

SLAPSA XII: The Twelfth Meeting of the Saint Louis Area Philosophy of Science

Association will take place this year online. Although we will not be in the same room, we look forward to continuing the SLAPSA tradition of supportive, engaging discussion while respecting the need to prevent the spread of COVID-19. Please join us!

April 25, 2020, 1pm – 4:30pm

We will utilize the Zoom videoconferencing platform. If you would like to hear the talks and participate in the discussion, just send an email to Kent Staley at staleykw@gmail.com to receive an invitation to join the meeting.

SLAPSA XII Speakers:

Janella Baxter, Washington University in St. Louis

Will Fleischer, Washington University in St. Louis

Sean Valles, Michigan State University (Keynote)

Yiling Zhao, St. Louis University

SLAPSA XII Schedule:

1:00 – 1:45: *The Problem of Disjunctive Variables in Causal Explanation*, YILING ZHOU, Saint Louis University

1:50 – 2:35: *Courage and Inquisitive Reasons*, WILL FLEISHER, Washington University

2:35 – 2:50: Break

2:50 – 3:35: *Explanatory and Non-Explanatory Values of Specificity in Genetics*, JANELLA BAXTER, Washington University

3:40 – 4:25: Keynote Address, SEAN VALLES, Michigan State University

Looking toward Post-COVID-19 Rebuilding: Population Health Science on What a More Resilient Health System Would Look Like

Abstracts

Janella Baxter, WUSTL: Explanatory and Non-Explanatory Values of Specificity in Genetics

Sequence specificity has been embraced as the causal property that makes molecular genes explanatory biology (Waters 2007, 2017, 2019; Weber 2013, 2017). I argue that sequence specificity does not capture what makes molecular genes in the majority of explanations formulated by geneticists. By drawing on one of the most central experimental methods in genetics – namely, the loss of function study – I show that molecular genes are often singled out in biological explanations for their regulatory properties. What this shows is that, as Waters (2006, 2019) has recently argued, there is no general structure to the biological world; however, the scope of genetic explanations is broader than what Waters admits. Although the sequence specificity of genes may not be as

explanatorily significant as some philosophers have suggested, I argue that it is nevertheless significant for the purposes of intervention. Unlike biomolecules like proteins, intervention on molecular genes is much more tractable because of sequence specificity. In this way, molecular genes don't just have a plurality of explanatory properties, but they have a plurality of uses in the life sciences.

Yiling Zhou, SLU: The Problem of Disjunctive Variables in Causal Explanation

The manipulationist view of causal explanation (Woodward 2003, 2008b, 2010) is recently criticized as inadequate for providing theoretical background for why in some cases "high level" causal variables are explanatorily (vs. practically) superior to others (Franklin-Hall 2016). In the manipulationist view, when multiple variables are qualified for causal explanation of one explanandum effect, the variable that constitutes the most *proportionate* and *stable* causal relationship is better. Franklin-Hall's example, however, shows that proportionality and stability as defined by the manipulationist lead to a bizarre judgment that disjunctive variables (whose values include a disjunction of relevant causes) are always better than single-factor variables (whose values include only a single cause). Franklin-Hall assumes that the single-factor variable is not just practically but explanatorily better than the disjunctive ones. Without clarifying what the distinction is, she draws the conclusion that the only way to draw the difference is appealing to metaphysical standards. In this paper, I disagree with Franklin-Hall's conclusion that to solve the problem of variables, the manipulationist must abandon the minimalist, purely relational view of causation and embraces additional metaphysical constraint on what qualifies as a causal variable (so that the disjunctive variables can be excluded). Instead, I interpret her example as a case where the norms of causal representation (i.e., proportionality and stability) are not sufficient for norms of causal explanation, which highlights a possible difference between causal representation and explanation. I thus suggest whether there is any non-causal and non-pragmatic norm of explanation that favors single-factor variables depends on how we understand the nature of explanation in comparison to representation of causal structures.

Will Fleischer, WUSTL: Courage and Inquisitive Reasons

Nobel laureate Barry Marshall famously drank broth infected with bacteria (*H. pylori*) in order to demonstrate that it causes stomach infections and ulcers (Marshall et al., 1985). This was a courageous act in the service of inquiry. Marshall acted in the pursuit of successful medical research, despite risking (and in this case suffering) serious harm. Even before this dramatic episode, Marshall and his Nobel-sharing collaborator Robert Warren were engaged in courageous inquiry. They endorsed a theory that had long been out of favor in the medical community: that ulcers are often caused by bacteria. Pursuing research on this theory, and advocating for it in print and at conferences, posed a significant risk of harm to their careers and reputations. This earlier work thus also risked harm in the pursuit of successful inquiry. For these reasons, Marshall and Warren count as intellectually courageous: they are pursuing epistemic ends despite significant threat of harm (Baehr, 2011).

When Marshall and Warren began their inquiry there was very strong reason to doubt that the bacteriological theory of peptic ulcers was true. The scientific consensus, and the available evidence, pointed to other factors as the primary causes of the disease (stress, excess acid production). Thus, Marshall and Warren cannot be simply described as seeking the truth, or following the evidence, despite risk of harm. Instead, Marshall and Warren were following good reasons to think that the theory was worth pursuing (Laudan, 1978). They were also (plausibly) sensitive to features of their social epistemic circumstances, in particular, that few other researchers were pursuing the bacteriological theory. Pursuing it would thereby improve the scientific division of labor (Kitcher 1990). Neither of these kinds of reasons count as evidence to think the theory is true.

We therefore need an account of intellectual courage that treats these considerations as involving appropriate epistemic ends.

In this paper, I offer a theory of the kind (or aspect) of intellectual courage displayed by researchers like Marshall and Warren. I argue that the proper account of this sort of courage requires recognition of what I call inquisitive reasons. Inquisitive reasons are a distinct category of epistemic reasons. These are not reasons to think a particular proposition is true. Instead, they are reasons concerning the promotion of successful inquiry. Reasons to think a theory is pursuitworthy are inquisitive reasons. Also included in the category are social epistemic reasons such as avoiding premature consensus and properly distributing cognitive labor. I propose that this aspect of courage, what I will call inquisitive courage, requires having certain competences to successfully act in a way that is sensitive to inquisitive reasons. Marshall and Warren act with inquisitive courage because they endorsed and pursued a theory based on the inquisitive reasons