

Interdisciplinary Evolution Research 6

Elena Pagni
Richard Theisen Simanke *Editors*

Biosemiotics and Evolution

The Natural Foundations
of Meaning and Symbolism

 Springer

Interdisciplinary Evolution Research

Volume 6

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Elena Pagni
Department of Philosophy
Federal University of Juiz de Fora (UFJF)
Juiz de Fora, Brazil

Richard Theisen Simanke
Department of Psychology
Universidade Federal de Juiz de Fora (UFJF)
Juiz de Fora, Brazil

ISSN 2199-3068

ISSN 2199-3076 (electronic)

Interdisciplinary Evolution Research

ISBN 978-3-030-85264-1

ISBN 978-3-030-85265-8 (eBook)

<https://doi.org/10.1007/978-3-030-85265-8>

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Physical Intentionality: The Phenomenological Roots of Biosemiotics



Roberta Lanfredini 

Abstract The concept of intentionality is traditionally ascribed to a state of consciousness or a mental state. The thesis that intention is the mark of the mind implies a *representational* model, fundamentally connected to the crucial notion of determination or characterization. This essay aims to investigate the seemingly oxymoronic notion of physical intentionality, which implies an *expressive* model, and the centrality of the notion of forceful (or powerful) property. The reason for this profound paradigm shift is the replacement of the notion of invariance with the notion of tension. This change marks the transition from a phenomenology of the inert to a phenomenology of the living.

Keywords Intentionality · Phenomenology · Forceful property · Embodiment

1 Mental Intentionality

Having Brentano's formulation as its starting point, the concept of intentionality stands as the mark of the mental. We will call this thesis IMM (Intentionality Mark of the Mental) (Crane 1998), in the sense that intentionality is the necessary and sufficient condition for a state to be called mental and differentiated from a physical state. With this understanding, intentionality functions as a demarcation criterion of the physical and mental realms. In this sense, Brentano's theory of intentionality differs from the Scholastic tradition. Indeed, while for Scholasticism, intentionality fits into the frame of the philosophy of knowledge, for Brentano, it belongs to an introductory chapter about psychology, being a criterion for *defining* psychic phenomena.

Every mental phenomenon is characterized by what the Scholastics of the Middle Ages called the intentional (or mental) inexistence of an object, and what we might call, though

R. Lanfredini (✉)

Department of Humanities (DILEF), University of Studies of Florence, Florence, Italy

e-mail: roberta.lanfredini@unifi.it

not wholly unambiguously, reference to a content, direction toward an object. . . . This intentional in-existence is characteristic exclusively of mental phenomena. No physical phenomenon exhibits anything like it. (Brentano 1995: 92–93)

In Husserl's reformulation of Brentano's theory, intentionality is the mind's distinguishing feature in the weaker sense that it is a necessary (though not sufficient) condition for a state to be called mental. Indeed, for Husserl (as for Kant), there exists a passive or pathic dimension (we might specifically think of sensory states such as pain, or mood-states such as anxiety, depression, or happiness, which infuse the whole of experience with a certain tone) which does not, at least in the first instance, show an intentional *direction* toward any object. In this regard, Husserl anticipates the distinction between mind and phenomenal consciousness in the philosophy of mind (Chalmers 1995, 1996, 2018), laying the ground for what will become phenomenal intentionality (Kriegel 2009).

In the contemporary debate, intentionality is often referred back to as the problem of its possible naturalization. The dispute between so-called *tracking theories* (TT) (Dretske 1981, 1995; Millikan 1989, 2009, 2017) and the so-called *Phenomenal intentionality research program* (PIT) (Kriegel 2013; Loar 1987) takes place within this general picture. TT attempts to neutralize qualitative states' content, reducing them to a *tracking relation* that holds sway between the phenomenality of consciousness and physical properties, framing intentionality in terms of causal relations between mental states and the environment. The underpinning assumption is that intentionality should by no means be conceived as a unique condition proper to elusive mental states, but as a natural interaction with the environment. For TT, the content of our conscious mental states strongly depends on objective external properties. Indeed, the *tracking approach* maintains that the content of qualitative states can be reduced to a monitoring relationship conceived as a function of the correspondence with certain external reality data that are capable of revealing information relating to the environment. In contrast to TT, phenomenal intentionality proposes an anti-naturalization of intentionality. According to this approach, experience manifests phenomenal properties that intrinsically characterize experience itself and, as such, are not reducible to naturalistic data.

A clear example of antinaturalism can easily be discerned in the phenomenological approach. Despite the attempts, some of them significant (Petitot et al. 1999), to naturalize phenomenology and to maintain full compatibility between the phenomenological method and the cognitive sciences, and more generally between the fundamental concepts of phenomenology (lived experience [*Erlebnis*], consciousness, subject) and the fundamental concepts of the natural sciences, it cannot be denied that the central approach of phenomenology is of a specifically and irreducibly antinaturalistic type. This general stance has repercussions for how intentionality is conceived.

For Brentano, the theses which lead to the formulation of the concept of intentionality are as follows:

- (a) Every psychic phenomenon is directed toward an object.
- (b) The object of a psychic phenomenon is a physical phenomenon.
- (c) The physical phenomenon is not a psychic phenomenon, nor part of it.

From these three theses derives the fact that, as we have seen, the characteristic sign of the mental is intentionality or, which is the same thing, that intentionality is the necessary and sufficient condition for something to be considered a mental state.

Physical phenomena, which constitute the terminal point of the “intentional arrow,” are not, for their part, directed to something, at least, not in the sense of intentional direction. Indeed, we can say that if a stone is dropped, it is directed toward the earth, but this “directionality” has nothing to do with intentional direction. Therefore, what characterizes the specificity of the intentional relation? In other words, what makes it “mental” compared to physical relations?

Two answers can be given to this question. According to the first, the distinctiveness of intentional mental states (perceiving, imagining, desiring, being afraid), as opposed to non-intentional states (walking, dropping books, sitting on a chair, lifting the arm), can be attributed to the distinctiveness of the *intended object*. We will call this thesis the *ontic theory of intentionality*. According to this thesis, intentionality is a *sui generis* relationship, not so much because of the link it sets up between a mental state and the object toward which it is directed, as because of the nature of the intended object. This object turns out to be ontologically distinct from the entities which are involved in non-intentional relations. The objects of intentional relations are independent of existence and, even in the case where the intended object can be accepted as actually existing (as when I perceive the pen with which I am writing, and there is a strong probability that it is not the product of a hallucination), the ontic theory of intentionality requires the intentional object to be distinct from the actually existing object. We can therefore conclude that the intentionality of mental states consists, in any case, in their being related to a sort of ontology that is parallel to the ordinary or real one.

The second answer goes in the direction of an *epistemic theory of intentionality*. According to this theory, intentionality is not a property of the object but a property of the conscious state (*Erlebnis*). More precisely, intentionality stands for the internal structure described in detail by Husserl in the *Fifth Logical Investigation* (Husserl 2001), which makes the intentional act capable of addressing the objects of experience. Based on this new and more complicated idea of intentionality, which is founded on the (originally Kantian) notions of the constitution and the transcendental, the object is such (*objectum*: i.e., “thrown before,” “placed in front”) in that it contains the reference to a content of consciousness (*Erlebnis*). The object contains *not* the content but only a reference to it. Otherwise, we would fall into that indistinction typical of classical empiricism (of Locke, Hume, and Berkeley) and the neutral monism of Russell, Mach, and James, in which experience presents the collapse of that bipolarity between the subjective (noetic) component and the objectual (noematic) component that is crucial for Husserl, following Kant. However, the object does contain the necessary reference to content to satisfy that *principle of manifestation*, which characterizes Husserl’s phenomenology.

Therefore, an object understood as a manifestation or phenomenon must contain not the lived experience but the reference to a lived experience. This reference translates into a founding or dependency relation that, if read in the opposite direction, exactly expresses the notion of intentionality. The mirror image of the thesis that every object necessarily contains the reference to a lived experience is in fact that, if the experience is intentional, it is directed toward an object through its content: therefore, according to specific qualifying modalities (e.g., perceptual or imaginative), but also attributive or determinative ones (such as having a particular color, or a particular sonic pitch).

The experience is, therefore, the condition by which the object is given. This topic of the *condition* is clearly inspired by Kant but becomes re-proposed by Husserl in descriptive and not prescriptive terms: the condition does not lie in a categorical system *a priori*, but in the internal structure of the experience. The conditions should therefore be read not as *conditions of possibility* but as *conditions of correlativity*. Phenomenology is a science of the necessary correlation between phenomenon and (underlying) experience or between the world and (underlying) consciousness. Every object is an intentional object and must only be investigated within the limits (and strictly within those limits) in which it is given in the intentional act.

2 Intentionality and Determination

The epistemic theory of intentionality relates to three central theses.

We will call the first one the *thesis of the perspectival character of intentionality*. According to this, every phenomenon that is not, in turn, an experience is always and necessarily given based on determined points of view. For Husserl, the object's perspectival character is a fundamental assumption: every object manifests itself only through perspectives and never in its entirety: that is, completely, from all points of view. The perspectival character is thus incorporated into the notion of the object as a defining condition. The intentional relation set up between a state of subjectivity and an object is always linked to (the act of) conceiving the object in specific ways (and not in others). Husserl denominated the intentional object as an object intended *in the how* of its determinacies and indeterminacies. For example, a thing's perception is always partial (from below, from above, from the side). It is never a perception of the thing in its entirety, whereas throwing something to the ground does not involve any intentional modality: that is, it has no perspectival character.

That intentionality is not confined to indicating *the what* (the intended object) but also *the how* (the way in which we intend it) is well expressed by the story of Oedipus. Only if we accept the thesis of intentionality's perspectival character, Oedipus can despise the man he kills on the road to Delphi without despising his father, or desire Queen Jocasta without desiring his mother; or again, hate the murderer of Laius without hating himself. In this case, moreover, the difference between intentional and non-intentional states is shown in all its tragic clarity:

Oedipus kills the man he meets on the road to Delphi and, in doing so, also kills his father; he marries Queen Jocasta and, in doing so, lies with his mother. Intentionality is, therefore, always partial or aspectual.¹

Focusing on an intended object, the statement “in the how of its determinacies (and indeterminacies)” also indicates the existence of a halo or indistinct background which constitutes the horizon (not attentional, but intentional) concerning which intentionality delimits and brings focus. For Husserl, appearance is always surrounded by a halo or horizon functioning as a non-attentional background. This background merely allows the appearance itself to be given by contrast. This horizon presupposes a permutation through space (the background, the tacit horizon) and a permutation through time (the retentive past). In *Ideas II*, Husserl refers to a “dark background” very remote from the attentional present, which nevertheless constitutes the foundation of experience.

What is specific therein is motivated in the obscure background and has its “psychic grounds” about which it can be asked: how did I get there, what brought me to it? That questions like these can be raised characterizes all motivation in general. The “motives” are often deeply buried but can be brought to light by “psychoanalysis.” A thought “reminds” me of other thoughts and calls back into memory a past lived experience, etc. In some cases, it can be perceived. In most cases, however, the motivation is indeed actually present in consciousness, but it does not stand out; it is unnoticed or unnoticeable (“unconscious”). (Husserl 1989: 235)

The thesis of tacit or background intentionality confirms the idea that the primary function of intentionality is to detach an object from a background, determining its characteristics and properties. Thanks to the very notion of intentionality, phenomenology is a discipline that describes the *determinations* of the phenomena constituted by states of consciousness.

We will call the second thesis *the thesis of the synthetic character of the intended object*. The perspectives by which the object is manifested are predominantly given as unitary. In the object, the manifestations are coherent and connected around a unitary, though indefinitely open, pole. This identificatory synthesis of appearances is an integrative part of the experience, except when the cohesion breaks or fragments. This fragmentation happens in hallucinations or, generally, in the interruption of the cohesion of experience in illusory states.

We will call the third thesis, which we have already encountered, the *thesis of the intended object's independence from existence*. Whereas a non-intentional relation (like riding a horse, being shorter than Tom, dropping a book) subsists between two entities only if both exist, the relationship between intention and intended object holds independently of the latter's existence. We can *see* an oasis in the desert, *fear* encountering the abominable snowman, *hope* that the fountain of youth will be discovered independently of these entities' existence.

¹The example of Oedipus also shows the possibility of re-signifying both the object and the mental state through time, so introducing into the notion of intentionality the dynamic character we will find in physical intentionality.

All the theses summed up so far imply this primary activity of “decoupage” from lived experience. Indeed, it is impossible to speak about perspective or viewpoint except based on many objectual determinations, just as it is not possible to refer to a synthesis of perspectives except based on coherence or coexistence of two or more “agglomerates” of determinations. The same suspension of existence strengthens the notion of determination by freeing it from the existential bond. Lastly, the implicit character of intentionality and the notion of horizon or background offer the intentional act the (indistinct, confused) terrain based on which it can distinguish an object of experience.

This centrality of determination, expressed by the notion of intentionality, is founded on the concept—a crucial one for Husserl—of invariance. Invariance results from a unifying function performed by consciousness on the variations, the incessant fluctuation, which experience presents by its very nature.

One of Husserl’s most frequently used formulae is, not by chance, *the object in the how of its determinations*. In this formula, the close nexus between the expressions *in the how* and *determinations* implies the modality’s indispensability and the need for this modality to be crystallized into properties or characteristics.

Without determinations, it would be impossible to speak about perspectives on the thing (the perspective being nothing but a “bunch” of determinations of the thing); or of synthesis and unity of perspectives (understood as cohesion and regularity between bunches of determinations); or about the implicit or background character of intentionality (understood as that which is not yet determined). In brief, intentionality converges on the notion of determination (or attribution), which in turn relates to the concept of representation.

My thesis is that this mental model is complementary to the conception of matter as essentially characterized by extension. The idea that the mind, as a cognitive modality, is a representational activity is the reverberation of conceiving matter as essentially extended (hence fragmentable, divisible, countable) and vice versa. Conceiving the mind as essentially intentional (that is, representational) and conceiving matter as essentially extended (object of representation) are two sides of the same coin.

In this model of the mind, in which representation becomes the mold of material extension (and vice versa), representational and extensive structure become primary (essential), at the expense of the qualitative dimension both of the physical body (secondary properties) and the mental (qualia).

This model’s source lies misconception of the notion of organism (and of life) in favor of “functional” notions such as mind, representation, cognition, and intentionality. This misconception extends to the notion of the body understood predominantly as a kinesthetic body, the primary function of which is to unify the object’s perspectives. Indeed, for Husserl, the living body (*Leib*) fulfills predominantly (though not exclusively) constituent purposes: through its kinesthesia, the body can accomplish that synthesis of perspectives that is an integrative part of the intentional function.

The result is an adaptation of the living to the inert (Bailly and Longo 2011; Longo and Montévil 2011, 2014) in a double sense: on the one hand, what emerges

from this perspective is an artificial conception of the mind, understood as empty representational and a merely kinesthetic conception of the living body (the *Leib* as a kinesthetic automaton); on the other, a reductive conception of matter, understood as a mere extension.

An alternative path can be traced in Husserl's acknowledgment that "the fully comprehensive essential attribute of material being is not mere extension but is, instead, materiality, so far as this latter in itself requires temporal as well as spatial extension" (Husserl 1989: 31, 1997).

It is permissible at this point to pose the question: what does it mean, and what does it entail to see the essence of materiality in temporality?

3 The Forceful Qualities

The Husserlian notion of invariance in variation implies, as its theoretical nuclear vehicle, a particular way of understanding essence. For Husserl, essence (*Eidos*, *Wesen*) is the product of that fundamental phenomenological mechanism that is eidetic reduction. The theory of ideation proposes, first of all, an explanation of the notion of datum and of what is effectively, analytically contained in such a notion. No datum could be understood/intended if it had not been ideated: indeed, the individual turns out to be such (that is, individuated) only by being an element in a field of possible variations limited by eidetic boundaries. If this were not the case, we would be dealing with a "formless substrate" lacking intuitive determination. Husserl's idea is that if deprived of its essentiality (phenomenologically understood as the unification of the possibility of its variations), the datum could not be discriminated.

Conceiving the qualitative in terms of categorical qualities has a long tradition. Onto it, Descartes and Husserl graft their idea of quality as invariance in variation (of states for Descartes, of adumbrations for Husserl). This conception is based on the fundamental, though not exhaustive, the character of extension. In fact, to be able to discriminate, we need to unite, and to unite, we must be able, even if only virtually, to "fragment" experience into unity. However, this fragmentation presupposes something anterior to extension, which is the terrain on which invariance can come into effect.

Conceiving extension as the essence of the matter is a mirror image of conceiving representation as the mental essence. In this sense, the idea that intentionality (and therefore representation) is a necessary (though not sufficient) condition of the mental fuels the idea that extension is the essence of matter, and vice versa.

However, maintaining that an essential condition for being material is *also* temporality entails escaping the circle of representation/extension by introducing a new actor: time understood as duration or history.

In this new scenario, the static concept of determination (*qualitative/categorical dimension*) is replaced by the dynamic and dispositional concept of *forceful qualities*.

The description of qualities in terms of *force* or *power* also has a tradition, albeit a lesser one, which counts Herbart and Mach among its most significant exponents (Blackmore 1972). Herbart originally presented his doctrine of quality in *Psychologie als Wissenschaft*. He proposed an *Elementenlehre* in which elements are conceived as similar to the Newtonian forces and qualities as the direction of the force itself (Banks 2005). One of the main consequences of this approach is a profoundly changed theory of essence (*Wesen*). For Husserl, as we have seen, the essence is attributable to the notion of invariance, and hence of identity. For Herbart, on the contrary, the essence is attributable to the notion of an equilibrium of forces. As he claims, the elements:

(...) press one another. For in the world of the senses we find resistance in pressure, where nothing gives way although each is supposed to move. Pressure is rest, through reciprocal endurance against another. (Herbart 1828–1829: 103)

And Banks comments, in response:

When Herbart's qualities exactly cancelled one another in magnitude and direction they were in spaceless equilibrium and could group together into stable point-like objects, which he called *Wesen* ("beings," "objects"). (...) *Wesen* were really point-like nodes held in position by the mutually constraining forces acting there and not by their mere existence. (...) Herbart claimed that each *Wesen* conserved itself against the others by "pressing back" through its qualities. In fact, he described two sorts of pressures. (Banks 2005: 210)

Resistance originates from the forces ("first forces must act, then there is resistance to them, thanks to other forces" (Herbart: 103) and on the other hand, force originates from resistance "force is that which overcomes resistance" (*ibidem*), since force is that which tends to change the state of a thing.

In the Herbartian scenario, essences are not the fruit of invariances but of *forces* or *equilibria*. In turn, qualities, far from being a "qualitative patina" that spreads over an extension—or invariance in variation, as Husserl maintains in his explication of eidetic variation—can be likened to *powers*. In this sense, properties traditionally considered primary, such as size, position, duration, divisibility, and solidity, are attributable to qualitative properties. We find something very similar in Mach in that he claims "the thing is (...) a mental symbol for a relatively stable complex of sensational elements" (Mach 1976: 322). Banks has shown how Mach's approach derives from the legacy of Herbart's thought, as well as from Bernard Riemann and Hermann Grossman, further connecting it to the neutral monism of James and Russell. The Machian elements can, in fact, be conceived as *forceful qualities*—"Elements are manifested forces in events" (Banks 2003, 2014: 49)—, an idea which Herbart himself traced in Leibniz's outlook.

The qualities are therefore not static but dynamic. Like Mach, Herbart proposes a distinctive theory of the datum in which it is constituted by a multiplicity of simple substances existing in a dynamic relationship with one another.

This theory of the datum can easily be read in terms of dispositions. These dispositions, in turn, are understood as "power or capacity" (Heil 2005: 343). The dispositions satisfy the following theses (Heil 2005, 2010; Martin 1993):

1. They are real characteristics of objects. What is merely potential is the manifestation of the disposition (e.g., the breaking of the glass) and not the disposition itself.
2. They are intrinsic properties of the objects which possess them. Most dispositions could never be manifested.
3. Their nature is not entirely reducible to conditional analysis. The glass would be fragile even if the conditional “the glass is fragile if it breaks when struck by something solid” were false.
4. They are not contingent characteristics of the world.

In conclusion, every property is dispositional and qualitative at the same time. Therefore, the primary properties are also qualities, and the qualities, in turn, are *powers*.

Hence, the reference to the distinction between primary and secondary properties is in a certain sense turned on its head. While tradition (which finds its most significant expression in the Galilean perspective) portrays the material world as consisting solely of primary properties and relegates the qualities to conscious observers’ minds, in the view just considered the qualities, understood as *forceful qualities* are in fact primary. In contrast, the properties initially considered primary (extension, size, form) are limited cases of those “disturbances and self-pervations” that constitute the ontological basis from which all the rest, including the concept of representation on the one hand and extension on the other, have their origin.

4 Physical Intentionality

To give priority to the qualitative dimension of experience over its character as extension, and to define this dimension in agentive rather than categorical terms, implies a transformation of the underlying ontological vision: the qualitative dimension is no longer understood in a functional sense (as invariance in variation) but in a dispositional sense (as powers, or forces). Ontological priority, according to this theory, belongs not to determination but to power, not to invariance but to force.

The concept of power is, according to Molnar 2003 and Munford (1998), closely connected to the concept of intentionality. Its fundamental characteristics are, in fact, five: *independence* with respect to its effective manifestation (power is ontologically independent with respect to the eventual phenomena in which it is realized), *actuality* (powers are “fully actual properties of their bearers”), *intrinsicity* (powers are intrinsic and not extrinsic properties of their bearers), *objectivity* (powers are endowed with an objective ontological existence and are not secondary, for example, with respect to microphysical structure) and, finally, *intentionality*. The last concept is the most important: the essential characteristic of power—what distinguishes it *prima facie* from non-powers—is its directness. Power is essentially connoted by directionality: that is, by being directed toward something.

But what exactly is meant here by intentionality? We have seen how there are three theses in this tradition that characterize the concept of intentionality: (1) the distinctive direction toward something: that is, the reference to an intended object, structurally different from a physical relationship); (2) the intended object's independence from existence (unlike a physical relationship, in which this independence does not exist); (3) the partiality and perspectivability of the intentional relationship (unlike the physical relationship, which is neither partial nor perspectival).

The first thesis is the one that allows Brentano to conceive of intentionality as a criterion of demarcation between psychical and physical phenomena (Brentano 1995) and that allows Husserl to conceive of intentionality as an essential feature of consciousness (Husserl 2001). For Husserl, in fact, not all states of consciousness (*Erlebnisse*) are endowed with an intentional structure: neither are sensations such as pain or pleasure, for example, nor moods, nor temperamental traits; nor are some emotional states such as panic or anxiety.

However, despite the recognition of a non-intentional dimension, Husserl conceives intentionality as characterizing consciousness. In fact, a consciousness that is not endowed with intentionality cannot be properly defined as such. The distinctive relation that consciousness has with its objects is confirmed by two further assumptions: the intended object is in fact *independent of existence* (I can imagine, fantasize, even perceive objects that do not exist, as in hallucinations or illusions), but necessarily *dependent on points of view* or perspectives.

It is not in principle possible to perceive, imagine, judge, feel something without incorporating a point of view. An absolutely independent object is nonsense, just like a round square. Furthermore, intended objects can be fuzzy objects. For example, I may perceive something in a vague way, as when I hear an indistinct noise or see a figure without identifying its outlines. But vagueness in phenomenology is not the same as indeterminacy. Being intentionally addressed toward an object means not only determining the intended object, but also the way in which it is intended. Intentionality, to use Nagel's words, is not a "view from nowhere" (Nagel 1974), a "naked" perception of the object, but a perspectival slant on things. And the perspectival slant is closely linked to the set of determinations in which it is realized.

This specific sense of *directness* interprets intentionality as closely connected to representational activity. The principle according to which "Every act is representation or founded on a representation" is considered by Husserl, and before him by Brentano, as a founding thesis of phenomenological investigation.

In physical intentionality what is lacking is the representational structure of mental intentionality. It is interesting to note, however, that despite this profound change in conception, the formal structure of the definition of intentionality remains unchanged. The three theses that define the concept of mental intentionality are in fact also maintained in the case of physical intentionality.

Physical intentionality is indeed directed toward something. The intentional object of a physical power (such as solubility or electromagnetic charge) is its

manifestation.² The link between power and its manifestation, just like the link between the intentional act and intended object, is not contingent but necessary and essential. Physical intentionality, like mental intentionality, is also independent of existence. Something may be soluble without ever being dissolved, or fragile without ever breaking. The manifestation of physical power may exist or not without detriment to the existence of the physical power itself. Finally, physical intentionality, just like mental intentionality, can be vague (Martin and Pfeifer 1986). Physical powers can also have fuzzy objects; such as the propensity of unstable elements to decay, which is indeterminate as to timing. What is missing is, despite the structural identity between the two theories of intentionality, the link (necessary for mental intentionality) with representation. The nexus between power and its manifestation is not representational but expressive and agentive.

The identification between dispositional properties and powers radically transforms the theory implied by the distinction between primary and secondary properties (Lanfredini 2018). Dispositional qualities or powers are not identified with primary properties simply because they are not properties. Powers are autonomous with respect to what is traditionally considered primary (that is, extension, figure, motion—in a word, what is measurable) simply because they are not on the same plane: if the distinction between primary and secondary properties has to do with the notion of determination, the distinction between power and non-power has to do with the notion of action. In this sense, if it is plausible to adopt a reductionist perspective and identify the dispositions with underlying physical structures, we may also quite plausibly adopt an anti-reductionist perspective and consider the powers as totally *groundless*: that is, ontologically independent of non-powers.

This difference implies a radical paradigm shift: time (understood not as succession—spatialized time—but as duration, or as history) is now primary to space (understood as extension). From this perspective, time is not a lack as far as stability and fixity (invariance in variation) are concerned, but it is efficacious or creative (stability or continuity in variation); it has, in fact, power. If dispositional qualities cannot be identified even partially with secondary properties, how can they be defined?

In this case, there are two strategies we could adopt. According to the first, powers and the qualitative/categorical dimension are two sides of the same coin (Martin 1994): that is, “a power is only a face/facet/side of a property that also has a qualitative face/facet/side” (Molnar: 159). According to this hypothesis all properties have something about them that is irreducibly and ineliminably powerful in the qualitative/dispositional sense, and something else about them that is irreducibly and ineliminably non-dispositional in the qualitative/categorical sense. From this perspective, the qualitative/categorical and the qualitative/dispositional are “parts” or “aspects” of the single underlying property.

²“Of the many ways of characterizing a power, the only one that reveals the nature (identity) of the power is the characterization in terms of its manifestation” (Molnar: 63).

The second hypothesis is that secondary properties in the qualitative/categorical sense and powers in the qualitative/dispositional sense are not being thought of a part or an aspect of the property, but are thought of the whole property *in a certain way*. Equally, to think of the property is not to think only of an aspect of the property but again to consider the whole property in a certain different way (Taylor 2013, 2018). A good example of this idea is the case of the Gestalt shift, as in the example of the famous ambiguous figure which can be seen as a duck or a rabbit. When we consider the figure as a rabbit or as a duck, we are not considering only a part or an aspect of the figure. Rather, we are considering the whole figure in a certain way. However, there is a further possibility: that powers are considered as neither different aspects nor different modes of the same thing. From this perspective, which we can call neutral and monistic, disposition or power is the only reality, the only true, vital dimension (Bergson 1998).

Seen in this light the qualitative/categorical dimension or secondary property is neither an aspect nor a certain mode of an underlying, whole property, but a limiting case of the original expression of qualitative dimension: the case, that is, in which this property is spread over an extension. According to this third hypothesis, the link between power or qualitative/dispositional dimension and secondary property or qualitative/categorical dimension is not mereological (i.e., between part and whole) but derivative: the latter would in fact be founded on the former, the former being more original.

5 Embodied Cognition

Interpreting the notion of intentionality not as “the mark of the mental” but as “the mark of the physical” entails a radical shift of viewpoint, resulting in a total paradigmatic reversal.

In the current debate about the philosophy of mind, it is customary to speak of an incarnate conception of the mind, guided by what is called in the literature *the four Es*, by which the mind would be *Embodied*, *Embedded*, *Enactive*, and *Extended* (Varela et al. 1991; Lakoff and Johnson 1999; Shapiro 2014; Clark and Chalmers 2003; Thompson 2009).

These words converge on a general and partially revolutionary thesis: that the mind is not a mere process elaborating information proceeding from the outside world (according to the well-known metaphor of the mind as the software of a piece of hardware) but, on the contrary, an open system endowed with self-organization and constant interaction and integration with the world; elaborating propositions directed toward the environment and dealing with challenges posed by the environment, in a constant reorganization and reconversion of the system: a system that is customarily called homeostatic.

This system corresponds to the paradigm of *Embodied cognition* in the philosophy of mind, by which the motor capacities that can be ascribed to a body should be considered indispensable factors for the development and functioning of a cognitive

system. This attribution leads the supporters of this view to maintain that, from both epistemic and ontological viewpoints, the definition of processes like perception, reasoning, and language depends on the bodily properties that can be situated beyond the central nervous system's established boundaries.

In particular, the paradigm of embodied cognition emphasizes the possibility of interaction with the environment over the processes that transform the information.

The best explanation of the systematic character of cognition must be sought not so much in the possession of computational and representational abilities or algorithmic processes within the system, as in morphological properties of the body and its interactions with the environment.

So, according to this theory, cognition is not a computational process. The idea that mental processes have a syntactic nature—that is, the thesis that posits a cognitive system and, on the same level, an elaborator capable of working on symbols and transforming input into output by using logical operators and rules for their application—becomes superseded.

In other words, cognition can no longer be likened to a calculus in which strings of symbols are elaborated according to definite formal rules within the cognitive system itself. In this highly delicate complex of equilibria, the world is by no means a reservoir of information from which to draw the material we need for “giving birth” to univocal representations of an objective reality which is independent of our way of observing it, but an environment which is the product of a co-creation: that is, of a reciprocal creation between mind, body, and environment, a sort of *structural coupling* which simultaneously modifies both the organization and the environment, and is compared by some phenomenologists (Merleau-Ponty 1968, 2002; Merleau-Ponty and Séglaard 2003) to the coupling which occurs in dancing.

Therefore, the mind is *Incarnate* in the sense that it is necessarily inscribed in a body. It is, for that reason, always situated. *Integrated* in the sense that it is not a closed system, but an open one, and, as Sartre saw clearly, not *inside*, solipsistically closed (as in the Cartesian paradigm) but *outside* from the start. *Agentive*, in the sense that the organism's essential property is not representation, which is entirely secondary, but action. *Extended*, in the sense that the organism's fundamental property is that of integrating and incorporating objectual and external elements. Just as a blind person incorporates her cane into her perception and *feels* the tip of the cane resting on the ground, in the same way, we incorporate external elements and make them ours, interpreting them as our effective prolongations.

The concept of openness, together with the concepts of retroaction, generativity, and aleatory character, allows the formulation of the thesis according to which no objects exist separately from their observers and the surrounding environment. There are only aleatory events emerging from complex systemic interactions. This idea performs a thoroughly Copernican reversal from the paradigm of control to recognizing the environment as a source of disturbances rather than information. This shift constitutes the basis of what Maturana and Varela called autopoiesis: that is, the definition of the living being as a system that continually redefines itself, maintaining and reproducing itself from within.

This thesis obliges us also to consider the world as a universe of participation, a world which, as Edgar Morin puts it, “is in us, just as we are in it,” and also, on substantially renewed bases, to rethink the concept of the body. The body (as biosemiotics has clearly shown) is, first of all, a means of expression. Alternatively, if we will, expression is achieved through the body before we acquire speech. Expression and perception, activity and passivity come about only through movement; more precisely, they *are* movement. Movement and expression can be considered (as Merleau-Ponty clearly revealed) synonymous: in moving, we explore the environment around us, and exploring the world, we simultaneously explore ourselves, our interior. Moving means bringing the inner toward the external, as Merleau-Ponty meant when he spoke of the body as flesh and flesh as dehiscence: the internal emerging into the external and, vice versa, the incorporation of the external into the internal.

Now, this circular movement is achieved in the flesh as the result of the theoretical passage from intentionality understood as the mark of the mental to intentionality as the mark of the material. More specifically, it is a passage from the static concept of determination to the dynamic concept of disposition (understood as a forceful or powerful property) or, if we will, from a conception of the body as a device for the constitution and objectual representation to a conception of the body as an organism whose essential task is the expression and the formation of sense.

References

- Bailly F, Longo G (2011) *Mathematics and the natural sciences: the physical singularity of life*. Imperial College Press, London
- Banks EC (2003) *Ernst Mach’s world elements: a study in natural philosophy*. Kluwer, Dordrecht
- Banks EC (2005) Kant, Herbart and Riemann. *Kant Studien* 96:208–234
- Banks EC (2014) *The realistic empiricism of Mach, James, and Russel: neutral Monism reconceived*. Cambridge University Press, Cambridge
- Bergson H (1998) *Creative evolution*. Dover, New York
- Blackmore JT (1972) *Ernst Mach: his work, life, and influence*. University of California Press, Berkeley
- Brentano F (1995) *Psychology from an empirical standpoint*. Routledge, London
- Chalmers D (1995) Facing up to the problem of consciousness. *J Conscious Stud* 2(3):200–219
- Chalmers D (1996) *The conscious mind: in search of a fundamental theory*. Oxford University Press, Oxford
- Chalmers D (2018) The meta-problem of consciousness. *J Conscious Stud* 25:6–61
- Clark A, Chalmers D (2003) The extended mind. *Analysis* 58(1):17–19
- Crane T (1998) Intentionality as the mark of the mental. In: O’Hear A (ed) *Contemporary issues in the philosophy of mind*. Cambridge University Press, Cambridge, pp 229–252
- Dretske F (1981) *Knowledge and the flow of information*. MIT Press, Massachusetts
- Dretske F (1995) *Naturalizing the mind*. MIT Press, Massachusetts
- Heil J (2005) Dispositions. *Synthese* 144(3):343–356
- Heil J (2010) Powerful qualities. In: Marmodoro A (ed) *The metaphysics of powers: their grounding and manifestations*. Routledge, New York
- Herbart JF (1828–1829) *Allgemeine Metaphysik nebst den Anfängen der philosophischen Naturlehre*. Erster historisch-kritischer Teil, SW VII, Königsberg

- Husserl E (1989) Ideas pertaining to a pure phenomenology and to a phenomenological philosophy, second book, studies in the phenomenology of constitution. Boston, London, Kluwer Academic Publishers, Dordrecht
- Husserl E (1997) Thing and space. Lectures of 1907, Collected works, Vol VI, Springer, Dordrecht
- Husserl E (2001) Logical investigations, vol II. Routledge, London and New York
- Kriegel U (2009) Subjective consciousness: a self-representational theory, Oxford. Oxford University Press
- Kriegel U (2013) The phenomenal intentionality research program. In: Kriegel U (ed) Phenomenal intentionality. Oxford University Press, Oxford
- Lakoff G, Johnson M (1999) Philosophy in the flesh: the embodied mind and its challenge to western thought. Basic Books, New York
- Lanfredini R (2018) Categories and dispositions. A New Look at the Distinction between Primary and Secondary Properties, in Special Issue “Contemporary Natural Philosophy and Philosophies”, “Philosophies”, G. Dodig-Crnkovic, Marcin J. Schroeder (Eds), *Philosophies*, pp.1–12
- Loar B (1987) Subjective intentionality. *Philos Top* 15(1):89–124
- Longo G, Montévil M (2011) Protention and retention in biological systems. *Theory Biosci* 130(2):107–117
- Longo G, Montévil M (2014) Perspectives on organisms: biological time, symmetries and singularities. Springer, Berlin
- Mach E (1976) Knowledge and error: sketches on the psychology of enquiry. Reidel, Dordrecht
- Martin CB (1993) Power for realists. In: Bacon J, Campbell K, Reinhardt L (eds) *Ontology, causality and mind*. Cambridge University Press, Cambridge, pp 175–194
- Martin CB (1994) Dispositions and conditionals. *Philos Q* 44:1–8
- Martin CB, Pfeifer K (1986) Intentionality and the non-psychological. *Philos Phenomenol Res* 46:531–554
- Merleau-Ponty M (1968) *The visible and the invisible*. Northwestern University Press, Evanston
- Merleau-Ponty M (2002) *Phenomenology of perception*. Routledge, London
- Merleau-Ponty M, Ségлар M (2003) *Nature: course notes from the Collège de France*. Northwestern University Press, Evanston
- Millikan R (1989) Biosemantics. In: McLaughlin BP, Beckerman A (eds) *J Philos*. Oxford University Press, pp 281–297
- Millikan R (2009) Biosemantics. *J Philos* 86(6):281–297
- Millikan R (2017) Beyond concepts: unicepts, language, and natural information. Oxford University Press, Oxford
- Molnar G (2003) *Powers*. Oxford University Press, Oxford
- Munford S (1998) *Dispositions*. Oxford University Press, Oxford
- Nagel T (1974) What is it like to be a bat? *Philos Rev* 83(4):435–450
- Petitot J, Varela J, Pachoud J, Roy JM (eds) (1999) *Naturalizing phenomenology: issues in contemporary phenomenology and cognitive science*. Stanford University, Stanford
- Shapiro L (ed) (2014) *The Routledge handbook of embodied cognition*. London, Routledge
- Taylor JH (2013) In defence of powerful qualities. *Metaphysica* 14(1):93–107
- Taylor JH (2018) Powerful qualities and pure powers. *Philos Stud* 6:1423–1440
- Thompson E (2009) Making Sense of sense-making: reflections on enactive and extended mind theories. *Topoi* 29(1):23–30
- Varela F, Thompson E, Rosch E (1991) *The embodied mind: cognitive science and human experience*. MIT Press, Cambridge