Home > Journal > Social Sciences & Humanities > PSYCH

OPEN ACCESS

# Pseudodiagnosticity: The Role of the Rarity Factor in the Perception of the Informativeness of Data

## Author(s)

Marco D'Addario, Laura Macchi

## ABSTRACT

This paper presents the results of a study designed to investigate the pseudodiagnosticity bias as a failure to identify and select diagnostically relevant information. The reported experiment (N = 240) aims to deepen understanding of the role played by the rarity of evidential features in a classical pseudodiagnosticity task. The problem used for the experiment was a classical pseudodiagnosticity task. Six experimental versions were constructed: they differed in the rarity of features proposed and in the percentages (high or low) associated with them. The results show that people's responses appear to be influenced by the percentage values associated with explicit information more than by a rarity factor. When an initial piece of evidence is associated with a low percentage, the percentage of normatively diagnostic answers is greater than when this percentage is high. Furthermore, rarity is not, in itself, a crucial factor in the occurrence of pseudodiagnosticity bias. Rather, the perception of the difference between two evidential features in terms of informative value influences people's responses when orienting a diagnostic evaluation. When people perceive an initial piece of evidence as having greater informative value than a second piece of evidence, they tend to (correctly) move their attention from the focal hypothesis to the alternative one.

## KEYWORDS

Pseudodiagnosticity; Rarity; Informativeness of Data

## Cite this paper

D'Addario, M. & Macchi, L. (2012). Pseudodiagnosticity: The Role of the Rarity Factor in the Perception of the Informativeness of Data. *Psychology, 3,* 489-493. doi: 10.4236/psych.2012.36069.

## References

[1]    Beyth-Marom, R., & Fischhoff, B. (1983). Diagnosticity and pseudodiagnosticity. Journal of Personality and Social Psychology, 45, 1185-1195. doi:10.1037/0022-3514.45.6.1185

[2]    Doherty, M. E., & Mynatt, C. R. (1987). The magical number one. In D. R. Moates, & R. Butrick (Eds.), Proceedings of the Ohio University Interdisciplinary Inference conference, Athens, 221-230.

[3]    Doherty, M. E., Chadwick, R., Garavan, H., Barr, D., & Mynatt, C. R. (1996). On people's understanding of the diagnostic implications of probabilistic data. Memory and Cognition, 24, 644-654. doi:10.3758/BF03201089

[4]    Doherty, M. E., Mynatt, C. R., Tweney, R. D, & Schiavo, M. D. (1979). Pseudodiagnosticity. Acta Psychologica, 49, 11-21.

[5]    Doherty, M. E., Schiavo, M. B., Tweney, R. D., & Mynatt C. R. (1981). The influence of feedback and diagnostic data on pseudodiagnosticity. Bulletin of the Psychonomic Society, 18, 191-194.

[6]    Evans, J. St. (1989). Bias in human reasoning: Causes and consequences. Brighton: Erlbaum.

[7]    Evans, J. St. (2006). The heuristic-analytic theory of reasoning: Extension and evaluation. Psychonomic Bulletin and Review, 13, 378-395. doi:10.3758/BF03193858

[8]    Evans, J. (2009). How many dual-processing theories do we need? One, two, or many? In J. Evans, &

K. Frankish (Eds.), In two minds. Oxford: Oxford University Press.

[9]    Evans, J. St., & Over, D. E. (1996). Reasoning and rationality. Hove, UK: Erlbaum.

[10]    Evans, J. St. B. T., Venn, S., & Feeney, A. (2002). Implicit and explicit processes in a hypothesis testing task. British Journal of Psychology, 93, 31-46. doi:10.1348/000712602162436

[11]    Feeney, A., Evans, J. St. B. T., & Clibbens, J. (1997). Probabilities, utilities and hypothesis testing. In M. G. Shafto, & P. Langley (Eds.), Proceedings of the 19th Annual conference of the Cognitive Science Society (pp. 217-222). Hillsdale, NJ: Erlbaum.

[12]    Feeney, A., Evans, J. St. B. T., & Clibbens, J. (2000). Background beliefs and evidence interpretation. Thinking and Reasoning, 6, 97-124. doi:10.1080/135467800402811

[13]    Feeney, A., Evans, J. St. B. T., & Venn, S. (2000a) A rarity heuristic for hypothesis testing. In: L. R. Gleitman, & A. K. Joshi (Eds.), Proceedings of the 22nd Annual Conference of the Cognitive Science Society (pp. 119-124). Mahawah, NJ: Erlbaum.

[14]    Feeney, A., Evans, J. St. B. T., & Venn, S. (2000b) The effects of beliefs about the evidence on hypothesis testing. Unpublished manuscript, Department of Psychology, University of Durham.

[15]    Feeney, A., Evans, J. St. B. T., & Venn, S. (2008) Rarity, pseudodiagnosticity and Bayesian reasoning. Thinking and Reasoning, 14, 209-230. doi:10.1080/13546780801934549

[16]    Fischhoff, B., & Beyth-Marom, R. (1983). Hypothesis evaluation from a Bayesian perspective. Psychological Review, 90, 239-260. doi:10.1037/0033-295X.90.3.239

[17]    Kern, L., & Doherty, M. E. (1982). "Pseudodiagnosticity" in an idealized medical problem-solving environment. Journal of Medical Education, 57, 100-104. doi:10.1097/00001888-198202000-00004

[18]    Klayman, J. (1995). Varieties of confirmation bias. In J. Busemeyer, R. Hastie, & D. L. Medin (Eds.), Decision making from a cognitive perspective (pp. 365-418). New York: Academic Press.

[19]    Klayman, J., & Ha, Y.-W. (1987). Confirmation, disconfirmation, and information in hypothesis testing. Psychological Review, 94, 211-228. doi:10.1037/0033-295X.94.2.211

[20]    Maggi, J., Butera, F., Legrenzi, P., & Mugny, G. (1998). Relevance of information and social influence in the pseudodiagnosticity bias. Swiss Journal of Psychology, 57, 188-199.

[21]    Mynatt, C. R., Doherty, M. E., & Dragan, W. (1993). Information relevance, working memory, and the consideration of alternatives. Quarterly Journal of Experimental Psychology, 46A, 759-778.

[22]    Mynatt, C. R., Doherty, M. E., & Sullivan, J. A. (1991). Data selection in a minimal hypothesis testing task. Acta Psychologica, 76, 293-305. doi:10.1016/0001-6918(91)90023-S

[23]    Oaksford, M., & Chater, N. (1994). A rational analysis of the selection task as optimal data selection. Psychological Review, 101, 608-631. doi:10.1037/0033-295X.101.4.608

[24]    Oaksford, M., Chater, N., Grainger, B., & Larkin, J. (1997). Optimal data selection in the reduced array selection task (RAST). Journal of Experimental Psychology: Learning, Memory and Cognition, 23, 441-458. doi:10.1037/0278-7393.23.2.441

[25]    Vallée-Tourangeau, F., & Villejoubert, G. (2010). Information relevance in pseudodiagnostic reasoning. In S. Ohlsson, & R. Catrambone (Eds.), Proceedings of the 32nd Annual Conference of the Cognitive Science Society (pp. 1172-1177). Austin, TX: Cognitive Science Society.

[26]    Villejoubert, G., & Vallée-Tourangeau, F. (2012). Relevance-driven information search in "pseudodiagnostic" reasoning. Quarterly Journal of Experimental Psychology, 65, 541-552. doi:10.1080/17470218.2011.617830

[27]    Wason, P. C. (1960). On the failure to eliminate hypotheses in a conceptual task. Quarterly Journal of Experimental Psychology, 12, 129-140. doi:10.1080/17470216008416717