



How Can the Dual Process Model Be Used to Explain Superstitious Thinking

Shengyang Lin^(✉)

Dulwich International High School Zhuhai, Zhuhai 519031, Guangdong, China
lincoln2005lin1@outlook.Com

Abstract. Literature review exploring the psychological reasoning behind why both individuals with and without mental deficits exhibit superstitious thinking under normal circumstances. This paper mainly utilizes the dual process model of system 1 and system 2—advocated by Kahneman and Frederick—as a suggested cause of the widespread use of superstitious thinking and why they exist despite being known to be untrue. System 1 is quick, instinctive, and has little to no effort required, whilst system 2 is slower, more conscious, and effortful. However, it is insufficient enough to represent this cognitive phenomenon without refining the model with the possibility that people recognize their beliefs as being inaccurate, in the moment, yet still act upon, nevertheless. The article revolves around system 1 and its hand in superstitious idea generation as well as the ability for system 2 to correct them.

Keywords: Dual-process model · intuition · superstition · magical thinking

1 Introduction

Superstition is a complex concept with abstract parameters on the scope of inquiry that require some clarity to give it to be analyzed, developed and explored more deeply [1]. Oftentimes, superstition can be referred to as irrational or false beliefs, whilst magical thinking is defined by the belief that certain actions may influence events or objects where there are no causal connections [2].

A cognitive deficit is an inclusive representation of the brain that has impairments within different domains of cognition. Although it is not limited to any condition or disease, it may be the embodiment of an underlying pathological condition [3, 4]. Superstition was traditionally thought of as such due to the unusual circumstances and predicaments created as a result of people being unable to think logically about the causal relations between different events. For example, when people knock on wood even though there no plausible mechanisms which will affect the odds of a future event from this action exclusively, and yet it is still done.

Superstitions was originally thought of based off peoples' cognitive deficits with culture, anxiety, desire, stress, gender and age factors [5–7]. Initially, people of archaic and non-western modern cultures were thought to have exhibited superstitious behaviour

because they were too primitive and paled in comparison to the technological advancements required to replace irrational beliefs [8]. However, superstitious belief and magical thinking aren't limited to mentally deficient people. A notable example of the contrary being the Toronto Maple leaf's fans on game night in 2013, where the majority of fans exhibited their superstitious rituals in preparation of the last game of the playoffs [9]. As well as evidence that shows some people may retain their beliefs throughout their lifetime.

There were other early accounts of superstition that revolved around motivation as the main component. Malinowski lived with the Trobriand islanders of Melanesia from 1914 to 1918 made interesting reports on the superstitions of deep-sea fishermen [10]. Compared to fishermen who fished in more familiar and calmer waters, the deep-sea fishermen partook in more superstitious rituals as a shield against the uncertainty of fishing out deep in the open sea due to the hazardous and uncertain environment.

Benno later proposed that people may receive psychological benefits if they understand, predict, and feel in control of one's environment in comparison to psychological costs(uncertainties) [11]. Superstition falls under this category of psychological benefits since it can offer individuals a sense of understanding even when there is insufficient information to develop and accurate causal explanation [8]. B.f Skinner did an experiment regarding pigeons and superstition [12]. Skinner did this through observing the rituals pigeons performed whilst waiting for a machine to dispense food at random intervals. He discovered that the birds associated the actions they did with the delivery of food and subsequently continued to perform these actions. This experiment demonstrates superstition as if there was a causal relationship between the actions performed and food dispensing, is similar to one of the reasons of why people can be superstitious.

2 Dual Processing Model

The dual processing model (systems 1 & 2) is accounted in understanding the psychology behind superstition and magical thinking. Intuition is usually defined with reference to its supposed characteristics, of implicit, fast, and automatic responses to a given situation. This refers to system 1 In the dual model system and arises from a number of different memory-related processes such as recognition memory, associative learning, and skilled memory [13]. For the case of superstition, superstitious beliefs are thought to arise from utilizing system 1 thinking alone without consulting system 2, and the recognition of superstitious thinking by utilizing system 2. However, there is a case for which people recognize that their thinking is superstitious through the consultation of system 2 yet choose to ignore it.

The model shown in Fig. 1 assumes the activation of magical intuition. What determines whether it is activated in the first place is based on the extent of motivation, previous consideration of the intuition and personal beliefs on the validity of the intuition. This simple diagram maps system 1 processing with a further dichotomous representation of possibilities when system 2 is engaged or not.

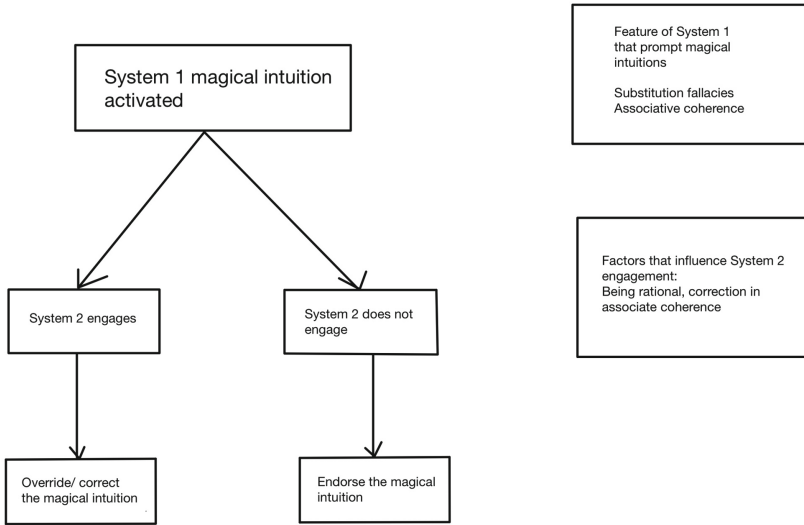


Fig. 1. The model that assumes the activation of magical intuition [14]

2.1 System 1

Substitution fallacies: A flaw of human nature is to answer complex questions with quick intuitive answers, through substituting hard questions with easy ones and regarding the answer of the latter to the former. Whilst doing this, people are unaware of their differences between questions and the answer provided is for a completely different question [8, 15]. Rather than system 2 engaging to answer a difficult question, system 1 substitutes the question with an associated but fundamental question that is much easier to answer. IE. “What is the probability that this teacher is going to give out homework today?” compared to “Does the teacher look like she is going to give out homework today?”. Frazer tells a story about the superstitions with regard to taboos whilst eating [16]. People eat certain body parts of animals in hopes of gaining their attributes. Like the people of Northern India who believed that eating the eyeball of an owl would allow them to see in the dark much better. As the eyeball of an owl represents enhanced vision, people make the association between ingestion and night vision for themselves [17].

Associative Coherence: A stimulus induces a coherent and self-reinforcing pattern that activates associative memory. This favours a series of ideas that reinforce each other whilst driving out the ideas that aren’t reinforced. Depending on the context, some words may have different meanings when used, (ie. Stable, meaning a high structural integrity and balance when referring to a building, and barn side structure that house horses when referring to the horses resting place. The words refer to one and not both simultaneously depending on the context used [10]. System 1 is activated here with automatic associations. The search for a priming effect within the mind was guided with a specific hypothesis that believes in rules regulate the spread of activation in associative memory ie. (idea activation spreads between literal and metaphoric meanings) [3, 11, 18]. People create their correlations through spontaneous activities that correlate with

events under certain context. Ie(slapping the ground before hitting a home run will create a correlation) quick and intuitively which results in their superstitious ritual if they do hit homeruns a few times right after slapping the ground.

2.2 System 2

Being rational: Several studies show a negative correlation between people who are more educated and rational and superstitious beliefs [19]. Generally, people who are more rational engage in system 2 more often than those who are less rational. Rationality can vary due to the mental state of the people. Some studies have shown different motivations to be more rational than others. One being individual differences. There are multiple studies that show those that are more motivated to think intuitively to engage in superstitious thinking compared to those who are more rational and less likely to do the same [20].

Associative coherence: Although associative coherence may be part of the reason why people would engage in superstitious behaviours in the first place, there are also reasons as to why some people would see contextual cues, such as the design of a task that can help people recognize the errors. It usually occurs through an opinion change through mentally represented problems or the direction of their attention. Engaging in system 2 thinking whilst observing the context and thinking rationally would help people identify their superstitious beliefs [20, 21]. Kahneman & Fredrick did a study where helped identify common judgement errors made by the subjects through changing their viewpoints [22, 23]. Namely from that of the subjects to the ones of the examiner. There was an experiment conducted where people read about a woman who is called by a breast cancer charity for a donation. The subjects who read that she chose to donate would infer that there is a higher probability for her to be a breast cancer patient. However, from the view of the examiners, those who read scenarios where she both donated and didn't donate money concluded that she had an equal probability of having breast cancer.

The circumstance in which system 2 is ignored can referred to as acquiescence. Risen J. L. [20] believes that if there are superstitious actions, there should be superstitious beliefs underlying. System 2 stops the superstitious action from occurring but doesn't explain why people take action that reflects irrational thoughts and behaviours whilst simultaneously being aware and often unable to get rid of these beliefs [24]. The point to be made is that people may be aware of their irrationality but "acquiescence to a powerful intuition nevertheless" [14, 25].

3 Conclusion

Out of the numerous models that could have been analysed for an explanation of why we exhibit superstitious thinking, I have settled on the dual model process and used systems 1 & 2 to showcase human susceptibility to false causal relations. Even educated and emotionally stable adults who know that superstitions are not rational will still have superstitious beliefs. Kahneman & Fredrick advocated this model to explain why superstition is so widespread and maintained even if known to be not true [22, 23]. I hope the points stated in this article will give insight to those who are examining the cause and effects of superstitious and magical thinking.

References

1. Taher, M., Pashaeypoor, S., Cheraghi, M. A., Karimy, M., & Hoseini, A. (2020). Superstition in health beliefs: Concept exploration and development. *Journal of family medicine and primary care*, 9 (3), 1325–1330. https://doi.org/10.4103/jfmpe.jfmpe_871_19
2. Henslin, J. M. (1967). Craps and magic. *American Journal of Sociology*, 73, 316–330. <https://doi.org/10.1086/224479>
3. Bargh, J.A. and Morsella, E. (2008) The unconscious mind. *Perspect. Psychol. Sci.* 3, 73–79
4. Goldinger, S.D. et al. (2003) “Blaming the victim” under memory load. *Psychol. Sci.* 14, 81–85
5. Dhakal, A., & Bobrin, B. D. (2022). Cognitive Deficits. In *StatPearls*. StatPearls Publishing.
6. Kahneman, D., & Tversky, A. (1979). Prospect theory: An analysis of decisions under risk. *Econometrica*, 47, 263–291. <http://dx.doi.org/10.2307/1914185>
7. Keinan, G. (1994). Effects of stress and tolerance of ambiguity on magical thinking. *Journal of Personality and Social Psychology*, 67, 48–55. <https://doi.org/10.1037/0022-3514.67.1.48>
8. Kahneman, D., & Tversky, A. (1982). On the study of statistical intuitions. *Cognition*, 11, 123–141. [https://doi.org/10.1016/0010-0277\(82\)90022-1](https://doi.org/10.1016/0010-0277(82)90022-1)
9. *CBCnews*, CBC/Radio Canada, <https://www.cbc.ca/player/play/2384945764>. Accessed 8 Dec. 2022.
10. Neely, J.H. (1977) Semantic priming and retrieval from lexical memory: roles of inhibitionless spreading activation and limited-capacity attention. *J. Exp. Psychol. Gen.* 106, 226–254
11. Torgler, Benno. (2007). Determinants of superstition. *Journal of Socio-Economics*. 36. 713–733. <https://doi.org/10.1016/j.socsec.2007.01.007>.
12. Malinowski, B. (1948). *Magic, science, and religion and other essays*. Boston, MA: Beacon Press.
13. Thompson, S. C. (1981). Will it hurt less if I can control it? A complex answer to a simple question. *Psychological Bulletin*, 90, 89–101. <https://doi.org/10.1037/0033-2909.90.1.89>
14. Risen J. L. (2016). Believing what we do not believe: Acquiescence to superstitious beliefs and other powerful intuitions. *Psychological review*, 123(2), 182–207. <https://doi.org/10.1037/rev0000017>
15. Kahneman, D., & Tversky, A. (1973). On the psychology of prediction. *Psychological Review*, 80, 237–251. <https://doi.org/10.1037/h0034747>
16. Frazer, J. G. (1922). *The golden bough: A study in magic and religion*. Abridged edition. New York, NY: The Macmillan Company
17. Levy-Bruhl, L. (1926). *How natives think*. London: Allen and Unwin.
18. Hassin, R.R. et al. (2002) Spontaneous causal inferences. *J. Exp. Soc. Psychol.* 38, 515–522
19. Aarnio, K., & Lindeman, M. (2005). Paranormal beliefs, education, and thinking styles. *Personality and Individual Differences*, 39, 1227–1236. <https://doi.org/10.1016/j.paid.2005.04.009>
20. Rozin, P., & Nemeroff, C. (2002). Sympathetic magical thinking. In T. Gilovich, D. Griffin, & D. Kahneman (Eds.), *Heuristics and biases* (pp. 201–216). Cambridge: Cambridge University Press. <https://doi.org/10.1017/CBO9780511808098.013>
21. Thompson, V. A., Turner, J. A. P., Pennycook, G., Ball, L. J., Brack, H., Ophir, Y., & Ackerman, R. (2013). The role of answer fluency and perceptual fluency as metacognitive cues for initiating analytic thinking. *Cognition*, 128, 237–251. <https://doi.org/10.1016/j.cognition.2012.09.012>
22. Kahneman, D., & Frederick, S. (2002). Representativeness revisited. In T. Gilovich, D. Griffin, & D. Kahneman (Eds.), *Heuristics and biases* (p. 49 – 81). Cambridge: Cambridge University Press. <https://doi.org/10.1017/CBO9780511808098.004>

23. Kahneman, D., & Frederick, S. (2005). A model of heuristic judgment. In K. J. Holyoak & R. G. Morrison (Eds.), *The Cambridge handbook of thinking and reasoning* (pp. 267–293). New York, NY: Cambridge University Press
24. Skinner, B. F. (1948). Superstition in the pigeon. *Journal of Experimental Psychology*, 38, 168–172. <https://doi.org/10.1037/h0055873>
25. Hasson, U. and Glucksberg, S. (2006) Does understanding negation entail affirmation? An examination of negated metaphors. *J. Pragmat.*38, 1015–1032

Open Access This chapter is licensed under the terms of the Creative Commons Attribution-NonCommercial 4.0 International License (<http://creativecommons.org/licenses/by-nc/4.0/>), which permits any noncommercial use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons license and indicate if changes were made.

The images or other third party material in this chapter are included in the chapter's Creative Commons license, unless indicated otherwise in a credit line to the material. If material is not included in the chapter's Creative Commons license and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder.

