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Aesthetic Affordances: Form and the Intuitive Mind

A dissertation submitted in partial satisfaction of the

requirements for the degree Doctor of Philosophy in Comparative Literature

by

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ABSTRACT

Aesthetic Affordances: Form and the Intuitive Mind

by

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Does form shape thought? If so, how, and to what degree? This dissertation answers the question by proposing a new cognitive theory of aesthetic affordances applied to case studies of Virginia Woolf (1941) and Lettrist cinema (1951). After a brief introductory chapter which includes terminological clarifications, the second chapter contributes to the present recourse to affordances in literary theory (Cave 2016; Felski 2017; Levine 2015; Serpell 2014) by addressing ambiguities in its use. It outlines the concept's intellectual heritage in psychology (Gibson 1979; Jones 2003; Shepard 1984; Turvey 1981). It argues that its current use in literary theory assumes an instrumental view of literature by accepting an embodied view of cognition, which stipulates that literature, like a tool, augments thought (Clark 1998; Heft 2003). The chapter then offers an alternative definition, which it calls aesthetic affordances, based on advances in cognitive neuroscience (Cosmides and Tooby, 1994; Dehaene, 2020; Kahneman, 2011; Pinker, 2007). This perspective captures how the mind can intuitively understand literary form through cognitive mechanisms. Crucially, the chapter argues that this redefinition is more faithful to the original concept of affordances which also proposed that understanding is intuitive, pre-verbal, and instant. This is also why

the following two chapters, three and four, focus on form: aesthetic affordances allow consideration of how literature can be understood outside a language of sense.

The chapter on Virginia Woolf addresses her lifelong attempt to find a form of writing which could communicate her political beliefs without stating them literally or symbolically. It analyzes her World War II novel *Between the Acts* (1941) through the cognitive mechanism entrainment, which describes how the mind intuitively understands rhythm (Poeppel and Assaneo 2020; Poeppel and Teng 2020). The chapter argues that Woolf uses entrainment to demonstrate and question the insidious ways that patriarchal traditions hold sway over the mind. It, therefore, argues that Woolf can communicate her politics through rhythm.

The fourth chapter builds on this question surrounding form and content by analyzing the avant-garde cinema (1951) of the Lettrists Isidore Isou and Maurice Lemaître. These artists sought to communicate exclusively through form by disrupting representational imagery and sound. The chapter argues that Lettrist cinema can be understood, despite its rejection of mimesis, through the mind's intuition for geometric primitives (Dehaene 2006; Dehaene 2020; Sablé-Meyer 2022). This analysis amounts to a defense of the Lettrist insistence on formal experimentation in contrast to the criticism by the Situationist International that the avant-garde must prioritize political content (Debord 1967).

The dissertation concludes in a short fifth chapter that summarizes future directions for how aesthetic affordances can analyze the impact of form in different media and how incorporating cognitive neuroscience can expand and democratize what it means to understand the arts.

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1. Introduction

1.1 What Are Affordances?

Affordances have become popular in literary studies. From C. Namwali Serpell's *Seven Modes of Uncertainty* (2014) to the MLA prize-winning *Forms* (2015) by Caroline Levine to Terence Cave's *Thinking with Literature* (2016), affordances are increasingly used as a new analytical concept to describe the instrumentality of literature. Affordances allow scholars to think about what literature does and makes possible.

Serpell uses the concept to capture "the many unique and diverse aesthetic, affective, and ethical experiences that literary uncertainty affords." (Serpell 2014, 25) Similarly, Levine and Cave use affordances to capture how form and genre can enable new thoughts and behaviors. Analyzing affordances is an attempt to uncover the effects of literature on both individual and societal scales. However, this also makes it an endeavor without boundaries.

The concept's analytical remit is intentionally open-ended so it can trace how a piece of literature impacts society "across time and space." (Levine 2017, 25) For instance, affordances explain how the invention of a genre, like the sonnet, generates expressions of romance that would not have been possible otherwise, such that "a sonnet sent to a potential lover on 14 February affords the possibility of actual sexual relations." (Cave 2018, 56) Similarly, the Greek tragedies have come to represent human suffering. Without this genre, the Western meaning of tragedy would be different. In short, affordances describe temporally unbounded instrumental relationships between literature, the reader, and society.

This makes the theory part of new critical methods, which Rita Felski characterizes as "reading as a coproduction between actors rather than an unraveling of manifest meaning."

(Felski 2017, 12) Affordances differ from the hermeneutical tradition, where texts are analyzed through a specific interpretive lens. However, this lack of scope is also a recognized weakness. If tragedy is an affordance of the ancient plays and romance is made possible by the sonnet, "the breadth, the inclusiveness, of its explanatory power is purchased at the expense of depth." (Cave 2018, 61)

The concept of an 'affordance' was coined by psychologist James J. Gibson to explain how perception gives rise to meaning. At its inception, affordance theory was a radical intervention in Cartesian philosophy. Gibson proposed a relational definition of meaning characterized by his oft-cited claim that "an affordance cuts across the dichotomy of subjective-objective." (Gibson 2015, 121) Specifically, Gibson explored the notion that understanding objects depends on perceiving their function, which depends on their relationship to an agent. Meaning is a matter of perceiving an 'afforded' action, and action includes the self. Thus, an affordance 'cuts across' the supposed divide between self and environment such that "the awareness of the world and of one's complementary relations to the world are not separable." (Gibson 2015, 133)

The notion that instrumentality could replace a hermeneutics of sense made the concept famous in other disciplines before reaching the humanities. In design theory, Donald Norman's influential book *The Psychology of Everyday Things* (1988)[1] contrasted

[1] The revised edition from 2013 is newly titled *The Design of Everyday Things* to reflect a shift from physical to virtual objects. In a testament to the popularity of affordance theory in design, Norman emphasizes that designers tend to use the term inaccurately, particularly in the context of computer and app designs. He, therefore, contrasts affordances with signifiers: "affordances determine what actions are possible. Signifiers communicate where the action should take place." (Norman 2013, 14).

affordances with a mechanical view of engineering to address how people interact with objects, like light switches and door handles. His simplified definition states that "affordances represent the possibilities in the world for how an agent (a person, animal, or machine) can interact with something." (Norman 2013, 18) Serpell, Levine, and Cave's use of the concept follows this genealogy.

However, literary scholars have yet to clarify *how* affordances arise. This question is essential given Gibson's hypothesis that "an affordance is not bestowed upon an object by a need of an observer and his act of perceiving it." (Gibson 2015, 130) Cave, Serpell, and Levine do not answer how a text or genre has *inherent* affordances, not imbued post hoc through social norms, popularity, or chance.

Exploring how affordances arise is particularly important in the arts because aesthetic appreciation, like reading a book, is usually considered an end in itself, to paraphrase G.E. Moore (1903). This received idea is sufficient to question the ontology of affordances, but it is necessary in light of Gibson's view that the meaning of an object is intuitive; "it therefore possesses meaning and value to begin with." (Gibson 2015, 130).

So, how do affordances work? First, it is necessary to recognize that Gibson never settled on a clear definition of the term, which he developed from 1966 to his death in 1979. Moreover, our knowledge of visual perception and cognition more generally has significantly advanced. Hence, examining the mind, like Gibson examined perception, can explain the kinds of affordances we perceive in literature and the arts more widely.

This dissertation will present a new analytical framework and propose shared definitions for the concept's use through a reexamination of the psychological foundations of affordance theory.

In the coming pages, I will outline the origin of affordance theory by James J. Gibson in the 1960s, its significance and limitations for humanities scholarship, and how it can incorporate an updated 21st-century view of the mind. I will address some of the pitfalls created by the concept's mixed disciplinary heritage and how to develop Gibson's work in light of recent findings in evolutionary psychology and cognitive neuroscience. My reconceptualization of affordances will retain what is unique about the theory: a way to describe the dynamic relationship between object and subject, art and spectator. I will call this new theory 'aesthetic affordances.'

Next, I will examine aesthetic affordances through case studies on reader reception of Virginia Woolf and Lettrist cinema. My focus is, therefore, on books and films, but the analytical framework can be extended to other art forms. My analyses lend themselves to studies of music and visual art since the chapter on Woolf will address rhythm and sound, and the chapter on Lettrism will concern visual form.

However, for explanatory simplicity, I will present my theory of aesthetic affordances with reference to 'literature' and 'texts.' This choice places my work in direct conversation with the existing humanities scholarship on affordances, but it does not limit the theory to writing. I aim to present a theoretical foundation for understanding the relationship between aesthetic form and the intuitive mind.

1.2 Cognitive Terminology

Since I will discuss the mind and brain, I offer a few preliminary notes on terminology. One of the most significant discoveries made since Gibson concerns the role and complexity

of cognitive mechanisms. Expanding on the limited and perhaps arbitrary list[2] of instincts known by Freud, like hunger and sex, cognitive neuroscience has revealed that humans have many innate skills that prepare us to perceive the world around us, like distinguishing animate from inanimate objects.

It has also become clear that the unconscious mind constantly monitors our surroundings to modulate our conscious attention. For instance, the sudden appearance of a friendly face in a crowd will stand out, their voice will be heard at the suppression of other distractions, and their wave will be noticed. The mind can also distinguish friend from foe at a glance, with much of the analysis happening outside our conscious awareness. We can intuitively tell by someone's gaze if they mean us well or harm.

The species-wide existence of such complex instinctive mechanisms has increased consideration of the impact of evolution on the mind. Furthermore, comparing the brains and behaviors of humans with other primates has demonstrated that many skills once believed unique to humans exist because of evolved mechanisms, including mathematical reasoning. So, when I refer to 'the mind,' I mean the cognitive mechanisms responsible for sense-making and understanding.

For the same reason, the term 'cognitive mechanisms' will refer to all operations of the mind, whether conscious or unconscious, that appear to have unique functional purposes, such as the ability to recognize faces. The term also designates 'sense-making' and 'reasoning.'

[2] Evolutionary psychologists Leda Cosmides and John Tooby remark that apart from drives to explain basic survival, "the tendency has been to keep these elements restricted to as small a class as possible and to view them as external to the important central learning or cognitive processes." (Cosmides and Tooby 1992, 30)

Determining the exact balance between conscious and unconscious is highly complex. For instance, even attention "happens with or without consciousness, though consciousness is a constant *phenomenon* in the most demanding selections." (Fuster 2013, 45) In short, determining when and how consciousness factors in a cognitive mechanism remains unanswered. My key terminological point regarding cognitive mechanisms is that the brain has evolved to understand certain aspects of the world and other people and that this understanding may not depend on conscious awareness, even less on verbalizations.

When I use the term 'process,' I refer to the discrete neurological steps that facilitate a specific mechanism. For instance, the mechanism for recognizing a friend will involve both visual and memory processes. This distinction connects to a point about the kinds of evidence I will introduce.

Cognitive mechanisms generally indicate adaptations that developed for a purpose. For example, the mechanisms for face recognition and understanding mental states based on facial expressions. These are two functionally isolable mechanisms. As a result, one can lose the ability to understand that facial expressions convey mental states, that a frown indicates upset, but retain the ability to recognize a friend's face from a stranger's. The two mechanisms share neurological processes, like brain tissue devoted to face recognition, but they do not denote the same function. Crucially, an adaptation can result from connecting various neurological processes whose locations in the brain can vary. A functionally isolable mechanism may not correspond to a small, localizable piece of neural tissue. No one-to-one correspondence exists between a single bit of neural tissue and a cognitive adaptation.

This evidence usually comes from experimental psychology, neuropsychology, and cognitive neuroscience. Experimental psychology denotes experiments that test for cognitive

mechanisms, such as comparing how individuals unable to understand facial expressions respond to depictions of moods. Neuropsychological evidence concerns brain injuries, for instance resulting from strokes. Cognitive neuroscience is usually connected to brain imaging, which may also include data from developmental disorders like autism.

These rich sources of evidence do not generally speak to the connection between cognitive mechanisms and neurons, that is, nerve cells. Hence, much of the evidence I will cite from cognitive neuroscience cannot answer the question of 'where in the brain' cognitive mechanisms take place. This is not my point. My theory of aesthetic affordances does not extend to the level of neurotransmitters. Examining neurons will not aid my argument about aesthetic affordances, which is the hypothesis that cognitive mechanisms can underlie an intuitive understanding of literary and cinematic form. I will therefore use the term 'cognitive neuroscience' to indicate the source of evidence for cognitive mechanisms or, more generally, how the mind works.

Moreover, I will use the term 'intuitive' to indicate that these adapted, functionally distinct cognitive mechanisms are instinctive and often unconscious. This also accounts for the fact that cognitive mechanisms can be intuitive without being present at birth. Much like the onset of puberty, evolved capacities of the mind also take time to develop.

Finally, I will frequently reference the discipline of evolutionary psychology as advanced by Leda Cosmides and John Tooby, also called 'the Santa Barbara school.' Evolutionary psychology combines the abovementioned approaches to understanding the mind, mainly its adaptive functions, that is, its cognitive mechanisms. This is my key explanatory framework in addition to Gibson's affordance theory.

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2. Intellectual History and New Directions

2.1 Gibson's Affordance Theory

Gibson developed his theory of affordances in the context of visual perception research in the mid-20th century. On the one hand, he rejects behaviorist approaches associated with B.F. Skinner that study manifest responses to external events. On the other, Gibson also opposes what he calls 'mentalism.' Internal representations are too subjective and do not focus sufficiently on the material environment. As he states in the introduction to his seminal work, *The Ecological Approach to Visual Perception* (1979), both views seem psychologically inaccurate: "The doctrine of stimuli and responses seems to me false, but I do not on that account reject behaviorism. Its influence is on the wane, no doubt, but a regression to mentalism would be worse. Why must we seek explanation in either Body or Mind? It is a false dichotomy." (Gibson 2015, xii) Hence, Gibson's solution is a new 'ecological approach' that defines perception as a relational process to account for how bodies relate to their surroundings.

Gibson argued against the prevailing views because neither offered a satisfactory account for how any of us adeptly navigates our physical environment by "extracting invariants [or constant properties] from the stimulus flux." (Gibson 2015, xiv)[3] Invariants are

[3] Gibson's terminology changed as he developed the theory, but his view remained that affordances describe invariant or constant features of the environment. For instance, in 1966, he wrote that "when the constant properties of constant objects are perceived…the observer can go on to detect their affordances." (Gibson 1966, 285) That account differentiates affordances from perceptible properties, but by 1979, he believed that affordances supersede the perception of discernible properties: "I now suggest that what we perceive when we look at objects are their affordances, not their qualities." (Gibson 2015, 126)

things like surfaces and edges. Consider his example of finding oneself in a heavy fog. Although light rays stimulate the retina, one cannot see: "this hypothetical case demonstrates the difference between the retina and the eye, that is, the difference between receptors and a perceptual organ." (Gibson 2015, 47) If perception was only about stimulus-response, i.e., a hard behaviorist view, there should be a difference between seeing in heavy fog and not seeing at all. However, we cannot perceive the invariant surface structures around us in both situations, like a trail or cliff edge. That is, we are unable to see what we can do. Hence, "the central question for the theory of affordances is not whether they exist and are real but whether information[4] is available in ambient light for perceiving them." (Gibson 2015, 132)

Gibson has a similar critique of mentalism, where perception is an operation of "the eye as a camera at the end of a nerve cable that transmits the image to the brain." (Gibson 2015, 53) How could such a passive, static process relate the constantly changing physical world to a body's size, abilities, and position as it walks through a terrain? So, instead of thinking of vision as a picture, we should instead consider it as a video: "we ought to treat the motion picture as the basic form of depiction and the painting or photograph as a special form of it." (Gibson 2015, 280) Once again, Gibson's introduction of affordances allows him to challenge traditional optics, for the perception of affordances depends on scrutinizing an

[4] Gibson often likens affordances to how an animal picks up information about the world from outside itself. For example, in the context of mate selection: "the perceiving of these mutual affordances is…based on the pickup of the information in touch, sound, odor, taste, and ambient light." (Gibson 2015, 127) More recently, Anthony Chemero has appealed to kinetics to suggest that affordances, as Gibson would have it, may not be restricted to vision: "there is information in the environment that enables the direct perception of affordances: perception of moveability by dynamic touch." (Chemero 2011, 154) Yet, how to exactly differentiate between information and affordances is still fraught with experimental difficulties: "identifying information that specifies affordances is a critical challenge for ecological theory." (Stoffregen 2003, 129) A recent helpful explanation from 2021 is found in experimental psychologist Brian Rogers' work on optic flow.

environment for possible movements. Imagining walking down your street will not specify affordances the way an actual walk will: “the imaginary scrutiny of an imaginary entity cannot pass the test.” (Gibson 2015, 245)

So, perception has to be understood as a whole-body moving process involving a physical reality, characterized by what the subject encounters in *optical flow*. Affordances, therefore, designate this nexus of the visual system of the brain and eye, the body, and the physical environment. This new ‘ecological approach’ bridges the historical tension between the material and the mental in the 1960s and 70s.

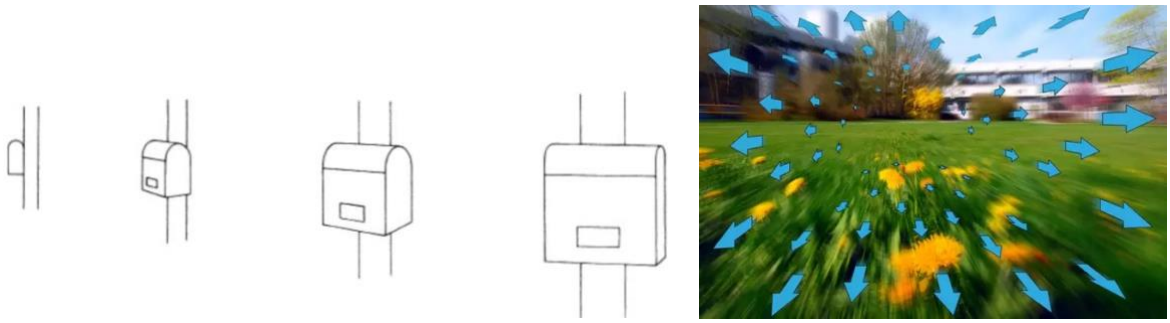

Figure 1: Example of optical flow (Gibson 2015, 131 and Schorner 2023). The observer perceives affordances depending on the changing perspective.

Of course, the scientific discourse has changed radically *after* Gibson, too. It is now firmly established that the mind-body dichotomy is indeed false. However, it was not proved through affordance theory. Since the 1990s, advances in cognitive neuroscience have made it possible better to understand the connection between the mind and the body. This is especially apparent in the field of visual research, where scientists like Thomas Albright uncover how subjective experiences correlate with neurological changes, so much so that it can be determined how “the stimulus selectivities of visual neurons account for perceptual

experience." (Albright et al. 2000, 613). This includes knowledge of how the mind allocates resources to the visual data hitting the eye, thus determining which details are given attention, eventually resulting in apperception, the recognition of a familiar object or person.

Gibson's rejection of all things mental puts him at odds with scientific advances. So, what explains the prevalence of affordance theory?

The concept's simplicity might be one explanation for its enduring appeal. When Gibson writes, Occam's razor is sometimes the only explanation. Consider part of an argument for why understanding affordances is intuitive: "they *seem* to be perceived directly because they *are* perceived directly." (Gibson 2015, 131) Affordance theory was once dismissed for this very reason. The 1989 Macmillan Dictionary of Psychology reads in part that "he [Gibson] handicapped and blinkered a generation of workers by his simplified approach." (Sutherland 1989, 175)

However, it would be amiss to reject affordance theory on that account. The concept's heritage in a range of disciplines should be taken seriously. To quote prominent ecological psychologist Edward S. Reed: "whatever the final status of Gibson's theories, his work has significantly changed the scientific study of human awareness and has deep implications for anyone interested in human behavior and knowledge." (Reed 1989, 2) Similarly, I suggest we conceive of affordances as a 'work in progress.'

In fact, *The Ecological Approach* (1979), which coincided with Gibson's death, concludes that "these terms and concepts are subject to revision as the ecological approach to perception becomes clear." (Gibson 2015, 298) Twenty years later, a special issue of *Ecological Psychology* (2003) titled *How Shall Affordances Be Refined?* addresses that

"what should and should not be considered an affordance is still an open issue." (Jones 2003, 107) It is especially noteworthy that although relationality is a prominent feature, "he [Gibson] never explicated fully what he meant by perceiving things with reference to an animal." (Jones 2003, 112) One cannot, therefore, be surprised that the simplicity and tentative nature of affordances theory spills into disciplines that did not even figure in Gibson's thoughts. However, it does beg greater clarity.

Scholars in communication studies have recently heeded that call. A meta-review of over 80 papers cautioned that "the creative adaptation of affordances is positive for research, but the ambiguous use of the term also needs to be addressed in order for scholars to build theory." (Evans 2017, 46) I wish to open the same conversation in the humanities.

I will unpack the notion that meaning can be inherent and intuitive, simultaneously pointing to self and environment. I want to understand Gibson's notion of relationality, the most popular aspect to humanities scholars. I aim to shore up the theory and move away from the ambiguity of "mutually shaping potentialities." (Levine 2017, 30)

2.2 How Do Affordances Work?

Affordances exist because of invariants. This originates in Gibson's theory of perception regarding the ability to distinguish between surfaces. People perceive affordances based on what is constant in an environment. It is what makes the fantasy world of *Alice's Adventures in Wonderland* magical; the limits to stability hinder the perception of affordances. However, when invariants are perceptible, Gibson claims that the affordances are intuitively understood. Perceiving an affordance is comparable to the operation of a cognitive mechanism. Their nature is decidedly unlike conscious experience,

and no amount of deliberation will add to their meaning. This corresponds to the notion that affordances are inherently meaningful, with nothing bestowed by an observer. In the words of cognitive neuroscientist Scott Grafton, recognizing an affordance is, therefore, "different from the conscious experience and verbal descriptions of the world you recognize through introspection and observation." (Grafton 2021)

This nuance matters because affordances in the humanities are usually imbued with a conscious analytical dimension. For instance, Levine critiques the affordances of disciplinary forms that shape society, such as the gender binary. In this view, the invariant is gender, but Levine mainly invokes affordances to suggest that the binary could have different potentialities. That is, she invites readers to reflect and deliberate. However, this is the opposite of an intuitive understanding, which is much more automatic and immediate, captured by Gibson's phrase, 'direct perception.' Affordances, therefore, have an immediacy not captured by conventional descriptions of sense-making, which tend to favor conscious deliberations.

In this section, I will explore how Gibson framed the relationship between invariants and the intuitive recognition of affordances. This will involve comparing Gibson's emphasis on physical actions with the operations of the mind by recourse to the evolutionary psychology associated with John Tooby and Leda Cosmides. I make that connection to inform my exploration of affordances in literature which I have suggested should consider the mind instead of instrumentality.

Secondly, I introduce the mind because the dated Gibsonian perspective has been proved inaccurate. Strictly speaking, 'direct perception' is the theory that perception is an

external process “unaided by inference, memories, the construction of representations, or the influence of other cognitive processes.” (American Psychological Association 2022) However, as my introduction explains, today’s scientific standards do not accept this. Hence, I opt for the term ‘intuitive understanding,’ which retains Gibson’s notion that an affordance is grasped instantly but avoids the historical baggage of ‘direct perception.’

Gibson’s affordance theory is inspired by Gestalt theory, which emphasizes the perception of form [*Gestalt*] over individual properties. The concepts of invariants and intuitive understanding derive from this point: “The affordance of an object is what the infant begins by noticing. The meaning is observed before the substance and surface, the color and form, are seen as such. An affordance is an invariant combination of variables….” (Gibson 2015, 126) For instance, a round object that rolls can be a tennis ball, golf ball, green or white, but what matters is the invariant property that it affords movement. The child perceives this value before all the other variable features.[5] Moreover, because affordances ‘cut across’ the subject-object dichotomy, the ball only affords movement because we, or someone else, can make it move. ‘Invariant,’ therefore, also points to the observer. The functionality of physical actions corresponds to the prevailing literary view; people can act in

[5] Another finding since Gibson favoring intuitive understanding is the demonstration by psychologists of cognitive development, notably Alan Leslie, that toddlers as young as seven months understand the rules of physical causality. They intuitively understand, i.e., without much experience, that a ball can only move if another touches it. They show surprise if a ball appears to move independently. See Leslie and Keeble 1987.

new ways because of literature. However, it has yet to be considered that affordances also imply constraint.[6]

Gibson addresses limitations by emphasizing that "the information to specify the utilities of the environment is accompanied by information to specify the observer himself, his body, legs, hands, and mouth." (Gibson 2015, 132-33) For example, the tree on an avenue affords walking around or climbing but never invites us to step over it. We are not tall enough. To another organism, like a bird, the tree does offer flying over, as well as nesting. An elephant might topple the tree. Thus, the tree has different affordances for each organism. Still, the range of possible actions will depend on the invariant properties of the tree and the animal – size, wings, and branches all matter.

Affordances, therefore, capture how "almost everything in the physical environment provides relevant information for possible as well as impossible behavior." (Grafton 2021) Emphasizing 'potentialities' *over* invariants ignores this distinction.

Without stressing the limitations of affordances, Gibson's belief that an affordance can be intuitively understood is rendered senseless, for what would inform its meaning? Instead, affordance would be reduced to something of a neutral exchange value devoid of the fact that "the affordances of the environment are what it offers the animal, what it provides or furnishes, either for good or ill." (Gibson 2015, 119) Moreover, affordances can only be intuitively understood because of "the notion of invariants that are related at one extreme to the motives and needs of an observer and at the other extreme to the substances and surfaces

[6] Although she makes the point without reference to Gibson or biology, Levine has implicitly addressed how the view from design does not capture this limitation: "Most design theorists emphasize the relations between an object and its users; I am more interested in the ways that affordance allows us to think about both constraint and capability—that is, what actions or thoughts are made possible or impossible by the fact of a form." (Levine 2017, 201, fn. 15)

of a world." (Gibson 2015, 135) We must therefore consider what restricts affordances. Enter evolution.

Gibson *seems* to explain the existence of invariants through evolution. This speaks to my approach informed by evolutionary psychology, a discipline that did not exist in his day. However, it is relevant if nothing else because his explanation needs to be more specific. Consider the following, which begins with an observation about environmental niches and ends with the geological lifespan of planet Earth:

"The niche implies a kind of animal, and the animal implies a kind of niche. Note the complementarity of the two. However, also note that the environment as a whole with its unlimited possibilities existed before animals. The physical, chemical, meteorological, and geological conditions of the surface of the earth and the pre-existence of plant life are what makes animal life possible. They had to be invariant for animals to evolve." (Gibson 2015, 120-21)

Here, Gibson ties the affordances of an environment to a species of animal to the affordances of water, earth, and air. Crucial to my reading, he emphasizes the complementarity of animals and the environment *by* accentuating the selective pressure of the properties of the atmosphere. Albeit not explicitly stated, only evolution can explain this level of complementarity that exerts limitations and possibilities across such scales. It is the sole mechanism broad enough to explain the invariants that occur from organic materials to an animal's niche. Cognitive scientist Anthony Chemero has similarly argued that

affordances "exist only in virtue of selection pressure exerted on animals by the normal physical environment." (Chemero 2003, 190) For example, 40ft acacia trees afford food to giraffes but do so because the giraffe evolved to its height. The evolutions of the tree and the giraffe create the affordance.

Similarly, development psychologist and Gibson's wife, Eleanor Gibson, believes that "his [James J. Gibson's] picture of the organism in a world that has properties appropriate for its use and to which it is responsive fits neatly in a Darwinian framework." (E. Gibson 2003, 293) In other words, evolution sets the parameters and limits the range of affordances.

Moreover, it is further reason to caution against comparing affordances with possibilities without qualification. This notion is popular in the humanities, as indicated by Cave's caution about the term's flexibility, but it is a misinterpretation of Gibson's claim that the world has "many observers with limitless opportunities for them to live in it." (Gibson 2015, 129) The fact that affordances always denote a restricted set of possible actions should remind us that 'limitless opportunities' do not reference any *one* animal but to all kinds of organisms. For the same reason, I argue that any scholar wishing to understand how affordances work in a literary context should consider the evolved nature of the mind. Books are read and understood before they spur actions in the world. It is, therefore, natural to consider how the mind limits the range of affordances, just like our bodies do.

Both our bodies and minds are the results of evolution. So there are invariants that set the foundation for what the mind can do, too. For instance, humans can intuitively attribute mental states to facial expressions. The existence of other people, with thoughts, beliefs, and

intentions of their own, is an invariant feature of human life that has impacted the evolution of the mind. In the words of Cosmides and Tooby, “if there is a reliable correlation over evolutionary time between the movement of human facial muscles and emotional state or behavioral intentions, then specialized mechanisms can evolve that infer a person's mental state from the movement of that person's facial muscles.” (Cosmides and Tooby 1992, 69-70)

Similarly, evolution can explain injurious affordances. To avoid incest, our ancestors must have evolved mechanisms to detect “cues, such as coresidence at an early age, that were reliably associated with kinship during our evolutionary history.” (Cosmides and Tooby 1994, 106). Moreover, individuals with this cognitive kin-detection mechanism “would produce children with fewer genetic diseases, and more of these children would mature and reproduce than would the children of those who were not averse to incest.” (Cosmides and Tooby 2005, 20) Understanding the dangers of incest is another example of how an invariant feature of our ancestral environment has impacted the nature of the mind.

From the perspective of evolutionary psychology, invariants are not limited to physical features of the environment but also the permanent presence of other human beings. However, the relationship between invariants and affordances remains the same. Whether about the height of trees or kinship relations, evolutionarily recurrent situations allow humans to understand affordances intuitively.

However, my introduction of evolutionary psychology is a clear departure from Gibson’s rejection of the mind and “old-fashioned mental acts: recognition, interpretation, inference, concepts, ideas, and storage and retrieval of ideas.” (Gibson 2015, 227)

Affordance theory is as much a new critical vocabulary to resist any terms that *could* imply a separation of body and mind, such as 'cognition.' Gibson introduces "the ecological theory of direct perception… [because] it implies a new theory of cognition in general." (Gibson 2015, 251)

Even today, with the advances of cognitive neuroscience, psychologists working in his heritage will disagree on whether "perceivers are aware of the action possibilities offered by objects." (Michaels 2003, 136) Some deny an appeal to cognitive mechanisms on orthodox grounds. For instance, Eleanor Gibson rejects the notion of mental operations, arguing that "the dynamics of the relationship between an organism and its environment are no chess game with a fixed set of rules." (E. Gibson 2003, 292) Here, even the mental states about possible actions do not count as affordances.

In favor are scholars like cognitive neuroscientist Joaquín M. Fuster who has suggested that the prefrontal cortex makes humans "capable of creating affordances and of projecting them on the environment." (Fuster 2013, 47) This part of the brain is responsible for many executive functions, such as planning for future actions. Thus, Fuster's suggestion is the opposite of Michaels and Eleanor Gibson; he applies affordances to cognitive states about actions, whether conscious or unconscious. What allows Fuster to bridge the gap between the actionable environment and the mind is his interest in the cognitive ability to plan the future through language, making the brain "the supreme enabler of both language and affordances." (Fuster 2013, 47)

Similarly, in philosophy of mind, Tom McClelland (2015) and Marco Bernini (2018) have applied affordance theory to introspection to characterize how we explore memories and dreams, similar to scrutinizing a physical environment. This corresponds to an earlier

adoption in literary theory by Nancy Easterlin, who argues that "whether they be descriptive, imagistic, metaphoric, or symbolic… humans narrativize… only in an environment rich in affordances… in relation to which knowing is necessary and action is possible." (Easterlin 2012, 193).

Interestingly, all approaches parallel Gibson's only remark on language, namely that "at the highest level, when vocalization becomes speech and manufactured displays become images, pictures, and writing, the affordances of human behavior are staggering." (Gibson 2015, 129) If language is an affordance, might not the words, phrases, and plans in our heads be too? Gibson does not elaborate.

Whatever the case, given the mixed intellectual heritage between Gibson, design theory, and action-oriented interpretations of his theory, it is unsurprising that the use of affordances in literary studies has yet to be coupled with a 21st-century understanding of cognitive mechanisms. However, evolutionary psychology makes this comparison possible in three crucial and as-of-yet unexamined ways.

Firstly, evolutionary psychology emphasizes the role of invariant properties of humans and their environment. Secondly, it offers a theory for how that relationship results in cognitive mechanisms that can intuitively understand affordances. Thirdly, the discipline provides evidence for their existence through cognitive neuroscience.

2.3 Evolutionary Psychology

Cognitive scientist Roger Shepard (1929-2022) was the first to extend Gibson's theory of environmental invariants to the evolution of the mind. Shepard argues that Gibson's

dismissal of stimuli that are not physically present neglects the fact that invariants can become internalized.

While Gibson focuses exclusively on affordances at hand, on what one can immediately perceive, Shepard suggests that animals must also have evolved to perceive affordances in the *absence* of stimuli. He writes that "although I agree with Gibson that the brain has evolved to extract invariants under favorable conditions, I also presume that it has evolved to serve the organism under less favorable conditions of nighttime, obstructed, and spatially or temporally limited viewing and, even, of structural damage to the brain itself." (Shepard 1984, 419)

For instance, animals kept in laboratories with constant illumination their entire lives maintain a circadian rhythm, suggesting that "the external constraints that have been most invariant throughout evolution have become most deeply internalized." (Shepard 1984, 422)

Moreover, Shepard's experiments with mental rotations, where human participants imagine the translations, rotations, and dilations of shapes, show that even internal representations are constrained by three-dimensional Euclidean space. We can only imagine a shape from one viewpoint at a time, and different viewpoints must integrate correctly before they can be effectively related. Shepard, therefore, concludes that "we are beginning to discover that humans have internalized the invariant principles of kinematic geometry." (Shepard 1984, 442) [7]

Although these observations anticipate Fuster, Bernini, and McClelland who also emphasize the affordances of internal representations, like imagination and planning,

[7] These data anticipate contemporary studies by Dehaene et al. on geometrical primitives, which will be discussed in Chapter 3.

Shephard arrives at his conclusions by emphasizing Gibson's theory of invariants. Specifically, he bridges cognitive science with affordances by pointing to "our ability to take account of events with which we are not in physical interaction." (Shepard 1984, 441)[8]

The critical point is not that the mind can plan what actions to take but that this ability hinges on the internalization, over evolutionary time, of environmental constraints, i.e., invariants. Evolutionary psychology, elaborated since the 1990s, follows a similar trajectory.

Gibson's notion of invariants is equivalent to Tooby and Cosmides' suggestion that the mind mirrors our ancestors' environment. These two theories differ because evolutionary psychology is about how evolution shaped the mind, which Gibson dismisses as irrelevant. However, both schools share Gibson's foundational principle that "that to perceive the world is to coperceive oneself." (Gibson 2015, 133) In evolutionary psychology, this contemporary perspective on relationality is captured by reference to 'the environment of evolutionary adaptedness' which is another way to describe how affordances arise from "the problems hunter-gatherers had to solve and the conditions under which they solved them." (Cosmides and Tooby 2005, 22) Specifically, evolutionary psychology emphasizes the impact of natural selection on the mind during the roughly 2 million years that our ancestors lived as Pleistocene hunter-gatherers. Yet, evolutionary psychology is as much about what is "ecologically rational." (Cosmides and Tooby 2005, 23) The so-called 'visual cliff experiment' will bear out this comparison to Gibson.

[8] This point has some similarity to the 'enactivist' view of cognition by Alva Noë. See footnote 18.

The visual cliff consists of a large, raised sheet of Plexiglass that babies are encouraged to crawl over. There is a cloth directly underneath, but at one point, it drops a few feet so that it looks like they are nearing an edge with a steep and dangerous drop. Babies exhibit fear and refuse to proceed.

Gibson cites this experiment to argue for "an innate capacity to notice [the affordance of] falling-off places in terrestrial animals." (Gibson 2015, 151)[9] That is, Gibson posits an intuition for noticing falls. He just frames it through a bodily response, not a cognitive adaptation.

However, perceiving the injurious physical affordance perfectly parallels the thesis from evolutionary psychology that our species has evolved instinctive *cognitive* responses to "the statistical distribution of past situations that our ancestors actually encountered over evolutionary time." (Cosmides and Tooby 1994, 90) An invariant feature of the ancestral environment caused the evolution of cognitive mechanisms to detect the injurious affordance of falling.

Instead, what separates the disciplines is a preoccupation with Shepard's notion that an external invariant has been internalized. According to evolutionary psychology, the baby on the visual cliff *does not need to fall* to learn that the cliff is dangerous.[10] Infants rely on an evolved cognitive mechanism that immediately recognizes the injurious affordance, causing the fear of falling.

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[9] Eleanor Gibson devised the experiment to demonstrate depth perception, but James Gibson disagreed and used it to demonstrate the perception of the affordance of falling.

[10] Further experiments have demonstrated that the aversion to moving over the cliff is associated with the onset of locomotion since babies that cannot crawl are not afraid to be near the edge, see Campos et al. 1992.

Several studies have demonstrated the existence of many other cognitive mechanisms that facilitate the intuitive understanding of what to do, i.e., recognize an affordance. For example, the ways humans accurately detect cheaters in social exchanges "do not map onto the rules of inference of the propositional calculus." (Cosmides and Tooby 1994, 98) Similarly, "game theoretic analyses of conditional helping show that programs designed for logical reasoning would be poorly designed for detecting cheaters in social exchange and vice versa." (Cosmides and Tooby 2005, 18) In short, neither experience nor logic can explain the sophistication of many cognitive mechanisms.

The human mind must have evolved to assume specific characteristics of the world will exist, from knowledge about edges and falls to the patterns of social exchange. In effect, "embedded in the programming structure of our minds are, in effect, a set of assumptions about the nature of the human world we will meet during our lives." (Cosmides and Tooby 1992, 89) The difference between evolutionary psychology and affordance theory is, therefore, not an emphasis on the mind *over* the environment. Instead, the evolutionary position emphasizes the ancestral environment, which includes other humans. It is only from this starting point that the mind is studied. Hence, affordance theory and evolutionary psychology are two disciplines that are profoundly engaged with invariant properties of the environment. In many ways, their methodologies are also comparable.

The prevailing view in ecological psychology is the legacy of Gibson that affordances are real, ontological entities. Turvey, Shaw, Reed, and Mace's definition from 1981 is the most influential: "there are ecological laws relating organisms to the affordances of the

environment." (Turvey et al. 1981, 237) Like in the visual cliff example, this means that affordances are intrinsic properties of the environment that, in tandem with an organism, act as causal dispositions[11] that "never fail to be actualized when conjoined with suitable circumstances." (Turvey 1992, 178) A fall will happen if there is no Plexiglass to protect. Hence, "the task of ecological science is… the empirical delineation of affordances." (Turvey et al. 1981, 265)

Evolutionary psychology proceeds along a similar route where "a major part of adaptationist analysis involves sifting for these environmental or organismic regularities or invariances." (Cosmides and Tooby 1994, 99) In this discipline, uncovering these regularities depends on a multidisciplinary approach: "Evolutionary biology and hunter-gatherer studies supply definitions of the recurrent adaptive problems humans faced during their evolution, and cognitive psychology describes the information-processing mechanisms that evolved to solve them." (Cosmides and Tooby 1992, 64) So despite the emphasis on the mind, it is essential to recognize the directionality: evolutionary psychology is a study of how "the enduring structure of ancestral environments caused the design of psychological adaptations." (Cosmides and Tooby 1992, 72)

This gives a new evolutionary perspective on Gibson's claim that 'to perceive the world is to coperceive oneself.' Perceiving one's environment is to coperceive our species'

[11] Note that some dissent to defining affordances as dispositions, suggesting it implies a physically mediated reality not found in Gibson's insistent dismissal of "physical physics" (Gibson 2015, 130)

evolutionary history.[12] Emphasizing the (ancestral) environment also reintroduces the point that affordances depend on offerings and limitations.

Whether in a strictly ecological or an evolutionary framework, affordances are actual dispositions and properties of self and environment. But their existence is limited by evolution and environmental constraints.

From an evolutionary perspective, affordances are not something people learn but a sign that the mind has cognitive mechanisms that intuitively understand specific affordances. Like infants on plexiglass, we all fear the risk of falling.

I will introduce this perspective into the discussion of affordances in a literary context, specifically the viewpoint from evolutionary psychology that "instead of all mental content being a social product; in many cases the causality is reversed. The evolved structure of the mind itself imposes content on the social world." (Cosmides and Tooby 1994, 108) I will argue that this new directionality, starting from the evolved nature of the mind, is the only way to explain how and why an object, like a piece of literature, can have inherent meaning. Indeed, only appeal to cognitive or physical limitations can explain Gibson's fundamental point that affordances 'possesses meaning and value to begin with.'

My approach contrasts with the instrumental view of affordances. So far, scholars like Cave and Levine have exclusively defined affordances as unending *offerings*. Here, affordances develop the mind, enabling people to understand what they otherwise could not.

[12] Cosmides and Tooby phrase it thus: "there has been the evolution of a mesh between the principles of the mind and the regularities of the world, such that our minds reflect many properties of the world." (Cosmides and Tooby 1994, 99) They are paraphrasing Shepard whose analysis was the first to make this connection.

Sonnets afford an understanding of romance and tragedies of suffering. In the next section, I will suggest how the instrumental view betrays a blank slate view of the mind, which is at odds with affordances as evolved intuitions. In that Lockean heritage, the mind is neither constrained nor rich in cognitive mechanisms. Instead, it is blank and needs culture to augment it.

2.4 Affordances and the Intuitive Mind

I have proposed that literary scholars consider affordances in light of cognitive mechanisms. Because invariants are caused by evolution, the perception of affordances depends on the mind's evolved sense-making capacities in the form of cognitive mechanisms. This reversed causality suggests that the intuitive understanding of affordances reflects the mind's design. Despite the novelty of this analytical position, it is essential to note that it parallels Gibson's methodology. As explained above, physical 'Gibsonian' affordances also exist because invariants simultaneously point to self and object, allowing immediate recognition. I have applied these same principles to the mind in light of evolutionary psychology.

However, this reversed directionality also challenges received notions of the mind, particularly given the prevailing view in the humanities that affordances enable humans to think in new ways. That is, instrumental affordances are associated with learning ideas or behaviors from scratch, as it were. In contrast, the evolutionary view rejects the notion that learning is "the tendency of the general-purpose, equipotential mind to grow… whatever functional information-processing abilities it needs to serve its purposes." (Cosmides and Tooby 2005, 13) Learning is not about developing new instruments. Instead, just like human

organs result from highly specialized evolved designs. The mind has intuitions about what it needs to learn, much like the heart's ability to pump blood or how the liver detoxifies poisons.

Of course, people still learn new information, such that one's cousin always cheats in cards. But this knowledge is based on a cognitive mechanism, like the ability to learn about reciprocity. People are disposed to learn about a range of invariant features consistent across evolutionary time.[13]

Neuropsychology provides compelling evidence for the distinct nature of cognitive mechanisms because their failures can be located with increasing neurological precision. Consider Broca's area on the left frontal lobe, which is the part of the brain concerned with speech production. If a stroke damages it, the person will have an impaired ability to speak but retain the ability to understand language, also called Broca's aphasia. Conversely, suppose the stroke impacts Wernicke's area on the left temporal lobe. In that case, that

[13] Cosmides and Tooby have provided a representative list of these cognitive mechanisms, which they call 'domain-specific' to contrast with the view of the mind as a general problem solver. The number of domain-specific mechanisms grows as cognitive psychologists, neuroscientists and anthropologists learn more about our species: "Over the course of their evolution, humans regularly needed to recognize objects, avoid predators, avoid incest, avoid teratogens when pregnant, repair nutritional deficiencies by dietary modification, judge distance, identify plant foods, capture animals, acquire grammar, attend to alarm cries, detect when their children needed assistance, be motivated to make that assistance, avoid contagious disease, acquire a lexicon, be motivated to nurse, select conspecifics as mates, select mates of the opposite sex, select mates of high reproductive value, induce potential mates to choose them, choose productive activities, balance when walking, avoid being bitten by venomous snakes, understand and make tools, avoid needlessly enraging others, interpret social situations correctly, help relatives, decide which foraging efforts have repaid the energy expenditure, perform anticipatory motion computation, inhibit one's mate from conceiving children by another, deter aggression , maintain friendships, navigate, recognize faces, recognize emotions, cooperate, and make effective trade-offs among many of these activities, along with a host of other tasks." (Cosmides and Tooby 1992, 110)

person may speak eloquently in long sentences but not understand what they are saying due to Wernicke's aphasia.

Other specific impairments can ruin the ability to use function words like 'or' and 'the' but not impact the ability to read out loud nouns like 'ship' and 'harvest.' This damage suggests that the brain has evolved distinct mechanisms for learning about objects that are not damaged when other grammatic abilities are lost. The point is that "if the mind consisted of a domain-general knowledge acquisition system, narrow impairments of this kind would not be possible." (Cosmides and Tooby 2005, 19)

But the notion that humans evolved unique organs is, forgive the pun, more digestible than the similar conclusion that cognition is evolutionary in origin. Moreover, it is necessary to distinguish why a cognitive mechanism evolved and what it can be used for. This is especially relevant in the context of aesthetic affordances.

The arts move quickly. The Impressionism of Claude Monet (1840 – 1926) gave way to the Surrealism of Salvador Dalí (1904-1989) and the Conceptual Art of Damien Hirst (1965). In about one century, aesthetic practices changed from examining the effects of light through delicate daps of oil painting to displaying a dead tiger shark in formaldehyde. In the words of cognitive scientist Dan Sperber, all aesthetic practices "must have been selected because of a preexisting proper domain." (Sperber 1994, 59) From this perspective, any human aesthetic activity can be traced back to a cognitive mechanism, like the evolved fear of heights. That specific capacity may explain the fascination with anything from first-person video games, to 'horror vacui' paintings, to tightrope walking at the circus.

Human aesthetic experiences have a long evolutionary history predating any unique ideals. For instance, in the West, experiences of beauty have been associated with harmony and balance since antiquity, but these components may not be essential to beauty. The point of evolutionary psychology is to explain why every human feels compelled to pay attention to particular objects, resulting in aesthetic experiences, not to delineate the qualities that make anything beautiful. The argument is that aesthetic objects reveal the nature of the human mind.[14]

This approach disrupts the conventional divide between learning and evolution. In the words of Cosmides and Tooby, "evolved learning programs were organized by evolution to learn some things and not others." (Cosmides and Tooby 2005, 31) Hence, two radical implications of the evolutionary perspective on cognition are that the mind is not a blank slate and that the environment is not a repository of human-made tools necessary for its development and acculturation. This departs from the instrumental view of affordances.

The prevalent view of affordance theory in literature is that texts afford new thoughts and behaviors. The value and uses of literature are discoveries. Hence, the sonnet affords a unique perspective on romantic love. On this view, the mind grows through its use of external objects. Understanding something is not a question of intuition but a matter of filling a gap in knowledge. This perspective, therefore, privileges the role of objects in cognition through approaches that can be broadly classified as 'embodied.'

[14] Similar to my appeal to evolutionary psychology, neuroscientist Semir Zeki, who is a leader in the field of neuroaesthetics, reformulates Clive Bell's theory of 'significant form' (1914) into a question of "what neural mechanisms or significant configurations are common to all humans, irrespective of culture and upbringing." (Zeki 2013, 12)

2.5 Embodied Cognition

In the years after his death, Gibson's affordance theory inspired the notion that the *relationship* between the body and the environment should be paramount to how humans make sense of the world. His theory was stripped of its outdated view of perception, and in its place emerged what is today called 'embodied cognition.'[15]

This cognitive theory has inspired many productive literary theories. For instance, Guillemette Bolens argues for "a methodology attentive to perceptual simulations" as much as literal meaning (Bolens 2018, 95). If cognition works through the body, then it is not enough to consider the literal meaning but also animated minutiae, such as how Don Quixote falls to the ground when he attacks the windmills. So, I want to specify that I am not criticizing all literary theories of embodied cognition; this field is growing with many unique theories.[16] Rather, I am concerned with what is lost about affordances in a literary context when there is an unaddressed commitment to embodied cognition. Specifically, I want to invite consideration of the fact that embodied cognition limits affordances to instruments and loses sight of the role of invariants and intuition.

Embodied cognition proposes that thinking occurs in the *interaction* between the mind and the features of an environment. According to the American Psychological Association, it is "the thesis that the human mind is largely determined by the structures of

[15] The connection between Gibson's affordance theory and embodied cognition is widely recognized, e.g., in the *Encyclopedia of the Sciences of Learning* (2012). Elsewhere Adenzato and Garbarini write: "one historical antecedent of the modern paradigm of embodied cognition is undoubtedly the concept of affordance." (Adenzato and Garbarini 2012, 1114)

[16] See Caracciolo and Kukkonen 2021 and Zunshine 2020.

the human body… and its interactions with the physical environment." (American Psychological Association 2022) One example concerns the significance of the physical world for language comprehension.

Cognitive linguist George Lakoff and philosopher Mark Johnson (1980) famously suggested that conceptual metaphors are rooted in aspects of the environment. For instance, in the phrase 'life is rough,' the sensory experience of rough surfaces should ground our understanding of the abstract concept. By 2012, neuroscientists found preliminary evidence that "metaphor processing selectively activated sensory areas in the modality from which the metaphors primarily derived their meaning." (Lacey 2012, 418) Psychologist Lawrence Barsalou, who is another authority in this field, therefore, argues that "grounding is at least somewhat involved in higher cognition." (Barsalou 2010, 719) [17]

From this perspective, external objects facilitate thought, making cognition *situated, grounded, distributed,* or *extended* into the environment.[18] This emphasis on the mind's reliance on tools separates embodied cognition from evolutionary psychology.

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[17] Barsalou uses the term 'grounding' to indicate that embodied cognition is not only about the body but equally about the physical and social environment: "''Grounded cognition'' captures the broad scope of grounding mechanisms, while not placing undue emphasis on the body." (Barsalou 2010, 721) This corresponds to the definition of 'embodied cognition' that I have cited from the American Psychological Association.

[18] A fourth view usually associated with extended cognition is called *enactive*. I will not consider this here because its phenomenological slant is at odds with Gibson's abolishment of dualism. Superficially, enactivism trails Gibson, however, by suggesting that "the rules of sensorimotor dependence that mediate our relation to our immediate environment." (Noë 2002, 10) However, the two views differ in their reliance on Gestalt theory. Enactivism follows the Gestalt emphasis on form over individual properties to the point that one can "experience as perceptually present something which is, in fact, hidden from view." (Noë 2002, 9) For instance, seeing the ears of a cat behind a short fence would constitute perceiving the cat. To cite *The Stanford Encyclopedia of Philosophy,* by emphasizing the experience of the presence of objects over the actionable affordances of an environment, "enactivism focuses on explaining the intentionality and phenomenology of perceptual

From a broad perspective, the views overlap because "everyone is also an environmentalist." (Cosmides and Tooby 2005, 32). In the words of linguist James Carney, the views are even similar if 'embodied' refers to the evolutionary fact that it will benefit an organism "if a regularity in the environment can be depended on to perform computational or inferential work." (Carney 2002, 2) However, embodied cognition is not about invariants or intuitive understanding.

The crucial difference is that theories of embodiment, in the words of ecological psychologist Harry Heft, argue that "when cognition is distributed across an individual, and a tool, artifact, or a representation, what operations the individual employs differ from those operations the individual uses when functioning in their absence." (Heft 2003, 357) In short, the environment augments thought and alters it from what it would have been otherwise. Philosopher Andy Clark, who has proposed the so-called 'extended mind thesis,' provides the example of an Alzheimer's patient whose reliance on a calendar aids their memory. The cognitive function would not exist in the tool's absence, prompting the claim that "certain aspects of the external world, in short, may be so integral to our cognitive routines as to count as *part of the cognitive machinery itself* [sic]." (Clark 1998, 274) Similarly, Heft proposes that "map-reading is a person-environment process, an act of distributed cognition." (Heft 2003, 357)

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experiences in particular." (Shapiro 2022) Thus the enactivist view deviates from Gibson's rejection of phenomenology for amodal perception and implies that "the vast majority of perceptual states are mixed perception/mental imagery cases." (Nanay 2018, 9) In fact, this is why Gibson ultimately rejects Gestalt theory for not leaving behind a "pernicious" duality on account of phenomenology (Gibson 2015, 130)

These statements are appealing. Who would deny that a map or diary allows us to navigate what would otherwise be nearly impossible? Instead, the difference with evolutionary psychology and, by implication with, my theory of aesthetic affordances is the offshoot. On the embodied view of cognition, "the external or bodily operations are themselves usefully seen as performing cognitive or information-processing operations." (Clark 1998, 269) In short, cognition is not bounded by the brain but also occurs externally.

Critics of this idea, like philosophers Fred Adams and Ken Aizawa, argue that an embodied view confounds cognitive and information processes: "just because a process Y interacts with a cognitive process does not mean that Y is itself also a (part of a) cognitive process." (Adams and Aizawa 2010, ix) In short, a calendar offers information, but only the mind thinks. I agree. There is minimal evidence that cognition extends into the environment compared to the ever-accumulating research about internal brain-bound processes, from the earliest studies of neurological damage in 1952[19] to the cutting-edge development of brain organoids via stem cell research.[20]

Moreover, a demonstrable lack of conceptual standardization hinders research on embodied cognition. Although the concept features in thousands of articles, a scientific review from 2016 concludes that it remains "vaguely defined." (Goldinger et al. 2016, 960) Like affordance theory, it has become something of a jack-of-all-trades-concept that spills over into the humanities.

[19] Squire 2009.

[20] Shou, Y. et al. 2020.

For instance, Katherine Hayles introduces the term ‘cognitive assemblages’ to indicate that “nonconscious cognitions in biological organisms and technical systems share certain *structural* and *functional* similarities.” (Hayles 2017, 13) Akin to Clark’s calendar and Heft’s map, the argument is that instruments, in this case, financial markets and autonomous drones, become entangled with the mind. Hayles cautions against this cognitive interdependence by citing the collapse of the stock market and warfare. The argument mirrors the view of affordances advanced by Terrence Cave and Caroline Levine: for better or worse, human cognition is augmented *by* affordances.

The claim that cognition involves external objects on a par with the mind stems from the idea that “the human species evolved against a background of cultural processes and artifacts already in place.” (Heft 2003, 333) In other words, tools impacted human evolution, and therefore cognition is already extended into the environment. Examples include stone toolmaking by our ancestors *Homo habilis* from 2.5 to 1.5 million years ago and that chimpanzees seem to transmit techniques for using specific tools. According to this view, the cognitive development of an individual depends on learning how to use particular tools: “cultural and biological processes are functionally intertwined, as individuals' experiences in a particular cultural setting "finishes" them into encultured human beings with specific qualities.” (Heft 2003, 334) Without advanced tools for hunting, for instance, humans would never have formed the societies we know today. Clark’s claims rest on the same assumption, namely that “external props and aids (laptops, filofaxes, texts, compasses, maps, slide-rules, etc.) … offset cognitive limitations built into the basic biological system.” (Clark 1998, 274)

Therefore, the embodied view, whether via Clark, Heft, or Barsalou, assumes that the mind is a blank slate, limited by its raw state. It is a conceptual position that, to cite Clark, "is demanded by the very ideas of knowledge acquisition and information-gathering." (Clark 1998, 268) However, need we conceive of the mind in this way?

If humans are born completely bare, cognitively speaking, then it is intuitively compelling, even necessary, that external objects should augment thought. In the words of one famous proponent of this view, anthropologist Clifford Geertz, "man's behavior would be virtually ungovernable, a mere chaos of pointless acts and exploding emotions." (Heft 2003, 334)[21] Moreover, "incorporating tools, artifacts, and representations into an account of cognitive functioning" solves a paradox of cognitive development by suggesting that skills, not present at birth, are aided by cultural objects (Heft 2003, 357).

The Elizabethan sonnet, in Terence Cave's example, is tantamount to how "the effects afforded by human cultural evolution can be viewed as the expression of 'extended mind.'" (Cave 2018, 52) Affordances are taught by others and passed down by generations.[22] In so, they help the blank mind to think in ways that would otherwise be impossible. Affordances make cultural practices and social norms possible (in direct opposition to the view from evolutionary psychology) by becoming "instruments of cultural

[21] This is also called the 'Incompleteness Thesis' – humans are born incomplete and need culture to replete them cognitively. See Miller 1999.

[22] Heft explains that a tool's "affordance should be easily perceived. Thus, through the availability of artifacts, an individual is the beneficiary of discoveries and the implementation of these discoveries made by countless others…The results of our predecessors' efforts enable us to function in our contemporary world in ways that would otherwise be difficult, if not impossible." (Heft 2003, 343)

evolution." (Cave 2018, 62) Hence, this conception of affordances as instruments assumes a blank slate of the mind.

Since John Locke, the empiricist *tabula rasa* has held sway. This is not a debate that I can settle here.[23] Instead, I caution against a default connection between affordances, embodiment, and a blank slate view of the mind.

The critical Gibsonian notion of invariants that are immediately and preverbally understood is at odds with any view where affordances augment thought. Specifically, the problem with the instrumental view is a reintroduction of the very dualism, or gap, between the environment and animals that Gibson resisted. It espouses that the mind is like a detached operator hovering above the environment doing things to it.[24] However, Gibson repeatedly rejects the idea that any part of the body exercises control over its parts. He writes that "the perceptual capacities of the organism do not lie in discrete anatomical parts of the body but lie in systems with nested functions." (Gibson 2015, 195) [25] Were it not for

[23] Neither am I the first to remark on the theoretical opposition between embodied cognition and evolutionary psychology. I have cited the most significant, such as Heft, Geertz, Clark (embodied cognition) and Cosmides and Tooby, Sperber (evolutionary psychology). One significant empirical criticism of evolutionary psychology is that "the comparatively short time period over which modern humans evolved (500,000 years by some estimates) makes the natural selection of so many distinct, domain-specific modules of cognition implausible." (Heft 2003, 336) Conversely, the demonstrable existence of many discreet neurological capacities associated with unique cognitive traits, like understanding the intention of others (see Baron-Cohen 1995) or the difference between episodic and semantic memory (see Squire 2009), offer convincing evidence for the evolution of discrete cognitive mechanisms.

[24] In the words of Clark, "the brain is revealed… as the organ of *environmentally situated control* [sic]." (Clark 1998, 268)

[25] Gibson does, however, speak favorably of instruments that facilitate the immediate recognition of affordances, such as "optical instruments [that] merely enhance the information that vision is ready to pick up." (Gibson 2015, 24). However, these instruments

Gibson's rejection of 'the mental,' it would be tempting to compare his emphasis on systems with functions to cognitive mechanisms.

Regardless, Gibson's emphasis on the intuitive, in his words 'innate,' understanding of an invariant is at odds with embodied cognition which purports that affordances, as tools, offset limitations through knowledge acquisition. This is the conventional view of learning, where the mind grows indiscriminately by any means necessary. However, it is the wrong way to think about affordances.

In summary, according to the blank slate view, cognition is explained by appeal to culture or the social customs that augment an otherwise chaotic mind. In this context, affordances play a crucial role as instruments of cultural evolution. On the contrary, in evolutionary psychology, induction is answered by recourse to human biology because of the robust evolutionary mesh between environmental invariants and cognitive mechanisms. This perspective on cognition is more faithful to Gibson because it retains his idea that affordances are intuitive because of invariants. It also offers a more robust framework for examining affordances in literature. I call this move away from instrumentality towards a consideration of the mind's evolved cognitive mechanisms 'aesthetic affordances.'

2.6 An Intuitive Understanding of Literature

I have reframed affordances away from an instrumental view toward the evolved cognitive mechanisms that make understanding them possible. Inspired by evolutionary

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do not impact the existence of affordances. What matters is which "measuring instruments are closer to perception than others." (Gibson 2015, 248)

psychology, I reject the notion that "the social [cultural] world is the cause of the mental organization of adults." (Cosmides and Tooby 1992, 26) Instead, the analysis is reversed from the new vantage point of aesthetic affordances. The point is not what literature makes possible but what the mind makes possible. The mind explains our intuitive understanding of aesthetic affordances. However, what does 'intuition' describe? I want to suggest that the phenomenology of aesthetic experiences begs consideration of unconscious cognitive mechanisms.

Firstly, from an anecdotal perspective, every reader can attest to understanding what a book or film is about but be unable to explain it succinctly. A summary of plot points will not do. Hence, thousands of articles, reviews, and blogs are published yearly – many on the same texts. This speaks to the way the brain works. People reason in ways that are intuitive all the time. Cognitive neuroscience has proved that the unconscious mind has intuitions we cannot verbalize.

Books display a similar divide between conscious and unconscious processes. I can tell you that the poem *We're Extremely Fortunate* by Wislawa Szymborska means something to me, but it is much harder to define what. It says that we are fortunate not to know the world we live in because if we did, we would realize that all our customs are "a symptom of lunacy." (Szymborska 1998, 258) So, I can say it is comical and wry but also heartbreaking. Still, there is a sense that these words cannot convey the lines' meaning. This dynamic is captured by what I explained about affordances and the intuitive mind; the poem is immediately meaningful to me.

Empirical data about reader responses indicate the same divide between verbal explanation and intuitive understanding. Researchers from the Max Planck Institute for Empirical Aesthetics have compared the responses to literature, visual arts, and music from thousands of individuals in Germany, Finland, and Holland across four separate studies. When people have to evaluate, that is, consciously define, the appeal of an aesthetic experience, the overwhelming majority cite "the concept of beauty." (Knoop 2016, 45) However, what does that mean? It designates a positive, probably meaningful experience, but precisely what is unknown or has not been measured.

This is in itself nothing new. Literary scholars working on trauma or in the psychoanalytical tradition have devoted decades to what the unconscious mind brings to the act of reading and literature. In a sense, the intuitive understanding of affordances falls into this category. The mind can understand literature without conscious awareness. But through recourse to cognitive neuroscience, it is possible to think about how in new ways. For what exactly could be happening in the brain?

Cosmides and Tooby have hypothesized that humans have evolved to seek out aesthetic experiences. This would make aesthetics yet another specialized cognitive mechanism, evolved in response to invariant conditions, specifically the existence of other humans sharing valuable information. Given the recurrent tendency to learn from the experiences of others, over millions of generations, humans could have developed an intuition for storytelling "that mimics the format in which experienced events are mentally represented… to extract meaning." (Cosmides and Tooby 2001, 24). This mechanism could explain the universal tendency to seek out fictional experiences. The practice is all the more

strange given how attentive humans are to truth and falsehood in almost every other situation.

Cosmides and Tooby, therefore, suggest that engaging in fiction must be designed to give people a conscious sense of pleasure. At the same time, our minds unconsciously extract meaningful information, that is, learn from others. For instance, while one consciously enjoys watching hours of *Game of Thrones* or is enthralled by volumes of *In Search of Lost Time,* the mind stores relevant information about coalitional dynamics and loss. It will also disregard irrelevant details, whether supernatural or real. The brain knows not to pay attention to information about dragons or the number of houses in Combray.

So, like anecdotal evidence and empirical studies, evolutionary psychology suggests that literature's meaning or value is striated across unconscious and conscious responses. Crucially, all three views suggest that a text can be intuitively understood in ways the reader cannot consciously articulate or define. In short, aesthetic affordances may be intuitively understood while readers only consciously or verbally can attest to a text's beauty, thrill, or 'je ne sais quoi.' However, can appeal to intuition avoid casting aesthetic affordances into obscurity or guesswork? I will answer this question by outlining my methodology.

2.7 Methodology: How to Find Aesthetic Affordances

Affordances are perceived because cognitive mechanisms are attentive to them. So, finding aesthetic affordances begins with the mind. This starting point is promising because what is known about cognition is only to increase further during the 21st century.

I propose two methods. One starts with a known cognitive mechanism and asks how a text might trigger it. The other begins with what is intuitively meaningful about a text and questioning how a specific cognitive mechanism may explain that understanding.[26]

Considering the latter, no one will fail the answer if I ask why Oedipus is disgusted with himself. When the shepherd reveals that he never killed him as a baby and thus prevent the incestuous prophecy from coming true, readers cry out with Oedipus: "…son of the mother I defiled / coupling in my father's bed, spawning lives in the loins / that spawned my wretched life." (Sophocles 1984, 1494-96) Whether Greek or American, living in 400 BC or 2400, I venture that everyone will immediately understand the horror. However, why does *Oedipus Rex* offer this intuitive understanding?

Freud suggested that the text spoke to "our first sexual impulse towards our mother and our first hatred and our first murderous wish against our father." (Freud 1955, 280) The intuitive horror of the situation is facing those unspeakable desires.

From an evolutionary perspective, there is overwhelming evidence of the detrimental effects of incest on the healthy development of humans. Cosmides and Tooby have documented the cognitive mechanism of incest avoidance resulting in the intuition that "incestuous sex will simply seem disgusting and wrong." (Cosmides and Tooby 2005, 48). Moreover, just like in the case of the visual cliff or cheater detection, the intuition exists "without individuals having to obtain any knowledge, conscious or otherwise, about the pitfalls of inbreeding." (Cosmides and Tooby 2005, 48) Similarly, this aesthetic affordance

[26] Proceeding this way resonates with Auerbach's *Ansatzpunkt* methodology, where scholars choose an *Ansatz* ('root' or 'approach' in German) from which to study literature, in this case, comparatively. See "Philology and *Weltliteratur*" (1969).

of *Oedipus* is intuitive and does not depend on our life experiences or deliberations. Hence, Sophocles' play is an example of what can be discovered about a cognitive mechanism based on aesthetic affordances, that is, an intuitive understanding.

The second method proceeds from a known cognitive mechanism. Consider the ability to understand the complex relationship between emotions and facial expressions. Simon Baron-Cohen, who is a leading authority on how this cognitive mechanism develops in children, outlines these "languages of the human mind: diagnostic facial-muscle configurations[27] defined by an emotion recognition system that maps the facial expressions of others onto models of their internal states." (Baron-Cohen 1995, xiv) From this methodological point of view, the question is what intuition this cognitive mechanism generates.

For instance, *The Princesse de Clèves* (1678) by Madame de LaFayette is about navigating ambition and love affairs at the French court at a time when a woman's survival hinges on "such a profound capacity for dissimulation that it was difficult to guess her true feelings." (LaFayette 1992, 3) De Clèves' agency is defined by her ability to manage the relationships to her husband and suitors through facial expressions. The plot, in turn, hinges on the deterioration of that skill, which moves from questioning "whether her face had really betrayed some inner turmoil" to "words [that] made Mme de Clèves blush" to being

[27] This 'diagnostic' ability is itself dependent on "a very small number of variables: the size of the pupils, the position of the eyelids, the position of the pupil relative to the sclera, the speed of the eyes' motion, the "focus" of the eyes, and the shape of the eyebrows." (Baron-Cohen 1995, 116) Neurologically, it is "the cells in the amygdala… [that respond] to facial expressions of emotions." (Baron-Cohen 1995, 90-91)

"disturbed… so deeply that she could not conceal her feelings." (LaFayette 1992, 24, 46, 102) The so-called 'theory of mind mechanism' makes Princess de Clèves' silent battle between emotion and facial expression intuitive.

The novel interrogates the 17th-century practice of dissimulation, but it is a cognitive mechanism that explains our intuition for this problem no matter the period we live in. Readers intuitively understand the stales and difficulties of this game.

Moreover, appeal to cognition can also achieve the opposite by explaining why readers do not intuitively understand what a text is about.

Lisa Zunshine has appealed to the theory of mind cognitive mechanism to suggest why many readers struggle to understand Virginia Woolf's novels. In *Mrs. Dalloway* (1925), Woolf embeds seven narratives, but this far surpasses the human ability to track intentional states. Research from evolutionary psychologist Robin Dunbar shows that people's ability to follow intentional states becomes increasingly erroneous at five levels, with up to 60% losing track of who thought what. From this perspective, considering how the cognitive mechanism is challenged might explain why the text is *not* intuitively understood, "we may say that Woolf's writing is difficult or even refuse to continue reading her novels." (Zunshine 2003, 281)

Every aesthetic experience will have intuitions that can be explained by recourse to cognitive mechanisms. Whether starting from an aesthetic affordance and asking what underlies it or commencing with a cognitive mechanism, the methodology aims to reveal how a text can be intuitively understood. Moreover, it also applies to other art forms, like film, paintings, or music. My case studies in the following chapters will consider literature

and film but also show the relevance of aesthetic affordances to sounds. Whatever the medium, aesthetic affordances offer a holistic view. In line with Gibsonian theory and the Gestalt emphasis on form over individual properties, aesthetic affordances designate an 'invariant combination of variables.' For instance, in *The Princesse de Clèves*, many details, such as the princess' clothes and eye color, will only be considered consciously after the affordance has been intuited.

Further, this emphasis is supported by contemporary knowledge about how the unconscious mind acts like a monitoring system, processing a range of impressions but only presenting the 'finished product' to consciousness, such as recognizing a friend, foe, cheater, next of kin, etc. For these reasons, aesthetic affordances designate a complete understanding. As I will show in chapters to come, this is what makes consideration of form all the more productive. Aesthetic affordances are a framework for asking how intuition operates on the total form of a text or film, not a linguistic analysis.

However, given that a text contains several possible meanings, it would be fair to question how cognitive mechanisms can comprehend an entire situation. Moreover, the criticism may go, appeal to cognition does not guarantee that only one intuition exists.

This is a valid point, mainly because it speaks to aspects my theory does not address, such as memory. For instance, two people may intuitively understand *Oedipus* and share the protagonist's horror due to shared cognitive mechanisms, but if one is a victim of incest, their understanding will differ.

Similarly, differences in psychological 'personality types' will also account for variations. There will always be contributing factors that no general theory can account for. However, this does not deny that a common understanding arises *despite* individual

variations and *because* of shared cognitive mechanisms. It is perfectly reasonable to assume that different readers recognize the same aesthetic affordances and have the same intuitive understanding. An example from psycholinguistics can demonstrate this point.

When people communicate, the situation resembles readers perceiving the same aesthetic affordances. It is a question of how evolved cognitive mechanisms ensure different people can have the same intuitive understanding.

Linguist Deidre Wilson and cognitive scientist Dan Sperber have proposed 'relevance theory' to explain how communication arises, given that the words of an utterance usually fall short of their actual meaning. Here, mutual understanding is ensured by how our minds have evolved to respond to 'relevant' cues beyond language.

For example, if your close friend says they 'do not want to talk about' why they are crying, you will either know they want to be left alone or want company. What explains knowing which is what they mean? According to Wilson and Sperber, we correctly understand an utterance because the mind pays attention to contextual cues: "the human cognitive system has developed a variety of mental mechanisms or biases (some innate, others acquired) which tend to allocate attention to inputs with the greatest expected relevance." (Wilson 2017, 5). So, deciding which cues are relevant depends on evolved cognitive mechanisms, such as "the capacity to read emotions from facial and vocal cues." (Wilson 2017, 19) The mind intuitively knows what cues to pay attention to and which to ignore. Our friend's tone of voice is relevant, so might be whether it is midnight or afternoon, and our assessment of how upset they are.

All these decisions are made through cognitive mechanisms, ensuring an intuitive understanding of your friend's words. As Wilson explains, "it is not a matter of first identifying the explicit content, then supplying contextual assumptions… [but] stopping at the first overall interpretation that makes the utterance relevant in the expected way." (Wilson 2017, 11)

Communication between friends relies on the operation of tightly constrained cognitive mechanisms. A similar process occurs when different readers perceive the same aesthetic affordances. It is reasonable to expect many readers to have a similar intuitive understanding of a text when that process depends on evolved cognitive mechanisms. Crucially, my suggestion is that readers will arrive at 'the first overall interpretation' similar to relevance theory. The affordances are immediately apparent.

I have proposed that aesthetic affordances reveal how the mind intuitively understands literature. Affordances work based on invariants, not variables, and can be likened to arriving at a complete understanding of a situation, much like the case in verbal communication.

I have suggested two methodological routes. One starts from an intuitive understanding of a text and then asks how a cognitive mechanism could explain it. The other approach begins with a cognitive mechanism and hypothesizes how it can explain an intuitive understanding.

In the next section, I will elaborate on my claim that aesthetic affordances are intuitive to different people. I will do so by considering how cognitive mechanisms can explain demonstrable variations in aesthetic practices, language, and script.

2.8 Universal Culture

Aesthetic affordances reverse the conventional causal relationship between the mind and culture. I now turn to specific examples of how a theory originating in an evolutionary view of the mind accounts for cultural variation. I also introduce the term 'universal' to indicate that variations can be explained by appeal to cognitive mechanisms that all people share, bar illness and injury.

Evolutionary psychologist Michelle Scalise Sugiyama offers an interesting case study of this phenomenon by studying the responses of the West African Tiv tribe to *Hamlet* (1603). The situation was first recounted in a classic anthropological essay *Shakespeare in the Bush*, by Laura Bohannan (1966), to demonstrate the insurmountable differences between Tiv and Western audiences. For instance, the Tiv ostensibly applaud Claudius for marrying his brother's widow Gertrude. Thus, the classical argument goes, the Tiv do not understand *Hamlet* as intended. They certainly do not have the same intuitive understanding of the text as a British audience does. However, another perspective emerges through an evolved view of the mind.

From the perspective of evolutionary psychology, the Tiv agree with Shakespeare. The only difference is that "The Tiv respond to Hamlet's difficulties by consulting their own cultural map." (Sugiyama 2003, 388). For instance, the Tiv *also* state in their interviews that Claudius deserves punishment. However, Hamlet must appeal to his elders to avenge his father because violence against senior relatives is frowned upon. In short, the Tiv are also against fratricide but interpret the injustice within their cultural context. Due to their levirate customs and strict hierarchy, the way to address revenge differs. However, they are far from

blind to injustice. Similarly, Tiv and Western audiences intuitively understand Hamlet's madness, which the Tiv call 'no longer having any sense.'

Thus, Sugiyama's reinterpretation of the supposed cultural divide suggests no *cognitive* differences in responses to *Hamlet*. Instead, the comparison reveals that there can be variation in the expression of universal cognitive mechanisms. I raise this point because it illustrates that "context-sensitivity affects literary interpretation in the same way it affects literary production." (Sugiyama 2003, 388) A Tiv story about murder, justice, and ghosts will be intuitively understandable to a Western audience once certain local variations are accounted for.

Incidentally, this example shows why some literary scholars limit their appeal to evolution to observable tropes. For instance, Joseph Carroll emphasizes "the central categories of life history... birth, growth, death, and reproduction." (Carroll 2004, 194) Conversely, the scope of aesthetic affordances goes beyond Darwinian themes and into evolutionary *psychology,* where "the causes of the commonality [or universality] can be identified." (Cosmides and Tooby 1992, 117)

In any case, variations in local responses can and do reveal a universal intuition for anything from injustice to the supernatural. The reason is that, though universal, cognitive mechanisms have evolved to be adaptive to any local context because natural selection cannot predict where one individual will be born. Consider the case of language acquisition.

The initial adaptive problem associated with the evolution of language was how to communicate successfully. According to the psycholinguistic theory associated with Noam Chomsky and Steven Pinker, humans evolved a cognitive mechanism called 'universal

grammar,' which is "the universal plan underlying languages, with auxiliaries and inversion rules, nouns and verbs, subjects and objects, phrases, and clauses, case and agreement, and so on." (Pinker 2007, 32) As a result, infants develop grammatical rules that far outstrip what experience could teach them, such as "a list of constraints on the hypothesis space of potential human grammars." (Cosmides and Tooby 1994, 93). Developmentally, there is insufficient time to explain how quickly infants understand when to use cases for nouns, for example, particularly in deprived contexts.

Consider the deaf and mute children in Nicaragua who were raised without adult signers in the 1970s and developed a pidgin, a simplified mode of communication with gestures and circumlocution. When their younger friends observed this basic means of signing, they spontaneously "standardized" the makeshift sign rules and "introduced many grammatical devices," which resulted in an expressive and precise sign language which today is called Idioma de Signos Nicaraguënse (ISN), or Nicaraguan Sign Language (NSL). (Pinker 2007, 25) Grammar reliably developed within one generation. Similarly, studies of Hawaiian Creole in the 1890s show the same pattern. The first generation of immigrant workers to Hawaii created a pidgin combining their native languages, Chinese, Japanese, Portuguese, Spanish, Korean, and Tagalog. Nevertheless, their children, the first generation to listen to this pidgin, formed a standardized language, Hawaiian Creole: "the children injected grammatical complexity where none existed before, resulting in a brand-new, richly expressive language." (Pinker 2007, 21)

Even in the most extreme circumstances, where children are deprived of formal language education, the cognitive mechanism for universal and culturally sensitive grammar manifests. Crucial for my theory of aesthetic affordances, these examples demonstrate that

appeal to universality does not suppose that all cultures are the same but that cognitive mechanisms can ground variation. The same can be shown by considering the universal foundation for the global variation in script.

Stanislas Dehaene is an authority on the cognitive neuroscience of reading, writing, and mathematics. His 'neuronal recycling hypothesis' describes how universal cognitive mechanisms, often shared with other primates, can be repurposed to fit the demands of a local context. In the case of script, humans were able to develop the cultural practice of reading and writing because of "visual pathways for invariant object recognition present in all primates." (Dehaene 2003, 4872-4873) An evolved cognitive mechanism is 'recycled' for a different purpose, namely recognizing scripts instead of leaves and stones, etc. This mechanism relies on the left ventral occipitotemporal regions that process visual word recognition, which is then connected with further left hemisphere areas in the temporal and frontal lobes that encode pronunciation and meaning. I will emphasize the first relationship between the universal objection recognition mechanism and local script variations for simplicity.

According to the neuronal recycling hypothesis, "human brain architecture obeys strong genetic constraints, but some circuits have evolved to tolerate a fringe of variability," which allows the child's brain in the early stages of its development to remain open to changes in the environment, for instance, to recognize alphabetic letters instead of Chinese script (Dehaene 2003, 149-150).

As a result, a fluent Chinese reader instantly differentiates the signs for *not yet* [未] from *end* [末]. Similarly, a reader of English knows to disregard visual *ChAnGes* in capital

letters but will amplify minor differences between *s* and *e* in *eight* and *sight*. The cultural context, what people learn, impacts when the visual system "neglects irrelevant variations in character shape, even if they are huge, but amplifies relevant differences, even if they are tiny." (Dehaene 2003, 327-28). However, the universal cognitive mechanism can be identified for any script *and* explain the variation. This principle is also evidenced by how these evolved neurological functions "put a limit on acceptable writing systems." (Dehaene 2003, 4873) For instance, all scripts are written on a contrasting background, like black on white, to optimize the ratio of the transmission of visual information by the retina to visual fixation, i.e., maintaining our gaze at one point. Moreover, all writing systems rely on basic shapes that can vary significantly in size but minimally in rotation because our visual neurons only tolerate about 40 degrees before they cease to respond to an object.[28] In a sense, scripts demonstrate the need for any local, variable practice to be easily learnable by the brain we all share.

The examples from language and script show that the explanatory force of universal cognitive mechanisms applies fully to local variations. It also challenges the conceived notion, addressed previously, that the mind is chaotic and needs culture to organize it. The direction is reversed. Everything around us reveals the nature of the human mind.

The conclusion extends to every facet of our lives. For instance, humans are highly aware of their religious beliefs. Attributing agency to a supernatural being is always an

[28] "A few neurons, however, are more abstract and react to an object regardless of its position in space." (Dehaene 2003, 2016). To Dehaene, these are not the neurons responsive to script, and their scarcity reveals the reason why script writing, as a practice, does not condone excessive rotations of characters or letters.

explicit assumption about the nature of the world, unlike the beliefs that automatically attribute agency to humans. To cite cognitive anthropologist Pascal Boyer, "belief in supernatural agents… is a high-level, conscious and meta-representational state." (Boyer 2003, 123) Therefore, there are cognitive commonalities to how a religious belief is formed: it is based on intuitive notions of agency, associated with the theory of mind mechanism, but is always explicitly held; people *know* what they believe in. However, the diversity of religions provides the impetus for understanding the mind.

Evolved cognitive mechanisms, therefore, explain both variation and universality. It is what leads to the conclusion that "given that cultural ideas are absorbed via learning and inference—which is caused by evolved programs of some kind—a behavior can be, at one and the same time, cultural, learned, and evolved." (Cosmides and Tooby 2005, 32) [29] This is what makes an evolutionary approach to literary scholarship all the more relevant. Aesthetic affordances can fruitfully examine how universal cognitive mechanisms enable an intuitive understanding of all kinds of literature.

[29] This point is often mischaracterized. For instance, archeologist Lambros Malafouris will dismiss evolved cognitive mechanisms using an argument that is entirely commensurate with evolutionary psychology: "This means that interaction elicited by our surroundings (human or nonhuman) not only influences our cognitive abilities and affective responses from the very beginning but also shapes the form and the constitutive mechanisms of interaction." (Malafouris 2013, 39) This claim is no different from the views of Cosmides and Tooby about the co-evolution of environment and cognition. Similarly, Chemero (who elsewhere equates affordances with selective pressures) believes that an evolved, functional view of the brain means that "you deny that perceptual systems are highly plastic." (Chemero 2011, 191) However, this criticism is only valid if the evolved mind is assumed to be like a general-purpose problem solver, which would need to adapt to different (cognitive) tasks. As shown above, an evolutionary perspective on the mind has plasticity built into it through recourse to domain-specific evolved cognitive mechanisms, such as intention detection and incest avoidance.

Aesthetic affordances, based on universal cognitive mechanisms, also fall into a universalist *literary* tradition. These approaches are not necessarily cognitive, but, like my theory, they bridge or challenge the supposed gap between universality and variation ('culture').

For instance, Patrick Colm Hogan posits 'literary universals' which are universal plots and formal devices, such as the love story and alliteration. His point is not to nullify cultural differences but to ponder why universals exist. From this analytical perspective, "it is in fact, highly surprising that verbal art is produced in small nomadic groups as well as in vast, highly urbanized nations." (Hogan 1997, 231) Similarly, H. Porter Abbott (2000) hypothesizes that narrative, as form, is a distinct cognitive mechanism, which explains the human propensity for storytelling.

From a postcolonial perspective, Kwame Anthony Appiah's concept of 'cosmopolitanism' bridges divisions due to cultural differences. Appiah appeals to the universal capacity for imaginative thinking[30] to challenge the divide between 'own' and 'foreign' cultural artifacts and ensuing battles over appropriation and ownership. He points out that the ability to connect with any piece of art is always imaginative, "the connection through a local identity is as imaginary as the connection through humanity." (Appiah 2007, 135)

Thus, the universalist tradition challenges many entrenched notions of difference and hierarchy. My theory uproots the supposed opposition between culture and evolution.

[30] In cognitive terms, this capacity for imaginative engagement rests mainly on the theory of mind mechanism.

Universalist strategies are not primarily for assessing literature as ideological instruments because the aim is to understand commonalities. Moreover, when they are used 'politically,' the question is examined in reverse, starting from the universal. As Appiah's cosmopolitanism shows, this can have surprising consequences. By emphasizing the universal imaginative connection to all art, he reveals that framing art as own or foreign betrays the impact of intellectual property rights on all aspects of contemporary postcolonial thought.

Similarly, the theory of aesthetic affordances can also address ideological questions surrounding literature's political role. However, those debates will emanate from analyzing universal cognitive mechanisms, specifically how form engages the mind. In contrast, the instrumental view of affordances that I have challenged starts with an ideological concern, endowing a text with a meaning from the outside.

For example, Levine suggests that Elizabeth Barrett Browning's *Crowned and Wedded* criticizes the institution of the monarchy through affordances. Contrasting rhythmic structures indicate that Queen Victoria is both a woman in love and sovereign, so Levine traces the "affordance… for institutional routines to be interrupted." (Levine 2017, 94) However, this frames affordances as tools of ideology.[31] Why our minds should be universally attuned to rhythm in the first place and how that impacts the intuitive understanding of affordances is ignored. I would argue that this universal question should be

[31] In this respect, Levine's approach to rhythm has similarities to Henri Lefebvre's 'rhythmanalysis' of how "everyday life remains shot through and traversed by great cosmic and vital rhythms," creating diverse relations from the organizing measure of the working day to music and ocean sounds. (Lefebvre 2014, 73)

the starting point for examining any possible ideological import, much like Appiah's strategy – an issue I will address in my analysis of Virginia Woolf's wartime writing in Chapter 3.

2.9 A New Theoretical Framework

In this chapter, I have presented the theoretical considerations that lead me to formulate my theory of aesthetic affordances to address how cognitive mechanisms enable an intuitive understanding of literature. It is a continuation of the Freudian tradition and a break with it. Analyzing the impact of sense-making mechanisms operating outside conscious awareness continues this legacy by introducing a 21st-century perspective from cognitive neuroscience. Conversely, emphasizing an intuitive understanding of literature by grasping aesthetic affordances moves away from a language of sign and signifier.

Instead, the theory analyzes how meaning is inherent to a text and indicative of cognitive mechanisms. I emphasize Gibson's concept of invariants as the hallmark of affordance theory, which I read through evolutionary psychology. This disciplinary and theoretical combination defines perceiving an affordance as an intuitive process independent of conscious deliberation.

As methodology, I have proposed that analyzing aesthetic affordances proceeds from considering what is intuitively meaningful and then exploring what cognitive mechanisms could explain that understanding. I have also suggested a complementary method, which asks how specific cognitive mechanisms facilitate an intuitive understanding of literature. The two approaches reflect that the theory reveals both how readers intuit affordances and how texts leverage the role of cognitive mechanisms.

In the chapters to come, I will apply this new conceptual framework by analyzing the aesthetic affordances of Virginia Woolf and Lettrism. This will demonstrate the two methodologies and build on the topics raised in this chapter. Specifically, I shall analyze the intuitive way readers can understand Woolf's novel *Between the Acts* because of its rhythmic structure. I isolated this aesthetic affordance because it is central to the book's meaning *and* matches a known cognitive mechanism for rhythm perception. The analysis will elaborate on how rhythm facilitates an intuitive understanding of the text. Moreover, I will explore how Woolf's decision to use rhythm as a central organizing device suggests a cognitive foundation for the novel's intended ideological function amid World War II.

The chapter on Lettrism proceeds from the alternative methodology. Here, I am interested in how the cognitive mechanism for shape recognition might facilitate an intuitive understanding of their cinema. This, therefore, extends aesthetic affordances from the written word to a visual practice. Because of the theory's appeal to universal cognitive capacities, this extension should only add to its credibility. Moreover, studying the Lettrists offers another perspective on how even intentionally senseless aesthetics can have affordances. Specifically, this tension will enable a cognitive view on co-option and how an art form might avoid a reduction to instrumentality and insist on 'art for art's sake' by appealing to intuitive mechanisms.

These case studies present how singular aesthetic affordances of rhythm and geometrical primitives, can facilitate an intuitive understanding. I do so to theoretically isolate the role of specific cognitive mechanisms that I am examining and to address specific formal concerns of the artists. In reality, any text or film will have plural aesthetic affordances operating in tandem.

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3. Virginia Woolf and Entrainment

3.1 Introduction: Form and Cognition

Aesthetic affordances analyze how cognitive mechanisms enable an intuitive understanding of literature. This chapter examines how a mechanism of rhythm perception called 'entrainment' can facilitate an intuitive understanding of Virginia Woolf's World War II novel *Between the Acts* (1941). Woolf called the novel a "medley," and she made use of rhythm to criticize how British society never speaks "with a voice free from old vibrations." (Woolf 1953, 309) The remit of aesthetic affordances is to shed a cognitive perspective on how Woolf develops this technique.

Examining the role of aesthetic affordances is particularly relevant in Woolf due to what she in 1935 calls her "hatred of preaching." (Woolf in Lee 2010, 1116) Her resistance to overt political fiction propelled her lifelong experimentation with form. I will show how seeking the 'right relations' to communicate with her readers is fundamentally a question of how form can impact cognition. I will specifically explore how her decision to use rhythm as a central organizing device suggests a cognitive foundation for the novel's critique of war.

Between the Acts is Woolf's attempt to find a suitable method to communicate with her readers about World War II. Her belief in the power of formal innovation is famously stated in "On Re-Reading Novels" (1947):

"First, that when we speak of form we mean that certain emotions have been placed in the right relations to each other; then that the novelist is able to dispose these emotions and

make them tell by methods which he inherits, bends to his purpose, models anew, or even invents for himself. Further, that the reader can detect these devices, and by so doing will deepen his understanding of the book…." (Woolf 1947, 134)

Crucial to this approach is that literature should not convey a literal meaning but impact understanding through formal elements, like the structure of a text.

For instance, Woolf mapped out *To the Lighthouse* (1927) as "two blocks joined by a corridor," which resulted in lengthy first and third chapters with a slim interim to indicate that the novel was to be "all character – not a view of the world." (Woolf 1925) Exactly how 'the right relations' of form give rise to an understanding which is only about character and not 'of the world' is indicative of aesthetic affordances. Woolf's view on form suggests that readers can intuitively understand without verbalizations or representational knowledge. As she writes in a letter to Roger Fry dated 1927, "directly I'm told what a thing means, it becomes hateful to me." (Woolf 1977, 385)

Woolf's commitment to formal innovation corresponds to the goal that she sets out in "The Narrow Bridge of Art" (1927) to "take the mold of that queer conglomeration of incongruous things – the modern mind." (Woolf 2011, 20) Her 'hateful' rejection of representational knowledge is at heart an attempt to convey the mind. This makes it all the more interesting to examine the relationship between form and thought from the point of view of aesthetic affordances, for as I have explained, there is a host of unconscious cognitive mechanisms that can ensure our understanding of literature in ways that, although communicated in writing, do not depend on a language of sense. This includes emotions.

In contemporary cognitive neuroscience, emotions are a vital part of cognition and in no way indicate a contrast with what may conventionally be called 'reasoning.' I will, therefore, not take Woolf's appeal to 'mind,' 'ideas,' or 'emotions' to indicate a separate sphere of inquiry from aesthetic affordances. Instead, I follow the tenets of evolutionary psychology that "'cognition' refers to language for describing all of the brain's operations, including emotions." (Cosmides and Tooby 2000, 98)

Earlier, I mentioned our intuitive ability to detect a suspicious person in the street as an example of a cognitive mechanism, but this is just as much an example of what evolutionary psychologists also call an 'emotion program' which triggers a range of cognitive changes, like a heightened awareness of one's surroundings. Neurologically, these mechanisms are intimately connected, from the triggers in the amygdala to the attention control of working memory to motive states of the central nervous system.

Hence, I shall take Woolf's attempts to express 'emotions' through form as a synonym for her quest to portray the mind. Further, from this vantage point, the significance of her endeavor emerges to offer a Modernist critique of the unconscious ways that our minds uphold the thought patterns that lead to war.

3.2 Woolf's Critique of Form

Woolf's attention to form was inspired by Clive Bell's 'Significant Form.' In *Art* (1914), Bell argues that there is a strict formal foundation for aesthetic emotions. In the context of paintings, Bell writes that "lines and colours combined in a particular way, certain forms and relations of forms, stir our aesthetic emotions." (Bell 1914, 8) The arrangement of lines 'in a particular way' is the equivalent of Woolf's emphasis on the 'right relations' in

literature. However, what connects these approaches most of all is the belief that art can create 'good states of mind.' The phrase is G.E. Moore's who in *Principia Ethica* (1903) connects aesthetics to religion and ethics by suggesting that "to be conscious of a beautiful object is a thing of great intrinsic value." (Moore 1993, 79) This gives artistic creation philosophical and moral gravitas for the Modernists because, as Bell writes, "to pronounce anything a work of art is, therefore, to make a momentous moral judgment." (Bell 1914, 115)

Ethics is, therefore, what propels Woolf's focus on form. It puts into context why in "How Should One Read a Book?" (1932), she equates "the love of reading" with one of those "pursuits that we practice because they are good in themselves." (Woolf 1986, 270) But it also means that artists assume a political role as guides towards 'good states of mind.' In *Three Guineas* (1938), for example, Woolf writes of "the scattered beauty which needs only to be combined by artists in order to become visible to all." (Woolf 2012, 104) Yet she did not wish to be a political writer.

Hermione Lee's analysis of Woolf's collected diaries reveals a lifelong attention to the balance between "the writer's privacy, sensuality, lyricism, dreams – to 'beauty' – [and]…the shocks and jolts of political reality, social conditions, or scientific facts." (Lee 2010, 918) Much like Mrs. Ramsay in *To The Lighthouse*, who likens herself to "an investigator, elucidating the social problem" while carrying "the torch of her beauty," Woolf sought balance. (Woolf 2006, 1391, 1863) For instance, she likens Gertrude Stein's experiments, which she finds too extreme, to "contortions" and "spasms." (Woolf 1977, 209) Instead, Woolf always seemed keenly aware to "maintain communicable shape or structure." (DuPlessis 1989, 101)

It may seem contradictory to profess the ethical powers of art but resist overt political messages. After all, many art forms are effective morally by directly referencing social problems. One needs only consider the films of Ken Loach, such as *Rif-Raf* (1991) about the plight of workers during the Thacher years, or the more recent *Parasite* (2019) by Bong Joon-ho, which is also devoted to class struggle.

Yet since the 1980s, poststructuralist readings of Woolf have moved away from content analysis and towards her revolutionary use of language. Critics like Toril Moi have shown that it is through Woolf's "textual practice… in which language refuses to be pinned down to an underlying essential meaning" that her role as a feminist writer emerges (Moi 1985, 138). Woolf's approach is thus more akin to the critique of racist patriarchy by Audre Lorde (1984), which recognizes that "the master's tools will never dismantle the master's house… they will never enable us to bring about genuine change." (Lorde 1984, 112) I wish to take this line of inquiry one step further by analyzing revolutionary *form*.

In *Three Guineas* (1938), Woolf argues that male institutions, like church, university, and government, are responsible for the evils of society, like war and colonialism, and so "…if we [women] wish to help the human mind to create, and to prevent it from scoring the same rut repeatedly, we must do what we can to shroud it in darkness." (Woolf 2012, 104) Here, this new 'darkness' is an allusion to finding the 'right' form because experimentation must exist outside the conventions of writing if it is to have any ethical or political import.

Her British predecessors had argued for the necessity of the feminist experimental perspective, notably Dorothy Richardson (1873-1957), who also "felt unable as a woman to identify herself within [tradition] and unable to endorse its values." (Hanscombe 1989, 91)

Indeed, Woolf criticizes women writers who never innovated formally. Her assessment of Charlotte Brontë in *A Room of One's Own* (1929) concludes that "Brontë with all her splendid gift for prose, stumbled and fell with that clumsy weapon [a man's sentence] in her hands." (Woolf 1929, 115) Connecting a lack of formal innovation with 'a clumsy weapon' once more underscores the Modernist ethical and political imperative. However, Woolf was always aware of this battle and, in some ways, wished that she did not have to partake.

In a letter to Robert Fry in 1925, she laments, "I wish we could skip a generation—skip Edith and Gertrude and Tom and Joyce and Virginia and come out in the open again, when everything has been restarted, and runs full tilt, instead of trickling and teasing in this irritating way." (Woolf 1977, 209) As such, Woolf's critique of form and the mind is not solely an artistic conviction but an ethical and historical necessity. This reaches a crescendo during World War II.

Her essay on the Blitz on London, "Thoughts on Peace in an Air Raid" (1940), urges readers, once more, to consider the relationship between form and cognition. She writes that "the young airman up in the sky is driven not only by the voices of loudspeakers; he is driven by voices in himself—ancient instincts, instincts fostered and cherished by education and tradition." (Woolf 1940)[32] The reason for war is found in the books he reads, the voices he passively follows. Of course, these are all male – a point which Woolf makes clear in reiterating that German and British soldiers both suffer from a "subconscious Hitlerism that holds us down." (Woolf 1940)[33]

[32] Woolf 1940 has no pagination.

[33] Woolf is citing Lady Nancy Witcher Astor (1879-1964), the first woman to serve in the House of Commons, who had recently written an article in *The Times* stating that "women of

Everyone suffers due to tradition, but it can only be changed through writing which brings forth beauty and gives, especially male readers, "access to the creative feelings." (Woolf 1940) Like *Three Guineas*, Woolf continues to dismiss the notion that women cannot mobilize for peace because they are not part of political or military life. Instead, it is in virtue of being outside of power structures that women can help and "think for him." (Woolf 1940)

In other words, peace is linked to form, as beauty and goodness are. Woolf concludes her essay on the air raid by saying that "we [women] can best help you to prevent war not by repeating your words and following your methods but by finding new words and creating new methods." (Woolf 2012, 131) This makes the study of her formal innovation in *Between the Acts*, during World War II, all the more important, for this is where Woolf shows how "we can fight with the mind." (Woolf 1940)

3.3 Between the Acts

The tension between beauty and politics, which Woolf experienced throughout her career, started disappearing when she wrote *Between the Acts*. Early drafts from the novel, then called *Pointz Hall*, reveal that Woolf finally feels that "I shall never write to 'please', to convert; now I am entirely and for ever my own mistress." (Woolf 1953, 286) Relinquishing the need to 'convert' her readers signals an end to her anxiety about polemics. Writing *Three Guineas*, her most substantial essay against patriarchy to date, had tackled being "afraid of autobiography in public." (Woolf 1953, 141) In short, Woolf feels more at ease and balanced in her creative expression at this point in her career. She finally reports "immense relief and

ability are held down because of a subconscious Hitlerism in the hearts of men." (Woolf 1940)

peace" and has the confidence to state, "I am an outsider. I can take my way: experiment with my own imagination in my own way." (Woolf 1953, 292) Composing the novel is therefore marked by unusual joy: "Never have I been so fertile…I am very 'happy' as the saying is: and excited by *P.H.*" (Woolf 1953, 358-59)

However, this joy is not an abandonment of her belief in the power of form to critique the mind. *Between the Acts* is both a symbol of a new creative expression and a wartime commentary. By February 1941, when Woolf writes in her diary – "Finished Pointz Hall, the Pageant; the play — finally *Between the Acts* this morning" –her houses on Tavistock and Mecklenburg Square in London had been destroyed by bombs (Woolf 1953, 365). She had also been forced to hide from German fighter jets hovering above Monk's house in Sussex and was keenly aware, Leonard Woolf being Jewish, that "capitulation will mean All Jews to be given up. Concentration camps." (Woolf 1953, 336) Hence, her more liberating experiment with form is still an ethical endeavor, an antidote to war. She emphasizes this relationship in her diary: "For the hundredth time I repeat – any idea is more real than any amount of war misery. And…this little pitter patter of ideas [*Between the Acts*] is my whiff of shot in the cause of freedom." (Woolf 1953, 318)

She consistently likens *Between the Acts* to her act of resistance, connecting the courage displayed by British civilians under bombardment to her progress with the novel. In September 1940, she writes: **"**As I say, we have need of courage. A very bad raid last night on London — waiting for the wireless. But I did forge ahead with P.H. all the same." (Woolf 1953) Such emphasis on a writer's courage resonates with remarks from years earlier in "The Narrow Bridge of Art," asserting that "whoever attempts" to find the right technique for the

modern age "will have need of all his courage." (Woolf 2011, 23) The question then is, what form Woolf settles on?

Between the Acts is set during a village empire pageant. These were popular displays of historical British greatness performed locally across the UK in the early 20th century. Woolf conceived of the idea at her disillusionment and anger with "the battening down of imagination in the material" that she witnessed at pageants in London and Sussex (Woolf in Beer 1996, 146). However, of course, this is a wry choice on Woolf's part; she will not celebrate Britain but explore what else a pageant can call attention to.

The setting lends itself to continuing the mockery of "the masculine trappings of solid social rituals" that she commenced in *Three Guineas*, to cite Gillian Beer (Beer 1996, 128). For instance, pageants usually celebrate British expansionism and colonial wars, but much to the dismay of audience members, the army is noticeably absent from *Between the Acts*, probing the rhetorical question, "What's history without the Army, eh?" (Woolf 1970, 157) Moreover, the image of Victorian greatness is tarnished by the mention of child labor in coal mines. Finally, the proud British audience is asked whether they can mount civilization.

Thus, as Beer has argued, Woolf explores the "patriarchal, imperialist and class-ridden" history behind present-day England (Beer 1996, 147). Much like *Orlando* (1928) – which "abandons verisimilitude to test the possibilities of antirealism as another means of shattering master narratives" – *Between the Acts* asks whether the violence of male history is inevitable (Beer 1996, 147). The novel questions the traditions and values that lead to war. This inquiry is underscored by the fact that the pageant's director, Miss La Trope, is an 'outsider' struggling to create *her* vision of English literary history. She is a mysterious

lesbian who, like Woolf, in the words of Sue Roe, "simply wants her play to change the way her audience sees things." (Roe 1990) Woolf thus emphasizes the female vision in this rearrangement of a nationalist narrative. As Roe further explains, "Woolf's concern, here in *Between the Acts*, is primarily to explore the hypothesis…that 'Difference of sex makes a different view." (Roe 1990, 152) However, I believe the gendered critique of war and patriarchy is but for these superficial examples, never literal.

To one's surprise, *Between the Acts* is, in Woolf's own words, "all literature discussed in connection with real little incongruous living humor… — and a perpetual variety and change from intensity to prose, and facts — and notes." (Woolf 1953, 289-90) The novel is fun, dynamic, and piercing. It is anything but what one would expect of a wartime text. This incongruity sparks consideration of its form.

A glance at Woolf's essays and notes from this time makes clear that she was exploring how a female form of writing could constitute a wartime critique. Moreover, the novel emphasizes that language is just "verbiage, repetition." (Woolf 1970, 91) It is not about semantics. So, the criticism of tradition is carried by the form. The remit of aesthetic affordances is to examine this relationship and describe how an intuitive understanding of the novel can arise.

My examination of the significance of cognitive mechanisms is also an effort to answer the call from Woolf in "On Re-reading Novels" to move from analyses of the novel where "the methods are unnamed" to having a vocabulary for how "the novelist explores and perfects his technique." (Woolf 1947, 134) Thus, Woolf remains the instructor of my analysis of the aesthetic affordances of *Between the Acts*. Specifically, I will proceed from her idea

that readers can detect the 'right relations' and intuitively understand the meaning that an author has in mind. This corresponds to the methodology I outlined in the previous chapter, which commences with an intuition about how meaning arises and then looks at how a specific cognitive mechanism might explain that process.

Woolf initially conceived of *Between the Acts* as a medley with "some kind of musical structure." (Lee 2010, 1046) The result is an incongruous combination of varieties and intensities, where plot and words are of minimal importance. Crucially, she remarks in 1939, while composing the book, that she believes to have found "a more direct method of summarising relations." (Woolf 1953, 311)

I suggest that this new method is Woolf's use of rhythm, which works as a central organizing feature of the text.

Much like the swooping plane connects the onlookers in Regent's Park in *Mrs. Dalloway* (1925) or the interweaving soliloquies of *The Waves* (1931), I propose that Woolf is testing another way that a single formal element can hold a text together.

Given the importance of 'right relations' to Woolf's artistic pursuit, I will examine how the aesthetic affordance of rhythm can generate an intuitive understanding of the text's ethical dimension. For, to remind, the significance of formal experimentation in Woolf's oeuvre is to make literature understood, not through literal means, but by conveying 'beauty.' I will analyze how rhythm operates as a formal organizing principle of *Between the Acts* and then outline the cognitive mechanism 'entrainment,' which explains our intuition for rhythm. This analysis will, in turn, indicate in what cognitive ways Woolf may be succeeding in her desire to convey ideas of beauty strong enough to change minds away from war.

One caveat, however, is Woolf's changing attitudes toward the novel. She began composing what was then *Pointz Hall* in 1938 as a distraction from a draining, monumental biography on Roger Fry.[34] The immense joy of writing the novel is almost always expressed in contrast.[35] Moreover, the fact that the war meant a likely lack of an audience might be another reason she felt it a liberating pursuit. She confesses in her diary to "rather enjoy doing *P.H.* That's something, for it won't please anyone, if anyone should ever read it." (Woolf 1953, 299) By March 1941, Woolf insists to John Lehman at Hogarth Press that "I can't publish that novel as it stands – its [sic] too silly and trivial." (Woolf 1980, 486)

It is therefore possible that the experiments Woolf carried out in this novel were either incomplete or not intended for an audience, as Mark Hussey has argued.[36] No one knows. Despite unanimous praise by Lehmann and Leonard Woolf, Virginia took her own life just as she decided to pull the posthumous novel from publication.

However, I wish to resist, as does Hermione Lee, "that image of a sensitive, aesthetic, nervous creature, too fragile for her own good," which both Leonard Woolf and Lehman battled in the days after her death (Lee 2010, 1135). Woolf's mounting confidence in her

[34] "Let it [a new book] be random and tentative: something I can blow of a morning, to relieve myself of Roger…" (Woolf 1953, 289)

[35] "Like the Waves, I enjoy it [P.H.] intensely: head screwed up over Roger." Woolf, Virginia. "Thursday, October 6th, 1938." (Woolf 1953, 305) Similarly, Woolf writes on July 7th same year: "Oh the appalling grind of getting back to *Roger*, after these violent oscillations, *Three Guineas* and *P.H.*" (Woolf 1953, 299)

[36] Hussey 2013.

experimentation with form in the late 1930s post *Three Guineas* merits attention of her final novel.[37]

3.4 The Medley Structure

Woolf wrote part of *Between the Acts* from her house in the small village of Rodmell in Sussex. Her diary records the sound of the church bell of St. Peter's by Monk's House: "ding dong bell . . . ding dong — why did we settle in a village? And how deliberately we are digging ourselves in! And at any moment the guns may go off and explode us… Hitler has his hounds only very lightly held…Ding dong ding dong." (Woolf 1953, 301) She hears the bell while reflecting on her progress with *Roger Fry*, then her thoughts shift to the threat of war, but the sound of the bell remains, 'ding, dong.'

The church bell also makes its way into *Between the Acts*. Here, it permeates the chatter of the audience when the pageant is over: "That's the bell. Ding dong. Ding." (Woolf 1970, 199) The onomatopoeia occurs four times across two pages, with a final repeat at the end of the book. Woolf demonstrates human attentiveness to sound and rhythm. She shows the way it lingers in the mind. For the 'medley' novel abounds with sounds. Specifically, the pageant structure demonstrates the power of rhythm to impact thought, just like the pervasive bells.

[37] It is possible to include Woolf's drafts *Anon* and *The Reader* (1941) in this assessment which, for instance, according to Sue Roe, mirror many of the concerns that Woolf *first* examined in *Between the Acts*, such as the impact of literary history on writing – themes which "she has already… courageously and ingeniously told." (Roe 1990, 167) See also p. 161, same essay. Gillian Beer makes a similar point about the "communal playwright." (Beer 1996, 147)

To recall the novel is set at an empire pageant, but what is unique is that the diction, style, meter, and typography change with each vignette from Elizabethan, Restoration, and Victorian times to the present. With each performance, the audience starts "catching the infection of the language." (Woolf 1970, 149) They begin to speak with the affect of the Elizabethans or to assume the high morals of the vignettes devoted to the Age of Reason. Moreover, the rhythms and sound patterns go beyond the vignettes and audience responses, permeating the entire novel, even 'between the acts,' with rhymes like, "music makes us see the hidden, join the broken. Look and listen." (Woolf 1970, 120) Often it is unclear if the rhyme is part of the play, an audience member speaking, or part of the narrative. Woolf blurs the lines between the pageant and the novel "till the play hung in the sky of the mind—moving, diminishing, but still there." (Woolf 1970, 212) Both readers and characters are immersed in sounds.

This formal innovation can be placed in connection with Woolf's longstanding belief that the novel must embrace the characteristics of poetry. She had sought to integrate the features of poetry and prose to develop a new mode of the novel since at least 1927. In "The Narrow Bridge of Art," she advocates for a new form of the novel which "will be written in prose, but in prose which has many of the characteristics of poetry." (Woolf 2011, 22) She envisions this as an alternative to the male traditions, mainly Georgian and Victorian fiction, which she feels create a vast distance between readers and writers. Instead, Woolf is searching for a way to intimately connect with her readers to awaken their minds to a new Modernist view on life and beauty, in line with Moore and Bell.

To Woolf, the value of making poetry part of the form of the novel is the intimacy afforded by rhyme, rhythm, and figurative language, which makes it possible to "say the

simple things which are so tremendous." (Woolf 2011, 20) Lyricism will grant new flexibility to the novel, and "prose thus treated will show itself capable of rising high from the ground, not in one dart, but in sweeps and circles." (Woolf 2011, 22) However, integrating poetry and sound in *Between the Acts* never denies reality. The 'medley' structure is not indicative of superficiality Woolf is still, in her way, seeking a political or ethical awakening, never foregoing "the most minute fragments of facts." (Woolf 2011, 20)

Between the Acts references factual events which would have been known to readers in her day. There is mention of the disturbing rape of a fourteen-year-old girl by guardsmen at Whitehall in London.[38] In addition, the threat of a Nazi invasion is represented by the villagers' devotion to British history, as, to cite Beer, a "defense against that future." (Beer 1996, 126) Nevertheless, these facts are never directly interrogated. Indeed, Woolf seems intent on demonstrating that they provide no relief. To recall, it is the *combination* of different techniques that creates the "perpetual variety and change from intensity to prose, and facts." (Woolf 1953, 289-90)

Consider the opening of the novel. The protagonist, Isa, is staying in the countryside with her husband's family, the Olivers, at Pointz Hall. She is bored and lonely – her husband Giles is unfaithful – so she is looking for something to read to entertain her. Her father-in-law's sister, Mrs. Swithin, obsessively reads about the past in an *Outline of History*.[39] But Isa cannot find anything that speaks to her, although she has internalized adages like "the library's always the nicest room in the house" and that books are "the mirror of the soul." (Woolf 1970, 19) There is a gap between the complexity of her life, where she debates the

[38] See Beer 1996, 138.
[39] This fictional title recalls "*History of England*, a work she [Woolf] mocked in *Orlando* for the absence of women from its social history." (Beer 1996, 144)

difference between love and a failed marriage to "the father of my children," and the literature at her disposal.

Isa asks, in indirect discourse, "what remedy was there for her at her age – the age of the century, [nineteen] thirty-nine – in books?" (Woolf 1970: 14, 19) So, the only resource available to Isa "that was so real" is the newspaper (Woolf 1970, 20). This contains the factual story of rape: "so real that on the mahogany door panels she saw the Arch in Whitehall; through the Arch the barrack room; in the barrack room the bed, and on the bed the girl was screaming." (Woolf 1970, 20)

However, not even those facts make a difference to Isa. Instead, Woolf emphasizes the fragile and versatile nature of news and facts because old Mr. Oliver, her father-in-law, also uses the paper to scare his grandchild, Isa's son, into tears. Moreover, her angry husband "crumpled the newspaper" by nighttime. (Woolf 1970, 218-19) Instead, Isa's development is tied to witnessing the medley of the pageant, connected to the experience of the 'sweeps and circles' of prose.

One must look beyond the few literal readings to understand Woolf's criticism of patriarchy and violence. Mainly, I propose that her use of sound patterns, which I, for brevity, will characterize as rhythm, is the most crucial.

Woolf feels that *Between the Acts* 'summarized relations' in a new and exciting way. By means of comparison, the sound patterns of this novel are decidedly unlike the repetitive structure of *The Waves* (1931). Here, Woolf said, "I am writing to a rhythm and not to a plot." (Woolf 1974, 204) Readers feel this perpetual push and pull of Earth's gravity through the characters' experience of "the shock of the falling wave which has sounded all my life."

(Woolf 1951, 251) It is a lull, a thud, which ends "*The waves broke on the shore.*" (Woolf 1951, 256) This is a very different rhythmic structure to 'the pageant play.' Here, Woolf presents a constant flux and finishes the novel with jazz, 'a cacophony.'

In music, playing with what is onbeat and offbeat, in and out of time, is called syncopation. It is a rhythmic form associated with jazz and Stravinsky. The constant displacement disrupts expectations, and we await the reestablishment of metric normality. This mirrors Woolf's variations on sound to which the minds of readers and characters become attuned in *Between the Acts*. In cognitive neuroscience, this mechanism is called 'entrainment' and indicates an instinctive human tendency. It is not something that can be switched off.

In the pages to come, I will present an analysis from aesthetic affordances of how *Between the Acts* uses entrainment to call attention to the power of rhythm to impact the mind. This is neither preaching nor overt anti-fascism but a more subtle critique of the 'ancient instincts' fostered by patriarchal traditions. It is a matter of strategically placed rhythms.

3.5 Entrainment

Entrainment explains the way our brains log on to rhythms. Put differently, it allows us to perceive and encode temporal regularities from the sounds we hear. Like the intuitive ability to infer a person's emotional state from their facial expression, entrainment describes a cognitive mechanism with a rich evolutionary history. It is facilitated by the auditory cortex, located in the superior temporal gyrus, but the mechanism is shared with other primates and rodents. It is, therefore, a deep-rooted, evolved feature of our minds. Moreover,

because of the primarily unconscious nature of this cognitive mechanism, it is always 'on.' People are constantly picking up on rhythms.

At the most basic level, entrainment is an adaptation of our nervous system, allowing us to extract the sensory information needed to survive. In humans, "entrainment serves the function of selective tuning to relevant auditory information in natural sounds." (Poeppel and Teng 2020, 71) This fact is most apparent in the domain of language. It is entrainment that allows us to track syllables and understand language. Like in the case of universal grammar discussed in the previous chapter, this capacity is not contingent on any particular language. It seems highly likely that the natural selection of syllables and entrainment go hand in hand. The mean syllable duration is the same cross-linguistically, roughly 250 milliseconds, which matches the level at which our brains distinguish sounds. Whether Zulu, Dutch, Polish, or Japanese, all syllables match the exact temporal window through which the brain can distinguish sounds.

As a result, leading scientist in the field, David Poeppel, argues that "the rhythm of speech emerges as a consequence of the underlying neural architecture." (Poeppel and Assaneo 2020, 332) Crucial to the examination of the impact of the changing, syncopated rhythms in Woolf, "the evidence points to the rhythmic structure of speech being recovered by the perceptual system and playing a critical role for spoken language comprehension." (Poeppel and Assaneo 2020, 326) This is a radical but well-researched idea. It means that understanding language does *not* depend on morphemes or units of semantic meaning but, first and foremost, on entrainment. Comprehension is fundamentally a question of neurological attentiveness to a rhythm.

So, when we understand phrases and sentences, cognitive neuroscientists have discovered that syllables provide a temporal basis for advanced linguist units like phrases and sentences. Moreover, it has become clear that this structure becomes internally regulated to the point that the time scales of phrases and sentences follow the rhythm of syllables. To use the example of Poeppel and Assaneo, the pattern of *The Beatles* line, *Baby you can drive my car,* depends on entrainment to the rhythm of the syllables, *ˈbeɪbi ju*… etc. That is, the temporal window that the brain is inherently receptive to is followed at linguistic levels. Other cognitive factors, like semantics, also play a role, but these have nothing to do with rhythm. The interesting point is that, properly speaking, the brain does not *hear* phrases and sentences. Neurologically, brains follow the rhythm of syllables. This finding speaks to the strength of this inherent rhythmic principle.

Entrainment is essential for speech intelligibility, such that "robust speech entrainment correlates with speech intelligibility." (Poeppel and Teng 2020, 70) If one's cognitive function of entrainment is optimal, so will one's understanding of spoken language. But the cognitive mechanism is, to repeat, not simply a secondary aspect of language or song. It is the *primary* sense-making mechanism. Its internally regulated nature evidences this.

Consider further how the brain uses "access to past acoustic information… to predict the incoming stimuli." (Poeppel and Teng 2020, 72) Through attention to rhythmic structures, the brain can use 'the when' to predict 'the what.' For instance, the chime of the bell near Monk's House comes to be expected by whoever is in the vicinity of the parish church. This finding suggests "an inherent link between temporal predictions and content-based processing." (Doelling and Poeppel 2015, 6240) Listeners not only begin to predict the recurrence of the bell; they also listen to the sound more carefully and process it better

because entrainment is known “to enhance the representation of attended sounds.” (Obleser and Kayser 2019, 913) Specifically, there is “converging evidence that the brain transforms weakly periodic inputs by selectively enhancing the representation of metric pulses.” (Lenc et al. 2021, 8).

Further, the so-called ‘missing pulse phenomenon’ demonstrates that when a rhythm changes, like the syncopated patterns in *Between the Acts*, the brain will continue internally generating the temporal frequency it picked up on without any further stimulus. Crucially, “the effects found for the syncopated stimuli do not result merely from a carryover of evoked responses to preceding sounds.” (Tal et al. 2017, 6331) Entrainment is not a ‘reflex’ or response but an intuitive cognitive mechanism.

Cumulatively, the force of these examples is overwhelming. They demonstrate that entrainment to rhythm goes beyond a language of sense. This means that rhythm as a formal feature of literature is not simply an addition to semantics but a crucial cognitive principle. It even extends far beyond language. For instance, Poeppel and Assaneo report that the rhythmic structure of speech of about 250 milliseconds corresponds to the saccadic timing of our eyes when reading. The same interval has been found in jaw movements during speech. Indeed, the rhythmic structure is also found in the movement of rodents’ whiskers as they survey a new environment.

In short, the cognitive neuroscience of entrainment provides overwhelming evidence that the temporal structure of syllables is privileged by the human mind. It is an evolved mechanism, a feature of the lowest neural frequency through which our brains can gather information from the world. It tells us of the properties that the brain has evolved to follow.

There is ample reason to consider the aesthetic affordance of rhythm in *Between the Acts*, a novel through which Woolf continued her lifelong attempt to mirror and impact the mind.

I am particularly interested in how entrainment speaks to Woolf's circumvention of overt politicization. By playing with different rhythms, facilitated by the structure of the pageant with changing registers, she can show the central importance of rhythm to cognition. Entrainment has only been demonstrated in the context of actual sounds, but that same mechanism would likely occur when reading aloud to oneself or quietly.[40] For instance, the minuscule jaw movements many make to sound out words during reading display entrainment. Moreover, "entrainment has been shown to be abnormal in poor readers and dyslexic children," which further suggests the importance of the mechanism to reading (Poeppel and Assaneo 2020, 326).

From another disciplinary perspective, in the domain of empirical aesthetics, studies by Winnifred Menninghaus and colleagues have found that "poetic speech melody" – the sound of the text – does not depend on being read out loud but exists as "an inherent textual property." (Menninghaus et al. 2018, 17-18) Moreover, silent reading is known to produce the experience of an 'inner voice,' or "the phonetic recoding of written text." (Blohm et al. 2021, 11) Crucially, this inner sonic experience includes "not only individual speech sounds and syllables but, like overt articulation, also sentence intonation, phrasing, stress, and rhythm, partly guided by punctuation." (Blohm et al. 2021, 11) In short, it is reasonable to assume that entrainment takes places during reading, and particularly of intensely poetic texts.

[40] According to David Poeppel. Private correspondence.

The forthcoming analysis of aesthetic affordances will suggest three ways entrainment, as a cognitive mechanism, can provide an intuitive understanding of *Between the Acts*. Although Woolf would not have known it, she surely understood the power of parallelism. So, I will assume the novel contains strategically placed rhythms, inviting readers to associate with the characters or read aloud. I propose that there is a reason for Woolf's unique rhythmic signature. My ultimate suggestion will be that rhythm is her Modernist ethical approach to World War II, which cautions her readers about 'the voices of loudspeakers' and 'ancient instincts' that drive the nation to war.

Through the methodology of aesthetic affordances, I propose that entrainment reveals the subtlety of Woolf's use of rhythm to portray the mind. I will offer specific examples of how rhythm can inspire and manipulate but also suggest how *Between the Acts* reveals the principle of entrainment, so readers can take responsibility for the rhythms they follow.

3.6 Inspiration

Isa writes poetry in secret, "afraid" of her husband finding out, yet often unable to express her thoughts: "she waited for a rhyme, it failed her." (Woolf 1970, 50, 61) Only the village pageant eventually enables her to speak. This connection between audience and artist is echoed in Woolf's lifelong insistence, for instance, in "Mr. Bennett and Mrs. Brown," (1924), that "the writer must get into touch with his reader by putting before him something which he recognizes, which therefore stimulates his imagination." (Woolf 1924, 17) Isa is debating the institution of marriage and her feelings for a strange man in the crowds, which are complexities that her seniors would not have engaged in. Her character's development, therefore, mirrors Woolf's justification of formal innovation, the mixing of genres, to create a

novel that can express "the contrast, the question, the closeness and complexity of life." (Woolf 2011, 20) This is precisely what the use of rhythm does, for it is the Elizabethan vignette, performed in verse, that enables Isa to begin to articulate how she feels.

The vignette, set at the Globe Theater, is "about a false Duke; and a princess disguised as a boy; then the long lost heir turns out to be the beggar, because of a mole on his cheek…[and] Ferdinando who had been put into a basket as a baby by an aged crone," and so on (Woolf 1970, 88). It is a decidedly entertaining but confusing experience to watch; the village cast either cannot be heard or shout on top of each other. They mock about, as amateur actors and actresses might, and it is unclear whom they are meant to portray. In short, "there was such a medley of things going on…that she [Isa] could make nothing of it." (Woolf 1970, 90) However, the play gives Isa a voice. She starts to speak in rhymes, like the cast. At the interval, she playfully turns gossip about the royal family into a poem and thus "filled in the phrase." (Woolf 1970, 105) Excusing herself for the impromptu verse, she explains that "It's the play…The play keeps running in my head." (Woolf 1970, 105) This is entrainment.

Isa has latched onto the rhythm of the Elizabethan drama, but, as I explained about this cognitive mechanism, her newfound ability has nothing to do with repeating words or meaning. Indeed, "it didn't matter what the words were; or who sang what." (Woolf 1970, 94) It is the rhythm that comes to dictate Isa's inspiration. My reading, therefore, differs from Sue Roe's feminist reading, which insists that Isa "can never seem to find a way of 'giving birth to' herself." (Roe 1990, 153) Roe lingers on Woolf's *initial* characterization of Isa's efforts to speak as 'abortive.'[41] However, this analysis ignores entrainment.

[41] "'Abortive,' was the word that expressed her." (Woolf 1970, 15)

Isa clarifies that her newfound voice depends on her intuitive understanding of the play. The messiness of the play is not a hindrance, for, as she repeats, "the plot's nothing" as long as the performance manages to move people (Woolf 1970, 91). In other words, it is because the play *lacks* ostensible semantic meaning that entrainment to its melody can take priority. In line with entrainment research, Woolf suggests that rhythm supersedes and is separate from linguistic units like phrases and sentences. Moreover, this response is not unique to Isa.

The play is a huge success; people are engaged – "all arms were raised; all faces stared" – and continue to speak about it after it ends (Woolf 1970, 91). Indeed, the verse drama also impacts rigid characters, notably Isa's husband, Giles, who starts to rhyme unbeknownst to himself.

When asked if he wishes to follow his party to the refreshments area, the irritable Giles replies: "'Follow?' He kicked his chair back. 'Whom? Where?' He stubbed his light tennis shoes on the wood. 'Nowhere. Anywhere.' Stark still he stood." (Woolf 1970, 96) The angry husband now speaks in terse spondees. However, real poetry begins with the iambic descriptors, which are only legible to the reader. Thus Giles, who elsewhere stomps a toad and snake to death, with blood all over his shoes, now sings. Woolf has both shown the impact of the play on his mind and lightened, or mocked, the force of his anger to the ears of the reader. This is where Woolf's subtle and beautiful feminist critique emerges through the form. By the aesthetic affordance of entrainment, she provides readers with an intuitive understanding of the folly of male violence. She achieves this without explicit political

engagement but through the 'medley' of the pageant structure.[42] Moreover, she explicitly rejects the power of words; they are an incomprehensible mess. Instead, entrainment is achieved through the form of verse drama.

The fact that Woolf made the Elizabethan vignette the most inspiring segment in *Between the Acts* corresponds to her belief in the supremacy of that form. Her aim to make prose assume the features of poetry is, in many ways, a reference to Elizabethan dramas, particularly Shakespeare's, which boasted a combination of "psychological subtlety and tremendous imaginations." (Woolf 2011, 15) Further, she admires that the bards "had an attitude which allowed them complete freedom." (Woolf 2011, 15) As she explains in "Notes on an Elizabethan Play" (1925), they may forego the plot. This might, on the one hand, "confuse and fatigue a reader," but the result is worth it because "the power of the whole is undeniable." (Woolf 1985, 51, 55)[43]

Similar to *Between the Acts*, or "On Re-Reading Novels" Woolf repeatedly emphasizes that "the 'book itself' is not form which you see, but emotion which you feel." (Woolf 1947, 130) Woolf's experiment with *Between the Acts* tests this balance between the literal of the plot and the messiness of the whole. Moreover, her diary entry draws a perfect line of comparison: "the Elizabethan play… Pointz Hall, the Pageant; the play — finally *Between the Acts*." (Woolf 1953, 365)

[42] Roe also recognizes the importance to Woolf of this "new form (based on the play-poem idea) to find a different way of appealing to her audience." (Roe 1990, 155)

[43] In this essay Woolf explicitly blames the lack of plot for this confusion: "the greatest infliction that Elizabethan puts upon us – the plot." (Woolf 1984, 51)

Appeal to entrainment suggests one crucial way this Shakespearean experiment succeeds. By showing that minds entrain to rhythms, Woolf suggests that inspiration emerges not from the words spoken but from the beats that are felt.

3.7 Manipulation

The Shakespearean perspective shows the positive potential of entrainment, particularly when analyzed with attention to Woolf's admiration of the genre. Nevertheless, other aspects of the novel offer a more cautionary tale. The novel reveals that our minds are always entrained to the rhythm of someone or something else. One benefit of the pageant structure is that it allows Woolf to probe many rhythmic relations. I will examine how the novel calls attention to the element of power in this cognitive relationship, particularly the roles of the pageant's director and her gramophone.

Each vignette is accompanied by music from a gramophone hidden in the bushes. Its presence is announced twelve times in the novel via alliterations: "Chuff, chuff, chuff, the machine buzzed." (Woolf 1970, 77) The line looks like prose but sounds like poetry: a molossus of three metrical feet with a line break after the last 'chuff.' To recall, one of the functions of entrainment is to connect rhythmic regularity with enhanced processing of content, such that 'then when' predicts 'the what.' Woolf, therefore, calls attention to how a machine can diminish this mechanism.

Initially, the gramophone does not work – the needle goes "tick, tick, tick" – but by the first interval, Miss La Trobe can use its music to rehearse the next act: "A.B.C., A.B.C., A.B.C. – someone was practicing scales. C.A.T. C.A.T. C.A.T. …" (Woolf 1970, 82, 114)

As research on sound patterns how, this rhythmic structure becomes "the prosodic grid necessary to predict the position (i.e., the 'when') of this phonemic parallelism [the end rhyme]" – in this case, the 'T' and 'C.' (Blohm et al. 2021, 26)

Woolf locks the reader into the tight hold of the machine and Miss La Trope, for the same meter dictates the first lines of the following vignette, which alternate between iamb and trochee: "And the gramophone began A.B.C, A.B.C. / *The King is in his counting house /Counting out his money, The queen is in her parlor / Eating bread and honey…*Miss La Trobe watched them [the audience] sink down peacefully into the nursing rhyme." (Woolf 1970, 122)

Cognitively, this dynamic is typical. Humans are neurologically geared to fall in line with rhythm. However, the novel questions this level of cognitive control.

To recall, Miss La Trope is "an outcast. Nature had somehow set her apart from her kind." (Woolf 1970, 211) Not only is she a lesbian, which was taboo then, but alcoholism and theft are also suggested. Yet, she exhibits generosity, too, by calling herself "the slave of my audience." (Woolf 1970, 211) The pageant play that causes her much frustration due to the cast and budget is also characterized as her 'gift' and the only place "that the triumph was." (Woolf 1970, 209)

But La Trope is ambiguous, making her 'gift' hard to define. She uses the gramophone to summon the audience back from the intervals like a witch "who seethes wandering bodies and floating voices in a cauldron." (Woolf 1970, 153) Given the force of entrainment on the mind, it is possible to view Woolf's characterization as a caution. The audience does not know what they have committed to in following the lull of her witches' music. Moreover, neither does La Trope.

Just as the audience unconsciously entrains to the music and lines of La Trope, the director suddenly finds herself subject to the rhythm of the gramophone. She loses control of the machine. Towards the end of the play, “suddenly the tune stopped. The tune changed.” (Woolf 1970, 182) Although the exact order of events is not clear in the novel, it is apparent that this transformation is unplanned. Crucially, no person is identified as having changed the records, suggesting that the gramophone is now the agent. La Trope hides from the audience and feels like a failure, “something was going wrong with the experiment.” (Woolf 1970, 179) The mechanism of entrainment is no longer under her control, but ruled by the autonomy of the machine.

Whereas earlier, the rhythm had entrained the audience, and readers, to a particular tradition like Elizabethan or Enlightenment, the shuffling of the records makes the tune “broke; jagged.” (Woolf 1970, 183) As a result, both the audience and actors follow multiple rhythms at the same time, like “foxtrot?” or “jazz?” (Woolf 1970, 183)

The actors emerge onto the stage, called by the music, and “each declaimed some phrase or fragment from their parts.” (Woolf 1970, 185) Woolf suggests that entrainment to ‘their parts’ results from the change in music, much like dogs will perform to different commands. However, this time, the mechanism is not regulated but a cacophony. The audience's responses also evidence this.

Hitherto, the audience, like Isa, had been inspired or entrained by what one vignette at the time. However, with the shuffling of the records, the audience begins to speak in an entirely new, jumbled way. Similarly, the typography changes from italicized verse to regular prose font, yet it retains the qualities of poetry. It serves to cite a key part of the section in full, with my addition of rhyme schemes:

“What a cackle, a cacophony! Nothing ended. So abrupt. [A] And corrupt. [A] Such an outrage; such an insult. And not plain. [B] Very up to date, all the same. [B] What is her game? [B] To disrupt? [A] Jog and trot? [A] Jerk [C] and smirk? [C] Put the finger to the nose? Squint and pry? [D] Peak and spy? [D] O the irreverence of the generation which is only momentarily [E] —thanks be [E] — “the young.” The young, who can't make, [F] but only break; [F] shiver into splinters the old vision; smash to atoms what was whole. What a cackle, [G] what a rattle, [G] what a yaffle [G] —as they call the woodpecker, the laughing bird that flits from tree to tree.” (Woolf 1970, 183)

From entrainment to this syncopated rhythm, the audience begins to speak in a rapid rhapsody. The lines between narrative and character are blurred again as Woolf shows how several minds can entrain to the same sonic pattern.

According to Beer, these sound patterns represent the ‘group mind’ as it becomes “half consciousness, communal and individual.” (Beer 1996, 133) She likens this experience to a sense of protection from the impending war. However, from my reading via entrainment, the gramophone, a machine, is the originator of this new and receptive community. Through the gramophone, Woolf is exposing the impact of rhythm on cognition.

Moreover, readers also fall into the ‘jazz’ of the new structure. So, in one way, this parallels the call in “Thoughts on Peace in an Air Raid” that women can “free the man from the machine” by introducing creativity into the stale old vibrations of tradition (Woolf 1940).

However, I propose that the more important lesson is not a glorification of La Trope or an equivocation of her and Woolf but a warning that entrainment is always a type of

manipulation, too. This is not a criticism of a cognitive mechanism that cannot be switched off. Instead, the view from aesthetic affordances compels readers to consider the ensnaring nature of rhythms. From this vantage point, Woolf challenges our intuition for rhythm by demonstrating how it operates. As the sudden change of the tune shows her readers, we are not in control of how our minds entrain to the rhythms surrounding us either. It is not only the characters that follow the gramophone. The task then becomes, to cite some of the final lines of the novel, to "break the rhythm and forget the rhyme. And calmy consider ourselves." (Woolf 1970, 187)

3.8 Attention

My analysis equates the entrainment to any of the pageant period pieces with that of the jazz cacophony. This may appear to counter the marked sense that Woolf also celebrates the mix-up of the tunes. Indeed, the parody of the empire day pageant is emphasized by this mishap. However, I am more interested in what I see as Woolf's use of entrainment to caution against our instinct to follow rhythms. For in the middle of the disarray, whether it be orchestrated by Miss La Trope or not, an anonymous voice calls out in a megaphone, "let's talk in words of one syllable." (Woolf 1970, 187)

Suddenly, a voice not driven by the machine asks the audience to pause. Instead of following a rhythm, the audience is confronted with themselves for the first time. Onto the stage march actors carrying tin cans, mirrors, candle sticks, even a colossal cheval glass – "Anything that is bright enough to reflect, presumably, ourselves?" (Woolf 1970, 183)

Once the rhythm of the past – of empire – and the cacophony of the uncontrollable gramophone is switched off, the audience has only one word to repeat, namely 'ourselves.'

Consider the history and church-loving Mrs. Swithin who exclaims, "'What did it mean?' and added: 'The peasants; the kings; the fool and' (she swallowed) 'ourselves?'" (Woolf 1970, 213) Without entrainment, the audience has no rhythm to repeat. This change can also be compared with, to cite Beer, "the casualness about source which hitherto did not trouble the audience." (Beer 1996, 135)

When all they did was follow the rhythm set by history, the director, and the machine, the unity created by these examples of community did not bother them. However, when the source lacks a rhythm, when there is no rhyme or repetition, but only the word 'ourselves,' then the questions emerge. As one audience member puts it: "But that's cruel. To snap us as we are, before we've had time to assume…" (Woolf 1970, 184) People are lost without the standards set by history. In fact, at this point in the novel, an "uproar… has passed quite beyond control." (Woolf 1970, 184)

Woolf uses entrainment to show the force of the rhythms of the heritage of male instincts traditionally celebrated on Empire Day. The real political import of the novel is, therefore, not overt preaching, which Woolf disliked, but rather its attention to how an unseen cognitive mechanism impacts cognition, behavior, and society. The novel thus charges its readers with a new responsibility, namely, to pay attention to what is heard. In that regard, its ending is particularly arresting.

As the music fades and the audience disperses, "A zoom severed it. Twelve aeroplanes in perfect formation like a flight of wild duck came overhead. *That* [sic] was the music. The audience gaped; the audience gazed." (Woolf 1970, 193)

Equating the formation of planes to music suggest, once again, the unavoidable risk of entrainment. It is a cognitive mechanism that Woolf displays and uses on her readers to

call attention to it. Armed with this understanding, each individual will be able to release themselves from the snare of harmful traditions.

Hence, it is only by letting go of rhythms that each person, at the very end, "saw something different." (Woolf 1970, 213) They finally all have something *new* to think about, which is not dictated by entrainment to a common source. This especially concerns Isa, who realizes that her oscillations between love and hate towards her husband Giles have to end; "it was time someone invented a new plot." (Woolf 1970, 215)

In summary, Woolf shows the power of entrainment, revealed by my analysis of this aesthetic affordance. My framework shows both how Woolf develops a formal technique to communicate her politics and the dangers of passive entrainment to institutionalized rhythms.

I argue that *Between the Acts* concludes with both a warning and a sign of hope by showing that rhythmic traditions can be broken and questioned – ultimately to enable each person to 'see something different,' that is, to 'free the man from the machine' and 'to give access to the creative feelings.' Such is Woolf's antidote to war.

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4. Lettrism and Geometrical Primitives

4.1 Introduction: Form and Aesthetic Affordances

The previous chapter offered a cognitive perspective on how Virginia Woolf uses form to portray the mind, communicate with readers, and critique patriarchy. The analysis also showed that aesthetic affordances position ideology as inherent to form because any societal critique operates cognitively, first and foremost. The current chapter will build on both strands by analyzing how Lettrist cinema communicates with an audience and criticizes convention through formal experimentation. Specifically, I will employ aesthetic affordances to explain how Isidore Isou's *Treatise on Venom and Eternity* (1951) and Maurice Lemaître's *Has the Film Already Started?* (1951) trigger a cognitive mechanism devoted to geometric shapes that afford an intuitive understanding of their films. Hence, the present chapter will also propose a reconceptualization of mathematical 'reasoning' as an intuitive cognitive mechanism, not an abstract and advanced ability.

In addition, this chapter will address how my theory of aesthetic affordances provides specific insight into forms that reject art as mimesis. I touched on this idea concerning Woolf, but the avant-garde is more extreme in its approach than the Modernists. Thus, I will give more attention to this issue, which I shall frame as the tension between aesthetic practices with a clear political message and those prioritizing formal innovation. This tension holds special significance for Lettrism, which quickly fractured in two; the Situationist International rejected the Lettrist emphasis on form and favored art with easily recognizable content.

The avant-garde seeks to disrupt convention. The term initially indicated the political role that artists would play in a socialist world post the 1789 French Revolution. Therefore, the avant-garde has always been closely tied to how art can avoid co-option by the mainstream to effect change. This is also what occupies the Lettrists, particularly Isou, who believed that "our role is… to perfect this beauty without name." (Isou 1974, 311)[44] It is vital for Isou that his formal experiments function on the level of the 'unknown' to have an impact. In short, Lettrism should remain "never *present*, but *to come*." (Isou 1964, 129)

The appeal to 'beauty' and "the lure of this new Posterity" is reminiscent of Woolf's attempt to uncover new means of communicating with her readers (Isou 1974, 314). Moreover, the fact that both experiments with form were developed around World War II arguably points to a shared desire for a new future. However, for the avant-garde, art should *remain* in the vanguard. Formal experimentation should aim to be impenetrable, odd, and arresting.

For instance, John Cage's *4'33* (1952) is a composition without music. Foregoing all formal musical properties like beat and note rate, the piece is instead punctuated by three movements marked by the opening and closing of the keyboard lid. In the words of Susan Sontag, the avant-garde is thus indicative of "art that is at the same time anti-art." (Sontag 1981, 24) The following pages will propose how aesthetic affordances can account for this aim.

I will first situate the Lettrists in 20th-century French intellectual history. I will then present how neurocognitive science, especially the research of Stanislas Dehaene and colleagues, can reframe their experiment with cinematic form.

[44] All translations are my own unless otherwise stated.

4.2 Lettrism

Lettrism was founded by Isidore Isou (1925-2007) in the 1940s with the express aim of "*teaching that letters have a destination other than words*." (Isou 1983, 72) He saw himself continuing the legacy of Charles Baudelaire (1821-1867), Paul Verlaine (1844-1896), and Tristan Tzara (1896-1963) whose formal experiments with language at the level of verse, phrase, and lexicon led to a new phase occupied solely with letters. Hence, the first manifesto, *Poetic and Musical Principles of the Lettrist Movement* (1946), proclaims: "after the destruction of the word…poetry leads to LETTRISM." (Isou 1974, 310)

Isou's emphasis on destruction and regeneration is not explicitly tied to the end of World War II, but it cannot be divorced from its horrors, either. The Lettrist endeavor has striking similarities to Tzara's *Dada Manifesto 1918,* which argues "for continuous contradiction… because I hate common sense." (Tzara 1981, 76) To the Dadaists, World War I was a "plague produced by intelligence," leading to passivity and enslavement to the will of the authorities (Tzara 1981, 81). Hence, Dada is "art on the basis of the supreme simplicity: novelty, we are human and true for the sake of amusement, impulsive, vibrant to crucify boredom." (Tzara 1981, 76) From this perspective, the avant-garde insistence on innovation equates to a defense of life, amusement, and impulsivity, which further parallels Woolf's fight for 'the creative feelings.' Similarly, Isou insists on opening up a new future, although he does name the wars or his Jewish heritage,

To Isou, the letter is the most fundamental scriptural unit, but its poetic potential was unexplored. Maurice Lemaître (1926-2018), another founding member of Lettrism, makes this explicit in his definition of their aesthetic aims. Experimenting with letters as a form is to develop "a code (of signs) addressing the senses or presaging notions yet to be defined."

(Lemaître 1966, 11) In other words, Lettrists seek to renounce all linguistic and poetic conventions. The most obvious example of this aesthetic persuasion is found in their spoken-word poems, where lines like "cncn ff vsch gln ié / gué rgn ss ouch clen d" are inflected with sighs, groans and wheezes[45] (Isou 1947, 323). The purpose of making these sounds is to emphasize a new form of letters, separate from words and semantics, "*to lay out in front of the bedazzled audience wonders realized in letters* (debris of destruction)" (Isou 1974, 307).

Crucially, the Lettrists admit they do not *know* how to speak their new language. Instead, "LETTRISM IS AN IDEA WHICH ONE WILL KNOW HOW TO PROCLAIM THROUGH ITS REPUTATION." (Isou 1947, 18) Their aesthetic priority is to challenge the conventions of poetry, to cause a stir, and to make their audience "attentive to the beauty of letters and sounds, existing without any logic but full of an insolent magic." (Isou 1974, 311) In short, Lettrism is an attempt to remove the "utilitarian aims" of poetry and language (Lemaître 1966, 11). These same ideals informed the Lettrist approach to film.

In *Aesthetics of Cinema* (1952), Isou advances a theory called 'discrepant cinema' on how the filmstrip can be reduced to "essential particles." (Isou 1999, 69) Just like letters are the most basic form of poetry, so Isou wanted to isolate the 'particles' of the image. Color should be divorced from its functional role of depicting visual nuances and turned into "an alphabet of metagraphic signs…rendered independent of the image." (Isou 1999, 61-62) For instance, a shot might be interrupted by thick undulating lines running across the screen in purple or pink to contest color as something that only exists as part of an image. Similarly,

[45] Gil Wolman builds on this style to develop a 'physical poetry' called 'mégapneumie' which exclusively uses breadth and sounds.

through an improvised process[46] called 'discrepant editing,' Isou would scratch the film reel and paint it with ink or glue, while Lemaître would paint the reel with eyes, diagonals, and other symbols in various colors.

Figure 1: Stills from Lemaître's *Has the Film Already Started?* (1951) and Isou's *Treatise on Venom and Eternity* (1951).

In addition, Isou and Lemaître would disrupt the image by using soundtracks bearing no relation to the shots "to separate the ear from its cinematographic master: *the eye*." (Isou 1964, 16) For instance, *Treatise* has a soundtrack that is part manifesto,[47] part crass melodramatic romance,[48] but often paired with archive footage utterly unrelated to the action, like fishing expeditions, gymnastics, and shots of the First Indochina War (1946-1954).

[46] Isou insists that the chiseling was "improvised" and "not premeditated." (Isou 2019). However, Lettrist scholar Kairna M. Cabañas disagrees and suggests that a pattern emerges around "a shot's visual marking and its content." (Cabañas 2014, 41) She also cites Lemaître, who (apparently contradicting Isou) claims "it is mistaken to see [the chiseling] as independent of the images." (Cabañas 2014, 44)

[47] Isou wrote and shot his film in 1951 before writing *Aesthetics of Cinema* in 1952. He developed content in the essay that he had to cut from the film; the uncut version is over 4 hours long.

[48] Lines like the following abound: "The Narrator: And she [Ève] believed it [that she is with her true love]. And Daniel believed it. And when he took her to his place, he thought "I want

In the words of Lettrist scholar Kairna M. Cabañas, these interventions are all attempts to "direct attention away from the *what* of the image to the *how* of the footage's framing." (Cabañas 2014, 47) Indeed, Isou emphasizes that the sonic manipulation only exists to support his experiment with the form of the image, stating that "one work must limit itself to one process." (Isou 2019)[49] Moreover, as fellow Lettrist Frédérique Devaux argues, the intervention on the actual filmstrip, as opposed to the movie as a whole, is of prime importance: "referencing the physical basis for the film experience and manipulating the image by sculpting it manually is a primary component of Isou's aesthetic." (Devaux 2019)[50] The introduction of painted filmstrips (*pellicule brossée*) is the critical formal innovation.

In comparison, the Dadaist film *Ghosts Before Breakfast* (1927) by Hans Richter (1888- 1976) already merged discordant clips, inversed colors, and used stop motion effects to alternate between empty and full coffee cups, for example. Further, directing the viewer's attention away from a coherent narrative towards visuals had been experimented with since A *Trip to the Moon* (1902) by Georges Méliès (1861-1938), where "in a conception that sees cinema less as a way of telling stories than as a way of presenting a series of views to an audience, fascinating because of their illusory power." (Gunning 2006, 382) So, I will focus my analysis of Lettrist cinema on its visual experiment with painted filmstrips.

By foregoing supporting narratives and disrupting the filmstrip, Isou hopes to demonstrate "the limitations and impotence of the image." (Isou 2019) Indeed, as the

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to do good to you here (and pointed to her belly) and do harm to you here (and pointed to her heart)." And the whole night was incredible. He loved her so much, he sank into her body, he shed tears of love – he, the distant one, the cynic…" (Isou 2019)

[49] Isou 2019 has no pagination.

[50] Devaux 2019 has no pagination.

character Ève in *Treatise* exclaims to Isou, who plays the role of Daniel, which in true discrepant fashion is voiced by a different actor, Albert J. LeGros, "You're the first to have understood that the destruction of the picture is the only possible way for it to evolve." (Isou 2019) That is, the aim of discrepant cinema is not only to 'destroy' representational imagery but equally to discover a new mode of communication. To cite the epilogue running across the screen of *Treatise*, Lettrism exists to "invent *new words*." (Isou 2019) I will interpret 'words' in the Lettrist sense of isolating basic units of meaning, whether verbal of visual. This is the paradox of 'anti-art' proposed by Sontag. How can a new visual form contradict verbal and figurative sense-making conventions and produce a new understanding?

Their avant-garde aims are usually framed as 'affective' or somatic responses, concepts associated with poststructuralist thought. From this perspective, the Lettrists speak to the instability of language and the need for liberation from the bourgeoisie. These are prominent concerns of the 20th century that I will address to further situate the contribution of aesthetic affordances to a new understanding of Lettrism and the avant-garde attempt to 'destroy' meaning. Specifically, I will examine this intellectual heritage through attention to Antonin Artaud (1896-1948), whose development of nonverbal theater inspired both Isou and Gilles Deleuze (1925-1995) and Félix Guattari (1930-1992).

I will then offer my analysis of the aesthetic affordances of Lettrist cinema to examine how representational imagery is destroyed and rendered into 'essential signs' by appealing to how our brains engage with geometric shapes. Specifically, I will equate this to an analysis of how form can engage a cognitive mechanism that does not depend on

conscious deliberation or a language and imagery of sense. Like Woolf, striking this balance between declarative knowledge and intuition is crucial to the Lettrist experiment.

4.3 Antonin Artaud

Isou states his indebtedness to Artaud in *Treatise,* where a Lettrist poem is recited in his honor. Artaud had already in 1938 insisted "to turn against language and its basely utilitarian, one could say alimentary, sources." (Artaud 1958, 46) Specifically, his concept of 'the theater of cruelty' proposed a mode of communication "addressed first of all to the senses instead of being addressed primarily to the mind as is the language of words." (Artaud 1958, 38) Moreover, Artaud also experimented with the use of somatic sounds by incorporating incantations, vibrations, rhythms, and gestures to act like "displacements of significations." (Artaud 1958, 43) Again, the aim was to break up the structure of language. He believed that culture had grown stagnant and that a "cultivated 'civilized' man is a person instructed in systems, a person who thinks in forms, signs, representation." (Artaud 1958, 8) In short, Artaud questioned language as the sole vehicle of sense-making. Specifically, he attacked what he termed "psychological theater" and the notion that the arts should only portray the mind (Artaud 1958, 84).

Hence, Artaud's criticism of the form of theater is usually presented as favoring the body *over* the mind. Language, culture, and sense belong to the mind, whereas freedom, art, and innovation emanate from the body. This binary has significantly impacted poststructuralist responses to the avant-garde, particularly from Deleuze and Guattari, who draw on Artaud to propose their somatic critique of language. However, Artaud's reservations about the mind as the seat of reason should be seen in its historical context. He is

responding to the psychoanalytical legacy of Sigmund Freud (1856-1939) and Jacques Lacan (1901-1981), who had both emphasized the centrality of language and signifiers to the mind in theories like 'the talking cure' (Freud) and the dictum that 'the unconscious is structured like language.'[51]

I will explore this intellectual history in the pages to come because my approach from aesthetic affordances offers an alternative view of the relationship between language, sense, and the mind. As explained in previous chapters, advances in neurocognitive science in the 21st century have dispelled the myth that cognition is about verbalizations, 'sense,' and representational knowledge. On the contrary, the mind does not operate through normative principles and linguistic signifiers alone.

For example, pioneering research by psychologist Gerd Gigerenzer and colleagues has repeatedly demonstrated that both expert adults, like medical doctors, and children, consistently fail to reason via Bayesian inferences. Our minds find it difficult to use statistics to understand any situation, such as a 10% chance that a woman without breast cancer will still have a positive mammogram. Much overdiagnosis and overtreatment in clinical settings are in part due to the failure of physicians, patients, and politicians "to understand the meaning of numbers." (Gigerenzer 2007, 53) As a result, healthcare systems worldwide are increasingly transitioning to what Gigerenzer has termed 'natural frequencies.' This evolutionary approach frames situations, such as likely medical outcomes, based on how our ancestors encountered information. Relating likelihoods now corresponds to how people

[51] I have chosen 'structured like language' instead of the direct translation 'structured like a language' to encapsulate the French *langage,* which is about the rules of signs and signifiers, not any individual language: "l'inconscient est structuré come un langage." (Lacan 97, 1973)

would intuitively understand scenarios, such as determining the likely success of foraging for green apples in an area with many kinds of fruit trees.

My point is that there is no neurocognitive basis to the idea that the mind is 'rational' if rationality is defined through normative inference models or a language of signifiers. This argument corresponds to points I raised in the introduction about how game theories based on logical reasoning perform worse than human intuition when detecting cheaters in social exchanges. In short, cognition is not only a matter of logic, language, or what Artaud would have considered 'the mind.' Hence, my analysis of aesthetic affordances in Lettrism will not discuss the purported divide between a rational mind and a (free) irrational body. But I do want to situate the motivations present to Artaud and the Lettrists.

The purported binary of body and mind is their way of accounting for formal innovation. This resembles Woolf's vague reference to 'beauty' and 'right relations.' It is also in this communicative light that I will understand Isou's wish to "make silence concrete" and "write nothingness." (Isou 1974, 307). Isou wants to make his audience understand *something*. The last lines of *Treatise*, rolling down the screen in large font, state: "Ask yourself on the way out whether or not this film possesses at least the value of a gangster film or a love story – or any 'realistic' film which the critics consider acceptable." (Isou 1964, 88)

With this proviso, I will examine the significance of Artaud to poststructuralism before reframing that debate through my analysis of aesthetic affordances in Lettrist cinema.

4.4 Poststructuralism

Artaud's artistic practice expresses resistance to language as the primary organizing principle of society. A famous example can be found in his censored radio piece *To Have*

Done with the Judgement of God (1947). He cries, screams, and stutters the words to his play denouncing god and the confines of the human body. The tortured voice is aching for that final moment because "when you will have made him a body without organs,/ then you will have delivered him from all his automatic reactions/ and restored him to his true freedom." (Artaud 1976, 571)

The disorganized body is a compelling concept for Deleuze and Guattari because it insists that finding ways of making sense that do not depend on language must be possible. For instance, Artaud finishes his radio play by favoring a frenzied dance: "Then you will teach him again to dance wrong side out/ as in the frenzy of the dance halls/ and this wrong side out will be his real place." (Artaud 1976, 571) The philosopher duo calls this liberation from language and civility 'the body without organs.' In their view, "the body without organs is not a dead body but a living body all the more alive and teeming once it has blown apart the organism and its organization." (Deleuze and Guattari 1987, 30). To understand why, it is necessary to consider their resistance to Lacanian psychoanalysis.

According to Lacan, people's identity is at the mercy of others' desires. We become who our parents and society want us to be, and we develop "the illusion of autonomy" to cope with this ultimate misrecognition or 'mésconnaissances' of our existential situation (Lacan 1977, 7). Life is a process of existential (mis)interpretation. Moreover, this situation is inescapable as language structures *all* experiences.

Combining the illusion of autonomy with the structure of language suggests, quite tragically, that people can only express themselves using an inherently alienating language. People, therefore, keep searching, moving from word to word and meaning to meaning, but our "(unconscious desire) is never fulfilled; it is only displaced and substituted for, forming a

chain of signifiers." (Meltzer 1995, 159) Sense-making via language is a failing and inescapable travail. This is where Deleuze and Guattari take issue.

Following Michel Foucault (1926–1984), they state: "Hence, instead of participating in an undertaking that will bring about genuine liberation, psychoanalysis is taking part in the work of bourgeois repression…*making no effort to do away with this problem once and for all*." (Deleuze and Guattari 2000, 50) On the other hand, Artaud offers a solution to the problem of language by emphasizing that sense-making can be unregulated through the body: "Antonin Artaud discovered this one day, finding himself with no shape or form whatsoever." (Deleuze and Guattari 2000, 8)

According to Deleuze and Guattari, the Lacanian view of human nature leaves no room for creativity. People crave meaning but are caught in an endless string of signifiers they have no control over. This makes desire "primarily a lack" or "a machine, producing certain effects, amenable to a certain use." (Deleuze and Guattari 2000, 25, 108) [52] People are both participants and pawns in this semiotic web where naming takes on incredible political significance. For instance, entire groups have come in and out of history based on named categories like 'African American' (a sermon from Philadelphia in 1782), 'homosexual' (Prussian penal code, 1869), or 'cisgender' (a 1991 German journal of sexology).[53]

[52] They label this a binary of acquisition and production, which forms part of their critique of capitalism – an avenue of thought that I will not continue here. Suffice to say that reconfiguring desire involves reconfiguring not only the means of production (as Karl Marx would have it) but also questioning the need to produce in the first place.

[53] Comparable claims have been made about scientific discoveries. Ludwik Fleck (1896-1961) suggested, as early as 1935, that "even the simplest observation is conditioned by thought style and is thus tied to a community of thought." (Fleck 1981, 98) Fleck's theory of *Wunschtraumerfüllung* – that wishful and self-fulfilling expectations drive science– paved the way for poststructuralist science and technology studies led by Bruno Latour (1947-).

Yet despite the impact of language on individual lives, according to Lacanian psychoanalysis, these societal shifts and "their effective realities depend upon no particular subject in history." (Bové 1995, 56) Sense-making is fundamentally a disembodied, anonymous, and shifting process of coherence. To Deleuze and Guattari, this is a flawed understanding of the creative potential of desire.

Instead, we should reconfigure what desire and language are. They credit the 'revolutionary literature of the likes of Allen Ginsberg (1926-1997) and Jack Kerouac (1922-1969) with advancing a form of writing "when language is no longer defined by what it says, even less by what makes it a signifying thing, but by what causes it to move, to flow, and to explode – desire." (Deleuze and Guattari 2000, 133) That is, the innovation of the Beat Generation offers an alternative to psychoanalysis.

Like Artaud and the Lettrists, the American counterculture resisted the idea that literature was a language of sense and repressed desire. This criticism had already been articulated by Tzara, who argued that "psychoanalysis is a dangerous disease, it puts to sleep the anti-objective impulses of man and systematizes the bourgeoisie." (Tzara 1981, 79)[54]

Deleuze and Guattari, therefore, use avant-garde literature to argue that language and desire can be a 'multiplicity' that is "irreducible to any sort of unity." (Deleuze and Guattari 2000, 42) In the context of Lettrism, destabilizing language to prove its creative potential compares to Isou's claim that 'letters have a destination other than words' and that letters do

[54] The repeated choice by Isou and the Lettrists to demonstrate indebtedness to Artaud and limited recognition of Tzara would be an exciting course of study, which will not be undertaken here. The framework of Harold Bloom's *The Anxiety of Influence* (1973) might be a good starting point for understanding this dynamic.

not have to create an apparent unity. Language, words, and letters should not be conceived as shackles but celebrated for their capacity to instill uncertainty.

However, this tension between a langue of sense and nonsense betrays a deep rift within the avant-garde, characterized by the balance between co-option and innovation.

If the avant-garde seeks to disrupt a language of sense through formal innovation, in Isou's case, by moving from the Dadaist play with words to the Lettrist use of letters, how do artists maintain communicable meaning? The question parallels Woolf's attempt to avoid preaching. There, I proposed that aesthetic affordances can answer the question because readers can intuitively understand *Between the Acts* through entrainment. Here, I will examine how Lettrist cinema can afford an understanding that does not rely on representational imagery but depends on a cognitive mechanism devoted to geometric shape perception.

But, first, I want to discuss the significance of this debate over 'meaning' to Lettrism which caused a rupture between its founding members. Moreover, examining the tension between what can broadly be categorized as aesthetics versus politics will further define my aesthetic affordances theory.

4.5 Aesthetics versus Politics

I have suggested that aesthetic affordances can explain how form invokes cognitive mechanisms, like Woolf's use of rhythm. Further, I have proposed that this analytical perspective can explain how form can facilitate understanding in ways that avoid preaching or co-option by the mainstream. In the case of the Lettrists, this will involve how their experiments with the visual form of cinema can disrupt representational imagery and

maintain a communicable sense triggered by our intuition for geometric shapes. However, my use of cognitive neuroscience is not an attempt to explain away the tension between aesthetic innovation and political content.

Any theoretical framework, including the one I am advancing, must account for the need of artists like Isou and Woolf to reach their audience. Otherwise, appeal to 'cognitive' becomes a buzzword to characterize an otherwise unknown sense-making process.

For instance, Deleuze and Guattari's arsenal of concepts like 'rhizomes,' 'deterritorialization,' 'lines of flight,' and 'the molecular' all exist to object to the organizing principle of language, summed up by their insistence on conjunctions over disjunctions.[55] Yet, they are notoriously vague. What does it mean that Ginsberg's writing is rhizomic? There is no definite answer. Instead, the concept is elusive *because* its critical function is to destabilize meaning. In contrast, my appeal to neurocognitive science seeks precision. This holds significance for the way I will position the balance between aesthetics and politics.

To poststructuralists like Deleuze and Guattari, cognition is celebrated when it is abnormal. They famously use the term 'schizoanalysis' to critique the 'cure' psychoanalysis offers. Indeed, the subtitle of their first three books is *Capitalism and Schizophrenia*. This also indicates their indebtedness to Artaud, who had that mental condition.

Unfortunately, that reference fails to account for the significant personal cost and suffering caused by schizophrenia, such as the loss of language and hearing voices.[56] Thus,

[55] "…the fabric of the rhizome is the conjunction, 'and…and…and…'" (Deleuze and Guattari 1985, 25)

[56] See Frith 2003.

destabilizing concepts can be productive critical tools but do not account for *how* cognition operates or how art is understood. I, therefore, want to recognize that my analysis of the issue of co-option, or how to balance the use of a 'preaching' language of sense with formal innovation, will seek to go beyond a description of the experimental process towards a theory of reader-reception.

Specifically, I am interested in how neurocognitive science can help scholars reframe how form is perceived when manipulated and divorced from representational language and imagery. Hence, it is from this theoretical perspective that I wish to consider the tension between aesthetics and politics, which in Lettrism resulted in the formation of a countermovement by its original members Guy Debord (1931-1994) and Gil Woman (1929-1995) in the guise of the Lettrist International in 1952 and the Situationist International in 1957.

Isou wanted to demonstrate the image's limitations and that letters can 'have a destination other than words.' The tension between aesthetics and politics concerns how to make these new forms comprehensible without falling back into convention. If Lettrist cinema is too avant-garde, then Isou and co. risk audiences will not appreciate their critique of politics and the status quo. Conversely, aesthetic innovation succumbs to convention if it is too 'preachy,' to borrow Woolf's phrase. Now, I have suggested that analyzing aesthetic affordances offers insight into this balance by separating what is verbalized from how an art form engages cognitive mechanisms. From this perspective, it is possible to consider what split the original Lettrists in a new light.

Fundamentally, the question of balance can be described as the need for the avant-garde to make sense. Sontag recognized this problem in Artaud's work by noting that "only a few situations…seem sufficiently extreme and uncommunicative to have a chance of evading cooptation" (Sontag 1981, 50). For the Lettrists, provoking nonsense poetry constituted an 'uncommunicative' stance, which resisted co-option. However, it was *also* at odds with communicating any radical left-wing politics. As a result, Debord and Wolman quickly grew impatient with a modus operandi that "granted the creation of new forms the highest value among all human activities." (Wolman 2001, 74) Specifically, they equated this creative obsession with "the idealist and bourgeois position in the arts." (Wolman 2001, 74)

The inciting incident to their rupture with Lettrism was a Charlie Chaplin press conference in 1952. Here, Wolman, Debord, Serge Berna, and Jean-Louis Brau – all Lettrist adherents – interrupted Chaplin's talk at the Ritz in Paris by throwing leaflets denouncing him as an "emotional blackmailer" and "fascist insect." (Wolman 2001, 32) Chaplin may have started in vaudeville, epitomized silent cinema, and created a vagrant 'tramp' character in a bowler hat and mustache. Nevertheless, he had become a multimillionaire, owning his own Hollywood studio and selling merchandise of his famous characters. Hence, according to Wolman and co., it was necessary to expose a person who was falsely portrayed "in a progressive perspective." (Wolman 2001, 77)

This provoked Isou, who recognized Chaplin in *Treatise* for having added "something new and personal to the art of cinema." (Isou 1964, 10) As a result, he, Lemaître, and Gabriel Pomerand publicly expressed their horror at Debord/Wolman's "mental instability" and "bitterness." (Isou et al. 1952)

In some way, Debord's blindness to his own sensationalist tendencies and the politics of his adversaries would suggest that much. For instance, he completely ignores that Chaplin was blacklisted during the McCarthy era and surveilled by the FBI for most of his life under the suspicion of Communism. Moreover, Situationist tactics would become increasingly violent to the point that Debord, in 1962, celebrated "the recent bomb-action of the Danish comrades against those travel agencies that arrange tourist trips to Spain." (Debord 1963, 11) One would be hard-pressed to find anything 'aesthetic' about the Situationist disruption of travel to Francoist Spain.

In any case, the two responses to Chaplin indicate a conflict over how art should address contemporary politics. By celebrating his reputation, Isou emphasizes the Lettrist contribution to an aesthetic lineage, that is, to a heritage of formal innovation. Conversely, Debord argues that content is more important than form by calling attention to a political reality, specifically capitalism.

I will examine these opposing views to present how my theory of aesthetic affordances analyzes form and to absolve Isou and the Lettrists from Debord and Wolman's criticism.

4.6 Form and Content

Artists must spell out their material concerns to effect change. As Debord will later claim in his seminal work *Society of the Spectacle* (1967), "the spectacle is not an assemblage of images, but a social relation between people, mediated by images." (Debord

2018, 4). Art exists to draw attention to the role of visual culture and the impact of that culture on social life.[57]

This insistence is evident in Debord and Wolman's provocative rejection of Lettrism in a 1955 essay titled *Why Lettrism?* They emphasize that aesthetic value is only found by tying content to politics: "the powers of a work of art of its time should know to depend only on its content." (Debord and Wolman 2001, 75) Art should be "educative propaganda." (Debord and Wolman 2001, 88) Their 1956 paper *A User's Guide to Détournement* offers an early guide to how images can be imbued with political messages.

Debord and Wolman present a case study of their technique *détournement* – French for turning in another direction – involving a neorealist film still. They do not name one, so I offer Vittorio De Sica's *Bicycle Thieves* (1948) as an example. The film follows the desperate laborer Antonio who secures a job hanging advertising posters in postwar Rome but loses it because someone steals his only means of transportation, his bicycle. The film is ripe with misery and exploitation.

Debord and Wolman would then take a still and add lines from a different source to further emphasize a political message, hence the *détournement*.

Consider Antonio, hunched on the curb, addressing his worried boy Bruno with the following words: "the rule was in the books of the philosophers, we have placed it in the rule of nations." (Debord and Wolman 2006, 19) The introduction of this famous line from

[57] Debord and Wolman were formulating ways to address the mounting commodification of cultural life. This culminated in Debord's critique in *Society of the Spectacle* of "[an] advanced economic sector that directly creates an ever-increasing mass of image-objects, the spectacle is the *leading production* of present-day society." (Debord 2002, 10) Of note, as Lettrist Marc'O reminds us, these politically motivated artistic interventions originated before the term *mass media* became an object of academic study (see Marc'O 1999, vii).

Robespierre (1758-1794) “illuminates the thought of Maximilien [Robespierre], namely that of the dictatorship of the proletariat.” (Debord and Wolman 2006, 19)

Debord and Wolman believe an audience can only develop a critical consciousness if the aesthetic technique supports direct communication. The combination of Robespierre’s line with the movie’s still facilitates an understanding of their politics. The form should serve the content, in other words. Aesthetic innovation should serve politics.

Thus, the early appeal of Lettrist cinema to Debord and Wolman was undoubtedly the revolutionary potential of a new cinematic form. But their excitement transformed into an awareness that even aesthetic experiments take place in a political reality such that the filmstrip, like any other technical apparatus, “is in fact not at all neutral.” (Debord 2018, 12). It is already political.

The purpose of *détournement* – and terrorist attacks, sadly – is to shock people into understanding a political reality, as Debord sees it. Hence, the proto Situationist attitude towards co-option, to the balance between aesthetics and politics, directly contrasts with Isou’s Lettrism. Debord already dismisses Isou’s cinematic aesthetics in the very first Lettrist journal, *ION* (1951), claiming that Isou’s carvings of the filmstrip “belongs to an era which is finishing, and which no longer interests me…The arts of the future will the disruptions of situations, or nothing.” (Debord 1999, 217) In contrast, Isou always emphasizes formal innovation above all else.

Isou’s primary commitment to form is apparent in his efforts to curate his aesthetic experiments, starting with where *Treatise* was initially screened, the Ciné-Club Avant-Garde

52 in Paris and at the Studio l'Étoile, precursor to the Cinémathèque française. At these venues, each film is preceded by an introduction and followed by a debate.

Moreover, this curation is reinforced by the tripartite structure of Isou's film, which is divided into *The Principle*, *The Exposition*, and *The Evidence*. The film aims to demonstrate the form of discrepant cinema, not to engage in politics. In addition, the audience is frequently reminded by sentences printed on the screen that they are watching a Lettrist film, which is preceded by shots of Isou's book covers and the message "Dear Viewers,/ You are about to see a "Discrepant" film." (Isou 2019)

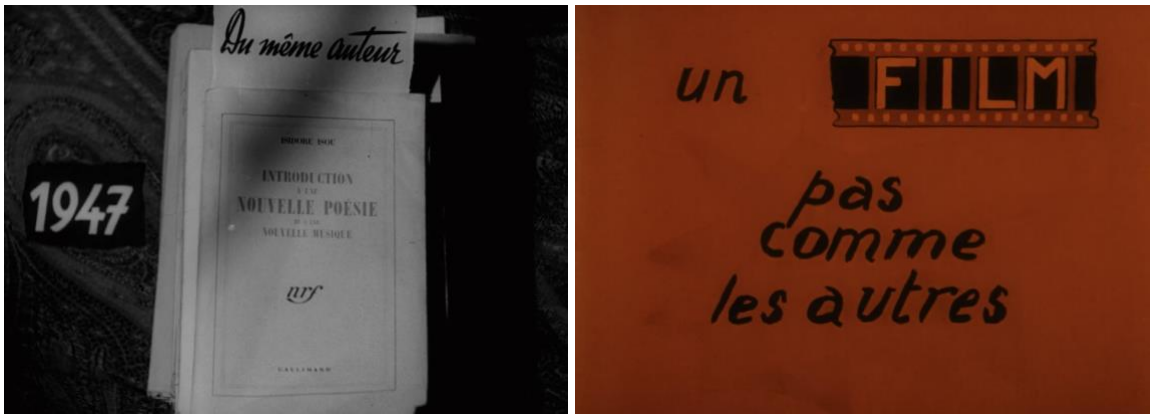

Figure 2: Stills from Isou's *Treatise* (1951) showing his past works, and Lemaître's *Film* (1951) which states that it's 'not like the others.'

The third part presents experiments in Lettrist poetry. Nevertheless, the audience is also told that "the Lettrist poems which you will hear in this final part *have no meaning and mean nothing*." (Isou 1964, 66) Isou thus dismisses their content as insignificant. Moreover, the few times *Treatise* explicitly communicates the purpose of Lettrist poetry, the film resorts to comedy. For instance, when the narration breaks the discrepant editing, which mixes a love story with the exposition of Lettrism, viewers see Daniel and Ève in their Parisian

apartment while the soundtrack explains, “they let themselves be dragged into the orbit of Lettrist folly.” (Isou 1964, 68) This editing is unlike Debord and Wolman’s call for a politically engaged art form. For instance, why folly is essential is not explored. Instead, as Isou explains in *Aesthetics of Cinema*, the formal technique is the “subject of the film itself.” (Isou 1999, 104)

Similarly, Lemaître’s *Has the Film Already Started?* curates Lettrist sound-poetry with introductions and epilogues, just as the film references Isou and Lettrist principles and so “repeatedly calls attention to its unique status and departure from classical cinema through intertitles such as ‘un film pas comme les autres’ (a film unlike any other).” (Cabañas 2014, 54) In short, the Lettrist films are always defined against traditional cinematography. Their purpose is a curated demonstration of new techniques.

In Lettrism, the content supports the form whereas the future Situationists Debord and Wolman argue that form should serve the content. I outline this tension for two reasons.

Most importantly, Isou and Lemaître, like Woolf, offer a case study for how form can trigger cognitive mechanisms that facilitate an intuitive understanding of an art piece, thus maintaining the intended political effect. That analysis of aesthetic affordances can, in turn, address the Situationist criticism that Lettrist aesthetics are ineffective.

The second related point is that analyzing the impact of the form of Lettrist cinema on the mind offers an alternative framework for how the avant-garde. The poststructuralist perspective, which I equated with Deleuze and Guattari, usually emphasizes the way form can destabilize a language of sense. I wish to reframe that question from a cognitive perspective, which discards intentionally vague descriptions of the avant-garde process of

sense-making in favor of a more precise vocabulary for how representational language and imagery are sidestepped.

4.7 Geometrical Primitives

Lettrist cinema disrupts representational imagery. For instance, faces and eyes are scratched out or squiggled over. In Deleuze and Guattari's terminology, these interventions are rhizomic and 'schizoid' because they destabilize the features that would typically regulate our understanding of the image. This point can also be made cognitively.

To recall, the 'theory of mind' cognitive mechanism allows us to intuitively and immediately interpret a person's mood based on their eyes, lips, and face. Even colleagues outside cognitive science recognize that the Lettrist interventions in the film "strain the viewer's cognitive abilities" – even more so when some frames have been soaked in soapy water, "disintegrating before our eyes." (Uroskie 2011, 36) However, I want to suggest that other cognitive mechanisms *remain*, particularly the ability to reason about geometric shapes, like zig-zags, spirals, squares, and triangles. This claim entails re-examining how mathematical 'reasoning' conventionally is defined.

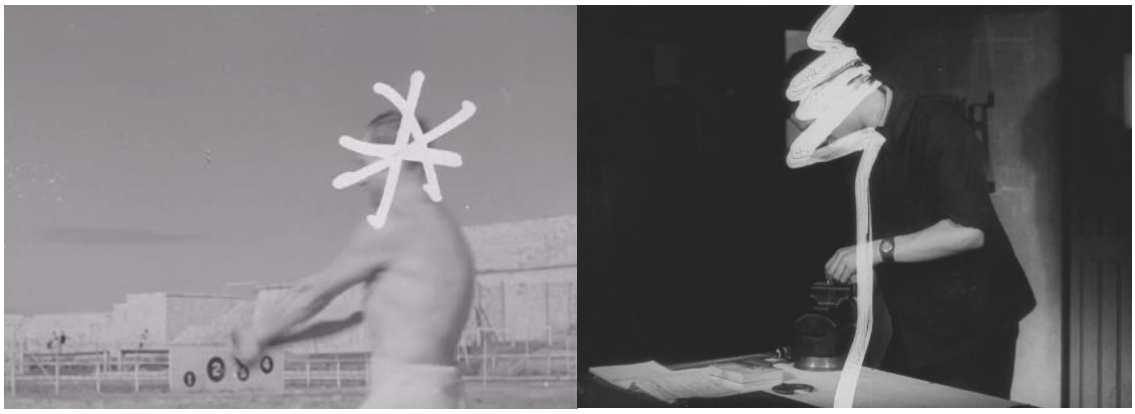

Figure 3: Stills from Isou's *Treatise* (1951).

I have explained in previous chapters that there is a difference between conscious verbalization and intuitive understanding, aided by unconscious 'automatic' cognitive mechanisms. For instance, there is a difference between how rhythm is intuitively meaningful and how I use language to explain my life experiences. Now, the Lettrists disrupt both kinds of cognitive mechanisms. Their poems uproot a language of signifiers, but their discrepant editing even challenges intuitive nonverbal mechanisms, like the ones that rely on perceiving facial features. This dual intervention takes their approach one step further than Woolf's critique of language. However, this does not mean that Lettrist cinema interrupts *all* the ways audiences might intuitively understand their films. To make this case, I wish to consider the cognitive neuroscience of geometric shape perception.

Decades of research by Dehaene and colleagues have now demonstrated that humans have an "intuitive system of mental geometry" for parallel lines, right angles, geometrical figures, rotation, symmetry, or what is called 'geometrical primitives.' (Roumi et al. 2020, 17) Like entrainment, the cognitive mechanism for rhythm perception, the human intuition for shapes is cross-cultural and not dependent on education. It has a long evolutionary history, far predating the formal geometry of Euclid (c. 300 BC).

In short, our intuition for geometry should be understood like universal grammar or the theory of mind mechanisms. Crucially, this new neurocognitive perspective on shapes in Lettrist cinema redefines the conventional definition of 'reasoning.'

Once again, the legacy of the blank slate view – which my theory of aesthetic affordances challenges – dominates existing approaches by positing a difference between the rational mind and the unregulated body. Suffice to consider Deleuze, Guattari, Freud, and Lacan. The present analysis, however, will reiterate that the "remarkable intuition [of infants]

in the fields of language, geometry, numbers, and statistics confirms that they are anything but a blank slate, a tabula rasa." (Dehaene 2020, xxvii)

Evidence for the human intuition for geometry comes from archaeology, experimental studies of the psychology of Indigenous and Western adults and children, and cognitive neuroscience.

Archaeological evidence from a period of 70,000 years, crossing every geographical boundary, suggests that "possibly all human cultures share a drive towards creating geometric designs." (Sablé-Meyer 2022 et al., 1) From Stonehenge and the Lascaux Caves in Europe to the Blombos Cave in South Africa and Signal Hill in Arizona, disparate populations have "produced parallel lines, circles, squares, zig-zags or spirals" in a wide array of activities, like pottery, drawings and large-scale constructions (Sablé-Meyer 2022, 2). It is the existence of these enormous objects at Neolithic sites in particular that provide the archaeological argument for a human intuition for shapes "whose axes are often systematically oriented relative to geographical or astronomical landmarks." (Sablé-Meyer 2022 et al., 2) Our ancestors must have possessed mental concepts of geometry to perceive, through abstraction, what these massive formations would look like from above because they appear distorted from the ground, like ellipses or quadrilaterals.

Standing directly in front of the pyramids of Giza or attempting to walk the Nazca lines in Peru shows the difficulty of seeing the shape based on what is immediately in front of you. Instead, it is as though our ancestors could take a bird's eye view in artificial light, to perceive the perfection of their geometric creations. They must have been able to imagine the shapes without seeing them in their actual proportions, which suggests that the visual

perception of a shape is distinct from the cognitive capacity of abstract reasoning on a symbolic level. Hence, from an archaeological perspective, humans appear to have a cognitive mechanism that facilitates understanding geometry.

Figure 4: Stonehenge seen from the ground compared to a computer rendering of the site (Wikimedia Commons 2007 and 2011).

Next, I wish to consider evidence from experimental psychology, particularly comparative studies of geometric reasoning in Western and Indigenous groups. Dehaene and Elizabeth Spelke, a leading authority in cognitive development, have found that "uneducated adults from an isolated culture, as well as young children from the same culture or from a Western culture, exhibit a shared competence for basic geometrical concepts." (Dehaene et al. 2006, 383) The 'isolated culture' refers to the Munduruku people living in the Amazon River basin in Brazil who have no education in geometry or experience with maps and measuring devices. Yet, when Dehaene and colleagues designed an abstract map of the village and asked the Munduruku to locate objects, they were able to "relate the geometrical information on the map to the geometrical relations in the environment." (Dehaene et al. 2006, 383) The village was now seen from above at a much smaller scale. Crucially, the

map's orientation changed with each trial so that the participants could only refer to the geometric relationships between items on the map, like right-angle turns. Although the Munduruku would never have used any map before or relied on geometrical reasoning for navigating by boat or foot, they "were able to use sense relationships, as well as distance or angle, to relate the map to the environment." (Dehaene et al. 2006, 384)

Similarly, in other tests, the Munduruku could spontaneously infer the geometric concept behind a group of similar images and instantly point out any discrepancies. For instance, they immediately understood which shapes corresponded to the rules of quadrilaterals, trapezoids, and rectangles, further attesting to an intuitive understanding of geometric primitives. However, the real significance is that these results have been replicated cross-culturally. From the Himba in Namibia to Indigenous groups from Northern Australia to Western preschoolers, there is strong evidence that adults and children "already possess strong intuitions of numerical and geometric concepts" (Sablé-Meyer et al. 2022, 3) In short, experimental psychology confirm the archaeological hypothesis that humans have an intuitive understanding of geometry.

Finally, I will consider how these observations connect to the cognitive neuroscience of shape perception. This aspect will have crucial implications for my analysis of the use of shapes in Lettrist cinema because it shows that geometric reasoning relies on something other than a language of sense. As in the case of rhythm, this basic intuition underlies what is conventionally considered explicit knowledge. This will demonstrate how paying attention to the aesthetic affordances of the Lettrist form can replace the poststructuralist notion that the avant-garde is impenetrable or schizoid.

Neurologically, the intuition for geometrical reasoning has a long evolutionary history because the cognitive mechanism is shared with other primates and develops in early infancy. It is an internally regulated principle of how humans perceive the world like entrainment is for rhythm. Consider the studies of blind mathematicians whose visualization of geometrical concepts "recruited the very same parietal and frontal lobe pathways as a sighted mathematician." (Dehaene 2020, 128) This is only possible neurologically because humans have evolved an intuition for geometry that, like all other functional capacities, is rooted in specific brain parts.

Moreover, just like the rules of universal grammar can enable all sorts of linguistic variations, the geometric primitives can generate all kinds of geometric shapes and drawings by "nested combinations of elementary rules." (Roumi et al. 2020, 19) For instance, one rule is that two symmetrical lines (primitives) can be translated and create a zig-zag (shape). Another rule is that two squares (primitives) can be rotated over each other to create an eight-pointed star (shape). Crucially, people can identify the elementary rules and the geometric primitives used to form shapes like zig-zags and stars. In short, these data from cognitive neuroscience corroborate the archaeological hypothesis that sensory experience does not *cause* our intuition for geometry.

Moreover, early studies of split-brain patients[58] show "right hemisphere dominance for geometrical reasoning," which means that "geometrical properties and theorems can be intuitively understood well before a full verbal expression is possible." (Franco and Sperry

[58] Roger W. Sperry received the Nobel Prize in Physiology and Medicine in 1981 for his research on split-brain patients. When the corpus callosum, which connects the two hemispheres, is separated, usually to treat severe epilepsy, it becomes possible to study neurocognitive functions by hemisphere.

1977, 112) The reason is that the brain's language areas are on the left hemisphere. So, if geometrical properties can be apprehended using the right side, then sophisticated verbalizations do not factor in our intuition for geometry. Of course, language and education improve this ability significantly. A person without a formal education will not proceed quickly to a Ph.D. in geometry. Instead, my point is that experts and lay people reason about shapes using the same foundational neural circuitry.

Dehaene has found a similar explanation for how people reason about mathematics, which solves the so-called 'symbol grounding problem' of *"*how arbitrary shapes can ever acquire genuine meanings, over and above a mere network of relations to other symbols." (Dehaene 2007, 551).

Numbers can be represented in two ways: as arbitrary abstract symbols – 5, 8, 9, and so forth – and as actual countable quantities, like these five stars * * * * *. The ability to count nonsymbolic quantities, like the five stars, is inherited from evolution and shared with monkeys, such that "a baby's parietal cortex already responds to the number of objects, at a location that matches the [brain] region which is activated when a human adult calculates 2 + 2, or when a monkey memorizes a number of objects." (Dehaene 2020, 77) Although the symbolic representation is contingent on a local context – the reason why *five* and *5* equate to five dots – the same neurons are involved in both types of mental representation. Similarly, sentences like 'three parallel lines' or 'arrange ten circles in the shape of a square' will all trigger the parietal and frontal lobe pathways devoted to our intuition for geometry. Thus, even very advanced cognitive functions – like reasoning about algebra – are based on evolved cognitive mechanisms.

In short, cognitive neuroscience demonstrates that *any* verbalizations or conscious deliberations about geometry, and mathematics more generally, hinge on intuitive cognitive mechanisms. This prompts Dehaene to conclude that "the basic building blocks that we inherit from our evolutionary history become the foundational primitives of a new, productive language in which mathematicians write new pages every day." (Dehaene 2020, 132) Crucially, the majority of studies to date indicate "a dissociation of the neural circuits involved in mathematical thinking and in natural language processing." (Roumi et al. 2020, 5) The brain has special circuits for mathematical reasoning, in other words. Of note, the exact *process* of interaction between the geometric and language areas of the brain is still unknown, but it does not change the consensus "that these basic geometrical intuitions may serve as foundation for more abstract ideas." (Amalric et al. 2017, 2)[59]

Thus, evidence from archaeology, experimental psychology, and cognitive neuroscience all turn the normative view of learning as knowledge acquisition on its head. Like entrainment, shape perception is another cognitive mechanism facilitating intuitive, preverbal knowledge of the world. In the context of Lettrism and the poststructuralist approach to the avant-garde, the dichotomy of reason and nonsense as the exclusive remit of language breaks down.

[59] Our intuition for geometry also factors in reading which is based on learning and recognizing new shapes as script, which in turn become connected to neurological areas coding for meaning and pronunciation. That is why reading is an example of Dehaene's neuronal recycling hypothesis, introduced in Chapter 1.

4.8 Lettrist Aesthetic Affordances

It is clear that Isou and Lemaître's discrepant editing trigger viewers' intuition for geometry. Their many shapes, like spirals, squiggles, zig-zags, rectangles, circles, and squares, are all part of the geometric primitives the mind uses to make sense of the world. Crucially, this entire system of understanding is neurologically and evolutionarily separate from mechanisms associated with conscious verbalizations. This suggests that the Lettrists succeeded in communicating apart from the 'utilitarian' aims of language *by* 'destroying' the representational image associated with conventional Hollywood cinema.

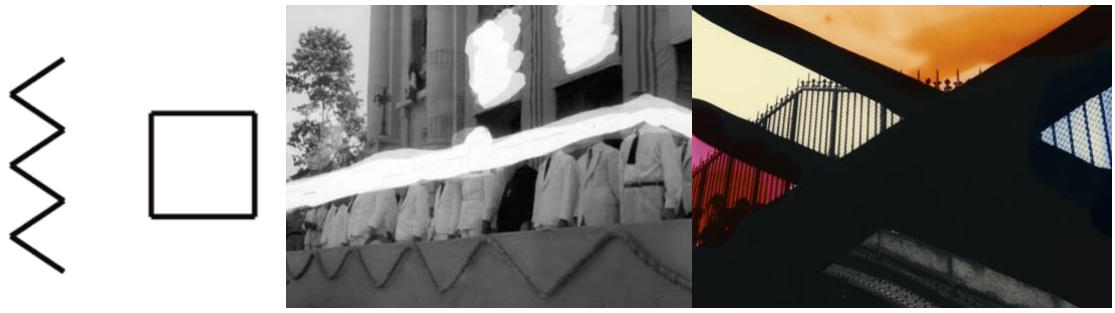

Figure 5: Examples from Sablé-Meyer et al. of basic shapes that exemplify geometric intuition, specifically lines translated into a zig-zag and a square, coupled with stills from Isou's *Treatise* and Lemaître's *Film*.

The application of my theory of aesthetic affordances to Lettrist cinema provides vindication for Isou and Lemaître in the face of Debord and Wolman's denigration of the "Lettrist-aesthetes." (Wolman 2001, 76) It shows that far from creating an overly aesthetic form of cinema, their formal innovation is surprisingly more *fundamental* than the Situationist political critique of mass media. In line with my thoughts on Woolf, this analysis further suggests that the ideological import of form can be examined by attention to aesthetic

affordances. My analysis also shows that only when Lettrist cinema is framed through intuitive sense-making principles does their manipulation of the filmstrip pack a political punch. By reconceptualizing the nature of 'reasoning' and 'sense-making,' the framework of aesthetic affordances can account for how *Treatise on Venom and Eternity* and *Has the Film Already Started?* address the paradox of anti-art. Thus, Lettrism avoids co-option by emphasizing nonverbal communication, which triggers the intuition for geometric shape perception. Isou and Lemaître could not have known about cognitive neuroscience, but my analysis does bring a new perspective on *their* intuition that Lettrist aesthetics would be understood by "notions yet to be defined." (Lemaître 1966, 11)[60]

However, this emphasis on what Isou calls a 'new posterity' addresses an important point about my appeal to intuition. If Lettrist cinema can be intuitively understood because all audiences have a cognitive mechanism devoted to the perception of geometry, why doesn't everyone watch their films? As the rhetorical question indicates, I wish to emphasize that there can be degrees of intuitive engagement.

To explain the *popularity* of an aesthetic practice, I follow the proposal of Dan Sperber, which is that art forms spread in proportion to their "fit with human cognitive organization." (Sperber 1994, 55) Lettrism has limited renown from this perspective because its cognitive 'fit' is limited to few cognitive mechanisms, such as shape perception. In contrast, conventional cinema, like *The Wizard of Oz*, will undoubtedly trigger many more, such as those devoted to exploring new environments, theory of mind, supernatural beliefs,

[60] This could include the Lettrist spoken-word poems, often chanted throughout the film. The regularity of these segments in the film would undoubtedly entrain the audiences to the 'poems.' Although the linguistic structure is nonsensical, the perception of the rhythm is intuitively understood, as my analysis of Woolf suggested.

etc.[61] *The Wizard* will therefore appear more intuitive than *Treatise*. This brief point provides a critical concluding remark on the purpose of aesthetic affordances for literary and cinematic scholarship. As my studies of Woolf and Lettrism show, examining the role of evolved cognitive mechanisms is primarily an inroads to understanding the value of formal experiments.

By definition, aesthetic affordances delineate a smaller area than analyses of language and representational imagery. But it is also what makes the framework unique. Aesthetic affordances insist that form can be intuitively and preverbally understood and isolated from language. From this perspective, the Lettrist experiment is a remarkable example of cinematic art broken into basic units of meaning.

[61] I provide context to some of these in my introduction in Chapter 2 to the field of evolutionary psychology and the domain-specific view of the mind which studies cognitive mechanisms.

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5. Conclusion

5.1 Summary

Aesthetic affordances describe how evolved cognitive mechanisms facilitate an intuitive understanding of literary and cinematic form. This is an essential connection because in making it, the theory advances analysis of a new kind of aesthetic appreciation that does not hinge on language and mimesis.

I have shown that Gibson's theory of affordances proposes that objects can be inherently valuable and meaningful. I explained how his theory of invariants supports this hypothesis, which today finds an equivalent in cognitive neuroscience. I have thus moved Gibson's affordances from an idea about what physical actions are inherently meaningful to an aesthetic theory of intuitive understanding. In doing so, I have also corrected the overall approach in the humanities, which equates physical Gibsonian affordances with aesthetic responses. Specifically, I have argued that aesthetic affordances depend on underlying cognitive mechanisms. This is the only way to substantiate the idea that affordances describe a relation between an object and a subject that is immediately meaningful. I am therefore contrasting aesthetic affordances with an instrumental view of literature and the arts.

This is where my choice to emphasize form and the works of experimental artists, Virginia Woolf and the Lettrists, becomes significant.

I have shown the explanatory force of aesthetic affordances in two ways by emphasizing case studies that seek to circumvent figurative imagery and representational language. Firstly, I have given a new perspective on the efforts of artists to communicate outside a language of sense. The examples demonstrate how literature and film can be inherently

meaningful in virtue of evolved cognitive mechanisms. This was aided by the fact that both Woolf and the Lettrists sought to harness form as an isolable sense-making mechanism, specifically rhythm, and shapes.

Secondly, the case studies have revealed how artists can circumvent and challenge tradition, whether defined as patriarchy or the bourgeoisie, through form. Crucially, because these ideological aims hinge on the audience's ability to 'understand the form,' to paraphrase Woolf, appeal to aesthetic affordances has demonstrated the efficacy of such formal experiments in hitherto unexplored ways.

In short, by isolating formal elements, I have shown that sense-making need not hinge exclusively on language or representational imagery. In consequence, the theory of aesthetic affordances introduces new terminological distinctions.

My framework introduces a new vocabulary for aesthetic analysis, which sidesteps the hierarchy of language. The notion of a language-based and fragmented self has held sway for most of the 20th century. As a result, critical concepts for the study of literature and the arts have either upheld the supremacy of the signifier by psychoanalyzing texts or sought to reject language by appealing to 'nonsense.' Moreover, the incumbent humanities definition of affordances as utilities further cements the idea that meaning is tied to what an object does, to its societal significance.

Aesthetic affordances resolve this tension by introducing cognitive principles of sense-making that dismiss the centrality of language. The shift from a single linguistic sense-making process to considering a range of sophisticated reasoning mechanisms offers a nuanced approach to studying how film and literature impact the mind through form. I

propose that this new approach from cognitive neuroscience can have a democratizing effect. Where the role of intuition is fully recognized, eloquence and formal education are no longer prerequisites for aesthetic appreciation.

This takes me to consider what aesthetic affordances can do to better understand the mind's engagement with art to elaborate the theory further and aid democratization.

5.2 Future Directions

Aesthetic affordances push away from linguistics towards the incorporation of cognitive neuroscience to expand our definition of what meaning is. Similarly, the theory moves away from viewing the arts and affordances through instrumentality and towards analyzing art's inherent value and meaning. This shift could incorporate studies on neurodivergent approaches to meaning, mainly since my analyses all draw from universalist theories of cognition. For example, research in experimental psychology by colleagues and I suggest that the personality trait schizotypy plays a significant role in finding Isou's Lettrist film meaningful (Gross et al. 2022). The cognitive dimension of this difference is not known, but the study speaks to how my framework could benefit from further diversity.

There is also scope to expand beyond the universal cognitive mechanisms that I have presented. I chose entrainment and our intuition for geometrical primitives, but there is robust evidence for several more, some of which I mentioned in setting out my framework in Chapter 1. For instance, the intuitive cognitive mechanisms for numerosity (Dehaene 2007) or causal events (Leslie et al. 1987) could be applied to our understanding of anything from repetitions in poetry to the genre of magical realism.

Similarly, the framework should be expanded to other art forms in addition to the novel and films. Sound is mentioned in my analysis of Woolf, but there is scope to apply aesthetic affordances to music in its own right, too. Moreover, the cognitive framework can be applied to all visual art forms, such as painting and sculpture, as suggested by my analysis of Lettrist cinema. This takes me to a remark on interdisciplinarity.

The theory of aesthetic affordances is a framework grown from my interdisciplinary training. It results from the combination of ecological psychology, evolutionary psychology, and general recourse to cognitive neuroscience, placed in conversation with literary theories of the 20th century, notably Bell, Moore, and Woolf's aesthetics of Significant Form, and the Lettrists' heritage in Dadaism, psychoanalysis and poststructuralism. My theory is a first attempt at a new explanatory framework for understanding literature and film. It remains hypothetical.

Aesthetic affordances could expand on the framework's interdisciplinary foundation and be tested through experimental psychology and empirical aesthetics. Scholars could examine if the cognitive mechanisms of entrainment and geometry that I propose figure in Woolf and Lettrism are activated or how they impact aesthetic appreciation. Yet, my aim is never a final positivist account of aesthetics.

The ultimate purpose of theory is to elaborate on the Gibsonian notion that the affordances of any object depend not on learning, rationality, or wit but on how easy they are to perceive. It is arguably a sign of the most outstanding artistic talent to create works that may escape our ability to define what they mean yet always remain within our intuitive reach.

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