Zvi Biener — Narrative

I am applying for promotion to the rank of Professor. I was hired in 2011 at the rank of Assistant Professor and was promoted to Associate Professor in 2017.

My work since tenure is distinguished from prior work primarily by its breadth. Since 2016, I have pursued interests in a wide range of areas, emphasizing collaboration and interdisciplinarity. Some of these areas are far from my core research, but I have developed them to align with the university's strategic mission, particularly in relation to digital futures and urban health. These include empirical research on loneliness, the philosophy of big data, and public engagement with science, most recently in regards to environmental sustainability.

In the following summary, I discuss these projects. I close by assessing how they meet the departmental RPT criteria. I include only work completed since my previous RPT evaluation. For a more comprehensive view, please see http://zbiener.github.io. Because my work blends research, teaching, and service in a manner increasingly common in the academy, the summary below often departs from a strict division between those three main fields.

I. Research Narrative

1. History of Philosophy of Science

- 5 co- and single-authored articles
- 1 article in 'revise and resubmit'
- 1 introduction to Encyclopedia part
- Monograph in progress for Oxford University Press
- 15 articles solicited and edited for *Encyclopedia of Early Modern Philosophy and the Sciences*
- 10 Peer reviewed talks (could not attend 2)
- 6 invited talks
- Book and journal refereeing
- Taft Center Fellowship Award

- Vice-president (2021-2023) and president (2023-2025) of *the International Society for History of Philosophy of Science*
- Editor-in-Chief, PhilSci-Archive (2020-2026)

My primary focus is on the philosophical implication of Newtonian science. I use Newtonian sciences as a compelling example through which to explore two fundamental questions: First, how and why do advancements in physical theory mandate new, often unanticipated, answers to longstanding philosophical questions? Second, how and why do such advancements open new methods and strategies for answering philosophical questions in general? This multifaceted investigation aims to shed light on the intricate relationship between scientific progress and philosophical thought.

In “The Certainty, Modality, and Grounding of Newton’s Laws” (with Eric Schliesser), we address the first of these questions. We explore how bodies, understood within a modern framework where the laws of nature are contingent, "know" which of many possible laws they ought to follow. By analyzing Newton's discovery of the Laws of Motion and examining their role in Newtonian physics, we argue for a Neo-Aristotelian perspective. On this view, laws and bodies are mutually determinative. Laws provide the formal causes of bodies and bodies provide the grounds for the existence of the laws. The view has been highly influential. It is presented as one of the two ‘dominant’ views on the subject in an upcoming issue of *Studies in History and Philosophy of Science*.

In "Definitions *more geometrarum* and Newton's Scholium on Space and Time," I shift focus to a different question: Do the technical concepts employed in a given physical theory possess any significance or applicability beyond the confines of that specific theory? The work exemplifies some of the key elements of my approach to historical inquiry: a close textual reading of unpublished sources and a deep sensitivity to the scientific and rhetorical contexts in which they were written. In addition, I challenge the common historiographical assumption that historical actors held rigid and unchanging views throughout their lives (e.g., that Hobbes held a distinctly ‘Hobbesian’ view; that Carnap held ‘the Carnapian’ view). This is an unrealistic assumption that fails to provide illuminating insights. Instead, I argue that Newton’s views evolved over time. Initially, Newton regarded “space” as a theory-neutral concept. He held that his account of space emerged in the context of physical theory, but could be detached from it and have larger applicability. In other words, he believed that his understanding of "space" unveiled a fundamental truth about the universe that transcended the intricacies of individual physical theories. However, Newton’s perspective eventually shifted. In his later years, he came to think of space as a theory-specific concept, one that cannot be detached from particular theoretical frameworks. Consequently, its truth/falsity could not be evaluated outside the specifics of particular physical theories. By exploring the progression of Newton's thinking, I shed light on the dynamic nature of his intellectual development. Moreover, I show that there are principled reasons to reject the idea that scientific theories have philosophical implications in an absolute sense, implications that are divorced from the theories that gave rise to them. This nuanced perspective provides a richer and more accurate depiction of the relationship between science and philosophy.

In “Mechanics in Newton’s Wake” (with Brian Hepburn), we explore a question first raised by Aristotle: how are physical and mathematical principles combined in disciplines like ancient optics or modern physics? We approach this questions by studying the connection between the mathematical formalism employed in physical theories and the substantive claims they make. Specifically, we challenge the received notion that the substantive principles of physics remained unchanged in the century following Newton and that the contributions to physics of thinkers like Euler and Lagrange were ‘purely’ mathematical. Instead, we present an alternative narrative. Our narrative describes post-Newtonian developments in mechanics as largely a search for equilibrium principles that characterize increasingly complex kinds of bodies. Newton's own work primarily focused on center-directed forces applied to point particles. A *purely* mathematical development of this work would have had no ontological implications. Yet our paper demonstrates that later developments were driven by two crucial insights. First, that different types of bodies — different ontologies — require different principles. And second, that different principles (e.g., for point particles, for rigid bodies, for fluid bodies) need not reduce to one another. Moreover, we argue against attempts to segregate these principles into separate domains labeled as "mathematical" or “physical." Instead, we show that they were discovered through the integration of mathematical and physical reasoning in the new discipline of ‘mathematical analysis.’

"Mechanics in Newton's Wake" aligns well with contemporary non-reductive approaches in philosophy of science, as well as with two other of my essays. The first is an titled "On the Integration of Mathematical and Physical Considerations in Aristotle's Subordinate Sciences" (R&R, unpublished). Famously, Aristotle held that nature can be studied mathematically by sciences that stand 'beneath' arithmetic or geometry, such as optics, harmonics, and astronomy. Scholars have traditionally argued that these 'subordinate' sciences differ from pure mathematics only in their limited physical domains. The prevailing view is that they treat these domains in a purely mathematical manner, neglecting the nature of the domains themselves. However, I present an alternative interpretation. I argue that, according to Aristotle, a subordinate science is defined by the essential inseparability of physical and mathematical principles. My argument is centered on Aristotle's polemical use of the subordinate sciences as an example of physics-mathematical reasoning in *Physics* 2.2. For context, I appeal to Plato's *Republic,* Euclid's *Optics,* and forms of ancient optical practice that relied on an inseparable mélange of physical and mathematical considerations. This essay, like the one mentioned previously, emphasizes the idea that traditional distinctions between physical and mathematical principles are inadequate for understanding the interplay between the two domains. By highlighting the intrinsic connection between them, I contribute to a broader understanding of the integration of mathematics and physics, both in Aristotle's works and in later science.

A second work that fits well with contemporary non-reductive approaches is "From Kepler to Gibson", co-authored with Vicente Raja and Anthony Chemero. In this paper, we argue that the concept of embodiment, which plays a central role in present-day approaches to cognitive science, can be traced to early-modern explanatory strategies rooted in physico-mathematics. Specifically, we highlight two key insights from early-modern thinkers that resonate with contemporary embodied approaches. The first insight pertains to the rejection of internal natures and the shift towards considering the body-in-its-environment as the appropriate unit of analysis. Within cognitive science, this shift challenges the traditional view of cognition as solely occurring within the confines of the individual mind, emphasizing instead the inseparable connection between the body and its surroundings. The second insight relates to the interconnectedness of mathematical and physical/corporeal traits. Many of the explanatory advances of 17th century mechanics resulted from treating mathematical principles and bodily characteristics as inherently intertwined. This recognition is also part of contemporary cognitive science, which uses mathematical techniques to study the ecological relationship between an organism and its environment. By exploring the historical roots of this idea, we show that contemporary analyses of ecological psychology that stress its essentially non-mechanical nature are mistaken. They have simply misidentified what is crucial about 'mechanism.' The paper once again shows that advancements in physical theory can have unexpected philosophical implications, sometimes in quite distant intellectual fields.

In "Working Hypotheses, Mathematical Representation, and the Logic of Theory-Mediation" (with Mary Domski), we explore the philosophical presuppositions necessary for constructing empirically meaningful physical descriptions, particularly in relation to establishing well-defined physical quantities. We use George Smith's notion of 'working hypotheses' and his studies of 'theory-mediated measurement' as launching points. By analyzing Newton's experiments on fluid motion, we formulate a crucial distinction between two types of evidential warrant: 'conditional evidence' and 'independent evidence.' Conditional evidence is evidence for an hypothesis that is based on phenomena that would not be constituted *as phenomena* (and thus could not serve *as evidence*) without assuming the hypothesis

which the evidence supports. In other words, this evidence relies on the very hypothesis it is meant to secure. Independent evidence is evidence for an hypothesis that relies on phenomena that are well-defined independently of the hypothesis itself. By differentiating between conditional and independent evidence, we shed light on the epistemic foundations of scientific reasoning and the role of theory-mediation in shaping our description of physical phenomena. Importantly, we stress that almost all evidence is conditional evidence. There are no ready-made phenomena in nature, no phenomena independent of the theories that characterize them. The analysis also allows us to contextualize Newton's *Principia* in the larger history of philosophy. We show that following the logic of theory-mediated measurement, as one is naturally urged to do when engaging with the *Principia,* suggests that the most basic posit of physical theory is that only phenomena that can be assigned determinable magnitudes – phenomena subject to mathematical representation – can serve as evidence about motions and forces. Consequently, the initial step to developing physical theory is the idea that all phenomena occur within a structure already rife with mathematical meaning. A Kantian reading of the *Principia* — perhaps even Kant's reading — naturally follows.

In addition to my published papers, I have also delivered 16 talks, often on topics that are not covered in my written work. For instance, I have given several talks on the early historiography of mechanics and Newton's role within it. I argue that the importance we now place on Galileo in the history of mechanics is largely due to Newton's attribution of his first two laws to Galileo. However, I show that Newton was in no position to make this attribution. In fact, my analysis reveals that Newton actually learned from Robert Hooke what he attributes to Galileo. The talk is based on a highly detailed analysis of the sequence of drafts leading to Newton's *Principia*, the correspondence between Hooke and Newton, and a bibliographical history of Galileo's publications in the 17th century. The written version of this talk has been promised for inclusion in a volume titled "The Mechanization of Philosophy 1300-1700." This volume is part of a project led by Henrik Lagerlund and funded by the Swedish Research Council.

I have also explored Newton's view on induction in several talks. They rely on the following key idea: Isaac Newton used multiple comparative concepts to characterize inductive success/failure. Scholars, however, have traditionally tried to reduce the meaning of 'Newtonian induction' to a single defining characteristic: simple 'enumerative' induction, or induction as generalization in scope, or induction as greater and greater confidence in increasingly accurate claims. I argue that attempts to find a defining feature of Newtonian induction are misguided. I claim, instead, that Newton understood induction along three, irreducible dimensions: strength, generality, and fit. Each corresponds to a different *desideratum* of his new physics: increasing strength corresponds to 'simple' enumerative inductive support, increasing generality corresponds to broader and broader scope in space, time, and classes of objects; and increasing fit corresponds to higher and higher precision within inductively made claims. Keeping these dimensions distinct allows us to recognize that Newton purposely emphasized different features of induction in different contexts, and thus see that his formulations were not confused, but responsive to different argumentative needs. This subject, once again, demonstrates the main theme of my work: how and why advancements in physical theory mandate new answers — often unanticipated by their original proponents — to longstanding philosophical questions.

The professional recognition of my work has been gratifying. First, Oxford University Press has approached me to write a monograph on Isaac Newton, which will be a part of their *Philosophical Outsider* series. This series emphasizes the valuable contributions of non-philosophers to the development of philosophy. Second, I have been awarded the Taft Center Fellowship for the upcoming

academic year, AY 23-24. This fellowship will provide dedicated time and resources for me to focus on authoring the above book. I am grateful for this support. Third, I have been elected to two central positions within the profession. These positions allow me to contribute to and engage with the wider philosophical community.

In 2021, I was elected as the vice-president and president elect of the *International Society for History of Philosophy of Science*. It is the central society of my specialization. This appointment brings with it a substantial service obligation, but it also presents a remarkable opportunity to contribute to the future direction of the field. In 2020, shortly before my election, I took on the responsibility of managing the technical aspects of our biennial conference, originally scheduled to be held in Hong Kong in the summer of that year (see supporting letter in eRPT "External Letters"). Despite significant efforts to ensure a smooth operation of the conference's backend processes, including the management of submissions, scheduling, and registration platforms, the conference had to be cancelled due to the global pandemic. With my election to vice-president in 2021, my main task was to secure a location for the 2024 conference. Given the lingering impact of the COVID pandemic on the academic world, it required persistent efforts to convince organizers to pledge their support for a future conference. Despite the challenges, I successfully secured the University of Vienna as our host for the 2024 event. In 2023, I assumed the role of president, now overseeing all of the society's operations. This encompasses the complete organization of the 2024 conference (including the entire management of the back-end submission and scheduling platform), the management of committees and committee elections, negotiating contractual obligations with the University of Chicago Press (the publisher of our journal), initiating a capital campaign to secure the society's long-term financial well-being, and managing various financial obligations related to graduate student support and conference management/travel. My term ends in 2025, at which point I will become "Past President" until 2027.

In 2020, I was also elected as the Editor-in-Chief of the PhilSci-Archive (http://philsci-archive.pitt.edu), a position which was renewed for another 3 year term in 2023. The PhilSci-Archive, located at the University of Pittsburgh, serves as the primary preprint repository for the philosophy of science community. As of 2022, the archive records nearly 1 million downloads per year, illustrating its significant impact and reach within the field. The archive is financially supported by Pittsburgh's Center for Philosophy of Science, Pittsburgh's Department of History and Philosophy of Science, Pitt's Libraries, Pitt's Provost's Office, and the Philosophy of Science Association. Notably, I am the first to hold the Editor-in-Chief position from outside the Department of History and Philosophy of Science at the University of Pittsburgh, marking a significant milestone in the archive's 20-year history. I am deeply committed to upholding the archive's mission of facilitating open access publishing. By overseeing the day-to-day operations of the archive (including the overseeing of 2 graduate students), securing yearly funding, and working closely with the editorial team to ensure the quality and relevance of the publications, I aim to nurture a dynamic and inclusive platform that supports the free dissemination of philosophical work. I am also responsible for generating the archive's annual reports and data analysis. I should note that my position in PhilSci-Archive demonstrates one of the ways in which the philosophy department at UC, which also houses the administrative offices of the Philosophy of Science Association, has emerged as a major player in the field of philosophy of science nationally. In fact, it is now almost impossible to be part of the philosophy of science community in the US without going through some UC-based service or personnel in one way or another.

These two elected positions serve as clear evidence of the international recognition and value placed on my work, abilities, and dedication. They also highlight the qualities and expertise that have made me suitable for assuming field-wide leadership positions.

2. Loneliness in Older Adults

- Successful Institutional Review Board (IRB) application for long-term study
- $120,000 seed funding from the Office of Research
- R21 grant application to National Institutes of Health, unfunded
- Mentoring of two undergraduate summer researchers

From 2019 to 2021, I actively participated in collaborative research focusing on loneliness in older adults. This research project emerged from my involvement in a year-long "Transdisciplinary Leadership Research Program," which was led by the Office of Research. Our research team consisted of faculty members from Biology, Nursing, and Environmental Engineering. Our overarching objective was to characterize loneliness in older adults along several dimensions – psychological, social, biological, and environmental – with the aim of determining measurable markers, correlating their interactions, and formulating a multivariate metric.

Initially, our investigation yielded positive results, and as a result, we secured $120,000 in funding from the Office of Research at the University of Cincinnati. This funding served as seed funding for a larger study that was meant to employ a combination of qualitative and quantitative research methods. Specifically, we aimed to correlate human gut biome and gut metabolite composition (known to be associated with depression) and loneliness itself, which was to be characterized through extensive one-on-one interviews with volunteers from the Maple Knoll retirement community. Through whole genome sequencing of fecal samples from lonely and non-lonely adults, the presence of microbes, bacteria, and viruses correlated with loneliness was to be determined.

After obtaining Institutional Review Board (IRB) approval in late 2019, we successfully conducted qualitative interviews and subsequent data analysis in the spring of 2020. Our next planned steps involved analyzing the gut microbiome and conducting site visits to Maple Knoll in March 2020. Unfortunately, our plans were disrupted by the onset of the COVID pandemic and the subsequent lockdowns. This meant that we had limited remote access to our research participants and no access to their biological samples. Our seed funding was also soon to expire.

In response to the challenges posed by the pandemic, we attempted to adapt our research strategy. We submitted an R21 grant application to the National Institutes of Health (NIH), with the goal of re-gathering preliminary data to compensate for the setbacks caused by the pandemic. Regrettably, our application was not successful, and we were unable to secure additional funding.

Nevertheless, the project entailed a significant time investment: from weekly meetings with the research team over 2 years, to significant time devoted to mastering the sociological and psychological research on loneliness, to the work associated with interviews and data analysis. I've included the successful IRB application and part of the unfunded NIH application as part of my dossier. These documents provide valuable insights into the rigorous ethical considerations and the comprehensive research plan that were

developed to investigate loneliness in older adults. Although the NIH application was not funded, it is a testament to the significant effort and thought put into the research design and the potential impact of the study.

Work on the study also bled into my teaching. In the summer of 2019, I mentored two undergraduate students in conducting research on loneliness. The work was part of Discover, a project of the University Honors Program. The project allows undergraduates to select their own mentors based on shared research interests, and pays the student's summer salary to engage in this research. Notably, faculty members often receive limited expressions of interest from students in this program. However, the topic of loneliness proved to be compelling enough that two students specifically chose to work with me, with one of them willing to dedicate their time without any compensation.

3. Big Data and AI

- 3 new courses on philosophy of big data
- 1 first prize in talk competition for "AI, Skill, and Human Identity."
- Member of Taft Center "Algorithms" and "Digital Bias" research groups
- Dovetails with open-access efforts as philsci-archive Editor-in-Chief.

Since an early career as a database engineer, I've had an abiding interest in the philosophical implications of large-scale data analysis. Specifically, I'm interested in challenges to causal reasoning posed by the the nominalist metaphysics that underlie category construction in current data techniques. In the popular press, this idea has been presented as the "End of [Scientific] Theory" (most notably by Chris Anderson). But while that prognosis is overly dramatic, I'm interested in what truth there is to it. Specifically, I am curious about how we can navigate and achieve anything that resembles "understanding" in a future where opaque artificial intelligence guides scientific theory construction.

In the past six years, I've created three new courses that deal with these topics. Two are focused on the ethical challenges raised by big data, and the third is a hands-on, experiential exploration of big data techniques. This course, offered through the University Honors Program (UHP), bridged the gap between theory and practice and proved to be particularly rewarding. During the course of the semester, students created a complete data 'lifecycle' centered around analyzing enrollment patterns at UHP: from scrubbing raw data, to choosing and implementing appropriate analysis techniques, to data visualization and formulation of recommendations.

In addition, I am active in various data-centered initiatives at the University of Cincinnati. I am a member of two data-related Taft Center Research Groups: one focused on algorithms (2019-2022), and another specifically addressing digital bias (2023-2026). Furthermore, I have been involved in the University Library System's annual Data-Day since 2017, where I have served as a panelist and regular attendee. Additionally, I had the opportunity to deliver a well-received talk at UC Forward's "AI and the Future of (No) Work" Colloquium (2019). This colloquium featured a talk competition, and I was honored to receive first prize for my presentation on "AI, Skill, and Human Identity." The talk argued that we ought to look to an unexpected source — disability studies — for insights on how to find our place in a future in which work is increasingly automated and dominated by artificial intelligence.

My interest in data analysis aligns with my role as the Editor-in-Chief of PhilSci-Archive, where I am dedicated to promoting the principles of Open Access (OA) publishing. During my tenure, the archive has expanded the reach of OA by establishing partnerships with and 'echoing' OA books by publishers such as the University of Calgary Press and the British Society for Philosophy of Science. We have also echoed an increasing number of OA journals. Yet the field is not without its challenges. New laws in the European Union have raised concerns about potential unintended consequences that could hinder the growth and accessibility of OA publications. To address these issues, I have been involved in an Interest Group consisting of editors and representatives from the Philosophy of Science Association, the British Society for Philosophy of Science, the European Philosophy of Science Association, the Society of Philosophy of Science in Practice, *Studies in History and Philosophy of Science*, *International Studies in Philosophy of Science*, *Philosophy of Medicine*, and the *Journal of Economic Methodology*.

4. Public Partnerships and Environmental Sustainability

- 1 co-authored paper on public engagement and philosophy
- 3 co-taught courses pairing students with industry-partner projects (2 as overload)
- 1 primary advisory role in project with the Environmental Protection Agency on remediation of Harmful Algal Blooms.

I have been an affiliate of UC's Center for Public Engagement with Science (PEWS) since its inception. In that capacity, I have co-authored a paper on the "Divergence of Values and Goals in Participatory Research," with Lucas Dunlap, Amanda Corris, Melissa Jacquart, and Angela Potochnik. In this paper we provide a framework for analyzing the variety of participatory research. We emphasize the significance of the *differences* that exist between the goals of academic researchers and the goals of public participants. Understanding these divergences is crucial for effectively constructing and comprehending participatory projects. By unpacking the variations in values and goals between different stakeholders, we provide valuable insights into the dynamics of participatory research and enhance existing categorizations of the field like those provided by Jennifer Shirk (et al.) and Aya Kimora & Abby Kinchy. Our framework not only enhances the conceptual understanding of participatory approaches but also informs the practical implementation of such projects.

In the past two years, I have also been part of the teaching team of UC's Institute for Research in Sensing (IRiS). Each year, the institute brings together a cohort of graduate students from a variety of disciplines, and pairs them with industry partners to tackle real-world challenges. As part of the teaching team, my role has involved guiding and mentoring these students throughout the program. The students are presented with unique challenges posed by industry partners, and their task is to devise innovative and interdisciplinary solutions to meet those challenges.

This last year, in particular, I have been the primary advisor on a project posed by the Environmental Protection Agency on the remediation of Harmful Algal Blooms (HABs). The student group — Xin Gu, Michael Meece, Sirjana Pun, and Steven Quarin — and I created a Citizen Science Project that allows beach-goers to actively participate in monitoring and reporting the presence of HABs in their local areas. Through a mobile interface, individuals can capture photographs of HABs in their early stages of development and submit them for analysis. The data collected through this citizen science initiative can

then be reported to the EPA for further investigation and remediation efforts. The project encompasses a public-facing informational component that provides educational resources and raises awareness about HABs (created using ArcGIS StoryMaps), as well as a data-collection component that leveraged the services of Zooniverse and CitSci.org to enable the efficient submission and management of HAB reports.

To sum, the categories above demonstrate my commitment to interdisciplinary collaboration. Since tenure, I have actively sought opportunities to bridge different fields and perspectives, and it is evident that my efforts have been recognized and appreciated by others. The invitations, leadership positions, and collaborative projects I have been involved in demonstrate that people value my work and trust in my ability to contribute meaningfully to their own projects.

II. Teaching Narrative

- 19 courses since previous evaluation, including:
    - 2 overloads
    - 4 courses competitively selected for University Honors Program
    - 4 cross-listed with Psychology, Urban Planning, Engineering Education, and Geology
- Runner-up for Dean's Teaching Excellence Award (2017)
- Recipient of Transformational Experiential Leaning Award from UC Forward (2022)
- A&S college-wide nominee for university-wide Distinguished Teaching Professor Award (2022)

Since joining the University of Cincinnati in 2011, I have been dedicated to promoting novel and interdisciplinary learning experiences that extend beyond the boundaries of traditional classrooms and subjects. This commitment has not gone unnoticed. Recently, I received UC Forward's "Award for Transformational Experiential Learning," which is given for "innovation opportunities for University of Cincinnati students to put learning into action" and "to develop skills through collaboration, team leadership and project management that extends the traditional classroom experience." I was a runner-up for A&S's Dean's Award for Teaching Excellence in 2017, A&S's nominee for the university's Distinguished Teaching Professor Award in 2022, and was a founding member of A&S's Instructional Innovation Advisory Council, which focuses on improving faculty support related to teaching technologies. Below, I outline some elements of my teaching methodology:

1. Bringing collaborative work into and out of the classroom.

I have expanded UC's course offerings through a series of novel courses that aim to bring original collaborative work into, and subsequently out of, the classroom. In the past 3 years alone, I've proposed and was competitively selected to offer 2 new undergraduate courses for the University Honors Program, co-taught with faculty from Geology (PHIL/GEOG 3095) and faculty from Engineering Education (PHIL/ENED 3094). Previously, I proposed and was competitively selected to offer one of A&S's 'first-year-experience' core courses on "The Power of Big Data," with faculty from Psychology (PHIL / PSYC 1070). This was the first philosophy course on big data. I also proposed and was selected

to offer the UHP course "The Good Life - And How to Live It" in collaboration with faculty from DAAP (PHIL / PLAN 3093). Because of this record of interdisciplinarity, I was asked three times in the past 2 years to co-teach the core graduate course of the Institute for Research in Sensing (IRiS), alongside faculty from Chemistry and DAAP (NSCI 7001). The course focuses on project-based real-world challenges, in collaboration with external business partners (Kroger, P&G, the Environmental Protection Agency, the National Institute for Occupational Safety & Health, and Clovernook Center for the Blind and Visually Impaired).

2. Undertaking teaching initiatives outside of normal workload.

I've also been involved in several teaching initiatives outside of my normal workload. Apart from the already-mentioned creation of an A&S 'first-year experience' collaborative course and A&S's Instructional Innovation Advisory Council, I was part of A&S's "iPad initiative" (focused on bringing teacher-student interactive technology into the classroom) and, prior to tenure, a CET&L 6-week summer seminar on creating asynchronous online courses (the course received a score of 97% on QualityMatter.org's evaluative rubric). I've chaperoned students on two study-abroad trips, both to Cambridge and London, UK.

3. Fostering an inclusive, honest, and open space for students.

My teaching recommendations show that I create an inclusive, honest, and open space for students. They show that in a space where knowledge is produced, I embraces lesser represented epistemic standpoints and/or lack of knowledge as publicly and explicitly as possible. In other words, I share epistemic authority with students and allow all students an equal standing. While inclusivity, diversity, and openness are their own moral imperatives, the letters included in my dossier show that this approach also has a distinctly pedagogical outcome: when students recognize themselves as authoritative epistemic agents, they hold themselves more accountable for their own learning. My quantitative evaluations show consistently higher scores than the A&S average for "Instructor demonstrated sensitivity to students' needs and diverse life experiences."

4. Numerous mentoring, supervising, and advising activities.

I have engaged in numerous mentoring, supervising, and advising activities. Over the past 3 years, I have served on 4 PhD committees, written and graded the Department of Philosophy's Qualifying PhD Exam in Modern Philosophy, and mentored 2 pre-dissertation advisees. Additionally, in the past 5 years, I have mentored 4 undergraduate Honors students through UHP's Discover program. As my recommendation letter from Quentin Sutton (who left UC in 2015) shows, I am also involved with a few students' lives far after they leave UC. My quantitative evaluations are higher than the A&S average on "The instructor cares about the success of their students / The instructor was willing to help students outside of class."

5. Motivating students to reflect on the role of academic learning in their lives.

A regular element of my teaching is to motivate students to reflect on the role of academic learning in their broader lives. For example, in PHIL / ENED 3094 ("The Happiness of Pursuit"), students were asked to create a non-academic goal that they could complete within the course of a semester. Goals ranged from having conversations with people without homes living around UC, to overcoming social

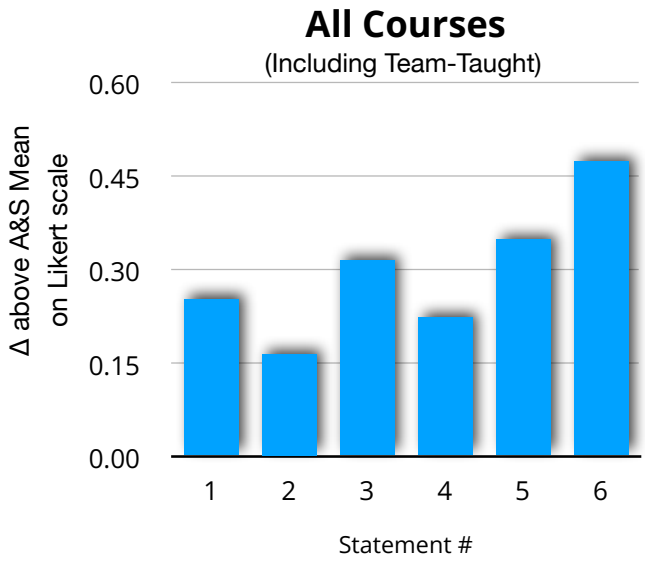
anxiety in large groups, to learning to cook international cuisine. The course combined scholarship on goal planning/execution with philosophical theories on happiness, with the aim of helping students achieve personal growth. In PHIL / PLAN 3093 (“The Good Life - And How to Live It”), students used ancient greek theories of good living as frameworks through which to interview an elder member of their family. The culminating project involved creating a "life-plan" in which students articulated a life goal and explicitly described how it could contribute to their personal growth and fulfillment, drawing insights from both their family interviews and philosophical sources. Relatedly, I often emphasize to students the worth of exercising critical thinking with their own lives as targets. In other words, I urge them to place themselves on a life-trajectory that they undertake with open eyes, not because of unspoken societal expectations or inertia. The lasting impact of this approach is clearly evidence by the enclosed recommendation letters, one of which plainly (and, of course, partially) attributes the author’s eventual success as an Assistant Professor at OSU to working with me as an incoming international student with little experience in English.

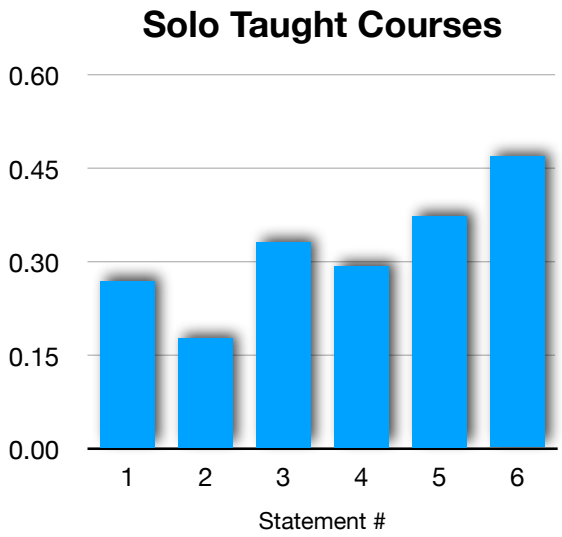
All in all, my teaching is effective and well received. Like my research, it is defined by discipline-bringing and collaborative work.

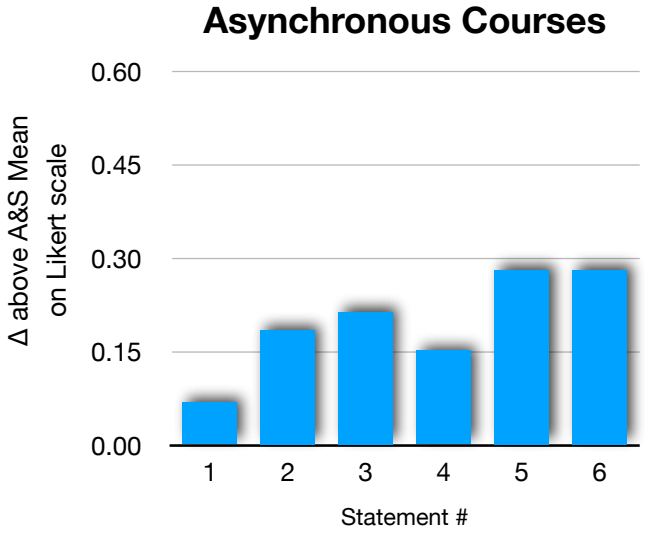
Quantitative Analysis

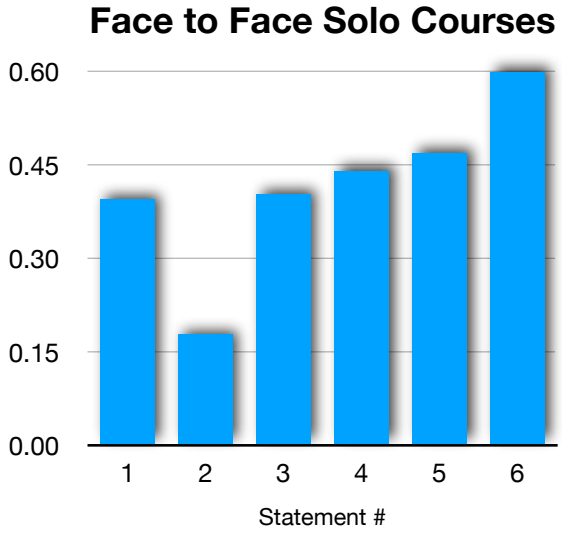
Student evaluations demonstrate that my approach to teaching is well received. Each Semester, students are asked to express how strongly they agree with a series of statements, on a Likert scale (from 5 (strongly agree) to 1 (strongly disagree). The graphs on the next page track 6 representative statements concerning my teaching for the last 3 years, each keyed to a number. The baseline for each graph represent the A&S average for that statement. The graph clearly show that I am consistently above the A&S average.

#	Statement
1	The instructor was well prepared and knowledgeable./ The instructor demonstrated a thorough knowledge of the subject.
2	The instructor showed interest and enthusiasm for the subject matter / The instructor dealt effectively with student questions.
3	The instructor cares about the success of their students / The instructor was willing to help students outside of class.
4	Instructor demonstrated sensitivity to students' needs and diverse life experiences.
5	I learned perspectives, principles, or practices from this course that I expect to apply to new situations.
6	The instructor used a variety of teaching approaches where appropriate (some examples include presentations, use of videos or other media, student discussions, collaborative work, and a variety of assignments such as tests, written responses, etc.)









III. Service Narrative

I have already discussed my substantial service commitment to HOPOS and philsci-archive. Besides these, I have carried above-average service obligations at the university and departmental level. Please refer to my CV for a list of these.