

Theory Instruments as Tangible Ways of Knowing

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While ethnographers and the data they produce already play a role in affecting industry practices, there is potential to integrate anthropological ways of seeing and knowing into a shared transdisciplinary design praxis. In a series of design research experiments, we have taken a pragmatic and playful approach to physicalizing theory. The result is a set of 'Theory Instruments' that transform theory into tangible interaction. Theory Instruments scaffold knowledge production by encouraging new ways of seeing organizations, products, users, and the relations between them. We present two of these instruments, Actor-Network Rings and Reciprocity Balance, through a case study with a design team at a health product company that wished to generate new design concepts from field material. Theory Instruments helped bridge the gap between the epistemic modes of knowing employed by ethnography practitioners and the technical and tacit modes of knowing familiar to design practitioners. This new mode of collaboration helped them to cross worlds, cultivating a more resilient, transdisciplinary praxis.

Keywords: design anthropology, design practice, theory, interdisciplinary collaboration, ways of knowing

MAKING ANTHROPOLOGICAL WORK VISIBLE

While ethnographic fieldwork is increasingly celebrated as valuable to design and innovation, the potential of anthropological theory remains virtually invisible and underexplored in industry practices. This has consequences. When the analytical work required to turn field data into interesting insights takes place 'backstage' (Forsythe 1999) it is often not given the space or the credit it deserves. More importantly, analysis and the particular ways of seeing that inform analytical processes remain inaccessible to the designers. As a result, the ethnographer's role may be minimized to data collector and reporter, while the designer's distance from the greater theoretical context may limit their capability of transforming insights into meaningful design decisions.

We address these problems with our design research study, exploring how the anthropological theory that underlies ethnographic method may become more visible. To that end, we developed a set of *Theory Instruments* [Figure 1].

These instruments turn theoretical concepts into tangible and playful resources for collaborative analysis while sensitizing and challenging practitioners and researchers to gain new perspectives on field material. By foregrounding theoretical perspectives and keeping them active during all stages of design research, Theory Instruments open up new design potentials and new transdisciplinary competencies. Like musical instruments, each Theory Instrument 'plays a different tune' in analysis, highlighting different perspectives, potentials, and challenges embedded in the empirical material. When used as a set, the instruments create a richer ensemble than one instrument alone. As in an orchestra, this requires players of diverse expertise, each playing different instruments, to produce 'harmonious music'.



Figure 1. Six *Theory Instruments*: (top) Classification Boxes, Rites of Passage Tubes, (middle) Product Ecology Cubes, Actor-Network Rings, (bottom) Reciprocity Balance, Capital Cards. Photograph © Ayşe Özge Ağça, used with permission.

We have already deployed the instruments in collaboration with several industry partners. Recently we used the instruments to analyze user-research data and develop initial design ideas in a workshop with anthropologists, UX researchers and designers from a large health product company in Denmark. Afterwards, one of the anthropologists used the phrase “magic moment” to describe the experience:

“These are ways of thinking that are very classical for us [as anthropologists], but to see what it can do to play with them in this way, to instrumentalize it, go through the process, and hear what others get out of it, how these perspectives suddenly become simple and easy to talk about for all of us, together, I am totally amped up about it. Because now we have actually reached another shared level of understanding of these people [the users] than what I have experienced before. I find that really cool, that with these instruments we get a shared baseline for creating an understanding, but actually also to move that [understanding] into a solution space.”

For the anthropologists, the theoretical perspectives were not new, but were in fact an integral part of the analytical work they were already doing. What was new, however, was the particular way of engaging anthropological perspectives in design practices, and the effect it seemed to have on the non-anthropological colleagues. The engagement and co-creative energy sparked by using the Theory Instruments, the “magic moment” can be described as a ‘collective effervescence’, a kind of social electricity that happens when people interact with a shared purpose. Émile Durkheim, the sociologist who coined the phrase, notes the

importance of *things* as symbols of this effervescence: “A collective feeling can become self-conscious only by being anchored in a material object,” (2001[1912], 180). With collaboration-made-material and theory-made-tangible, Theory Instruments were able to foster a kind of transdisciplinary creativity in the ideation process. We see Theory Instruments—both the instruments and the research around them—as a contribution to a more resilient shared praxis.

So how do these instruments work? How did they come about? And what potentials and challenges do they elicit for the resilience of ethnographic practice and design? We will use this paper to answer these questions.

FROM PERSPECTIVES TO WAYS OF SEEING

As university researchers in a design department, we are regularly working with practitioners in industry, while training new generations of researchers and practitioners. In 2020, some of our collaborators contacted us, feeling that they had exhausted their user-research methods without drawing forth particularly new or relevant insights. To investigate this frustration, we initiated the project New Challenges in Interaction Design, which has involved several stages of studying practitioners and the emerging issues they face in their everyday work (Kjærsgaard et al. 2021).

Early on in the project, we identified areas where practitioners were particularly underprepared for the changes brought about by the post-digital era we are entering into: where ICTs and the IoT are so prevalent that these concepts are naturalized as inherent to popular notions of technologies, where data collection is taken for granted, and where connectivity is assumed. Our practitioner collaborators, trained in an information era, have become overwhelmed by too much data, increasingly data-driven processes, and the integration of digital components and data harvesting into longstanding product lines. These changes infiltrate the products themselves, their use and implementation, design processes, organizational cultures and structures, and the human-human and human-object relations implicated at all of these levels. In an earlier paper (Kjærsgaard et al. 2021), we describe these findings and our first design research experiment aimed at solving some of the issues we identified. By the end of that experiment, we had come to the conclusion that what design practitioners needed most, in order to remain effective and relevant in a fast-changing field, was fresh perspectives.

A Pragmatist Approach to Theory and Design Anthropology

We initiated a collaboration with an interdisciplinary team of UX researchers developing health products in a large company, attempting to combine their search for fresh perspectives on field material with our own academic interest in exploring the potential role of anthropological theory in design.

Working from a pragmatic approach to theory, where theoretical concepts “...are not representations or copies of how the world is, but are tools, with which we transform, engage, and cope with the world...” (Brinkmann 2012, 38), we strove to provide these interdisciplinary teams with a set of theoretically inspired lenses that would help them *see* their products and users in new ways.

Each theoretical perspective should serve as a lens that would make particular aspects of the world visible. We were particularly interested in how different lenses could make different things visible, and how shifting between these lenses might help challenge taken-for-granted perspectives, while creating awareness of other potential ‘ways of seeing’ not only ‘what is’ but also ‘what might be’.

Building on Otto and Smith’s (2013) understanding of design anthropology as a distinct style of knowing “...characterized by a particular use of theory aimed at generating concepts and new framework or perspectives” (11), we explored how theory might serve as ‘sensitizing concepts’ (van den Hoonaard in Otto & Smith 2013, 11) that do not only guide the empirical research process and ethnographic description, but rather move beyond analysis and description to the generation of *design concepts*. In other words, we investigated how anthropological theory and its analytical application become instrumental in challenging implicit assumptions within interdisciplinary design teams, opening up the design process through re-framing these assumptions (Kjærsgaard 2013).

Theory Cards as a Set of Lenses

Our first design research experiment was to develop *Theory Cards* [Figure 2] to explore how theoretical concepts might instigate perspective shifts, to meet these new challenges posed by digital connectivity (see Kjærsgaard et al. 2021).

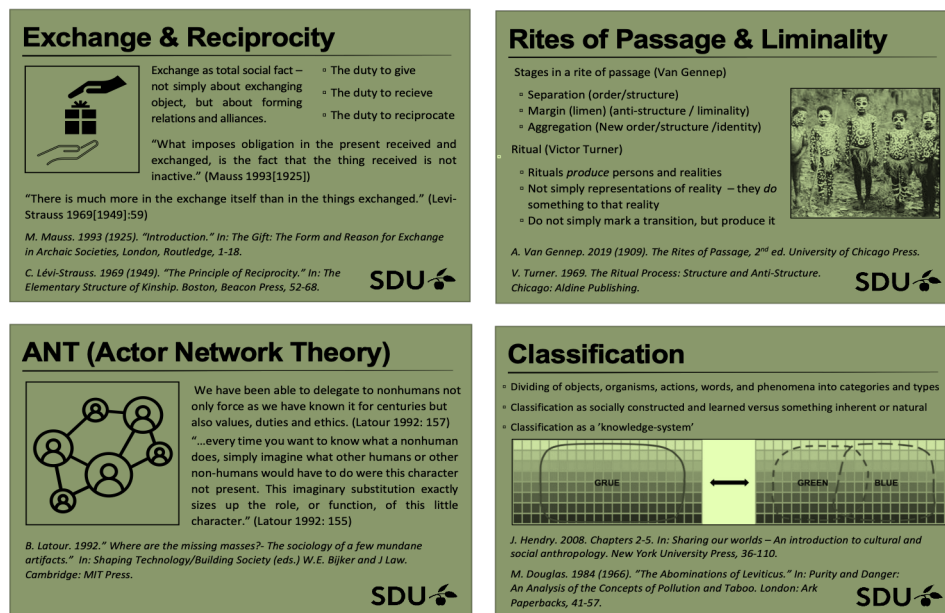


Figure 2. Examples of *Theory Cards*: Exchange & Reciprocity, Rites of Passage & Liminality, Actor-Network Theory, and Classification. Images © Mette Gislev Kjærsgaard and Jessica Sorenson, used with permission.

The Theory Cards effectively communicated unfamiliar theoretical ideas from design anthropology in a playful context familiar to the UX practitioners and industry professionals we were working with, adding a new layer to the insights we had drawn from the material in the previous analysis workshop. We saw potential in working with theories as ‘sensitizing devices’ (Otto & Smith 2013), whereby a design practitioner could try on new perspectives, by employing new theory cards at any given moment, with the hope that this sensitivity would lead to richer insights, which might then yield new design directions.

However, the experiment did not seem to have the generative effect on the design process that we had all hoped it might have. The designers were still left frustrated with

insights that they did not know how to use. We had to interrogate what it was that theory was doing, and *not* doing.

Theory as a Way of Seeing

Theory's oldest roots are *thea* (like theater) meaning 'a view', and *horan* meaning 'to see'. *To see a view* – that is what theory is and what it does. In the pragmatic understanding, it is a schematic, a tool, a framework, or an instrument that gives us the ability to develop a new perspective. Theory Cards kept theory tethered to a particular codified way of knowing (as knowledge). With Theory Cards, practitioners were given *the view*, but they were struggling to turn that view into something actionable. As one of the designers said:

“We know a lot about how they [the users] live and what other products they use and everything, but it doesn't influence or give us strong direction for the rest of the business ... So, I know I might tread on some toes, right? But somehow it needs to be boiled down and delivered into something that's actionable. If it's not actionable, we can't use it.” (Reflection session, May 2021)

What we wanted to do differently moving forward was to provide practitioners not only with the noun-theory (*a view*) but with the verb-theory, a way of *seeing* beyond what 'is' to what 'might be'. We had a hunch that if we could introduce the practitioners to theory as a flexible, repeatable, but always-different experience, and demonstrate the merit of shifting perspectives, we might contribute to new ways of seeing that may inevitably underlie a change in praxis – a way of *doing*. This would help them develop a resilient way of knowing and practicing design, while breathing new life into academic theories and renewing our relevance as ethnographers.

MATERIALIZING MEANING-MAKING

With the ambition of meeting practitioners in the space between our academic practice of epistemological production and their design practice of material production, we endeavored to make theory more *tangible*, literally – with the aim of avoiding the knowledge-transfer problem we had previously encountered. Building on a long tradition of materiality in design (e.g., Brandt & Messeter 2004; Buur & Sitorus 2007) and our more recent experiences cultivating engagement through data physicalizations (Buur et al. 2021), we sought to bring anthropological ways of knowing to bear on the design process, by translating the analytical power of theory into material interactions.

This Research through Design (RtD) experiment (Stappers & Giaccardi 2017) began with an interrogation of theories and materials in an ideation process, followed by several iterations of prototyping and testing, and ultimately led to a playful and pragmatic tangible interaction set which we call *Theory Instruments*.

Matching Qualities of Theories with Meaningful Materials

Our prototyping process began with an exploration of particular theories that we selected as general enough to be interesting to design teams across a range of industries where we had collaborators. We looked at grand social theories from traditional anthropology that had to do with kinship and relationship- and identity-formation, as well as more modern theories or fundamental concepts emerging from the materialist turn with a focus on bringing things into the social, and finally some more specific theories relating to design and users' interactions with objects.

We examined theories for their essential qualities – what is it that these theories draw our attention to? We took note of keywords and telling examples from source texts which might later inspire material interaction. For example, we looked at the back-and-forth, push-and-pull qualities of ‘reciprocity’, at the heart of Marcel Mauss’s 1925 theory on ‘gift’ relations and Claude Levi-Strauss’s 1949 later contribution to this area of anthropological theory. This early ideation process was coupled with lo-fi prototyping with tinkering materials we had on hand, such as cardboard, LEGO, poster gum, and reclaimed toys. We tried to make apparent the reciprocal quality of exchange in relationship-building, through the use of a potluck storytelling probe, for example, but this prototype lacked the physical back-and-forth qualities that we’d identified as essential to gifting. In our iterations, we shifted toward a balancing rod, which better captured the physicality of the theory itself. In this way, we examined the extent to which it was possible to translate theory into interactions with things.

Beyond the material challenges of physicalizing theory, we had to face some epistemological challenges to instrumentalizing theory. Theories constitute blocks of thought well established within the academic world, and adherence to particular schools of thought can be rather dogmatic (Jöhncke 2021). Therefore, we had to shake off the fear of using theory in the “wrong” way. We leaned on the Foucauldian approach to theory as dynamic, not belonging to the theorist, but serving as living tools for organizing our ideas about the world: “*Je n’écris pas pour un public, j’écris pour des utilisateurs* [I don’t write for an audience, I write for users],” (Foucault 2001, 524). It was clear from the beginning that when physicalizing theory we could not completely portray all of a theory’s dimensions. So, we stripped the theories down until we found what was useful for our purposes. Certain elements had to be highlighted and others to be dimmed as we aimed at simplifying the interaction in the material space.

A Set of Theory Instruments

So far, we have produced six different instruments based on classic theoretical concepts from anthropology like *rites of passage*, *exchange & reciprocity*, *forms of capital*, and *classification*, as well as some somewhat newer theories on product interaction like *Actor-Network Theory* and *product ecology* [1]. This menagerie provides a set of lenses that are general enough to be able to apply to different types of people, practices, and products, while still having specific relevance to health product company and user material we were working with at the time. Another criterion was that the theories would be different enough to bring out complementary insights in the material. In this paper, we focus on just two of the instruments used in our case study.

Actor-Network Rings [Figure 3, left] is an instrument based on Actor-Network Theory (ANT) (Latour 1992), which highlights the complex network of people and things that make up our sociomaterial worlds. The theory brings attention to the interactions that happen between human ‘actors’ and non-human ‘actants’ in fulfilling a particular ‘program of action’. That is, ANT helps us to understand that while artefacts are agential [they act on us/the world], things don’t ‘do’ anything by themselves. We are likewise dependent on technologies – making ourselves with the things we create (van den Hoven 2012). With this instrument, we aim to increase this complex web's physical perceptibility and show the effects of the human and non-humans on each other.

Actor-Network Rings is a set of wooden rings, wooden balls, differently colored plastic and wooden clothespins, and magnets. The wooden rings represent networks with attached

plastic clothespins as non-human ‘actants’ and wooden clothespins as human ‘actors’. The anthropomorphism of objects inspired us to attribute humanness to the softer, more natural shape of the wooden clothespins. Wooden balls have a manipulative property that lend themselves to describing the ‘program of action’. Removing or shifting clothespins triggers ‘delegation’ or ‘imaginary substitution’ of roles between the actor and actants. The placement of magnets on clothespins displays ‘disciplining’ of the actor by the role assigned to the objects. While ANT is perhaps one of the more difficult-to-understand theories, the Actor-Network Rings instrument has been the most universally appreciated of the six instruments, applicable in nearly every design setting in which it was tested. The success of this instrument—as we demonstrate in the case study that follows—can be attributed in part to its simple and open-ended design with seemingly innumerable reconfiguration and interpretation possibilities.

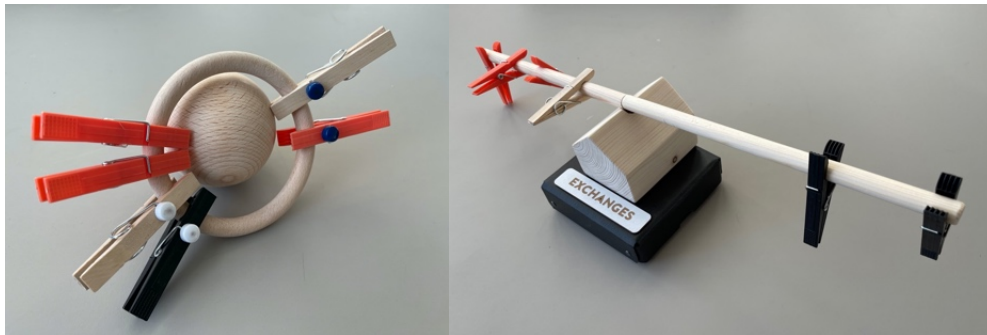


Figure 3. (left) *Actor-Network Rings*, based on the socio-material theory of networked relations Actor-Network Theory (ANT) (Latour 1992); (right) *Reciprocity Balance*, based on relationship-building theories of exchange and reciprocity (Mauss 1925; Lévi-Strauss 1949). Photographs © Jacob Buur and Ayşe Özge Ağça, used with permission.

Reciprocity Balance [Figure 3, right] is based on relationship-building theories of exchange and reciprocity (Mauss 1925; Lévi-Strauss 1949). The instrument consists of a rod, differently colored plastic and wooden clothespins, and a wooden house-shaped foundation. The rod rests horizontally atop the wooden house, with clothespins attached along the length of the rod. Depending on how many clothespins the participants attach to the rod, and how far along the rod they are placed, it can tip to one side to the other. Two participants sit across from each other. When the participants attach a pin as a gift or gesture, the other must receive and reciprocate with another pin on the other side of the balance point. Participants can attribute meaning to the color and material choices of the pins they place, and the number of pins may give insight into the meaning or weight of these exchanges. For instance, short-term, transactional interactions are indicated by pins placed close to the center (demonstrating immediate give and take) while deeper relationships are indicated by pins placed farther out, indicating a longer interval between gift-giving and reciprocation.

In order to put Theory Instruments to the test, we reopened our collaboration with the health product company. Our collaborators had not come much further in translating their user insights into new product concepts and they wanted to take our collaboration further by integrating academic theoretical perspectives into their early-stage front-end development process. Neither of us wished to revisit the knowledge-transfer problem we had previously encountered, and we took a chance on Theory Instruments as a way through the disciplinary divide.

PLAYING THE INSTRUMENTS

We facilitated a workshop using the Theory Instruments with a group of in-house UX researchers and designers from the health product company. The design team used the instruments in a shared sensemaking and idea-generation session that would inform their design directions. The Theory Instruments were to serve as ‘boundary objects’ (Star & Griesemer 1989), helping this interdisciplinary research and design team get beyond knowledge-sharing and begin engaging in processes of transdisciplinary knowledge production.

The workshop lasted a day and was divided into two main parts. In the first part, Theory Instruments were used to analyze video-based field material from a particular theoretical perspective. In the second part, Theory Instruments served to support ways of imagining and evaluating design possibilities while staying within the same theoretical frame of mind. There were four participant groups, each playing one of our six instruments. The entire workshop was organized around the musical instrument metaphor, with a focus on the integration of essential parts into a harmonious ensemble –which is what a good theoretically-grounded analytical process ought to yield.

Part one consisted of three steps:

1. **Tuning:** Each group examined what their particular instrument (with its embedded theoretical perspective) would sensitize them to see in the field material (user videos). This step involved getting to know the instruments, reading the instructions on how they worked, and exploring the theoretical ‘sounds’ they were able to ‘play’.
2. **Rehearsing:** The groups watched videos from field studies and used the instruments to make sense of what they saw. What kind of ‘music’ could be made with this particular instrument when coupled with the field material?
3. **Auditioning:** Finally, each group showed to the other groups what they had learned while playing (with) the instrument. What insights and surprises had their particular perspective brought forth?

In the second part of the workshop, each group used the same instrument to explore what new design opportunities might be seen from this particular theoretical perspective. Or, to stay with the metaphor, the groups examined what kind of new music might be ‘composed’ out of these various ‘tunes’.

The second part was also divided into three steps:

4. **Improvising:** Based on insights from the first round, each group wrote a number of what-if questions to challenge taken-for-granted perspectives and to point towards new design possibilities.
5. **Composing:** After choosing a what-if question to work with, each group then watched a new user video and used their instrument to ‘compose’ future scenarios based on the what-if question and the video.
6. **Performance:** In the final performance, each group illustrated how the new ‘composition’ would play out from the particular perspective of their instrument.

In what follows, we present examples from the groups that ‘played’ the instruments Actor-Network Rings and Reciprocity Balance.

Case 1: Actor-Network Rings

The Actor-Network Rings group used the Theory Instrument to explore differences between cooking your own healthy food and relying on fast food – as this is a dominant theme in the video observations. They started discussing what concerns a network in this case and what actors and actant are involved, continuously consulting the ‘manual’ to check if they have understood the different terms correctly. While discussing what they have observed, they gradually built two competing ‘network’ rings.

The strength of the instrument is that the tangible materials commit the group members to develop a shared vocabulary: wooden pins represent actors (people) and plastic pins represent actants (objects). As they built, we sensed a shift in their way of seeing the problem, from a prevailing focus on the individual user and his or her decisions, toward an understanding that many things and people act together to create (un)healthy eating habits. The instrument seemed to encourage ‘seeing’ a larger complexity.

As they worked, the players pointed some of the pins on each ring upwards to create a sort of stand that could support a wooden ball – representing what Latour calls the ‘program of action’ – in this case, eating a healthy meal. One of the players explains:

“My first thought is that this one (pointing to a wooden pin in the network) his [human] support in the network, that he [the person in the video] in fact needs someone to discuss this with ...he is in a place where all of these ones (pointing towards pins that are standing up), well he is nearly able to keep this one up (tilting the wooden ball), because he is strong when it comes to preparing and cooking healthy food.”

One may say, the players are ‘rehearsing’ with the instrument, trying out what kind of music it can ‘play’. It took at least three upright pins to balance the hovering ball. Besides looking for enough actors and actants, they came to discuss what ‘supporting’ the program of action means, how the support for ‘healthy eating’ and ‘fast food’ is vastly different.

In the audition stage, user insights, theoretical vocabulary, and material affordances became intricately connected as the group played for the other workshop participants the piece of analysis brought forth by the Actor-Network Rings. They set the scene by introducing the theory and its different components, then started building networks and programs of actions that reflected what they had seen.

“What is worth noticing is that of all the ones [people] we saw in the video, none of them have the support, they have no one but themselves (showing a ring with only one pin standing)...”

They went on to show how the users’ experience with healthy eating stood in contrast to another network users tend to rely on for food, namely the fast-food network. The point was made very tangible toward the end of their audition as a small wooden ball balanced delicately on the many pins supporting the fast-food network, while a big ball in the central network –representing the program of action “healthy eating”-- had few pins to support it and fell heavily onto the table [Figure 4]. The audience felt the weight of this particular program of action and the lack of support currently on offer to users.

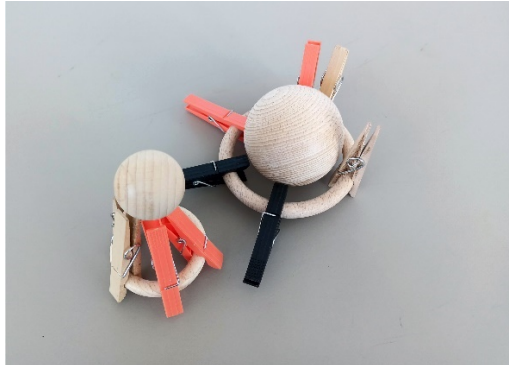


Figure 4. An *Actor-Network Rings* configuration, depicting the fast-food and health-eating support networks. Photograph © Ayşe Özge Ağça, used with permission.

In the second part of the workshop, the players started improvising new configurations of pins on the Actor-Network Rings, removing or replacing them. In ANT, this analytical exercise would be termed ‘imaginary substitution’, envisioning the roles the remaining actors and actants must play if one element is removed. As one of the players said:

“...so we try to maintain some of those things that makes this one [fast-food network] attractive. It isn’t necessarily the food itself... There it’s always open, you drive through, and that’s what makes him [the user] make this choice.”

The players started seeing new ideas of how the networks might be configured differently to uphold the desired program of action. Using the same instruments, they now started to move beyond the analysis of ‘what is’, and began exploring ways of seeing ‘what might be’. Hence the final performance of their new ‘composition’, started out like this:

“What has happened since last time [the audition] is that now this one (pointing to the large wooden ball) is flying. It now has a solid base.”

They continued to describe which pins were added, changed, or ‘re-designed’ to provide what could be a solid support for the program of action they were designing for, namely “healthy eating”. There is, of course, an element of speculation involved here. Still, their re-design is strongly based on their analysis of the actors and actants that already form current networks supporting particular programs of action in the users’ worlds.

“What you can see from the model [the new imaginary network they have built] is that the human support is, is laying down [the pin is flat on the table] he does not get any human support, instead he gets this one (pointing to a new plastic pin representing one of their design ideas), that is his support... We quickly realized that there was something strong over here (pointing to the fast-food network) so instead of trying to disregard that, the idea is to try to change it towards the better, so that it might actually help towards maintaining his [the user] general program [of action] (pointing to the wooden ball).”

What became clear for the players while working with the instrument was how current products speak to the individual, but never individuals acting independently, as they always rely on other actors and actants --both when they succeed and when they do not. For the

players, this constituted a new way of seeing not only the users, but also the product design space.

With Actor-Network Rings, the players no longer focused on designing objects or services, instead they identified existing and potential supports for a particular ‘program of action’. Design solutions were, therefore, not found in individual design objects, but rather in the way particular actors and actants were brought together to accomplish an intended task (a program of action). Some of these actants they identified do not exist yet, and therefore could be potential new products for the company to develop in future. This outcome aligns with our initial shared goal of generating new product directions from theoretically inspired co-analysis of user data.

While still emergent, the use of the instrument shows both analytical and generative design potential. We claim that the particular theoretically inspired ‘way of seeing’ supported by the instrument was extended beyond pure analysis to inform ways of reframing design problems and their solutions –making user research data more actionable for practitioners.

Case 2: Reciprocity Balance

The Reciprocity Balance group explored “healthy living” from the theoretical perspective of gift exchange (Mauss 2002 [1925]), focusing on how particular relationships were formed and changed by health issues, and the exchange of tangible and intangible ‘gifts’ related to these health issues. The players explored the relationship between the company and its users, shaped by exchanges taking place around a particular healthcare service. Based on the video material, the players placed pins on each side of the balancing rod to represent ‘gifts’ given and received in this exchange, while discussing their perceived value (represented by weight). At first glance, it seemed that the company provides many gifts: information, guidance, better health, and perhaps even a longer life, while the user reciprocates with money and loyalty alone. However, on closer inspection, the balance is not so simple. As one designer said:

“The [service] gives a lot of information [to the user], but what comes back [to the company]?”

The designer put the pin representing information at the very tip of the balancing rod on the user’s end, indicating that this is a valuable gift from the company. Then, they discussed what value the information actually provides, and whether this information is perceived as a gift by the user. Based on examples from the video, the interface designer suggested:

“One reaches a saturation point. Oh, all of the things I need to do [in order to become healthy], and if I do not manage then it is my own fault.”

The players moved the pin representing information closer to the middle. It might not be as valuable and heavy a gift as they first assumed. Moreover, the players realized that information goes both ways, as the service requires data from the user in order to provide useful healthcare advice. They agreed that the biggest gift provided by the service is better health. Still:

“It might be that you [the service] give me better health, but you are also reminding me that I am [unhealthy].”

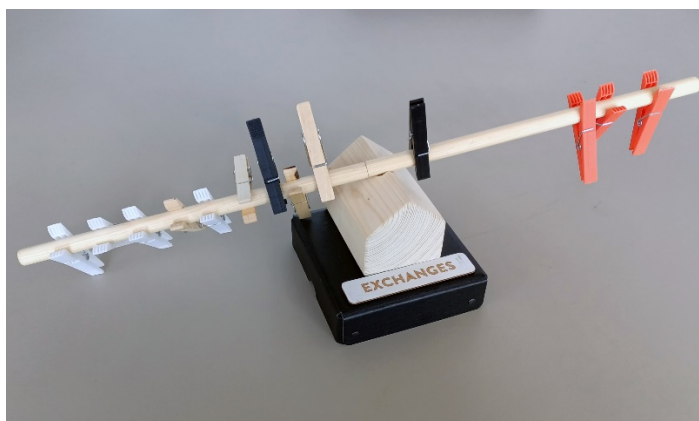


Figure 5. The *Reciprocity Balance* instrument depicting the imbalanced relationship between service-provider and user. Photograph © Ayşe Özge Ağça, used with permission.

The players decided to distinguish between physical and mental wellbeing, as well as between prolonged life and quality of life, as it seemed increasingly clear that for the user these might not be the same. As they continued to discuss, they also attached, moved, labeled, and re-labeled the pins. The service side of the *Reciprocity Balance* grew increasingly heavy from all the gifts provided by the user [Figure 5].

“...the thought of being able to live longer versus all this (pointing to all the things that the user has to give up). A lot of these things, they are more important on a daily basis than the fact that I get this (pointing to what is received from the service), but I don’t know.”

In the end, it was not only the pins that shifted, so did the players’ understandings of the exchange. They started questioning who gives and receives which ‘gifts’, and how their ‘value’ might be experienced differently by the different parties involved. Along the way, it became increasingly clear that the value of the service provided by the company could not be understood independently from the exchange it becomes a part of.

Playing the instrument at the ‘audition’, the players demonstrated how various ‘gifts’ are exchanged between company and user to make the service relationship work. The *Reciprocity Balance* instrument disclosed an imbalance in the exchange, as the company’s services seemed insufficient reciprocation for what the user had to ‘invest’. Their performance ended with the question:

“What are you willing to pay for better physical health?”

This question then set the scene for the second part of the workshop in which the players explored a situation in which the user *receives* rather than *gives* quality of life in this exchange. As the players generated ideas, they no longer used the instrument hands-on, instead they began relying on familiar tools like notes, post-its, and drawings. Still, the gift-exchange way of seeing and the reference to the material interaction of restoring balance pervaded their discussions and ideas.

Even if the players’ use of the *Reciprocity Balance* instrument might seem a little simplistic and sometimes not entirely in tune with the theoretical perspectives that inspired it, from a pragmatic perspective, it still did the job. The instrument provided a shared

vocabulary and a new way of seeing the relationship between the company and their users, as well as the challenges and potentials embedded in that.

When taken together as a duet (just two instruments), already the music becomes richer. With the Actor-Network Rings, the design team expanded their ways of seeing the users and the product design space. With the Reciprocity Balance, the design team developed a new way of seeing the user-company relationship, as mediated by the product and its services - and as a result, reconsidered their understanding of users' experience of health. These tangible ways of seeing generated new product ideas, but perhaps more importantly, restructured roles in knowledge-production within the design team.

THEORY AS TANGIBLE INTERACTION

In the shadow of a long history of tangibility, we would like to position Theory Instruments in relation to other traditions in design and anthropology.

'Design games' as a method (Brandt & Messeter 2004) is by now well accepted in many areas of collaborative design. These tools typically employ snippets of particular field observations in the form of pictures, maps, or cards to engage participants in making sense of material, sharing their own experiences, and pushing forward toward solutions. Like with design games, we use (design) material to scaffold active conversation between participants in turn-taking (Lucero et al. 2016). But where design games are typically tailor-made to each project, our Theory Instruments are designed to be general enough to be applied in different design contexts and toward different ends. The Theory Instruments are designed around the theoretical, not the empirical. Thus, they are open for analysis of any sort of specific field material or situation.

Turning to anthropology, we build on 'elicitation techniques' from the social sciences and humanities, where researchers engage participants in material interactions to both elicit and document data in co-creative processes. By handing the participant the pen, the researcher relinquishes some control of what counts as data. Methods like timeline interviews (Adriansen 2012), robot mapping (Sorenson 2018), or photography (Pink 2001) can be classified as elicitation techniques. Likewise, Theory Instruments can be used to generate data. However, the integration of theory into the material interaction also enables these instruments to be used analytically, in collective sense-making processes. Just as traditional elicitation techniques disrupt the knowledge-production hierarchy in data collection, Theory Instruments disrupt the typical knowledge gaps between design practitioners and user researchers.

Drawing from other tangibles developed for/with industry, we take inspiration from the use of physical material to scaffold 'talking with hands', as seen in LEGO Serious Play (Gauntlett 2007) and Tangible Business Models (Mitchell & Buur 2010; Buur et al. 2013). These methods use physical material (Lego, hardware store haberdashery) metaphorically to support conversations about abstract concepts, like 'organization', 'manager', 'value proposition', 'customer', or 'value chain'. In a similar manner, we provide familiar physical materials, like clothespins, with meanings tied to abstract, theoretical concepts, like 'actors' or 'gifts'. Our incorporation of rather open and interpretable materials, that have an unfinished quality, allows for the same kind of improvisation and unpredictability inherent to this tradition.

Finally – and this seems the most challenging – we try to incorporate kinetic behaviors in the instruments, to build in the chance of 'Oops Moments' (Mitchell et al. 2013). These are moments of surprise when the material behaves in unexpected ways. As the materials play a role in a metaphoric understanding, participants will feel compelled to explain (away)

such dynamic behaviors within the metaphor. They constitute a very vivid form of the Schönian ‘backtalk’ (Schön 1992). This way of engaging kinetic resources is also prevailing in the ‘object theatre’ tradition (Ryöppy 2021) where artefacts are given metaphoric meanings and hence appear to behave in strange and unexpected ways. A few of the instruments manage to incorporate components which may introduce this kind of dynamism – the Actor-Network Rings perhaps most of all. When differently configured, the resulting networks may roll away, collapse, or stand firmly in place.

Theory Instruments build on existing tangible traditions by adding a generalizability not inherent to design games, while still encouraging specificity in the use of the instruments. They incorporate the participatory aspects of elicitation techniques, with a focus on both process and product (data analysis and data creation). The materials and forms selected integrate the improvisatory, metaphorical, and unpredictable qualities that have made tangibles so pervasive in participatory design and research traditions.

With this rich history of tangible interaction, both in anthropology and in design, what we hope to contribute is the addition of theory as a foundation for tangible design, reuniting theory and method. We see potential in Theory Instruments and the physicalization of theory to move toward a shared transdisciplinary design praxis, where knowledge hierarchies are minimized by a shift away from codified and siloed knowledge toward a co-production of situated knowledge, where participation is facilitated by material interaction, where metaphor encourages developing shared understandings of complex and abstract subjects, and where engagement and ownership is more evenly distributed. By opening up the praxis in this way, we might enable new ways of seeing that have implications for design practitioners’ processes and products, but may also establish a new robustness for ethnography.

TOWARD RESILIENT TRANSDISCIPLINARY DESIGN

In our experiments with Theory Cards, we succeeded in bringing new perspectives to the design table, using theory to bolster the co-analysis process and develop richer insights. In our subsequent design research experiment with Theory Instruments, we developed tools that went further, to facilitate new shared ways of seeing within design teams. Our key contribution to both of these methods is the repositioning of theory within ethnography in industry praxis.

When we interrogate the role of theory in ethnography, we are really bringing back into question the role of the ethnographer –who has almost been made irrelevant to the method by its naturalization into other fields of practice. Within design –and indeed, among our own collaborators—ethnographers often struggle to extend their role beyond collecting and delivering insights. At the same time, the design teams often have difficulty transforming these insights into design specifications. One of the well-documented challenges we have seen first-hand is this knowledge-transfer problem.

An explanation for this phenomenon is that the knowledge generated in one field of practice, may not be readable in another. An ethnographer does more than collect and report (Macaulay et al. 2000). The ethnographer *selects* data, informed by a particular set of theories (ideas about the world), and *interprets* this data through theoretical lenses to distill them into insights. If the design team receives only the insights, without the appropriate ways of seeing to understand them, how can they possibly be expected to use them?

With Theory Instruments, we emphasize interpretation as critical to ethnographic method, and we physicalize this quality with metaphorical materials. By bringing the rest of

the interdisciplinary design team into this meaning making process, we destabilize the knowledge hierarchy surrounding field material and theory. The role of the anthropologist and UX researcher changes from collecting information about users ‘providing a view’ on their world to facilitating (design anthropological) “ways of seeing” field material and design possibilities. By embedding anthropological ways of knowing into the instruments themselves, we circumvent the knowledge-transfer issue and instead knowledge production is distributed across the team and through their bodies. The effect is a flattening of the collaboration, bringing the typically cognitive and epistemological praxis of anthropology and the material world of tacit and technical spaces of design together in a shared design space.

These are precisely the changes we saw in our own design research experiments with the health product company. We moved from giving them lenses providing a particular view, to engaging them with instruments that integrate different ways of seeing directly and physically in processes of sense-making and idea generation.

After the experience with the Theory Instruments, we received feedback from the designer who was so frustrated at the start of our collaboration with receiving more user insights that seemed apparent and were not “actionable”. By moving from ‘a view’ to ‘a way of seeing’ (with your hands), the designer was finally able to understand the significance of the users’ experiences for the design process:

“I mean, now we have worked with this little tool that does so that **you don’t just have in your head** what you’re working with, but **you can actually see it**. Such a simple rocking function (pointing to the Reciprocity Balance instrument) that we can actually understand, like an installation, and look honestly at the situation. I think this weighing of the different things, that it becomes a bit unbalanced, it shows that [the users] are getting a ridiculous amount of information... I think it could be really cool to use this as a tool in our everyday practice...” (Reflection session, March 2022)

Through this pragmatic and playful approach to engaging with theory, Theory Instruments can diminish disciplinary divides, helping ethnographers to make visible (and tangible!) their ways of seeing the world, facilitating sensemaking processes, helping designers to find meaning in user research insights to generate new design ideas, and helping organizations to respond to new challenges. In this way, we aim to move ethnography toward a more resilient transdisciplinary praxis in design.

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NOTES

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1. Each of these theories offers different perspectives on the sociomaterial world. *Rites of passage* concerns social identity, as described by Arnold Van Gennep (1909) and later Victor Turner (1969). Theories of *exchange & reciprocity* concern the formation of social relations through gift-giving, as described by Marcel Mauss (1925) and elaborated by Claude Lévi-Strauss (1949). Pierre Bourdieu (1986) introduced us to various *forms of capital* that act as social currency. *Classification* concerns the way we conceptualize information using language, and how our mental concepts and words influence each other, often attributed to Mary Douglas (1984). John Law and Bruno Latour (1992) introduced *Actor-Network Theory*, which describes the networked relations of people and things. Jodi Forlizzi introduces a related theory that adds contextual and temporal layers to the network with her theory of *Product Ecology* (2008).

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