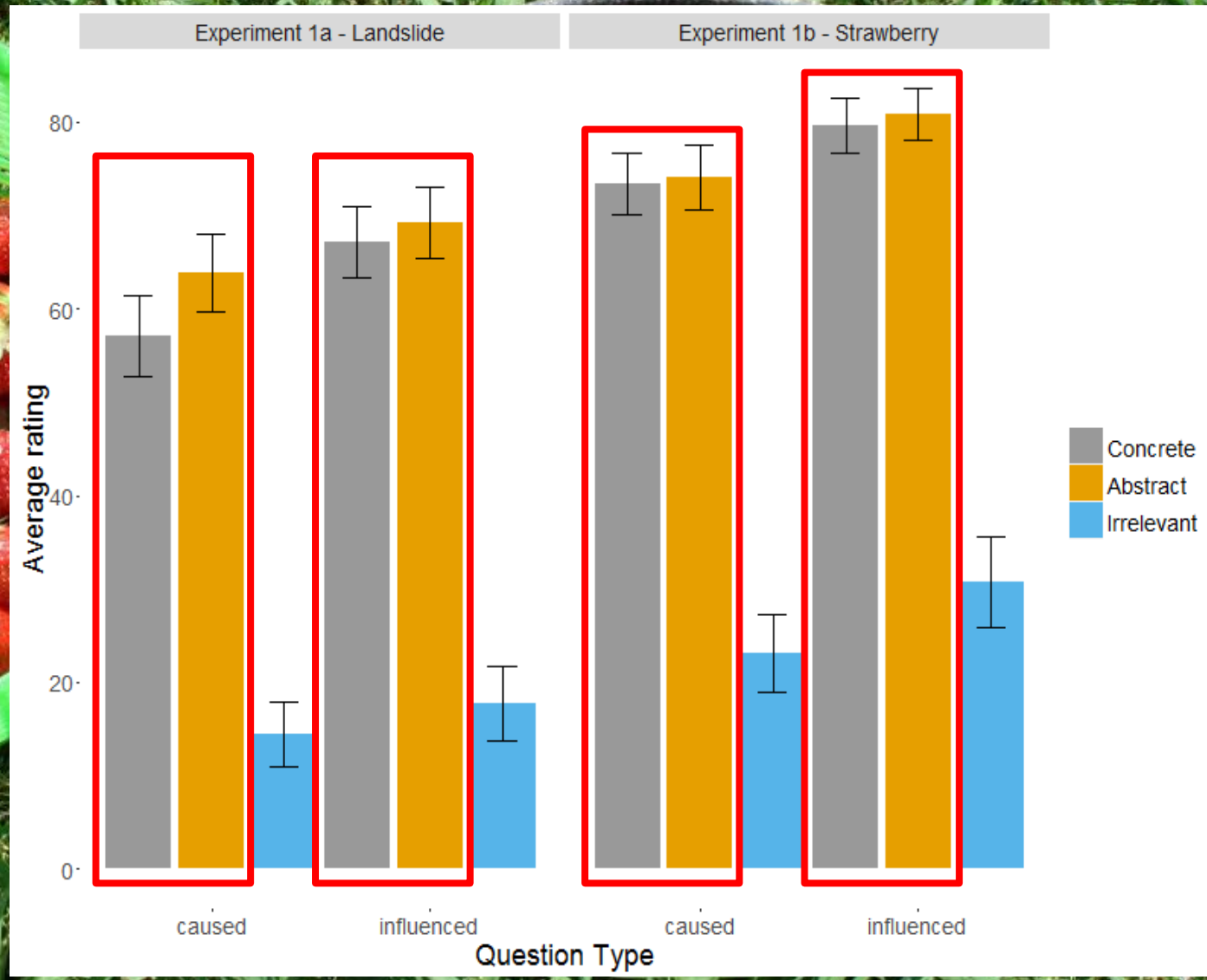
Causal Ratings



Explanation Ratings



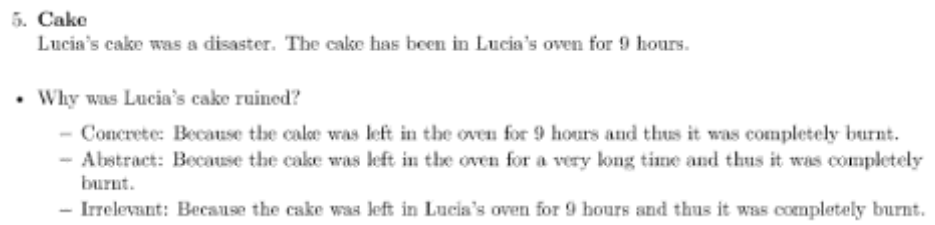
Causal Ratings



Concreteness and detail preferred over abstraction

- Participants do not penalize causally irrelevant information included in explanations
- Participants prefer explanations to mention the events in as much detail as possible compared to mentioning only the counterfactually critical factors.

- Repeated the experiments with numerical information in all explanation types
  - no difference
- Replaced newspaper reports with multiple short stories (within)
  - no difference



5. **Cake**
   Lucia's cake was a disaster. The cake has been in Lucia's oven for 9 hours.

   - Why was Lucia's cake ruined?
     - Concrete: Because the cake was left in the oven for 9 hours and thus it was completely burnt.
     - Abstract: Because the cake was left in the oven for a very long time and thus it was completely burnt.
     - Irrelevant: Because the cake was left in Lucia's oven for 9 hours and thus it was completely burnt.

Is causality a requirement?

- Created hyperconcrete explanations that did not communicate the critical causal properties.

e.g. Peter was suffering from respiratory problems. The concentration of carbon dioxide in the school where he was teaching was regularly at the very high level of 3000ppm.

Why was Peter suffering from respiratory problems?

- Concrete: Because he was regularly exposed to carbon dioxide **at the level of 3000ppm**.
- Abstract: Because he was regularly exposed to a **very high level of carbon dioxide**.

Results:

<u>Concrete explanations without causal information are NOT preferred.</u>

Explaining the explanation preferences

- Two unexpected findings in need of explanation:

1. Why don't participants penalize the presence of (causally) irrelevant information
   - why it is ok to refer to the edibility of the vegetation when explaining the landslide?

2. Why people prefer concreteness over abstraction?
   - It is true that Michael drunk exactly 8 vodka shots and 3 glasses of gin & tonic, but any excessive alcohol would lead to and thus explain the accident.
     - Maybe preciseness shows expertise: but people penalized the overly technical explanations.

In both cases the problem is that irrelevant and hyperconcrete details worsen the explanation by obscuring the factors that do the explanatory work, making it harder to "grasp the essence" (Jorland, 1994)

Explaining the explanation preferences

Irrelevant and hyperconcrete details make it harder to "grasp the essence" (Jorland, 1994)

```
for x in range(0, 30):
        print("Hello world")
```

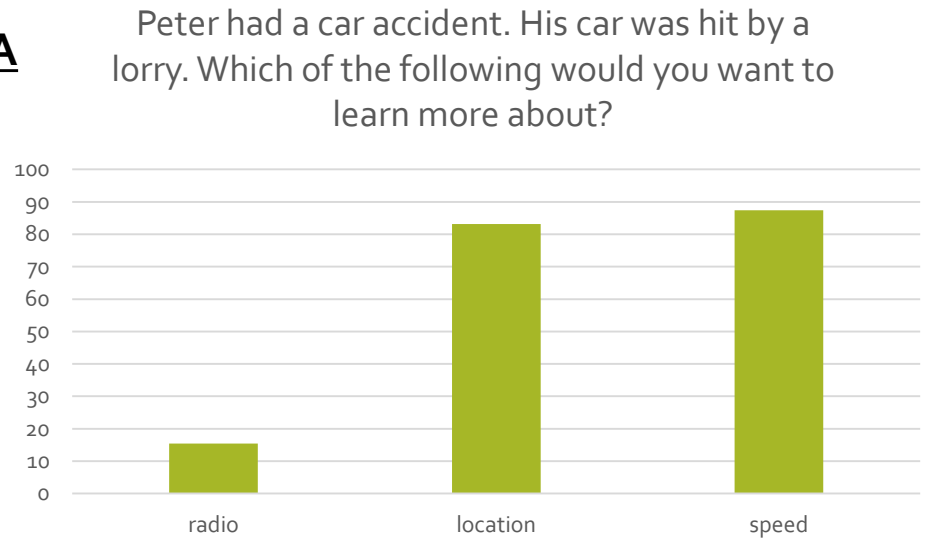
Why was ''Hello World" printed 30 times?

- Because it was enclosed in a loop that iterated 30 times
- Because it was enclosed in a loop that went from 0 to 29
- Because it was enclosed in a loop in which 'x' took the values 0 to 29, successively
- .....

On the inclusion of irrelevance

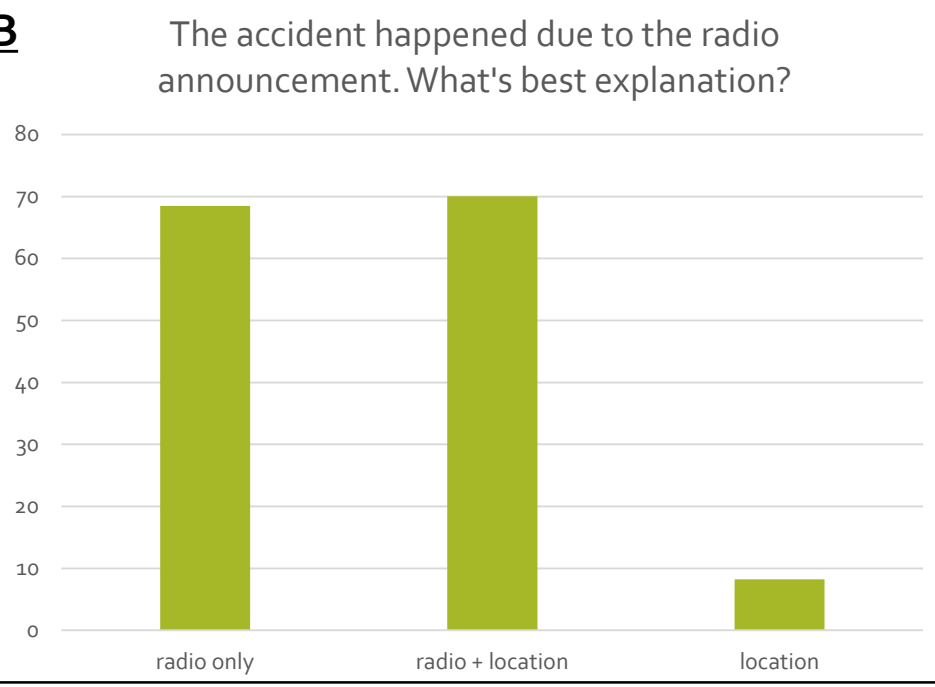
- Pragmatic aspects of explanation:
  - Explanation as a form of communication is not only used to explain but also to describe and inform (Gricean maxim of quantity)
  - Besides the causal factors people will include other "interesting" information as long as there's no ambiguity (maxim of manner)

Group A

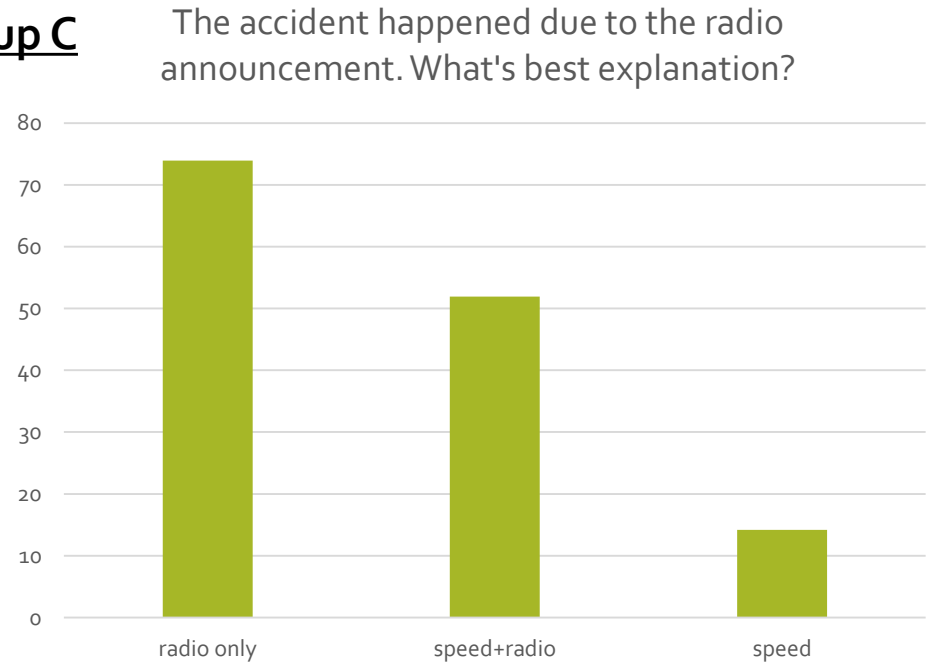


"Peter was driving at 10 miles/hour near Hancock Park. Peter jumped the red light and was hit by a lorry. At the time of the accident, the radio in Peter's car was announcing a plane crash. Peter knew that his wife was in that plane"

Group B



Group C



On the preference for concreteness

- Explanations (especially of token events) might differ depending on the aim:
  - We may try to understand why this particular event happened (e.g. to attribute responsibility) – backwards-looking
  - We may try to avoid or generate future instances – forwards-looking

vs.

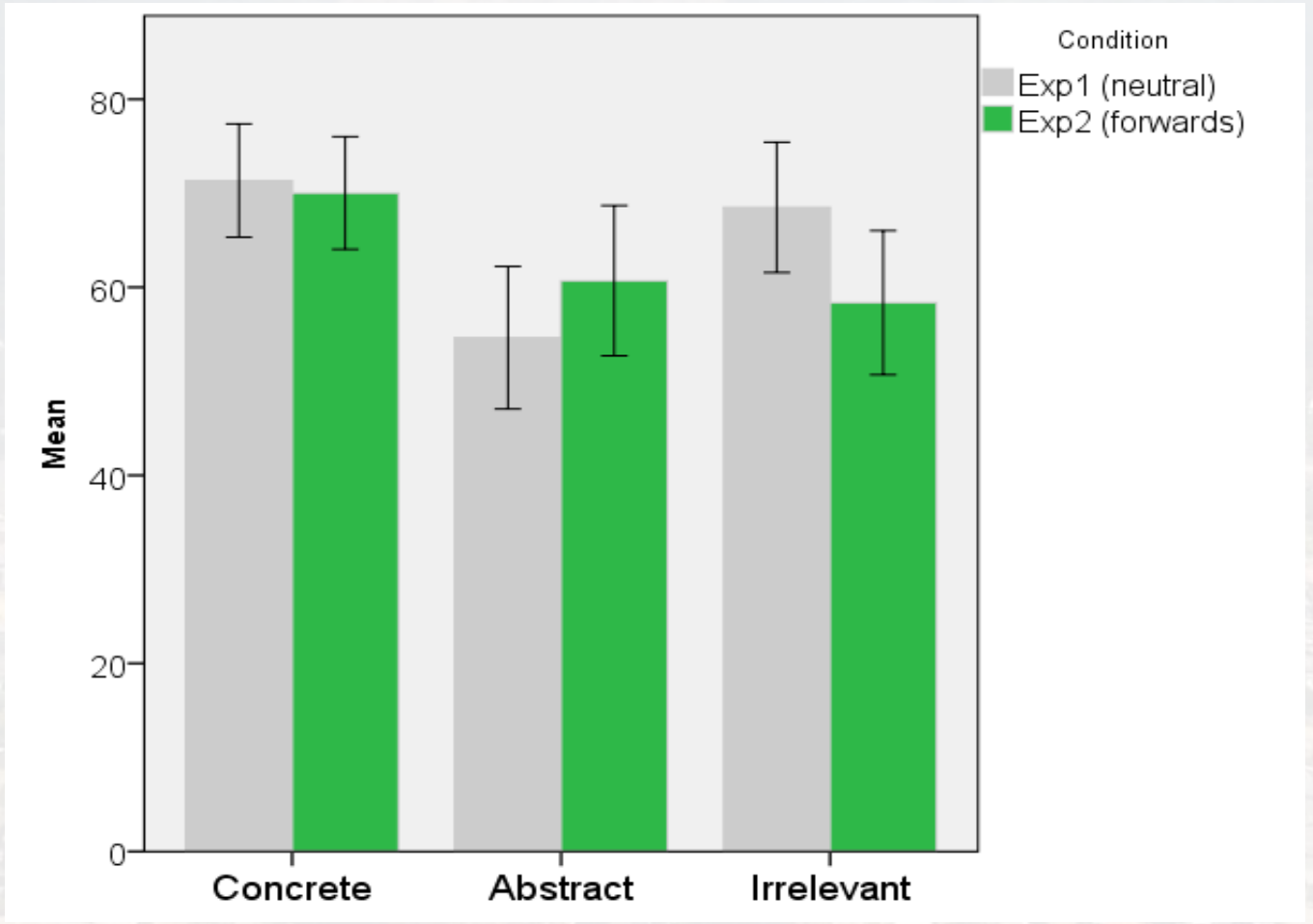
- People might default to backwards-looking explanation, in which concreteness matters

Forwards-looking explanations

- Repeated the landslide experiment but biased participants towards a forward-looking perspective.

> "The explanation should help people who live elsewhere in the country but close to hills determine whether they have reasons to worry."

Forwards-looking explanations



Summary + Future Work

- Contrary to recent philosophical prescriptions:
  - people include non-causally relevant information in their explanations
    - perhaps due to the pragmatics of communication: transmit the causal events/properties + anything "useful".
  - people prefer detailed information not abstract difference-makers as long as causality is clearly communicated (contra Strevens):
    - perhaps because the adopt a backward-looking perspective when explaining events

- Will these preferences persist when explaining type events?
- Is extra information preferred for facilitating the construction of better narratives, for allowing visualization and thus leading to better understanding?
- Memory effects: do people recall irrelevant information when reconstructing explanations or do people mainly recall the difference-makers?


Thank you