

# Matter of Transformation: A study of theories through prototyping with coffee

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## ABSTRACT

This pictorial provides an overview of the work produced for the course Matter of Transformation. The goal of this course was to create an understanding of the relation between aesthetics and theory through prototyping within the context of tea or coffee. Touching upon the concepts of Ecological and Environmental Psychology; (Post) phenomenology and Transition theories, the students were asked reflect on these concept and to translate their understanding into prototypes that embodied the values of the theories discussed in the lectures.

## AUTHORS KEYWORDS

theory informed design; transformation; prototyping; coffee; social psychology

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## INTRODUCTION

Over the course of eight weeks 4 prototypes were designed for the course Matter of Transformation, as a part of the master's program of Industrial Design at Eindhoven University of Technology. In this course prototyping was used as a tool to form an understanding of several theories discussed in the lectures. These theories were about Embodied Aesthetics(phenomenology, ecological psychology and aesthetics of transformation)[6], sustainable transition theory[12], environmental and ecological psychology[1] and post-phenomenology[13]. The subject of the prototyping was about drinking tea and coffee and the rituals surrounding this.

At the start of the course we were asked to make 2 infographics, one on a selected paper from a list and the other about a paper of your choosing. The first paper was about the social in Ecological Psychology(figure 1)[5] and the Second about Historical Consciousness and its relation to Historical Media(figure 2)[15]. This assignment was meant to create and understanding of the basic theories that would form the base of the course.

From these theories introduced at the start a more in depth lecture on a specific theory was given every week. From the presented and discussed theory the students were asked to make a prototype by using the introduced concepts.

This pictorial will shortly introduce every discussed theory and how it was incorporated in the four prototypes. It will end with a discussion on the integration of the theories and the value of this approach for designers.

## The Social Constitution of Perceiver-Environment Reciprocity

by Harry Heft - 2007  
Infographic by Sam van der Horst

### What is the place of the "social" in Ecological Psychology?

"Historically and programmatically, ecological psychology (EP) is first and foremost about perception and action. With its primary concern long having been the individual's adaptive functioning in an environment, ecological psychology's focus is the ongoing perceptual processes by which the individual monitors and adjusts to stable and changing environmental conditions. What then is the place of the "social" in ecological psychology?"

Following, Heft states that issues of a social nature fit into the 'social perception' realm of Ecological Psychology, for the environment of an individual is filled with animate features (prominently other individuals). "Therefore environmental perception would by necessity include consideration of the information and the processes underlying person perception." From this Heft argues that the use of social issues has only been to expand the range of issues tackled by the approach of EP and as a subdomain for the evaluation of the generalizability of EP's concepts and research findings's.

"I submit, however, that this point of view seriously limits our understanding of the place of the social in EP." From this Heft constitutes that the "social" is part of the background conditions from which EP operates. Therefore social issues should take a more central role in EP.

Social considerations need to be recognized as constitutive rather than peripheral features of the ecological approach. This is the case for two reasons: first, the environment, to varying degrees, is a product of ongoing actions of animals. In the case of humans, it is exceedingly rare that we ever encounter environments that do not bear the mark of our actions. Second, we learn from contemporary paleoanthropology and developmental psychology that the social is woven into the very fabric of what it is to be human.

The features of the human ec niche are not solely biological and geological in nature; they are also sociocultural. Although we can separate these different classes of features analytically, experientially they are a composite. Likewise, our relationship to places is as biological and embodied beings, as well as sociocultural beings, and this appears to have been so from the beginnings of human existence. Our environments and our development bear the mark of all of these dimensions of human life. (Merleau-Ponty, 1963)

One essential feature of a behavior setting is a sustained pattern of dynamic relationships among the individual participants of the setting. This pattern of actions is structured by a joint understanding among participants of the purpose of the collective activity.

Significantly, behavior settings would only seem feasible in a species that is intensely social and one in which individuals can establish a degree of intersubjectivity that makes joint action possible (Tomasello, 1999; Tomasello & Rakoczy, 2003).

"When we take our species' evolutionary history as a background condition for an ecological approach to psychology, that history will by necessity include an appreciation for the sociocultural domain."

**BEHAVIOR SETTINGS**  
Theoretically, the manner in which the dynamic structure of a behavior setting operates may be most readily understood by recognizing that its constraints and possibilities emerge from the collective actions of its participants.

**NICHE CONSTRUCTION**  
The qualities of the ec niche that organisms monitor and adjust to are themselves partially created and sustained by activities of individuals acting singly and collectively.



Merleau-Ponty, M. (1963). The structure of behavior. Boston: Beacon Press.  
Tomasello, M. (1999). The cultural origins of human cognition. Cambridge, MA: Harvard University Press.  
Tomasello, M., & Rakoczy, J. (2003). What makes human cognition unique? From individual to shared to collective intentionality. Mind & Language, 18, 121-147.

## The Concept of Historical Consciousness as an Interpretive Frame for Historical Media

by Robert Thorp - April 2013  
Infographic by Sam van der Horst

### APPLICATION OF HC

A concept that creates and establishes meaning in an individual's life through multichronological connections. [7]

a person by her use of historical consciousness manages to understand the underlying conditions for her life and that there are historical reasons to why the contemporary world is constituted the way it is. [8]

a person's historical consciousness is instrumental in creating meaning in history itself; our historical consciousness enables us to see patterns in history, instead of just an infinite number of historical events and people. That one historical event follows another one with a certain amount of necessity (real or imagined) is possible because a person possesses a historical consciousness and applies it to create meaning in history. [10]

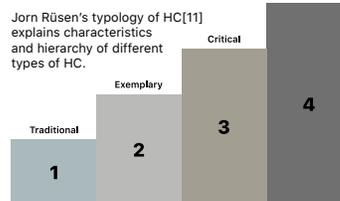


**Historical culture**  
"the artefacts, rituals, customs, and assertions with reference to the past that offer manifest possibilities to connect the relation between past, present, and future." - Peter Aronsson (historian) [13]

A fully developed level of historical thinking can be seen as the highest level of HC, the genetic.

### QUALITATIVE CHARACTER OF HC

People can have historical consciousnesses of a higher or lesser degree.



1. History is full of repetition and all members of society are supposed to uphold what tradition dictates.
2. History is still static, but also generates normative rules about how a person should lead her life.
3. A person that possesses a critical historical consciousness uses history as a way of criticising contemporary society and culture.
4. This type lends an ability to historicise past and present societies and cultures by explaining continuity and change through the use of history.

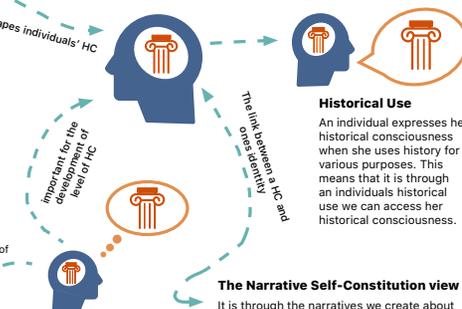
### AGGREGATED DEFINITION OF HC

It is an individual ability to create meaning in life and history through multichronological connections that everyone possesses (consciously or not) and there are four different types of historical consciousness that are qualitatively different in character.

Societies cannot possess a historical consciousness, only its human members.

### Historical Consciousness (HC)

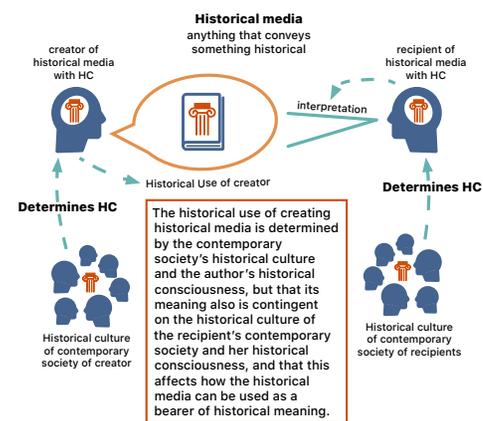
An ability to create connections between past, present & future in an individual. [3] Also referred to as multichronology [5]



**Historical Thinking**  
An ability to understand how historical knowledge has been constructed and to know what that means, and an ability to contextualise historical facts, events and persons. [24]. For this one needs historical empathy, an appreciation for how historical societies and historical people differed from present day societies and people. [27]

**The Narrative Self-Constitution view**  
It is through the narratives we create about ourselves and the world around us that we become individuals with identities. Our narratives functions as a type of lens through which we filter experiences, actions and plans, and it is only the entities that make sense and are conceptualised in our narratives that we incorporate. [32] What does not fit in to people's narratives, they will forget, and in order to make history affect people's historical consciousnesses and identities it has to address the narratives that people have about history and themselves.

### AN INTERPRETIVE FRAME FOR HISTORICAL MEDIA



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[2] Jörn Rüsen, "The Changing Sociocultural Dimensions of Historical Consciousness: Towards a Sociocultural Theory of Historical Consciousness," in The History of Historical Consciousness: Sources, Structures, Mutual Relations, and Contemporary Developments, ed. Theodor Kohers, (Frankfurt: Peter Lang, 2009), 15.  
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figure 2, The Concept of Historical Consciousness as an Interpretive Frame for Historical Media.

figure 1, The Social Constitution of Perceiver-Environment Reciprocity, Ecological Psychology

## EMBODIED AESTHETICS

The theories of Embodied Aesthetics aim to explore how we currently interact with the world around us, how we can use intuition as a valuable asset in moving forward and stimulate transformation. Embodied Aesthetics finds its roots in phenomenology[11] and ecological psychology[3], and discusses aesthetics of interaction[7] in daily life, enhancing the experiences of people. It constructs preferable futures to drive societies and life in general forward.



## APPROACH

In this first prototype I explored my interaction with the Vietnamese phin (coffee filter). Why do I like this method of making coffee and what are the essential of the interaction for me. From the embodied aesthetics theory I wanted to explore the first-person perspective and the being in the moment as an essential for my design.

Making coffee through using a phin requires a careful preparation, and has a longer waiting time due to its slow dripping. By using a phin to make coffee I am able to take a step back from the work I am occupied with, carefully preparing the filter



figure 3, interaction steps





figure 4, securing the glass cylinder

and waiting for the coffee to slowly drip into my glass. At the moment the coffee is ready I have "reset" my mind and am able to enjoy the coffee without being bothered.

My experience with the pin makes that the process of making coffee has become more efficient which has a negative effect

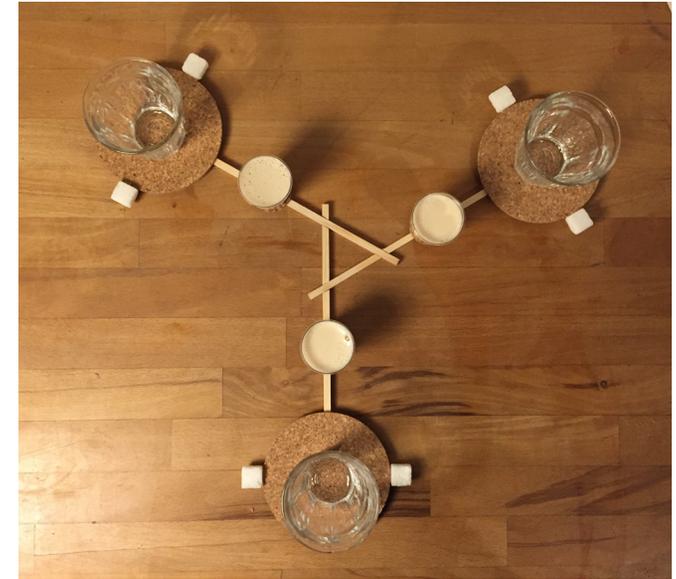


figure 5, waiting for the coffee to finish

on the meditative effect that helps me "reset". With the design I try to elegantly extend the current process with more steps. Expanding on the previous ritual and shaping the process of making coffee with a pin into an even slower process.

# SUSTAINABLE TRANSITIONS THEORY

Sustainable Transitions theories explore the process of change on a systemic level. It looks into the patterns and mechanisms that drive social change on a large-scale, non-linear and long-term level. It gives us a multilevel perspective to map this change and find opportunities for design interventions in its context. It explores how designers can use their skills to inclusively empower the actors involved in this transformation to use their full potential [12].



## APPROACH

This design illustrates the multilevel perspective [2, 12] that plays a central role in Sustainable Transition Theories. The landscape (meso) [2, 12] is the strength of the coffee in the centre. This is something that is influenced by the coffee available. The users have no influence on the initial strength of the coffee.

The coffee in the centre illustrates the regime (macro) [2, 12], or the mainstream, in this case standard black filter coffee. Every user illustrates a niche (micro) [2, 12] that tries to influence and alter the regime to its own benefits. The users do this through deciding to



figure 6, details of the prototype



figure 7, negotiating to reach a stable regime

add milk and sugar to the regime. In order to come to a stable regime that is accepted by all niches, negotiation needs to happen, because all the users drink from the same central regime in the end.



figure 8, sharing from the new regime

The negotiation illustrates the actor(systems)[2, 12] and the tensions that are present and make the system. It shows that it is important to know who is in your system to understand how transformation can happen, and how the actor network can empower your niche.

## ENVIRONMENTAL AND ECOLOGICAL PSYCHOLOGY

Humans and their environment continuously interact with each other. Environmental Psychology look into the effects (positive and negative) of this relationship we have with our physical and social surroundings. Designers have the power to alter the environment of humans, with this power comes responsibility. Designers should understand what the impact of their work can be, in order to do this they need to form an understanding of human-environment relationships. Ecological Psychology [1, 4] provides designers with the tools and theories needed to understand how design influences this relationship.



## APPROACH

In the last years, the coffee stop has become a central part of many cyclists' rides [14]. As a cyclist I like to ride wherever the road takes me, setting off in a random direction and explore new terrain. The coffee stop is therefore not a guaranteed part of the ride. With my design I try to integrate the coffee stop in these explorative rides. Building on cycling's coffee culture and my own experience as a cyclist I created a portable coffee maker tailored to cyclists.

Using the context of the ride for the ritual, with the set looking very similar to the classic tire repair



figure 9, details of prototype



figure 10, thermos in bottle cage



figure 11, coffee kit in jersey pocket

kits, and made to fit perfectly in a cycling jersey's back pocket. The cyclist can go anywhere and take their coffee stop anywhere they want.

Regarding ecological and environmental psychology, I used the Transactional theory[1] as a starting point. A cyclist is one with his bike, there is constant feedback through vibration combining this with the changing environment and a cyclist's ability to tackle different terrain, allows for a long and fun ride. As a cyclist I like to ride wherever the road takes me, I often decide that I want to ride for a certain amount of time, but not where. I just ride of in a direction and explore new terrain. The coffee stop is therefore not a guaranteed part of the ride. With my design I try to allow this to happen wherever the cyclist feels the most comfortable. Using the aesthetics that are familiar to many cyclists.

Working from my personal perspective, provided me with the psychological insights that a designers needs to get a grip on the complete context.



figure 12, portable set ready to be taken

## POSTPHENOMENOLOGY

Postphenomenology [13] looks at how technology functions as a mediator between humans and the world. The concepts discussed by postphenomenology help to form an understanding how technologies affect our everyday lives. An important factor in postphenomenology is the idea that technology is never “neutral”, they have a sense of morality because they help to shape our behaviour.



## APPROACH

The simplicity of this design, a mug attached to a set of drop handlebars, has the ability to demonstrate multiple concepts discussed within (design informed) postphenomenology.

It builds upon the practical dimension where it demonstrates the balance between enabling – constraining elements of the design [6]. The background of the user shows different usage abilities of the design, since the handlebars allow for multiple hand position. The more experienced the user is the more the design enables the user to drink.



figure 13, interaction with the prototype



figure 14, empty cup

The design also works on an epistemological [6] level. Using the magnifying – reducing structure where in the case of this design the motion of drinking from the cup is magnified by the use of the handlebars, forcing the user to make a large motion in order to drink.

If you look at the design from an ethical [6] perspective, so taking into account the enabling – alienating dimension, the user that has experience with cycling with drop handlebars will be more likely to handle the design as it was intended. In this dimension the power struggle between the design and the user also becomes evident. Since the design does not allow the user to put the cup down after having taken a sip, for it will be out of balance and tip over, spilling its contents.



figure 15, full cup

Looking at the previously described dimensions and how they fit the design, we can look at the multistability [8, 9], the concept points to the indefinite uses a technology could have. Coming from this you could state that the design in itself has no meaning, only when it is used it will have meaning. The handlebars with the cup are an irrational object and in everyday life it will probably never be an useful product. But when it is used it creates a sense of awareness of the users movement and the power that the design has over the user. For every user this use will be different due to the multiple action possibilities.

figure 16, overview of prototypes during exhibition



## DISCUSSION

There are two ways you can look at the produced prototypes in this course, in this context I describe them as theory driven designs or as theory informed design. They are either driven by the concepts of the theory or through the knowledge the designer takes from the theory in order to come to a design. When looking at the four prototypes you can see that there is a distinction in the 4 prototypes were the first and third (Embodied Aesthetics and Ecological and Environmental Psychology) are theory informed, for the designer uses the knowledge gained from the theory and combines this with his intuition in the design process. Whereas the second and fourth designs (Sustainable Transition Theories and Postphenomenology) are theory driven, here the designer has not been able get a good enough grip on the theory to use it in his design. This results in a design that is more an expression of the theory rather than a implementation. The designer in this case has not been able to merge his intuition and the theory. And uses his skills in making to try to grasp the theory. In this sense you could say that when using theory as a base for the design process, the designer first needs to form an understanding of the theory in order to use it in combination with intuition.

Within this course the short timeframe for every prototype meant that the skills of the designer and the ability to create played an important part in the success of the presented prototype. Also the availability of materials effected the prototypes created every week. However this short timeframe also has a positive effect because it forces the designer to make quick decision and trust on his/her intuition. In this course there is not really such a thing as a wrong design because it does not need have the requirements of a commercial design. The design in this case is an expression of values both personal and the ones derived from the discussed theories.



figure 17, presenting prototypes during exhibition



figure 18, prototype theory mapping during reflection session

## CONCLUSION

The prototypes in this pictorial serve as examples on how theory can be used in a design process and how design can be used to grasp theory. The theory driven and theory informed approaches give the designer the ability to combine the act of making with intuition and theory and implement this in the design process. The prototypes illustrate how making can be used to grasp theory but also how theory can be used to feed a designers intuition.

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