# UNIVERSITY *of* WASHINGTON

# Undergraduate Research Symposium  *May 17, 2019 Mary Gates Hall*

# Online Proceedings

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## SESSION 1L

### MATHEMATICAL MODELING IN THE SCIENCES

*Session Moderator: Elizabeth Thompson, Statistics*
**MGH 271**
*12:30 PM to 2:15 PM*

\* Note: Titles in order of presentation.

**Objectivity and Likelihoodism: Relaxing Rationality Constraints via Qualitative Probability**
*Aditya Saraf, Senior, Computer Engineering*
*Soham Pardeshi, Junior, Pre Engineering*
*Mentor: Conor Mayo-Wilson, Philosophy, University of Washington, Seattle*

Likelihoodism is the conjunction of the following two statistical principles: (1) the Law of Likelihood (LL) which characterizes when a piece of evidence "favors" one hypothesis over another; and (2) the Likelihood Principle (LP) which characterizes when an agent ought to draw the same inference about how likely two competing hypotheses are, given a piece of evidence. Elliot Sober has argued that some of the greatest scientific achievements of the last two centuries – from Darwin's arguments for common ancestry to Eddington's argument that the bending of light during an eclipse favors Einstein's theory of relativity – are applications of likelihoodism. Many proponents of likelihoodism maintain that it provides an "objective" standard for evidence, and we first provide a precise account of the sense in which LL and LP are objective. We consider a statistical principle more objective if it is acceptable to agents with more diverse beliefs and/or values. We argue that LL and LP meet this type of objectivity by showing that all Bayesian agents endorse LL/LP. However a statistical principle is clearly not objective if it is acceptable only to agents meeting stringent rationality constraints. The typical formulations of LL and LP rely on the probability axioms, but one can show that requiring agents to cohere to these axioms requires agents to be logically omniscient. This unreasonable constraint makes LL/LP unacceptable for any human agent. Our paper resolves these issues by restating likelihoodism in a formal representation of qualitative probability and proving the corresponding theorems in this new context. This work elucidates how likelihoodism is objective and how it plays into a Bayesian framework.

## SESSION 1O

### MCNAIR SESSION - POLITICAL DIVIDES: QUESTIONS ABOUT IMMIGRATION, CLIMATE CHANGE, AND REPRESENTATION

*Session Moderator: Gabriel Gallardo, Geography*
**MGH 288**
*12:30 PM to 2:15 PM*

\* Note: Titles in order of presentation.

**America The Polarized: Surveying America's Political Split over the Topic of Climate Change**
*Alec Chapa, Senior, Conflict Resolution, Portland State University*
    *McNair Scholar*
*Mentor: Albert Spencer, Philosophy, Portland State University*

Climate change is divisive among Americans. Among scientists, there is virtually a consensus affirming climate change; the political scene, however, has been polarized, and polarization appears only to be growing. Though different segments of the population may understand the issue at varying levels of detail, the majority of these understandings must stand consistently for America to take decisive action on the matter, whatever action that may be. To address polarization, this research frames the issue as a national conflict in two parts: 1) a relational problem among America's constituencies, which sets the stage for 2) problems of communicating climate change information, which is difficult given gaps and complexity of information, amidst misinformation. Together, these two components explain the standstill of climate change initiatives. This research sets outs to address the question: "to what extent have opposing climate change views become polarized and dialogue been disabled, and how do internal and/or external narratives influence individual perspectives?" Possible research methods include: a quantitative analysis measuring political polarization, and qualitative close readings of two texts, each representative of the polarized constituents. Predicted results: 1) America has become increasingly polarized, so much so that it significantly interferes with academia, policy, and daily life, and 2) Narratives among Americans, on all sides of the conflict, are complex

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combinations generated by individuals, the media, and the forces that shape the media itself. Far from ordinary, these conflict-conditioned narratives perpetuate and escalate conflict, while also further disabling intergroup communication. The implications of this research entail how the current political impasse can be overcome, which thereby enables climate change initiatives to proceed uninhibited.

Doing so will also allow us to possibly add a purpose to different types of art depending on what concept they are the perfection of.

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## SESSION 2N

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## MCNAIR SESSION - THE IMPORTANCE OF PERCEPTIONS (HUMANITIES AND SOCIAL SCIENCE)

*Session Moderator: Phillip Thurtle, Comparative History of Ideas*
**MGH 295**
*3:30 PM to 5:15 PM*
* Note: Titles in order of presentation.

**On the *A Prioricity* of Beauty in Kant's 3rd Critique**
*Jesse Loi, Junior, Philosophy, Mathematics*
   *McNair Scholar, UW Honors Program*
*Mentor: Colin Marshall, Philosophy*

Immanuel Kant, in the Critique of the Power of Judgement, describes how we come to find objects beautiful through an aesthetic judgement. In particular, he claims that an object is beautiful in virtue of its property that we cannot find a concept to match it with. This explains our contemplation when looking at art whereas an object such as a hammer does not motivate us to contemplate it. He also notes that beauty does not rely on the idea of perfection, which is to have the most of certain qualities. In contrast to beauty, Kant puts forth the idea of purposiveness, which is a consideration towards an object's existence being a part of the causation of some end. This means for an object to have a purposiveness would be for it to fit as a means to an end goal. Kant then puts forth the idea of there being two types of beauty, being adherent and pure. Pure beauty follows Kant's general agreement that beauty should be free from concepts. However, Kant experiences certain tensions in terms of adherent beauty, in which an object is beautiful because of its utility. This appears contradictory to Kant's previous commitments to a lack of concepts. I explore these tensions and consider possible Kantian explanations for this. I've begun study on Robert Clewis' "The Origins of Adherent Beauty" to inform this topic as well. Clewis elaborates on the different approaches during that time to reconcile utility and beauty, noting several position Kant takes before assuming his current ideas. If we are able to resolve answers relating to adherent beauty, we will be able to design possible criteria for secondary adherent beauty.