<u>Comprehensive Exam Field #2:</u>

Methodological considerations of phenomenological thought in research methods concerning experience and the human relationship to technology.

This comprehensive exam field engages phenomenology, critical technical practices, ethnomethodology, post-phenomenology of technology, critical making, applied media theory, and participatory design. I sketch the preliminary groundwork for an approach that uses practices of designing and making to critically interrogate how humans relate to and through technical objects in hopes of locating opportunities for negotiating and contesting the design and use of consumer computing technology in domestic contexts. To this end, this field reads phenomenology in order to establish an understanding of how people relate to, and exist in the life world. The field then looks at how critical technical practice, ethnomethodology, and post-phenomenology of technology apply phenomenological thought to the investigation of human relationship to technology in everyday life. It then discusses critical making, applied media theory, and participatory design to in order to understand of how the methods of these approaches provide a means of concrete, experimental inquiry in line with a traditional of phenomenological thought and criticism of technical practices.

Phenomenology:

Although the term had been used earlier, this field begins its focus on phenomenology at Husserl (2014a, 2014b, 2014c). Husserl's phenomenology starts with the subjective, sensible experience of things in the world. Through epoche, the process of bracketing, he formulates a process of phenomenological reduction wherein the subject attempts to identify the features of experience that are contingent upon his

or her own subjective position, leaving only the essential features of the thing-in-itself. In this sense, Husserl's transcendental phenomenology is commonly understood an epistemological project concerned with developing a rigorous method for knowing essential characteristics of experiencing things in the world.

Heidegger's (1996) phenomenology diverges from Husserl's, focusing on the ontological interpretation of human lived experience in the world and how being emerges through situatedness. Unlike Husserl's, Heidegger's phenomenology seeks to understand subjective experience in context as a means of understanding how the relationship to the life world shapes being. Of particular interest to this field is Heidegger's distinction between types of relationships to tools as ready-to-hand and present-at-hand which respectively describe understanding as a tool an extension of oneself when in use and contemplating it as an object in moments of breakdown.

Merleau-Ponty (2012) orients his phenomenology toward how embodiment, existence in the world as and through a body, necessarily mediates, informs, and structures perception and lived experience. Through Merleau-Ponty's understanding that "a theory of body is already a theory of perception", his phenomenology can be understood as aiming "to reconcile Husserl's 'philosophy of essences' with Heidegger's 'philosophy of being' by providing an account of perception from a situated position, that of an embodied subject. (Dourish, 2004). Merleau-Ponty's discussion of figure-ground relationships, embodied artifact relationships, and how his "intentional arc" is at work in skill acquisition, gaining expertise through learning to perform the gestalt of a milieu as a matter of intuitive action, are particularly relevant to this field.

Critical Technical Practices arising from Phenomenological analyses of Artificial Intelligence:

Dreyfus (1992), immersed in the work of Heidegger and Merleau-Ponty, criticizes the representational model of computing employed in classical artificial intelligence (AI) research that reduces intelligence to processing information by applying formal rules to data sets, neglecting to offer any account of embodiment and experience as requirements for intelligence.

Winograd and Flores (1986) echo this criticism and reject representational approaches to AI as incapable of succeeding. Their rejection of AI follows from a Heideggerian understanding of being-in-the-world as irreducibly complex, such that human experience cannot be fully expressed as a set of discrete atomistic facts, formal rules describing the relationships between said facts, and logically programmed plans for performing abstract actions. Following this rejection, their attention turns to matters of Human-Computer-Interaction (HCI), the design of computing, asking whether or not computation can be modelled more closely upon human cognition, an embodied cognition based upon a history and tradition of being-in-the world.

Following in this critique of AI, Agre (1997a), advocates the need for critical technical practices in order to encourage critical reflection in artificial intelligence research for the purpose of providing restraint to the field in order to guide its direction. The method of Agre's critical technical practices involves selecting a metaphor employed in AI research and assuming its inverse in order to reveal the assumptions implied in that metaphor and what understanding AI through that metaphor necessarily excludes from that understanding. It should be noted that Agre's work is influenced by

the ethnomethodological work on plans and situated action by Suchman, who will be discussed shortly. This, along with Agre's call for critical technical practices attracting attention from HCI researchers employing ethnomethodology, suggests that these approaches influence each other such that they are not entirely separable in their more recent applications and should be treated as interwoven.

Sengers (1998,1999) employs critical technical practice as the basis for her project of allowing cultural theory the space to inform technical disciplines; she calls this project cultural informatics. She locates her project in relation to: Winograd and Flores discussion of how classical AI's foundation in analytical philosophy constrains itself; Suchman's uncovering latent bias in the use of metaphors in technical research; and Agre's dialectical use of technical and philosophical arguments. Given this basis, she describes cultural informatics as an "anti-boxological" effort to contextualize AI by answering "what are the limitations in the way AI currently understands human experience and how those limitations be addressed in new technology?" "Anti-boxological" is what Sengers calls for her project's orientation toward interrogating and accessing the inner workings of black boxes through defamiliarization.

Ethnomethodology and Technomethodology:

Husserl's phenomenological method was put to use as a means of investigation in sociology. Schutz (1972) formulated a phenomenological sociology, extending the lifeworld to include a concept of the social world. Garfinkel (1967) took this as inspiration for his ethnomethodology, a research method that focuses upon making the dynamics of the milieus in which everyday life occurs, and hence become naturalized

and invisible to the subject through familiarity and proximity, explicit and recognizable through disruption of the everyday order of things.

Suchman's (2007) use of ethnomethodology, as concerns this field, focuses on uncovering the cultural biases assumed by classical AI in its use of the metaphor "planning" to describe the strategy of thinking about action in terms of sets of logical steps needed to complete potential future tasks in the abstract. She challenged this "naturalized" understanding of "planning" by asking how the same metaphor would be understood if alternative cultural biases were substituted for those held by classical AI. This revealed to Suchman that classical AI implicitly understands "planning" in terms of "route planning" and how the metaphors employed by classical AI were culturally bound. From this understanding, she develops a concept of situated action which grounds action in the immediate concrete situation rather than as abstract, pre-formulated plans. Suchman's concept of situated action and use of metaphors influenced the work of Agre, Sengers, and Dourish and, as such, ethnomethodology is present in critical technical practice.

Dourish's (1998) efforts, with Button, to establish technomethodology involve negotiating the challenges of attempting to derive an ethnomethodological approach, in conversations with systems design, specifically oriented toward studying HCI. Similarly, his approach to reflective HCI, often done in cooperation with Sengers, McCarthy, and Wright (Dourish, 2004; Sengers, 2006), seeks tactics for incorporating critical technical practices into the field human-computer-interaction. In this sense, Dourish's work echoes Winograd and Flores, similarly demonstrating how critical appraisals of AI productively inform HCI. Lastly, Dourish's (1999, 2004) work on embodied interaction

engages phenomenological analysis, especially Merleau-Ponty's, of skill acquisition in order to understand the process of "coupling" in learning to use and interact with an artifact. So, through his work in reflective HCI, technomethodology, and phenomenologically informed embodied interaction, Dourish brings together much of what has been discussed in this field thus far.

Postphenomenology of Technology:

Ihde's (1979, 1990, 1995, 2001, 2008) post-phenomenology of technology is based upon hermeneutic phenomenology, albeit in continued conservation with Husserl, with revisions informed by the American pragmatism's study of experience and considerations of technology. Ihde's post-phenomenology of technology is oriented toward being non-foundational and experimental, understanding technology as an existential facet of human being resulting from endeavouring to exist in the lifeworld. This understanding of technology as an everyday practice, and science as the formalized, abstract version thereof, reflects interpretations of pragmatist views on technology, especially Dewey's (Mitcham, 2006; Cohen, 1955; Hickman, 1990, 2001). The "post" of Ihde's post-phenomenology signals an attempt to formulate a phenomenology that reflects a post-modern attitude, capable of allowing for a plurality of perspectives in its analysis. According to Verbeek**,** Ihde's post-phenomenology, when compared to classical phenomenology, is more capable of making space for the discussion of how technological artifacts mediate experience of the world. A method by which post-phenomenology does this is by engaging technical artifacts as what Ihde calls "epistemology engines" (2001). Grounded in theories of embodiment and situated knowledge, Ihde's approach seeks to understand how perceptual relationships between

technical artifacts that interface with the body shapes the knowledge learned through

that artifact and, hence, its users' understandings of the world.

Critical Making:

Ratto's (2011) project of critical making uses making as a site of reflection to

encourage critical technical practices. He distinguishes critical making from critical

design, arguing that where critical design is "research-oriented design", critical making

is "design-oriented research" insofar as its aim is to engage the design process to learn

more about it rather than having the production of an artifact its goal. He explicitly aligns

hims with the approaches of Dourish and Sengers in this assertion. He goes on to

describe critical making as a contructionist approach, which is to say, it engages "lived,

individual, socially embedded experience" through "actively making things. In this

sense, critical making fits in this field as a method of employing the practice of making

to critically reflect upon the human relationship to technology as appears in concrete

situations of designing and building artifacts.

Applied Media Theory:

O'Gorman describes applied media theory (AMT) as " a method that engages in

formal experimentation with media to generate critical discourses and technologies…

that not only examines, but also intervenes, in the formation of culture, primarily by

combing digital art practices conventional research practices" (2012). O'Gorman further

explains, in Heideggerian terms, that "Applied Media Theory serves as a vehicle for

provoking an experience of technological objects as present-at-hand to one in which

they are ready-to-hand" (2012). He suggests that a method by which AMT could do this

is along the lines of Ihde's engagement with "epistemology engines". Only, for

O'Gorman, Idhe is mistaken for looking at existing, already invented technologies, instead of using calling research to be done by building "epistemology engines" as a means of revealing how technological objects act upon user's and for the sake of informing and influence cultural understanding of technology.

Participatory Design:

Participatory design (PD) is based on participatory action research (PAR) and shares PAR's orientation toward "knowledge by doing: the traditional, tacit, often invisible… ways that people perform everyday activities and how those activities might be shaped productively" (Spinuzzi, 2005)[1]. PD's aim is to engage an iterative, interactive design process wherein technical systems are designed with persistent reference to insight provided by users and stakeholders as an effort to ensure that any resulting system is situated in the concrete contexts of that specific site of the research and the existing practices and processes found there.

PD arose from cooperation between organized labour and academics in Sweden in the 1970's and 1980's, participatory design (PD) began as a means democratizing unionized work places through negotiating technological change. With the introduction of computerized technical systems to their workplaces, workers were in a position of either being alienated from their traditional labour processes and work processes if they let management dictate the new technologies to be used or refusing accept any change. As a result of this dilemma, recognizing that they didn't have the expertise to design their own computerized technical systems, the workers sought a third way through this issue by cooperating with academics and researchers who could facilitate the workers'

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[1] The parenthetical aside "(in the sense of Nardi and Engestrom 1999; Muller 1999)" was omitted from this quote.

efforts to figure out how computerization could extend, enhance, and support the traditional labour processes and everyday work practices of the workers as they already existed.

PD has since been reformulated to suit particular research projects. For instance, the approach employed at *Malmo Living Labs* (2010) takes PD out the work place and re-situates it in public spaces, re-orienting emphasis from encouraging "democracy at work" to "democratizing innovation", recognizing that issues of design, innovation, and technological change increasingly influence activities of everyday life.