BIAS

#18 Conjunction Fallacy

Conspiracy Theories … most of us find them rather humorous, but also wonder why anyone believes in them. There are countless examples, and there are several psychological explanations of why people believe in them (see Douglas et al, 2017). Some famous examples include: Lee Harvey Oswald did not act alone in the assassination of President John Kennedy, 9/11 was a U.S. government plot, and British government agents killed Princess Diana, to name a few. Given my work with cognitive bias, I postulated that one explanation for some could be related to the *representative* heuristic (see earlier blog article #3), and more specifically the *conjunction fallacy*.

***CONJUNCTION FALLACY***

The *conjunction fallacy* is a specific error of reasoning under conditions of uncertainty whereby people overestimate the likelihood of co-occurring, ostensibly unrelated, events, which is a product of the *representative* heuristic. Simply, people use their intuition in perceiving that the two events together are more likely to occur than either event alone. Let's start with an easy one, which is more likely:

1. Tom has eyes
2. Tom has blue eyes

In this example, there is no narrative to explain; we all get the correct answer.

This *conjunction fallacy* was explored by Tversky and Kahneman (1983) with what they called the Linda problem. In their studies they found that over 50% of the participants in their studies fell prey to the *conjunction fallacy*.

Now, select which is more likely:

1. Tom has blue eyes
2. Tom has blue eyes and is Norwegian

The latter certainly sounds more plausible and more representative, as the majority (55%) of Norwegians have blue eyes. However, it must be far less frequent than option #1. Choosing option #2 is an example of the *conjunction fallacy*. This is a problem when listening to forecasters when they add detail to scenarios, perhaps inferring a linkage, making them more persuasive and believable, but less likely to come true.

We can observe the *conjunction fallacy* in the hydrocarbon industry where it manifests itself when there is a higher confidence in opportunities or options that are highly complex and involve many components that must come together for success. Some examples of the *conjunction fallacy* in E&P include:

- A prospect with several faults, initially requiring one to be open to charge but then all faults to be closed to seal
- Because our reservoir model suggests a turbidite, we infer that the porosity must be good.

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- The presence of fractures suggest that they must be interconnected and will enhance productivity.

All of these examples are certainly viable possibilities, but not necessarily the likely ones.

***CONSPIRACY THEORY***

Conspiracy theories are an unverified and implausible allegation of conspiracy, usually claiming that outcomes are the result of abnormal and sinister events. A small handful of studies have looked at the role of reasoning biases and heuristics as an influence in believing in conspiracy theories (Brotherton and French, 2014). For example, one suggestion for why people believe in conspiracy theories is that simple explanations for large events (e.g., 9/11) cannot be enough, and rather there must be a proportional explanation (i.e., mundane events result from mundane causes; significant events require significant causes). In other words, this is an example of the *representative* heuristic. Another suggestion is that conspiracy theories explain seemingly random and inexplicable events (*information* bias).

Rogers et al (2011) suggest that people who strongly endorse conspiracy theories are particularly susceptible to the *conjunction fallacy*. The *conjunction fallacy* posits that people are more susceptible to believing untrue stories if they are more elaborate and specific. Taken together with their earlier research (Rogers et al, 2009), this provides further evidence that conspiracy theories, similar with other anomalous beliefs, are associated with reasoning biases and heuristics.

They found that conspiracy believers have a biased conception of randomness, according to which they believe coincidences are rarely mere chance occurrences. Rather, causal relationships are inferred, which make conjunctive events more representative to conspiracy believers and thus more plausible than singular events (Nestler, 2008 and Tversky & Kahneman, 1983).

As those that believe in conspiracy theories often hinge on the idea there is a deeper conspiratorial plot, this helps give plausibility to the conjunction of unrelated facts. Any information that may support the hypothesis is used to validate the theory and any counter arguments can be easily justified away by employing the *confirmation* bias (see earlier blog article #6). Of the biases we have discussed over the past months, these two biases – *confirmation* and *conjunction fallacy* – perhaps contribute most to entrenched views of individuals.

***EXAMPLES OF CONSIPIRACY THEORIES***

The internet is awash with conspiracy theories, many that are absurd (e.g., the Beatles never existed, the Earth is flat, or Barack Obama can control the weather). However, there are many that could appear to be plausible, and hence why some may believe them. For example:

- President Franklin Roosevelt knew about Japan's 1941 attack on Pearl Harbour in advance and allowed it to happen to bolster support for the US Congress to declare war on Germany
- The 1963 assassination of President John Kennedy was a plot by either Cuba, the CIA, or U.S. organised crime
- The 1969 moon landing never happened, but rather was staged by NASA to hide the fact that they were unable to achieve that goal set nine years earlier
- President George Bush orchestrated the 2001 Twin Towers attack as an excuse to declare the Administration's 'War On Terror'
- The pharmaceutical industry has mounted a cover-up of the causal link between vaccines and autism

- The COVID-19 pandemic was initiated by the government for ulterior motives

Each one of the above examples could have a believable outcome, with components of the theory having a plausible explanation. I would be interested in readers choosing any of the above theories or one of your own and using the Comments section to discuss how the *conjunction fallacy* may have contributed to people believing in your selected conspiracy theory.

***IN SUMMARY***

Is the *conjunction fallacy* the only reason to explain why people believe in conspiracy theories? Certainly not; however, there is evidence to suggest that cognitive biases play a part and the *conjunction fallacy* may help to explain the reasoning that leads people to believe in conspiracy theories.

***REFERENCES AND SUGGESTED READINGS***

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***UNTIL NEXT TIME***

Next time … we will wrap up our bias blog with a summary of the past year articles and the interrelationships between the biases that we have addressed.

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Stay safe and healthy.

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