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Philosophy at work: Postphenomenology as a generative lens in design research and practice

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Abstract: We investigate the use of five postphenomenological concepts by bringing them to design practice and using them as a “generative lens” in design research. The use of these concepts in design research creates tension between the general and the particular. In a constructive design research process, we resolve this tension. We follow two complementary lines of inquiry: first, we design a ritual to support a postphenomenological analysis of the workplace. We discuss insights regarding ordering and formulation of the concepts, selecting a technological intermediary and assessing technologies. In the second, we use postphenomenology as a generative lens in designing the ritual. We discuss the iterative process in which the designer shapes specific uses by proposing different designs and reflecting on them using postphenomenological concepts. These reflections point to a responsibility of the designer to incorporate ways of being, ways of knowing and values on top of specific uses and utility.

Keywords: postphenomenology; design research; design practice; generative lens;

1. Introduction

Postphenomenology is an empirically oriented philosophy of technology (Ihde, 1993; Selinger, 2006; Rosenberger and Verbeek, 2015). It has developed theoretical concepts and handles to analyse and reflect on the particularities of technologies and how they might affect our everyday lives. Postphenomenology focuses on the description of human experience and action from a first-person perspective and on how these experiences and actions are mediated by technology. Key to postphenomenology is the idea that things “are not neutral ‘intermediaries’ between human and world, but mediators; they actively mediate this relation” (Verbeek, 2005, p. 114). They “carry morality” because they co-shape how we act, perceive and interpret the world around us (Verbeek, 2006b, p. 127).



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1.1 Outline

Hauser et al. (2018) show that postphenomenology is an “under-utilized yet productive” (p. 10) framework for design researchers. In particular, they discuss two opportunities for how postphenomenology could be drawn upon in design research. Firstly, to better support the analysis of design artefacts, and secondly, as a “generative lens” (p. 10) to frame the crafting of such artefacts. We follow up on this suggestion by reporting a design process in which postphenomenology acts as a generative lens. Namely, we use postphenomenology (with foresight) to inform or guide the design process, as opposed to its typical use, i.e. to analyse the mediation of existing technological artefacts (in hindsight). We emphatically agree with Hauser et al. that postphenomenology is under-utilised in the analysis of technological artefacts and emphasise that this is not only the case for design *researchers*, but for design *practitioners* as well. With this said, we arrive at the two lines of inquiry conducted in this study. The first is an inquiry into how postphenomenology could support design practitioners in analysing technological artefacts. The second is an inquiry into the novel proposition brought to us by Hauser et al.: the use of postphenomenology as a generative lens.

Both these lines of inquiry, articulated in this way, immediately introduce a tension between *the general* and *the particular*, which is a central theme in this paper. On the one hand, we are presented with abstract, theoretical concepts and on the other, concrete designs in use. In navigating and resolving this tension, we uncover insights and questions worth pursuing with regards to the application of postphenomenology in design practice and design research.

2. Theoretical Concepts

In order to scope our inquiry, we specifically draw upon four different dimensions that postphenomenology gives us to describe characteristics of technological mediations: the *practical*, *ontological*, *epistemological* and *ethical* dimensions of technological mediation (Kiran, 2015). These dimensions all have a two-sidedness. This should not be read as a positive-negative, but rather a mutually dependent relation, as “there can be no shaping movement without a corresponding downplaying movement” (Kiran, 2015, p. 123). In addition to this, we draw upon the concept of *multistability* (Ihde, 1986, 2012), which is in direct relation to these dimensions. The concepts can be briefly described as follows:

2.1 The ontological dimension

In their ontological dimension, technologies exhibit a *revealing-concealing* structure. Technologies co-shape what the world *is* for us. In using a technology, it *reveals* a relevant context of engagement, while at the same time *concealing* other possibilities for action that do not belong to that context (Kiran, 2015, pp. 125-128). The technology is thereby simultaneously shaping the world and us as humans. For example, should you become skilled in using a coffee grinder to make coffee every morning, the coffee grinder *as an object* will withdraw from your experience and show up as something *for-grinding* (unless it e.g., breaks

down). In a different context, for example when cleaning the kitchen with a cleaning cloth, the coffee grinder might reveal itself as something that needs cleaning. With the cleaning cloth in your hand, the grinder, as ready to be used to grind coffee, is concealed.

2.2 The epistemological dimension

In their epistemological dimension, technologies exhibit a *magnifying-reducing* structure. Technologies may augment certain perceptual capabilities and simultaneously weaken others. They may *magnify* some aspects of our experiential presence and *reduce* others. In doing so, technologies shape our ways of gaining knowledge of the world (Kiran, 2015, pp. 128-131). For example, if your workspace is getting cold, you might have a look at the thermostat showing that indeed the temperature is below 18°C. The thermostat therefore magnifies the temperature in your experience of the room while at the same time it might reduce your experience of, e.g., the amount of oxygen in the room.

2.3 The practical dimension

In their practical dimension, technologies exhibit an *enabling-constraining* structure. Technologies *enable* specific actions and ways of performing them, while *constraining* others. In using a technology, we are forced to adapt to its material and social reality (i.e. to the affordances that it does and does not offer). Technologies therefore shape how we behave and act (Kiran, 2015, pp. 131-134). For example, if you have printed this paper, the paper document enables you to make drawings or write things down with a pen. However, it constrains you from sharing those remarks instantly with other people as a digital version might enable you to do. Different media enable and constrain you to read and understand it in a different way.

2.4 The ethical dimension

In their ethical dimension, technologies show an *involving-alienating* structure. The three aforementioned dimensions have ethical implications and, in addition to this, technologies might open up their own ethical issues. As such, a technological mediation often pulls towards various moral directions (Kiran, 2015, pp. 134-137). For example, digital communication technologies such as collaboration or teamwork hubs (e.g. Microsoft Teams, Slack) grant many people the opportunity to do a lot of work from home. They *involve* these people in a particular way of working, independent of their regular workplace. However, at the same time, these technologies imply *alienating* aspects, as users are alienated from physical social contact with coworkers.

2.5 Multistability

The described four dimensions might give designers the illusion that they can *ensure* a certain change in values through design, but this would be to underestimate the complexity of technological mediation. *Multistability* brings part of this complexity to light. The concept

points to the indefinite meanings and uses a technology can have (Ihde, 2012). For example, one could use a screwdriver as a way to screw the components of a table together. However, it could just as well be used to open a can of paint or, as we are doing now, to make a point. This means that a design has the potential for being put to multiple purposes in multiple contexts. These purposes may surpass (or be entirely different to) what the designer may have considered in the design process. In other words, a technology potentially has unintended applications or consequences.

3. Approach

To pursue our first line of inquiry, into how postphenomenology could support design practitioners in analysing technological artefacts, we conducted a *Constructive Design Research* (CDR) process (Koskinen et al., 2011). In such a process, knowledge is generated through design processes in which constructing and materialising (prototyping) play a key role. Carrying out this process, we designed a tool, embedded in a ritual, that supports design practitioners in analysing technological artefacts in their workspace using the aforementioned postphenomenological concepts. This analysis was done in a workshop setting, whereby a specific focus was laid on the *everyday* of these organisations. The *everyday* pertains to the reality in which they act and perceive through unremarkable experiences (Levy, 2018). In the context of these organisations, the *everyday* is about hanging up your coat, having a meeting, drinking tea or coffee, making plans, reading a report etc. It is therefore entangled with a milieu of unremarkable technologies: the coat hanger, the meeting table, the teacup or coffee mug, the whiteboard and the report to be read. We tested this ritual during five workshops in five different design organisations including an urban planning company, two design agencies in the Netherlands and two design research departments in Sweden. These organisations were sized between five and fifteen employees.

The tension at play here is between the postphenomenological concepts (*the general*), and the workshop participants' workplace (*the particular*) (figure 1). The iterative process of testing the ritual in the workshops, developing both low- and high-fi prototypes and uncovering new insights in and during this development is our effort to resolve this tension. The final result, the ritual, is thus a concrete response to our first line of inquiry.



Figure 1 The tension between the general and the particular in the first line of inquiry.

In pursuit of our second line of inquiry, that is, the use of postphenomenology as a generative lens for design researchers, we utilised the postphenomenological concepts to frame and guide the crafting of the ritual as explained in our first line of inquiry. In this case, there is a tension between the postphenomenological concepts (*the general*) and the ritual

(*the particular*). The use of these concepts in our design rationale is our effort to resolve this tension (figure 2).



Figure 2 The tension between the general and the particular in the second line of inquiry.

4. A Postphenomenological Ritual

The outcome of the CDR process undertaken is a ritual that supports design practitioners in analysing technological artefacts in their workplace using the postphenomenological concepts. In the following section the different steps of this ritual are described (figures 3-10).

Step 1



Figure 3 [Translation: “stairs are good for physical movement”]. Participants select artefacts in their workplace by taking photos of these objects and making annotations in a text overlay using Snapchat.

Step 2



Figure 4 The pen is given to one of the participants and they become the note-taker.

Step 3



Figure 5 The printer is placed in its printing position. This reveals a set of cards.

Step 4



Figure 6 The printer prints a randomly selected picture of an artefact selected during step 1 of the ritual.

Step 5

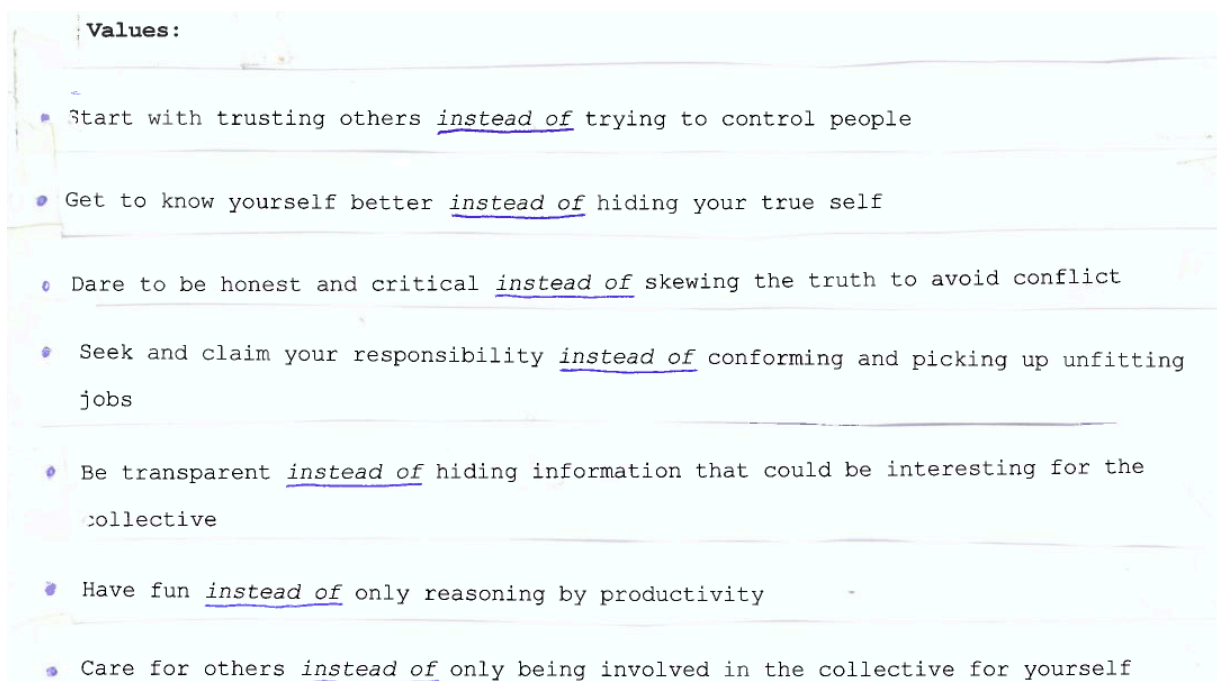


Figure 7 An expression of an ethical vision of 'a good work life' in the form of a set of values along with counterparts, printed on an A4 sheet of paper, is introduced as inspiration for an ethical vision to work towards. The aesthetics of this formulation reflect the in-process and imperfect nature of it. Participants can alter the vision as they please.

Step 7



Figure 9 Having reflected on the artefact, participants write down how they are going to take action on the reverse side of the printed picture.

Step 8



Figure 10 Finally, in step 8 of the ritual, the result is placed somewhere visible (e.g., on the fridge door) using 10 numbered magnets, shaped to fit the photographs.

5. Observations and Reflections From the Two Lines of Inquiry

The described ritual tacitly holds the knowledge generated in pursuit of the first line of inquiry. At the same time, the design rationale behind this ritual is the result of our second line of inquiry. Both inquiries were fully entangled over time. For the sake of clarity, we proceed to arrange the knowledge generated under two headings. In the first, we make explicit three insights that came to light in our attempt to bring postphenomenology as an analytical tool to design practitioners. In the second, we explicate part of the design rationale behind the development of the ritual in which the concepts played an important role.

5.1 Line of inquiry 1: a ritual to support postphenomenological analysis and action

SHIFTING AND REFORMULATING THE CONCEPTS

In “Four Dimensions of Technological Mediation” (Kiran, 2015), the four dimensions of technological mediation are laid out in a particular order. Kiran indicates that the ontological dimension should be concerned with first (p. 125). However, for the purpose of the ritual it appeared to be too abstract to grasp as a first step in the reflection. Although not demonstrated here, this difference may be due to a difference of approach and perspective between philosophy and philosophy-informed design. Therefore, in order for the participants to perform a postphenomenological reflection, we changed the order in which the concepts were presented: beginning with the practical, then the ontological, the epistemological, and finally the ethical. This way, participants started with the most concrete and easy to apply concepts and ended with concepts directly related to their ethical vision. Secondly, the concepts needed to be understandable and guide participants through the reflection. To do this, we reformulated the concepts in terms of non-jargonistic reflection questions with corresponding examples and presented them on small reflection cards.

SUPPORTING THE SELECTION OF THE TECHNOLOGICAL INTERMEDIARY

With the intention of changing an already existing technological milieu that is used by multiple people in their everyday, such as the workspace, come criteria for selecting the technology to be reflected upon. These are different from those relevant for a typical postphenomenological analysis (e.g., possibility of theory development). In order to support this selecting, we initially presented the participants with an ethical statement in terms of values and asked them to pick a value that they agreed was important in their organisation. Following this, we asked them to collectively select a technological intermediary in their milieu that they associated with that specific value. However, this turned out to come with two major challenges. First of all, associating an abstract value with concrete technologies was very difficult to do for most participants. In some cases, participants resorted to selecting abstract concepts such as communication, instead of concrete technologies (e.g., a telephone). Secondly, we see here that *that what is to be reflected upon* has no inherent boundaries outside an interpretation of ‘technological intermediary’. What this technological intermediary *is* depends on where you choose to set the boundaries, and this has

consequences for the practicality of the reflections. For example, in one case an entire office building including its thousands of uses was selected. This reflection did not lead to practical changes as for the participants the selection was not practical to change. They had little control over the entire building. All its different uses meant that judgements on whether or not it should be changed were difficult to make and concrete handles to act on were hard to find. To address these challenges, we handed the participants a smartphone with Snapchat and asked them to take pictures of those technological intermediaries that intuitively affected them in a positive or negative way. This reasoning from the everyday experience instead of abstract values turned them towards those artefacts that were relevant for reflection from their experience. At the same time, taking pictures with Snapchat revealed to them only those artefacts that were present in the building itself and turned participants away from abstract concepts.

TECHNOLOGY ASSESSMENT

In a typical postphenomenological analysis, one does not necessarily have to take a normative stance towards the technological intermediary. However, when the design practitioners were asked to write down next steps for action, questions arose, such as: “Should we include or exclude the technology?”, “Should we redesign the technology to fit the vision better?” and “How can we change our relation with the technology?”.

Therefore, when aiming to practically change the technological milieu, some discussion about ethics has to be carried out. In order to take action *towards* something, participants need to have a common understanding of *towards what* they desire to take action. In order to provoke this discussion, from workshop 3 onwards, we introduced an ethical vision after the selection of the technologies (step 5 of the ritual). We formulated this vision in terms of values which allowed for a discussion taking into account a variety of views. The addition of counterparts to these values aided participants in recognising how certain artefacts may be pulling in different ethical directions.

5.2 Line of inquiry 2: postphenomenology as a generative lens

In the following, we make explicit how our understanding of the concepts shaped some of the decisions we made in the design of the ritual.

MULTISTABILITY

As technologies have multiple stabilities depending on, for example, their material qualities and the (social) context, we cannot ensure that a certain design will be used in the way that we intend it to be. On the other hand, a design cannot be used to do simply anything (you cannot use the ritual we designed to grind coffee). An understanding of this concept permeated our design process in two ways. Firstly, it shaped our understanding of the appropriation of technology in the crafting process. For example, in order to afford participants to take photographs in step 1 of the ritual and make notes immediately in these photographs, we could have designed a dedicated smartphone application. However,

understanding that Snapchat already provided these affordances, and with an understanding of multistability, we appropriated the app to become part of the ritual. Once a photo was taken and annotations were made on it in Snapchat, we instructed people to save the Snap. This immediately uploaded the resulting image to the printer. Embedding Snapchat in a different practice than its developers intended for it (as social medium), meant we were able to give it a different stability, namely, as a selection tool for technological artefacts, affording people to quickly take photos and make annotations on these photos.

Secondly, and more radically, an understanding of this concept brought a certain fragility to our design intentions. We found ourselves talking about 'opening up' and 'closing off' stabilities of the artefact we were crafting. For example, we did not intend that participants engage in a postphenomenological analysis of artefacts while they were selecting them in the first step of the ritual. To close off this stability, we designed step four of the ritual in such a way that the reflection cards were only revealed once the printer had been placed on its stand, thus only once the selection was made and automatically uploaded to the printer. At the same time, when designing the eighth step of the ritual (placing the numbered magnets somewhere visible) we intended for participants to be able to place the next steps for action (which they wrote down) somewhere visible in their surroundings, but wanted to leave room for them to find a suitable place for this themselves. We designed ten magnets, specifically to open up more stabilities for this placing (on any visible metal surface). With this frame in place, the four dimensions of technological mediation become handles that give some grip to navigate this opening up and closing off.

THE PRACTICAL DIMENSION (TECHNOLOGIES EXHIBIT AN **ENABLING-CONSTRAINING** STRUCTURE)

In step 8, once the reflection on a certain technology has been carried out, participants make decisions about what action should be undertaken with regards to this technology. We learned that in the everyday practice of an organisation, it often does not make sense to take action immediately after a decision has been made about what that action may be. At the same time, if left unnoted or hidden away, these decisions can be easily forgotten. Also, if the ritual would be repeated a number of times, there would be a possibility for reflections to pile up and action to be left untaken. With these insights in mind, we attempted to design the ritual in such a way that the reflections would not be easily forgotten, and participants would in some way be triggered to take action. To do this, we purposely designed ten numbered magnets, precisely shaped to fit the photographs, hereby *enabling* participants to place the actions somewhere visible in their surroundings (for instance on the fridge door) and *enabling* them to prioritise actions. At the same time, we *constrained* participants from being able to place more than ten reflections by only providing ten magnets, thereby, to a certain extent, *constraining* them from continuing to reflect on technologies without being triggered to take action.

THE ONTOLOGICAL DIMENSION (TECHNOLOGIES EXHIBIT A **REVEALING-CONCEALING** STRUCTURE)

In the first step of the ritual, participants need to end up with technological artefacts that they desire to reflect on. In the everyday comings and goings of a workplace, many of such artefacts are likely to be used without their users reflecting on them i.e., they are approached as ready-to-hand (Heidegger, 1927/1962). If this would not be taken into account, there would be a likely possibility for many technological artefacts to be left unselected, not because they would not be relevant to reflect upon, but simply because they would go unnoticed. To *reveal* the workplace as a constellation of technological artefacts that could be reflected upon i.e., as present-at-hand (Heidegger, 1927/1962), and *reveal* the participants as 'searchers' of these artefacts, we gave participants a smartphone with the Snapchat camera running. Pictures taken with this smartphone loaded automatically onto the printer and would be randomly selected for reflection later on. With this knowledge, and the smartphone in their hands, the use of these technologies as ready-to-hand was *concealed*.

THE EPISTEMOLOGICAL DIMENSION (TECHNOLOGIES EXHIBIT A **MAGNIFYING-REDUCING** STRUCTURE)

In step 6 of the ritual, participants use the question cards provided to reflect on technological artefacts selected during the first step. Understanding that technologies shape our ways of gaining knowledge about the world made us think carefully about how to present this selection to participants, as different media would *reduce* and *magnify* different experiential aspects of the artefacts. One thing that characterises postphenomenological research is the analysis of (technologically mediated) experiences 'from within' (Rosenberger and Verbeek, 2015, p. 20). This means such analyses describe first-person experiences of technologies in use. With this in mind, we designed the ritual in such a way that it printed pictures of these artefacts. By doing this, we knowingly *reduced* participants' perception of the artefacts' material qualities, temperature, smell and temporality and *magnified* their perception of the static, visual representation of the artefact in use. In doing this we sought a balance in, on the one hand providing the affordance of writing on the back of the photographs and easily placing them in one's surroundings, and on the other providing as rich as possible reference to the artefact as it is experienced in use. We considered, for example, having participants film the artefact during the first step. This medium would not have *reduced* participants perception of e.g., sound, as much as the photographs, but the affordances of, for example, writing on the back, would not have been present.

THE ETHICAL DIMENSION (TECHNOLOGIES EXHIBIT AN **INVOLVING-ALIENATING** STRUCTURE)

The understanding that technologies can pull in different ethical directions, and that, through postphenomenological analysis, we might be able to describe these directions to some extent, led us to consider ethical directions the ritual might pull towards in advance. With this in mind, we made an effort to elicit certain values through the ritual. For example, it was our intention for the ritual to *involve* all participants in taking responsibility for their surroundings and *alienate* the use of mere authority to steer these changes. For this reason,

in step 4, the ritual *randomly* selects which technological artefact will be reflected on. This random selection does not take authority into account, which could have been (as it often is) a factor if this selection process had been carried out through negotiation.

6. Discussion

In this paper we started with five postphenomenological concepts: the *practical*, *ontological*, *epistemological* and *ethical* dimensions of technological mediation and *multistability*. We aimed to bring these concepts to design practitioners (our first line of inquiry) and use them ourselves in the crafting of a design research artefact (our second line of inquiry). Following our first line of inquiry, we discussed Kiran's (2015) order of the dimensions, and proposed presenting the concepts in a different order, starting with the most concrete. Secondly, we found that it was necessary to support the selection of the technological intermediary to be reflected upon and proposed a way of doing this through the ritual. Finally, we found that some ethical vision had to be discussed in order to aid technology assessment and lead to practical next steps for action.

As a result of the second line of inquiry, we note a few consequences of using postphenomenology as a *generative lens*. The practical dimension is already commonplace for most designers as the *enabling-constraining* structure is in line with a traditional view on *affordances* as introduced by Gibson (1979). However, both the ontological and epistemological dimensions build on top of this understanding of affordances and offer novel perspectives to work with. Suddenly, designers are put in charge of not only designing human-technology relations (focussing e.g., on concepts such as cognitive strain and transparency), but also of co-shaping how humans experience and act in the world (human-technology-world relations). This simultaneously brings to light that design and designing have always been interwoven with ethics (Trotto, 2015). We are "materializing morality" (Verbeek, 2006a, p. 369). Now that these other dimensions have been laid down by postphenomenology, we advocate that designers take up the responsibility that comes with this. Incorporating the four dimensions and multistability in design processes, first of all, leads to design intentions that incorporate ways of being, ways of knowing and values on top of specific uses and utility. Secondly, it involves the designer in an iterative process in which they try to open or close specific stabilities by jumping back and forth between proposing different designs and reflecting on them using the different concepts.

6.1 An eye on the future

In this paper we explicate how postphenomenological concepts can be used as generative lens by designers. The success of the generative lens hinges on the resolution of the tension between the general and the particular: abstract postphenomenological concepts, and concrete designs. In this last section we connect the process that was undertaken in this study to a fundamental issue in design research: the tension between the aim of design research (working towards general theories) and the aim of design (working towards

particular designs) (Nelson and Stolterman, 2012; Redström, 2017). Navigating and resolving this tension is imperative if design research is to address its own foundational concepts.

In this study, we worked from postphenomenological concepts to a particular design (i.e. the ritual). Moreover, this design, in turn, mediates and facilitates the postphenomenological analysis of the workplace. In this way, design research can contribute to and shape the methodology of postphenomenology. This is a first step in closing the loop between postphenomenology and design: in not only having postphenomenology transform design practice, but in design practice transforming the philosophical apparatus of postphenomenology (i.e. design-informed philosophy).

7. References

- Gibson, J. (1979). *The ecological approach to visual perception*. Hillsdale, NJ: Lawrence Erlbaum Associates Publishers.
- Hauser, S., Wakkary, R., Odom, W., Verbeek, P. -P., Desjardins, A., Lin, H., ... De Boer, G. (2018). Deployments of the table-non-table: A reflection on the relation between theory and things in the practice of design research. In *CHI'18. Proceedings of the 2018 CHI conference on human factors in computing systems* (Paper No. 201). New York, NY: ACM Press.
- Heidegger, M. (1927/1962). *Being and time*. Oxford: Blackwell Publishers. (Macquarrie, J. and Robinson, E., trans)
- Ihde, D. (1986). *Experimental phenomenology: An introduction* (2nd printing). Albany, NY: SUNY Press.
- Ihde, D. (1993). *Postphenomenology: Essays in the postmodern context*. Evanston, IL: Northwestern University Press.
- Ihde, D. (2012). *Experimental phenomenology: Multistabilities* (2nd ed.). Albany, NY: SUNY Press.
- Kiran, A. (2015). Four dimensions of technological mediation. In R. Rosenberger and P. -P. Verbeek (Eds.), *Postphenomenological investigations* (pp. 123-140). Lanham, MD: Lexington Books.
- Koskinen, I., Zimmerman, J., Binder, T., Redström, J and Wensveen, S. (2011). *Design research through practice: From the lab, field and showroom*. Waltham, MA: Morgan Kaufmann.
- Levy, P. D. (2018). The beauty of making hot chocolate: An inquiry on designing for everyday rituals. In *Proceedings of DRS 2018 international conference: Catalyst* (Vol. 5, pp. 2126-2135). London, UK: Design Research Society.
- Nelson, H. G., and Stolterman, E. (2012). *The design way: Intentional change in an unpredictable world*. Cambridge, MA: MIT Press.
- Redström, J. (2017). *Making design theory*. Cambridge, MA: MIT Press.
- Rosenberger, R. and Verbeek, P. -P. (2015). *Postphenomenological investigations*. Lanham, MD: Lexington Books.
- Selinger, E. (Ed.). (2006). *Postphenomenology: A critical companion to Ihde*. Albany, NY: SUNY Press.
- Trotto, A. (2015). On Making and other froths. In L. T. Dimitriou (Ed.), *Making and Thinking*. Firenze: Edizioni Polistampa.
- Verbeek, P. -P. (2005). *What things do: Philosophical reflections on technology, agency, and design*. University Park: Penn State University Press.
- Verbeek, P. -P. (2006a). Materializing morality: Design ethics and technological mediation. *Science, Technology and Human Values*, 31(3), 361-380.
- Verbeek, P. -P. (2006b). The morality of things: A postphenomenological inquiry. In Selinger, E. (Ed.). *Postphenomenology: A critical companion to Ihde* (pp. 117-128). Albany, NY: SUNY Press.

Verbeek, P. -P. (2011). *Moralizing technology: Understanding and designing the morality of things*. Chicago, IL: University of Chicago Press.

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