

Delusion and Evidence

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Introduction

Delusion: A false belief based on incorrect inference about external reality that is firmly held despite what almost everyone else believes and despite what constitutes incontrovertible and obvious proof or evidence to the contrary.
(American Psychiatric Association 2013, 819)

Question: Is delusion sensitive to evidence?

“A Thirty-Three-Year-Old Man with Chronic Schizophrenia. The patient had been ill for fourteen years. At the time of the interview, he was preoccupied and distressed by the firm belief that he had no internal organs. Although his doctors had told him that this was a physiological impossibility, and despite some acknowledgement on the part of the patient that he could not quite understand how such a thing was possible, the patient said that he could not rid himself of the belief. The patient also expressed the belief that spirit doctors had come to his room one night to perform a magical operation in order to remove his internal organs. This happened, he believed, because he was being punished by God for some evil or sin that he had committed, although he was uncertain about the nature of that sin. The most distressing aspect of the delusion for this patient was the pervasive worry that, when he died, he would be rejected from heaven because he was no longer a proper human being.” (Davies et al. 2001, 136)

- insensitive to doctor’s statement, etc.
- more or less sensitive to somatic feelings, etc.

Sensitivity-Insensitivity Dilemma: difficult to explain sensitivity & insensitivity simultaneously

- some ideas nicely explain sensitivity but not insensitivity
- other ideas nicely explain insensitivity but not sensitivity

Clarifications

(1) Sensitivity \neq Rationality

- Maher (1974): sensitive and rational
- Stone & Young (1997): sensitive but not rational (too sensitive due to the “bias towards observational adequacy”)

(2) Confirmation bias cannot be the (full) answer.

- Sensitive to somatic feelings because they are coherent with his delusional hypothesis; insensitive to doctor's statement because it is incoherent with it.
- Problem: somatic feelings are considered *before* adopting the delusional hypothesis

Sensitivity-Insensitivity Dilemma

[T1]

Prior Belief: "I do have internal organs". (P1)

New Evidence: abnormal somatic feelings (E1)

[T2]

Prior Belief: "I have no internal organs". (P2)

New Evidence: doctor's statement (E2)

Some theories: nicely explain sensitivity to E1 at T1 but not insensitivity to E2 at T2

Other theories: nicely explain insensitivity to E2 at T2 but not sensitivity to E1 at T1

Reasoning Biases

Jumping-To-Conclusion Bias (Huq, Garety, & Hemsley 1988)

JTC bias nicely explains sensitivity to E1 at T1 but not insensitivity to E2 at T2

- Why not jump to conclusion with regard to E2 at T2? (Garety, Hemsley, Wessely 1991)
 - Garety & Hemsley (1997): This phenomenon is paradoxical and hard to explain.
 - Davies et al. (2001): JTB bias cannot be the second factor for this reason.

Bias Against Disconfirmatory Evidence (Woodward et al. 2006)

BADE nicely explains insensitivity to E2 at T2 but not sensitivity to E1 at T1

- Why not discount E1 (which is disconfirmatory with regard to P1) at T1?

Objection: perhaps E1 is confirmatory (with regard to P2); not disconfirmatory (with regard to P1).

- Problem: It is *ad hoc*; e.g. perhaps E2 is confirmatory (with regard to P1); not disconfirmatory (with regard to P1)

4: Two-Factor Theory

[T3]

Prior Belief: "This woman is my real wife". (P3)

New Evidence: reduced autonomic/affective response (E3)

[T4]

Prior Belief: “This woman is an imposter”. (P4)

New Evidence: trusted friend’s statement (E4)

Two-factor theory (Coltheart 2007; Coltheart et al. 2011; Davies et al. 2001):

(Monothematic) delusions are explained by two distinct causal factors; the first factor and the second factor.

Capgras delusion

- first factor: reduced autonomic/affective response to familiar face
- second factor: discounting counterevidence (E4) at T4 (Coltheart et al. 2010 / discounting prior probability ratio at T3 (McKay 2012)

Coltheart, Menzies, & Sutton (2010)

$$P(A|B) = P(B|A) \times P(A) / P(B)$$

- $P(P4|E3) = P(E3|P4) \times P(P4) / P(E3)$
- $P(P3|E3) = P(E3|P3) \times P(P3) / P(E3)$

$$P(P4|E3) / P(P3|E3) = P(E3|P4) \times P(P4) / P(E3|P3) \times P(P3)$$

According to Coltheart et al. (2010) at T3:

$$(1a) P(P4) < P(P3)$$

$$(2a) P(E3|P4) \gg P(E3|P3)$$

thus they rationally conclude:

$$(3a) P(P4|E3) > P(P3|E3)$$

At T4, however, they irrationally discount E4 (the second factor), which is why P4 persists despite counterevidence.

Coltheart et al.’s theory nicely explains insensitivity to E4 at T4 but not sensitivity to E3 at T3

- Why not irrationally discount E3 at T3?
- Perhaps the bias acquired after T3? (“Implausible Chronology” McKay 2012)

McKay (2012; Miyazono & McKay 2019)

According to McKay (2012; Miyazono & McKay 2019) at T3:

$$(1b) P(P4) \ll P(P3)$$

$$(2b) P(E3|P4) \gg P(E3|P3)$$

and from these they irrationally conclude:

$$(3b) P(P_4|E_3) > P(P_3|E_3)$$

This irrational inference is due to the bias of discounting prior probability ratio (the second factor).

McKay's theory nicely explains sensitivity to E3 at T3 but not insensitivity to E4 at T4.

At T4:

$$(1c) P(P_3) < P(P_4)$$

$$(2c) P(E_4|P_3) > P(E_4|P_4)$$

thus anyone with the bias of discounting prior probability ratio should conclude:

$$(3c) P(P_3|E_4) > P(P_4|E_4)$$

- But this does not happen. Why?
- Perhaps the bias disappeared after T3? (another “Implausible Chronology”)

5: Towards A Solution

Sensitivity-Insensitivity Dilemma: difficult to explain sensitivity and insensitivity simultaneously

- some ideas nicely explain the former but not the latter
- other ideas nicely explain the latter but not the former

A Solution: reject the assumption that people respond to all kinds of evidence in the same way

- sensitive to some kind of evidence but insensitive to other kind of evidence

Testimonial Abnormality Hypothesis:

- sensitive to *individualistic* evidence: abnormal somatic feelings (E1), abnormal autonomic/affective experience (E3)
- insensitive to *social* evidence: doctor's statement (E2), trusted friend's testimony (E4)

Testimonial Abnormality Hypothesis (Miyazono & Salice 2021): Social impairments in schizophrenia can cause:

1. the loss of epistemic interaction with others (“testimonial isolation”)
2. the failure of trusting testimony (“testimonial discount”)

which explains:

1. why delusions are maintained despite the obvious counterevidence, and/or
2. why delusions get elaborated

Note 1: does not deny individualistic factors (especially at the adoption stage)

Note 2: compatible with many (if not all) existing theories

Social impairments responsible for testimonial isolation include:

1. social skill impairment (e.g., Mueser et al. 1991)
2. social cognition impairment (e.g., Penn et al. 2008)
3. social anhedonia (e.g., Blanchard et al. 2001)

Social impairments responsible for testimonial discount include:

1. discounting the competence of the testifier
2. discounting the cooperativeness of the testifier

which can be caused by:

1. paranoia thoughts or feelings
2. grandiose thoughts or feelings
3. failure of group-identification (Salice & Henriksen 2015)
 - Assumption: perception of competence or cooperativeness is influenced by group-identification (e.g., Turner 1982, 1991)

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