

III.

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Characteristics of An Invested Object

If we are not objects or gadgets, what kind of relationship can we have with an object and what sort would it be? Developments in digital computing have changed our world and expectations of objects — and these we should leverage. As Lanier points out above, we do now have remote eyes and ears, and that is a compelling development. To set technology and humanity at odds is a failing strategy. The objections and complications of Murray’s “humanists” — who seem to urge us to stop playing with fire and instead return to a pastoral Eden — are easily dismissed as an unenlightened Luddism. And then off go the engineers, refusing the critiques.

Likewise, as we can see with critical design, accepting without discrimination the value of experts and the values of the technocratic — in their case by insisting on a plausible path to the imagined situation — can hinder the critical value of work.

Lanier appears to avoid both, finishing *You Are Not A Gadget* with his own prescription for more humane technical development. Extolling the “morphing” capabilities latent in VR, he suggests that, when paired with

human neoteny (that is, our plastic brains), these will allow for us to create an augmented future that keeps the human at fore and thereby remains humane. For this he uses the cephalopod as metaphor and contrast.

For the invested object, I prefer a half-aquatic metaphor: the lichen. Lichen are actually two creatures, algae and fungus, combined as one. The protection of the external fungus allows the algae to live in environments too dry for survival alone. The photosynthetic properties of the algae provide the energy the fungus needs to live. It is this type of symbiotic experience I hope we can mirror with the invested object.

In this case, we can use digital technology and its veneer of the *future path* as the shell to protect and shepherd an experience of contextualized information. But what features can we expect from a wee investable lichen?

It should be a real thing.

An investable must be a real thing, which in this case implies both depth and materiality.

Just twenty or so years after the domestication of the computer, there exists already a growing desire to rip pixels off the static and distant screen. Put the screen on your face and call it virtual reality; put the sensors on your skin and call it embodiment; put reality back into the pixels as video and call it augmented reality — do something to make it real again. Lanier echoes Walter Benjamin's construction of the aura as he expresses the lure of the object:

A real painting is a bottomless mystery, like any other real thing. An oil painting changes with time; cracks appear on its face. It has texture, odor, and a sense of presence and history. (133)

Here he is touching on what Benjamin calls the “authenticity of a thing”: “the essence of all that is transmissible from the beginning.” (221)

Later Lanier renders a distinction between the digital and the physical, writing,

[A digital object] will be a flat, mute nothing if you ask something of it that exceeds those expectations [of which aspects are important]. If you didn’t specify the weight of a digital painting in the original definition, it is not just weightless, it is less than weightless.

A physical object will be fully rich and fully real whatever you do to it. (Lanier 134)

It can be easy when considering the aura, or authenticity, to forget that “Art in the Age of Mechanical Reproduction” is actually an argument *for* the value of a new, de-ritualized art. Benjamin asserts that though film and photography work differently from painting, they allow for “the direct, intimate fusion of visual and emotional enjoyment by the public” and allow for “simultaneous collective experience” in a way painting does not, and therefore still possess an artistic value. (Benjamin 234)

And so, contra Lanier, I would say it is not an immanent difference between digital and physical that gives one depth and leaves the other

dead and lesser. As ethnologist and researcher Sherry Turkle puts it, technology is "as much an architect of our intimacies as our solitudes." (CITE) Intra Lanier, though, there lies a point central to the invested object project: there are strengths in the physical and the digital that complement one another and we can access them when we have objects that are both *physical* and *digital* and thereby become *real*. That is, a fully rich digital object must have a physical manifestation beyond a screen to be a real thing.

In fact, the watcher objects with whom we began are precisely this combination. They are literally digital lichen (though inside-out from our intention to wrap the contextual in the digital) wrapping electronics inside plastics and other materials that can be held, that hold on them physical traces much like the Victorian objects of Manual Charpy in section II.

In this way, realness also opens up for the invested object project a place in material culture analysis. Beyond saving and reflecting the gestures of its time as Charpy describes, the physicality of the object both makes it available as a projection surface for current meanings and to be projected far into the future.

John Styles sketches the working of the first in "Objects of Emotion," a study of tokens left at the London Foundling hospital with the abandoned infants. These tokens served to identify the infants, should the mother return to reclaim it under better circumstances. These, like most objects, encode emotion, he notes, but transmission is a complex function and may not always succeed.

Objects can transmit emotional messages, carry emotional associations, and evoke emotional responses but frequently

they do in such a personal way as to defy broader appreciation. Even when objects are emotionally charged in ways that command wide recognition, that recognition is often restricted to very specific circumstances. Things that exhibit emotional power in one setting can lack it in another. Moreover, even when an object's emotional charge was widely recognized at some period in history, there is no guarantee it can be recaptured by the historian. (165)

He goes on to explore the meanings embedded in the tokens, which were often fabric or ribbon. The cultural ground — that ribbon was cheap and available for poor women, that ribbon was already a ground for emotional communication — is reflected in the tokens. The figuring on the ribbon, often of hearts, reflects eighteenth century emotional beliefs. (Styles 166–68) Styles complicates this communication of emotion by suggesting it may just be a reflection of the emotions mothers were *expected* to display instead of being known to be authentic, but this is a criticism that could be leveled at most communications that survive beyond their context. At some point, we must take earnestness on faith. On the other hand, keeping in mind some historian's demands for text corroboration can only help us shape our communications.

Paying attention to the external design and decoration of our physical object, as well as surrounding it by texts, means we are at least attempting to leave a trail for those who follow us — and this trail creates an opportunity for the ideas embedded in the objects to be re-inscribed into the cultural sphere once we are gone.

If we want the object inscribing long after we are gone, of course, the materials used are also important. David Gaimster, in “Material Culture,

Archaeology, and Defining Modernity,” describes how ceramics become an ideal medium for material cultural transmission from Europeans circa 1400 to 1700. “By virtue of its utility at all levels of society, its relatively short lifespan and its durability in the ground, ceramics have proved to be one of the most sensitive and reliable archaeological indicators of social behavior and mobility.” (59) The durability combined with mutating decoration creates an expressive and long-lived object of communication.

Altogether, physical-digital objects provide the base desirable in an invested object: they can communicate across cultures, they are capable of embodying emotional and historical experiences. In addition, our experiences with them are rich and complex.

It should be a thing you can think with.

The richness of physical objects does not lie only in their physical presence and concomitant persistence in the world once we are gone; there is also great value in the relationships and connections we are able to find with our objects. We are able to think with them, as Turkle says.

In *The Inner History of Devices and Evocative Objects*, Turkle collects stories of the transformative relationships between everyday people and the objects around them. There is E. Cabell Hankinson Gathman, who holds her study abroad to Japan frozen inside a cell phone and Barry, the man for whom computers open the world by making math accessible and tactile. He tells Turkle, “that with a computer and calculator, “The numbers are in your fingers They put mathematics in my hands and I am good with my hands.”” (Turkle, *Devices* 28) Basic digital items can morph our bodies and minds without VR at all.

In her piece on the digitization of Le Corbusier's digital archives, Susan Yee articulates the connection to the past derived from physical objects, reveling in her ability to touch the paper Le Corbusier touched and to do the calculations he has scrawled into the margins along with him. (Turkle, *Objects* 32–33) She laments the passing to the digital — “It made the drawings feel anonymous and me feel anonymous” (35) — but we know that we can look for a way to keep the values of both working together — instead of letting the algae escape.

“The acknowledgement of the power of objects has not come easy,” writes Turkle, tracing the reluctance to engage with the power of material culture to the same Western predilection for abstraction that gave us free-floating data. Fortunately, through the 1980s and into today, Turkle and others made it their work to pinpoint and relate the value of objects. This was often found in the very heart of abstraction territory (that is, science) (Turkle, *Objects* 6–7), which made for a compelling case. Turkle has collected these stories and outlined common functions of object-thinking found inside: “_Objects are able to catalyze self-creation. ... Objects bring together thought and feeling. ... [W]e often feel at one with our objects.” (Objects_ 9, emphasis original)

The three capabilities work together to make objects part of us and us part of the world. This push and pull can be seen in the relationship between objects and theory Turkle describes:

One role of theory here is to defamiliarize [objects]. Theory enables us, for example, to explore how everyday objects become part of our inner life: how we use them to extend the reach of our sympathies by bringing the world within.

As theory defamiliarizes objects, objects familiarize theory.
The abstract becomes concrete, closer to lived experience.
(*Objects* 307)

This is a goal then of the invested object. To bring the abstract theory of contextualized information into a touchable, desirable, expressive form.

As the essays in *Evocative Objects* demonstrate, the types of evocative objects — in form and function — are vast. There are objects of transition and passage, of memory and mourning. These are trains and suitcases and Fords and wooden radios. Slime molds straddle a border and serve as objects of meditation and new vision. Objects can contain thoughts and experiences that may only ever get out through thinking with them.

We can build on this.

We can also build on the investigations into how physical objects can work to express experiences outside words. Just as objects we think with are invested with thoughts by experience, they can be invested with emotion by the shapes themselves. And these shapes are intelligible on an instinctive level.

Human-computer interaction researchers Jarmo Laaksolahti, Katherine Isbister and Kristina Höök created and tested the sensual evaluation instrument (SEI), “an instrument previously developed to facilitate nonverbal self-report of emotion, which consists of eight sculpted objects.” (Laaksolahti 165) These sculptural objects, ranging from smoothly stone-like to spiky, to complexly blobby, were deployed in a number of studies, including one that used photos from the International Affective Picture Set, computer games, and conversation to test the

expressive values of the objects across two cultures, Swedish and American.

Explaining the project they write,

We wanted to allow for ambiguous and evocative communication between user and designer, to preserve the rich and multi-layered feelings that users might be having and to create sparks in the designer that could lead to powerful design insights — what Gaver and Dunne [our old critical design friends!] might refer to as ‘inspiration cues’ (Isbister 315)

and later emphasize the value of ambiguity in emotional expression

Language is wonderful for summarizing and categorizing and processing one’s emotions after an experience, but might sometimes be a clumsy tool for communicating affect in the fleeting moment of interaction, particularly if one is feeling a jumble of half-resolved emotions-in-progress. We hoped using the visual sense as well as the sense of touch would elicit different kinds of responses from users, and perhaps allow for greater unresolved ambiguity in their expression. (Isbister 317)

The same emotional ambiguity that historians such as Styles might identify as a liability becomes a support for an expressive emotional complexity. And it worked. While participants from both cultures complained some emotions were lacking from the set the objects, all were able to express emotion with the objects and their choices were consistent across most of them. (A few were hard to interpret — sometimes only for

one culture.) Although some differences were observed, particularly in terms of combining objects to make complex communications, the overall ability of these shapes to be read across cultures was established — spikiness was used to communicate frustration, roundness to communicate calmness, and asymmetry for feelings of tension. (Isbister 319–322)

By holding on to experiences and emotions, the invested object reaches out towards what Frederick Brooks calls intelligence amplification. As Susan Kozel explains,

AI refers to a field of research that seeks to replace the human mind with machines. IA is different since it aims to build systems that amplify the human mind by providing it with computer-based auxiliaries to do the things that it has trouble doing (like enormous sums), thereby freeing it to scale new heights at more creative tasks (Rheingold 1991, 37). (Kozel 99)

In the case of the invested object, holding onto some aspects of experience and emotion might free us to make more complex observations and insights into the information contained within.

It should be a private thing.

If information will be brought down to live again within its context in an investable object, we must consider how to avoid the pitfall of recreating the surveillance-friendliness of the watcher object. Wanting to pollute the possible with ideas that move away from the inhumanity of contemporary digital hybrid objects requires the development of pieces that make surveillance difficult if not impossible.

Höök, who worked with Isbister on the SEI, has also researched what she calls interactional design:

An interactional perspective on design will not aim to detect a singular account of the “right” or “true” emotion of the user and tell them about it, but rather make emotional experiences available for reflection. That is, to create a representation that incorporates people’s everyday experiences that they can later reflect on. Users’ own, richer interpretation guarantees that it will be a more “true” account of what they are experiencing. (647)

The goal of designing from this perspective is to preserve user’s autonomy and privacy. Höök et al. begin by describing privacy in the negative, pointing to un-private systems, like the EmpathyBuddy email system or affective learning tools from Picard’s group, which use different methods to build up an emotional model of the student and use this to shape the learning approach the system takes. Höök describes the problem:

All of these applications regard emotion as something that can be measured, isolated and then used as a basis for how to make a system respond. This makes these kinds of systems potentially vulnerable to privacy protection issues. By that, we do not mean that the problem necessarily lies in what these systems store on the computer and whether that can be properly protected by various security solutions. Our concern lies on the level of what users may feel about systems that claims to know something about their emotional states, perhaps building profiles of them. (648)

When the system proposes to know a user's state, particularly when it uses methods to which the user has no access, the system can be seen as violating privacy. (649) This, too, is one of the more creepy features of the watcher objects — their promise to track your actions and thereby predict and automate system changes, without your needing to have any input at all.

Höök continues to address the second contributor to the creepiness of the watcher object — the question of autonomy:

Overall, these systems may also threaten users autonomy since they do not hand over any control to the user, but instead decides what to communicate to others (be it friends or teachers or the system itself) about the end-user's emotional state. (648)

To counter these issues Höök et al. advocate for designs that “assume that the meaning of an emotional process is created by people and that affective interactive systems should be such that users are encouraged to negotiate these meanings themselves.” (649) After reviewing designs they believe to meet this approach, in particular, the eMoto and Affective Diary, the authors offer up six principles based on work from Kirsten Boehner and colleagues:

1. The interactional approach recognizes affect as a social, cultural and bodily product
2. The interactional approach relies on and supports interpretive flexibility
3. The interactional approach is non-reductionist
4. The interactional approach supports an expanded range of

communication acts

5. The interactional approach focuses on people using systems to experience and understand emotions
6. The interactional approach focuses on designing systems that stimulate reflection on and awareness of affect (652–53)

which can be summed up in three design approaches:

- Designing open familiar surfaces that can be appropriated by users
- Leaving the interpretation to the user through a balanced ambiguous design elements
- Involving users in affective loop experiences (653)

Openness and balanced ambiguity are approaches that allow users to invest the system with their own meanings and communicate them in the manner they find most true and accurate. The affective loop is a process wherein the system reflects the user's emotions back to them, creating both a relationship with the system and deeper understanding within the mind of a user.

Or as Hayles herself wrote,

If what is exactly stated can be done by a machine, the residue of the uniquely human becomes coextensive with the linguistic qualities that interfere with precise specification — ambiguity, metaphoric play, multiple encoding and allusive exchanges between one symbol system and another. (Hayles 67)

We see an expression of this sense of ambiguity in the SEI's non-anthropomorphic, non-singly mapped approach. The sculpted objects are

meant to express an emotion without using faces to describe them or being mapped to one exclusively; for instance conflict is often represented by users with the spiky object or the anteater, but neither is said to consistently represent conflict in a direct mapping. Each object can be used with other objects to express multi-layered emotions. They take on meaning culturally, in context and in conversation.

Gaver et al. also make a case for ambiguity in design as a driver of engagement and contextualization:

[Ambiguity can] be intriguing, mysterious, and delightful. By impelling people to interpret situations for themselves, it encourages them to start grappling conceptually with systems and their contexts, and thus to establish deeper and more personal relations with the meanings offered by those systems.
(233)

If we keep the suggestions and cautions of interactional design in mind when considering the investable object, in particular ambiguity, we can be sure we are working towards creating objects unlike the watchers — objects that support the privacy and autonomy of the users.

It should be a reflexive thing.

Investable objects ought to be reflexive objects instead of homeostatic ones. That is, rather than reflecting a theory of an objective conservation of stability, the objects will reflect an interpretation of information that is focused on expressive systems.

When Höök et al. describe the interactional point-of-view, they are also describing a reflexive one. Interactional design is design that works to communicate emotions and these:

are not only cognitive phenomena, but are also experienced as physical, bodily processes, and are in turn influenced by our bodily experiences. The way we experience emotions is shaped by the culture we live in and the specific social setting they occur in. (647–48)

Continuing, they write

From an interactional perspective, communication of emotions is not simply an information transfer problem; it is about physically and intellectually experiencing the whole range of emotions that make up a conversation. We name them affective loop experiences, experiences where it is not possible to separate the intellectual from sensual experiences, nor to single out what is my individual experience from the overall experience arising in a dialogue with a friend or in dialogue with a system. (648)

This in itself rhymes with McKay's alternative information theory as reported by Hayles, which "[a]rguing for a strong correlation between the *nature* of a representation and its *effect*, ... recognized the mutual constitution of form and content, message and receiver." (Hayles 56)

Turkle's view of evocative objects, on which the investable object draws, also refuses the image of free-floating, decontextualized information. Evocative objects, she writes, are those considered "as companions to our

emotional lives or as provocations to thought.” They “[underscore] the inseparability of thought and feeling in our relationship to things.”

We find it familiar to consider objects as useful or aesthetic, as necessities or vain indulgences. We are on less familiar ground when we consider objects as companions to our emotional lives or as provocations to thought. The notion of evocative objects brings together these two less familiar ideas, underscoring the inseparability of thought and feeling in our relationship to things. We think with the objects we love; we love the objects we think with. (Turkle, *Objects* 5)

However, reflexivity, in terms of the second wave cybernetic theories, is about more than just re-situating information into a body — tethering it, as it were. The theory, developed by Humberto Maturana and Francisco Varela, describes how physical systems make possible the production of meaning. With a background in biology, Maturana’s theory of reflexivity was born in a paper, “What the Frog’s Eye Tells the Frog’s Brain,” and various retinal studies. In the former, he looks at the way in which a frog’s nervous system interprets and filters actions in the world to provide images relevant to a frog’s needs. That is, frogs hardly see objects that are not in motion, as these are not relevant to the frog; this is a result of the physical development of the frog’s nervous system. Likewise perceptions of color cannot be mapped in any way to the outside world but are rather determined by an animal’s retinal shape.

From these experiments, Maturana concluded “that perception is not fundamentally representational.” Instead reality, insofar as it exists, “comes in to existence for us, and for all living creatures, *only through interactive processes determined solely by the organism’s own*

organization.” (Hayles 136, emphasis hers) This organization, whole and complete to the organism itself, is *autopoietic*, self-created and self-organizing. From this comes the assertion that “[e]ach living system thus constructs its environment through the ‘domain of interactions’ made possible” by such organization. (Hayles 137) Each organism is therefore capable of expressing that which its organization permits.

To describe communication between various autopoietic structures, such as various humans or even perhaps between our current selves and past ones, Maturana refers to “‘*languageing*,’ a process wherein observers, acting solely within their own domain of interactions provide the triggers that help other observers similarly orient themselves within their domains.” (Hayles 147)

Being rooted in physical bodies, in biology rather than mathematics, seeing information as not only tethered to but constructed by our organization, Maturana’s reflexivity provides a radically different and perhaps more humane way to look at message generation and communication. A reflexive object is then part of a system and a manifestation of its organization; it will provide triggers for other autopoietic systems, which is to say, ourselves. A reflexive object too can be an object that facilitates an observer’s self-conscious review of its own organization.

It should be a transportable thing.

An object we want to develop a relationship with should be an object we can hold close.

In the initial stages of the investable object project, I ran an online survey investigating what participants considered lovable objects, giving the prompt “Tell me about an object you love and why you love it.” In this case, a survey was good tool, giving broad responses to a wide request for information quickly and without geographic limitation.

Because I wanted as much emotional honesty as possible I did not ask for demographic or personally identifying information; however, as the respondents were drawn from my Twitter followers (or followers of followers in the case of retweets), certain facts can be inferred from Twitter’s audience analytics. Namely, they are tech-savvy and design-interested, between 25 and 44 (mostly under 35), and from the coastal US. Although containing slightly more men than my real-life friendship group at 60%, the audience are my peers. This is who we are aiming for when we check for resonance beyond the immediate experience.

More than two-thirds reported touching the object they loved sometimes or often. Over a quarter had it in their pocket or hand when answering. Half chose an object of memory, something that reminded them of something and a further fifth chose an object of comfort.

While some objects stayed at home and a hard-to-move invested object is imaginable, for most respondents, an investable object, a loved object that contains history, experience and emotion, was at hand.

It should be something people can make themselves.

As a final corollary to reflexivity, an investable object should be something people can make themselves. In this way the object also is a flow polluting

the possible as proffered by the maker movement, today a defender of the real object but also a breeding ground for the watcher object.

This state of affairs is in many ways the expression of the construction of information as untethered. As Evgeny Morozov relates in his history of the maker movement for the *New Yorker*, the flowering of DIY electronics and related products begins with Stewart Brand and his *Whole Earth Catalog*. Brand himself has moved on to championing makers, who “take whatever we’re not supposed to take the back off of, rip the back off and get our fingers in there and mess around. That’s the old impulse of basically defying authority and of doing it your way.” (Brand, quoted in Morozov)

And yet, as Morozov points out, the resulting works are about anything but rebellion: “our hackers aren’t smashing the system; they’re fiddling with it so that they can get more work done.” He elaborates, “In this vision, it’s up to individuals to accommodate themselves to the system rather than to try to reform it.” And much in the same way that revolutionary language has produced submissive action, the actual devices produced by these makers tend to be either robot toys, fun but unremarkable, or sensors, made to watch and report back on heat, weather, movement, and other free-floating information around us.

Morozov identifies the core of our sickness again in imagination:

Our tech imagination, to judge from catalogues like “Cool Tools,” is at its zenith. (Never before have so many had access to thermostatically warmed toilet seats.) But our institutional imagination has stalled, and with it the democratizing potential of radical technologies.

But if we were able to disseminate the means of creating reflexive, personal, investable objects, we might pollute the narrative currently living inside the maker movement. One vector might be FabLabs, as developed by Neil Gershenfeld. The labs are “globally connected open workshops where people can meet, collaborate, interact and exchange ideas, machines, tools, materials, and software with the common purpose of making distinctive and digitally designed objects (from scratch) in an accessible and cheap way.” (Walter-Hermann and Büching 13) They were born from Gershenfeld’s experience at MIT, where a class he created for advanced physical sciences students, “How to Make (Almost) Anything,” ended up attracting a hundred interested artists, architects, and engineers. Not only was he surprised by the students, but their approach to learning also made a big impression: “the class turned out to be a bit of an intellectual pyramid scheme,” he writes, noting that students learned machines and techniques just-in-time then passed them on to others when others needed them. (Gershenfeld 5–7)

From his experience putting fabrication tools in students hands and standing back, Gershenfeld concludes “the killer app for personal fabrication is fulfilling individual desires rather than merely meeting mass-market needs.” (9)

What if instead of just sharing machine knowledge, an invested object maker also spread an idea of interactional information design and the possibility for a different set of objects?

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