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### Abstract

Recently there has been renewed interest in psycho-neural identity theory. This is in large part due to Heuristic Identity Theory, which brings some new insights into the relation between psychology and neuroscience. Perhaps even more significant is its concept of hypothetical identity that is positioned by McCauley & Bechtel to eclipse classical theories on psycho-neural identities in virtue of its relevance to scientific practice, specifically inter-level contexts. McCauley & Bechtel claim that in addition to providing an accurate representation of the practices of science Heuristic Identity Theory also answers some philosophical objections directed at classical identity theory. The correlation objection states there is no conceivable observation that could confirm/refute an identity but not the associated correlation. In this paper, I compare the classical psycho-neural identity theories of J.C.C. Smart and U.T. Place to Heuristic Identity Theory through their relation to the correlation objection. I aim to clarify the distinction between the two kinds of identity theory, one being philosophical while the other a method of science. Through this I will show that the correlation objection is not directed at Heuristic Identity Theory and therefore McCauley & Bechtel do not appropriately answer the objection.

# Identity: Philosophy or Science?

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## 1. Introduction

Recently there has been renewed interest in psycho-neural identity theory. This is in large part due to Heuristic Identity Theory, which brings some new insights into the relation between psychology and neuroscience. Perhaps even more significant is its concept of hypothetical identity that is positioned by McCauley & Bechtel to eclipse classical theories on psycho-neural identities in virtue of its relevance to scientific practice, specifically inter-level contexts. McCauley & Bechtel claim that in addition to providing an accurate representation of the practices of science Heuristic Identity Theory also answers some philosophical objections directed at classical identity theory. The correlation objection states there is no conceivable observation that could confirm/refute an identity but not the associated correlation. In this paper, I compare the classical psycho-neural identity theories of J.C.C. Smart and U.T. Place to Heuristic Identity Theory through their relation to the correlation objection. I aim to clarify the distinction between the two kinds of identity theory, one being philosophical while the other a method of science. Through this I will show that the correlation objection is not directed at Heuristic Identity Theory and therefore McCauley & Bechtel do not appropriately answer the objection.

## 2. Place & Smart

The classical psycho-neural identity thesis has its most famous proposals in U.T. Place and J. C. C. Smart. Generally, it states that insofar as a statement is reporting a sensation, it is reporting a brain process. There is nothing to report about mental phenomena beyond brain processes. As such, sensations

are identical to brain processes. Where Place and Smart differ is on the identity theory's status as a hypothesis.

Place defends the physicalist position as not ruled out a priori by dualistic arguments (Place, 44). That mental phenomena are processes in the brain is a "reasonable" scientific hypothesis, which is not philosophically contradictory (Place, 45). As such, it is a "contingent" empirical claim that makes use of the "is of composition" that may or may not receive evidentiary support in the future (Lyons, 101).

We are justified in identifying mental phenomena with a given brain process if we can explain psychological observations by reference to the brain process with which it is correlated. What changes these two sets of observations from strong correlation to identity is in treating the two sets of observations as observations of the same event (Place, 48). To establish mind-brain identity it is necessary to show the reports of introspection to be accounted for in terms of brain processes, virtually mirroring each other. This vague proposal of the identity thesis received an important criticism from Smart.

Smart also commits to the mind-brain identity thesis but adjusts its status from a "straight out" scientific hypothesis, in Place's sense, to an ontological orientation (Smart, 155). Instead of an empirical hypothesis, it is rather the result of an application of unificationist values, specifically simplicity, to the ontological status of psychological phenomena (Lyons, 104). The thesis is with respect to materialism and dualism or immaterialism. There is no conceivable test that could confirm one and falsify the other. They are each different ontological theories that provide different explanations for the same facts. The issue is in committing oneself to believe in the "nomological danglers," which Smart "is just unable to believe in ..., or in the laws whereby they would dangle" (Smart, 143). Admitting this as confession of faith, Smart is dissatisfied that everything but mental phenomena should be explicable by physical science. As long as there is no philosophical reason to be a dualist, though, we might as well uphold virtuous scientific values and be as parsimonious as possible - and dualism "offends" parsimony (Smart, 155). Echoing Edwin Boring, Smart concedes that its persuasiveness is in its usefulness for science (Lyons, 98).

### **3. Heuristic Identity Theory**

McCauley and Bechtel propose an identity thesis that differs radically from Place and Smart's formulations. They identify the identity thesis as more so a method for discovery than the means for ontological simplicity or a reductive scientific theory. Instead of identity being strictly the end of research, it can also be the beginning through "hypothetical identity" (Bechtel (2002), 236). It is a powerful tool used between disciplines of differing levels as a heuristic, such as lower level neuroscience and higher-level psychology (also see Shouten & de Jong (2001) for an application to genetics). Its purpose and benefit is to generate research that reliably leads to the development of more refined and accurate hypotheses (McCauley & Bechtel (2001), 737). Specifically, they aid the development of hypotheses that aim to connect two distinct explanatory levels. What motivates the formulation of such hypotheses is their potential to further research in each level (753).

McCauley and Bechtel's proposal stems from observations of the practices of psychology and neuroscience. Underlying cognitive neuroscience is a commitment to psycho-neural identity claims

(Bechtel (2002), 236). They are of the kind that identifies some functional entity in the field of psychology with an entity identified structurally in neuroscience. The details neuroscientists are learning about of brain mechanisms and their roles provide good reasons for psychologists to pursue new lines of experimentation, and vice versa. It aids the search for supporting or refuting evidence for their own research but also those across levels. This can result in the reconsideration of taxonomies and functions concerning cognition at both levels (McCauley & Bechtel (2001), 753). Thus, hypothetical identities are a valuable process in inter-level contexts.

Their proposal of identity theory, then, is radically different than its original formulation in the 1950s. They call it Heuristic Identity Theory (HIT). As hypothetical, these type-identities, when of “comparable grain,” are heuristics of discovery that inspire multi-level programs of research (McCauley & Bechtel (2001), 753). They enable one level of science to exploit the “conceptual, theoretical, methodological and evidential resources available at another” – all in the interest of advancing research (753). In addition to (potentially) being the conclusions of research (as in Place’s formulation) they are also the premises of research (753).

Shouten and de Jong in (2001) called for further clarification on HIT, as so far articulated it is far too permissible (Shouten & de Jong, 802). Specifically, more emphasis needs to be put on explanatory failure and success in order to “limit the HIT rate” (803). That is to say, not all hypothetical identities are justified in their proposal or as interesting as others. In order to limit the proliferation of “false positives” or similar downfalls, McCauley and Bechtel need to describe the relevant methods of falsification and identity choice – rather than emphasizing how fertile hypothetical identities can be for predictions.

Other than the role of a heuristic, then, is there any more description of hypothetical identities available? According to McCauley and Bechtel they are strong and falsifiable claims (Bechtel (2002), 236). The justification of hypothetical identities is the same as for any other scientific hypothesis and the same applies for its rejection (McCauley & Bechtel (2001), 751). They are particularly motivated by the predictive and explanatory progress they initiate – which is a way to vindicate the use of some rather than others (754). However, obtaining corroborating evidence for identifying some neural process with some psychological function along such lines will no more finalize that identity than it would any other hypothesis in science (McCauley (2012), 8). However, the more hypotheses the identity informs and the more successful those hypotheses prove, the more likely the hypothetical identity will come to serve as a reduction science can rely on rather than a baseless hypothetical identity (8).

Hypothetical identities do not require scientific explanations because, rather, they play a significant role in providing them (McCauley & Bechtel (2001), 756). Even when erroneous, hypothetical identities can provide significant foundation for discovering more adequate theories or models (Bechtel (2002), 235). Hence, conjecturing an identity that is not precise or accurate could still be beneficial, as it provides routes to eliminate and refine each level’s theories.

A central motivation for comparing HIT to classical identity theory is noticing that no longer is “philosophical cleverness” or “metaphysical comfort” the basis from which the identity theory gets its support and plausibility (McCauley (2012), 5). In fact, for McCauley and Bechtel it is absurd that psycho-neural identities be free from empirical evidence and that metaphysical considerations and the

logical circumstances of the identity claims carry so much weight. Rather, it should be empirical and explanatory adequacy that supports hypothetical identities (5). The philosophical picture drawn by classical identity-theorists and their critics is a misleading characterization of the place of identities in science.

HIT shifts the debate about the plausibility of psycho-neural identity theory. It proposes to move the assessment of identity theory away from the domain of philosophical and conceptual reflection and toward the actual practices of psychology and neuroscience. If philosophical contributions are to carry any weight, HIT maintains that with respect to the psychological and neural sciences, philosophical accounts should compete (and acknowledge their failure to do so) against our best scientific accounts (McCauley (2012), 9). Furthermore, compared to competing accounts of the relation between psychology and neuroscience (such as multiple realizability arguments and “psychometrics”) identities are most plausible if understood correctly as described by HIT (see Bechtel (2002), 236; and Burnston, Sheredos, and Bechtel (2011)).

#### 4. The Correlation Objection

A variety of objections have been launched against the original identity thesis formulation. The correlation objection, however, still receives attention and newer formulations (e.g. David Chalmers (McCauley & Bechtel (2001), 755)). A classical formulation of it comes from Kim (1966) (McCauley & Bechtel (2001), 754). For psycho-neural identities, “there is no conceivable observation that would confirm or refute the identity but not the associated correlation” (Kim, 227). Moreover, identity statements are not confirmable or refutable as an identity statement. Kim extends this objection to psycho-physical theories in general, concluding that they are not empirical hypotheses. Their “facts” are not falsifiable and their meaning is exhausted by their respective correlation statements.

Kim’s response even extends to Smart’s particular reasons for adopting identity theory, namely ontological simplicity. By moving from correlation statements to identity statements, Smart believes that we are ridding ourselves of unnecessary nomological danglers and thus moving towards a simpler and more unified science. However, according to Kim this is only a trivial achievement of simplicity, as the “factual cash value” of an identity statement is still the correlation. To replace correlation statements with identity statements does not achieve simplicity meaningfully as it does not reduce the number of “independent primitive assumptions” and the psychological entities in question are still disconnected from neural entities (Kim, 230). According to Kim, reducing the amount of primitive physical concepts is near tantamount to the parsimony Smart aims for. However, the “ontological simplicity” the Smart’s identity theory supplies does not achieve this.

McCauley and Bechtel believe that if “philosophy of science is (often) philosophy of mind enough” HIT refutes the correlation objection (McCauley & Bechtel (2001), 754). In fact, in almost every place they articulate HIT they mention its success in refuting the classical objection (McCauley & Bechtel (2001), 754; Bechtel (2002), 236; McCauley (2012), 5). McCauley and Bechtel urge that there is more on the table than the logic of confirmation for identity statements. If there was not, then the correlation objection would indeed succeed. It is what HIT provides to theories beyond their ontologies that gives an adequate response to the correlation objection.

McCauley and Bechtel accuse the correlation objection of totally missing the point with respect to hypothetical identities' role in scientific inquiry. Beyond indicating correlations, they stimulate research at multiple levels of study by allowing the utilization of explanations from different explanatory levels. Hypothetical identities as a methodological heuristic, then, are not justified as much as they are vindicated. They do not claim to rule out correlations by way of empirical evidence – but are rather used to occasion evidence and explanations (McCauley & Bechtel, 754). The correlation objection, then, misses the point entirely by getting the role of identities in scientific practice wrong.

### 5. Is HIT “philosophy of mind enough?”

It is clear from McCauley and Bechtel's work that HIT claims to have successfully refuted the correlation objection. In sum, the correlation objection does not refute identity theory because it does not reflect descriptive scientific practice. It seems there are two kinds of arguments here: philosophy of mind conceivability arguments and debates over the specific methods of scientists working in psychology and neuroscience. I submit the former is the debate between classic identity theorists like Smart and Place while the latter is with respect to abstracting from practice methods of science.

Kim's formulation of the correlation objection is targeted at Place and Smart's version of identity theory. And Place and Smart's version of identity theory is not talking about the descriptive use of identity in the sciences, at least not beyond their analogies to other kinds of identity. In fact, their opponent is dualism. Place argues that a priori psycho-neural identities are not ruled out and thus are possible (however low or high their probability of being true are). Smart argues on the basis of ontological simplicity – submitting that in accordance with our general values on simplicity and unification, we ought to believe in psycho-neural identities as opposed to the existence of some distinct ontology where psychological phenomena reside.

The correlation objection has a special force with such proposals because the proposed psycho-neural identities offer little in the way meaning and of simplicity. But does the correlation objection at all aim to challenge the specific methods of science described by McCauley and Bechtel?

I suggest that the correlation objection is not aimed at hypothetical identities because HIT is not “philosophy of mind enough.” It “misses the point” because McCauley and Bechtel have introduced a new concept of identity that the correlation objection was not intended to attack. HIT deals with specific methods in science that are described and abstracted from case studies rather than justified by some philosophical system of mind or science. In fact, that is one of the reasons HIT is interesting because it shows a distinct use of identity outside of the reduction of psychological phenomena to neuroscience. However, their use in the sciences is irrelevant to the correlation objection's force to identity theory. The correlation objection does not account for the vindication of prediction-inducing hypothetical identities because that is not its target. Its target is philosophy of mind arguments and classical reductionism is general, where McCauley and Bechtel agree that the correlation objection succeeds (McCauley & Bechtel (2001), 754). In fact, they concede that any direct evidence for the identity would succumb to the correlation objection (McCauley (2012), 8).

Furthermore, if the correlation objection was a criticism to the methods of science as described or abstracted from case studies, why wouldn't any instance of a scientist satisfied with a reduction or

identity answer the correlation objection? Why wouldn't any description of scientific methods with respect to identity or causation "successfully" answer the correlation objection? I submit that in order for the correlation objection to apply to HIT, there would need to be analogue correlation objection for the practices of science as opposed to the philosophical objection that applies to classical identity theory. Shouten and de Jong even point to a new kind of correlation objection resulting from an "inflated HIT rate" (Shouten & de Jong, 803).

## 6. Conclusion

Heuristic Identity Theory may indeed provide a better understanding of the practices and relation of psychology and neuroscience. However, it is not a philosophy of mind theory in the same way classical identity theory is. The cut here of course is that classical identity theory aims to make unempirical-philosophical claims about ontology where HIT is a method abstracted from case studies in science. The correlation objection to the classical identity theory is a philosophical objection. HIT has not responded to it, as McCauley & Bechtel claim, because the correlation objection is not attacking HIT. That is to say, the correlation objection "misses the point" of hypothetical identities precisely because it was not aimed at hypothetical identities. In order for HIT to refute it a bridge needs to be established to import the correlation objection's relevance to hypothetical identities' vindication (as opposed to justification).

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