Introduction

Two major families of physicalist strategies concerning the body-mind problems have crystalized during the last century. The by far most influential one is defined by the behaviourist perspective on mind, and includes most of modern reductive materialism. The second kind of strategy has its roots in 19th century experimental psychology. It was evaluated, criticized and developed further by the Gestalt psychologists, who named the strategy the *hypothesis of psychophysical isomorphism*. The present poster sketches the main features of the Gestalt approach. This is an approach which should be regarded as an early formulation of connectionism (as opposed to cognitivism) in the debate about the nature of basic psychological processes\(^1\). In recent years there has also been a growing attention to the “Dynamical approach” of Timothy van Gelder et al. As far as I can judge, this “new approach” is very similar to Wolfgang Köhlers suggestions from the 1920\(^{th}\) concerning what kind of system organisms are.\(^2\)

Gestalt theory is however not just an historical ancestor to some modern theories. My claim will be that the psychophysical strategy, in its Gestalt psychological version, far from being a dead end, is one of the most intelligible ways of facing the body-mind problem in all its aspects. My claim is not, however, that Gestalt theory offered some sort of final solution to the body-mind problem, only that it remains in the epicentre
of the puzzle. Neither is my poster an attempt to diagnose what might be problematic with a Gestalt theoretical kind of solution; my ambition is only to present an overview over the questions Gestalt theory tried to answer.

Kurt Koffka’s once asked the famous question, ”Why do things look as they do?” This is a good way to start an introduction of Gestalt psychology. So, let us try to elucidate this question, starting with another and more basic one: "How does the following picture look?"

![Picture 1](image1)

Maybe this picture prompts the utterance ”I see a black dot slightly to the upper right in a square”. But if we look carefully at the picture, there is more to be seen. Among many things, isn´t there an imbalance in this picture? People tend to say that there is ”a tension” in the picture, almost as if there were a rubberband pulling the black dot.

Is the next picture more ”at rest”?

![Picture 2](image2)
If so, could the difference between the two pictures tell us anything about the underlying neural processes – more than that some of these brain events produce utterances like ”I see a black dot slightly to the upper right in a square”, while others do not? A Gestalt psychologist would answer the question in the affirmative, and would very likely argue that the visual system strives to be as stable as the conditions permit. The perceived tension is nothing else than the system trying to adjust itself towards an equilibrium. The Gestaltist view is that there are similar ”rubberbands” everywhere in the visual field – balancing and counterbalancing each other – when we organize our surroundings perceptually, and that every piece of behaviour is a result of such an adjustment towards an equilibrium of the organism.

So the question Gestalt theory really puts is, Is the perception of these pictures an indication that our perceptual system is more like those dynamical system found elsewhere in nature than it is like a symbol-processing machine? In other words: Is the perceptual system more like a compass needle in a magnetic field, adjusting its behaviour in relation to the various ”field forces”, and less like a computer ”drawing inferences” from ”sensory-information” somewhat mysteriously, but in analogy with conscious human activities?

Koffka’s famous question is a suggestion not to explain the body-mind problem away, but actually to confront it.

**Behaviourism and its offsprings**

The behaviourist-materialist who claims that the scientific third person perspective can give us a comprehensive account of mind has to face the
problem of "phenomenological qualities" or "qualia". "Qualia” are the mysterious "qualities” which are left when the common vocabulary of mental phenomena has been defined in behaviourist/functionalist fashion. It is claimed that a future unified science will know everything there is to know about mental phenomena, except possibly the ”qualia”. A common strategy, then, is to try to show that these strange entities are totally incomprehensible, and to dismiss the qualia hypothesis as a prescientific prejudice.

Put in this way it seems as if the materialist theory is evoking a Kantian picture turned upside down: The only thing we can have complete knowledge about is the "Thing-in-itself”, while the phenomenal world where all scientific observations have their origins is beyond the reach of human knowledge. It is obvious that the distinction between the first and the third person perspective is not that clearcut when the objects of study are the mental phenomena. Put in this way, it is equally obvious that the most prescientific thing about the usual conception of "qualia" is that it represents a poor understanding of how these entities, whatever they are, are structured in perception. That's why the modern notion of qualia is misleading as to what kind of relationship you can expect to find between physical stimuli, brain processes and the phenomenal world.

**Psychophysicalism and its offspring**

The rising experimental psychology of the 19th century was still under the Kantian spell, and the young science fought a battle against the idealistic implications of Kant’s epistemology. The main questions were the epistemological ones: If there is a material world, existing independent of the human senses, and if the assumption of scientific realism is correct –
that it is possible to form knowledge of the external world – what, then, is the relation between the physical realm and the sense-impressions, and is it possible to represent this relation mathematically? These questions express much of the essence of the psychophysical strategy.

Among philosophers, at least to a large extent, the psychophysical strategy of early experimental psychology fell into disrepute in the early 20th century. The main official reason for the relative decline of psychophysicalism was the well-known but often oversimplified critique of introspection. It’s clear, though, that the real reasons for the decline are rather to be found in certain important features of the Zeitgeist. To single out just two of them:

– Psychology’s strive to prove itself useful. The consequence of this strive was that experimental psychologists started to ask the questions of the military, the educational system, the psychiatrists and so forth. These were questions better taken care of, at least superficially, in the stimulus-response theoretical framework of behaviourism. Ontology and perceptual theory fell out of fashion.4

– The philosophers’ relative loss of interest in the philosophy of mind. There was a (rethorical) anti-metaphysical trend among empiricist philosophers in the early 20th century, which disqualified questions put in a Kantian framework, as for example the ontological questions concerning the relation between the physical and the mental.

Let us take closer look at the psychophysicalist strategy and its roots in 19th century epistemology, since this is one of the best ways to understand that there is more to the body-mind problem than just ”qualia”.

The mechanistic world view, elementarism and Helmholtz’s solution

The world view of early experimental psychology was based on a Newtonian mechanistic universe, a clockwork picture of the organism, and (most important): a basic belief that, if the project should ever succeed, the young science had to presuppose (at least as an abstraction) that sense impressions/Empfindungen exist as elements or atoms in consciousness.

Mechanistic psychology was problematic from the beginning. Philosophers hostile to experimental psychology argued that mind was not a mechanized clockwork, and that it was therefore beyond the scope of the methods of natural science. The mechanistic assumption was also criticized from within psychology; Helmholtz is the most well-known example. He argued at length against naïve mechanistic conceptions of the workings of the sense organs, and against the camera as a metaphor for vision (Helmholz 1873, 1878). His argument has become the archetypical empiricist way to treat perception. The bottom line is this: perception is an activity best described in cognitive terms. Helmholtz tried to prove that vision was not at all ”camera like”, with arguments showing that physical stimuli were fragmentary and incomplete. As a consequence he considered the nerve signals from the retina as abstract ”signs” to be interpreted by subconscious cognitive processes. Helmholtz claimed that these processes had the same effect as the fully developed and to some extent conscious activities that are commonly described in terms of ”inference”, ”interpretation”, ”hypothesis testing”, ”induction”, ”guessing” etc.

Many later philosophers and psychologists found these arguments unproblematic, which the long post-Helmholtz tradition shows (including that the major trend after behaviourism is the cognitive one). Others have
found it either totally mysterious or totally non-informative. The divide seems to be whether or not every-day terms, commonly used in situations of cognitive activity and associated with mental phenomena, could be defined or redefined for describing neurological states, events inside computers etc, and whether such a new use would bring the understanding of the human cognitive activity and of the mental phenomena any further.

The solution of Gestaltpsychology – Gestalt qualities and physical Gestalts

The Gestalt psychologists sided with the critics of “cognitivist” or intellectualist vocabulary in psychology, but with the ambition to continue on the anti-mechanistic road Helmholtz started to walk. Helmholtz’ empiricist argument illuminated the problem of the seemingly unbridgeable gulf between the mechanistic universe revealed by natural science and the mental as just something completely different. The Gestalt psychologists set out to save the psychophysical project with arguments trying to show that the mental was not so completely different from the physical after all. In doing so they tried to convince people that Helmholtz’ mysterious “unconscious mental processes” (whose hidden guesswork was supposed to construct the phenomenal world) was an unnessesary hypotheses considering the real characteristics of physical and the mental processes. Helmholtz’ ghostlike cognitive processes were just the symptoms of the disease which experimental psychology suffered from.

The Gestalt psychologists gave a name to this disease of early psychophysicalism: the constancy hypothesis. This is the belief that the
basic relation between the physical and the mental has to be a constant correspondence between a local physical stimulation and an isolated element in consciousness. Hence the sting of a needle had become the standard case of perception. In fact, the needlesting seems to be just a special and not very paradigmatic case of perception. All perception exists in an overall perceptual framework and is dependent, in one way or another, on a larger totality of stimuli. The sensory signal caused by the needlesting is not sufficient to put the pain in an overall perceptual context. The constancy hypothesis cannot handle perceptual structure.

The case against the constancy hypothesis seems at its clearest in the field of vision. As Wertheimer simply puts it, we see trees and not only hundreds of different elements of sensation. And most importantly, we see the same tree even when light conditions and perspective imply a complete change of the elements in question. In other words, it is not the elements but the perceptual structures, extended in space and time, that are fundamental – these so called Gestalt qualities are global mental phenomena. Primarily, we do not hear the isolated tone sensation – we hear the melody, we hear words and sentences and not just varying sounds, moving objects remain identical, and we see the big Dipper on the night sky not just as seven stars among thousand of others. Koffka once asked why we see this structure on the night sky:
And not this:

This difference in visual structure is not easily described in terms of ”just qualia”.

Of course this is a well-known aspect of Gestalt psychology: Wertheimer’s list of organizational tendencies, ”The Gestalt laws”, can be found in most textbooks of perceptual theory, and is not seldom considered as Gestalt psychology’s sole contribution to science. But the emphasis on the Gestalt qualities was not meant just to remind us of certain familiar facts (such as the fact that dots in a line are usually seen as dots in a line). Instead it was seen as the starting point of a renewed psychophysical project, a new start hopefully without the Helmholzian ghost in the machine. The Gestalt psychologists did not see perceptual organisation as something which widens the gap between the physical and the mental (as the vitalist and the Helmolzian lines of argument suggested), but as the opposite. They pointed to an alternative way of conceptualising the subconscious processes Helmholz had postulated, not as the workings of a mental agent fabricating conscious phenomena, but
instead as the interplay of good old natural forces acting in a dynamical
system.

Dynamical systems instead of mechanics
In natural science of the early 20th century, the Newtonian mechanical
world view had lost its force and the newer approaches tended more and
more to see the universe and its events in terms of field processes. New
methods and mathematical tools had been developed in natural science to
study these processes. Gestalt psychology suggested the same shift with
regard to the organism’s perceptual and cognitive systems. Here is the
real key to the the Gestalt psychologists refinement and development of
psychophysicalism – the hypothesis of psychophysical isomorphism. The
basic claim of Gestalt psychology was that the phenomenal Gestalts have
their counterpart/equivalent in physical Gestalts, i.e., dynamical
processes in (or approaching) steady states which have certain structural
characteristics in common with the phenomenal Gestalts. Helmholtz’s
famous telegraf wires and the mechanical clockwork were not, according
to gestalt psychology, proper metaphors for the working of the neural
counterpart to the phenomenal experience of hearing a melody, or seeing
the great Dipper. Electrochemical field forces were supposed to be better
candidates.

This part of Gestalt theory is very often ridiculed; it is said that the
hypothesis of psychophysical isomorphism is a claim that there are blue
circles in the brain when we see such circles (or even that according to
Gestalt psychology, the perceptual system consists of soapbubbles). In
other words, the physiological hypotheses of the Gestaltists were often
dismissed just as naïve ”brain mythology”. However, this is to
misconceive their intentions severely. Psychophysical isomorphism is so
geneneral that it is reasonable to call it a metatheory. To deny it is to deny
that brain events are subjects to the same natural laws as the rest of nature (or even to deny the existence of electromagnetic force fields and soapbubbles elsewhere in nature).

I concede that it is possible to get the impression of Gestalt theory as being a "blue circles in the brain-theory", and not only so when the theory read in a careless way. At the heart of the theory there sometimes seems to be intuitions with almost these implications. *The important thing, though, is to emphasise that none of the Gestaltpsychologists were naïve in this respect.* The explicit claim of the Gestaltists’ isomorphism hypothesis is a lot weaker than the impression which one can get from the analogies with oildrops, soap bubbles and so on. Köhler spent his last 30 years trying to explain that the isomorphism was not intended to be picturelike or geometric, but was meant as a heuristic search for essential and in some sense "similar" structural/functional characteristics in the respective realms. The hypotheses of psychophysical isomorphism is only a suggestion where to start looking for bridges between the physical and the mental realms. It is also a call to philosophers and experimental psychologists to learn more both about perceptual structure and about the nature of natural science before they shape their definite picture of the organism and of matter.

The Gestalt strategy is an expression of a scientific hope that there is a close and understandable connection between mental and physical events and that, one day, we will know enough about the processes in the brain to establish a proper understanding of this relation. *With this strategy, the structure of the experienced world becomes an important key to the understanding of the characteristics of the physical processes in the perceiving organism.* Obviously this strategy has a "hard problem" of its own: it is remarkable how easily talk about mental phenomena becomes
talk about brainstates. Nothing seems to be denied, yet the whole cluster of mysteries concerning the world-body-mind relation becomes explicit and overwhelmingly problematic.

**What Gestalt psychology is not**

Whatever the reasons for today’s relatively slight attention to the actual positions of Gestalt psychology, the list of remarkable misconceptions is long. Mary Henle has put a lot of effort into sorting out the most common misunderstandings. It might be a good idea to sum them up (partly from Henle 1986):

1. The isomorphism was meant to be functional and not geometrical. (See above).

2. Gestalt psychology has nothing to do with Gestalt therapy (see Henle 1978).

3. The Gestalt psychologists were *not nativists* in any central sense of this term. Because of their opposition to certain empiricist hypotheses (the Helmholzian ”intellectualistic” hypotheses as well as the elementarist and mechanist approach of associationism), Gestalt theory has repeatedly been called nativistic. The truth is that if Gestalt theory underemphazised anything, it was the inherited features of the nerve system, features that have an evolutionary history. Instead Köhler stressed the invariance postulate of evolution – ”no essentially new kind of action appears in living systems”.

Organisms obey much of the same general principles as inorganic nature. These natural dynamic processes has intrinsic ways of organization. The inherited constraints exclude certain possibilities for
these processes to develop, but an important sense, many dynamic forces of the brain are neither inherited nor learned, they are just special cases of Nature’s way of organizing itself.

Conversely, Gestalt theory did not underestimate the role of learning and past experience. A central postulate in the Gestalt theory of perception and cognition is that past experience leaves ”memory traces”. Indeed, already temporal Gestalt qualities (like melodies and the phi-phenomenon) are explained in Gestalt theory as memory phenomena (but not as results of intellectual inferences). More cognitive aspects of mind like beliefs, the ego, intellectual abilities etc. are considered to be ”trace systems”, i.e. rest products of the organism’s past experiences. The dynamics of this trace system were meant to explain why human memory, learning, thinking and problem solving function as they do. But again, the explanations were not framed in terms of inferences. Of course this way of thinking is nothing but the way which is now often called "connectionist".

4. Gestalt psychology therefore belongs firmly to the empiricist side and not to any nativist or Kantian camp. The perceptual theory of Gestalt psychology is dealing with the basic epistemic level of empiricism, focusing on the early beginning of the thinking process, on basic perceptual skills like recognition of similarities – on concept formation rather than readymade logical structures, on the everyday interaction with the perceptual world and with problem solving in this world. This empiricist point of departure becomes even clearer in the perspective of 19th century epistemology and one great intellectual worry of the time: the status of the synthetic apriori. Here the position of Gestalt theory is explicitly anti-Kantian. According to the Gestalt perspective, thinking is not due to innate rules of any sort. The apriori character of logical
thinking is explained in terms of stable organisation (depending on intrinsic relational traits of the dynamical system), and at the same time, the human capacity to form different axiomatic system and to solve problems in different ways are described as possible restructurings of this organisation – a physiological Gestalt shift so to speak. *Cognition is an activity that, according to Gestalt theory, is best described in the same terms as perception.* This is not just the traditional Helmholzian strategy turned upside down, but a strategy which is trying to diminish the distance between the thinking subject and its percepts.

The empiricism of Gestalt theory departed from traditional stereotypical empiricism in two important and interconnected ways: in its anti-elementarism and in its scientific realism. As mentioned, the realism of the Gestalt psychologists was a typical trait among German scientists with their strong anti-idealist inclination. The Gestalt psychologists *were* phenomenalists in the respect that they felt the existence of (and how to get knowledge about) the external world to be a problem. Both Köhler and Koffka were explicit about this: everything we know about the external world is in the end just a theoretical construction from the phenomenal world. The picture of the relation between empiricism and Gestalt theory is a little bit more obscure when it comes to the elementarism. The latter doctrine seemed to disappear (at least out of focus) with the Gestalt debate during the end of 19th century – meanwhile the constructivism remained. This ghostlike process of construction had become highly problematic in a theory of perception and cognition, but constructivism (and the unexplained intellectual capacity behind the construction) seems to be natural in an empiricist analysis of knowledge.
5. Gestalt theory should not be regarded as a close ally with Husserl’s phenomenological approach. In fact, Gestalt theory could be seen as an empiricist reply to Husserl’s attack on psychologism. However, the ties between Gestalt theory and Merleau-Ponty are close even though Merleau-Ponty didn’t agree with the materialism of Gestalt theory.

To sum up, the Gestalt project is a continuation of the projects of Helmholtz and Wundt to a much larger extent than the Gestalt rhetoric might suggest. The Gestaltist critique of empiricist lines of thought is a lot more in the spirit of Mach than of Kant. Gestalt theory is what is left of Helmholtz’s approach when the elementarist assumptions, which made Helmholz suggest ”unconscious inferences”, are removed. It is a thoroughly modern project, and modern cognitive scientists had better take a close look at it.

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1 Helge Malmgren brought my attention to the relation between Gestalt theory and connectivism and commented helpfully on the rest of this poster.


3 Koffka K *The principles of Gestalt Psychology* London 1935 p.76-105

4 For an extensive discussion of these perceptual forces and some experimental results see Arnheim R. *Art and Visual Perception, A psychology of the creative eye* Berkeley, Los Angeles, London 1954, 1974 chapter 1


7 Just as rubber band metaphors for neural networks do not imply that entail networks are really made of rubber bands.

8 There is a passage in Wittgensteins *Philosophical investigations* which I believe is addressing the ”incomprehensibility” of the Gestalt theory and of similar approaches.
It’s when Wittgenstein in an characteristically cryptical way answers an accusation of being a behaviourist “in disguise”:

“How does the philosophical problem about mental processes and states and about behaviourism arise? – The first step is the one that altogether escapes notice. We talk of processes and states and leave their nature undecided. Sometime perhaps we shall know more about them – we think. But that is just what commits us to a particular way of looking at the matter. For we have a definite concept of what it means to learn to know a process better. (The decisive movement in the conjuring trick has been made, and it was the very one that we thought quite innocent) – And now the analogy which was to make us understand our thoughts falls to pieces. So we have to deny the yet uncomprehended process in the yet unexplored medium. And now it looks as if we had denied mental processes. And naturally we don’t want to deny them.”

Wittgenstein (Oxford, Blackwell1953) §308


10 See Schlick M Philosophical Papers vol-II Dordrecht 1979

11 See Husserl E. Logische Untersuchungen bd 1 chapter 3 (Halle 1900/01), where Husserl states that any attempt to look for an psychological foundation for our ability to recognize logical truths leads to relativism. The Gestalt perspective is best explicated in Köhler The place of values in a world of facts London 1938. Köhler argue that Husserl is captured in the old conception of psychology, and that he takes that as an excuse to reject the psychophysical project and to continue in the old Kantian framework.


13 See Mach E Beträge zur analyse der Empfindungen Jena 1886