

INFERENCEAL INTERNALISM AND THE CAUSAL STATUS EFFECT

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ABSTRACT: To justify inductive inference and vanquish classical skepticisms about human memory, external world realism, etc., Richard Fumerton proposes his “inferential internalism,” an epistemology whereby humans ‘see’ by Russellian acquaintance Keynesian probable relations (PRs) between propositions. PRs are *a priori* necessary relations of logical probability, akin to but not reducible to logical entailments, such that perceiving a PR between one’s evidence *E* and proposition *P* of unknown truth value justifies rational belief in *P* to an objective degree. A recent critic of inferential internalism is Alan Rhoda, who questions its psychological plausibility. Rhoda argues that in order to see *necessary* relations between propositions *E* and *P*, one would need acquaintance with too many propositions at once, since our evidence *E* is often complex. In this paper, I criticize Rhoda’s implausibility objection as too quick. Referencing the causal status effect (CSE) from psychology, I argue that some of the complex features of evidence *E* contribute to our type-categorizing it as *E*-type, and thus we do not need to ‘see’ all of the complex features when we see the PR between *E* and *P*. My argument leaves unchanged Fumerton’s justificatory role for the PR, but enhances its psychological plausibility.

KEYWORDS: epistemic justification, logical probability, memory, acquaintance, Richard Fumerton, internalism

1. Introduction

In performing inductive inferences from given evidence, such as when attempting to win a card game, diagnosing an automobile malfunction, or justifying human memory, can some conclusions be only “probably” true? Or is that locution bad philosophical grammar? Supporting the ‘bad grammar’ response is Richard Fumerton,¹ who by his theory of “inferential internalism” proposes that we can ‘see’ by intuitive insight probable relations (PRs) between propositions of binary

¹ Richard Fumerton, *Metaepistemology and Skepticism* (Lanham, MD: Rowman & Littlefield Publishers, Inc., 1995); “Epistemic Probability,” *Philosophical Issues* 14 (*Epistemology*) (2004): 149-164, <https://doi.org/10.1111/j.1533-6077.2004.00025.x>; *Knowledge, Thought, and the Case for Dualism* (New York: Cambridge University Press, 2013); “The Challenge of Refuting Skepticism,” in *Contemporary Debates in Epistemology*, 2nd Edition, eds. Matthias Steup, John Turri, and Ernest Sosa (Malden, MA: John Wiley & Sons, 2014): 120-132.

truth value. If I draw an ace-five unsuited at a small poker table, for example, it is either true or false that I will win the hand, but I may be able to *see* in a non-inferential direct sense that my ace-five *makes probable* that the proposition expressing my victory is a true proposition. It is never “probably true” that I will win, but my awareness that the ace-five and my victory (construed as propositions) stand in an *a priori* and necessary probable relation may be more or less acute, intense, or salient.

This concept of probable relations (PRs) hails from John Maynard Keynes, who calls them “a new logical relation” of non-frequentist logical probability, the latter being a set of relations about “knowledge, ignorance, and rational belief” irreducible to the more philosophically familiar logic of entailment, truth, and falsity.² Keynes considers it rational to believe, for example, a proposition *P* that may be false, because our antecedent knowledge sets up an objective PR relation to *P*, and humans subjectively ‘see’ such PRs by Russellian acquaintance (see section 2).³ Whereas some PR values are numerical, like 0.75, a Keynesian agent might at times only recognize that one PR value is greater or less than another.⁴ Nevertheless, Fumerton finds PR acquaintance to justify the conclusions *P* of inductive inferences, because PRs are necessary *a priori*, and because acquaintance with them is infallible (section 2).

My goal in this paper is to deflect a recent criticism of inferential internalism by Alan Rhoda.⁵ Rhoda finds inferential internalism psychologically implausible, because he thinks that it requires simultaneous acquaintance with more propositions than a human agent can ‘see’ at once. At my poker table, for example, I may need to ‘see’ more than that I am holding an ace-five and that I am trying to win, to be justified in believing that my hand stands in any probable relation to victory. To gain the PR insight in question, I may additionally need to ‘see’ that aces rank higher than kings, that I am betting first, that I am the chip

² John Maynard Keynes, *A Treatise on Probability* (USA: Rough Draft Printers, 2008/1921): §I.I.8, p. 8. Why Keynes endorses logical over frequentist probability *in probability theory* falls outside the scope of this paper, but see Charles R. McCann, Jr., “On the Nature of Keynesian Probability,” in *The Philosophy of Keynes’ Economics: Probability, Uncertainty and Convention*, eds. Jochen Runde and Sohei Mizuhara (New York: Routledge, 2003): 37-45, for an accessible introduction.

³ Keynes, *Treatise*, §I.IV.12, pp. 52-53; §I.II.6, p. 12.

⁴ Keynes, *Treatise*, §I.IX.4, p. 112; McCann, “Nature of Keynesian Probability,” 43-44.

⁵ Alan R. Rhoda, “Fumerton’s Principle of Inferential Justification, Skepticism, and the Nature of Inference,” *Journal of Philosophical Research* 33 (2008): 215-234, https://doi.org/10.5840/jpr_2008_2.

leader, etc., and as I infer my pending victory from these variables, the allegedly non-inferential justificatory power of the PR insight is lost.

Against Rhoda, I maintain that the PR can be an epistemically justifying relation perceived by acquaintance, because some of the complex features that make the ace-five competitive *in this poker hand* (features like my betting position, the card rankings, etc.) are cognized automatically and unconsciously by the mind in type-specifying the ace-five as a keeper or as worthless. Specifically, I appeal to the “causal status effect” (CSE) from psychology⁶ to argue that such type-categorization on complex evidence transpires subconsciously (section 3). The CSE indicates that humans classify the objects of their awareness more quickly or readily⁷ by those objects’ causal features than by their effectual features. In a scenario simpler than card-playing, for example, humans are less likely to categorize an animal as a goat if the human knows that the animal lacks goat genes, than if it merely fails to produce milk;⁸ genes are a causal feature of goats, whereas their milk production is an effectual feature.⁹ The point, for my purposes, is that because the proposition “there’s a goat in the yard” may in some (unusual) instances be cognized only *after* such complex conditioning on genes and milk, the perception of a PR between “there’s a goat in the yard” and “some laundry is chewed up” remains plausible and uncluttered, despite the many background beliefs that I would supposedly need in order to see the *a priori necessary* PR between those propositions. Rhoda thinks that most of our inductive inferences

⁶ The seminal paper on CSE is Woo-kyoung Ahn, “Why are Different Features Central for Natural Kinds and Artifacts?: The Role of Causal Status in Determining Feature Centrality,” *Cognition* 69 (1998): 135-178, [https://doi.org/10.1016/S0010-0277\(98\)00063-8](https://doi.org/10.1016/S0010-0277(98)00063-8). CSE continues to be discussed by, e.g., Woo-kyoung Ahn, Nancy S. Kim, Mary E. Lassaline, and Martin J. Dennis, “Causal Status as a Determinant of Feature Centrality,” *Cognitive Psychology* 41 (2000): 361-416, <https://doi.org/10.1006/cogp.2000.0741>; Bob Rehder and Reid Hastie, “Causal Knowledge and Categories: The Effects of Causal Beliefs on Categorization, Induction, and Similarity,” *Journal of Experimental Psychology: General* 130, no. 3 (2001): 323-360, <https://doi.org/10.1037/0096-3445.130.3.323>; Tania Lombrozo, “Explanation and Categorization: How ‘Why?’ informs ‘What?’,” *Cognition* 110 (2009): 248-253, <https://doi.org/10.1016/j.cognition.2008.10.007>; Lance J. Rips, *Lines of Thought: Central Concepts in Cognitive Psychology* (New York: Oxford University Press, 2011); David Danks, *Unifying the Mind: Cognitive Representations as Graphical Models* (Cambridge, MA: The MIT Press, 2014); Bob Rehder, “Concepts as Causal Models: Categorization,” in *The Oxford Handbook of Causal Reasoning*, ed. Michael Waldmann (New York: Oxford University Press, 2017): 347-376.

⁷ I say “or readily” because the manifestation of CSE is not restricted to categorizations performed under time pressure (cf. Ahn et al., “Causal Status as a Determinant”).

⁸ Ahn, “Why are Different Features Central,” 143, 145.

⁹ Ahn, “Why are Different Features Central,” 142.

follow from contingent relations too complex to see by acquaintance, but I contend that the causal status effect incorporates many of the background beliefs that Rhoda thinks the inferential internalist unjustifiably takes for granted (section 4). In the sections that follow, I elaborate all of these claims, not just to ward off Rhoda,¹⁰ but to render inferential internalism more plausible than even Fumerton and his other critics have rendered it.

2. The Elements of Inferential Internalism, and Rhoda's Critique

As we have seen, and helping ourselves to a bit of casual language (bad grammar), inferential internalism is a justificatory scheme for the agent who infers from evidence *E* that her belief *P* is probably true.^{11,12} At my poker table, I infer that the ace-five I drew (*E*) can probably win me the pot (*P*). Fumerton supports such inferences¹³ with his “principle of inferential justification” (PIJ): to justifiably infer proposition *P* from evidentiary proposition *E*, “one must be (1) justified in believing *E* and (2) justified in believing that *E* makes probable *P*.”¹⁴ By “evidentiary propositions,” I mean propositions whose referents are ordinary experiences like entertaining some thought, remembering some event, seeing colors, etc. For as mentioned in the previous section, Fumerton supposes a Russellian-Keynesian intuition of “acquaintance” to supply justifications (1) and (2) of the PIJ.

The genesis of Fumertonian acquaintance is Bertrand Russell's account, which calls acquaintance a non-judgmental “relation” of “aware[ness]”¹⁵ between

¹⁰ Rhoda, “Fumerton's Principle,” sections II and IV-VI, criticizes inferential internalism for problems besides the contingency/necessity of PRs, but to answer all of his arguments would take me too far afield. The possible role of the causal status effect within inductive inference seems sufficiently important to address exclusively in this paper.

¹¹ Fumerton, “The Challenge,” 124. Note that Keynes, *Treatise*, §I.I.2, p. 3, insists that propositions are either true or false, but that I follow Fumerton in sometimes casually referring to ‘probably true’ propositions.

¹² For readability, I make variable *E* refer interchangeably to the proposition *E* and to the object of acquaintance that proposition *E* describes; I trust that context makes this switch obvious. Likewise for *P*, *B*, and any mention of a PR. I discuss acquaintance later in this section.

¹³ In response to criticism from Michael Huemer, “Fumerton's Principle of Inferential Justification,” *Journal of Philosophical Research* 27 (2002): 329–40, https://doi.org/10.5840/jpr_2002_4, Fumerton delimits inferential internalist justification to “non-enthymematic and non-deductive reasoning” (“Epistemic Probability,” 160). Whether my card-playing example meets such criteria I ignore for the sake of argument. Rhoda argues from an example different from card-playing, which I take up shortly.

¹⁴ Fumerton, *Metaepistemology*, 36.

¹⁵ Bertrand Russell, “Knowledge by Acquaintance and Knowledge by Description,” *Proceedings*

an agent and her sense data, such as a color, noise, or other person's testimony.¹⁶ To this list of acquaintance referents, Keynes adds one's own thoughts, and "facts or characteristics or relations of sense-data or meanings..."¹⁷ Fumerton capitalizes on the notion of "fact" as "a nonlinguistic complex that consists in an entity or entities exemplifying properties," and he characterizes acquaintance as "a *sui generis* relation... between a self and... a fact."¹⁸

Thus epistemic justification via clause (1) of the PIJ proceeds straightforwardly. I am justified in believing that I hold the ace-five because I see with my eyes those characters printed on the cards. By my acquaintance with this fact of my experience, I secure justification for believing proposition *E*: "I am holding an ace-five."¹⁹ The more controversial and unusual function of Fumertonian acquaintance is its role in disclosing the alleged fact (PIJ clause 2) that '*E* makes probable *P*.' In the justification of human memory, for example, acquaintance with the probable relation (PR) between *E* and *P* blocks a vicious regress; for one cannot non-circularly believe proposition *P*—e.g., "Event *x* happened," or "My memory works"—on the putative evidence *E* that "I *remember* my memory working in the past." Inferential internalists escape this circularity by their acquaintance with the PR that proposition *E* ("I am remembering event *x*") makes probable the claim *P* ("Event *x* happened").²⁰ Hence the PR is necessary *a priori*, on pain of justificatory regress;²¹ the PR cannot itself be inferred to obtain, or obtain only "probably" in the bad-grammar sense in question.²²

of the Aristotelian Society, New Series, Vol. 11 (1910-1911): 110, <http://www.jstor.com/stable/4543805>.

¹⁶ Russell, "Knowledge by Acquaintance," 109, 115.

¹⁷ Keynes, *Treatise*, §I.II.6, p. 12.

¹⁸ Fumerton, *Metaepistemology*, 74.

¹⁹ More precisely, but digressing from my thesis, Fumerton claims that noninferential justification for believing *E* amounts to the quaternary condition of (i) "ha[ving] the thought that" *E*, (ii) being "acquainted with the fact that" *E*, (iii) being acquainted with "the thought that" *E*, and (iv) being acquainted with "the relation of correspondence holding between the thought that [*E*] and the fact that [*E*]" (*Metaepistemology*, 75).

²⁰ For simplicity, I make no distinction between "remembering" and "seeming to remember," although other authors might. For independent criticism of Fumerton's concessions to the memory skeptic, see Josep E. Corbi, "The Principle of Inferential Justification, Scepticism, and Causal Beliefs," *Philosophical Issues* 10 (2000): 377-385, <https://doi.org/10.1111/j.1758-2237.2000.tb00032.x>.

²¹ Rhoda, "Fumerton's Principle," 219, 221; Fumerton, *Metaepistemology*, 199.

²² Keynes, *Treatise*, §III.XXII.11-12, pp. 259-261, assumes a "limitation of independent variety" of causes and laws in the universe to undergird the *a priori* necessity (of logical probability) between propositions, but I doubt that the inferential internalist needs to follow Keynes in this

According to Rhoda, however, neither can PR acquaintance be an *insight* into all the dependencies “typically” obtaining in our inductive inferences;²³ for those dependencies are contingent, and thus too complex to plausibly see at a glance. In Rhoda’s thought experiment about a car mechanic, the mechanic hears engine sound *E* to ‘see’ by PR acquaintance that *E* makes probable *P*, *P* being “that a piston rod needs replacing.”²⁴ Rhoda understands the object of PR insight in this case to be a contingent relation, because “the sound [could] be caused by something else.”²⁵ Granted, Rhoda admits that a necessary relation may well obtain between *E* and the “complex body of background beliefs” held by the mechanic, and *P*; but the mechanic cannot plausibly see *that* relation at a glance.²⁶ Such background beliefs “*B*”²⁷ include those “about the internal structure of car engines, beliefs about what healthy engines sound like versus what different types of unhealthy engines sound like, etc.,”²⁸ and the necessary relation putatively representing the PR becomes ‘(*E* & *B*) → *P*,’²⁹ a relation too complex to intuit by acquaintance. Hence Rhoda recommends a weakening of the PIJ, taking it to describe the simple and contingent relations that we ‘see’ against a backdrop of beliefs that we already hold,³⁰ rather than the necessary relation ‘(*E* & *B*) → *P*.’ He furthermore denies that background beliefs *B*, or classical skeptical problems like the reliability of human memory, are or need be justified by the PIJ.³¹

To recapitulate, I enter this debate to bolster on empirical and theoretical grounds the plausibility of the claim that PRs referenced by the PIJ are *a priori*

assumption.

²³ Rhoda, “Fumerton’s Principle,” 221.

²⁴ *Ibid.*

²⁵ *Ibid.*

²⁶ *Ibid.*

²⁷ Rhoda, “Fumerton’s Principle,” 222.

²⁸ Rhoda, “Fumerton’s Principle,” 221.

²⁹ Rhoda does not use this conjunctive AND (&) formula; he uses “(*E* + *B*) → *P*” (“Fumerton’s Principle,” 222-223), parsing the “+” symbol as “*plus...*” (“Fumerton’s Principle,” 221). By this nomenclature he implies that the “background beliefs, presumably, define a possibility space in which the conditional probability of the piston rod hypothesis, given the evidence, is significantly higher than that of any other available hypothesis at the same level of generality” (*ibid.*). I eschew the “+” notation to avoid misrepresenting it as a logical OR operator, which it is not. Neither Rhoda’s nor my argument suffers by my pretending the “+” relation to be a simple AND. My purpose in so transcribing Rhoda’s inference is to situate *B* in a toy PR relation easy to analyze, *viz.* simpler than a Bayesian analysis. My psychological and epistemological arguments are not, I assume, implicated by this simplification.

³⁰ Rhoda, “Fumerton’s Principle,” 222.

³¹ Rhoda, “Fumerton’s Principle,” section V.

necessary relations. My central argument is that the causal status effect (CSE)³² strips the B term from Rhoda's problematic $(E \& B) \rightarrow P$ relation, by shunting B -beliefs into the agent's very acquaintance with her evidentiary evidence E . That is, I think that being acquainted with complex evidence E sometimes requires background beliefs B that bear necessarily on our inferences; but if those background beliefs (B) operate beneath consciousness to bring the agent to acquaintance with E , then the agent's insight to the PR between E and P not only remains simple and uncluttered (*pace* Rhoda), but the *a priori* necessity of the PR remains plausible, and acquaintance with it remains justificatory per the PIJ.

Simply stated, I think that Rhoda makes too-heavy weather over the fact that the engine rattle E could be the sound of something besides the bad piston rod P . Of course it could! That possibility is why PRs often have values less than 1 (certainty). The mechanic is infallible that the sound E necessarily makes probable a piston replacement P ,³³ but mechanics of varying backgrounds perceive the value of that PR as higher or lower than the next mechanic does. My answer to Rhoda's worry is that what makes acquaintance with complex evidence E actually *about* E , can sometimes be previous acquaintance with background beliefs B . In particular, I think that the CSE employs B -beliefs to classify evidence E as E -type (see section 3).

Nor do I fall into circularity or justificatory regress by making acquaintance with E depend on prior acquaintance with B . The justifiability of human memory is its own problem that the inferential internalist solves if she perceives that her memory experiences (E) make probable that the events they depict really happened (P); such is the "dialectically impregnable" advantage accruing to inferential internalists about fundamental skeptical problems like memory.³⁴ Thus I face no special *justificatory* problem in claiming that acquaintance with a complex E sometimes depends causally on subconscious memory of B .³⁵ By the "causal dependence" of my acquaintance with E on my (subconscious) belief that B , I mean that E is a complex "fact" in the Fumertonian sense, an entity with properties (see five paragraphs ago); and perhaps I had to learn what "entities" or certain

³² Or the machinery of the mind that makes this effect happen. If CSE reduces to cognitive processes, so be it; I intend to beg no questions about the (im)materiality of mind.

³³ Indeed, the mechanic is infallible that the engine sound E necessarily makes probable that the moon is made of cheese (P); there is some probable relation between those propositions, but its value must be astronomically low, since no one reports perceiving it, and since anyone who compares the two propositions sees their relation as practically nonexistent.

³⁴ Fumerton, *Metaepistemology*, 218.

³⁵ For acquaintance is justificatory bedrock. My memory of B does not justify my acquaintance with E ; my acquaintance with the fact that E is its own justification.

“properties” even are, before I could be acquainted with facts about them: a doctor becomes immediately acquainted with a patient’s neurosis, for example, while the patient’s kin, or even a medical student, might not. Nor need I endorse any particular *philosophical* account of how this “causality” between background beliefs and acquaintance works;³⁶ the question is whether PR insights are phenomenologically plausible, and the overarching epistemic rule in that analysis is that acquaintance with PRs must be doing the justificatory work in the PIJ. My thesis does not, to my mind, transgress that epistemic rule.³⁷

Hence the remaining, relevant, twofold problem is (i) providing empirical and theoretical grounds for my thesis that acquaintance with a complex *E* depends causally on subconscious prior knowledge *B*, and (ii) assuring my philosophical reader that shunting *B* from ‘(*E* & *B*) → *P*’ into a causal factor for acquaintance with *E* renders the PR between *E* and *P* necessary *a priori*. I introduce cognitive psychological support for (i) in section 3, and address philosophical problem (ii) in section 4.

3. On Seeing Relations Between Propositions

Before examining how the CSE might relate *B*-beliefs to *E*-acquaintance, it pays to consider what Fumerton thinks the phenomenon of PR perception would be like.³⁸ The PR is “an *internal* relation holding between propositions,” he explains, and internal relations are those which “hold[] necessarily” if their “relata... obtain.”³⁹

One might argue, for example, that ‘being darker than’ is an internal relation that holds between the colors black and white. It is a necessary truth that if black and white both exist, then black is darker than white. The relation ‘darker than’ holds between black and white solely by virtue of the intrinsic character of the respective colors. ‘Being a lower note than’ is arguably an internal relation that holds between middle *C* and middle *E* on the piano.⁴⁰

Fumerton elaborates:

If there are internal relations and we can be directly acquainted with the intrinsic

³⁶ Although I outline what I think is an empirical correlation between *B*-beliefs and *E*-acquaintance by appealing to the CSE throughout sections 3 and 4.

³⁷ I thank an anonymous reviewer for pressing me to answer the contentions in this paragraph.

³⁸ Fumerton notoriously but consistently doubts that he has ever perceived a PR (Richard Fumerton, *Metaphysical and Epistemological Problems of Perception* (Lincoln, NE: University of Nebraska Press, 1985): 185; *Metaepistemology*, 204, 218; “The Challenge,” 128). As embarrassing as this point might appear, it does not undermine my thesis.

³⁹ Fumerton, *Metaepistemology*, 198.

⁴⁰ Fumerton, *Metaepistemology*, 198.

character of the relata of such relations, we might also be directly acquainted with the fact that the relation obtains. If propositions are the sorts of things we can *hold directly before our minds*, and if making probable is an internal relation holding between propositions, it might not be that hard, dialectically, to claim that one can *hold directly before one's mind* the kind of fact that makes propositions of the form '*E* makes probable *P* true.'⁴¹

The metaphor of "holding before the mind" just is Fumerton's metaphor for experiencing the acquaintance relation, and this metaphor facilitates Rhoda's objection⁴² that to 'see' the background beliefs *B* that *make it perspicuous* that '*E* makes probable *P*' is to simultaneously "hold before the mind" an implausibly large number of beliefs. Recall from section 2, however, my counter-objection to Rhoda, that one need not make a PR concomitantly perspicuous with the *B*-beliefs, if the *B*-beliefs instead subconsciously ensure that complex evidence *E* is *about E*, in a person's awareness.

Such "ensuring" amounts to *B*-beliefs playing a role in the agent's conceptualization of *E* evidence as *E*-type: that a hospital patient's off-topic remarks are apprehended not just as "some sounds" or "some words," but as "neurosis." It is this role of *B*-beliefs in the conceptualization of *E*-concepts that I find preliminarily indicated by the "causal status effect" (CSE) of psychology.⁴³

Roughly stated, the CSE is the tendency of humans to classify a given object under a type-concept, according to the causal features rather than the effect (or otherwise inert) features of that concept. A helpful summary of CSE is Bob Rehder's review of Woo-kyoung Ahn, Nancy S. Kim, Mary E. Lassaline, and Martin J. Dennis:⁴⁴

Ahn et al. tested novel categories with features related in a causal chain ($X \rightarrow Y \rightarrow Z$). For instance, undergraduates were instructed on a type of bird called roobans that typically eat fruit (*X*), have sticky feet (*Y*), and climb trees (*Z*) and that $X \rightarrow Y$ ("Eating fruit tends to cause roobans to have sticky feet because sugar in fruits is secreted through pores under their feet.") and $Y \rightarrow Z$ ("Sticky feet tend to allow roobans to build nests on trees because they can climb up the trees easily with sticky feet."). Feature importance was assessed by the missing feature method in which participants rated on a 0-100 scale the category membership of test items missing one feature (one missing only *X*, one missing only *Y*, one missing only *Z*). The results... revealed that the item missing *X* was rated lower than one missing *Y*, which in turn was lower than the one missing *Z*, suggesting

⁴¹ *Ibid.*, emphasis mine.

⁴² Rhoda, "Fumerton's Principle," 220-221.

⁴³ And not *uniquely* so; there may be other measured effects or cognitive theories that support my objection to Rhoda better than CSE does.

⁴⁴ Ahn et al., "Causal Status as a Determinant."

that X is more important than Y , which is more important than Z .⁴⁵

The causal status effect, then, is the tendency to rate an object's membership in a given category as less likely when a causal feature (X) of the object is missing, than when its effect features (Z) are missing. Woo-kyoung Ahn demonstrates the effect not only in the assignment of novel categories like roobans, but in the classification of artifacts and natural kinds.⁴⁶

Thus my objection to Rhoda is that what he calls background beliefs B sometimes refer to the causal and effectual features by which the evidence E with which we are acquainted is type-categorized by our cognitive system.⁴⁷ I hypothesize that Rhoda's mechanic, for example, employs B to "bring to mind" *that kind* of engine noise E , such that he may intuitively 'see' that ' E makes probable P '. That is, the particular rattle E is either metallic or pneumatic (versus plastic or wooden, etc.), metallicity and pneumatic-ness being causal or effectual features of the rattle, features about which the mechanic possesses background beliefs B . By the CSE, causal and effectual features present in or missing from the perceived rattle E impel the mechanic to categorize E as a certain type, and this type of evidence (like all type-categorized evidence in propositional form) stands in an *a priori* necessary PR to inferential conclusion P . This PR can be plausibly 'seen' by acquaintance, therefore, because the B term in ' $(E \& B) \rightarrow P$ ' has been shunted out: the B term is employed via CSE *to bring* evidence E before the mind, and so *contra* Rhoda, the mechanic need not hold $B \& E$ simultaneously before the mind to 'see' that P is probable.

I supported this "shunting" maneuver philosophically in section 2. There and here I retain the justificatory structure of the PIJ (as Fumerton construes it), but only elaborate from cognitive psychology what it means to be acquainted with complex evidence E , or to "hold E before the mind" when making inferences. Still, some readers may want additional reason to believe that my interpretation of CSE has anything to do with cognitive theory about our knowledge structures; the CSE may at this point appear too disconnected from *epistemology*. To meet this objection, I attempt in the next section to support my tacit assumptions (1) *that* we type-conceptualize⁴⁸ the evidence with which we are acquainted, and (2) that such conceptualization proceeds by way of CSE or something like it.⁴⁹

⁴⁵ Rehder, "Concepts as Causal Models," 361.

⁴⁶ Ahn, "Why are Different Features Central."

⁴⁷ By "cognitive system" I mean mind, body, brain, or whatever unobjectionable machinery undergirds human knowledge and consciousness.

⁴⁸ I treat "type-conceptualize" and "type-categorize" as equivalent terms.

⁴⁹ Most of my data supporting (1) and (2) comes from psychological studies of memory about the

4. Type-categorizations in Human Psychology

My task in this section is to redeem claim (1) of the previous paragraph, that when we wrack our memories to ascertain whether we performed an x -type action, we first retrieve a *concept* of x -type actions as a template to guide our search. To recall without looking at my cards whether I drew a suited ace-five of clubs, for example, I have to first conceptualize the generic act of ‘drawing an ace-five,’ an act which can be executed 16 different ways. If it can be shown that we type-conceptualize the objects of our acquaintance, then claim (2) of the previous paragraph can also be profitably investigated: that the CSE modulates conceptualization by something like Rhoda’s background beliefs B . Perhaps the reader will object that the action of drawing a hand of cards differs from the passive apprehension of the fact that I am holding that hand, or from passively hearing an engine noise in the example of Rhoda’s mechanic. My cognitive psychology data focuses on actions, so I ignore this discrepancy (see footnote 49).⁵⁰

actions we undertake, and perhaps my conflating knowledge with memory is objectionable (Akira R. O’Connor, Chris J. A. Moulin, and Gillian Cohen, “Memory and Consciousness,” in *Memory in the Real World*, 3rd edition, eds. Gillian Cohen and Martin A. Conway (New York: Psychology Press, 2008): 344 ff.). For present purposes I downplay this concern, because theorists routinely structure conceptual knowledge and memory in a relation of correspondence: “[R]ecognizing an event as an instance of a category consists of matching it to a schema stored in memory” (Jeffrey M. Zacks and Barbara Tversky, “Event Structure in Perception and Conception,” *Psychological Bulletin* 127, no. 1 (2001): 13, <https://doi.org/10.1037/0033-2909.127.1.3>). See also Johannes Engelkamp, *Memory for Actions* (East Sussex: Psychology Press Ltd., 1998): “free recall starts in the conceptual system” (136). Cf. Koen Lamberts, “Process Models of Categorization,” in *Knowledge, Concepts, and Categories*, eds. Koen Lamberts and David Shanks (Cambridge, MA: The MIT Press, 1997): 371-373 ff. On the philosophical side, Fumerton applies the PIJ to overcome memory skepticism (*Metaepistemology*, 34-36 ff.; “Epistemic Probability,” 160), so my appeal to psychological data on memory seems apropos.

⁵⁰ One frustration I will be unable to shake in this paper is that while my cognitive psychological data focuses on actions, several key studies of the CSE do not (Ahn, “Why are Different Features Central”; Ahn et al., “Causal Status as a Determinant”; Rehder and Hastie, “Causal Knowledge”; Christian C. Luhmann, Woo-kyoung Ahn, and Thomas J. Palmeri, “Theory-Based Categorization under Speeded Conditions,” *Memory and Cognition* 34, no. 5 (2006): 1102-1111, <https://doi.org/10.3758/BF03193256>). Hence I attempt in this section to show that the CSE plausibly pertains to the categorization of human actions, with the overarching goal of suggesting that we type-conceptualize *many kinds* of propositions with which we are acquainted, by something like the CSE.

4.1 The Type-categorization of Action: Galambos and Rips

Within the cognitive psychology literature, James A. Galambos and Lance J. Rips analyze action categorization by measuring subjective rankings of sequence and centrality for the episodes (“Take off hubcap,” “Unscrew the lugs,” “Put away jack”) comprising a routine (“Changing a flat”).⁵¹ They find that the subjective rankings of sequence and centrality are “not strongly correlated,”⁵² and that the time needed for subjects to categorize a given episode into a familiar routine is a statistically significant function of centrality, but not of “sequence nor the interaction of sequence and centrality...”⁵³ Thus an important question for my paper is how “centrality” relates to the background beliefs *B* that Rhoda finds to condition our perception of PRs. For if centrality is a background belief *B* employed in inferences, such as, ‘*that pitch* of the engine noise is *central* to classifying it as type-*E* evidence,’ then I would have in the data of Galambos and Rips an example of *B*-beliefs transpiring *before* and independently of Rhoda’s alleged ‘(*E&B*) → *P*’ inference (see section 2). Recall that according to my thesis, cognizing *B* before ‘(*E&B*) → *P*’ allows the PR between *E* and *P* alone to stand perspicuous to Fumertonian acquaintance. I hypothesize, then, that Galambos and Rips’s conclusion about the action-categorizing feature of centrality anticipates the more general findings of contemporary CSE research: that *causal* features categorize objects of awareness.

Fortuitously for me, Galambos and Rips take up just such a hypothesis. They investigate, for example, whether the statistically significant “centrality” more strongly connotes either the sufficiency or the necessity of an episode’s membership in a routine. Because the relations of sufficiency and necessity feature prominently in both commonsensical and philosophical notions of causality,⁵⁴ my assumption of the previous paragraph that centrality could stand-in for causality appears on-target.

Galambos and Rips’s results, however, are mixed. In a subjective ranking test, they measure necessity but not sufficiency to correlate to centrality,⁵⁵ but in timed categorization trials, they report that “[t]aken together,” sufficiency and

⁵¹ James A. Galambos and Lance J. Rips, “Memory for Routines,” *Journal of Verbal Learning and Verbal Behavior* 21 (1982): 265, [https://doi.org/10.1016/S0022-5371\(82\)90604-1](https://doi.org/10.1016/S0022-5371(82)90604-1). Each routine employed in the study contains twelve episodes.

⁵² Galambos and Rips, “Memory for Routines,” 266.

⁵³ Galambos and Rips, “Memory for Routines,” 268.

⁵⁴ Ned Hall, “Philosophy of Causation: Blind Alleys Exposed; Promising Directions Highlighted,” *Philosophy Compass* 1, no. 1 (2006): 86-94, <https://doi.org/10.1111/j.1747-9991.2006.00002.x>.

⁵⁵ Galambos and Rips, “Memory for Routines,” 269-270.

necessity “account for 65% of the variance in reaction times...”⁵⁶ Thus Galambos and Rips conclude that sufficiency and necessity are “not... the whole story behind centrality...”⁵⁷ For my purposes, however, 65% seems to be enough. All I need to argue is that actions are categorized by type, and that this categorization proceeds by something like causal features, to assume that the CSE modulates action categorization.⁵⁸ To argue, in turn, that Rhoda’s background beliefs *B* include these type-categorizing causal features is the philosopher’s job. That hurdle is, however, a small one, since Rhoda gives no rigorous account of which beliefs are background, other than that they conditionalize the belief of which an agent happens to be conscious.

I propose that one way to condition the belief of which I am conscious (of which I have acquaintance) is to *impel* my consciousness of it. Galambos and Rips report, for example, that cognizing the most central (i.e. causal) routines of “Changing a flat,” such as “Raise the car,” brings to human consciousness the ‘Change-a-flat’ action concept faster than does cognizing less central routines like “Put away jack.”⁵⁹ Thus against Rhoda’s charge that I must “hold before awareness” too many beliefs to see necessary connections between propositions, I can deny that when I am acquainted with the ‘Change-a-flat’ action type, I am simultaneously acquainted with the fact that the car is raised.⁶⁰ The latter belief instead sometimes causes my acquaintance with a ‘Change-a-flat’ action in progress,⁶¹ and from this complex evidence *E* (“someone is changing a flat”), I might see a PR to the conclusion that “someone is sweating.” Thus as I interpret Galambos and Rips, something like the CSE obtains in action categorization. In section 4.2, I relate these type-categorizations to knowledge structures, to strengthen the applicability of my cognitive psychological findings to epistemology.

⁵⁶ Galambos and Rips, “Memory for Routines,” 270.

⁵⁷ *Ibid.*

⁵⁸ Of course, only an empirical test would show that we categorize actions by the CSE.

⁵⁹ Galambos and Rips, “Memory for Routines,” 265, 268.

⁶⁰ As Fumerton warns, disputing with another the veracity of their reports about the objects of their acquaintance is a fool’s errand (*Metaepistemology*, 76).

⁶¹ Just as a certain pitch (*B*) of engine rattle may bring Rhoda’s mechanic to acquaintance with the kind of *E* that makes probable *P*.

4.2 Remembering Cause-categorized Types of Actions and Events

Although I lack data for the causal status effect with respect to categorizing *actions* like changing a tire,⁶² some researchers appear to suggest that our mental protocols are primed to exhibit such an effect in memory. To analyze this research, I must first sophisticate the vocabulary I have been using for human actions. I follow Brian J. Reiser, John B. Black, and Robert P. Abelson in distinguishing activities (e.g. *Eating in Restaurants*) from more generic actions (e.g. *pay the bill*),⁶³ actions being routines that we execute within various kinds of activities. Reiser, Black, and Abelson construct this taxonomy by measuring the time required for test subjects to recall an autobiographical memory described by activity and action cue words. Subjects recall memories faster when presented with activity cues, than with activity and action cues, both types of presentation yielding faster recall than that yielded by action cues alone.⁶⁴ Presenting activity cues before action cues also results in faster retrieval than the *vice versa* presentation.⁶⁵

Of interest to my thesis is Reiser, Black, and Abelson's identification of "knowledge structure[s]" of the human mind, in which activity concepts reside:

[T]he memory structure, *Eating in Restaurants* contains generalizations necessary for determining what actions to perform in restaurants... Accessing this knowledge structure while actually visiting restaurants results in the memory representations of particular restaurant experiences becoming associated with that structure in memory... *Thus individual experiences become linked to knowledge structures containing generalizations used in... comprehension.*⁶⁶

Helpful from this passage is the "link" between one's "comprehension" of *x*-type activities as *x*-type, and a knowledge structure representing that *x*-type concept (*Eating in Restaurants*). This link supports claim (1) from section 3, that humans do cognize type-level action and activity concepts like 'drawing an ace-five' or 'replacing a piston rod.' And given this additional support that we conceptualize the objects of our conscious awareness (and acquaintance) by type, we may consider whether these type-concepts are retrieved according to their causal features (background beliefs *B*).

⁶² I mean the CSE proper, not Galambos and Rips's intimations of it.

⁶³ Brian J. Reiser, John B. Black, and Robert P. Abelson, "Knowledge Structures in the Organization and Retrieval of Autobiographical Memories," *Cognitive Psychology* 17 (1985): 98, [https://doi.org/10.1016/0010-0285\(85\)90005-2](https://doi.org/10.1016/0010-0285(85)90005-2).

⁶⁴ Reiser, Black, and Abelson, "Knowledge Structures," 118.

⁶⁵ Reiser, Black, and Abelson, "Knowledge Structures," 107.

⁶⁶ Reiser, Black, and Abelson, "Knowledge Structures," 92; the emphasis on the final sentence is mine.

Interestingly, Reiser, Black, and Abelson endorse just such a theory. They claim that an agent's endeavor *to locate* the knowledge structure serving as the activity concept of a sought-after memory "is guided by reasoning mechanisms that utilize social knowledge about the *causes...* of behavior in order to predict circumstances likely to result in the target event."⁶⁷ For example, in the attempt to recall an *Eating at Restaurants* event that featured the outcome "*didn't get what you wanted,*" a test subject denied remembering any such event, but in the process verbalized his search among what Reiser, Black, and Abelson call his "hectic" restaurant experiences, presumably because this type of situation might result in not getting what was wanted."⁶⁸ Reiser, Black, and Abelson's point is that the "reformulation" of the activity concept directing the subject's search (from '*Eating...*' to '*Hectic dining*') "relies on *causal knowledge* represented in *Eating in Restaurants...*"⁶⁹ They conclude that activities, in contrast to generic actions, are what contain the "causal rules" employed "in comprehension and in directing [the] autobiographical retrieval" of individual actions and activities.⁷⁰ This modulation of action conceptualization by causal knowledge appears to support my thesis (2) of section 3.

Thus some psychological research suggests that we cognize the *E* and *P* of inferential internalism in terms of type-concepts, and that such conceptualization is directed (*viz.* modulated) by some of the *causal* beliefs that Rhoda calls *B* in his ' $(E \& B) \rightarrow P$ necessary inference. If the function of *B*-beliefs terminates *before* acquaintance with a PR is had, then Keynesian-Fumertonian acquaintance with necessary probable relations between *E* and *P* remains plausible (*contra* Rhoda). In my view, Reiser, Black, and Abelson support my thesis that an agent need not perceive whatever *B*-belief makes a restaurant memory "hectic," *while being acquainted* with the "hectic dining" activity concept. The *B*-belief instead guides the agent to acquaintance with a sought concept (*hectic dining*) from which she may perceive PRs to "probable" conclusions like "stood a long time in the lobby." Reiser, Black, and Abelson anticipate the CSE or something like it in the organization of human memory, and this organization enhances the plausibility of inferential internalism by my arguments already rehearsed.

4.3 Objections

⁶⁷ Reiser, Black, and Abelson, "Knowledge Structures," 93-94, emphasis mine.

⁶⁸ Reiser, Black, and Abelson, "Knowledge Structures," 94.

⁶⁹ Reiser, Black, and Abelson, "Knowledge Structures," 94. The emphasis on "causal knowledge" in this quote is mine.

⁷⁰ Reiser, Black, and Abelson, "Knowledge Structures," 126.

From a cognitive psychological perspective, someone might object that my evidence is not ironclad. M. A. Conway and D. A. Bekerian, for example, report an inability to replicate the findings of Reiser, Black, and Abelson with respect to action and activity cues,⁷¹ although as Conway and Bekerian admit, the cue presentation times differed considerably between their experiment and Reiser, Black, and Abelson's.⁷² Conway and Bekerian instead find a "highly significant effect" of priming the human test subjects in recall measurements with "personal cues," particularly "lifetime periods" (e.g. *sixth grade*)⁷³ solicited from test subjects prior to the experiment.⁷⁴ Conway and Bekerian surmise that Reiser, Black, and Abelson's subjects could have been surreptitiously categorizing recalled activities from lifetime periods, when those subjects demonstrated faster recall times for activities than for actions.⁷⁵

Another objection to my thesis is that the CSE is not settled science. Rehder reports that "the causal status effect can be overturned when an effect is generated by multiple causes,"⁷⁶ and can even disappear when "tends to" language in the stipulated causal relation experiments (X tends to Y) is replaced by "always" language (X always Ys).⁷⁷ Open questions also remain about the existence of the effect in children.⁷⁸

For my epistemological purposes, however, I do not need perfectly confirmed laws of cognitive psychology to undermine Rhoda's skepticism about the plausibility of perceiving necessary relations (PRs) between propositions. I did not even need to appeal to the CSE and its apparent predecessors as I did. I could have appealed instead to the "semantic congruity effect," whereby humans judge, for example, the differential largeness of large animals ("elephant versus hippopotamus") faster than they judge the differential largeness of small animals ("hamster versus gerbil...").⁷⁹ Differential largeness just is the larger-than internal relation, a member of the class of relations (including PRs) that Fumerton finds

⁷¹ M. A. Conway and D. A. Bekerian, "Organization in Autobiographical Memory," *Memory & Cognition* 15, 2 (1987): 124, <https://doi.org/10.3758/BF03197023>.

⁷² Conway and Bekerian, "Organization," 127.

⁷³ Conway and Bekerian, "Organization," 125.

⁷⁴ Conway and Bekerian, "Organization," 123.

⁷⁵ Conway and Bekerian, "Organization," 127.

⁷⁶ Rehder, "Concepts," 363.

⁷⁷ Rehder, "Concepts," 364.

⁷⁸ Rehder, "Concepts," 366. See also Brett K. Hayes and Bob Rehder, "The Development of Causal Categorization," *Cognitive Science* 36 (2012): 1102–1128.

⁷⁹ Linda B. Smith and Larissa K. Samuelson, "Perceiving and Remembering: Category Stability, Variability, and Development," in *Knowledge, Concepts, and Categories*, 179.

humanly perceptible in principle (section 3). Why do humans subconsciously exhibit the semantic congruity effect? *Pace* Rhoda, ostensibly *not* because humans hold more beliefs consciously “before their minds” when they see hamsters than when they see elephants. Perhaps instead, background beliefs *B1* facilitate acquaintance with the concept of a “large elephant,” and different beliefs *B2* direct the search for the comparatively rarer concept, “large hamster.” The point is that Rhoda rejects inferential internalism, partly because he thinks that the PRs obtaining between complex evidence *E* and conclusion *P* are “contingent, and therefore not internal. Instead, they are external relations grounded in background beliefs by virtue of the *content* of those beliefs.”⁸⁰ This paper challenges Rhoda’s claim by arguing that the CSE (or something like it) allows the PR between *E* and *P* to be internal and necessary *a priori*. The CSE subconsciously shunts the “content” of background beliefs *B* into the very formation and retrieval of the *E*-concept with which the inferential internalist is acquainted.

5. Conclusion

My objective in this paper was to undermine Rhoda’s skepticism about the plausibility of perceiving Keynesian-Fumertonian probable relations (PRs) between propositions. Such relations can be necessary, and yet perceptible in a single intuition (of acquaintance), I argue, because the background beliefs *B* which make salient the PR insight—that *E* makes probable *P*—themselves factor non-consciously in bringing complex fact *E* (or *P*) “before the mind.” That *B*-beliefs play such a nonconscious role in acquaintance with complex facts, I support by appeal to the causal status effect (CSE), the empirical tendency of human agents to categorize the entities of which they are conscious by those entities’ causal and effectual features. Rhoda provides no reason to doubt that *B*-beliefs could be such causal and effectual features. I additionally cited cognitive psychology literature to support my hypothesis that something like the CSE facilitates our memory recall and action recognition, enhancing the plausibility that inferential internalism justifies beliefs in those domains.⁸¹

⁸⁰ Rhoda, “Fumerton’s Principle,” 232, n. 28.

⁸¹ The author thanks Brett Sherman and Michael Stoeltzner for feedback on previous drafts.