



Introduction

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Abstract

Several strands of contemporary cognitive science and its philosophy have emerged in recent decades that emphasize the role of action in cognition, resting their explanations on the embodiment of cognitive agents, and their embedding in richly structured environments. Despite their growing influence, many foundational questions remain unresolved or underexplored for this cluster of proposals, especially questions of how they can be extended beyond straightforwardly visuomotor cognitive capacities, and what constraints the commitment of embodiment places on the ontology of explanations. This special issue aims to contribute to these foundational debates by drawing on important precursors to embodied cognition in mid-twentieth century gestalt psychology, its immediate successor ecological psychology, and their dialectical counterpart, phenomenology. Gestalt psychologists and phenomenologists wrestled with many of the same foundational questions that still haunt us today, in a manner that seems refreshing in hindsight, and poised to contribute constructively to contemporary debate. Looking back on this history reveals deep commonalities across competing embodied approaches, exposing fundamental tensions that remain unresolved, but also paving the way to a more ecumenical and conciliatory embodied cognitive science.

Keywords Embodied · Enactive · Cognitive science · Gestalt psychology · Phenomenology

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1 Introduction: structures for active cognition

Several strands of contemporary cognitive science and its philosophy have gained momentum and influence in recent decades through their focus on cognitive agents as inherently *active*. Recognizing the importance of action for understanding cognition draws attention to minds as embodied and embedded in richly structured environments. If some cognitive capacities depend on active engagements with an environment, then cognitive science must consider the ways in which features of cognizers' bodies shape and constrain those engagements, and the environmental properties that fuel particular cognitive achievements. Over the last 3 decades a spectrum of approaches to cognition as embodied, embedded, extended, and enacted (brought forth via the coupling of agent and environment) have attempted to develop new frameworks for cognitive science based on these insights (Varela et al. 1991; Haugeland 1993; Clark 1997; Hurley 1998; Wheeler 2005; Thompson 2007; Clark 2008; Chemero 2009; Barrett 2011; Hutto and Myin 2012; Anderson 2014; Di Paolo et al. 2017).

Despite their growing influence, many foundational questions remain unresolved or underexplored for this cluster of proposals. To what extent is it possible, or desirable, to unify the various approaches that march under the banner of embodied cognitive science? Can the explanatory power of these approaches extend beyond straightforwardly visuomotor cognitive capacities? And what, if any, further theoretical or methodological commitments are incurred by accepting the core insight that cognition should be understood as active, embodied, and embedded: a particular ontology of cognitive states and processes? Constraints, or an outright ban, on explanatory appeal to mental representations? A particular view of the balance of power between philosophical theorising and empirical investigation in understanding the mind?

This special issue aims to contribute to these foundational debates by drawing on important precursors to embodied cognition in mid-twentieth century *gestalt psychology* and *phenomenology*. All the theorists cited above have explicitly acknowledged some debt to one or both of these traditions (as well as to the *ecological psychology* of J. J. Gibson that developed out of gestalt psychology proper). Yet these acknowledgements often function merely as token "shout outs", only rarely drawing on detailed analysis of these traditions or the rich philosophical dialog that took place between them. Gestalt psychologists and phenomenologists wrestled with many of the same foundational questions that still haunt us today, in a manner that in hindsight seems subtle and refreshing, unencumbered by the negative backlash against computational and representationalist cognitive science that defines much work within the embodiment movement.

One theme that unites gestaltist and phenomenological traditions, and emerges repeatedly within the contributions to this issue, is *structure*: gestalt psychologists took perceptual experience to be irreducibly structured, and Gibson took this idea a step further by taking the environment to be rich with structured information, translucent to the agent, and supporting a direct link from perception to action. Phenomenologists, questioning the seeming scientism of the gestalt psychologists, aimed to transcendently rather than empirically uncover the structural features that make experience possible. Thus, from different critiques of the gestalt tradition, Gibson and the phenomenologists had already arrived at key commitments of embodied cognition (direct

perception; centrality of action; body-relative structural properties of perception and cognition) and enactivism (mutuality of agent and environment), with the complementarity of perceptual and ecological structure at the center of this endeavor. Revisiting the way in which these commitments emerged from the interplay between empirical psychology and phenomenological reflection will, we hope, help to illuminate current debates in embodied cognitive science, reframing and redirecting them on constructive new trajectories.

The next sections provide brief historical surveys of the gestalt and phenomenological traditions, positioning the contributions of the present collection within this nexus of issues. We conclude by returning to the question of contemporary embodied cognitive science and reflecting on how a better engagement with these aspects of its history can inform and advance its foundational project.

2 Gestalt psychology

Gestalt psychology emerged at the start of the twentieth century as the distillation of a holistic tendency found in several heterodox philosophical psychologists, especially Ernst Mach, Franz Brentano, Ewald Hering, and Carl Stumpf. In one way or another, each of these figures emphasized the inadequacy of the prevalent psychological atomism, on which perceptual experience was the mere aggregation of simple sensations. A historical linchpin in this trajectory was Brentano, who argued for a descriptive psychology, aimed at uncovering the complex mereological relationship between the various parts that constitute the unified whole of conscious experience. In 1890, Brentano's student Christian von Ehrenfels applied Brentano's ontological project to an example introduced by Mach, the apparent unity, over and above its constituent notes, of a perceived melody, coining the term *Gestaltqualität* to capture this notion of an irreducibly holistic mental property.

Two distinct traditions emerged in the wake of this insight. The *Graz school* traces a direct lineage from Brentano, through his pupil Meinong, who developed the ideas of Ehrenfels (whom he also supervised), and influenced a number of promising young philosophers in his circle at the University of Graz in Austria. The philosophical importance of the Graz school has been greatly neglected, and warrants revisiting (Smith 1988; Mulligan and Smith 1988). Especially important for the topic of this issue is the influence of early Graz school ideas on Brentano's student Husserl, initiator of modern phenomenology. Nevertheless, in the empirical sciences, far greater influence was felt from the distinct *Berlin school* of gestalt psychology. Stumpf, himself both student of Brentano and teacher of Husserl, moved from Wurzburg to Berlin in 1894, where he taught a number of promising young psychologists, including Max Wertheimer, Kurt Koffka, and Wolfgang Köhler, founders of Berlin gestalt psychology.

While Ehrenfels' notion of gestalt quality was known to the Berlin psychologists, they considered their movement a radical break from the Graz tradition. For Meinong and his followers at Graz, a gestalt quality was a special kind of perceptual quality, dependent on, but not derivable from more primitive sensations—consequently, this quality must be somehow “produced” by a higher mental process. Once produced, a melody could then be detached from the initially heard simple tones, and reinstated

by an entirely different set of tones, as when a melody is transposed into a different key. Wertheimer initiated Berlin gestalt psychology with a sequence of experiments that led to the insight that the qualities of supposedly primitive sensations differ depending on the holistic perceptual structure in which they are found—the very same middle C sounds qualitatively different if it appears as the tonic, or as the dissonant seventh, in two different transpositions of the same melody. This led Wertheimer to the conclusion that these *prima facie* “simple” sensations could not actually be ontologically primitive, but rather must be derivative from ontologically primary *Gestalten*, or “whole structures.” On this view, there is no need for a higher faculty of gestalt production, since gestalts are accessed at the most basic level of perception.

In other words, what the melody gives me is not built up (by some added aids) secondarily out of the sum of the individual parts, but what takes place in the individual part radically depends on the whole. (Wertheimer 1924)

Despite the historical rivalry between Berlin and Graz gestalt traditions over this key point, one might think there are ways to reconcile their respective insights. In part, this is what we hope to achieve with this special issue, by examining the implications of the dialog between (Berlin) gestalt psychology and phenomenology for contemporary cognitive science. In the empirical domain, a kind of reconciliation of this sort may arguably be found in the Italian gestalt tradition: Austrian-Italian philosopher Vittorio Benussi emigrated to Padua after WWI and transmitted the Graz tradition to his student Cesare Musatti. After his teacher’s untimely suicide in 1927, Musatti adopted Berlin school ideas, passing them on to his own influential student Gaetano Kanisza, amongst others. Nevertheless, a hint of Graz, and its connection to the phenomenological tradition, has remained in Italy, re-emerging explicitly in late Kanisza and the work of his student Paolo Bozzi, who in the late 1980’s advocated a reconceptualization of gestalt psychology as “experimental phenomenology” (Verstegen 2000; Albertazzi 2013)—foundations and methods for such an experimental phenomenology are defended and developed by Albertazzi (this issue).

Returning to the Berlin school, an example will highlight some key features of their approach.¹ The experiments that initially inspired Wertheimer in 1910 concerned the “phi phenomenon”: two lights are flashed in succession a short distance apart; when flashed at just the right speed, the subject observes a single light, moving between the two positions. Wertheimer pointed out that there is no motion in the stimulus, no light in the space between the two flashes, and so the phenomenal character of this “apparent movement” cannot be derived directly from the properties of the stimulus. Moreover, the phenomenal character changes abruptly in quality as the speed of the alternating flashes increases: first two separated flashing dots are seen, then a single light moving back and forth, and finally, two stationary, flickering lights. While apparent motion is “apparent” in the sense that the stimulus itself is not in motion, it is, from the phenomenal standpoint, identical to actual motion, and not some bizarre or ambiguous experience—a fact demonstrated by the empirically confirmed indistinguishability of

¹ For introductions to Berlin school gestalt psychology, see Köhler (1947) or Metzger (1936); the most thorough statement of their research program is perhaps Koffka (1936); a useful second-generation work that clears up many misconceptions about the Berlin school is Henle (1986).

flashing dots in apparent motion and an actual moving stimulus, calibrated to the same speed.

There are several points to note here. First, careful observation and description of phenomenal experience played a crucial role in establishing the phi phenomenon and motivating this experimental regimen. Thus, despite their ongoing disputes with philosophical phenomenology, gestalt psychologists necessarily “frontloaded” their experiments with a kind of phenomenological analysis—a point developed in more detail by Feest (this volume). Second, the results of gestalt psychology combine qualitative claims with quantitative measurement: the points at which the qualitative character of the flashing stimulus shifts from stationary to moving and back again may be indexed quantitatively to the speed of the flashing, and thus compared precisely across variations in the experimental condition. Finally, these results imply a “double dissociation” between stimulus and the holistic features of perceptual experience: the very same stimulus (e.g. stationary lights) may be perceived differently in different contexts (e.g. before and after subjects are primed by viewing apparent motion), likewise the very same experience (e.g. of motion) may be induced by physically different stimuli (stationary lights flashing; an actual moving dot) (Isaac in press). The gestalt psychologists drew two conclusions from this double dissociation: first, methodologically, perceptual experience cannot be studied by studying simple sensations in isolation; rather only experiments involving complex, structured stimuli will probe the primitive features of experience. Second, since the holistic structure of a perceptual experience cannot be found in the incident stimulus itself, it must be somehow internal to the perceiving agent. Let’s examine these points more closely in turn.

The gestalt psychologists made clear their disagreement with the behaviorist tradition that dominated the first part of the twentieth century by drawing a distinction between “molar” and “molecular” behavior. Molecular behaviors are the circuits of activation from incident point stimuli to efferent muscle twitches studied by first generation behaviorists (Watson 1913). In contrast, gestalt psychology advocated the study of molar behavior, those larger scale units we call behavior in ordinary speech: “the student’s attendance at class, the lecturer’s delivery, . . . the excitement of the spectators at a football game, . . . the hunting of the hound and the running of the hare” (Koffka 1936, p. 25). The first step in a systematic theory of molar behavior was the positing of the so-called gestalt “laws” or principles of perceptual organization, perhaps the most well-known contribution of gestalt psychology in modern psychology. These principles characterize and predict the way in which an unstructured stimulus will be perceived as structured. For instance, the law of proximity states we are likely to group objects into a whole if they are close together, while the law of similarity states we are likely to group objects when they share similar properties (Metzger 1936; Köhler 1947). As an application, consider the standard tests for color blindness, where amongst a field of similar shapes (say, circles of different sizes) a red pattern pops out from the surrounding green (say, a “7”), constituted entirely by the similarity in color of the circles that compose it. These principles of organization are meant to apply to any organized domain, not just visual perception; for instance, Pawlett-Jackson (this issue) argues they can serve to characterize and explain our “second-person plural” interaction with groups as unified wholes.

Another point of contrast with behaviorism is the evidential role gestalt psychology allowed for subjective experience. In the late nineteenth century, the “structuralism” of Titchener and others aimed to decompose experience into its atomic elements through introspective analysis. Both behaviorists and gestalt psychologists positioned themselves against this tradition, rejecting as unscientific the method of introspection (Watson 1913; Köhler 1913). Unlike the behaviorists, however, the gestalt psychologists did not conclude that experience or mental phenomena per se were not objects of scientific inquiry. Rather, the double dissociation between stimulus and experience showed that one must appeal to some internal differences to explain differences in behavior. Recognizing that behavior is nevertheless a response to an environment, Koffka drew a distinction between the *geographical environment*, the physical state of the world, and the *behavioral environment*, the world as perceived, and consequently, the proper locus for explanations of behavior (see discussion and Fig. 1 in both Hatfield, this issue, and Kiverstein, van Dijk, and Rietveld, this issue).

The status of the “internal” behavioral environment is rendered ontologically unproblematic by Wertheimer’s *principle of isomorphism*, positing a structural correspondence between experience and neural activity (Henle 1984). On this view, studying perceptual experience is a perfectly legitimate way to obtain evidence about the brain (and, in principle, vice versa). So, while the unconstrained introspection of Titchner was ruled out by their experimental methods, the gestalt psychologists never denied that the target of these experiments was the mind itself. One way to interpret the philosophical implications of the principle of isomorphism is as the intersection of phenomenal realism and “programmatically reductionism,” i.e. a project aimed at eventual reductive explanation, but which does not begin from presuppositions about the reducing domain (Epstein and Hatfield 1994).

It is important to emphasize that the phenomenal realism of the gestalt psychologists was in no way meant as a discontinuity with the rest of science. Rather, they argued that explanations in psychology should take the same form they do in physics, namely by appeal to a field of forces (Köhler 1940). Electromagnetic and gravitational fields are modeled as a distribution of vectors of force across space; unperturbed they find an equilibrium, but introduction of a new charged or massive particle dynamically disrupts their arrangement. Likewise, perceptual gestalts may be conceived as the equilibrium outcome of organizational forces, and by the principle of isomorphism, one can expect a structurally identical field of force in the electrical activity of the brain. Insofar as fields exhibit holistic directional tendencies (seeking equilibrium states) that cannot be reduced to behavior of atomic components, Köhler argued they constitute a kind of physical gestalt. Ironically, this emphasis on non-reductive, holistic organization in the physical explanans for psychological phenomena may be found not only in the direct descendants of this explanatory tradition, contemporary Dynamical Systems approaches to cognitive science, but also in their arch-nemeses, the New Mechanists, a point investigated in detail by Sheredos (this issue).

Some of the most philosophically intriguing commitments of the Berlin school concern meaning. Just as with phenomenal experience *tout court*, the Berlin school adopted a kind of realism plus programmatic reduction about significance, value, or meaningfulness in the world. Meanings were not to be construed as an add-on to perceptual experience, but rather a fundamental, directly accessed component, inex-

trically entwined with its structural organization. The organization of experience is significant insofar as it invites us in some directions and repels us in others, and it is in virtue of that organization that it does so (much as an electric field differentially repels and attracts charged particles). A prime example of this phenomenon for Koffka was the *physiognomic character* of objects, a kind of extension of facial expression characterizing how, say, an apple might invite eating, or a corpse invite disgust (1936, pp. 359–363). This core idea was further elaborated in the work of Kurt Lewin, who coined the term *Aufforderungscharakter* for the positive or negative valence of items in the behavioral field.

The legacy of the Berlin school, and the transmission of these ideas, was complicated by the rise of National Socialism in Germany. In 1922, Köhler succeeded Stumpf as the director of the Berlin Institute for Psychology, positioning the Berlin gestalt movement to become the dominant force in European psychology. Yet, with the Nazi control of the Reichstag in 1933, came also control over government institutions—consequently, the choice of students and researchers at the Institute was no longer up to Köhler, and many of the best candidates were lost or demoted, due to politics or (perceived) race. In 1935, Köhler left Germany for the United States, taking up a position at Swarthmore, following his colleagues (Koffka had moved to Cornell, then UWM in the late 1920s, and Wertheimer and Lewin both emigrated to the US in 1933). With the loss of funding and graduate students, the power of gestalt psychology as a movement became diffuse, and its full potential was left unrealized.

Perhaps the most significant route for the transmission and transformation of gestalt ideas, especially in American psychology, was through J. J. Gibson (1904–1979). Gibson's ecological psychology both develops, and explicitly rebuts key tenets of the Berlin school. As a major influence on contemporary embodied cognition, several of our contributors have engaged gestalt ideas in part through the lens of Gibson. A key area in which Gibson built on the gestalt tradition was to emphasize the temporal and dynamic character of structural gestalts. He pointed out that the kind of artificially induced double dissociation identified by Wertheimer rarely occurs in natural, “ecological” environments, as our motion through these environments (especially our changing perspective on them) serves to disambiguate any (momentarily) under-determined stimulus. Consequently, Gibson expanded the gestalt psychologists' first conclusion, and rejected the second. Not only should stimuli for the study of perception be structured and complex, they must be realistic and realistically (i.e. dynamically) accessible by the subject, for only then can we study true perceptual capacities. Once we do this, however, we realize the distinction between an internal (behavioral) environment and an external one is unnecessary, for the dynamically accessible information in a natural environment “uniquely specifies” its source (Gibson 1979).

Following this line of thinking, Gibson introduced one of the tenets most influential in contemporary embodied cognition: *direct realism*. Like the behaviorists, orthodox Gibsonians need not appeal to intermediary mental states, yet their reasoning is different: it is not because internal states are somehow unscientific, but because, as a matter of contingent fact, the ecological environment is transparent to our experience. This direct realism manifests itself today in the anti-representation movement, which argues that psychological explanation need not appeal to internal semantic objects. Puzzles surrounding this direct realism/anti-representationalism exercise several of

our contributors: Albertazzi, for instance, sees Gibson's direct realism as a fundamental break with phenomenology, and thereby excludes him from her "experimental phenomenology"; in contrast, Hatfield takes a conciliatory line, arguing that Gibson's insights may be preserved within a minimally representational framework, on which our perception of the environment is mediated and subjectively conditioned, without the strong reification or hyper-intellectualization of traditional representationalist accounts.

Both Baggs and Chemero and Kiverstein, van Dijk, and Rietveld elaborate on Gibson's direct realism from within the perspective of contemporary embodied cognitive science. Both stress the need for distinct environments for the social or conspecific group and for the individual, yet to different ends: Baggs and Chemero are concerned with reconciling embodied and enactive branches of anti-representational cognitive science, while Kiverstein, van Dijk and Rietveld aim to revive Koffka and reform him, by positing a more complex pattern of interaction between his two environments. Both papers, as well as that of Crippen (this issue) turn also on the concept of an *affordance*, one of Gibson's most influential (and puzzling) innovations. The affordance is Gibson's version of the environment-residing significance identified by both Koffka and Lewin, a kind of latent opportunity for action, indexed to the abilities of the perceiving agent. Yet Gibson's rejection of the behavioral/geographical environment distinction drives him to assert that affordances must exist objectively in the world, independent of the presence of perceivers or their interests. Progress is made on demystifying affordances by both Baggs and Chemero and Kiverstein, van Dijk, and Rietveld, by distinguishing different types of affordances, residing differentially in their respective binary environments. Crippen takes a different tack, looking at the microstructure of affordances, and analyzing physiognomic character as a subcategory of affordance in a new theoretical (and experimental) investigation of the Kuleshov effect—the phenomenon by which we attribute emotions differentially to the very "same" face depending on the context in which it appears.

3 Phenomenology

The line of influence connecting Brentano, Gestalt Psychology, Gibson, and embodied cognitive science is one thread connecting early twentieth century ideas about structure and significance to the present day. Another thread, interwoven with the first, runs from Brentano to Husserl, and on through the phenomenological philosophy that continues and develops Husserl's work.

Edmund Husserl's (1859–1938) early preoccupation was with the theoretical and philosophical foundations of mathematics. His studies under Thomas Masaryk (a student of Brentano's), Brentano, and Stumpf informed his *Philosophy of Arithmetic* (1891), an attempt to apply Brentano's descriptive psychology to the consciousness of number. However, the 'psychologistic' project of grounding the logical structures of mathematics in structures of our experience which animated this work was robustly criticised in a review by Frege (1894/1972). This criticism informed Husserl's own demolition of psychologism in his 2-volume *Logical Investigations* (1900–1901), and laid the groundwork for his subsequent methodology. Instead of attempting to capture

the logical force and structure of mathematical and other forms of cognition via careful investigation and empirical description of the structure of associated experiences, Husserl from the *Logical Investigations* onwards takes a transcendental turn. Inquiry into the structure, content and authority of our meaningful psychological states should begin not with the piecemeal identification and description of their contingent properties, but by identifying their transcendently necessary structures—the structures they *must* possess in order for us to experience them in the way we do. The project of identifying the essential structures in virtue of which our psychological states can be experienced as possessing their characteristic meanings becomes definitive of phenomenology.

Husserl thus sharply distinguishes between the job descriptions of psychologists and phenomenologists. Psychologists identify, from the laboratory, empirical facts and laws about the properties of experience; phenomenologists identify, from the study, the a priori structures that experience must possess in order for it to be intelligible that there are empirical facts to identify and catalogue. While Husserl sometimes emphasises that each mode of inquiry has its proper place, he is insistent that they are distinct—in particular, that empirical inquiry can neither replace nor constrain the phenomenologist's a priori specifications of experience's essential structural properties. As we will see below, many subsequent phenomenologists (and several contributors to this special issue) disagree with Husserl's rigid separation of phenomenological and empirical reflection. For now, this broad characterisation already foreshadows phenomenology's love/hate relationship with gestalt psychology. Phenomenologists and gestalt psychologists are united by an ambition, mutually inherited from Brentano (and Stumpf) to identify the fundamental structures that confer different forms of meaning and significance on our psychological states. But they are divided as to how this should be done. While gestalt psychologists proceed via the kinds of phenomenologically-informed experimentation outlined above, phenomenologists aim to show that particular meaning-bestowing structural properties are transcendently required for our experiences to manifest themselves to us as they do.

How does the phenomenologist identify these structural features? As we have described it so far, there is nothing to separate Husserl's project from Kant's a priori attempt to specify the necessary structural features of world-disclosing experience in his *Critique of Pure Reason*. The difference between Kant and Husserl opens up when we compare the methodological tools at their disposal. While both attempt to identify essential structural properties of experience from the study rather than the laboratory, they differ as to the standards against which these claims about essentiality should be assessed. For Kant the relevant standards are *rational*—we know we have identified an essential structural property of experience when we have constructed a valid argument that shows that some universally agreed-upon property of experience (such as its seeming to present a perceiver-independent world; or its having some kind of perspectival unity) could not obtain in the absence of the structural property in question. By contrast, the phenomenologist assesses claims to essentiality by the lights of experience itself. This assessment requires engaging in the *phenomenological reduction*—the suspension or bracketing (*epoché*) of the phenomenologist's convictions or presuppositions about the structure of experience, the experienced world, or

their relations. Any conclusions about experience must be grounded in how things seem to the phenomenologist in this (attempted) presuppositionless perspective. By the lights of the phenomenologist, then, the Kantian strategy just sketched involves a dogmatic acceptance of the authority of reason—the supposition that what we do or do not find rationally intelligible is an authoritative guide to the structure of experience is among those that should be checked at the door when the phenomenological reduction is performed. The phenomenologist's attempt to identify essential structures is guided by the activity of *eidetic variation*—the imaginative addition, subtraction, and transformation of the properties of an experience in order to reveal the structures that would remain invariant in all its potential transformations. You can imaginatively vary the size, colour and position of a perceived square, but not its number of sides, or the angles formed by their intersections. The latter properties are thus revealed as part of the essence of your experience of squareness while the former are not. Importantly, this conclusion is secured simply by the way things strike you in experience—you *intuit*, rather than deduce or infer, that a shape with non-ninety-degree angles, or more or less than four sides, would no longer be experienced as a square.

These basic phenomenological ideas—its transcendental component, the suspension of presuppositions, and the role of eidetic variation—are taken up and modified in various ways by subsequent phenomenologists. But as they figure in perhaps their canonical expression in Husserl's *Ideas*, they entail the basically dismissive attitude to gestalt psychology sketched above, which Husserl retained throughout his career (see Husserl 1993, pp. 423–424, 1970, p. 297). The phenomenologist, thinks Husserl, is committed to the temporary suspension of the naturalistic and methodological commitments required to engage in any form of empirical psychology, and phenomenological claims about the structural properties of experience require a justification that empirical psychology cannot provide.

Each of the subsequent phenomenologists who engage with gestalt psychology retains elements of this critique. But each softens Husserl's sharp boundary between the empirical and ('pure' or transcendental) phenomenological investigation of experience in ways that place phenomenology in dialogue with gestalt psychology's findings. The pathbreaking figure here is Aron Gurwitsch. Yet another of Stumpf's students, Gurwitsch studied in Berlin from 1919–20 before working with Husserl in Freiburg, then the gestalt psychologists Admar Gelb and Kurt Goldstein in Frankfurt. Gurwitsch's dissertation on the relationship between phenomenology and gestalt psychology was written during this time, and published in 1929. In that work, Gurwitsch argues that Husserl underestimated the radicality of gestalt psychology in lumping it together with other 'naturalistic' modes of empirical psychology. He emphasises the way in which gestalt psychology problematises and rejects the *constancy hypothesis*—the claim that proximal sensory stimulation determines the character of experience. As we saw above, gestalt psychology appeals to various perceptual grouping and apparent motion effects to demonstrate that the same proximal stimulus can give rise to different experiences in different contexts. Gurwitsch argues that this rejection of the constancy hypothesis is carried out in accordance with the methodological recommendations of Husserlian phenomenology—we are motivated to abandon it by suspending our presuppositions about the relationship between stimulus and experience, and undergoing the experiences which the gestaltists study (see Feest, this issue,

on this commonality between Berlin gestalt psychology and Husserlian phenomenology). As well as providing a rich diet of experiences upon which the phenomenologist can reflect, Gurwitsch also argued that gestalt psychology suggested a corrective to some imperfections in Husserlian phenomenology. He read Husserl as committed to a sharp distinction between the raw sensory matter of experience (*hyletic data*, in Husserl's terminology) and the intentional acts of the subject which bestow meaning and structure on that sensation. However, a lesson of Berlin gestalt psychology is that the systematic study of experience reveals no such distinction—our sensory awareness is structured from the outset, without requiring the subsequent contribution of some subsequent psychological faculty.²

Gurwitsch thus brings phenomenology and gestalt psychology into contact by appropriating gestaltist insights about the kinds of experiences that should inform our reflection on essential psychological structures, and using gestaltist conclusions to criticise Husserlian phenomenology in places where he thinks lingering theoretical presuppositions illicitly inform claims about experience's essential structures. Nonetheless, he retains Husserl's sharp division between empirical psychology and phenomenology, with its essential transcendental component. While the gestaltists' rigorous observations and classifications of structural properties of experience have a place in phenomenological philosophy, their naturalistic and reductionist aspirations do not. Tenets such as Wertheimer's principle of isomorphism or Köhler's commitment to a physicalist ontology of forces (see above) must be jettisoned as part of the phenomenological reduction, and could only be recaptured were they somehow shown to be evident from unprejudiced, presuppositionless reflection on experience.

Gurwitsch's ambivalent view of the relationship between phenomenology and gestalt psychology was taken up by the French phenomenologists Jean-Paul Sartre and Maurice Merleau-Ponty. Sartre's early works [e.g. *The Imaginary* (1940/2010) and *Sketch for a Theory of the Emotions* (1939/2015)] dabble with using gestalt psychology to inform phenomenological philosophy in the same way as Gurwitsch—mining gestaltist texts for perspicuous characterisations of experience that can then be put to use in the Husserlian project of identifying experience's essential structures.³ But it was Merleau-Ponty who carried out the most sustained and influential development of Gurwitsch's early ideas. The earliest records we have of Merleau-Ponty's research reflect a preoccupation with the relationship between gestalt psychology and the philosophy of perception (Merleau-Ponty 1933/1980) which was catalysed by his meeting Gurwitsch in Paris in 1933 and attending his subsequent lectures at the Sorbonne. These lectures and his exposure to Gurwitsch's work informed his first major work, *The Structure of Behaviour* (1942/1963). Here, Merleau-Ponty builds on Gurwitsch's strategy of using gestaltist findings to inform phenomenological reflection, surveying a swathe of work criticising atomistic conceptions of sensorimotor relations. As we saw above, gestaltists argued that *molar* behaviour cannot be understood in terms of the rigid stimulus/response patterns in terms of which behaviourists sought to analyse

² See Sokolowski (1964, pp. 177–181) for the case that Husserl abandoned such a distinction in his later works—though not, it seems as a direct result of Gurwitsch's critique.

³ In addition, see Harrison (2016, pp. 7–8) for an account of how gestaltist ideas figure in Sartre's *Being and Nothingness*.

molecular behaviour.⁴ Merleau-Ponty takes these considerations to have phenomenological import because he agrees with Koffka and Köhler that they point us towards the necessity of understanding behaviour in terms of its relation to the *behavioural environment* of the agent rather than the *geographical environment* as might be described by physics (see Sheredos 2017, and Muller (this issue) for detailed reconstructions of the gestaltist insights on which the *Structure of Behaviour* draws). The early chapters of *Phenomenology of Perception* (1945/2012) employ a similar strategy, using (among other considerations) various gestaltist perceptual grouping phenomena to criticize atomistic conceptions of perceptual experience in which meaningful, structured experiences are built out of punctate sensations occasioned by external stimuli. The overall picture of our perceptual and active relation to the world that emerges in these and later works incorporates many of the gestaltist and Gibsonian tenets surveyed above—the motivational character of the experienced world; the mutuality of the perceiving and acting organism and its environment; and the emergence of practically and perceptually meaningful structures from this organism/environment mutuality.

Merleau-Ponty's engagement with gestaltist ideas diverges from Gurwitsch's in three ways that are particularly important for this special issue. First, his phenomenological critique of gestalt psychology differs subtly from that of Husserl and Gurwitsch as presented here. Merleau-Ponty provides an *immanent* critique of gestalt theory (Sheredos 2017, this issue). Roughly, he argues that the reasoning that led gestaltists to reject atomistic conceptions of behaviour and perception should also lead them to reject their own naturalistic and reductionist aspirations. Gestaltists were right to conclude that their research pointed to the need to understand perceptual and practical significance in terms of structures or forms that emerge from an inseparable interplay of organism and environment; but they were wrong to think that these structures could be understood in terms of a revised physicalist ontology. The same phenomena that motivated gestaltists to reject the constancy hypothesis and atomistic conceptions of perception and behaviour should, argues Merleau-Ponty, also lead them to reject the reductive explanatory project of pairing up structures of experience with mind-independent features of the physical world, however construed. In this way, Merleau-Ponty agrees with Husserl and Gurwitsch that the gestaltists made use of naturalistic assumptions that should be suspended as part of a phenomenal reduction—but unlike Husserl and Gurwitsch, he argues that this suspension is already motivated by the gestaltists' own findings, independent of any commitment to phenomenological methodology.

This anti-naturalist strand brings us to the second divergence: Merleau-Ponty's softening of Husserl's sharp divide between empirical psychology and transcendental phenomenology. Merleau-Ponty provides an immanent critique of the gestaltist's naturalistic aspirations not merely because he wishes to hoist the gestaltists by their own petard, but because he holds that the findings of empirical sciences can genuinely inform phenomenological theorising. How exactly to interpret Merleau-Ponty's views on the relationship between phenomenology and empirical psychology is controversial (see e.g. Gardner 2015; Reynolds 2017; Romdenh-Romluc 2018; Muller, this issue

⁴ See Sheredos (2017) for a useful summary of Merleau-Ponty's reconstructions of gestalt psychological arguments for this claim.

for a range of perspectives). However, in at least some places, he insists on a ‘fundamental homogeneity’ (1964, p. 72) between the inductive experimental methods of empirical psychology and the phenomenologists’ attempts to uncover essential experiential structures via eidetic variation. Just as imaginatively varying the aspects of an experience can help us grasp an essential structure that remains invariant among the changes, experimentally varying parameters of organism and environment can reveal structural regularities within types of experience or activity. This reading of Merleau-Ponty suggests a closer, more reciprocal relationship between phenomenology and psychology than the hierarchical one endorsed by the other phenomenologists considered above, wherein psychologists can, at best, help provide a varied diet of experiences on which phenomenologists can reflect. Hence, it seems, Merleau-Ponty’s critique of the gestaltists’ naturalistic aspirations should not be read as ruling out the prospects of a productive interplay between phenomenological and empirical enquiry. Albertazzi, Muller, and Kee’s contributions to this special issue each take up, in different ways, the question of what this interplay might look like.

The prospect of a mutually enlightening relationship between phenomenology and psychology is one reason why Merleau-Ponty has been a favourite touchstone for contemporary embodied cognitive science. Another reason is the final divergence between Merleau-Ponty and the other phenomenologists considered above: Merleau-Ponty’s explicit emphasis on the body as the fulcrum of the mind/world relationship, and the key to understanding the structural properties that bestow significance on perception and action. At least in *The Phenomenology of Perception*, the centrality of the body is the key lesson to which the findings of gestalt psychology point. The figure/ground structure of experience, for example, is argued to depend on contingencies of the embodiment of human perceivers that prevent them from taking in all the perceptible aspects of their environment simultaneously. Unlike an omniscient God or a static camera, our perceptual contact with the environment is structured by a grasp of the possibility of bringing other, interrelated aspects of the perceptible world into view. Thus, the structure of perception must be understood partly in terms of a perceiver’s particular embodied capacities to actively modulate their sensory contact with the environment—a point common to both sensorimotor enactivist theories of perception (e.g. Hurley 1998; Noë 2004, see Ward et al. 2017 for a survey of the relationships between biodynamic, sensorimotor, and ‘radical’ variants of enactivism) and Gibson’s development of gestalt psychology (plausibly influenced by his reading of Merleau-Ponty, see Baggs and Chemero, this issue).

4 Conclusion: a historically informed future for embodied cognitive science

The contributors to this issue have uncovered a surprising diversity of themes wending from the gestalt-phenomenology debates, through Gibson, to contemporary embodied cognitive science. They by no means share a unified perspective or agenda, and some classical disagreements persist and continue to divide. Nevertheless, (*and we find this “nevertheless” inspiring!*) taken together the contributions hint at a unified methodological picture—one that reframes the projects of embodied and enactive cognitive

science as a multifaceted whole, rather than a hodge-podge of competing commitments, and enables a richer, more constructive dialog with conservative trends in mainstream cognitive science. This new picture derives its power from a careful reflection on the commonalities inculcated into these traditions through their shared historical roots.

Consider, for example, the relationship between the biodynamic enactivism of Varela et al. (1991), Thompson (2007), and Di Paolo et al. (2017) and contemporary ecological psychology (e.g. Chemero 2009; Turvey and Carello 2012; Rietveld and Kiverstein 2014). Viewed ahistorically, these approaches appear incompatible. While both recognize the importance of agent–environment interaction, enactivists see meaning as emerging principally from the structure of an organism’s biological dynamics, while ecological psychologists locate significance externally in the structure of environment-residing ecological information. However, once we see both movements as emerging from interrelated (Merleau-Pontian and Gibsonian) critiques of gestalt psychology, they are revealed as complementary attempts to understand cognition’s emergence from the structure and dynamics of the organism/environment mutuality emphasised by gestalt, ecological, and phenomenological approaches alike. As Baggs and Chemero (this issue) argue, while enactivists focus on the organismic side of this mutuality, and ecological psychologists on the environmental side, this contrast should be understood as a complementary difference in starting point and emphasis rather than a deep theoretical divergence. They view the unified core that synthesizes these views as plausibly “the most complete alternative to cognitivism as a working metatheory for the study of minds” (p. xx).

The promise of this synthesis is illustrated by the success of other authors in exploiting this shared ancestry of embodied and enactive approaches to make progress at the frontiers of current debate. Kiverstein et al. revisit Koffka’s distinction between behavioral and geographical environments and use it to enrich Gibson’s theory of affordances. Whereas Gibson rejected Koffka’s distinction as part of his defense of direct perception, Kiverstein et al. argue that an analogous distinction can capture the interplay between individually and intersubjectively recognized affordances, clarifying distinct but interrelated notions of environmental meaning to which embodied cognitive science can appeal. Pawlett-Jackson also draws on gestalt ideas, using laws of well-formedness and grouping to frame an original phenomenological account of multi-person intersubjectivity, while Crippen brings the gestalt notion of physiognomic character into dialog with Gibson’s affordances to explain the emotional responses to visual phenomena emphasized by Merleau-Ponty. In all three cases, drawing on the past pushes embodied cognitive science beyond the domain of straightforwardly visuomotor capacities to encompass new phenomena.

Complementary to these theoretical developments, are the insights into experimental design and method offered by Albertazzi and Feest. Feest’s contribution sees a role for phenomenological methods in early gestalt experimental design. Albertazzi argues that an even richer synthesis may be found today in the experimental phenomenology movement. For Albertazzi, even the strict anti-psychologism of Husserl can constructively inform her empirical project, giving it a vocabulary and explanatory constraints apt for investigating phenomenal experience proper.

Nonetheless, there are residual tensions that a unified embodied cognitive science must confront—Albertazzi, for instance, sees the gap between her project and Gib-

son's physicalism as irreconcilable. More generally, several contributors point out conflicts between the transcendentalist aspects of Merleau-Pontian phenomenology and the uses to which those ideas are sometimes put by embodied approaches. Sheredos argues that 'ontic mechanist' approaches to naturalistic explanation—sometimes mooted as a useful addition to the toolkit of embodied cognitive scientists (Gallagher 2018)—are undermined by Merleau-Ponty's critique of the naturalistic ontology of gestalt psychology; Muller argues that the same Merleau-Pontian critique extends to the biological and ecological structures that are the stock-in-trade of embodied cognitive scientific explanation; and Kee similarly argues that Merleau-Ponty's positive phenomenological analysis of the structure of sensorimotor behaviour is in tension with both biodynamic (Thompson 2007) and 'radical' (Hutto and Myin 2012) enactive approaches. Reconciling the phenomenological ancestry of embodied cognitive science with its naturalistic aspirations emerges as an important priority for future work.

Another choice-point for future embodied cognitive science is suggested by Hatfield's contribution. He argues that the appropriation of ecological psychology needn't entail the hostility to cognitivist explanation (in terms of the production and manipulation of representational structures) that usually characterises embodied cognitive science. While the move is conciliatory and deflationary, opening space for dialogue between cognitivist and embodied projects, it does so at the expense of the most deeply ingrained anti-representational shibboleths of many embodied approaches. The benefits of a theoretical vocabulary that allows embodied cognitive science to accommodate some of the undeniable successes of cognitivist frameworks must be weighed against the strength of its anti-representational commitments.

The papers collected here demonstrate a proof of concept: tensions within the embodiment movement—between a Gibsonian focus on the environment and an enactivist focus on the organism; between its phenomenological heritage and its naturalistic agenda—can be diagnosed and perhaps reconciled by understanding how they emerge from the interplay between different aspects of its ancestry. Considering this ancestry suggests that the branches of embodied cognitive science are guided by a common ideal: the aspiration to set agent/environment mutuality at the heart of our theory of mind. But it also shows the profound challenges that attempts to realise this ideal will face. Nevertheless—*another nevertheless of inspiration*—, it is precisely here that future work remains to be done, and the prospects for building a more coherent, profound, and inclusive embodied cognitive science are to be found.

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