The Performative Experiment:
A Polylogue to Practice the Malleability of an Aesthetic and Spatial Sense of Self

by

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SUBMITTED TO THE DEPARTMENT OF ARCHITECTURE IN PARTIAL FULFILLMENT
OF THE REQUIREMENTS FOR THE DEGREE OF

MASTER OF SCIENCE IN ARCHITECTURE STUDIES
AT THE
MASSACHUSETTS INSTITUTE OF TECHNOLOGY

June 2017

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ACKNOWLEDGEMENTS

This is an impossible section as it grows each moment. My heartfelt thanks to:

Mark Goulthorpe for the unique program he has helped develop at MIT; your insistence on Gregory Ulmer's *theopraxeses* and creative, independent scholarship has sinusoidally displaced and centered my work over the course of these two years in very productive ways.

My readers, Terry Knight and Morana Alač, for your thoughtfulness and care in your comments.

Shaun Gallagher and Marie-Christine Nizzi for their invaluable input at key points as I shaped my work.

The growing SMArchS AD group, for your friendship and incredible talents; there’s so much I’ve learned from each of you. I look forward to the growth of this wonderful program.

All the participants in my experiments for your time and enthusiasm.

Lorena, for appointing me as your TA for Intro to Architecture Design for 3 terms, allowing me to be intimately involved with foundational architectural pedagogy. All the students who I have TA-ed whose commitment and talents have been inspiring.

Rebecca, for your perspective as the writing in this booklet grew.

The innumerable kind, generous, and brilliant friends, colleagues, professors, and staff at MIT. This community has taught and transformed me in more ways than I could have ever expected.

Kristy, for grounding me with your patient friendship.

My 107 family - Natalia, Arielle, and Arin, for all your love and support.

UCSD's Communications and Science Studies departments where I will be starting a joint PhD. in the Fall, for welcoming me.

To every kindred spirit navigating transdisciplinarity, who has encouraged me to be intrepid.

My wonderful parents, sister, and the rest of my family for their buoyant spirit, perspective, and immeasurable love.

To all these incredible people, and so many more: I will pay it forward.

*This is for Aarik.*

*May 25, 2017*
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Submitted to the Department of Architecture
on May 25, 2017 in Partial Fulfillment of the
Requirements for the Degree of Master of Science in
Architecture Studies

ABSTRACT

This thesis contends that basic architectural design training requires malleable aesthetic and spatial sensibilities which in turn can cultivate a pliable and multiple sense of self. “A sense of self” here draws on William James’s and Ulric Neisser’s plural ways of conceiving and knowing oneself through self-knowledge, self-consciousness and self-agency, all of which combine to motivate our actions in the world. “Aesthetic”, borrows from Mark Johnson’s definition of constituting the patterns, images, feelings, qualities, and emotions by which meaning is possible for us in every aspect of our lives. “Spatial” captures the ways in which we situate and orient self in the world. How we are trained to perceive, apprehend, cogitate, examine, reflect, record, and practice these sensibilities guides how we piece together our experiences in the world as a series of aesthetic and spatial fragments. I argue that 1. The cultivation of multiple and pliable attributes of self is prescient and relevant to fields beyond design. 2. The site of cultivation lies beyond the mind. I build a case that these two contentions are picking up on recent waves in situated and embodied cognition and posthuman discourse, that have each reclaimed the body, physical, digital and virtual environments, and the non-human respectively as extended sites of perception and cognition. Posthumanism here, in the terms of physicist and feminist theorist Karen Barad, extends agency
to the nonhuman by prefiguring neither human nor nonhuman in interactions. Both situated cognition and posthumanism are engendering new aesthetic and spatial abilities that exemplify the multiplicity and malleability of self. In order to productively instrumentalize their common findings, we need new methodologies and materials that escape individual disciplinary silos which proliferate canons and inhibit the creation of common ground. Design pedagogy has the ability to subsume the motivations of various fields in order to develop such methodologies. I embody cognitive science and posthuman discourse, in order to make visible their pursuits, knit together their underlying values, and frame their common calls as design problems. Through this, I develop a new methodology called Performative Experiment, that primes the malleability of aesthetic and spatial sensibilities by estranging one from canons and rote moves. Like parkour for imagination, displacing the center of thought from the mind into the surroundings that are appropriated as an extension of self, performative experiments arrest the spatial and aesthetic aptitudes growing out of a malleable sense of self. I present the shadow and shaded silhouette as materials with which to engage these priming methodologies. In order to implement the case I’ve built, I present Hogarth’s Silhouettes as a proof of concept of a foundational experiment in design education. My claim is that it puts into play a malleability of aesthetic and spatial sense of self, which constitutes a new form of design thinking/doing, across disciplines.

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a prologue to a polylogue

What follows is a polylogue of multiple voices speaking in the form of provocations towards a common goal of developing a foundational pedagogical experiment. It is a negotiation of the complicities and contradictions of the voices, a familiarization of each others’ vocabularies, and an estrangement of one’s own.

To answer *How might architecture design and cognitive science meet?*, this polylogue paves a transdisciplinary route.
As we situate self in physical and digital space, co-opting personal, digital technologies that expand our sensory perceptions, and engage with the physical and digital environment through variously mediated interfaces, our aesthetic and spatial sensibilities are morphing.
What ensues is a polylogue. The actors in the polylogue will pave a way for a pedagogical approach to develop aesthetic and spatial concepts, across disciplines. Their communication will reveal itself to be performative in that it is always only morphing, and unfurling. What ensues is a polylogue. The actors in the polylogue will pave a way for a pedagogical approach to develop aesthetic and spatial concepts, across disciplines. Their communication will reveal itself to be performative in that it is always only morphing, and unfurling. What ensues is a polylogue. The actors in the polylogue will pave a way for a pedagogical approach to develop aesthetic and spatial concepts, across disciplines. Their communication will reveal itself to be performative in that it is always only morphing, and unfurling.

Basic design training requires malleable aesthetic\(^1\) and spatial sensibilities, and trains one to think about and imaginatively manipulate the known and unknown relations between self and the other. On the other hand, cognitive science, as a study of mind and its processes, attempts to understand but also improve human intelligence, including our unique aesthetic and spatial aptitudes. As we situate self in physical and digital space, co-opting personal, digital technologies that expand our sensory perceptions, and engage with the physical and digital environment through variously mediated interfaces, our aesthetic and spatial sensibilities are being challenged. We can apprehend and train these sensibilities via consciousness, experience, and imagination. These themes themselves can be approached through various lenses. When squinting to merge the inventive horizons of design and the

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cognitive sciences\textsuperscript{2} in the pursuit of apprehending these changing abilities, the problem and role of the self emerges as the common ground before much else. It emerges under multiple guises: self, I, me, avatar, agent, individual, identity, subject — none of which are synonymous. It also emerges through a variety of roles such as self-agency, self-organization, and self-design, which combine to motivate our actions in the world.

The word self itself is complex, insofar that it might mean too many things. The caution then is to avoid describing any one, unified self, and instead, consider what we do and can do with its various attributes.\textsuperscript{3} However, regardless of the moniker of this entity (let’s call it the self), it is no longer the humanist, unified self. Whatever else it may be, must be re-conceptualized, in order to make visible and available the aptitudes, abilities, and sensibilities that result from an awareness of its malleability. Malleable in this context represents the self’s characteristic of being multiple, mutating, distributed, and pliable. A study of such a malleable self is a transdisciplinary pursuit.

This body of work is a series of provocations of transdisciplinary operations in order to understand the aesthetic and spatial attributes of this malleable self, and their subsequent agency. I don’t suggest that we make defunct existing practices, but rather that we momentarily set aside disciplinary presuppositions about other fields’ visions and methodologies, in order to discover our evolving abilities to sense, perceive and cogitate, and to put them into practice within the world. The cognitive sciences and basic design education can extend each other’s discursive reach, when they presuppose the following:

\textsuperscript{2} The cognitive sciences is a catch-all for an interdisciplinary approach to the study of thought, either through cognitive psychology, experimental psychology, computer science, linguistics, philosophy, and neuroscience.

\textsuperscript{3} This suggestion, is something Marvin Minsky makes when he described the word “Consciousness”. He calls it a “suitcase word”, in that it could mean too many things. Minsky, Marvin. The emotion machine : commonsense thinking, artificial intelligence, and the future of the human mind.
Self is continuous flow.  
Self is shaped by what it subsumes.
Self can be primed to subsume.
Self is primed through awareness.

Self is continuous flow. It is not Cartesian.

It is not singular.
It is not static.

It is not solely human.
Self is mind.body.environment.other
Self is malleable.

The self, in design education, can assert its role at various levels: at the level of the individual, then the interface, and finally the extended world. Certain behaviors can be explained by attributing them to the inner most layer of self such as self-knowledge, self-consciousness, and self-agency. At the level of the interface, we have Boris-Groys’s “self-design” that describes how we are curating our digital presence, occluding certain aspects of the self. At the extended self level, self-agency is augmented through borrowed means such as digital tools that instill a sense of self-sufficiency in various tasks (such as organizing, designing, planning). All of these levels of self-engagement steer how we sense, perceive, and think about the world. When the French philosopher Paul Ricoeur expressed that self-knowledge only comes through relations with others in the world, across time, he was going against the grain of the hermetic, essentialist, humanist self, that alienates consciousness from body. This is similar to William James’s concept of the knower and the known, the subject and the object, the percept (an object of

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4 This flow is not unlike J.J.Gibson’s “flow” which although Gibson only meant to be visual, a concept he called “visual kinesthetics”, captures the awareness of one’s own movement. Gibson, James J. The ecological approach to visual perception.
5 Descartes’ “Cogito Ergo Sum” is not sufficient
6 Self knowledge is acquired “through an understanding of our relation with and amongst others in the world and of our life with and among others in time in the world”. Ricoeur, Paul, and Paul Ricoeur. 1992. Oneself as another.
7 Ibid.
perception) and the perceiver, all being the same self. To both James and Ricœur, self morphs through experience—an experience that is embodied in the world.

Priming our selves to identify these perceptual and cognitive relationships with the world via experience is a spatial and aesthetic act. I defend this position by calling for an awareness of the malleability of our aesthetic and spatial sense of self. Aesthetic, borrowing from Mark Johnson, in the lineage of John Dewey, concerns the patterns, images, feelings, qualities, and emotions by which meaning is possible for us in every aspect of our lives. Jacques Rancière would even more broadly, define aesthetics as how we “make sense of and act in the world”. When this making sense of the world and meaning-making is tied to bodily experience through sensorimotor expression, we’re led to ask: whose body, perhaps avatar, perhaps self, is transforming and being transformed by this aesthetic? On the other hand, spatial here is how the malleable self conceives of orientation, location, proprioception, and relative distance in an environment. The frames of reference we use in these spatial acts dictate our experience.

Observing, conceptualizing, and enacting the aesthetic and spatial sense of self as self-object-environment becomes an entangled and material exercise. I contend that this entanglement calls not for a new theory of responsive objects, but rather a theory of the self that extends animism and agency of the human, to non-human and object alike in both physical and digital environments, and makes

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8 “Whatever I may be thinking of, I am always at the same time more or less aware of myself, of my personal existence. At the same time it is I who am aware; so that the total self of me, being as it were duplex, partly known and partly knower, partly object and partly subject, must have two aspects discriminated in it of which for shortness we may call one the Me and the other the I.” James, William. Psychology. n.p.: New York : Henry Holt and company, c1892., 1892.pp. 176


aware its aesthetic and spatial attributes. A theory like this acknowledges the transformative power of the self in all its concentric levels of interaction, creating new confluences in how we make aware, engage, and practice the malleability of self. But these various attributes of self — consciousness, experience, imagination, meaning-making, aesthetics, spatiality — don't belong to any one discipline, making an understanding of them a transdisciplinary pursuit. As such, this body of work has been crafted to embody the multiplicity and malleability that such a transdisciplinary enterprise demands. It is an answer to a need for critical and comparative approaches between disciplines to expose creative, imaginative, and speculative inquiry. This research it thus multiple things. It is a call for an awareness of the malleability of self. It is an inciting venn diagram of 3 disparate and variously scaled topics (embodied cognition, posthumanism, foundational design pedagogy, floated by Hogarth's aesthetic enterprise). It is also a proposal for a methodology to engage this intersection, through appropriate materials, and a survey of the state of the art of embodied modes of thinking, making, and doing. It presents as a productive challenge, the synthetic work that architectural design education and the brain sciences can generate in order to cultivate our aesthetic and spatial sensibilities, and provides a methodology for this synthesis.

I present the need for a conception of a malleable self in Chapter 2 in addition to a dynamic definition of it and its agency by synthesizing posthumanism and embodied cognition. Two attributes of the self are isolated — aesthetic and spatial, which pose the cultivation of a malleable sense of self as a design problem. Here I dismiss Descartes's mind-body dualism, to which I add, the mind-body-environment divide, in order to mobilize the malleable self. This new conception allows me to place the mind, body, and environment as parts becoming wholes in place, in movement, in order to apprehend their interactions.

In this chapter, I also argue that embodied, embedded, and distributed cognitive science and posthuman cultural theory both have in common their efforts to denounce the humanist view in order to expand the location of sensation, thought, and agency outside the human mind. I illustrate this in chapter 2 by using a time-slice from the 1990s, when both fields were beginning to stir in directions
that challenged notions of self beyond the individual. In the field of embodied cognitive science, forerunners such as Francesco Varela and Eleanor Rosch,\textsuperscript{11} retaliated against the cognitivist approach that views the body as a mere casing for the internal symbolic representational views of the mind. They emphasized the role of the embodied agent's interactions with the social and material world.\textsuperscript{12} Concurrently, in the distinct fields of cultural theory and philosophy of science, materialist, realist and posthuman theories supported this claim. By curating and combining these two centers of engagement I argue that certain readings of posthumanism and the embodied cognitive science show that they have more in common than is usually acknowledged. This generates a new confluence for how we make aware, engage, and practice the malleability of self.

Architectural design exercises can instrumentalize this malleable self. I choose the two attributes \textit{aesthetic} and \textit{spatial} deliberately, because of their implications to basic design education, which aims to cultivate a spatial and formal understanding of bodies and objects in built space, and a meaning-making sensibility that reveals patterns, organizations and compositions in the built world. How we sense and spatialize the world, and how we sense and spatialize the self, are both design problems. When self is thought of as malleable, we need new spatial and aesthetic frames of reference.

In Chapter 3, I contend that an intersection of cognition and design requires its own methodologies in order to operationalize their productive intersections, and extend access of the aesthetic and spatial sense of self to fields beyond architectural design. I develop and present one such methodology called \textbf{Performative Experiment}. I lay out the requirements of such a hybrid methodology that exposes one to new experience. In doing so, I acknowledge the intuitive claim

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\textsuperscript{12} Embodied cognition has a range of the embodied and embeddedness of cognition within the body and the environment, such as simple and radical embodiment, amongst others. While a thorough discussion of the differences are beyond the scope of this body of work, I touch upon this further in Chapter 5.
\end{flushright}
behind this effort: one can be trained to sense the world differently, which in turn can shape how we perceive, think, imagine, and create. This idea should not be new. It is a fundamental assumption of design education. The real challenge to design then takes the form of the following questions: How well and consciously are we engaging the malleability of the aesthetic and spatial sense of self? How often do we challenge the aesthetic and spatial canons on which we are trained to practice our growing abilities? How legible are our methodologies in order to successfully transfer them to other disciplines? And lastly, what room do we have for scientific empiricism in our methodologies that might serve as a gateway for the sciences to engage with them?

On the other hand, to the field of embodied cognitive science, the challenges translate to this: What are the appropriate ways through which we can query high level cognitive functions such as imagination? While confronting consciousness of our perceptions and thoughts in terms of a malleable self, how do we acknowledge and understand experience of the self as self + other? What room is there for a phenomenological account of experience in the brain sciences? What materials do we engage to answer questions of self?

I contend that these provocations are best answered via practice -- a practice that requires new methodologies and materials.

In Chapter 4, I caution that choosing materials with which to engage our aesthetic and spatial malleability through Performative Experiment must not be incidental. As such, I present the shadow and the shaded silhouette as productive materials for this hybrid methodology. Since the intention is to locate and mobilize the frontier between human and posthuman, the infinitely fluctuating boundaries of the shadow’s umbra, penumbra and antumbra can best perform the bistable switch between perceiver and perceived, human and non-human. This chapter kneads in two sets of micro-cases to present the shadow as a posthuman material that renders equal human and non human, animate and inanimate, in order to challenge the agency shadows are typically assigned.
Chapter 5 is organized as three case studies of performative experiments, which demonstrate ways to foster an awareness of aesthetic and spatial attributes in an audience beyond that of design. The topics that performative experiments engage range from meaning-making in vague shadows, meaning-making as agency of both the perceiver and the stimulus (the image), view canonicality, and the role of self-consciousness. I also present the future scope of this methodology to topics beyond those listed here. Also in Chapter 5, I present a device called the Traceur, that becomes an integral part of performative experiments. The Traceur stands in as an interface that reintroduces the performance of the body in visual perception tasks, which then allows for analog interactions with digital stimuli.

These priming experiments culminate in Chapter 6 in a proof-of-concept training exercise called Hogarth's Silhouette, where new frames of reference and a new aesthetic and spatial priming co-mingle. Hogarth’s Silhouettes is a revision of William Hogarth's iconic plate accompanying his essay “An Analysis of Beauty”. I lay out why this plate from 1753 is an appropriate one to return to. In this exercise, the malleability of the aesthetic and spatial sense of self is practiced as scenes get re-seen, objects gravitate towards new relationships, and frames of reference escape traditional ego vs allo binaries.

The shaded silhouette prefigures relationships not yet formed.
Objects that have not yet met.
Selves that have not yet been morphed.

William Hogarth’s “Analysis of Beauty” Plate I is used as an unexpected companion throughout this body of work. It illustrates various points as I invite disparate fields into an aesthetic and spatial self-examination, and mutual-recognition, just as the plate illustrated Hogarth’s own attempts for the democratization of taste and the upending of classical canons. I suggest that perhaps Hogarth was a sort of posthumanist, a proponent of situated cognition, and a design educator — far before any of these topics were conceptualized.

I summarize my contributions to this transdisciplinary scholarship of
understanding the role of self in aesthetic and spatial practices of imagination in
Chapter 7, as the following:

1. Propose and demonstrate that the self is malleable and multiple. An awareness of
this malleable self is useful to various disciplines
2. Demonstrate that embodied cognitive science and certain strains of
posthumanism have more in common than is typically acknowledged.
3. Propose that foundational design education can mobilize the intersection
of embodied cognition and posthumanism through its aesthetic and spatial
engagement
4. Develop a methodology to mobilize this intersection called Performative
Experiment.
5. Present the shadow and shadow silhouettes as materials for the cultivation
and performance of the aesthetic and spatial sense of self through Performative
Experiment.
6. Design a proof-of-concept foundational design exercise for a wide audience that
puts into play this new malleability of aesthetic and spatial sense of self using
William Hogarth’s iconic plate from his treatise “An Analysis of Beauty”.

Lastly, through this research, I contend that a sense of self guides our expectations
of and experience in the world. When we are not bound by causal strictures, it
answers what else the malleable self might sense, perceive, think, and generate.
This body of work is ultimately motivated by a desire for the situated and
embodied cognitive sciences, posthumanism, and architectural design pedagogy to
meet.

To meet more often.
To meet without defense.
To meet more messily.
CHAPTER 2
MALLEABLE SELF

Taking on the subject of the “self” in any form in the context of this research is like trying to handle a burning coal bare-handed in order to track its part to whole relationship with the log it came from, the haze it emanates, and the coal dust it will transform into; in short, it is a risky commitment. I acknowledge that this topic inherits a long, contentious history, with a plenitude of interpretations, including a sizable dissent of the self’s existence. However, I contend that this risky exercise is necessary in order to gain access to themes of consciousness, experience, and behavior, which shape and are shaped by our imagination. I invoke some of the growing scholarship that displaces the classically bound, unified self, in favor of a multiple, malleable conceptualization. One does not find the self nestled in a particular spot in the brain. Instead, we find it in the experiences we create and curate. How we create and curate these experiences are then a function of whether we are willing to acknowledge the malleability of self, and where we seek it.

2.1 Why a malleable self?

As we situate self in physical, digital, and virtual space, co-opting various technologies that expand our sensory perceptions through variously mediated interfaces, the self is morphing. But the self itself is often thought of as static, pitting Cartesian self against other. This limited sense of self inhibits its agency in shaping our experience of the world aesthetically and spatially. The unwavering self is also thought of as solely a result of internal processing in cognitivist accounts, which is misleading. Beliefs and expectations shape the self’s awareness. Experiences with the world we are surrounded by, and the objects and things we engage with shape and are shaped by the self. Some of these beliefs, expectations,

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13 Some other versions of the self include the Buddhist “non-self” that contends that there is no unchanging, self, or the Hindu “eternal self” that conceptualizes the self as eternal, momentarily inhabiting various beings.
and experiences are guided by principles we take for granted such as intuitive physics and folk-psychology, while some others are shaped by cause and effect assumptions, and others still are often packaged within disciplinary canons. We must be aware of their malleability in order to challenge them via practice.

Through our experiences, we are constantly performing our self-concepts, as expressions of the feelings and attitudes which we have concerned ourselves with. In this body of work, self is invoked as the primer, the host, the sensor, the perceiver, and the cogitator of experience, that also ascribes meaning to them. It is the conduit to consciousness, and ultimately, the shaper of behavior. When experience calls on the imagination to synthesize sensation and perception, we must not only ask how we perceive as questions of cognitive process and interface, but also what do we perceive? What do we pre-reflexively perceive? What do we choose to perceive? Through these questions, we confront the range of ways in which attributes of the self are engaged. This confrontation exposes the need for new modalities and methodologies through which we engage with and define the abilities of this self. I ground this proposal in William James’ view of the self as being an entity consisting of fluctuating material. This fluctuation, an ebbing and rising, implies that the self subsumes other, and follows what James might mean when he proclaims that in the widest sense, “a man’s self is the sum total of all that he can call his.” This ‘empirical self’, that James defines, lies somewhere between the tenuous relationship between me and mine, with a difficult boundary to draw—a boundary that relies either on self-agency or self-ownership. He illustrates that at times, “the hand”, “your child”, and I add, “a tree branch”, “a prosthetic”, “your phone”, “a shadow”, “an image”, may further

14 For more on how folk-psychology and intuitive physics shapes our understanding of the world, see the work of Allison Gopnik, in Gopnik, A. and A. N. Meltzoff, 1997, Words, Thoughts and Theories, Cambridge, MA: MIT Press
15 Self-concept is often thought of as a mix of objects and ideas that motivate the attributes and feelings with which an individual attends to the world. For more on this area, see Landsman, Ted. “The Role of the Self-Concept in Learning Situations.” The High School Journal, 1962.
16 I discuss this later on in terms of a minimal vs. narrative self. Section 2.2.4
18 James. Self = what a man can call his.
blur the difference between the me and the mine. This blurred me-mine becomes
the source of our distributed self-agency through which we create our belief-
desire-expectation models, points of view, and frames of reference. Through
this, we anticipate, apprehend, create, and manipulate the world. But self is not
limited to the human. I invoke posthuman theorists who grant agency to the non-
human, residing outside traditional boundaries of the (human) mind or body.19 Our
engagement with various digital technologies and an increasing acknowledgment
of the nonhuman objects and their ability to shape experience thus positions us in
a time where self might be conceived of as a shifting self +other: a malleable
self.

This revisitation of the topic of the self is due also in part to the various rhetorical
frameworks that are pre-fixed with “self” such as self-organization-systems (SOS),
self-generation, and self-assembly, which have been rising across many fields.
These frameworks present the self as having agency, and have emerged in fields
as wide ranging as the social sciences, artificial intelligence and robotics, design,
and architecture. I call these rhetorical frameworks “self-var paradigms”, short
for self-variable. Largely because they borrow from the biological sciences, and
because of their often deterministic bent, the meanings and implications of self
that come pre-baked into their perceptions is seldom questioned, let alone defined.
Posthuman theory gives us a way of diffractively examining self within these
systems.21

Various fields have thus been hinting at the malleability and de-centralized nature
of the self-concept since the late 1980s. Whether the neuroplasticity discoveries

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20 This is again, similar to William James’ “duplex self” that is composed “partly
of object and partly subject” in his “discriminated aspects of the self”.
21 Traditionally, systems such as Self Organizing Systems (SOS) engender the I
vs. Other frameworks which is problematic. They equate the self to an organism”
within a system, and discuss its ability to regulate, organize, and develop in open
or closed loops. Self-var rhetoric has forayed into the domain of architectural and
design.
in the neurosciences,\textsuperscript{22} situated, embodied, and distributed cognition theories in cognitive science, or the co-formation\textsuperscript{23} conceptualizations of self in posthuman theory as laid out by Donna Haraway and Karen Barad,\textsuperscript{24} we are becoming increasingly aware of a multiple and malleable self. Just as Catherine Malabou asks “What Should We do with our Brain?”\textsuperscript{25} this research asks a prescient question: How should we identify, embrace, and perform the malleability of our aesthetic and spatial sense of self?

2.2 What is malleable self?

A malleable self can be defined in many ways. In the context of this body of work, it is fundamentally multiple, morphing, and pliable. What follows is an explanation of my concoction of the malleable self, through its borrowings from posthumanism and embodied cognitive science.

Posthuman Borrowings:

Posthumanism provides a critical plane that challenges the Cartesian self. It not only allows one to occupy the de-centered, malleable subjectivity of the human, but also creates a need to revise the methodologies involved to apprehend, study, prime, and train the new ways that this self perceives, cogitates, and performs. It further asks what are its resulting belief-desire models and presumptions,

\textsuperscript{22} Catherine Malabou defends plasticity as an awareness of our abilities to morph and change in the context of discoveries of our neural plasticity. Malabou, Catherine. What should we do with our brain? New York: Fordham University Press, 2008.
\textsuperscript{23} According to Barad, individuals do not preexist as such but rather materialize in intra-action. That is, intra-action goes to the question of the making of differences, of “individuals,” rather than assuming their independent or prior existence. 1. Karen Barad, “‘Intra-Actions’ (Interview of Karen Barad by Adam Kleinmann),” accessed January 13, 2017, https://www.academia.edu/1857617/_Intra-actions__Interview_of_Karen_Barad_by_Adam_Kleinmann__.
\textsuperscript{24} To Donna Haraway, the naturalization of the unified self is problematic. Donna Haraway, “A Cyborg Manifesto: Science, Technology, and Socialist-Feminism in the Late Twentieth Century,” in Simians, Cyborgs and Women: The Reinvention of Nature (New York; Routledge, 1991), pp.152.
and how might a remodeled self question the canons of aesthetic and spatial perception and cognition? I suggest that posthumanism answers these questions based on the following principles:

1. **Posthumanism engages the “other” intimately:**
   Posthumanism, in the lineage of Karen Barad, not only acknowledges the animism of the “other” once it's subsumed by or attended to by the human, but also *a priori* to human intervention. Contrary to popular conceptions that the posthuman is concerned with only the advent of non-physical, digital technology,
the posthuman, as Katherine Hayles posits, addresses the time that challenged the inheritance of Enlightenment, which favored individuality, autonomy, and rationality\(^2\).

Within this particular posthuman framing, various materialist, non-human theories have emerged in cultural theory and philosophy of science since the late 1990s, such as new materialism and agential realism, that blur mind-body distinctions and extend agency to the non-human. I use the work of the theoretical physicist and feminist theorist Karen Barad to bridge a connection between the malleable self and these cultural theories, via Barad's engagement with science. In Barad’s theory of agential realism, the world is made up of phenomena, which are “the ontological inseparability of intra-acting agencies”.\(^2\)\(^7\) Thus for Barad, things or objects do not precede their interaction, rather, 'objects' emerge through particular intra-actions.\(^2\)\(^8\) Karen Barad makes a specific call for “an account of the materialization of all bodies — “human” and “nonhuman” — and the material-discursive practices by which their differential constitutions are marked.”\(^2\)\(^9\) The implementation of this call of the other in various cognitive and creative practices is imperative. This implementation, I argue, is a design problem.

2. Posthumanism productively challenges design education and situated cognitive science

My invocation of posthumanism is in an effort to develop an intuition for expanded experience that can be primed aesthetically and spatially. I frame this priming as a challenge for the fields of foundational design education and cognitive science. In a transdisciplinary pursuit such as this, Karen Barad cautions well— that if we follow disciplinary habits of tracing disciplinarily-defined causes through to the corresponding disciplinarily-defined effects, we will miss all the crucial intra-actions among these forces that fly in the face of any specific set of

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\(^{27}\) See Barad, Karen. “‘Intra-Actions’ (Interview of Karen Barad by Adam Kleinmann).” Accessed December 02, 2016.

\(^{28}\) Ibid.

disciplinary concerns.  

3. Posthumanism animates the in-between:  
Malleable selves are blurry entities, and rather than a singular definition, privilege relationships. In her book “Manifesto for Cyborgs”, Donna Haraway proclaims that her cyborg myth is about posthumanist “transgressed boundaries, potent fusions, and dangerous possibilities”. These transgressed boundaries do not efface the self. Instead, they evoke infinite other possibilities of it that emerge from the in-betweens of wrongly reified discrete selves. Many of these boundaries reveal new aesthetic and spatial sensibilities. In chapter 4, I posit that the shadow holds one such boundary — a transgressed boundary that can act both as a “companion species” to the human, but also as a nonhuman object that exerts its agency a-priori to the human gaze on it. Thus the animation of the in-between is a reminder that the displaced sense of self does not always return to the human mind. We subsume what once had its independent agency; as such, the malleable self, lies somewhere in-between. Malleable selves are dispersed -- occasionally housed in, but never contingent upon the human mind.

Situated Cognition Borrowings:  

*When I perceive objects or movement in the external environment, I also gain information about myself — information that is pre-linguistic and non-conceptual.*

— Ulric Neisser

In the last decade of the 1990s, the situated cognition camp of cognitive science, uniquely restored the role of the body and the surrounding physical environment


into various processes including perception, cognition, emotion, and simulation. This was in contrast to traditional cognitive science that relegated all cognitive processes to the brain. Situated Cognition contends that a full understanding of the mind requires studying its relationship with the body and the world it occupies. We respond to ego and allo-centric frames of reference in order to establish these relationships of location and movement in space. Spatial concepts like “behind”, “between”, “up”, “down”, “above”, “below” are just a few of the examples that already demonstrate the situated and embodied aspects of our experience that are linguistically baked into our perceptual apparatus. They acknowledge either spatial relationships in relation to our body, or other bodies. Spatial cognition in general, as a study of the knowledge and beliefs about spatial properties of objects in the physical environment has seen new directives since the late 1970s through developments in ecological psychology, neuro and cognitive science, and artificial intelligence. As J.J. Gibson, the influential ecological psychologist claimed, all perception involves co-perception of self and environment. Consciousness then is out in this environment. So long as our perceptual and cognitive capacities are acknowledged to also reside outside the brain in entangled agent-body-environment couplings, we are already in the realm of the posthuman. The malleable self and its cognitive abilities is out in the physical environment, amongst various material substrates — bodies, artifacts, agents, and technologies, relying on experience.

33 Some of the seminal work in the field has been done by Francisco Varela, Evan Thompson, and Eleanor Rosch in their book “The Embodied Mind”. Varela, Francisco J., Evan Thompson, and Eleanor Rosch. The embodied mind: cognitive science and human experience. n.p.: Cambridge, Mass.: MIT Press, c1991.
34 I discuss how these embodied, spatial concepts are hard to shake off even in 2D images of shadows, in Chapter 5.
36 James called his epistemology radical empiricism, a method of doing science that required: (i) that all of the ideas and theories in science be grounded in direct experience, and (2) that no experience be excluded from the scientific purview (Taylor 1994:353-354).
2.3 Aesthetic and Spatial Sense of Self

“Flexibility is plasticity minus the genius”\textsuperscript{37}.
*Catherine Malabou*

In order to find common ground between the cognitive sciences and design, I narrow down two attributes of the self: aesthetic and spatial, to practice the self’s malleability (plasticity, as Malabou might call it). This narrowing avoids the trap of over-generalization, which seldom leads to engageable methodologies.

1. Why Aesthetic?

Aesthetics is meaning-making. Mark Johnson, vehemently rejects the blind inheritance of Enlightenment’s view of the mind, that regarded aesthetics as being purely subjective, and “outside the domain of knowledge judgments,”\textsuperscript{38} and instead, in the lineage of John Dewey, broadens the concept of aesthetics to encompass all of the processes by which we enact meaning through perception, feeling, imagination, and bodily movement.\textsuperscript{39} A philosopher of embodied cognition, Johnson positions aesthetics as being fundamentally about how we are able to have meaningful experience. When this meaning-making in the world is tied to bodily experience through sensorimotor expression, then we’re led to ask: whose body, perhaps self, perhaps avatar do we then speak of that is transforming and being transformed by this aesthetic? Aesthetic, then, is also what Jacques Rancière would more broadly call how we “make sense of and act in the world”\textsuperscript{40}. A cultivation of


\textsuperscript{38} Johnson makes a compelling argument against the prevailing view that equated aesthetics to subjective feeling and cognitive to concepts. He writes about aesthetics being the place where a signification becomes a sensible form, or a sensible form becomes a manifestation of sense, of meaning, Scarinzi, Alfonsina. Aesthetics and the embodied mind: beyond art theory and the Cartesian mind-body dichotomy. Dordrecht ; New York : Springer, [2015]. Pg 22.


\textsuperscript{40} Ranciere's essay, “What aesthetics can mean” in Peter Osborne, From an aesthetic point of view: philosophy, art, and the senses (London: Serpent’s Tail, 2000). Keeping with the Deleuzian notions of distributed sensing as a condition
a malleable aesthetic sense of self to "make sense of and act in the world", I state, is a design problem.

2. Why Spatial?
Spatial refers to how the self conceives of orientation, location, proprioception, and relative distance in a physical environment. Knowing where the self is situated, how it's oriented, and how it lies in relation to the other is integral to our mental experience and selfhood. Spatial cognition typically has two spatial coding frameworks: allocentric and egocentric. Allocentric, whereby one centers one's spatial processing on other people and objects rather than themselves, and egocentric, is when the processing is centered on oneself. Once we employ a posthuman, diffractive reading of spatial sense of self, these frames of reference get fractured, prompting an accommodation of disorientations to be conceptualized as orientations of an emergent self. For instance, Alzheimer’s patients are known to lose their sense of self-agency when they can’t locate themselves, feeling displaced not only in space but also in mind and identity. However, when we challenge the prevailing ego vs. allo frames of reference, and fracture them, we begin to ask: whose

“behind”, “front”, “back”, “up”, “down”, “between” do we refer to? Just as behavior is context-specific, our aesthetic and spatial sense of self-awareness can then be thought of as context-specific, varying across time and space. Conceptualizing and cultivating this diffractive spatial sense of self, I contend, is also a design problem.

2.4 Design-driven instrumentalization of posthumanism and situated cognition

Having laid out the posthuman and situated cognition borrowings in the conceptualization of a malleable self, I ask how might we train ourselves to be sensitive to our malleability? How do we instrumentalize this malleability? Positing that the malleable self plays a dominant role in the shaping of our consciousness and imagination, I demonstrate how design can subsume this pair of posthuman and situated cognition borrowings in order to instrumentalize it. Posthumanism and situated cognition come together through the relationship of the self and the other, in a way that Ricœur describes in his book “Oneself as Another” : “one’s own self narrative is always entangled in the narratives of others”. The self narrative is distributed and de-centralized. It influences our experiences, and design exercises can anticipate, reveal, and train these experiences. While translating the training and the practice of the malleable self into design problems, I challenge the conventional egocentric vs. allocentric frames of reference of spatial cognition. Instead, I use agential realism’s frame of reference which might be stylized as this provocation: Instead of conceiving the world as discrete objects that exist prior to an interaction, what if we changed our frame of thinking to imagine how these emerging selves and objects-as-selves might rely on interactions (or intra-actions) for their co-becoming?

2.5 The narrative self and the minimal self

The malleable self has many temporal dimensions. According to Shaun Gallagher,

42 Social psychologists Kihlstrom and Klein discuss how we have various self-concepts that dictate our behavior in various contexts. For more, see Kihlstrom, J F, and S B Klein. “Self-knowledge and self-awareness.” Annals Of The New York Academy Of Sciences 818, (June 18, 1997): 4-17.Pg 17
philosophy presents to the cognitive sciences two useful concepts of the self: the minimal self and the narrative self. While using design to negotiate between posthumanism and embodied cognitive science, I revisit the minimal and the narrative self concepts, in order to gauge how they organize the levels at which the malleable self is engaged. The minimal self, Shaun Gallagher writes, is a "primitive something", an underlying intuition, that is atemporal, does not draw on memory, and is limited to "that which is accessible to immediate self-consciousness." This consciousness is non-continuous. While it depends on the brain, and is thus certainly embodied, one does not need to have a sense of the body for this. It is also the "pre-reflexive point of origin for action, experience, and thought". The narrative self, on the other hand, is extended in time, has access to memories, and projects intentions into the future. It needs memory in order to sustain a continuous sense of self. Just as memory aids in a sense of self, our beliefs, proclivities, desires, and expectations, also contribute to a sense of self. The canons we inherit via education dictates a lot of these beliefs, proclivities, desires, and expectations. Altering the canons is thus a proxy to altering an aesthetic and spatial sense of self. This reading frames the practice of the malleable self as a design problem. If we are to make our malleable selves intuitive, we must have access to it at the minimal self level, and if we are to train for the instrumentalization of the malleable self over extended periods of time, we must have access to the narrative self.


a methodology
fig. 3 Foundational architectural design pedagogy as the root of a new methodology
CHAPTER 3

METHODOLOGY
for enacting an aesthetic and spatial sense of self

I suggest that the minimal and the narrative selves can be tapped via a confluence of architecture design pedagogy and situated cognitive science. However, the cognitive sciences and architecture design don’t usually meet substantially. In the cognitive sciences, the valuable role of architectural design is not understood yet, unless it is a test subject to be studied— designer as lab rat, design studio as maze. Consequently, architecture design education has at most been involved with phenomenological traditions of defining first-person accounts of experience in built environments. Similarly, the cognitive sciences are often vilified as “truth-seeking” in the field of architectural design, flagging proof-finding and truth-demonstrating experimentation as being of little use to architectural design. Finding both these positions futile and short-sighted, especially when the task is to train a wide audience in our spatial and aesthetic malleability, I propose engaging the spatial and aesthetic sense of self through a methodology that can be common to the brain sciences and design: the Performative Experiment. I develop a version of the experiment from a commitment to the concepts of situated cognition and posthumanism, where existing and potential interactions between one another (both human and non-human) primes perception and cognition, that in turn shapes action. This notion of there being emergent abilities between humans and nonhumans and the environment that go beyond their individual properties, has resonance with Barad’s notion of intra-actions.46 Such confluences that arise from renouncing an anthropocentric view of agents and artifacts forms the basis of the proposed methods and methodology that guides the conceptions

46 Barad’s intra-actions are also echoed in Teemu Pavavolainen’s account of the interactions between performers and theater objects. ‘Once we relax our anthropocentric views of agents and artifacts, and allow for a more fuzzy boundary...between ourselves and our environments”, we begin to fathom the fundamentally distributed character of agency and cognition. Paavolainen, Teemu. Theatre/ecology/cognition : theorizing performer-object interaction in Grotowski, Kantor, and Meyerhold. n.p.: New York, NY : Palgrave Macmillan, 2012., 2012. Pg. 41
of new selves. However, this awareness is only as good as the methods and methodologies that are developed to engage and practice it. We must then place a proverbial ear to the tracks to foretell the intersections that might arise from the common ground of these fields to lay out the requirements of such a methodology that we then implement. When we bring posthuman theories, situated cognitive science and architecture design together, a promise of such a methodology arises.

3.1 Influence of Architecture Design and Embodied Cognitive Science on Methodology:

Acknowledging that an awareness of our malleability can transform multiple scales of behaviors and practices is important to why this is both an architectural design education and a situated cognitive science problem. This acknowledgment then exposes a need for hybrid methodologies to study experience—experience that holds clues to our canons, beliefs, and biases. The intention is not to displace the methodologies of any of these disciplines entirely, but to provide a guided, productive synthesis of methodologies that helps us escape our disciplinary biases, and exposes us to other lines of interrogation and doing. If the task is to re-train, we must first become aware of our inherited baggage. Such a synthesis would investigate how one might transform the other, what might arise from their interaction, and how might that overlap be used to prime both designers and scientists to frame various questions as spatial and aesthetic ones. This echoes Sean Gallagher’s vision that many self related questions through which experience can be studied, including complex phenomenon such as “consciousness, space, time, embodiment, or other relationships with others”, requires approaches.

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47 Much like Katherine Hayles' call for a contemporary technogenesis, a belief that humans and technics are coevolving, so is this a call for the understand of the coevolution of the self with a variety of others (human, nonhuman, technology, animal), in a manner that subsumes the abilities of the other so deeply in oneself that the malleable self might be transformed into self-as-other.

that involves many kinds of arts and sciences. As Gallagher notes, “...not all scientific concepts are third-person concepts....Coping with the question of how the body shapes the mind requires a complex, up-to-date, multidisciplinary theoretical framework in which science is the general platform that provides the methodological standards and in which the humanities provide some key concepts and symbols.” Architectural design confronts embodied cognitive science here. I posit that architectural design can suggest methodologies beyond the scientific tradition, in a manner that exposes the qualitative and affective nature of experience that leads to meaning making. It can lend its familiarity with putting bodies and objects in digital and physical environments to curate aesthetic and spatial experiences to not only serve as data to be studied, but also as factors that might influence the design of the experiments in the first place. Additionally, architectural design challenges the incidental quality of material choice in perception experiments. The material we choose is important because it can determine whether or not the experimental apparatus that has been setup can challenge human assumptions, and whether it can productively skew the Performative Experiment in order to generate new areas of interrogation.

On the other hand, the cognitive science methods are occupied with fundamental questions that shape our intuitions and actions. How do we develop spatial concepts of the world? What are the neural correlates of certain of these spatial actions? When asking the right questions, and when employing reflective thought in their experiments, cognitive science methodologies can make accessible some of our deep seated assumptions and provide ways to estrange oneself from tropes in order to probe where and how certain proclivities emerge, and how they might be productively avoided in order to expand our range of perception and cognition. Together, architecture design and cognitive science can create hybrid

51 The methodology proposed is what Francesco Varela might call a “methodologically guided reflective examination of experience”.
methodologies that can not only be inventive about how problems are approached, and selves are primed, but also how various other lines of questions can be set lose that were not originally thought of.

3.2 Requirements of a New Methodology

Rather than engendering the disciplinary cause and effects that come packaged in the form of principles and canons, I re-focus our attention to Barad's intra-actions in order to lay out the requirements of a new methodology. Performative Experiments acknowledge the animism and agency of all involved in an aesthetic and spatial experience, including and beyond the human. In order to be able to account for this, I suggest that an appropriate methodology to engage this acknowledged animism would have the following attributes:

1. Reflexivity and Reflectivity: By being reflexive, the methodology allows the turning inside-out of current practices when we encounter another discipline, in order to examine our habits and assumptions. By being reflective, it makes legible one’s disciplinary habits and personal biases. For instance, Shaun Gallagher makes a case for front loading phenomenological insights into the design of the experiment\textsuperscript{52}, arguing that this sort of first person account in empirical experiments are critical.

2. Specificity: The methodology should be able to acknowledge and register the specificity of the concept(s) it is engaging from respective fields, to avoid over-generalization. This requires that the disciplinary questions and biases of each field not be displaced prematurely, but be examined, in order to then estrange, and eventually morph. This specificity of concepts requires that one maintain fidelity of vocabularies as they play out in various disciplines. For instance, representation in cognitive science and representation in architectural design are not entirely synonymous.

\textsuperscript{52} S. Gallagher, “Phenomenology and Experimental Design - Toward a Phenomenologically Enlightened Experimental Science,” Journal Of Consciousness Studies 10, no. 9–10 (October 2003): 85–99.
3. Estrangement: The methodology should allow an estrangement from typical practices of the disciplines involved, in order to shed disciplinary habits. By estranging just enough, we begin to challenge the canons that shape our disciplinary belief-desire models, our defaults, and our rote-moves, and question how a more familiar “A leads to B” cause and effect pair may be changed to accommodate a host of ‘what ifs’: What if A subsumes B, B acts as A, A causes C as C causes A? Estrangement provokes reflexivity at the disciplinary level, and prompts reflectivity at the level of the individual, accommodating role of the individual’s experience in the performative experiment. This is not unlike Francisco Varela’s framing of phenomenology as being a “methodologically guided reflective examination of experience”.

4. Embodiment: Each field must be able to operationalize the methodology by embodying the other field. Through this embodiment, one is exposed to new spatialities, new aesthetics, and new propensities with which to apprehend the world. At another level of embodiment, the methodologies should involve the body and the environment in which the body and the stimulus is situated, even in seemingly disembodied tasks. This re-insertion of the body opens up other ways of framing problems that are inadvertently truncated when embodiment is ignored.

53 Estrangement or defamiliarization is a concept proposed by the Russian Formalist Victor Shklovsky, to describe the method of estranging oneself from familiar objects, in order to render them novel again. In my usage, I make a call for the estrangement of both methods and materials to expose our biases.
55 The topological structures of these engagements will eventually require their own rule sets in order to represent fully the process of parts becoming wholes in movements. Suggesting a mereotopological method, more spatial concepts might be proposed to engage the emergent selves. Regardless of what parts engage in the emergence of a new self, these three spatial registers are trackable, and become a record of measures of the spatial and formal transformations of the entity. Casati, Roberto, and Achille C. Varzi. Parts and Places: The Structures of Spatial Representation. Cambridge, Mass.: MIT Press, 1999.
to favor purely symbolic representations.

3.3 The Performative Experiment as Proposed Methodology:

Synthesizing design, embodied and situated cognitive science, and posthumanism, I present Performative Experiment as a methodology for the practice of an awareness of one's spatial and aesthetic sense of self through a polylogue. The audience for this methodology includes but goes beyond the designer and the cognitive scientist. “Performative” and “Experiment” bring together a cohesion in the epistemologies of the various disciplines that have been framed in previous chapters. Karen Barad suggests that a performative understanding of discursive practices challenges the hegemony of the linguistic representation of pre-existing things. To her, this marks a shift towards doing rather than merely finding corresponding descriptions in various acts. I take her notion of performativity further in the methodology I propose. Performative Experiment as a methodology is “performative” because it enacts the confrontations and complicities between design pedagogy, cognitive science, and posthumanism. It is “performative” because it conducts a deliberate scrutiny of what it means to be material in motion — a material body, a material mind, a material stimulus, a material shadow. It is “performative” because it implements a recursion of situating mind in body, body in stimulus, stimulus in material, material in body, and body in mind.

The performative experiment does not undermine the complexity of local interactions and intra-actions in the manner that black box/simulated experiments do. By doing so, it exposes questions that get dusted off as too complex in cognitive science, or that hide behind intractable concepts like “intuition” in foundational architectural design studies — concepts that have little resonance to audiences unfamiliar with the discipline. The Performative Experiment asserts that

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when we're trying to create an intelligence that stems from an increased sense perception and cognition, simplistic models are not useful. Thus when the task is to expand the human imagination in aesthetic and spatial ways, any methodology — either through cognitive science or through design exercises, as I laid out in the principles, must engage the first-person account while engaging a variety of disciplines, much like what we're seeing a return of in the cognitive sciences.

Tapping into internal states that conduct our conscious and unconscious responses is important to understanding self through self-agency, that is, whether or not one intended on perceiving or responding in a certain manner. In order to make one aware of the mental processes that are defining our aesthetic and spatial sense of self and prime them, more elaborate 'first person methods', are necessary.

58 Intelligence without representation paper. Rodney Brooks
59 For instance, when Rodney Brooks, while making a case for embodied cognition in artificial intelligence, advocated for a “world as model” mantra, rather than the prevailing representationalist models
60 “It is something of a fantasy, to use Dennett’s term, to suggest that neuroscience or psychology are best done by averaging out, reducing, and re-engineering first-person data so that it looks like third-person data. There is no scientific promise in failing to consider experimental designs that leave the complexity of first-person perspectives out of the equation.” Overgaard, M, S Gallagher, and TZ Ramsoy. “An integration of first-person methodologies in cognitive science.” Journal Of Consciousness Studies 15, no. 5 (n.d.): 100-120. Arts & Humanities Citation Index, EBSCOhost (accessed April 7, 2017).
I propose the Performative Experiment as one such priming methodology. It is not meant to radically replace the methodologies in traditional cognitive science or architecture design education. Instead, by inviting a freedom that the individual fields may not allow, it opens up various other lines of questioning and reflection. The promise of the performative experiments lies in its ability to go beyond just the representation of shape or space (mereotopology), to include how one might ascribe meaning to what they see. Thus the question to be asked is not whether the designer must also be a scientist, or vice versa. Instead, I ask, what material and practical ground can be suggested for experimental research of the aesthetic and spatial kind? How is this research conditioned by the various epistemic contexts within which it is situated?

By embracing the complexity of experience and making it useful via the principles laid our earlier, the performative experiment achieves the following:

1. **Performative Experiment makes room for and values first-person phenomenological accounts:**

Currently, in cognitives science experiments, first-person data is averaged out in statistical summaries. On the other hand, phenomenological accounts in architecture design are denounced as being too subjective. Introducing the malleable self to various kinds of experiments marks a return of first-person data to not only understand the outcomes of performative experiments better, but

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61 This proposal comes from having walked the walk of cognitive science, an empirical science, to interpret their practices through a design-driven approach, motivated by ways to expose the malleable spatial and aesthetic sense of self. In a later section, I compare, within the scope of one experiment, the motivations and methodologies when a concept is tested the traditional cognitive science way, versus when it it approached as a performative experiment.

62 These are not unlike the three steps that Francesco Varela identified in a phenomenological method, each of which requires training:

63 See also, APPENDIX 1, where I explain how I treat first-person data such as "confidence level" within the context of a cognitive science experiment. This can be contrasted with Experiment #2 in section 5.2, where the same first-person data is used to re-design the experiment in order to ask questions about shape canons.
also re-design the experiments themselves. Since the role of experience is key to such experiments, primary, creating an awareness requires that we employ the right methods to eke out information about altered experience. Similarly, Shaun Gallagher notes in his paper *Phenomenology and Experimental Design*, “if experimentation is being used to the effect that subjects may be able to report on their experience, a training paradigm must be necessary to report lucidly their experience.” Performative Experiment makes room for these kinds of accounts through open ended questions which allow participants to become aware of their own actions. Through this, invariants in their responses are exposed. To borrow a phrase from Shaun Gallagher, the subjects are trained to “gain intimacy with their own experience” in the domain of investigation. This, to architecture design, becomes a porthole to canons, proclivities, and habits, all of which shape the spatial and aesthetic sense of self. To the cognitive sciences, it reemphasizes the importance of first person data. To discard this, as Gallagher notes, is ultimately unscientific because responses of participants may be based on folk-psychology, and or inherited canons, that may be feigning objectivity, by nature never being challenged in a hybrid context. Self-aware, first-person accounts are cycled back into the experiment’s design.

2. Performative experiment grants agency to the non-human:

The performative experiment insists that despite recording the role of the human as it subsumes the non-human, agency is ultimately not restricted to the human itself. The malleability of the self lies somewhere in-between the agency of the non-human and that of the human through their interactions (or intra-actions). The image has agency. The material has agency.

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64 Gallagher, Shaun “Phenomenology and Experimental Design - Toward a Phenomenologically Enlightened Experimental Science.”
65 Ibid.
66 Gallagher explains that when saying something about consciousness or cognitive experience, subsuming phenomenological experience into statistical data is ultimately unscientific, because it fails to acknowledge the folk-psychology or “anonymous non-methodological phenomenology” that responses may be based on, which may pass off as objective categories.
a material
In order to make visible and engage the spatial and aesthetic abilities of the malleable self, the choice of material we use is significant. It is significant because materials bring with them their own disciplinary baggage that can stifle the range of questions being probed. If we are to think of the self as a self+other+environment, then I propose that the shadow is an appropriate material for many reasons including that by nature of rendering equal human and non-human, animate and inanimate, it is posthuman.

4.1 Why Shadow and Shaded Silhouette:

*Photons nosedive*

*Off fuzzy edges—*

*Into collective pools of absence.*

For the sighted, it is seldom opposed that vision is the predominant mode of perception. The greater critique, however, is of the “domination [...] of a visual paradigm in our cultural history”, as the philosopher David Michael Levin notes, which has shaped ethical, social, technological, and ontological structures through vision-driven illusion and allusion. Amidst this reasonable discontent, I pause to suggest that vision has not yet been exhausted in all its nuance, particularly in its attitude towards absence. Absence here includes percepts resulting from the absence of light, where percepts are defined as objects of perception. I present shadows as one such “object of perception,” and provoke that the shadow is material, and the shadow is object. The shadow usually represents a relationship already formed between a light source, body/object, and physical or digital

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67 A version of this chapter appears in the form of an essay in PLAT 6.0, a student-run journal published by Rice University. Forthcoming, May. 2017.
environment. The shadow is familiar — perhaps, even the original companion species with which we share an intelligence about being situated in the world. Few have not gazed at a shadow, even if uncritically, manipulating it from hands to winged bird taking flight. Yet, the shadow’s presence is not contingent on the human gaze. In the following section, I take a detour in order to lay out the provocation for not only why the “ontologically marginalized” shadow is a suitable material to engage and expose the malleability of our aesthetic and spatial sense of self, but also for why it is material in the first place.

What if, when examining the frontispiece of the English translation of Laugier’s “Essay on Architecture” by Samuel Wale (fig.1), we begin not with the primitive hut, but instead, with the cast shadow of the foregrounded body? What story might the shadow tell us as it stretches against the mound of earth? Perhaps, it would tell us that origin stories are inadvertently about the material assertion of a bodyobject’s presence in an environment — whether in the foreground of the primitive hut, or on the surface of the moon (fig. 2). Assertion of presence precedes habitation; absence marks presence. The asserting cast shadow is then a companion to the belaboring bodyobject, making momentary marks of labor on the terrain. This cast shadow, by making and marking a relationship between a bodyobject, light source, and environment (both of the surface and atmospheric), performs such a territorial pronouncement. Whether this imposition is made on behalf of the bodyobject, or as a free agent unto itself, reflects the historic debates

69 See Figure 1. Frontispiece on the English translation of Marc-Antoine Laugier’s Essay on Architecture”(1753). Illustrated by Samuel Wale.
70 I deliberately use “bodyobject” to avoid any biases of the body over object or vice versa. One could also add “thing” to the mix, but I deliberately avoid that route, finding futile the Heideggarian thing vs. object debates within the scope of this article.
71 See Figure 2. One of NASA’s iconic Apollo 14’s ALSEP, deployed. The shadow belongs to Al Shepard. Light, Michael, and Andrew Chaikin. Full moon. New York: Alfred A. Knopf, 1999.
72 The invocation of “companion” is not merely a coincidental reference to Donna Haraway’s nature culture collapse in her Companion Species Manifesto, a deeper discussion of which is beyond the scope of this article. Haraway, Donna Jeanne. The companion species manifesto: dogs, people, and significant otherness. Chicago: Prickly Paradigm Press, 2015.
about the relational/dependent vs. independent nature of the shadow. In both conceptions, however, the shadow performs. And through this performance, I argue, the shadow is material.

This cast shadow is an enactment of the weakening of photons, and of the absence of photons. In purely physical terms, it is an area with lower electromagnetic (EM) radiation energy than its immediate environment, when blocked by an opaque or translucent object. As one of our foremost visual percepts, shadows subconsciously structure our world and shape our perceptions. They have variously been shown to provide cues about source, motion, orientation, and location of the objects casting the shadows, as well as the environments on which they’re cast. However, this relational definition, where the shadow is bound to the caster, is only one way to conceptualize the shadow. The shadow may, as Michael Baxandall has suggested, also be an independent entity, actively fighting light. This view suggests that it is a free agent, where the material shadow is no longer leashed to a bodyobject, nor solely bound to how a human perceives it.

The conceptualization of the shadow as free

agent might provide a productive limitation to “hegemony of vision” arguments. It questions whether the hegemony of vision is really just the hegemony of limited point of view, and point of interest (PoI). Who gets to see? What is seen? What is the meaning of what’s seen by who gets to see? The assumed default of human seeing an object, and its implied passivity of the object must be challenged, in order for absence to be conceptualized as active and material. The downside of our ocular centrism is then that it reifies the human’s subjective viewing of the world as the only reality.

Over centuries, shadows have, by being animated in both myth and science alike, fractured their causal bindings to enrich our visual and mythic culture. In separate bodies of work, Roberto Casati and Victor Stoichita have provided fascinating accounts of the mythic and scientific lineage of shadows ranging from eclipses to Peter Pan. I posit that the shadow, by flattening color, texture, material, volume and depth, renders equal human and non-human, animate and inanimate, and is thus an object and material of significance when discussing agency beyond the human. What follows is two sets of curated pairings that interrogate the shadow in terms of this material status.

1. Shadow as (il)legal tender in fiction: Death of a Shadow vs. Peter Schlemihl

The following pairing depicts the shadow as a decoupled agent used as currency, in two fictional instances. The first of the pair is a scene from a short film where shadows are characters suspended in time, displaced from the bodyobject it once belonged to. The second is an age-old myth where the shadow, again, with the ability to be disengaged, is used as a bartering unit.

a. Dood van een Schaduw (Death of a Shadow) is a 2012 French–Belgian live
action short film directed by Tom Van Avermaet. It tells the story of a World War II soldier, Nathan Rijckx, shot and killed during the war. He is offered a deal by a “Collector of Shadows”, to capture 10,000 shadows of people in their dying moments (one for each day of Nathan’s life) in exchange for Nathan’s mortality (“Your demise has been erased” the Collector will eventually say, when the 10,000 shadows have been tallied). The shadow collection is housed within enormous frames, displayed along an impressive hallway, glowing like fossils in amber, with pegs holding the shadows in place as they shimmer ever so slightly within the frames. Nathan’s own shadow, captured by his predecessor, lies in a frame, loosely frozen in the moment he was killed, waiting to be restored to life when he captures the 10,000th shadow. In the following scene, the Collector of Shadows walks down the hallway with Nathan in tow (fig. 3). The Collector’s remark as he stops at a frame to comment on Nathan’s newest, penultimate addition to the collection, captures the various roles of the shadow in this short film.

THE COLLECTOR OF SHADOWS. [pointing at a framed, slouching shadow of a man who died of old age]

Old Age? You know that worn down shadows are seldom interesting. This is a worthless composition. I know that all deaths can’t be masterpieces, but still. I hope your last work will be interesting. Otherwise...[he shakes his head and pauses.]
The spontaneous aesthetics of an accident, for example. Let’s say...a train, a plane, a car. Something explosive! Or a drowning. It’s been ages since I’ve had a drowning. Or murder! Murder is always expressive.  

Pegged into the frame, dismembered in form, space and time, the shadow here is only one count away from being revived into full animism, returned to the original scene, coupled with a bodyobject. But while in the frame, the collector evaluates “dead shadows” in terms of their compositional elegance and vitality – attributes

78 See Fig. 3. Tom Van Avemaet, Death of a Shadow. Live-action short. Directed by Tom Van Avemaet (2014; Brussels: Studio/Distributor, 2014. iTunes movie.)
79 Ibid. A hybrid between the Barnes Foundation in Philadelphia, the John Soane house, and the Mutter Museum in Philadelphia, the hall of shadows is a unique museum – a collection of the absence of bodies, labelled by their cause of death.
80 Ibid. English translation subtitles from the movie.
augmented by the degree of suffering they contain within the turgid bounds of their quivering silhouette. The collection of these shadows are a collection of absence – absence of body, photons, and life. Yet the absence is rife with potential of the impending vitality of energies past. The absence is material.

b. A much older and widely popular story in this genre, where the shadow is used as currency and acts as a manipulable agent, is titled “Peter Schlemihls Wundersame Geschichte”, written by Adelbert von Chamisso in 1814. The story centers around Peter, stricken by a lifetime of poverty, who barters his shadow with an elusive stranger in exchange for a magic purse, promised to be perpetually

81 These energies are not unlike what the New Materialists argue for, although a deeper discussion is out of the scope of this article, and can be found in the larger body of the author’s work.
filled with gold. The absence of his shadow (the absence of an absence) however, renders Peter inauthentic in the eyes of others, and he is shunned by society.

In both these stories, the shadow has been objectified in a manner that myth and fiction have often found evocative.

2. Shadow Sweepers and Shadow Tweeners
The shadow, beyond myth, can also be generative when we actively decouple it from bodyobject, as is evident in the next pairing. In the first of the pair, a pragmatic counterpoint to myth and fiction, the shadow has agency by being considered noise,83 in the context of computer vision surveillance algorithms. In the second, the shadow is a productive generator of shape, challenging the line of the cast shadow that mediates between darkness and environment.

a. Shadow Sweepers: The processing of visual information is a delicate dance of cognitive censorship, based on computational economy for the mind. Because of this, in everyday vision, we seldom look to shadows as the first source of clues to structure human visual perception. On the contrary, the shadow is particularly significant to certain human–computer vision perceptual hybrids, tasked with being attentive to and engaged with shadow detection and manipulation. One such agent is the shadow–detection algorithm. “Shadow detection” (SD), a relatively mature topic within the field of computer vision and pattern recognition, is a critical step in object detection and tracking in various video applications (such as surveillance and traffic monitoring). In these applications, shadow often competes with foregrounded objects of interest, and is thus considered noise. This problem is

83 This concept of “noisiness” was partly inspired by the name of a seminar conducted by Roberto Casati, Patrick Cavanagh, and Paulo E. Santos, titled “The Message in the Shadow: Noise or Knowledge?”
not unlike when Leonardo Da Vinci expressed a rule to paint shadows in a diffused manner, so that “the outlines of the shadow would not clash with the outlines of the lights”. Through its agency as noise-maker, the shadow is material.

Shadow detection algorithms themselves tend to be feature-based, parsing through attributes such as light intensity, chromacity, geometry, and texture, to detect and discard the shadow from scenes (fig. 5). As light sources multiply, shadows spawn, extending the bodyobject diffractively into space. They claim corners, scale walls, and fold onto ceilings. In order to detect these, shadow algorithms go through various sequences of edge-detection followed by some version of assigning a “shadow-ness” to an isolated blob. These algorithms have the ability to expand the human perceptual system to not only apprehend shadows, but also perceive differently, through patterns.

b. Once we allow the shadow to be conceptually decoupled from the caster, then the shadow gets offered back to the environment. In the computer vision examples, the shadow is decoupled only to be discarded. In the second of this pairing, shadows are decoupled in order to shift focus to the infinite bandedness of umbras, penumbras and antumbras that lie in-between shadows. In the project “the Expanded Body” (fig. 6), the heaving shadow bands of bodyobjects acquire an animality that is less object-centered and more about a mutual, relational becoming. This is the shadow’s way of exerting alterities through emergence,

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when vectorized photons and objects interact to go beyond priors of body, object, environment. By embracing the haze of the shadow line, we don’t bind the boundary to the shape of the object. Instead, the shadow is offered to the environment, allowing it to be a figuration of the space it occupies. The promise of the materiality of the shadow is thus enticing. My provocation is to heed to the performative power of the weakened or absent photon, and attend to the attenuated in order to see differently. While querying the shadow’s materiality and objecthood, I probe its ontological status as discrete or relational. Tangentially, I also propose that physical objects at many scales be not only rendered by, but also augmented with, the subsumption of the absence we drag along -- the absence we apprehend, the absence we cast, and the absence that can later be bartered. Perhaps, when we think of these shadows as generative percepts, we might see the potential agility of the shadow’s materiality, as it pleats in play with stairs, rests awhile against walls in alleyways, molts itself to melt into the shadow of a bench or a lamppost, all with an agency of its own. Our environments are then swarming with these morphing, never-dead shadows, uninterested in human vision, animated in absence.
This agency of the shadow and the shaded silhouette then feed into the methodology of the Performative Experiment. Through its characteristics of absence (material, depth, texture), it engenders an estrangement from the familiar. Through its infinite in-betweenes of umbra–penumbra and antumbra, it pushes back, challenging the perceptual habits of the perceiver, and thus skewing the boundaries of the Performative Experiment to open up various lines of interrogation and meaning–finding. Some of these lines of questioning will be demonstrated in the case studies in the following chapter.

86 The shadow embodies the instability required of it as a posthuman material. Katherine Hayles might call it a flickering material, one that does not commit not conform to either disciplinary question. This then is an attempt to expand self from human to other, and in this process of subsuming the other, we also reclaim the body. We reclaim the materiality of the body, through the shadow.
CHAPTER 5
PERFORMATIVE EXPERIMENT IN PRACTICE

5.1 Introduction:

Performative experiment synthesize situated and embodied cognitive science, posthumanism, and architecture design, to create a methodology that engages and makes apparent self-attributes. It embodies facts of either fields and reveals their assumptions, while making each field actionable and approachable to the other, thus instigating a new form of practice. Some of its salient features include: 1. Performative experiments don’t privilege the knower over the known; this position is in line both with Barad’s agential realism that blurs the line between subject and object, all the way back to William James’s plural self that conflates knower and known. Through a negotiation between material and discourse as a way to engage the aesthetic and spatial senses of self, the Performative Experiment is empirical, reflexive, and aware of the pliability of all that it involves, rather than relying on a pre-cast replicability. There is no longer a static human subject testing the world and its objects (material object, digital and physics stimuli). Rather, by being in it, being shaped by mutual experience, agency in the context of the performative experiment is the performance of the negation of subject–object divides and is vigilant of other lines of interrogation that open up as a result of an “open-ended practice.” 88 Performative Experiments can productively reconfigure aesthetic and spatial experiments to be material-discursive exercises, in order to shed Cartesian cause-effect dependencies.

The following three case studies are examples of Performative Experiments. They find a middle ground between empiricism and intuition. They are designed to sample from the methodologies of experiment design in the cognitive sciences and foundational design education exercises, in order to test, make visible, and

prime aesthetic and spatial concepts. I summarize the influence of cognitive science experiments and foundational design exercises on each other while they come together in order to shape the performative experiment methodology as the following:

1. Influence of cognitive science experiments on architecture design:
   Foundational architectural design exercises can be deconstructed into expository spatial and aesthetic questions, in order to expose underlying processes involved in imagination and intuition. Once the exercises are thought of as a dynamic system that can manipulate the aesthetic and spatial aspects of self by tapping into perceptual and cognitive biases, relationship with environment, social interactions, and various other factors that contribute to a sense of self, we can create new problems in order to examine them in a manner that scientific experiment allows. Through this close examination, we can re-frame aesthetic and spatial questions for various audiences. We can also find ways of identifying self-agency in various rote moves, and point out ways in which certain operations are embedded in our pedagogical systems. This clues us into how we find meaning in the forms and shapes we perceive and create, through which we perform our aesthetic and spatial sense of self.

2. Influence of architecture design exercises on cognitive science experiments:
   Architectural design brings to the table its insistence on the non- incidental nature of material choice. In performative experiments, the material plays a significant role in skewing the nature of the experiment itself. Architecture design exercises also lends its familiarity of putting bodies and objects in digital and physical environments to curate aesthetic and spatial experiences to not only serve as data to be studied, but also as factors that might influence the design of the experiments in the first place. These exercises thus provide clues by which cognitive science experiments of visual perception can be re-graded to become spatial and aesthetic experiments, creating a conduit that taps into deeper cognitive and perceptual lines of questioning.89

89 While not within the scope of this report, these case studies emerge from an exercise where I conducted visual perception exercises first through the cognitive science way, and subsequently through a performative experiment (Experiment 2
With this recap, below is a description of the experiments that were conducted. The first three experiments are primers, and the fourth, *Hogarth's Silhouettes*, is a proof-of-concept of a creative exercise that results from priming, which in turn fosters un-seeing and re-seeing, un-scening and re-scening, in order to recompose formal and spatial relationships. Through these experiments, I respond to the following question: How might the performative experiment expose certain abilities, challenge canons, and encourage an estrangement from assumptions in order to prime the mind to embrace otherness? Each experiment makes visible new lines of questions. All these experiments use shadow and shaded silhouette as a material. Each experiment provides an opportunity for self-attribution, which refers to the process through which people determine the antecedents and consequences of their behaviors. Because people do not have access to their internal states—attitudes, beliefs, emotions, motives, traits—they must infer these from observations of their own behaviors and the situational contexts in which they occurred. These three experiments are but fine slivers of how the aesthetic and spatial sense of self might be cultivated through a new methodology. Through close examination and manipulation of material through language, touch, image of mind, and action, they become conduits through which we bring multiple disciplines to engage in malleable aesthetic and spatial senses of self.

To aid in this examination and interaction in order to make inferences, from them, I have developed a projection and drawing surface interface, called the *Traceur*. The *Traceur* is an active part of the performative experiment, opening up the possibility of displaying and interacting with visual stimulus. It simultaneously performs as the projection surface, the drawing surface, and the recording surface. It is no coincidence that a traceur is also the name of one who performs parkour and free-running. As will become clear in the experiment's description below, the Traceur as surface device becomes the site where:

*Shadow, mind, and body meet,*

*Projected image and the image of the mind fight and fuse,*

*Traced image persists, as a proxy for the persistent image of the mind.*

was one such example). By doing the experiment both ways, I follow the natural line of questioning that each approach opens up, and compare the two. fig. 17
5.2 Experiment #1: The 'I' sees

"I see a llama speaking to a camel.
I see the Pope on a Pope mobile"

a. Overview

An aesthetic and spatial sense of self fosters imagination. This experiment is motivated by the following questions: How do we graft interpretation and meaning-making onto stimulus and experience? How do we see shapes in things? Describing vague shapes is one way to tap into the drivers of imagination — our various internal states including our attitudes, beliefs, emotions, motives, to which we may not have direct access. Further, it tracks the role of tracing in the perception of vague shapes. Does tracing allow one to slow down the perception process to see differently, or to notice more details? It gives the subject and the experimenter methodologically controlled, "phenomenologically enlightened\(^{90}\)" ways of understanding the importance of first person experience and how this reported experience can affect the experimental results, and experimental design. This experiment employs the shadow and its ability to abstract away material, texture, depth, color, pattern, and tap into deep seated preconceptions and assumptions about meaning-making from vague stimuli.

Various cognitive and neurocognitive studies have been conducted to show how we gain information about the world from 2D retinal images. We have the capacity to infer solidity and depth from the 2D retinal image, based on visual cues such as shading, perspective and occlusion.\(^{91}\) Additionally, as Richard Gregory has demonstrated, we carry in our minds "predictive hypotheses" of what we see in the world, that influences our perceptions. This top-down interaction of how we makes sense of visual stimulus clues us into aesthetic and spatial aspects of

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90 A term of Shaun Gallagher.
fig. 11. Participant tracing a shadow stimulus in "I See" case study experiment
self. Since we employ shadows, which flatten depth, we can ask questions of how we perceive and make meaning of vagueness. Do we still infer depth in shadow? Can the infinite in-betweenness of the umbra, penumbra and antumbra, and the fusion of flattened shadows make us infer objects that are not there? Scenes that are not real? In asking these questions, the Performative Experiment not only acknowledges the role of the human as the agent who perceives, but also the shadow image as an agent that influences perception. This intra-acting relationship between non-human stimulus and human perceiver, that generates a joint perceptual capacity, is central to why this is a posthuman Performative Experiment.

b. Hypotheses of Experiment:
1. We use familiar approximations of objects to describe vague shapes. Context drives perception.
2. Tracing vague images requires closer observation than just looking, and can provide additional detail about vague images.
3. We can update our visual shape reference, even when they are vague shapes, when we’re made to attend to them closely.

c. Participants
All 28 participants were non-incentivized, naive to the experiment, aged 22-30. There was a 7:11 F:M ratio. All participants were students at MIT. For this experiment, the students were all architecture majors.

d. Design and Procedure
The “I see” responses that the experiment was designed to prompt were meant to incite first-person responses, to expose the perception and imagination processes the first person self employs when ascribing meaning to vague stimuli. The stimuli itself were images of ambiguous shadows created for the purpose of this experiment. Each participant was shown a series of 5 images, projected on the

92 Some of the questions posed were “What do you see...”, prompting “I see...” responses. The I within such “I see” responses are known to disambiguate who the referent person is.
fig. 12. Sample shadow stimulus
fig. 13. Sample shadow stimulus
fig. 14 “I See” experiments
Traceur. Once presented with the stimulus, the participants were given a series of prompts. All answers were recorded verbally (See Appendix 1 for transcriptions). When prompted to trace, the participants traced the image on the Traceur with a pencil.

**Pre-test**

Pre-tests were conducted on a similar demographic as the final group, to clarify wording, and to test the effectiveness of the sequence of the questions. During the pre-test, first-person questions were asked such as “Could you describe what you were thinking as you were drawing?”. Additionally, words like shape and object were clarified during this process.

The pre-test participants performed the following sequence:

**Look — Describe — Draw — Describe.**

The sequence of questions were:
1. What do you see in the image?
2. Trace over the image
3. Did you update your opinion based on what you just traced?

Two significant trends were noticed:
1. All pre-test participants reported that having described the shadow stimulus first, they had conjured a mental image for themselves. Having verbally described it, this description-driven mental image dictated what they drew. All 3 test subjects did not update their opinion about the shapes after tracing over it. This introspective portrayal of the participant's thinking disproved my initial hypothesis that tracing over the image would make the participant look closer, and see additional detail in the image, or update their impression of the image.
2. All 3 participants described at least one of the images in terms of a previous image (“looks like the same llama, maybe a mirror image of the first image”). This demonstrated that participants were updating their referent set of images even in the case of vague images. These two observations prompted me to re-design the experiment.

93 Other versions of the questions considered were: What do you see in the image? This allowed for extraneous information, so the questions got more specific.
Final test

Based on the pre-test results, the Performative Experiment was re-designed in order to test the order of the sequence of seeing, tracing, and describing, with an updated hypothesis that the verbal description of an image has an influence on how one traces the image, and how much information one gleans from the tracing. Two trials, now with 14 different students each were conducted to study the effect of sequence of seeing, tracing, and describing on how one utilized the trace to ascribe meaning to vague shapes. The version that was administered to each participant was chosen at random, while maintaining an equal number of participants in each group.

Trial A performs the sequence: Look — Describe — Trace — Describe
Trial B performs the sequence: Look — Trace — Describe
This was a significant step in the design of the experiment, informed by consciousness of self-thought. This reinforces Gallagher’s insistence on the role of first-person phenomenology in the design of cognitive experiments\(^\text{94}\), that encourages first-person accounts to be taken into consideration in the re-design of experiments.

Experiment Prompts
Trial A: Tracing before describing
Sequence: Look — Describe — Trace — Describe
Step 1: “Look at the image within the frame”
Step 2: “Describe what you see within the frame”
Step 3: “Trace over what you see within the frame”
Step 4: “Describe what you see within the frame? Has your opinion changed from your original impression?”

Trial B: Tracing after describing
Sequence: Look — Trace — Describe

94 ‘front-loaded phenomenology,’ A ‘phenomenologically enlightened experimental science’ (Gallagher, 2003, p. 89) means that the first-person experiences of experimental subjects are taken seriously and addressed by experiments that are designed to take them into consideration.
Step 1: “Look at the image within the frame”
Step 2: “Trace over what you see within the frame”
Step 3: “Describe what you see within the frame? Has your opinion changed from your original impression?”

e. Results
The following were the reports of change in opinion about what the shapes looked like after tracing.

**Trial A:**
YES: A change was reported 12.5% of the time. None changed their description significantly, where “significant”, for the purpose of this experiment is when the objects or the scene change qualitatively (kind of scene), rather than quantitatively (number of objects).
NO: 87.5% of times no change was reported.
A statistically insignificant number of participants could not describe what they saw (3.5% of the participants, in 1.43% of the images).
Additionally, 38% of the participants began to see connections to previous images, demonstrating that their shape referent set was expanding.

**Trial B:**
YES: Again, a change was reported 12.5% of the time. None changed their description significantly, where “significant”, for the purpose of this experiment is when the objects or the scene change qualitatively (kind of scene), rather than quantitatively (number of objects).
NO: In this trial, 87.5% of the time no change was reported.

**f. Discussion**
The following was noted in comparison to the initial hypotheses:
1. We use familiar approximations of objects to describe vague shapes. Context drives perception. The first hypothesis was proven to be true; the “predictive
hypotheses were generated both by initial impressions that triggered memory, but also subsequently as a self-referential context. 11.8% were able to “see something familiar in there”

2. The second hypothesis, that tracing vague shapes requires closer observation than just looking, and can give one additional detail about a vague image, however, was refuted. In this context, the following was noted: Self-narratives play an important role in the perception of vague stimuli. When the visual stimuli is vague and abstract like shadows (with missing material, texture, depth information), the hegemony of vision can be overturned by privileging the mental image and the narrative, guiding the participant to trace what they described. This refutation prompted the redesign of the experiment, to see if the sequence had an influence on the responses. Once again, the hypothesis was refuted. This lead to a significant hypothesis that perhaps the tracing is dictated by the verbal narrative, but the externalized image’s power on the predictive hypotheses was far stronger. Whereas the tracing stayed consistent with narrative, it perhaps is not an indicator of the hegemony of linguistic description. Rather, the power of the external image has in conjunction with predictive hypotheses that can generate unwilling results.

3. The third hypotheses that we can update our visual formal reference set, even when they are vague shapes, when we’re made to attend to them closely was also proven to be true. Our referent set of images does indeed get updated pretty quickly, even when the shapes are novel. Even though the stimulus was vague, participants began to notice relationships between some of the images. Some thought them to be “another view of…” or “a mirror image of” a previous image.

There were other additional results that were noted:
- First-person accounts can give rise to new lines of questioning, that become gateways to the full spectrum of the processes involved in meaning-making. In this instance, verbal reports to “What do you see?...” questions gave rise to a new hypothesis that the image of the mind as verbal narrative had a role to play in

I see a tortoise talking to a giraffe
I see a giant slug on a badminton court
I see a llama in a desert, with a mountain with a flag in the background
I see a brontosaurus reaching for branches
The figure of an animal, maybe a dog with raised ears. A mountain. A stick with a flag.

Llama talking to a tortoise

A chess-piece, but it's not a chess-piece. It's kind of like a llama, but it's flat.

Shadows which look like an animal. Left one looks like a giraffe with a shorter neck, or a horse. Something like that.

I see a mix between a giraffe and a horse in the center of the frame. On the right hand side, I see sort of a mix between a camel and a brontosaurus to be able to reach for the branches. In a way, it's like a scene where you can see the evolution of the two; the dinosaur is reaching for the leaves, and then the horse-giraffe.

A figure. Pope with a Crown or a cook. Same stick. Both on top of a base. Feel like they're becoming one.

Sir Arthur drawing a sword from a rock.

A monument surrounded by stairs or columns.

Difficult to describe. I'm still seeing an animal-like thing. Like a penguin. Maybe a meerkat? Standing on the ground in a desert, looking up.

Going with the more fun one. Either the top of a building from Gaudi, or the broken crown. Something that goes on the top of something else. We're only seeing the top of something that might extend down.

I see something like the top of a sculpture or the top of a building. I see one basic shape that has a main body, and two projections. Still one shape.

I see a human wearing long clothes, head covered. I see something that looks like a rope or a stick carrying another object, potentially the figure. The figure hold that sticks, which is the second most solid figure. There are also two sticks running around -- no they're just there. One of them is tilted. It seems like the figure and the thing that he/she carries passes between them.

Same object. Sir Arthur drawing a sword from a rock. Pen on a stand.

Some sort of animal climbing a tower, with a rock with a sign.

Looks like a stock on the left, on the right a battleship crushed down on the ground. A tank kind of thing.

Giraffe from the other side. The neck of the brontosaurus way in the back, and on the left hand side, the tip of the titled crown.

Theater play. I see the backs of two heads of people, watching. One may be a woman because it looks like long hair. There are 2 acrobats. 2 objects in the scene. I figure to touch the human. I see 1 bird.

Two children playing on several barrels. Just want to draw. Two children on 4 barrels.

Looks like a sculpture guy and a heron, and they're standing on things.

4 bodies. Third and 4th look more like they could be connected. I don't know. Too vague for me.

Simplest thing. Here, I enjoy seeing a guy or girl stretching his/hands way back and about to take a dive into a pool with many waves. Touching something in the back like a pole, ready to go.

I see the same thing. The guy is doing a handstand. The brontosaurus is pulling the guy's feet, he's maybe even going to eat the guy or "dive him" into the sea or the ocean. Someone's watching from the background. Voyeur.

To the left is a figure in the far distance. 2 figures. Standing on top of object. 2 persons plus anything. To the left is a shipwreck.

Still two children climbing a tombstone to climb a monument. Someone watching from the background.

This is like a figure on top of something precariously placed on a structure trying to reach something.

Cliff, someone is jumping down a cliff. Stop motion of this. Water coming out a tap.

I see the same thing. The guy is doing a handstand. The brontosaurus is pulling the guy's feet, he's maybe even going to eat the guy or "dive him" into the sea or the ocean. Someone's watching from the background. Voyeur.
I see a dog or something that has a sharp nose. It could be a big piece of infrastructure in a field. I think it’s a part of a landscape. The pile on the right... An agricultural landscape or urban landscape.

I see a llama in a desert with a flag in the distance. Beyond the flag, there’s a fortress in the distance.

Giraffe and some sort of turtle. But also saw some sort of chimney-thing with some smoke.

Looks like there are 2 distinct things. In the middle looks like a slug with a long neck, and two pointy ears. On the right, kid of like a vertical stick with some think near the top of it, and to the right of it, a shallow, truncated, pyramidal shape, pile.

A series of low, clustered objects overlapping, with a few tower like things peaking out. Tower is not the right word, but two tall figures amidst a clustering of low figures that are all overlapping to form one uniform shape.

I think this is a reflection of the first one. I still see this dog-like, shape nose creature-thing, which could be a building, or part of a building, or sign, but I see it from another angle. Perspective is different. Parts are not exactly the same.

This feels like they may be rooftops. Peaks of a roof, or protruding objects. Objects protruding, there’s got to be more in the bottom of the frame.

I’m not so sure. It’s a blob thing. I think they’re connected on the bottom.

I see another shadow that has a base at the bottom, and another figure coming out of it and another linear shadow coming out of it.

I see a landscape. Arches national park, rocks that form into a large arch. Profile.

I see a religious man standing on a podium.

I see a black shape.

This is a similar image. The sculptor became skinnier, The object in the middle looks more like an obelisk kind of statue, and the other two objects on the right side, look like tombstones. The blurry one looks like a greek column.

I see two people. Definitely a man in the picture, directing his hand towards someone else, or a wall, or an animal. There’s a surrounding landscape that is flat. I think it’s a agricultural landscape with the rolls that are bales.

Four objects connected by a base. A truncated pyramid, a sphere or something, and two taller objects, maybe statues, all on the same plinth.

Some sort of stone by the sea that is shaped by the weather.

Two people, One is touching the other's forehead, There are some 3 podiums, 3 objects that you can stand on.

4 shapes connected at the bottom. 2 are kind of mounds. 2 on right are a bit more anthropomorphic. One is touching the other, but they’re distinct.

I see the inhabited landscape here. I see a crane or an egret on the right, next to or near another one, or a plant, and rocks on the left.

I can’t tell if is a man now. Or even an agricultural landscape. It’s hard to describe this image. It’s someone or something stepping on something like a cube that is next to something flat. He’s trying to reach a wall. Definitely not a human.

Whatever they are, they are more articulated on the right hand side. Both in terms of contour line. Object itself not sure.

Candle and a metal cup, something that you would put as a table setting. A dinner set.

Definitely not a human. Experiment records.
A shadow that resembles a horse. There's also a linear shadow and next to it is a shadow that looks like a hill.

A shadow of a stuffed animal that is of a giraffe. And a little mountain.

I see a llama and a camel. Shadows of them.

I see an animal. And a mountain on the right. It could be a giraffe.

I see a dog and a tortoise on the other side. (laughs)

I see two objects here. One is some sort of a strange animal. One the right there's a snail. On the left, there's a cat meets giraffe meets penguin. It's a hybrid.

I see an animal, like a llama. Next to it, I see a factory, like a chimney.
I see a horse. And a car.

Looks like an origami camel to the left, and a flagpole and paper mountain to the right.

Looks like one strange shape. I don’t know what it might be. Can I guess? I could say there’s a human figure in the middle, standing on something, with something else sticking out of the something. Someone wearing a robe and a crown, so maybe like a kind person, with maybe a sword sticking out of the ground.

Oh! a mirrored image, almost! Two possible description. Either again a llama. Like a triangular thing with a stick on the top, and a very blurry object on the right. But this animal figure could also be a human figure standing on a base.

Looks like the silhouette of some kind of animal with long ears. Like a llama. A little mound with a flagpole.

I see two lower profile shapes, one which looks like a volcano, and the other a sphere. Two tall profiles one of them looks like a figure standing on a plinth, and the other is a very thin bowling pin.

I see sculptures. There’s a standing elongated profile of an animal. Maybe 3 animals in sculpture form.

OK. This is little nutty, but I see an Egyptian pharaoh jumping from a cliff, with a big hat.

I really don’t know how to describe this. Two vertical elements, this time not as curvy. They look machinic. Then a horizontal thing that looks like a base. Left corner, a very blurry object that’s hard to recognize.

I see a pile of stuff, that someone is trying to climb. A figure of a person is trying to prop themself up on a pile of stuff to climb over a wall.

fig. 15 Experiment records
I see a llama that is a little bit in the foreground. In the most background is a plateaued mountain, and in front of it, closer to the llama is a pole with a flag.

I see, I guess I'm still in the geological artifact stage, so I see a mountain in the distance, which is a low item, the taller center one is an eroded stone form, the stick is a flagpole with no flag this time.

So now I have some biblical imagery coming into my frame. The large figure in the center right is Moses, with his arms stretched out, with a cape flowing behind him on the left side, draping on the ground, standing on a rock, parting the Red Sea in the distance. Another figure in the foreground on the right, but the figure is very blurry.

There is a guy who has Mario hopped from object to object, and is touching a giraffe on the right side.

Looks clearer. One blurred objects more in the background.4 objects more in the foreground. The 3rd from the right appears more figural, like it has limb-like looking things. An obelisk in the middle, and someone, a person touching the top of it, with two kind of rock or stool objects on the right.

On the right side are 3 tombstones. The one on the left is rectangular and most upright, and the second is starting to fall over, and the last one is just completely on the ground. There is a figure that is cultishly bowing to the obelisk statue in the center, and off to the distance is kind of a peeping top that's just watching the scene.
superseding the externalized image. The data from first-person accounts is not just used as additional data; rather, it contributes to an organizing analytical principle.\textsuperscript{96} It helped shape the design of the experiment itself.\textsuperscript{97}

- Two distinct categories of observations were noted. The observations of what one saw within the vague shapes fell into one of two distinct categories: discrete objects and scenes.

Discrete objects here are objects that are not connected in the description via prepositions or action verbs. On the other hand, scenes are those descriptions that use prepositions to describe various objects in relation to each other. For instance, discrete objects were described as “I see...a man, a chair, and a ball”, whereas a scene was described as “I see...the back of the heads of the audience, watching a play on the stage in the background, where one man is punching another”.

Discrete Objects: 48.57%


\textsuperscript{97} Despite the “I See...” prompt, 3% of the participants felt compelled to describe the truth about where the shadows came from, struggling and resorting to responses like “I can't really say, it's just a blob. I don't know what it comes from”.
Scenes: 51.42%

- Subjects look to boundary quality to make depth inference. 93% of the participants relayed some sort of spatial relationship within the scene, and attributed this to the boundary condition (“There’s a voyeur in the far back” … “It’s in the background because it’s really blurry”). Particularly blurry shapes were interpreted in ways that were consistent with the invented scene. This further proves that thin the black boxing of visual perception, we not only rely on predictive hypotheses from real situations, but also from imagined one. For example, in response to a blurred, linear shadow, when the scene was described as a “llama beside a mountain with a flagpole”, the blurred shadow was traced as a flag on the pole. Another participant, who described the same scene as “the pope on a pope mobile”, drew the smudge as a cross.98

**g. A note on the posthuman nature of this Performative Experiment:**

This Performative Experiment is posthuman because it encourages a diffractive reading and performance of the experiment. The shadow here is performative and material because of its ability to be an active participant in the experiment, just as is the perceiver. It is complicit in the emergence of self attributes. It eventually can train for other readings that foster imagination. In addition to noting what was said, the performative experiment allows scrutiny of what could be said.99 The shadow imposes its own performance, constraining what responses the participant could give. This line of thought is not unlike what William James defined self as. Not of was was one’s own, but what could be one’s own. It communicates with the image of the mind, and together they joust with the narrative descriptions of the image. While it was concluded that tracing does not significantly alter the description of the image, leading one to believe that the narrative driven image of the mind takes precedence over the externalized image. Here again, Barad’s diffractive agential realism calls for a pause as she provokes, that “the

HOW DO WE STUDY MEANING-MAKING?

Imagination  Memory  Perception

Perception of Vague Stimuli

typical cognitive science approach

visual search experiments

Material
Role of gist information in face detection. Mooney images

reaction times greater for upright mooney faces than inverted ones

interaction
What MATERIAL do you engage for visual perception of vague stimuli?

Conclusion
reaction times greater for upright mooney faces than inverted ones

Material
How does the body interact with the stimuli in space?

Material
What MATERIAL do you engage for visual perception of vague stimuli?

Material
How do you interact with the other?

Other
Whose Body?

Material
What is the shadow’s agency?

Shadow
What is the shadow’s agency?

Material
What is the mental image’s agency?

Image of the mind
What is the mental image’s agency?

Material
attributing mental image to memory

Memory
attributing externalized image to perception

Perception
attributing externalized image to imagination

Material
attributing narrative to imagination

Imagination
What’s the role of narrative?

Narrative
What’s the role of narrative?

Externalized image
What is the externalized image’s agency?

Externalized image
What is the externalized image’s agency?

Nonhuman
Whose Body?

Other
How do you interact with the other?

What’s the role of narrative?

Image of the mind
What is the mental image’s agency?

Minsky’s k-lines, frames, and slots

Performative experiment approach

What MATERIAL do you engage for visual perception of vague stimuli?
presumption that we can know what we mean, or what our verbal performances say, more readily than we can know the objects those sayings are about is a Cartesian legacy, a linguistic variation on Descartes' insistence that we have a direct and privileged access to the contents of our thoughts that we lack towards the "external" world.

5.3 Experiment #2: Canonicality of Silhouettes

a. Overview
This experiment inquires about the agency of the shaded silhouette in object recognition, in order to ask whether there are preferred views that even when they lack information of material, texture, and volume can invoke the right corresponding object. Studies have shown that there are canonical views of fully rendered objects. However, if we can prove that this is the case for views of shaded silhouettes that have to encode much less information, then this is a valuable clue into visual perception and meaning making, and can be exploited to serve as an economical way of representing objects.

In the human visual system, data is interpreted for recognition from the retinal image in ways that are not fully known. In the process of learning about our world, at some point, the silhouette becomes important for recognition and for people's judgments about the objects they encounter in real-world settings. Do we have the concept of canonical silhouettes that aid in object recognition? What factors influence the choice of a canonical silhouette? This study examines people's predictions about the shape of slightly novel objects, from silhouettes with varying levels of uniqueness, chosen from a set of all possible silhouettes. They are considered novel because they don't have a ready-made name for them. The initial results suggest that accurate judgments have a correlation with how unique the silhouette is. While people tend to either be under or overconfident with their initial predictions, their judgments tend to get better as their knowledge is updated by more silhouette samples in a trial, particularly when presented with a unique silhouette.

100 Here, "canonical" is used to describe a unique view from which the object is best recognized.
This experiment was first designed “their way”, using cognitive science’s methodologies, methods, and principles. I then recreated the experiments “my way” (Performative Experiment) in order to flesh out and make visible additional self-reflexivities that become apparent the moment the questions are re-framed as aesthetic and spatial ones, and as soon as the experiment allows for the engagement of the body. Details of the experiment done the cognitive science way can be found in Appendix 2.

b. Hypotheses:
1. Canonical views of shaded silhouettes exist that are more attributable to the object it comes from.
2. The more unique the silhouette, that is, the less ambiguous it is to other silhouettes within a referent set, the more confidence for recognition nit instill in the perceiver. As the subject’s priors get updated with silhouettes of various uniqueness, their confidence will change, which will subsequently influence the posterior probability of picking the right object, given the new silhouette.

c. Participants:
All 28 participants were un-incentivized, naive to the experiment, aged 22–30. There was a 7:11 F:M ratio. All participants were students at MIT. For this experiment, the students were all architecture majors.

d. Design and Procedure:
To test whether there are canonical silhouettes, the following steps were followed:
1. As part of the experiment, 4 objects are generated digitally, using an open-source software called Blender. Three of the objects were slightly novel. Novel here means that the forms were derived from a standard Euclidean geometric solid, but was then subjected to one operation such as truncating, adding a side to the base, or slicing. The fourth object, a cone, serves as a control. It must be noted that these objects were deliberately chosen because William Hogarth’s describes them as having the most “eligible boundaries” (or profiles), which to him implied the right balance of simplicity and variety (as opposed to the sphere, which has the
The significance of acknowledging Hogarth will become clear in the last section of this chapter, where his analysis on the fitness of certain forms are referenced in order to develop a new design exercise.

2. Large sets of silhouettes are generated for each object, and stored in a database. From this database, a set of canonical silhouettes are chosen by a program. From the database of all possible silhouettes, 3 silhouettes of each object are curated (fig b), with varying “uniqueness”. Uniqueness is determined by the amount of overlap each silhouette shares with the other silhouettes from a master set of 200 possible silhouettes, and ranges from 1-10 (1-low uniqueness; 10– high uniqueness).

3. On the Traceur, the participant is shown digital animations of the object to familiarize themselves with the object. They are allowed to draw and take notes to remember the form of the objects.

4. Once familiarized, participants are shown sets of silhouettes in a randomized order. Each set contains 3 silhouettes from the same object, and are presented sequentially. In each instance, the participants verbally state which object the silhouette comes from, and their corresponding confidence level in their choice. Confidence level describes how confident a participant is with their choice. They also report on which silhouette they found most useful to identify the object.

5. I record whether the canonical silhouette picked by the participants belong to the canonical set determined by the computational model. I also record the likelihood for switching confidence if the silhouette belongs to a canonical set.

6. Lastly, the participants are asked to describe the objects, and I compare this to their written descriptions from when they were familiarizing themselves with the shapes.

f. Results and Discussion

For the purposes of the cognitive science experiment, this experiment demonstrated that there are canonical silhouettes that aid in object recognition. However, in terms of the Performative Experiment, several other lines of inquiry and observation emerged. In the pre-test, I asked participants to describe the objects at the end of the experiment. All 3 participants in the pre-test described at least one of the objects in terms of the other. This indicated the ability for novel shapes to be subsumed into a participants’ referent sets.

The following results were noticed:

a. Positive correlation between the uniqueness and the likelihood of correctly identifying objects

b. Positive correlation between the uniqueness of a silhouette and the average level of confidence. The more unique the silhouette, the more likely the average confidence in making a choice.

c. Likelihood of switching one’s choice when presented with a more unique silhouette was higher than when the silhouette was less unique than the previous silhouette in the sequence.

d. When asked to describe the objects at the end of the experiment, ~90% of the participants described the objects in terms of each other. (“Object D is truncated Object A”). This is in contrast to their initial written descriptions when they were learning each shape at the beginning of the experiment. Here, almost all of them tried to fit the description to a known canonical shape (eg. “Pentagonal pyramid”, “Extruded, tapered pentagon”). This shows that just within the course of an 8 minute experiment, one can update their prior referent sets. The self-agency that we assert from meaning-making by comparing with canons is malleable. Our
aesthetic sense of self is malleable.

5.4 Experiment #3: Baseline

a. Overview
This is a baseline experiment, that establishes some critical benefits of using abstractions such as shadows and shaded silhouettes as a material for examining perceptual and cognitive questions. It also exercises imagination through challenging spatial and aesthetic entities and relationships, and in doing so, established why I consider the shadow a posthuman material.

b. Hypothesis
Vague shapes prompt the imagination and have an agency that fully rendered images don’t have.

c. Participants
All 28 participants were un-incentivized, naive to the experiment, aged 22-29. There was a 7:11 F:M ratio. All participants were students at MIT. For this experiment, the students were all architecture majors.

d. Design and Procedure
The participants were shown a sequence of 2 images on the Traceur, and were asked to describe what they saw within the frame. The first image is a fully rendered photograph of a man holding two shapes. The second is a shaded silhouette of the same. The images, while derived from the same scene, were slightly dissimilar, in order to prevent participants from sensing an after-image that overlapped, giving away the source of the objects. Each image was framed with an orange rectangle, to minimize ambiguity of what they were responding to (see fig.). In each case, they were asked:
“What do you see in the frame?”
The answers were given verbally and recorded.
Responses that describe a human: 0%
Responses that included a nonhuman: 100%
Responses that describe a single object: 21.4% (eg.
Responses that describe discrete objects in a scene: 78.6% (eg.
Most popular description: “Giant mushroom”

Image 1b:
Responses that describe a human: 100%
Responses that included a nonhuman: 78%
Responses that describe a unified object: 0%
Responses that describe discrete objects: 100%
Most popular description: “Asian man holding two styrofoam shapes, one is an x, and the other is a y.”

102 Here, x and y are a stand-in for various responses regarding the actual shape of the objects seen.
e. Discussion
Although seemingly obvious, this baseline experiment serves the purpose of orienting one to the mindset of how much if too much information in an abstraction. In the fully rendered photograph, none of the subjects described it in vague terms. The material of the objects were almost always mentioned. Additionally, 33% of the subjects recognized the styrofoam shapes to be the same shape as the animated stimuli in experiment #2. This experiment came towards the end of the 15 minute sequence of experiments 1, 2, and 3. Within these 15 minutes, the subjects had already updated their reference set of shapes. The responses demonstrate that the shaded silhouette is a generative material because of its ability to allow for imagined shapes, objects, scenes to take on through an obscuring of shape, depth, material, and texture. This lies in contrast to the the fixity of responses from fully rendered information. While seemingly obvious, this experiment provides a posthuman understanding of how an image can have agency in dictating a certain kind of response from the perceiver.
CHAPTER 6

HOGARTH’S SILHOUETTES

6.1 Introduction:

The first three experiments were examples of hybrid exercises to make legible cognitive processes in tasks of visual, spatial, and aesthetic perception to a general audience. The small sample here is an initial illustration of the kinds of questions Performative Experiments can address, and problems it can device. Some of the themes addressed here are processes involved in making meaning of vague shapes, identifying concepts like unique silhouettes, becoming aware of operations such as mirroring and revolving in aesthetic canons, and introducing the body into visual perception questioning. These exercises were a warm-up of sorts. Once exposed to these diffractive slices of cognitive and perceptual processes that influence our aesthetic and spatial behavior, the aim is to put into play these aptitudes via a new culminating exercise that involves unseeing, re-seeing, un-scening and re-scening in order to create new spatial and aesthetic compositions. As a proof-of-concept, I propose a return to William Hogarth’s treatise “Analysis of Beauty: Written with a view of fixing the fluctuating Ideas of Taste” 103. I propose a revisitation of the first plate from his treatise, as a site where posthuman ideas converge. In doing so, I suggest that Hogarth’s agenda of democratizing an appreciation for aesthetics, displacing classical canons, and employing empiricism for which he was chastised at the time, was in fact not far removed from the agenda of some posthumanists, and embodied cognitive scientists of current times. His call for an empirical training of aesthetic sensibilities finds a new life in my own call.

103 I would need to do this experiment on a lot more non architecture participants in order to determine whether these operations are part of the architectural canon or a larger cultural aesthetic canon.
6.2 Purpose

The purpose of such an exercise is to serve as an educational tool to train and enact a malleable aesthetic and spatial sense of self across disciplines. This exercise cultivates diffractive sensibilities as a result of embodying human and non-human frames of reference in order to organize aesthetic and spatial forms and compositions. It also asks what is the scope of empiricism in design-motivated exercises, and reflects on how, in trying to distill and transfer key design ideas to fields outside of ours, we might be able to expose our own canonized proclivities which hinder our reach. Lastly, it questions whether in addition to visual arts, might the cognitive sciences and posthumanism provide an opportunity for cross-fertilization and inspiration by making legible our own malleable aesthetic and spatial sense of self?

6.3 Audience

The audience for this kind of exercise is not limited to students of basic design and early cognitive science. Instead, in line with the broader goal, it includes anyone who may want to cultivate an ability to frame a variety of questions of experience as spatial and aesthetic ones. In this way, the goal is to democratize the imposition of an aesthetic and spatial sensibility when one apprehends the world, by first being able to identify and cultivate the aesthetic and spatial sense of self.

6.4 Lineage

The lineage of this kind of exercise lies in basic architectural design studio exercises offered in the first year of architectural education, that are meant to cultivate an aesthetic and spatial sensibility amongst its students.105 Over the past 60 years, these exercises have not been exhausted to capture the malleability

of aesthetic and spatial sense of self that is emerging as a result of a posthuman occupation of the world. Some, however, have been known to be influenced by advances in understanding of visual perception. One can recall the famous kit-of-parts “9 square grid” exercise of John Hejduk and Robert Slutzky that was formulated as a basic design exercise at the University of Texas, Austin in 1954. This exercise incorporated Slutzky’s interest in Gestalt psychological principles\(^{106}\), and later was made more architecturally-relevant by John Hejduk. This exercise was later transplanted via Hejduk to Cooper Union, from which it catapulted to various parts of the world. The aim of the exercise was to get students to think about basic design principles, while confronting architectural elements, such as the post and beam, while thinking of the project as a frame\(^{107}\). While it successfully contributed in cultivating a sense of process rather than product, and a belief that design could be taught, as it was restricted by its solely spatial agenda, meeting the boundaries of the discipline far too soon, the moment architectural elements like post and beam get grafted onto the abstractness of the grid. In the wake of this, as Peggy Deamer and Timothy Love have each summarized, other models of such basic design exercises sprung up.\(^{108}\) Some of these included defamiliarization exercises, inspired by Victor Schlofksy, that encourage making unfamiliar common objects and common moves in order to read them anew. Others included material exercises, which emphasized, what Love reports, a learning-by-doing methodology\(^{109}\). Others still introduced a narrative layer approach to architecture design.\(^{110}\)

106 Ibid.

110 Ibid.
On close examination of the motivations of these various exercises, it becomes apparent that they are all in fact engaging questions of self, even if it was never called that—a cultivation of a self-awareness and self-consciousness that can engender an aesthetic and spatial enactment in the world. I contend that Hogarth's Silhouette, having emerged from the performative experiment methodology that is itself framed by an overarching intention to cultivate a malleability of the aesthetic and spatial sense of self, subsumes the motivations of defamiliarization, material scrutiny, and narrative development of beginning architecture design exercises that have preceded it. Additionally, by providing a posthuman diffractive lens that blurs the boundaries between perceiver and perceived, the malleability and multiplicity of self prompts a performance of the spatial and aesthetic exercises in ways never done before.

6.5 Why Hogarth's "Analysis of Beauty Plate 1.0?"\textsuperscript{111}

Written in 1753, Hogarth's treatise is an exercise in theorizing aesthetics.\textsuperscript{112} Hogarth's analysis has been called the “first sustained anti-academic treatise in the history of aesthetics”. A leading English artist of the 18th century, his goal, as is evident in the title of his treatise, is to democratize the seeing of and finding beauty in art.\textsuperscript{113} As I find aesthetic and spatial common ground between cognitive science and design through Performative Experiments that are empirical,\textsuperscript{114} Hogarth's Analysis of Beauty is a productive first stop to enact the methodology I have laid out. Through this return, I question and practice emerging aesthetics,

\textsuperscript{111} Hogarth's "Analysis of Beauty" plate I (fig) forms the frontispiece of his seminal and highly influential book in the field of Aesthetics, titled “The Analysis of Beauty. Written with a view of fixing the fluctuating ideas of taste.”

\textsuperscript{112} The Analysis has been called “the first sustained anti-academic treatise in the history of aesthetics”. Kilson Michael. “Hogarth’s Apology For Painters’.” The Volume of the Walpole Society, 1966., 46, JSTOR Journals. p.65.

\textsuperscript{113} As Charles Davis notes, Hogarth's book was meant for a general audience, beyond the world of artists, in order to foster an interest in art. Charles Davis in “To see with our own eyes”: Hogarth between native empiricism and a theory of “beauty in form”. William Hogarth: The analysis of beauty (London: Printed by John Reeves for the Author, 1753) (FONTES 52). http://archiv.ub.uni-heidelberg.de/artdok/volltexte/2010/1217

\textsuperscript{114} Empirical here, is that which is based in experience.
and an emerging sense of aesthetic ability via self-agency. This simultaneously empirical and hypothetical enterprise is not unlike Hogarth’s. Hogarth himself urges the reader to cultivate an aesthetic sensibility from non-human examples through experience and empiricism. He displaces canons of traditional statuary in favor of objects like bells, flowers, cacti, and wanton horses. His plate then is fitting to revisit when the goal is to democratize the cultivation of an aesthetic and spatial sense of self across disciplines. Hogarth’s Silhouettes unravels the geometric and aesthetic canons embedded in the plate, in order to ignite the formation of new aesthetic and spatial referents. Additionally, by now replacing the plate with shadows and shaded silhouettes, it makes absent detail in order to project other realities. The lines disappear into shaded pools of absence. Through this, it frees the imagination to project other forms that the silhouette can belong to, in turn, generating various other compositions.

Hogarth’s Analysis of Beauty can itself be seen as a posthuman call for aesthetic sensibilities. While asking how we train to sense, perceive, and cogitate, we are inadvertently asking what the visual and proprioceptive operations are by which the perceiver and the perceived are in contact with the world? These are posthuman questions in the way Barad talks about them, where subjects and

115 This kind of empiricism based in personal experience was not favored at the time.
116 Title of the subsection in the introduction by Charles Davis in “To see with our own eyes”: Hogarth between native empiricism and a theory of “beauty in form”. William Hogarth: The analysis of beauty (London: Printed by John Reeves for the Author, 1753) (FONTES 52). http://archiv.ub.uni-heidelberg.de/artdok/volltexte/2010/1217
117 “for whoever has seen a fine arabian war-horse, unbacked and at liberty, and in a wanton trot, cannot but remember what a large waving line his rising, and at the same time pressing forward, cuts through the air; the equal continuation of which, is varied by his curveting from side to side; whilst his long mane and tail play about in serpentine movements”. Ibid. p.140.
objects are not prefigured, but rather emerge through intra-actions of the external image (stimulus), the image of the mind, memory, perceiver, and perceived. Hogarth divorced motion from mechanism, and in doing so, he set the painter free to represent the world as he saw it ‘with his own eyes’ in the ‘vacant, hollow space in which all things move so freely.’ In doing so, he also ascribes an animism to the motley bunch of objects he chooses to represent as counter points to the classical canons that he lays sprawled in the open courtyard. The vacant, hollow space he describes can be conceived of as being the space of co-becomings that Karen Barad argues for.

118 Hogarth, pp. 83, 84
Motivated to analyze beauty, "with a view of fixing the fluctuating ideas of taste", Hogarth lays out the following as principles that work together to produce beauty: fitness, variety, uniformity, simplicity, intricacy, and quantity. Referring to the principles that he lays out, he uses his Plate I (and Plate II) as a discursive tool to point out examples of good and bad versions of the execution of beauty, rather than only portraying exemplars. In ways, Hogarth's text proposes a system of forms and actions:

"From the examples that have been given, enough may be gathered to carry on our

observations from them to any other objects that may chance to come in our way, either animate or inanimate; so that we may not only lineally account for the ugliness of the toad, the hog, the bear and the spider, which are totally void of this waving-line, but also for the different degrees of beauty belonging to those objects that possess it."

In addition, I argue, his is also a call for estranging oneself from reigning paradigms of beauty, to questions many other "what ifs". I put this into practice. Thus in order to expose a new awareness of malleability of spatial and aesthetic abilities of self, I invoke his work to address and challenge the following:

1. Variety

Although Hogarth includes simplicity as one of his principles, he does so with a caution that simplicity devoid of variety would produce displeasure. But when variety is included within simplicity, it gives the eye "the power of enjoying it with ease". For examples, he finds the pyramid pleasurable because it packs variety within simplicity, allowing the eye to travel around it without "giving the idea of sameness". Regularity, uniformity, or symmetry, then to him, are found to be pleasurable only by nature of their fitness.

2. Symmetry

"It may be imagined that the greatest part of the effects of beauty results from the symmetry of parts in the object, which is beautiful: but I am very well persuaded, this prevailing notion will soon appear to have little or no foundation."

While his plate includes many shapes that are symmetrical, he foresees us being disillusioned by symmetry — both in the form of a proportion of parts, and in terms of uniformity of profile. Through this, I add, he is essentially bringing to

120 Ibid. pp 60.
121 Hogarth himself mentions several of these ideas in his text.
122 Ibid. p.43
124 Ibid.
question rote operations that to this day have been subsumed into the aesthetics of design education, like mirroring and revolving.

3. Canons

In his mission to “teach us to see with our own eyes”, Hogarth gives preference to a kind of democratic eye, based in empiricism, one which “sees without prejudgement or prejudice”. Hogarth refers to spires and steeples, ships, a bell, a candlestick, stove-grates, “butterflies wings”, the monkey, the toad, the bear, the spider, the parsley-leaf, the lily, the “calcidonian Iris”, all in a call to update one’s canons of what one finds beautiful. This untraditional imagerie is found alongside the academic canon of ancient statuary in the plates of his book in an

125 Ibid. p6.
unconventional juxtaposition.

4. Motion
Hogarth strongly advocates for variety through motion, and denounces the myth of uniformity being the chief cause of beauty. Instead, he recommends putting into motion uniformity in order to insert variety. “If the uniformity of figures, part, or lines were truly the chief cause of beauty, the more exactly uniform their appearance were kept, the more pleasure the eye would receive: but this is so far from being the case, that when the mind has been one satisfied, that the parts answers one another, with so exact a uniformity, as to perceive to the whole the character of fitness to stand, to move, to sink, to swim, to fly, and without losing the balance: the eye is rejected to see the object turned, turned, and shifted, as to vary these uniform appearances.”

5. Silhouette
Hogarth’s studies focus on profile lines, as he is occupied with exposing his “line of beauty” in unconventional canons such as cacti and pineapple. In Hogarth’s Silhouette, I further abstract these by diffusing the lines into blurred edges, activating the in-between, thus making the edges come alive, by which volume is returned to the line. “Another advantage of considering objects thus merely as shells composed of lines, is, that by these means we obtain the true and full idea of what is called the out-lines of a figure...”

6. Composition
“The art of composing well” is the “art of varying well”. Hogarth’s silhouettes as an exercise Plate I to students, beginning with a fixed set of objects-to-scene relationships as in the plate. I then present them with a sequence of operations that fracture these various relationships dictated by posthuman mereotopologies and meaning-making, while also challenging them to imagine other forms that might emerge from silhouette profiles. This becomes an exercise in composition.
By estranging a silhouette from its baggage of operations, symmetry, points of view, and meaning, a series of new scenes are set loose. This exercise then performs a few key steps in the priming of a spatial and aesthetic awareness of self and the self’s agency, through the dismantling of canons:

- Dismantles ego vs. allo as spatial frames of reference, to reintroduce alternative spatial and aesthetic frames of self.
- Privileges profile, but not to reinforce symmetry or uniformity—rather, to generate variety
- Challenges spatial and aesthetic relationships based on canons
- Challenges operations such as mirroring and revolve, that reinforce uniformity
- Dismantles discreteness of objects, subsuming the other as self
- Updates canons that inform how we recognize and envision indeterminate shapes, in a manner that gives us the facility to use those shapes to generate new formal and spatial relationships.

*The shadow silhouette here is posthuman.*

*It prefigures relationships not yet formed.*

*Objects that have not yet met.*

*Selves that have not yet been morphed.*

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*fig. 24. Classical canons vs. lines of beauty in nature*

*fig. 25. Stills from one version of a foundational design exercise called Hogarth’s Silhouettes*
CHAPTER 7

CONTRIBUTIONS AND CONCLUSION

As we embrace the augmentation of the human via digital technology, and of experience via various interfaces, we are modifying both our sensory perceptions and knowledge about the world. Because of this sense perception and cognition being augmented, and their effects on our self-agency and self-knowledge, the boundaries of what we conceive of as self is changing dramatically. By making the case for exploring an aesthetic and spatial sense of self, this essay exposes the expanded spatial and aesthetic capabilities that are spawning new selfhoods, that are going unnoticed due to a lack of methodologies for engagement.

By picking up on recent waves in embodied and situated cognition,¹²⁷ and posthumanism discourse¹²⁸ that have each reclaimed the body, the physical and digital environment and the non-human respectively as extended sites of perception and cognition, examine areas of overlap that can invite wide audiences. I suggest ways in which this selfhood can be enacted through the decomposition, un-seeing, re-seeing, un-scencing and re-scencing of spatial relationships, it puts into play an emergence of infinite otherness, read both as individual entities and in-betweens. An aesthetic and spatial sense of self unlocks these infinite potentialities.

In carefully curating the above, and carefully pulling threads that may support each other in unfamiliar ways, I have contributed the following to a growing creative scholarship of new ways of design thinking and doing:

1. Proposed and demonstrated that the self is malleable and multiple, and an awareness of this malleable self is useful to various disciplines

¹²⁷ Situated and embodied cognition are theories that show the dependence of cognition on the entire body and the physical environment that the body interacts with, as a reaction to Cartesian mind–body dualism, which insists on mental phenomenon being non-physical.
¹²⁸ Posthumanism is the view that acknowledges non–human modes of being, and advocates to develop ways of exploring them.
2. Demonstrated that embodied cognitive science and posthumanism have much in common, in their respective calls for a malleable sense of self.
3. Proposed that basic design education can mobilize the intersection of embodied cognition and posthumanism through its aesthetic and spatial engagement
4. Developed a methodology to mobilize this intersection
5. Presented the shadow and shadow silhouettes as appropriate materials for this methodology
6. Designed a proof-of-concept exercise that puts into play this new malleability of aesthetic and spatial sense of self using William Hogarth’s iconic plate from his treatise “An Analysis of Beauty”.
7. Demonstrated that Hogarth's Silhouette subsumes the motivations of the predominant exercises in basic architectural design exercises of the past 60 years, and allows it to be much more by extending its audience beyond that of basic architectural design.

Through these contributions, I reiterate my motivations of a desire for the embodied cognitive sciences, posthumanism, and design to meet.

To meet more often.
To meet without defense.
To meet more messily.


