Unbearable Lightness of Shaky Inferences: When Misused Product Inference Is Detrimental to Verified Product Hypotheses

Rui Chen, University of Georgia, USA
Marcus Cunha Jr., University of Georgia, USA

Three experiments document an under-studied pattern of hypothesis-testing bias in which diagnosticity of inferred evidence overrides certainty of observed evidence when two product hypotheses are pitted against each other. The findings expand our understanding about the processes consumers use to integrate evidence in support of product hypotheses.

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EXTENDED ABSTRACT

Consumers often face consumption choices that involve deciding between two competing hypotheses supported by evidence that vary in terms of levels of certainty (i.e., the supporting evidence could be either missing, inferred, or observed). Understanding how consumers integrate multiple pieces of evidence varying in levels of certainty helps marketers develop better arguments for products. Previous research has presented mixed findings regarding the roles of inferred versus observed evidence in consumers’ judgment and decision making. On the one hand, preference for certainty suggests that a hypothesis with fully observed evidence should be favored over a hypothesis with one piece of observed evidence and one piece of missing evidence. This is supported by research showing that people favor explanations making fewer (vs. greater) number of predictions (e.g., Sussman, Khemlani and Oppenheimer 2014, Khemlani, Sussman and Oppenheimer 2011) and that consumers prefer brands which signal lower uncertainty (e.g., Muthukrishnan 1995). On the other hand, consumers evaluate products as a function of inferences they make (e.g., Dick, Chakravarti and Biehal 1990), which could lead them to become less sensitive to higher levels of uncertainty about the evidence at hand (Gunasti and Ross Jr. 2009). In addition, it has been shown that spontaneous inference making increases information utilization but only when the inference is diagnostic (e.g., Kardes, Posavac and Cronley 2004).

Our research is the first attempt to directly test how inferred evidence influences the value of observed evidence in hypothesis testing when two hypotheses are pitted against each other. Specifically, we investigate an under-studied pattern of hypothesis-testing bias in which consumers misuse inferences made about the missing evidence supporting only one hypothesis (“to-be-verified hypothesis” henceforth) to evaluate the validity of a competing hypothesis, which is fully verified by observed evidence (“verified hypothesis” henceforth). We label this phenomenon the “spillover of inferences effect.” We propose that consumers may more heavily rely on inferred than observed evidence when inferred evidence is biasedly perceived to be more diagnostic than observed evidence.

Study 1 established that consumers devalue the observed evidence supporting the verified hypotheses and judge the probability of validity across two hypotheses as a function of the extent to which the inferred evidence favors the to-be-verified hypothesis. In a 4 base-rate (i.e., base rate as 5-14%, 15-24%, 76-85%, 86-95%; between-subject) X 4 scenario replicates (within-subject) mixed design, participants were presented two hypotheses which compete with each other. Participants were asked to judge the validity of these two hypotheses on a 11-point trade-off scale in the end of the study. In each of the four scenarios (wine regions, telephoto zoom lens, virus, and product malfunction), one hypothesis was fully supported by the observed evidence whereas the other hypothesis was only partially supported by one piece of observed evidence because the other piece of evidence could not be observed at the time. However, the base rate of occurrence of that piece of missing evidence in the population of interest was provided. The analysis yielded a main effect of base rate, with participants reporting a statistically significant change in preference from the verified hypothesis to the to-be-verified hypothesis as the base-rate for the missing piece of evidence increased ($F(3, 130) = 38.98, p < .000)$.

Study 2 directly tested whether inferences made about the missing evidence for only to-be-verified hypothesis influences the extent to which participants are willing to support or falsify the competing verified hypothesis. The design was a 2 base-rate (i.e., base rate as 30% vs. 70%) X 2 hypothesis conditions (i.e., focus on the verified hypothesis vs. the to-be-verified hypothesis) between-subjects design. We predict that we will replicate the effect in study 1 regardless of which focal hypothesis consumers hold to evaluate evidence. Study 2 allows us to 1) rule out the alternative explanation that the effect documented in study 1 was a result of attention shifted toward the to-be-verified hypothesis and 2) show that consumers use the information perceived to be diagnostic (i.e., base rate of the missing evidence) to evaluate the verified hypothesis. We recoded the 11-point measure ratings by centering ratings around 0. Therefore, a rating of zero indicates no preference for either of hypotheses; positive scores (between 0 and 5) indicate preference for the to-be-verified hypothesis and negative scores (between 0 and -5) indicate preference for the verified hypothesis. The analysis revealed that participants who were explicitly instructed to evaluate evidence against the verified hypothesis which was not associated with the missing evidence still used base rate of the missing evidence to judge the validity of this hypothesis ($M_{low\ base\ rate} = -1.333$ vs. $M_{high\ base\ rate} = .318, p < .000$). In support of the null effect of hypothesis focus, the preference rating for the hypotheses was not a function of the interaction between the base-rate factor and the hypothesis-focus factor ($F(1, 202) = .656, NS$).

Study 3 explored when might consumers misuse high base rates favoring only the to-be-verified hypothesis in detriment of the verified hypothesis. We predict that when the missing evidence does not accommodate a broader scope of evidence in the context, the spillover of inferences effect should be offset. This was a single factor design, with base-rate of evidence (i.e., the missing evidence accommodates a broader scope of evidence vs. not) between-subject design with three levels. In the first and third conditions, the missing evidence accommodates a broader scope of evidence whereas in the second condition, the missing evidence did not. The results supported our prediction that when both hypotheses required equivalent scope of evidence, the spillover of inferences effect was offset ($M_{with\ scope\ discrepancy\ condition1} = .655; M_{with\ scope\ discrepancy\ condition2} = -1.828; M_{with\ scope\ discrepancy\ condition3} = .688, p=.000$).

Our research investigated and empirically showed a puzzling situation in which consumers prefer a product hypothesis supported by inferred evidence over a competing hypothesis supported by fully observed evidence. We further identified the underlying process – the spillover of inferences effect and showed when the effect was offset.

REFERENCES

Dick, Alan, Dipankar Chakravarti, and Gabriel Biehal (1990), “Memory-Based Inferences During Consumer Choice,” Journal of Consumer Research, 17(June), 82-93.


