

## ORIGINAL ARTICLE

# Merleau-Ponty on abstract thought in mathematics and natural science

Samantha Matherne 

Department of Philosophy, University of California, Santa Cruz, Santa Cruz, CA, USA

**Correspondence**Samantha Matherne, University of California, Santa Cruz, Department of Philosophy, 1156 High Street, Santa Cruz 95064, CA, USA.  
Email: smatherne@ucsc.edu**Abstract**

In this paper, I argue that in spite of suggestions to the contrary, Merleau-Ponty defends a positive account of the kind of abstract thought involved in mathematics and natural science. More specifically, drawing on both the *Phenomenology of Perception* and his later writings, I show that, for Merleau-Ponty, abstract thought and perception stand in the two-way relation of “foundation,” according to which abstract thought makes what we perceive explicit and determinate, and what we perceive is made to appear by abstract thought. I claim that, on Merleau-Ponty’s view, although this process can sometimes lead to falsification, it can also be carried out in such a manner that allows mathematics and natural science to articulate what we perceive in a way that is non-distortive and in keeping with the demands of perception itself.

## 1 | INTRODUCTION

When we consider the major philosophical contributions of Maurice Merleau-Ponty, what tends to come to mind is his analysis of the role that embodiment plays in perception and action. Far less attention has been paid to his account of thought in general, lesser still to his more specific views about the abstract form of thought involved in mathematics and natural science. However, according to some readers, this is entirely appropriate for, they argue, Merleau-Ponty simply did not have much to say about these matters. Hubert Dreyfus, for one, has claimed that,

*If [on Merleau-Ponty’s view] perception and action is always involved and holistic, how are we able to entertain propositional beliefs about isolable perceptual objects and their isolable properties and, more generally, how is thought able to make judgments on the basis of perceptual experience? As far as I know, Merleau-Ponty had nothing to say on these subjects so we shouldn’t fault [anyone] for failing to find Merleau-Ponty’s account of what makes abstract thought possible. (Dreyfus, 2007: 67)<sup>1</sup>*

This interpretation of Merleau-Ponty has been influential, especially in the context of the Dreyfus–McDowell debates where Merleau-Ponty is mustered in support of the view that normal perception does not involve concepts or thought but rather the unreflective, skilled bodily activity, which Dreyfus labels “absorbed coping.”<sup>2</sup> On this reading, the only time Merleau-Ponty addresses thought is in his account of experiences at the limit of absorbed coping, for example, when we acquire a new skill or in cases of breakdown where something interrupts the flow of absorbed coping.<sup>3</sup>

Thought, so understood, would indeed seem to provide meager resources for a robust theory of the intellect, let alone of abstract thought.

To be sure, not all commentators have agreed with Dreyfus's position. Indeed, against this anti-intellectualist reading of Merleau-Ponty, commentators have more recently been exploring the extent to which Merleau-Ponty accords thought to a more pervasive role in perception<sup>4</sup> as well as the role thought plays in his account of language<sup>5</sup> My concern in this paper, however, is more narrow: does Merleau-Ponty have a positive theory of the sort of abstract thought involved in mathematics and natural science? (See Section 2)

The temptation to answer “no” to this question is fueled not only by the sort of skepticism expressed by Dreyfus but also by Merleau-Ponty's own relentless criticism of the errors of thought throughout the *Phenomenology*. Indeed, Merleau-Ponty has a special label for the kind of thought that ignores and even conceals perception, namely, “objective thought” (see Section 4). And in this context, he makes claims like, “Scientific perspectives according to which I am a moment [*moment*] of the world are always naïve and hypocritical” (Merleau-Ponty, 1945: lxxii/9).<sup>6</sup> Remarks in this vein have led a number of commentators to attribute to Merleau-Ponty a negative account of abstract thought, as something that fails to capture perception.<sup>7</sup>

Nevertheless, there are a few commentators who have endeavored to show that in spite of his criticisms of abstract thought in certain contexts, Merleau-Ponty also attempts to provide a phenomenologically well-grounded theory of mathematics and natural science.<sup>8</sup> My aim in this paper is to lend further support to these latter efforts by bringing to light Merleau-Ponty's account of the reciprocal relation of “foundation” [*Fundierung*] that holds between abstract thought and perception and that enables abstract thought to articulate perception in a non-distortive way.<sup>9</sup>

In defending my interpretation, I draw on both the *Phenomenology of Perception* and Merleau-Ponty's later writings, including some of the essays collected in *Signs* and the manuscripts for *The Prose of the World* and *The Visible and Invisible*. By my lights, we need to supplement his views in the *Phenomenology* with these later texts because although Merleau-Ponty introduces the idea that abstract thought and perception stand in a foundational relation in the *Phenomenology*, he does not fully develop this claim there. This is because Merleau-Ponty's primary aim in the *Phenomenology* is to give an account of the “world of perception” not the world of the intellect.<sup>10</sup> However, in defending the *Phenomenology* after its publication, Merleau-Ponty insists that with it he neither meant to undermine the value of the intellect nor to divorce it from the world of perception. In his 1948 radio lectures, for example, he claims that,

*When I said ... that modern art and philosophy have rehabilitated perception and the world as we perceive it, I did not, of course, mean to imply that they deny the value of science, either as a means of technological advancement, or insofar as it offers an object lesson in precision and truth. (Merleau-Ponty, 1948: 34)*

Meanwhile, in his public defense of the *Phenomenology* immediately after its publication (“The Primacy of Perception”), he claims that the *Phenomenology* is only a “preliminary study, since it hardly speaks of culture or history” (Merleau-Ponty, 1947: 25). A more complete study, he indicates, is one that would explore the “organic tie, so to speak, between perception and intellection” and the ways in which perception itself “summons us to the task of knowledge” (Merleau-Ponty, 1947: 20, 25).

Undertaking a more complete study of this sort then became one of the main tasks that occupied Merleau-Ponty after the *Phenomenology*. As he articulates this new research project to Martial Gueroult in 1952, Merleau-Ponty hoped “to show how ... thought, take[s] up and go[es] beyond the realm of perception which initiated us to the truth” (Merleau-Ponty, 1962: 3).<sup>11</sup> Accordingly, Merleau-Ponty devotes many of his post-*Phenomenology* writings to questions surrounding the nature of thought and its relation to perception. And it is in this context that we find some of his most sustained discussions of mathematics and natural science.

Given this trajectory, I claim that we need to supplement Merleau-Ponty's early account of abstract thought in the *Phenomenology* with the more detailed account of it which he offers in his later writings. However, in following

development of his thought, I argue that he retains and deepens his initial commitments to abstract thought being something that stands in a foundational relation to perception and to this relation being what allows for thought to articulate perception in an illuminating way.

In order to develop my reading of Merleau-Ponty's positive theory of abstract thought, I proceed as follows. In Section 2, I offer a more precise definition of abstract thought on Merleau-Ponty's view. Then in Section 3, I examine Merleau-Ponty's claim in the *Phenomenology* that the relationship between perception and abstract thought is the two-way relationship of foundation. In Section 4, I address the concern that, on Merleau-Ponty's view, any effort by thought to articulate perception is something that is necessarily distortive, and I argue that his view of both perception and thought opens up space for thought, in general, to articulate perception in positive way. Then in Sections 5 and 6, I consider, more specifically, Merleau-Ponty's account of the foundational relation between the abstract thought of mathematics and natural science and perception. To this end, I analyze in Section 5 his claim that abstract thought makes perception *explicit* and *determinate*, and in Section 6 his contention that perception is *made to appear* by abstract thought. By way of a conclusion, in Section 7, I explore some of the implications of this analysis of the relationship between perception and abstract thought has for his view of culture more generally.

## 2 | MERLEAU-PONTY'S DEFINITION OF ABSTRACT THOUGHT

In order to orient our discussion, it will be helpful to begin with a more precise definition of the kind of abstract thought that will concern us here. In general, on Merleau-Ponty's view, abstract thought is the sort of thought that is involved in theoretical knowledge, where theoretical knowledge is defined as, "the field in which the mind seeks to possess the truth, to define its objects itself, and thus to attain to a universal wisdom, not tied to the particularities of our situation" (Merleau-Ponty, 1962: 6). There are three core features of Merleau-Ponty's approach to abstract thought that we can, in turn, tease out on the basis of this passage.

First, according to Merleau-Ponty, in abstract thought, we seek to "possess the truth." Merleau-Ponty often makes this point by characterizing abstract thought in terms of a distinctive attitude, which he calls the "critical attitude" or the "attitude of verification" (Merleau-Ponty, 1945: 280/317).<sup>12</sup> In this attitude, Merleau-Ponty claims that we do not take things as they appear; we, instead, inquire into and seek to verify what there "actually" is (Merleau-Ponty, 1945: 280/317).

Second, as we see above, Merleau-Ponty claims that in abstract thought, we offer definitions. By "definitions," Merleau-Ponty has in mind any kind of formal or symbolic statement in which we try and articulate the truth we have verified, for example, in propositions, algorithms, equations, formulas, models, and constructions. And he takes this tendency toward fixing truth in a formal or symbolic definition to be a key feature of abstract thought.

Third, Merleau-Ponty maintains that in abstract thought, we endeavor to grasp what is "universal." As Merleau-Ponty makes this point elsewhere, in abstract thought, one endeavors to "gather a maximum of *information* not so much on the spectacle as on the invariants that are recoverable in the perception of any spectator from any point of view whatsoever" (Merleau-Ponty, 1969: 149). For Merleau-Ponty, then, in abstract thought, we do not focus on what is present to our individual point of view; we look for what is universal and "invariant" across all possible points of view. From this perspective, Merleau-Ponty claims abstract thought attends to the particular as a "particular case within the system of other possible situations" (Merleau-Ponty, 1962: 7, see also Merleau-Ponty, 1969: 107).

Altogether, then, on Merleau-Ponty's view, the type of abstract thought involved in theoretical knowledge pursues and seeks to verify what is true, where this truth is something that is expressed in definitions and reflects the universal and invariant features of particulars that remain constant across the system of all possible experience. Merleau-Ponty, in turn, tends to identify the paradigmatic instances of abstract thought as those that occur in mathematics and natural science<sup>13</sup> which is why we shall focus on them in what follows.<sup>14</sup>

### 3 | THE RELATION OF FOUNDATION

With this definition of abstract thought in place, we can now turn to Merleau-Ponty's more general claim in the *Phenomenology* that thought and perception stand in the reciprocal relation of foundation, which lays the groundwork for his more specific claims about abstract thought.

Merleau-Ponty introduces his basic claim that thought and perception stand in "the two-way relation that phenomenology has called *Fundierung* [foundation]" in "The Cogito" chapter of the *Phenomenology* (Merleau-Ponty, 1945: 414/454). Under the influence of Edmund Husserl, Merleau-Ponty defines this relation as follows:

*The founding term ... is primary in the sense that the founded term is presented as a determination or a making explicit of the founding term, which prevents the founded term from ever fully absorbing the founding term; and yet the founding term is not primary in the empirical sense and the founded is not merely derived from it, since it is only through the founded that the founding appears. (Merleau-Ponty, 1945: 414/454)<sup>15</sup>*

As we see in this passage, Merleau-Ponty thinks foundation is a two-way relation because the founded and founding terms are reciprocally dependent on one another.<sup>16</sup> On the one hand, the founded term depends on the founding term insofar as the founded term makes the founding term *determinate* or *explicit*. On the other hand, the founding term is dependent on the founded term insofar as the founded term is what makes the founding term *appear*.

Merleau-Ponty, in turn, lists perception and thought, along with time and eternity, fact and reason, and the unreflected and reflected, as a pair of phenomena that stand in the founding–founded relation (Merleau-Ponty, 1945: 414/454). And insofar as they stand in this relation, Merleau-Ponty conceives of perception, more specifically what we perceive, as that which is made to appear by thought, and thought as that which makes what we perceive determinate and explicit. To be sure, more needs to be said about just which features of what we perceive are made to appear by thought and how exactly thought makes those features determinate and explicit; for now, however, I want to identify this basic foundational framework as the one within which Merleau-Ponty later develops his more specific account of the relation between abstract thought and perception.

### 4 | THE WORRY ABOUT THOUGHT

Before we can proceed, however, we need to address the worry that if this is, indeed, Merleau-Ponty's view, then thought is something that can only ever distort perception. The basic concern is this: given the resources that thought has at its disposal, any attempt it makes to articulate what we perceive will ultimately end up falsifying it. More specifically, the objection is that thought can only attempt to make what we perceive determinate and explicit by articulating it in general terms, for example, through concepts and propositions; however, this appears to be in tension with two key characteristics that Merleau-Ponty attributes to what we perceive: *indeterminacy* and *particularity*. This being the case, it would seem that any effort thought makes to articulate what we perceive is something that leads to its misrepresentation. In light of these considerations, it would then seem that Merleau-Ponty endorses a negative view of thought as something that can only fail to capture what we perceive.

In order to address this concern, in what follows, I hope to show that Merleau-Ponty's commitment to the indeterminacy and particularity of perceptual phenomena is, in fact, consistent with the further positive claim that thought, as long as it is not in the guise of objective thought, can make what we perceive determinate and explicit in an honest way. To this end, I will begin with a discussion of his account of the indeterminacy and particularity of perception, then turn to his criticisms of objective thought and, finally, consider his analysis of the features within perception itself that make it amenable to non-distortive articulation in certain forms of thought.

## 4.1 | Indeterminacy and particularity

Let us begin with a discussion of the role indeterminacy and particularity play in Merleau-Ponty's account of perception. Starting with *indeterminacy*, one of the most oft-cited phrases from the *Phenomenology* is Merleau-Ponty's claim that, "We must recognize the indeterminate [*l'indéterminé*] as a positive phenomena" (Merleau-Ponty, 1945: 7/28).<sup>17</sup> Using the Müller-Lyer illusion to make his point, he claims that in our perception of the two lines, we do not have a determinate experience of the length of the lines; rather, the lines as we perceive them "are neither equal nor unequal" (Merleau-Ponty, 1945: 6/28). However, on his view, indeterminacy is not something that arises only in the case of illusion; it is something that plays a more pervasive role in perceptual experience, arising in any instance in which we do not have a full or determinate grasp of what we perceive.

Indeterminacy, in this sense, is something that Merleau-Ponty indicates can be the result of both external circumstances and the intrinsic structure of perception. In the former case, the indeterminacy we experience is the result of being in suboptimal perceptual conditions, for example, if I perceive an object from too far or too near.<sup>18</sup> In principle, however, these circumstances could improve in such a way that would allow for me to have a more complete and determinate grasp of what I perceive.

Yet, on Merleau-Ponty's view, some indeterminacy results from the very structure of perception itself, and he identifies at least three sources of this kind of intrinsic indeterminacy. First, according to Merleau-Ponty, the kind of sense or meaning that we grasp through perception is indeterminate. This sense is what he labels "*immanent signification* [signification]" of what we perceive, and he characterizes it as something that is "non-thematic," "implicit," "opaque," and "foggy" (Merleau-Ponty, 1945: 51/76, 302/241, 349/390). The second kind of intrinsic indeterminacy results from the structure of bodily perspective. For, on Merleau-Ponty's view, given the limitations of embodied perspective, we can never perceive an object all at once. Instead, we can only directly perceive the aspects or adumbrations of the object present to our current point of view.<sup>19</sup> As a result, we experience the object as something that is "incomplete and open" and that has a horizon that promises "something more to see" (Merleau-Ponty, 1945: 72/91, 384/390). Finally, Merleau-Ponty claims that some indeterminacy derives from the figure-ground structure of perception.<sup>20</sup> As the kind of embodied perceivers that we are, Merleau-Ponty maintains that we can never focus on the figure in the foreground and background at the same time: if we focus on the figure in the foreground then the background will be indeterminate and vice versa.<sup>21</sup> According to Merleau-Ponty, then, in addition to the indeterminacy that results from external circumstances, there is an amount of indeterminacy that arises in perception as a result of its intrinsic features that no amount of improving our perceptual circumstances can erase.

Turning now to *particularity*, Merleau-Ponty insists that perception is not a matter of engaging in an intellectual act in which we subsume what we perceive under a general concept.<sup>22</sup> Instead, he claims that perception is a matter of us responding to a particular object, as it is present to our bodies in a specific situation.<sup>23</sup> Consider, for example, Merleau-Ponty's description of perceiving a red carpet,

*The red patch I see on the rug is only red if the shadow that lies across it is taken into account; its quality only appears in relation to the play of light, and thus only as an element in a spatial configuration. Moreover, the color is only determinate if it spreads across a certain surface; a surface too small would be unqualifiable. Finally, this red would literally not be the same if it were not the "wooly red" of a carpet. (Merleau-Ponty, 1945: 5/26–7)*

In this passage, Merleau-Ponty highlights two ways in which the perception of the red involves particularity. On the one hand, the red we perceive depends on the context, for example, on the lighting conditions and spatial configuration of the field.<sup>24</sup> On the other hand, the red we perceive depends on the object, that is, on the wooly carpet, insofar as this carpet is what determines the red as what it is.<sup>25</sup> On Merleau-Ponty's view, then, what we perceive is particular in the sense that it is context- and object-dependent.

In light of Merleau-Ponty's commitments to the indeterminacy and particularity of perceptual phenomena, the worry would seem to arise that thought, with its tendency towards generality, can only make what we perceive determinate and explicit in a way that falsifies it.

## 4.2 | Objective thought

Further support for this negative reading of Merleau-Ponty's position on thought can be gleaned from Merleau-Ponty's sustained criticism of what he calls "objective thought" in the *Phenomenology*.<sup>26</sup> According to Merleau-Ponty's characterization, the form of thinking involved in objective thought grasps things only in terms of "dichotomies," such as extension and thought, sign and signification, reason and cause, it-itself and for-itself, subject and object, and so forth (Merleau-Ponty, 1945: 50/75–6, 334/376). Moreover, Merleau-Ponty claims that objective thought is something that treats the world as something that is "ready-made," that is, as a fully determinate "universe" that is occupied by fully determinate objects and fully determinate subjects (Merleau-Ponty, 1945: 48/74, 50/75).

By Merleau-Ponty's lights, the error of objective thought is twofold. To begin, he maintains that objective thought is something that remains "ignorant" of the perceptual phenomena in which it is founded (Merleau-Ponty, 1945: 353/393, 468/507). To this end, he claims that rather than attending to the origin of the ideas of abstract thought in perception, objective thought focuses only on its own achievements, on its dualistic articulation of the ready-made universe.

Yet, according to Merleau-Ponty, it is not just that objective thought remains ignorant of its perceptual foundation; it, furthermore, "conceals" this foundation (Merleau-Ponty, 1945: 280/318). By shunting all phenomena into its general dualistic categories, Merleau-Ponty argues that objective thought "congeals" or "crystallizes" perceptual phenomena in a way that covers over their indeterminacy and opacity (Merleau-Ponty, 1945: 74/100). Thus, on Merleau-Ponty's view, objective thought does not just ignore but also conceals perception.

These criticisms of objective thought may thus seem to confirm the interpretation of Merleau-Ponty's view of thought as something that can only fail to capture what we perceive.<sup>27</sup> However, this conclusion is warranted only if Merleau-Ponty takes objective thought to exhaust all thought. Yet, as we shall now see, Merleau-Ponty indicates that there are other forms of thinking that avoid the pitfalls of objective thought and are capable of elucidating perception.<sup>28</sup>

## 4.3 | Non-distortive forms of thinking

We find Merleau-Ponty outlining what a non-distortive form of thinking would look like in the following passage about knowledge:

*Knowledge ... preserve[s] and continue[s] our perceptual life even while transforming it. Knowledge ... sublimate[s] rather than suppress[es] our incarnation, and the characteristic operation of the mind is in the movement by which we recapture our corporeal existence rather and use it to symbolize instead of merely to coexist. (Merleau-Ponty, 1962: 7)<sup>29</sup>*

Here, Merleau-Ponty indicates that although the thought involved in knowledge is something that "transforms" perception, it can do so in a way that rather than "suppressing" perception, in fact, "preserves," "continues," "sublimates," and "recaptures" it. This kind of thought, Merleau-Ponty suggests elsewhere, is "not a masquerade," but something that unmask those perceptual phenomena in a productive way (Merleau-Ponty, 1969: 69fn). These passages at least open the door to there being a form of thinking that does not distort perception as objective thought does but rather illuminates it.

Even still, the worry remains how these forms of thought could fail to suppress perception given the indeterminacy and particularity of what we perceive. By my lights, if we take a closer look at Merleau-Ponty's account of indeterminacy and particularity, then we will find that these features of perceptual phenomena are, in fact, consistent with the possibility of thought articulating what we perceive in a non-distortive way.

Let us start with indeterminacy. Although it is true that Merleau-Ponty thinks perception involves indeterminate elements, he does not think that perception is a *wholly* indeterminate affair. Rather, he attributes to perception a tendency to shift from what is indeterminate to what is (relatively) determinate. Indeed, Merleau-Ponty suggests that "the phenomenon of 'indeterminacy' [*bougé*]" is a dynamic one in which "the forces that inhabit this scene, seek equilibrium, and carry it toward the more determinate" (Merleau-Ponty, 1945: 51/77). On his view, then, even in perception, we are not typically content with an experience of indeterminacy, but rather our perceptual experience tends towards something more determinate, that is, toward having a fuller or clearer grasp of what we perceive.

Indeed, this point about the tendency toward determinacy is one that he emphasizes in his analysis of three pervasive perceptual phenomena: attention, depth, and perceptual constants. In his analysis of attention, Merleau-Ponty maintains that the objects in our perceptual field present themselves to us in an "ambiguous sense ... as needing-to-be-determined" (Merleau-Ponty, 1945: 33/55). By attending to the object, he claims that we then "develop and thematize" that "indeterminate horizon" (Merleau-Ponty, 1945: 33/55). Meanwhile, in his account of depth, he asserts that,

*Depth is born before my gaze because my gaze attempts to see something. But what is this perceptual genius at work in our visual field that always tends toward the more determinate? ... The gaze is this perceptual genius ... who knows how to give to things the correct response that they are waiting for in order to exist in front of us. (Merleau-Ponty, 1945: 274–276/312–313)*

As we see in this passage, on Merleau-Ponty's account, depth perception is made possible by our gaze making what we perceive more determinate by correctly organizing it three-dimensionally. Finally, in his analysis of perceptual constants, that is, our ability to perceive a property or object as constant in spite of its varying appearances, he indicates that what is at issue is "how a determinate form or size ... can appear in front of me" (Merleau-Ponty, 1945: 313/353). He then argues that what allows for a property or an object to appear as constant and more determinate is our body's understanding of how constant properties or objects appear in certain perceptual conditions.

To be sure, on Merleau-Ponty's view, there are limits to the process of determination in perception. Some perceptual phenomena, like the Müller-Lyer illusion, resist any kind of determination. Yet it seems that this is precisely one of the reasons that these phenomena fascinate us: They contravene the tendency toward determinacy that we take for granted in ordinary perception. So too in cases where the determinacy is the result external circumstances, even if we improve our circumstances, we will never have a completely determinate experience of what we perceive. This is because the forms of indeterminacy that are intrinsically built into perception place limits on how determinately perceptual phenomena can ever be experienced. Nevertheless, within these boundaries, Merleau-Ponty indicates that in perception itself, for example, through attention and exploration, we can gain a more determinate grasp of what we perceive.

For Merleau-Ponty, then, although perception involves indeterminacy, it, at the same time, involves a tendency towards determinacy. What this, in turn, means for his account of thought is that just because thought makes what we perceive determinate does not mean that it necessarily falsifies perception; it, instead, thereby takes up a tendency that is already present in perception (see Section 6).

As for the concern that the generality of thought distorts the particularity of perception, it is important to recognize that here too although Merleau-Ponty thinks that perception involves particularity, he does not conceive of it in *entirely* particular terms. To the contrary, Merleau-Ponty indicates that there is a kind of generality that is built into perception itself. As he makes clear in *The Visible and Invisible*, in order to understand the relationship between perception and thought we need to consider,

*how the "ideas of intelligence" are initiated ... and in particular by what miracle a created generality, a culture, a knowledge come to add and to recapture and rectify the natural generality of my body and of the world. (Merleau-Ponty, 1964: 152, my emph.)<sup>30</sup>*

On Merleau-Ponty's view, then, it is not the case that thought imposes generality on a generality-free perception; rather, the "created generality" of thought is something that draws on, indeed, "recaptures" and "rectifies," the "natural generality" involved in perception. More specifically, as I now hope to show, Merleau-Ponty offers a two-tiered account of this natural generality, which turns, first, on the notion of "style" as the natural generality that obtains for an individual, and, second, on the notion of "structure" as the natural generality that obtains across multiple individuals.

Looking first to style, Merleau-Ponty uses style in a somewhat unusual way in this setting. Often we think of style as something that unifies several different objects; however, in this context, Merleau-Ponty treats style as something that unifies together the various aspects of an *individual*:

*Just as a human being manifests the same affect essence in his hand gestures, his gait, and the sound of his voice, each explicit perception in my journey through Paris – the cafés, the faces, the poplars along the quays, the bends of the Seine – is cut out of the total being of Paris, and only serves to confirm a certain style or a certain sense of Paris. (Merleau-Ponty, 1945: 294/332–3)<sup>31</sup>*

He extends this point to mundane objects as well, arguing that even a piece of wood has a style (see Merleau-Ponty, 1945: 476/514). In this vein, he conceives of a style as a particular "manner of being" or "form of existence" that is manifest through and unifies together that individual's various aspects (Merleau-Ponty, 1964: 132; 1945: 333/374). Moreover, insofar as a style is something that belongs to an individual as such, Merleau-Ponty claims that it is "inimitable," that is, something that belongs to it and it alone (Merleau-Ponty, 1964: 132).

On Merleau-Ponty's view, style, in this sense, counts as a form of generality because it allows us to encounter an individual as the same regardless of which of its properties we attend to or in which circumstances we encounter it. As Merleau-Ponty tends to make this point, the style of an individual sets up a "system of equivalences" in which we can perceive its different aspects and appearances as "equivalent" insofar as they manifest that unique style (Merleau-Ponty, 1960: 54). The style of a red dress, for example, sets up a system of equivalents that make it possible for me to encounter the same dress, regardless of if I attend to its red color, silken texture, or a-line cut or if I see it in the store, reach for it in my closet, or feel it swish as I dance.

Merleau-Ponty furthermore maintains that the generality of style is a natural or "preconceptual generality" (Merleau-Ponty, 1969: 44fn). He takes this to be the case because unlike conceptual forms of generality, which are ideal and can be separated from the individuals that fall under them, the preconceptual generality of style is something that is *inseparable from* the individual. So understood, style is not an idea that has its seat in the intellect; it is natural and preconceptual in the sense that it "inhabits" and is "embodied" by the object itself (Merleau-Ponty, 1945: 333/375).

There is, however, one final point to make about Merleau-Ponty's account of style and its connection to the horizon, which will pave the way for our analysis of structure. According to Merleau-Ponty, an object's style is what opens up the horizon that is available to our perspective:

*a style, allusive and elliptical like every style, but like every style inimitable, inalienable, an interior horizon and an exterior horizon between which the actual visible is a provisional partitioning. (Merleau-Ponty, 1964: 132)<sup>32</sup>*

In this passage, Merleau-Ponty draws on Husserl's analysis of horizons in *Experience and Judgment* (1939), according to which an "interior" horizon includes the possible experiences we can have of the focal object, and the "exterior" horizon encompasses the possible experiences we can have of other objects that are related

to the focal object.<sup>33</sup> What Merleau-Ponty then adds is the idea that it is the style of an object that opens up these horizons.

The claim that the style of an object opens up its interior horizon is one we touched on above. Insofar as the style of an individual is what unifies together all its various aspects, all possible experiences we can have of that individual will be experiences of that unique style. And one way to think of the natural generality of style is as something that enables us to encounter the individual as the same across all possible experiences in the interior horizon.

Matters are more complicated, however, when we turn to the exterior horizon for, as we saw earlier, on Merleau-Ponty's view, the style of an object is something "inimitable," that is, something that belongs to it uniquely and is not shared by other objects. On his view, then, the focal object and the objects in its exterior horizon cannot share one and the same style. Consider the red dress again. Merleau-Ponty claims it is,

*a punctuation in the field of red things, which includes the tiles of roof tops, the flags of gatekeepers and of the Revolution, certain terrains near Aix or in Madagascar, it is also a punctuation in the field of red garments, which includes, along with dresses of women, robes of professors, bishops, and advocate generals, and also in the field of adornments and that of uniforms. (Merleau-Ponty, 1964: 132)*

The red dress's exterior horizon thus includes the other objects in the field of red things and red garments; however, it cannot be related to these other objects in virtue of having the same style as they do. Instead, as I read Merleau-Ponty, what allows for the red dress to be related to the other objects in its exterior horizon is the fact that they all share the second form of generality, namely, a common *structure*.

The kind of structure at issue here is what Merleau-Ponty describes as the "physiognomy" or "*Gestalt*" of a property of an object, for example, the structure of a color or a shape.<sup>34</sup> And this structure is one that can be shared by multiple individuals, for example, a blue bottle, blue vase, and blue blouse share the structure of the color blue. Moreover, Merleau-Ponty maintains that we have certain patterns of motor behavior that are geared into these structures. More technically, following Husserl, Merleau-Ponty labels these patterns of motor behavior "typics," and he maintains that they are "synchronized" with perceptual structures (Merleau-Ponty, 1945: 330/372).<sup>35</sup> For example, Merleau-Ponty suggests that the color blue has a certain inviting structure and that we have a typic for this structure, that is, a kind of "blue behavior" that involves being drawn toward the blue item (Merleau-Ponty, 1945: 217/254). Or to take another example, he maintains that the structure of the color red involves a physiognomy of "effort" or "violence" and that the typic correlated with this structure involves some kind of aversive behavior (Merleau-Ponty, 1945: 218–9/255–6). And, on his view, these typics will be elicited whenever we see an object with the relevant color, for example, whether I look at the blue bottle, blue vase, or blue blouse, I will respond with a similar pattern of motor behavior. Thus, for Merleau-Ponty, a structure is the physiognomy or *Gestalt* of a property that our bodies respond to via a typical pattern of motor response, that is, via a typic.

Returning now to the exterior horizon, on my reading, it is a similarity in these structures that allows objects to be related to one another in the exterior horizon. For example, the red dress resembles the red rooftop tiles, red flags, and red terrain of Madagascar because they all share a similar red structure that invites a similar behavior from us. To be sure, as we saw above, Merleau-Ponty does not think that the red of the dress is the exact same as the red of the tiles, flags, and terrain. Nevertheless, it is enough for an object to be included in the exterior horizon of another that they share a similar structure.

Although this discussion of structure helps explain Merleau-Ponty's view of the organization of the exterior horizon, it also helps clarify the sense in which structure also qualifies as a form of natural generality. For, in virtue of belonging to the physiognomy of the object itself, these structures are "natural." However, these structures also count as forms of generality because they allow us to experience multiple objects as similar to one another, for example, I experience the red dress, red tiles, and red flags as similar in virtue of them sharing the structure of the color red. For Merleau-Ponty, then, structure is another form of natural generality, which allows us to experience a focal object and the objects in its exterior horizon as similar to one another.

Stepping back, Merleau-Ponty offers a two-tiered account of natural generality. On the first level, style is a natural form of generality that enables us to experience an individual as the same, regardless of which of its properties, we perceive and in which circumstance we perceive it. This is the kind of generality that extends across the interior horizon. On the second level, structure is a natural form of generality that enables us to experience multiple individuals as the same in the more restricted sense of being similar in virtue of sharing properties with a similar physiognomy in common. This generality extends over the exterior horizon.

This discussion of natural generality and style is relevant for our purposes because it reveals that although Merleau-Ponty thinks that perception involves bodily engagement with particular objects in particular situations, this particularity does not exclude generality. Instead, he thinks that the particularity of perception is consistent with the natural generality of style and structure. This being the case, the objection that thought simply in virtue of articulating what we perceive in general terms necessarily distorts it need not follow from the particularity of perceptual phenomena. Instead, recognizing that perception already involves generality paves the way for thought, at least in some form, to involve a kind of generality that is continuous with and capable of elucidating what we perceive.

In the end, even though Merleau-Ponty is committed to the indeterminacy and particularity of perception, I hope to have shown that this does not, therefore, mean that thought, in virtue of making what we perceive determinate and explicit through general means, is necessarily distortive. Instead, by attending to the details of Merleau-Ponty's account of indeterminacy and particularity, we find that there are features of perception itself that are amenable to being articulated through the determinacy and generality of thought. Though Merleau-Ponty does not think objective thought can fulfill this demand, nevertheless, as we saw above, he thinks there is a kind of thought involved in knowledge that rather than suppressing what we perceive, can preserve, continue, and recapture it, even while transforming it. And it is within this positive framework that I now want to turn more directly to the topic of abstract thought and consider the way in which the foundational relation between abstract thought and perception can play out in a non-distortive way in mathematics and natural science.

## 5 | THE MAKING-DETERMINATE AND MAKING-EXPLICIT PROCESS

Recall that, on Merleau-Ponty's view, thought and perception stand in the two-way relation of foundation, according to which thought makes what we perceive determinate and explicit and what we perceive is made to appear in thought. Let us now consider how this can manifest in a non-distortive way in the case of abstract thought.

In order to explicate the process by means of which abstract thought makes what we perceive determinate or explicit, it will be helpful to recall Merleau-Ponty's characterization of theoretical knowledge:

*Knowledge ... preserve[s] and continue[s] our perceptual life even while transforming it. Knowledge ... sublimate[s] rather than suppress[es] our incarnation, and the characteristic operation of the mind is in the movement by which we recapture our corporeal existence rather and use it to symbolize instead of merely to coexist. (Merleau-Ponty, 1962: 7, my emph.)*

For Merleau-Ponty, then, what it means for abstract thought to make perception determinate and explicit in a non-distortive way is for it to develop *symbols*, which at once *preserve* and *transform* what we perceive. More specifically, as we shall see below, on Merleau-Ponty's view, abstract thought develops symbols, or what we earlier called definitions, which, on the one hand, preserve the structures of perception, whereas, on the other hand, transforming those structures into something universal, systematically significant, and intersubjectively accessible. And, as we shall also find, he indicates that the key to doing this in a way that does not suppress those perceptual structures is by adopting an attitude in which we are aware that these symbols do not swing free from their perceptual foundation but rather have they significance they do in virtue of referring to perceptual phenomena.

In order to tease out the details, let us consider Merleau-Ponty's account of the preservative and transformative features of the symbols of abstract thought, in turn. Beginning with the idea of preservation, according to Merleau-Ponty, in general, abstract thought preserves the sense or meaning of what we perceive. More specifically, he claims that the symbols of abstract thought bring about the "transmutation of sense [*sens*] into signification [*signification*]", where the sense is something implicit and indeterminate, and the signification is something explicit and more determinate (Merleau-Ponty, 1969: 48, transl. modified).<sup>36</sup> This is why, in the *Phenomenology*, Merleau-Ponty claims that the abstract thought of mathematics and natural science involves the "second-order expression" of the sense of perception (Merleau-Ponty, 1945: lxxii/9).

According to Merleau-Ponty, this process needs to be in place for the symbols of abstract thought to "mean" or "signify" anything at all. As he makes this point about formalization,

*however far one proceeds with formalization [in thought], its signification remains in suspension, actually means nothing, and has no truth at all unless we refer its superstructures back to visible objects. To signify ... is therefore accomplished only when that something's constructions are applied to the perceived as the source of signification. (Merleau-Ponty, 1969: 106)*

As Merleau-Ponty indicates here, the formal symbols we develop in mathematics and natural science abstract thought are "superstructures" that are able to mean or signify anything only in virtue of referring to the more fundamental sense of perception. In this vein, he claims science involves

*the making explicit or the bringing to life of the pre-scientific life of consciousness that alone gives the operations of science their full sense and to which these operations always refer. This is not an irrational conversion, but rather an intentional analysis. (Merleau-Ponty, 1945: 59/86)*

On Merleau-Ponty's view, in abstract thought, the sense of perception does not undergo an "irrational conversion" but rather an "intentional analysis," insofar as abstract thought intends or refers to the sense implicit in perception and aims only to analyze that sense in a way that makes it explicit and more determinate.

Now the fact that the symbols of abstract thought draw their meaning from and stand in an intentional relation to perception is something that objective thought covers over. However, in the kind of abstract thought that does not suppress but rather recaptures perception, we remain mindful of this. That is to say, in this form of abstract thinking, we adopt an attitude in which we are aware that what we perceive is the foundation on which mathematics and science is built and so take this as our ultimate point of orientation.

At the most basic level, then, Merleau-Ponty takes the symbols of abstract thought to preserve the sense of perception; however, we need to ask, more specifically, what kind of sense is preserved: style or structure? Given that, on Merleau-Ponty's view, abstract thought is not interested in the particular for its own sake but rather in it as a universal and invariant features of the particular that remain the same across the system of all possible experience, it stands to reason that he takes abstract thought to be oriented toward *structure*, as the generality that connects multiple individuals together rather than style, as what governs a single individual.<sup>37</sup> The orientation of mathematics and natural science structure rather than style is, in turn, borne out by Merleau-Ponty's analysis of specific examples, three of which we shall now consider. And by working through each of these examples, I hope to clarify his account not only of the role the preservation of structure plays in mathematics and natural science, but also how abstract thought can adopt an attitude that differs from the attitude of objective thought.

The first example is the example of the geometrical construction of a triangle that Merleau-Ponty offers in "The Cogito" chapter of the *Phenomenology*:

*I am thinking of the triangle (the three-dimensional space to which it is supposed to belong, the extension of one of its sides, and the parallel that can be drawn from one of its vertexes to the opposite side), and I see*

*that this vertex and these lines form a sum of angles equal to the sum of the triangle's angles and equal, on the other hand, to two right angles. (Merleau-Ponty, 1945: 403/443)<sup>38</sup>*

In this construction, we, in abstract thought, move from knowledge of a triangle as a three-sided enclosed figure whose interior angles equal  $180^\circ$  to the further knowledge that a line drawn through the vertex of the triangle results in three angles also equal to  $180^\circ$ .

According to Merleau-Ponty, in order to prove this theorem, we cannot proceed in a wholly “analytic” fashion because the theorem is not analytically contained in the definition of the triangle (Merleau-Ponty, 1945: 404/444). Instead, we must arrive at this theorem through the “act” of construction itself (Merleau-Ponty, 1945: 404/444). However, on Merleau-Ponty's view, this constructive act is not aimed at some abstract idea or “formal essence” of a triangle but rather at the “concrete essence,” that is, the “structure,” “physiognomy,” or “*Gestalt*” of the triangle in front of us (Merleau-Ponty, 1945: 404/444, 406/446). He takes this to be the case because he thinks that it is that physiognomic structure that contains or “has” what is “necessary” about the triangle (Merleau-Ponty, 1945: 407–8/445). By Merleau-Ponty's lights, it is thus the structure of the real triangle involved in the construction that reveals to us what properties the triangle necessarily has and which hold for all triangles. Accordingly, on Merleau-Ponty's view, this geometric process of construction is one in which we make determinate or explicit the implicit sense involved in the structure of the triangle:

*The construction makes explicit the possibilities of the triangle being examined, not according to its definition and as an idea, but according to its configuration and as the pole toward which my movements are directed. (Merleau-Ponty, 1945: 405/445)*

Although Merleau-Ponty takes this to be a description of what the geometer, in fact, does in construction, it is possible for the geometer to conceive of this process in different ways. In the attitude of objective thought, the geometer will take herself, as a fully determinate subject, to be uncovering the fully determinate properties of the fully determinate idea of the triangle. If, however, the geometer adopts a more phenomenological attitude à la Merleau-Ponty, then she will realize that the truths she, as an embodied agent, uncovers ultimately refer to and draw from the less determinate, implicit sense of the physiognomy of the triangle. To be sure, in her construction, she still uses abstract symbols to articulate what is universal and necessary about triangles; however, she does so in a way that involves bearing in mind the foundation of geometry in the perceived world.

Turning now to arithmetic, the second example we shall consider is of Gauss's formula for summing prime numbers:  $\sum \eta = \frac{\eta}{2}(\eta + 1)$ , which Merleau-Ponty discusses in *The Prose of the World*.<sup>39</sup> According to Merleau-Ponty, in order to arrive at this formula, one must perceive something about the “structure of the series of numbers”:

*I must notice that the progression from 1 to 5 is exactly symmetrical with the regression from 10 to 5, so that I can then conceive a constant value of the sums  $10 + 1$ ,  $9 + 2$ ,  $8 + 3$ , etc., and, finally, so that I can decompose the series into pairs each equal to  $(\eta+1)$ , whose total can only be equal to  $\frac{\eta}{2}$ . (Merleau-Ponty, 1969: 125–6)*

On Merleau-Ponty's view, then, what Gauss's formula does is make explicit this meaningful structure, which we implicitly perceive in the Sequence 1–10, for example, written on a page. As he puts it, Gauss's formula provides us with a “restructuring” of what “was announced in the vectors of the initial structure”, a restructuring that makes the implicit sense of the structure explicit (Merleau-Ponty, 1969: 126). Once again, however, insofar as this formula is meant to capture what is true of numbers as such and not just of the sequence we have in front of us, the sense that the formula makes explicit is better understood as a structure rather than a style. And although the mathematician

could, again, adopt the attitude of objective thought and forget the perceptual foundation of this process of formalization, if she, instead, remains attentive to this foundation, then her efforts in abstract thought would not necessarily suppress perception.

The third and final example we shall consider also appears in *The Prose of the World* and it is Galileo's law of free fall, which states that bodies uniformly accelerate in the same way and that the distance that they fall is proportional to the square of the elapsed time (Merleau-Ponty, 1969: 105). According to Merleau-Ponty, the signification of this law "can in principle appear only through the concrete shapes which it unifies", for example, in the downward motion of an orange and a cannonball dropped off the leaning tower of Pisa (Merleau-Ponty, 1969: 105). As such, the meaning of the law is "inscribed" in the concrete structures of what we perceive, and the statement of the law is a symbolic formulation of that inscribed significance (Merleau-Ponty, 1969: 105). Yet insofar as the law of free fall reflects what pertains to physical bodies as such, then it is not something that signifies the style of the orange and cannonball but rather the structure of falling bodies more generally. Thus also in the case physics, it is the structure of what we perceive, which provide its symbolic formulations with their significance. And, once more, if the physicist abandons the prejudices of objective thought and remains mindful of the fact that the meaning of her statements are drawn from the sense of perceptual structures, then she would be engaging in the form of abstract thought that preserves what we perceive in a non-distortive way.

Ultimately in all three cases, we find that, on Merleau-Ponty's view, the symbols and definitions that we come up with in abstract thought derive their meaning from the perceptual structures that they, in turn, make determinate and explicit. In this way, the symbols and definitions of abstract thought preserve the meaning of those perceptual structures by presenting them in a more determinate and explicit way. And in each case, it is possible for abstract thought to preserve perception without suppressing it, if the thinker adopts not the attitude of objective thought, but rather the phenomenological attitude that remains attentive to the foundation of abstract thought in perception.

However, although the symbols of abstract thought preserve the meaning that is presented to us in perception, Merleau-Ponty also maintains that these symbols *transform* that sense. There are several ways in which they do so. To begin, Merleau-Ponty claims that the process of signification in general is one in which, an operant and latent sense [sens] finds the emblems which should liberate it, making it manageable ... and accessible to others (Merleau-Ponty, 1969: 58, transl. modified).

The symbols of abstract thought, thus, transform the sense of perception into something that is more "manageable: and "accessible". That is to say, by "liberating" the implicit sense of perception from its perceptual conditions, the symbols of abstract thought turn that sense into something that is intersubjectively available for us to point to, talk about, argue over, and so forth.

Abstract thought further transforms perception by approaching it through a systematic lens. Recall that on Merleau-Ponty's view, abstract thought treats what we perceive here and now as a "particular case within the system of other possible situations" (Merleau-Ponty, 1962: 7, see also Merleau-Ponty, 1969: 107). In so doing, abstract thought does not focus on the particular per se but rather considers it with an eye to the broader system in which it is situated. Indeed, Merleau-Ponty suggests that, in abstract thought, we do not just develop isolated symbols, but rather entire "signifying systems," for example, a Euclidean or Newtonian system, to try and capture the systematic significance of the particulars we perceive (Merleau-Ponty, 1969: 75). We thus come to regard the particular in perception as situated in and full of consequences for a broader system. From this systematic perspective, abstract thought thus further transforms the structures familiar to us from perception into nodes within a system.

Once again, although this systematic perspective could align with the dualistic perception of objective thought, it is also possible to develop systematic perspectives in mathematics and natural science that respect the complicated relations between perception and abstract thought. Indeed, Merleau-Ponty indicates that this latter possibility is actualized in relativity:

*The scientist of today, no longer cherishes the illusion that he is penetrating to the heart of things, to the object as it is in itself. The physics of relativity confirms that absolute and final objectivity is a mere dream by showing how each particular observation is strictly linked to the location of the observer and cannot be abstracted from this particular situation; it also rejects the notion of an absolute observer. (Merleau-Ponty, 1948: 35–6)*

This, however, is but one instance of the way in which abstract thought could offer a systematized analysis of perception in such a way that illuminates rather than suppresses it.

In sum, on Merleau-Ponty's view, there is a positive version of abstract thought, which unlike objective thought, can make the sense of what we perceive more determinate and explicit by means of symbols and definitions, which at once preserve the structures of perception and transform those structures into something more manageable, intersubjectively available, and systematic.

## 6 | THE MADE-TO-APPEAR RELATION

In order to complete our analysis of the foundational relation between perception and abstract thought, we now need to consider Merleau-Ponty's claim that what we perceive is made to appear by abstract thought. Given our preceding analysis, we know that this, more specifically, involves the structure of what we perceive being made to appear in the symbols of abstract thought. A geometrical construction and a mathematical formula, for example, enable the sense that is latent in the structures we perceive to appear. Merleau-Ponty often draws on Husserl to make this point, suggesting that, in thought, a "pure and, so to speak, still-mute experience [is] brought to the pure expression of its own sense" (Merleau-Ponty, 1945: 228/264, quoting Husserl).<sup>40</sup>

This being said, it is important to recognize that, for Merleau-Ponty, this need for what we perceive to be made to appear is not one that is imposed on it from the outside by thought; rather, it is one that arises from the side of perception. As we saw earlier, on Merleau-Ponty's view, perception itself involves a tendency towards making perceptual phenomena appear in a clearer, fuller, and more determinate way. However, according to Merleau-Ponty, given the nature of perception, there are limits to how clearly, fully, or determinately it can make phenomena appear. Perception, then, looks to thought with its further means of making perceptual phenomena determinate and explicit in order to fulfill its own demand.

As we saw earlier, according to Merleau-Ponty, the immanent sense that we grasp through perception is something that is "veiled," "opaque," and "foggy." Nevertheless, he claims that when we express that sense through the "signifying systems" of culture, for example, through language, art, mathematics, or science, we can elucidate that sense in a clearer and fuller way:

*When one goes from the order of events to the order of expression ... the same circumstances which we previously submitted to now become a signifying system. Hollowed out, worked from within, and finally freed from that weight upon us which makes them painful or wounding, they become transparent or even luminous, and capable of clarifying not only the aspects of the world which resemble them but the others too. (Merleau-Ponty, 1960: 64)*

To be sure, on Merleau-Ponty's view, cultural expression can never fully clarify immanent senses; however, it can shed light on it in ways that perception cannot itself.

Though Merleau-Ponty thinks language and art certainly aid in this process, as we have seen, he also accords the abstract thought of mathematics and science a significant role in this endeavor. Indeed, mathematics and natural science contribute in a unique way to this process insofar as the symbols and signifying systems we develop in them articulate phenomena in abstract and universal ways, which are meant to reflect what is true of those phenomena

for all people at all times. The abstract and universal approaches of the systems of mathematics and science thus fulfill the demand made by perception, to have phenomena appear in a clear, full, and determinate fashion in a distinctive and valuable way. To be sure, on Merleau-Ponty's view, abstract thought can never do this in an entirely unambiguous way; the truths, symbols, and systems that we arrive at are only partial ones, which are open to revision over time.<sup>41</sup> Nevertheless, he thinks that the symbols of abstract thought can elucidate perceptual phenomena from its abstract, universal, and systematic perspective, and in so doing, contribute to fulfilling perception's own demand to make perceptual phenomena appear in a clear, full, and determinate fashion.

## 7 | CONCLUSION

My aim in this paper has been to show that in spite of suggestions to the contrary, Merleau-Ponty does, indeed, have positive things to say about the sort of abstract thought involved in mathematics and natural science. To this end, I explored the two-way relation of foundation that Merleau-Ponty takes to hold between perception and abstract thought. In analyzing this relationship, I tried, on the hand, to clarify Merleau-Ponty's account of how abstract thought, when free from the limitations of objective thought, can make what we perceive determinate and explicit in a non-distortive way. On the other hand, I attempted to show how, on his view, what we perceive, its indeterminacy and particularity notwithstanding, can be made to appear through thought in a way that is in keeping with the demands of perception itself.

However, as I have hinted at along the way, abstract thought is but one of the ways in which Merleau-Ponty thinks that the creative activities of culture give voice to the mute world of perception. And although his analysis of how other activities, like prose, painting, and philosophy have received more attention, his theory of abstract thought deserves no less attention as yet another rich modality of creative, cultural expression. In this spirit, it seems to me that we can say of abstract thought what Merleau-Ponty elsewhere says about language, namely, that the analysis of it

*should help us understand the more general order of symbolic relations and of institutions, which assure the exchange not only of thoughts but of all types of values, the co-existence of men within a culture. (Merleau-Ponty, 1962: 9)*

Seen in this light, Merleau-Ponty's theory of abstract thought is in no way ancillary to his phenomenological project. To the contrary, insofar as he acknowledges that we are beings who are thrown not just into a natural world but into a cultural world as well, his analysis of abstract thought promises to shed light on his phenomenology of human experience as a whole.

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## ENDNOTES

- <sup>1</sup> Here, Dreyfus is responding to Romdenh-Romluc's (2007) criticism of his view.
- <sup>2</sup> See Dreyfus (2006), McDowell (2007a), McDowell (2007b). See Schear (2013) for a discussion of this debate in the context of phenomenology.
- <sup>3</sup> Dreyfus (2000: 300–1, 2002).
- <sup>4</sup> Against Dreyfus's interpretation, both Romdenh-Romluc (2007, 2010: Chapter 6, 2012) and Berendzen (2009, 2010) argue that, for Merleau-Ponty, thought plays an important role in perception.
- <sup>5</sup> See Hass (2008: Chapters 6–7), Romdenh-Romluc (2010: Chapter 7), and Walsh (2017) for a discussion of Merleau-Ponty's views regarding the relationship between thought, language, and expression.

- <sup>6</sup> Citations to the *Phenomenology* are to the pagination in the English translation/original French.
- <sup>7</sup> See Baldwin's (2013) argument that, on Merleau-Ponty's view, science cannot capture the non-natural features of human existence, including perception and the structures, such as space and time, which depend on it.
- <sup>8</sup> See Hass (2008: Chapter 6) for a discussion of Merleau-Ponty's account of mathematics. See Rouse (2005) for a discussion of Merleau-Ponty's "existential" conception of science. See Romdenh-Romluc (forthcoming) for the argument that Merleau-Ponty's conception of phenomenology is continuous with science.
- <sup>9</sup> By making the foundational relation the centerpiece of my analysis of Merleau-Ponty's view of mathematics and natural science, I hope to develop a theme that Rouse (2005: 272–276), Hass (2008: 162, 171–2, 178, 233 n.17), and Romdenh-Romluc (forthcoming) touch on but do not develop along the lines that I do.
- <sup>10</sup> See, for example, Merleau-Ponty (1947: 18, 1948).
- <sup>11</sup> To this end, Merleau-Ponty projects two books, *The Prose of the World* and *The Origin of Truth*; however, he only completed half of the manuscript for the former, abandoning it in favor of *The Visible and Invisible*. As I hope to show below, however, even there, Merleau-Ponty continues to be interested in the relationship between perception and intelligence.
- <sup>12</sup> See also Merleau-Ponty (1945: 251/288) and Merleau-Ponty (1948: 34).
- <sup>13</sup> For the alignment of mathematics and natural science with the features of abstract thought in the *Phenomenology*, see Merleau-Ponty (1945: lxxii/8–9, 10–11/33, 248/286, 315/355, 359/401, 366/407). See also Merleau-Ponty (1969: Chapters 2 and 4).
- <sup>14</sup> There is a question as to whether philosophy employs abstract thought so defined. Although it seems that much classical philosophy could be understood as engaging in abstract thought, Merleau-Ponty claims that phenomenology is guided not by the attitude of verification but rather by the attitude of "radical reflection" (see, e.g., Merleau-Ponty, 1945: lxxviii/14, lxxxv/21, 227/264, 251/228, 302/341). And in radical reflection, what we are interested in is not the truth of reflective experience, but in how the world appears in unreflective experience.
- <sup>15</sup> As Landes notes, Merleau-Ponty is drawing on Husserl's analysis of "foundation" in the *Logical Investigations*. See Romdenh-Romluc (forthcoming) for an analysis of the influence of Husserl's account of the foundation of essence on Merleau-Ponty's account of science. See Hass (2008: 162–170) for a discussion of how Merleau-Ponty's notion of foundation departs from Husserl's.
- <sup>16</sup> I take the foundation relation to be an instance of the relation Merleau-Ponty, following Husserl and Stein, calls "motivation." So understood, the founding and founded phenomena are linked together neither by causes nor by reasons, but by a shared "sense" [sens] (Merleau-Ponty, 1945: 51/76). See Wrathall (2005), Romdenh-Romluc (2010: 60–1, 113–4, 243–4), and Walsh (2017) for a discussion of Merleau-Ponty's use of the notion of motivation in general as something that structures perception, action, and thought.
- <sup>17</sup> See Alweiss (2000) and Kelly (2005) for a discussion of indeterminacy in Merleau-Ponty.
- <sup>18</sup> See, for example, Merleau-Ponty (1945: 17/40, 239/276–242/280).
- <sup>19</sup> See, for example, Merleau-Ponty (1945: 69–70/95–6, 209/245, 339/380–1).
- <sup>20</sup> See, for example, Merleau-Ponty (1945: 4/25–6, 13–4/36–7, 103–130–1).
- <sup>21</sup> See Merleau-Ponty (1945: 70/96).
- <sup>22</sup> See Merleau-Ponty (1945: 128/159, 304/344, 333/375).
- <sup>23</sup> See Kelly (2001) for a discussion of Merleau-Ponty on the particularity and situation-dependence of perception.
- <sup>24</sup> See Merleau-Ponty (1945: 318–27/358–327).
- <sup>25</sup> See also his description of carpet at Merleau-Ponty (1945: 337/379). He discusses object-dependency at length at Merleau-Ponty (1945: 326/368, 331–41/373–83).
- <sup>26</sup> See Romdenh-Romluc (2010: 16–24) for an overview of Merleau-Ponty's view of objective thought and interpretation of it the secondary literature.
- <sup>27</sup> See, for example, Baldwin (2013) who takes Merleau-Ponty to be committed to a naturalistic, reductivist theory of science that is under the sway of objective thought.
- <sup>28</sup> Rouse (2005: 265) and Romdenh-Romluc make a similar move in the context of discussing Merleau-Ponty's view of science.
- <sup>29</sup> See also Merleau-Ponty (1969: 68–9, 75, 123–4).
- <sup>30</sup> See also Merleau-Ponty (1964: 148–152).
- <sup>31</sup> See Singer (1981) and Matherne (2017) for a discussion of Merleau-Ponty's individual-oriented analysis of style in this context. See Carman (2008: Chapter 6) and Gilmore (2005) for a discussion of Merleau-Ponty's view of style in an aesthetic and bodily context.

- <sup>32</sup> Making a similar point in the *Phenomenology*, he argues that the style of a piece of wood is something that “establishes a horizon of sense” around it (Merleau-Ponty, 1945: 476/514).
- <sup>33</sup> See, for example, (Husserl, 1939: 32–36, 361).
- <sup>34</sup> For this description of structure as the physiognomy or *Gestalt* of a property, like colors and shapes, see Merleau-Ponty (1945: 20–23/43–5, 62/88, 145/179, 217/254, 287/325, 404/444, 453/492). This is distinct from the physiognomy or *Gestalt* that belongs to an object as a whole, which would map onto the style of the object (see Merleau-Ponty, 1945: 61/88, 476/514).
- <sup>35</sup> See Section 8 of *Erfahrung und Urteil* for Husserl's discussion of typics. It is also worth noting that Landes translates both “*typique*” and “*schéma*” as schema; however, this covers over not only the connection to Husserl's discussion of typics but also Merleau-Ponty's distinction between a typic, which is a particular type of motor response, and the body schema, which is the whole that encompasses various typics. As Merleau-Ponty makes this point, typics are the “annexes” of the body schema (Merleau-Ponty, 1945: 49/74). For a more thorough discussion of my interpretation of Merleau-Ponty's account of typics and the body schema, see Matherne (2016: Sections 5.2–3).
- <sup>36</sup> This sort of transmutation is something that Merleau-Ponty does not restrict to abstract thought; rather, he thinks that whenever we engage in “creative expression,” whether in language or art, mathematics, or science, we transmute the implicit sense we are familiar with in perception into a signification that is manageable and intersubjectively accessible (Merleau-Ponty, 1969: 48).
- <sup>37</sup> This, of course, leaves open the possibility that other forms of culture, such as art, are more interested in the style of individuals.
- <sup>38</sup> See Hass (2008: Chapter 6) for a discussion of this example and its connection to Merleau-Ponty theory of expression and mathematics.
- <sup>39</sup> See Merleau-Ponty (1969: 125–6, 105–6).
- <sup>40</sup> See also Merleau-Ponty (1945: lxxix/15). This is also a major theme in both Merleau-Ponty (1969; e.g., 6, 124) and Merleau-Ponty (1960).
- <sup>41</sup> He makes this point about non-Euclidean geometry at Merleau-Ponty (1947: 20) and Merleau-Ponty (1962: 8) and about relativity at Merleau-Ponty (1948: 36). See Merleau-Ponty (1969: 100, 127) for his cumulative view of progress in mathematics and science.

## ORCID

Samantha Matherne  <http://orcid.org/0000-0003-4619-5563>

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