

TWO THEMES OF REDUCTIONISM AND THE PREDICAMENTS OF ARCHETYPICAL EMPIRICISM

The Crossroads between Empiricism and Rationalism: Part II

Fredrik Sundqvist

Introduction

In my thesis *Perceptual Dynamics* (Sundqvist 2003), I argued that Gestalt theory of the Berlin school not only is an important historical precursor to the new and rising sub-symbolic paradigm of cognitive science, but also that Gestalt theory can actually provide a clarifying framework to this new development of cognitive science. Thanks to new methods of neuroscience together with developments in dynamic systems theory and neural network modeling our opportunities to understand nervous systems and mental phenomena from the perspective of Gestalt theory have improved considerably. The notions of Gestalt and of psychophysical isomorphism can provide means for analyses of mental phenomena without the standard detour to various concepts of representation.

Hence, for a proper understanding of the philosophical implications of Gestalt theory, I believe it is important to explicate the difference between the present day dominating rationalist perspectives on psychology and perspectives of an empiricist blend, like Gestalt theory.

In three interconnected articles I explore the two diverging perspectives. In the first article I sketched out typical traits of the rationalist analyses of mind (Sundqvist 2007a). In this second one, archetypical traits of empiricism are examined. In a third article I will explicate the main tenets of Wertheimer's solution to the predicaments of empiricism.

Archetype Empiricism: Two themes of reductionism

Psychologists in the generation after Wundt (among them Wundt's influential students Oswald Külpe and Edward B. Titchener) took an open stance against Wundt and cognitivism of the rationalist blend. The ontology of British empiricism seemed to offer a road towards placing psychological explanations firmly within the frames of natural science.¹ The list of hallmarks that distinguish Archetype Empiricism (AE)

¹ An important source of inspiration was Alexander Bain and J.S. Mill's associationism. Mill and Bain were probably the most widely read associationists in Germany. See Mandler J.M. & Mandler G. (eds.) 1964, 129. Another influence, perhaps the most important one, was Ernst Mach and his views on psychological explanations. In fact, Mach was one of the first scientists to draw attention to the Gestalt phenomena. See Sundqvist F. 2003, chapters 2 and 3.

in psychology from *Archetype Rationalism* (AR)² can be summarized the following way:

AE 1. *The ideal of Occam's razor.* **i)** A disbelief in multi-layered ontologies, that is, in the concepts of intentionality and *universalia*; **ii)** A non-egological analysis of minds and a characteristic aversion against agency and cognitive terms presupposing *homunculi* in analyses of perception and cognition.

AE 2. *The Tabula rasa* of John Locke and the idea that we form all our concepts and conceptual frameworks in the perceptual encounter with the world. Concepts [ideas] arise in consciousness when the perceiving organism interacts with the world. No conceptual structures existed a priori in a Kantian sense. On the other hand, a certain primacy of a perceptual mechanism is postulated [associationism]. It was therefore a task for science to explore the nature of human thinking.

AE 3. The denial of a special psychological level of explanation. The psychological level, in which conscious phenomena are regarded as *sensations*, should lead to physiological hypotheses.

The core of empiricist psychology can be summarized as reductionism. The reductionism had two interconnected themes. One of them was motivated by epistemic considerations: The explanation of mental phenomena belongs to the realm of natural science, not to a non-material order as claimed by the rationalists (AE 3 vs. AR 3). The other theme was ontological in character: Minds are nothing but the sensuous elements of consciousness. No 'higher levels' of mind exist that are beyond reach for experimental study and for the explanatory frames of natural science (AE 1 vs. AR 1). An important task was then to carve out an ontology – that is, a way to describe the mental phenomena of perception and cognition – beyond the intentional stance of ordinary language and everyday psychology.

² The hallmarks of the tradition Archetype Rationalism (AR) relevant in this discussion were based on a presupposed distinction between sensibility and understanding and can be roughly outlined as follows: AR 1) Mind was regarded as an active and directive principle by which sensory processes became regulated. This active principle was a manifestation of a formal structure, a 'permanent background' against which temporary sensory processes stood out. In this Aristotelian way rationalists distinguish at least two 'ontological layers' of the conscious state. According to this perspective a 'cognitive component' needed to be added to sensory material to establish perceptions. AR 2) The essential structures of minds were subject matter for philosophical analysis rather than for laboratory experimentation. The structures of minds were conceptual in nature, built on logical, not factual, relationships. AR 3) A sharp dividing line was made between the laws of minds and the laws of physical nature. The consequence was that psychological explanations were equally sharply separated from explanations in natural science. Cf. Sundqvist F. 2007, *The crossroads: Part 1*; Sundqvist F. 2003, 3-9.

I. The epistemological theme and the psychophysical intuition

The empiricist model of mind started and ended with the concept of sensation. Sensations were the building blocks of mind as well as the bridging principle that connected mental phenomena with their physiological explanations. Sensations were considered to be pure quality, with a certain intensity, duration, and extension co-varying with the events of a specific nervous organ. Titchener states that sensations ‘are those elemental conscious processes which are connected with bodily processes in definite bodily organs’ (Titchener 1999 [1896], 28). Külpe conforms to this definition when he states that sensation is ‘a simple conscious process standing in a relation of dependency to particular nervous organs, peripheral and central’ (Külpe O. 1999 [1895, 1893], 29). The approach was based on the idea that there is a concrete and simple connection between well-defined magnitudes of physical stimuli that leads to an equally specific nervous activity and the elements of conscious experience – like the sting of a needle seemingly is.

The principle of ‘*the complete parallelism of the psychical and the physical*’ was regarded as heuristic, a hypothesis that it was possible to correlate two sets of facts.³ According to the hypothesis, each observable change of sensation should be accompanied by a corresponding change of the nervous process (Mach E. 1999 [1897, 1886], in Wozniak R.H (ed.) 1999, 30).

Psychologists should then search for correlations between sensations and associated events in physical stimuli and in nervous processes. Titchener was probably the one who most explicitly took this type of program into psychological practice.⁴ Titchener comments on the principle of psychophysical parallelism:

“There is no mental state which has not a peculiar nervous state corresponding to it. This rule – the principle of psychophysical parallelism, [...] is simply a statement of fact, not an explanation of the relation of mind and body. The bodily processes explain the corresponding mental process, because it is the condition under which the mental process appears”. (Titchener 1999 [1896], 342).

The principle does not explain itself, Titchener continues; psychologists take the two sets of facts for granted but leave the question of why this relation holds to speculative spirits. Most importantly, in the empiricist notion there is no difference

³ The relation between physiological and psychological research was once compared to two tunnel construction teams that worked on either side of a mountain. With proper methods the two teams were likely to meet in the middle in terms of laws that connected a specific physical event with a psychological one. According to Ash, this analogy was made by Oswald Hering. Ash M.G. 1995, 57-58. Cf. Müller G. E. 1965 [1896], in Herrnstein R. J. & Boring E. G. (eds.) 1965, 25.

⁴ Nowadays, Titchener is well known for his notorious attempts to map out all sensory elements ‘in healthy minds’. In one of his early attempts to list sensation elements, Titchener states that there are 44 435 different sensation qualities in all, including 32 820 from vision, 11 600 auditory, four sensory qualities descending from skin and tongue and so on. He then comments the list: ‘Each one of these forty thousand qualities is a conscious element, distinct from all the rest, and altogether simple and un-analyzable. Each one may be blended or connected with others in various ways, to form perceptions and ideas. A large part of psychology is taken up with the determination of the laws and conditions which govern the formation of these sensation complexes.’ Titchener E.B. 1999 [1896], 67.

between psychological explanations and the ones in natural science – explanation always meant ‘the specification of the conditions of the appearance of a given phenomenon’ (Külpe O. 1999 [1893], 6).⁵

In this perspective there is no difference between, for instance, an observed rainbow and the ‘conscious experience of a rainbow’ apart from the location of the causal nexus, which science attempts to describe, predict, and manipulate. If we regard the phenomenon as a ‘rainbow’ we find causal nexuses up in the sky; we find relations that hold between light waves and prisms. If we turn to ‘conscious experiences of rainbows’ we find a psychological phenomenon related to nervous processes and biochemical events. According to this model of explanation, science should then be able to form physiological hypotheses about causal nexuses inside the organism just as we can form physical hypotheses about causal nexuses outside the organism. The fact that prisms and light waves are easily accessible and that neurons and the biochemical events of the brain were more or less inaccessible for science [at the time] did not change anything in principle.⁶

Thus, the principle of *psychophysical parallelism* was solely an attempt to correlate two sets of facts – physiological and psychological observations – without any assumptions about the intrinsic connection between body and mind. However, many adherents of the empiricist tradition seem to share an assumption that the two epistemic realms, the two different perspectives stemming from experience, were united on a material level – an assumption I have named *the psychophysical intuition*.

The psychophysical intuition suggests a deep and thorough unity between mental processes and the material substrate. This unity is the assumed reason why the psychophysical relationship holds. The distinguished physiologist and influential pioneer in the field of color perception, Ewald Hering, formulated this psychophysical intuition nicely in the following passage:

“If my hypothesis is correct, the sense of sight presents us with a way to observe exactly the process of nourishment in the seeing substance [...]. Henceforth we shall be dealing not only with the idea that a complex of sensations is communicated by the human eye, which then makes them into pictures with the help of correct or false judgments or influence, *but with the proposition that whatever comes into our consciousness as a visual sensation is the physical expression or conscious correlate of the change of materials in the visual substance.* For this change of substance, then, we have a reagent of great sensitivity, namely our consciousness.” (Hering E. 1965 [1878], in Herrnstein R.J. & Boring E.G. (eds.) 1965, 256 (italics by Hering).)

Hering promotes the intuition that a conscious phenomenon is a property of the material event, the internal glow and crackling of the material state.

Boring has pointed out that Hering’s expression of a unitary materialism is a clear anticipation of Gestalt theory. Boring and others using the perspective of behaviorism

⁵ Cf. quotation from Titchener above.

⁶ For a detailed account of the Gestalt theorists conception of scientific explanation in psychology, see Sundqvist F. 2003, 50-58.

labeled this intuition ‘nativism’ and were then referring to the picture of mind as a (inborn) property of nature.⁷

One can then summarize:

The psychophysical intuition: Phenomenal qualities are properties of the ‘seeing substance’ and are thus a direct reflection of the events within the latter. Interaction between the world and the ‘seeing substance’ alters the states of the substance and, accordingly, the phenomenal properties of the state.

I label this metaphysical stance *critical monism*: the ultimate source of our existence is a transphenomenal reality (Sundqvist 2003, 154-159). With this transphenomenal reality we only have an incomplete acquaintance from two directions: on the one side from observations of behavior, from observations and knowledge of the physical environment, and from observations and knowledge of nervous processes, and on the other from conscious experience *as such*. Psychology, then, has two epistemological realms, one physical and one mental. Hence, the gulf between body and mind is considered to be epistemic in nature, not ontological.

⁷ It is on this point that the systematic misinterpretation of Gestalt theory in behaviorist America, to which Henle among others refers, seems to arise.

The two key words are nativism and learning. Gestalt theory has often been characterized as nativism in a rigid sense (supposedly hostile towards ‘learning’). The psychophysical project and the search for biological and physiological explanations were habitually characterized as ‘nativism’ in behaviorist America. Accordingly, Gestalt theory also got this epithet, for instance in Boring E.G. 1950; Herrnstein R.J. & Boring E.G. (eds.) 1965.

Henle has pointed out Boring’s characterization as the main source of the error, but also Mandler J.M. & Mandler G. (eds.) 1964. For further examples see Henle M. 1986, 121 (a list that also includes Piaget, Boring, Allport, Tolman and Gregory). See also Ash G.M. 1995, footnote 13, 433.

The next step is to confuse ‘nativism’ and loose talk about ‘Gestalt laws’ with the Kantian notion of apriori structures of mind, thus making Gestalt theory an heir of German rationalism. (By the way, Gestalt theory was not ‘anti-learning’).

To make things worse, the concept of empiricism is confused in perceptual theory. A consequence of the division between sensibility and understanding (AR 1) is that the archetype rationalist stance, paradoxically, is closely related to what is usually called ‘empiricism’ in psychology. Empiricism in perceptual theory (from now on called P-empiricism) emphasizes learning from experience, but more importantly, it emphasizes the active mind, and uses terms like ‘inference’, ‘hypothesis-testing’, ‘unconscious conclusion’ and the like when characterizing the perceptual process. The distinction between sensibility and understanding is the guiding principle.

Thus, in psychological theory P-empiricism fights nativism by stressing rationalist intuitions (basically AR 1). Gestalt theory strongly opposed P-empiricism because of its tendency to ‘explain away’ phenomena using rationalist strategies in perceptual theory rather than searching for concrete physiological hypotheses.

From an epistemological perspective it is ostensibly the other way around: archetypal empiricists often presuppose nativist models of perception. This might sound confusing but the explanation is to be found in the idea that we form all our concepts and conceptual frameworks in encounters with the experienced world. This *Tabula rasa* doctrine puts empiricism under the threat of a vicious circle – how do we form concepts if we do not have a starting point? The natural answer to this was the postulation of a perceptual mechanism – association – that also lends itself to mechanistic physiological theories. This mechanism was conceived as being flexible but pre-given, thus, epistemological empiricism has a tendency to turn toward nativism (in a weak sense) in perceptual theory.

Further, because of the assumed intimate unity of phenomenal consciousness and the material substrate any change in the realm of phenomenal consciousness is reflected by an *observable* change in the material substrate. The psychophysical intuition suggests that one could use the one set of facts (found in the mental realm) to trace the nature of co-varying events in the other set (found in the physiological realm). In this way, conscious experience is not only a phenomenon to be explained by knowledge about the nervous system, but also the other way around: a means to understand the physiological nature of nervous systems.

Hering finishes his argument with the words:

“[Heretofore] we have made full use of our sense perceptions to know the outer world and to make it useful to us. Now let us use them also to try to understand the material events within our own bodies so that, first of all, we examine with their help things we do not perceive, like the outer things, through media only, but directly – that is to say, the change of material substance in our nervous systems”. (Hering E. 1965 [1878], in Herrnstein R.J. & Boring E.G. (eds.) 1965, 256-257).

This is a stronger claim than the actual heuristic principle of psychophysical parallelism. It is this intuition that Köhler and Gestalt theory share with many other psychologists inclined towards empiricism.

Half a century later Köhler writes:

“There is no reason at all why the construction of physiological processes directly underlying experience should be impossible, if experience allows us the construction of a physical world outside which is related to it much less intimately.” (Köhler W. 1947 [1929], 45).

Gestalt theory is firmly rooted within the framework of this empiricist epistemological reductionist theme (Sundqvist 2003, 50-59). Accordingly, it is in the light of the psychophysical intuition one has to look if one wants to understand the philosophical stance of the Berlin school. It should be clear that the argumentation against the constancy hypothesis and atomistic versions of empiricism was not directed against the fundamental postulates of empiricism. In fact, Gestalt theory of the Berlin school claimed that empiricist psychology had not freed itself from the first postulate of Archetype Rationalism: the presupposed distinction between sensibility and understanding. The empiricist attempts to overcome rationalist duality concerning psychological and natural laws stumbled on a notion of sensation/*Empfindung* that more or less enforced rationalist anti-reductionist notions of psychology.

II. The ontological reductionist theme

If one wants to describe mental phenomena beyond the dualist perspective of rationalism one has to get rid of concepts like ‘believing’, ‘judging’, ‘inferring’ and other intentional concepts of ordinary language in the analysis of mind. In this way was the main enemy of empiricism the *homunculus* of rationalism. The cognitivism in rationalist models implied an agency that observed and interpreted its environment. This was no big deal in the rationalist understanding of psychology though. The *homunculus* was rather a side effect of the arguments for a specific realm of psychological laws (Sundqvist 2007). Empiricism on the other hand, was in search of a description that postulated nothing but natural processes interacting with each other and developing

due to the laws of nature. The empiricist notion of perceptual states had the direct encounter with the world as its point of departure. An encounter triggers chain reactions in the organism. Generally speaking, these patterns of reactions were thought to be partly dependent on the present impression and partly on the reaction patterns that past impressions had established. From the psychological point of view, this encounter with the environment was described as an arousal of characteristic compounds of sensation. These present sensations were connected to past impressions by associative links of contiguity and similarity. Similar impressions to the ones of the past evoke a similar type of compounds. Hence, the existing cluster of sensations and the existing associative links were, in accordance with psychophysical intuition, a reflection of the conditions in a psychophysical system – a similar perceptual situation arouses a similar perceptual state.

Both Titchener's as well as Külpe's versions of "*Outlines of Psychology*" are good illustrations of this perspective. According to the ontological reductionist theme, *mind* was defined as nothing but 'the sum total of mental processes experienced by the individual' (Titchener 1999 [1896], p. 10). (the time span between the conclusion of childhood and before the enfeebled states of old age). Minds were by this definition conscious phenomena existing in time; the temporal course was their very nature. *Consciousness* is defined by Titchener as a 'cross-section' of mind at any given time. The building blocks of minds, the sensations, were seen as mental processes of a certain quality, intensity, duration, and clarity. Sensations exist in time; they rise and vanish, and do not possess the permanence of 'things' (Titchener 1999 [1896], 10). Finally, attention in the empiricist version is described as just a certain clarity and intensity of sensation. Titchener states that 'a large part of psychology is taken up with the determination of the laws and conditions which govern the formation of sensation complexes' (Titchener 1999 [1896], 67).

At a first glance there is no big difference between the conceptions of for instance Wundt on the one side and his students Titchener and Külpe on the other. Sensations are conceived of as qualities of a measurable intensity and duration (using Fechner's psychophysics). However, one has to note a substantial difference. Külpe and Titchener use their notion of sensation to reveal how conscious phenomena might get into the frames of natural science – there is nothing in consciousness except sensations.

Külpe and Titchener were both looking for ways to understand the causal nexus that makes it possible to control and predict conscious phenomena. They were interested in understand the link between nerve activity and a sensuous quality. Wundt used his notion of sensation to prove that the process of *apperception* operates on the basic sensory layer. In the rationalist perspective, the concept of sensation serves to prove the existence of an activity which does not conform to the laws of natural science. In fact, as we have seen in part I (Sundqvist F. 2007), the rationalist tradition came to ban 'causal thinking' in the search for the *essence* of the conscious state. Even the term 'consciousness' means something completely different in Wundt's terminology than in Titchener's and Külpe's. Volition and the apperceptive capacity are central in Wundt's conception of consciousness. According to rationalism's [Wundt's] descriptive standards, any attempt to locate volition/apperception and directive forces of thought outside consciousness is metaphysical. This is of course a clash with Külpe's assurance that ideas follow laws

imposed upon them from without (Külpe O. 1999 [1893], 3). According to Külpe there is no such structuring process as apperception in consciousness; the conscious state is evolving as an effect of material events outside consciousness.

Titchener joins in the criticism of rationalist approaches. The order behind the phenomena should be searched for in the realm of natural science and in the material processes of nature. He characterizes the Wundtian type of psychology as being based on ‘popular thinking’ permeated by the assumption of an ‘inferred activity’ of consciousness that directs, shapes, and moulds its own processes: a permanent mind behind the varying manifestations of mind (Titchener 1999 [1896], 116-119). Titchener argues that this assumed ‘component’ of consciousness simply does not exist in consciousness (Titchener E.B. 1999 [1896], 118). He then dismisses ‘activity theories’ and any attempt to explain attention through appeals to the spontaneous activity of a mind independent of nature. This is, according to Titchener, an example of ‘popular thinking’ mixing with dualist assumptions (with regard to levels of explanations):

“We have been unable to find an activity-process, and have accounted for the manifestations of attention in general by emphasizing the natural ‘selectiveness’ of the nervous system, the presence of organic tendencies. We have now to ask for the special physiological conditions of these [...] manifestations of attention.” (Titchener 1999 [1896], 132-132).

It is on this point the predicament of empiricism begins. There are actually two difficulties.

The predicaments of empiricism

Ideas were bundles of sensations united with reminiscences of past stimulation brought back as ‘centrally excited sensations’ (Titchener 1999 [1896], 54). Titchener compares these bundles with molecules:

“The idea is a compound; it consists of a number of elemental processes, traveling side by side in consciousness: it therefore resembles the compound bodies analyzed in the chemical laboratory. But the sensation resists analysis, just as do the chemical elements oxygen and hydrogen. It stands to the idea as oxygen and hydrogen stand to water. Whatever test we put it to, – however persistent our attempt at analysis and however refined our method of investigation, – we end where we began: the sensation remains precisely what it was before we attacked it. ‘Cold,’ ‘blue,’ ‘salt,’ cannot be divided up into any simpler modes of experience” (Titchener E.B. 1999 [1896], 28).

In Titchener’s image of mind, one finds a conflict between the cut-to-pieces strategy of the laboratory and the conception of mind as a continuous cluster of processes. There are two fundamental problems to perform this type of analysis, Titchener suggests. The first concerns the problem of atomism: what is actually cut to pieces in our abilities to discriminate various aspects of experience? Are ‘cold’, ‘blue’, and ‘salt,’ concepts that actually distinguish elemental components of conscious states just like nametags on objects? The other problems concern the other side of the coin: how is the unit of consciousness established?

The problem of atomism (and the constancy hypothesis)

With a conception of conscious experience as a mosaic of atomized non-connected elements (standing in a one-to-one relationship with equally atomized fractions of stimuli) one soon has to accept the discrepancy between the real constituents of

consciousness and awareness. One has to realize that something more is needed to understand perception. By postulating the existence of a basic level of sensations the characteristic rationalist distinction between sensibility and understanding (AR 1) could be said to be part of the experimental setting.

First of all, one soon finds out that the primitive quality is not a simple, well-defined and isolated phenomenon as one might suppose. The hypothesis of a constant relationship between stimulus and sensation simply does not hold in most perceptual situations. For instance, the totality of a wide range of interrelated aspects, both outside and inside the organism, leads to the perception of a colored surface. It is not physical magnitudes in isolation that decide how surfaces will appear in size, spatial orientation, color, and shape. The most obvious cases are examples of color constancy: A black surface in bright light might reflect more light than a white surface in shade; still the black surface usually looks black and the white surface white regardless of the light conditions.⁸ On the other hand, a surface reflecting light that appears brown in one surrounding might very well appear yellow in another. Color and the distribution of color in perceptual space are in this way highly context dependent.

Secondly, von Ehrenfels' analysis of the Gestalt phenomenon went in a still more disturbing direction for empiricism (Sundqvist 2007). The conception of Gestalts of different orders put doubt on the *psychophysical* project – what happens to the psychophysical project if we never find the foundational substrate of the Gestalt qualities, only further levels of Gestalt qualities?

The possibility of dismantling the basic constituents of mind seems to be in danger. Külpe is well aware of the problem:

“Our concrete experiences are always made up of connections of conscious elements. Simple qualities, isolated sensations and feelings, are products of scientific analysis [...] and their separate investigation is only possible by the aid of special methods and under favorable general conditions. Even so, the actual experience is practically always complex in character.” (Külpe O. 1999 [1893], 276).

Külpe never doubts the reality of those elements of consciousness though. He takes a definite stance against von Ehrenfels' postulation of an extra item, the Gestalt quality, which Külpe calls ‘the doctrine of unity’. Külpe regards such postulation of ‘a second series of qualities’ as entirely wrong and ‘contradictive to a whole number of facts.’ (Külpe O. 1999 [1893], 281-282). He argues that trained musicians *can* distinguish the tonal components in compound clangs; overtones *are heard* in ‘absolute purity’. Thus, a melody is just the sum of its constituents according to Külpe. Külpe admits that some compounds are harder to analyze than others; it is a ‘possible phenomenon in every sense department’ that some analyzed complexes remain ‘total impressions’ for the inattentive mind. The relative unity is a matter of fusion between the constituents. Külpe acknowledges certain ‘figural moments’ but he does not doubt that such grouping is still a relationship between elements and not a melting of a multitude of

⁸ This does not mean that a white surface in sunshine appears identical in any absolute manner to the same surface in darkness. Hering called color constancy ‘the approximate constancy of the color of visual objects’, see Gelb A. 1938 [1929], in Ellis W. D. (ed) 1938, 196.

elements into one unit⁹. The relationships between the elements just seem to dissolve their absolute independence; however, this is a fact for the inattentive mind only¹⁰.

This kind of defense seems to be a fruitless task. The psychologist has to refer to *his inner* world of experience. Overtones *are heard* in ‘absolute purity’ in the head of Oswald Külpe. Sensations turned to secret private objects accessible only to the introspectionist himself.

It is clear that the atomism was an offspring of the psychophysical project and the attempt to make the relationship between mind and physical nature concrete and conceivable. The constancy hypothesis required sensory atoms so to speak. However, not only inattentive minds found it hard to dismantle those basal constituents of consciousness. As von Ehrenfels could show, ‘inattentiveness’ toward its basal elements seemed to be the guiding principle of consciousness. The psychophysical relationship turned incomprehensible.

In the early beginning of the ‘Gestalt movement’ Köhler launched an attack on the strategy to explain away the failure of the constancy hypothesis with references to ‘inattentiveness’ and ‘errors of judgments’ in the paper ‘On unnoticed sensations and errors of judgment’ (Köhler W. 1971 [1913a], in Henle M. (ed.) 1971, 13-39). In the paper Köhler argued that the constancy hypothesis was upheld even though direct evidence was missing and even though direct observation sometimes could be used as evidence against it. The correlation between stimuli and sensations that was determined psychophysically under certain specific conditions did not lead to any knowledge from which one could draw general conclusions. In fact, the whole approach based on *the constancy hypothesis* survived with the help of a battery of auxiliary hypotheses, impossible neither to verify nor falsify. This battery of ‘explain-away’ strategies took all for granted, and reinforced the Archetypical Rationalist diversion of mind (AR 1).

⁹ Külpe finds that there are two types of connections between elements that make up the total impression: 1) Fusion – when the elements are spatially and temporarily indistinguishable but differ in quality, like for instance the musical pitch. 2) Colligation – elements that differ in extension or duration but still are related, like melodies. These two types of relationships constitute every aspect of the phenomenal mind. In this view, the elements of the compounds are still absolute atoms. Külpe O. 1999 [1893], 277.

¹⁰ Atomism had been questioned from time to time in the empiricist tradition. The conception of independent sensory elements in mechanical relations to each other was challenged already by John Stuart Mill. In Mill, we have an early formulation of the fact that properties of complex wholes may differ from the properties of the constitutive parts and his example of mental chemistry certainly is a forerunner to Gestalt theory: “The laws of the phenomena of mind are sometime analogous to mechanical, but sometimes also to chemical laws. When many impressions or ideas are operating in the mind together, there sometimes takes place a process, of a similar kind to chemical combination. When impressions have been so often experienced in conjunction, that each of them calls up readily and instantaneously the ideas of the whole group, those ideas sometimes melt and coalesce into one another, and appear not several ideas but one; in the same manner as when the seven prismatic colors are presented to the eye in rapid succession, the sensation produced is that of white. But in this last case it is correct to say that the seven colors when they rapidly follow one another *generate* white, but not that they actually *are* white; so it appears to me that the Complex Idea, formed by the blending together of several simpler ones, should, when it really appears simple [...] be said to *result from*, or be *generated by*, the simple ideas, not *consists of* them”.

Mill J. S. 1965 [1843], in Herrnstein R.J. & Boring E.G. (eds.) 1965, 379.

Köhler argues that the explain-away strategy led the psychophysical project into a dead end. Köhler makes a list of three types of auxiliary hypotheses that are the outcome of the constancy hypothesis:

First of all there is an assumption of a double consciousness with one basic layer of constant unchangeable but unobserved atoms, and a second layer of 'ordinary' mind-dependent, noticed conscious phenomena (Köhler W. 1971 [1913a], in Henle (ed.) 1971, 14-15). One can see how nicely the *phi-phenomenon* highlights the problematic aspects of this assumed relation. As far as the *constancy hypothesis* could tell, the experience of movement, strictly speaking, has no stimulus. Moreover, there is no counterpart in experience to the real stimuli. Despite this illustrative contradiction of the constancy hypothesis (and a great deal of other evidence), the assumption of a rigidly fixed relationship between stimulus and sensation remained. It is on this point that the rationalist distinction between sensation and understanding/cognition was enforced; it slipped into the empiricist approach. The anomalies were explained by 'errors of judgment' on part of the subjects. The subjects missed the real sensations corresponding to the real stimuli and saw something else instead. When we apply it to the *phi-phenomenon*, we are forced to postulate unnoticed 'stationary sensations' according to the constancy hypothesis despite the concrete experience of movement. The constancy hypothesis also enforced rationalist analyses of attention. According to the constancy hypothesis, sensations remain constant under constant stimuli even though attitudes change, at the same time as attitudes and attention change conscious experience considerably. Compare the sound of a fan that suddenly comes to our attention. According to the postulation of the first auxiliary hypothesis, we have the double consciousness: first with the noise present as unnoticed sensations in a hidden layer and then as noticed when the process of attention/apperception (the attention ray) has brought the sensation into presence.

The second auxiliary assumption that Köhler thinks is forced upon us by the constancy hypothesis is the actual rationalist distinction between sensations and understanding. (Köhler W. 1971 [1913a], in Henle (ed.) 1971, 14-15). The price to pay for this distinction is skepticism. The *phi-phenomenon* shows that there are cases when our judgment is so poor that we 'see' an illusive movement and nothing else when actually two individual sensations should be expected. If the apparent motion is an error of judgment then it is reasonable to assume that awareness of the stimulus situation should help us to unveil the illusion. However, Wertheimer could show by simple means that the perceived motion is independent of belief.¹¹ In fact, knowledge about the 'illusion' enhanced the impression, not the opposite; *phi-movement* in the 60-msec interval was even judged as eliciting a more intense movement impression than a real moving light source. (Wertheimer M. 1925a [1912a], in Wertheimer M. 1925a, 162-163, 221-227). Can we trust our judgments when they are so deceptive? How can we trust our observations when we actually are blindfolded by our own judgment?

¹¹ Compare with Fodor's notion of 'cognitive impenetrability', in Fodor J. 1983.

Köhler also points out another consequence and a third type of auxiliary hypothesis; one needs not only a double consciousness but also a double mind to save the constancy hypothesis (Köhler W. 1971 [1913a], in Henle (ed.) 1971, 14-15). Köhler argues that the constancy hypothesis has to be saved by 'unconscious judgments'. This is the functionalist *as-if-a-homunculus* move that we can see so clearly in Helmholtz's theories (Sundqvist F. 2007a). Köhler argues that scientists are pleased to find something on which to blame the deviations and illusions. But theories based on phenomena which are, by definition, unobservable, are not possible to test.

Köhler maintains that the extreme variation in introspective reports, usually blamed on 'error of judgments', is actually an indication that factors other than physical stimuli influence the experience. The auxiliary hypotheses based on the 'error of judgment and unnoticed sensation' formula make it impossible to refute the theories with direct observation. In this way, Köhler highlights the fact that the rationalist strategy pre-empted attempts to find psychophysical explanations – every argument that rationalists like Helmholtz and Wundt brought forward to emphasize 'the constructive powers of mind' created a stop line for science. Köhler then states that the 'mere term error of judgment thus sometimes carries more weight than the most careful observations – just the phrase alone!' As Köhler points out, perfectly good observations become invalidated just because they are unexpected. He then wonders what other facts are dismissed with empty words just because they do not fit in with the familiar laws.

In this way, Köhler argues that the constancy hypothesis and the notions of unnoticed sensations and errors of judgment accompanying these sensations are not suited as components in a scientific theory, however simple and easily comprehended the psychophysical relation becomes in these theories.

The unity of consciousness

Hence, Köhler could show that the phenomenalist approach of traditional empiricism collapsed in its own home field – in the analysis of the phenomenal state. The case was even worse when we turn to the home field of rationalism – the analysis of cognition with the point of departure in object recognition. Here we find the other fundamental problem for empiricist perceptual theories: How can disconnected conscious constituents reveal any clues about the unitary phenomena of object recognition?

The associationist formula of spatio-temporal contiguity and the notion of 'ideas' had traditionally been the means for understanding the epistemic/semantic aspects of perception in the task of recognition; similar sensations arouse the same type of ideas when the associative link has been established.

Therefore, the key word for empiricists was *similarity*. A similarity between particulars served as the basis of classification. In that way collections of sensations that were excited peripherally and centrally turned into an almost identical *idea* if enough sensations were similar enough to earlier impressions to evoke the same associations – accordingly, the feeling of familiarity arouse.

The notion of similarity was the weak spot in the empiricist phenomenism: the human capacity to categorize and sort things is not an outcome of similarities between *qualities* in consciousness – an object in shade is the same as when seen in sunshine. Thus, the identity

of sensations seems to be governed by a different logic than the identity of objects. Identity and truth conditions in perception are preserved even when sensations are exchanged. In fact, phenomenism seems to miss essential traits of perception. The rationalists pointed out that there seems to be a duality involved within the elementarist framework for which empiricism could not account. Rationalists pointed out that the concept of sensation seemed to require *superiora* an apperceptive power that produces the unit.

Rationalists could in this way find powerful arguments to established the diversion of mind as well as a distinction between philosophical analyses of *essence* and natural science (Sundqvist 2003, 19-25). This had consequences for the relationship between philosophy and psychology. Rapid developments in the formal disciplines of logic and mathematics together with the concept of intentionality helped philosophers to define a new role for themselves apart from natural science and, more importantly, apart from hypothetical causal stories of the brain, setting them further apart from the old ‘metaphysical’ riddles like the relationship between body and mind. Husserl could accuse ‘the experimental fanatics’ for mistaking their ‘cult of facts’ for a genuine analysis of mind (Husserl E. 1910-1911, 319, 320-321). Philosophy should deal with conceptual issues and necessary Truths (with a capital T), not with contingent facts of the goings on in people’s heads. Philosophers should, one could say, be the knights of pure thought and explorers of formal languages (Koffa J.A. 1991).

Empiricism also lost faith in the traditional phenomenism. Their task to redefine mind and psychology with respect to the Gestalt phenomena was a more complicated one and went in two directions – towards behaviorism and towards Gestalt theory.

The principle of ‘similarity’ is explicit in Mach, but at the time of Titchener’s and Külpe’s writings the principle was no longer obvious. Mach’s attempts to expand the universe of (similar) sensations through the sensation of spatial structure had turned into one of the mayor rationalist argument (Sundqvist 2007). Instead, Titchener’s and Külpe’s solution to the question of why two qualitatively dissimilar conscious states still can be about the same object or condition of the world consists of a vague reference to future biological and physiological explanations.

The notion of *ideas* gradually lost its semantic powers. *The idea* was a reflection of our perceptual capacity to sense identity, but in no way an explanation. Titchener is even forced by his own phenomenism to warn us not to regard ideas as some sort of permanent [intentional] objects:

“The idea is not a thing: it does not stand, like the rock; it takes place and goes on, like the action of the waves upon the rock it is a process” (Titchener 1999 [1896], 7).

The only permanent and relatively unchanging thing about an *idea* is the name we use for it, according to Titchener.¹² One could summarize Titchener’s position saying that the only permanent thing about the *idea* is the name we use *and* the stable responses we as ‘locomotor organisms’ have towards our environment.

¹² The names, our whole representational systems like the ones in natural languages, formal disciplines, and all various forms of cultural symbols are just tools for thought in Titchener’s perspective. The semantic relation between the sign and the thing represented was the subject matter for linguistic and logicians but not for psychology.

In this empiricist perspective it's necessary to distinguish semantic analyses of language – the names we use to refer to objects and events – from the psychological experience of meaning and the scientific explanation of our capacity to “make sense”. There is nothing ‘mental’ in semantic analyses while there is nothing ‘semantic’ in mental phenomena (i.e., the notion of ideas). Thus, there is a sharp distinction between semantic analyses of linguistic expressions on the one side and ‘experience of meaning’ on the other. One should not use the semantic formula of sign and reference to analyse mental phenomena according to this developing empiricist perspective, even though ‘meaning’ in an ordinary sense of the word is a highly associated with conscious experience. Titchener even spoke against phenomenalism: *If we talk about these psychological or ‘existential’ aspects of meaning, Titchener argues, ‘so far as it finds representation in consciousness at all’, meaning is always ‘context’ (Titchener 1964 [1909], in Mandler J.M. & Mandler G. (eds.) 1964, 179). Context here means nothing else but the compounds of sensations reflecting the state of the organism and the way it is ‘attuned’ towards its environment: emotive tones, kinesthetic sensations stemming from locomotion and associated, centrally excited sensations. All of these sensations are the outcome of past and present perceptual situations and a direct reflection of the present physical state of the organism. Accordingly, in the psychological existential sense the meaning of a word might be an outcome of a number of various sensations loosely connected in the *idea* when we as perceivers are related to the representation. Sometimes, the psychological meaning of the word ‘tree’ is just the sound or the visual impression of the word uttered or printed. On other occasions, the word’s psychological meaning is the outcome of imaginative states in which tree-episodes are visualized more or less vividly.*

Most importantly, psychological meaning does not have to be explicitly conscious. It could just as well be a vague feeling of ‘knowing one’s way around’ or a recognition of what to do or how to act in a certain environment. ‘The idea’ lost its ‘conceptual powers’. The Idea was not responsible for our perceptual capacity to sense categorical order, but just a reflection of this capacity. In this discussion, it seems quite clear that empiricists started to explore a perspective that conceived our ‘sensitivity for identity’ as well as all variants of psychological meaning as ‘carried’ in purely physiological terms (Titchener E.B. 1964 [1909], in Mandler J.M. & Mandler G. (eds.) 1964, 181). The principle of similarity was concealed in an unspecified biological mechanism. Like all psychological phenomena, these tendencies should have physiological explanations. Titchener argues, directly addressing his rationalist opponents, that the laws of these tendencies should be sought in the realm of physiological explanations and not by appeals to a metaphysical order of ideal objects (Titchener 1999 [1896], 118 ; cf. Sundqvist 2003, chap.4).

All that has been said about the explanation of the psychological sense of ‘meaning’ could also be said about ‘attention’, the close psychological relative of the existential or psychological aspects of meaning. Titchener, for instance, defines the organism as ‘a bundle of tendencies’, tendencies of ‘stretching towards’ (Titchener E.B. 1999 [1896], 109). Psychological meaning in the final analysis was seen as an outcome of humans being ‘locomotor organisms’ – the motor attitude or ‘the executive type of attention’ resulting in both kinesthetic sensations and affective tendencies. The descriptive aspects of attention are, as far as Titchener could introspect, just a par-

ticular clarity of sensation. The explanation, on the other hand, concerns the executive processes of bodily movement. Titchener states that ‘the reasons why certain things or attributes of things compel attention, while others are left unnoticed, are, in the last resort, biological reasons’ (Titchener 1999 [1896], 130). The spontaneity of these processes is not, according to Titchener, evidence of a metaphysical or purely psychological activity that directs the attentive state (Titchener 1999 [1896], 118-120).

Külpe had a very similar view on attention, associating it with more vivid, clearer sensations. Külpe emphasizes that no special activity is added to the sensory content. Further, he finds no introspective evidence for any special type of ‘organic sensation’ that should be specifically associated with attention. Any sensation might come into an attentive condition so to speak; as always, the task of psychology is to specify the physiological conditions of the state (Külpe O. 1999 [1893], 425). Külpe also claims that the most essential conditions for the origin of states of attention are material events outside consciousness (Külpe O. 1999 [1893], 443).

Hence, empiricism attempted to elaborate a conception in which identity was conceived as an aspect of behavior and a given organism’s perceptual capacity to respond or ‘attune’ to its environment rather than to some phenomenal quality in experience. In doing so, empiricism also avoided postulating any irreal realm responsible for our ‘sensitivity’ for identity. This is a step towards a, in a wide sense, ‘behavioristic’ approach.¹³

The appeals to ‘unconscious’ physiological events as the driving force of mental states drew Oswald Külpe and his associates in Würzburg, as well as Titchener, into conflict with their own phenomenalism.¹⁴ The driving force of mind was not association of similarities but biological dispositions of behavior. The conception of ‘imageless thought’ or ‘dispositions of consciousness’ (*Bewusstseinslagen*) questioned the whole empiricist phenomenalist perspective on mind and the reductive project.

Empiricist psychology rapidly turned to the study of reflexes and behavior. Pavlov’s research on conditioned reflexes opened up possibilities to understand behavior on a physiological basis without appeals to the psychophysical intuition and phenomenal content of consciousness. However, as Köhler and Koffka relentlessly pointed out in their criticism against ‘machine theories’, this new approach of empiricist psychology did not change the rigid and mechanistic conception of the processes of perception and association taken from their empiricist predecessors.

One can clearly see that the general trends in psychology and philosophy were abandoning the psychophysical project and the attempt to get an empiric understanding of the philosophical body-mind puzzles (Sundqvist F. 2003, 19-25). ‘Introspectionism’ became an invective and scientists in all camps slowly started to believe that conscious experience belonged to a forbidden realm.

¹³ Different but closely related versions of this non-Cartesian project were developed Gestalt theory and also by philosophers like Merleau-Ponty and Wittgenstein. In perceptual theory J.J. Gibson contributed to this perspective with the ecological approach. Present days Artificial Neural Network modeling provides promising means to explore the empiricists intuitions of ‘meaning’, ‘attunement’, and classification in perception. See Sundqvist (2003), Chapter 7 and 8.

¹⁴ This development is explored in Mandler J.M. & Mandler G. (eds.) 1964.

In this perspective Gestalt theory was an anachronism. However, One has to add, Gestalt theory was an anachronism with a considerable historical influence (Sundqvist F. 2003 chapters 1, 7 and 8). The Gestalt psychologists tried to show how a descriptive phenomenalist approach could lead to progress in physiological knowledge by shifting focus from identification of a given *quality* to description of *functional dependencies in the perceptual structure*. The preliminary step in this development was to understand the true nature of conscious compounds.

* * * *

Zusammenfassung

In drei miteinander verknüpften Artikeln untersuche ich zwei widerstreitende Ansätze der Psychologie. Im ersten Artikel (*Gestalt Theory* 29, 40-58) skizzierte ich typische Merkmale der rationalistischen Analyse des Mentalen anhand von Beispielen aus Werken von Helmholtz, Wundt und Husserl. Im vorliegenden zweiten Teil werden typische Merkmale des Empirismus dargestellt, ebenso wie einige Probleme dieses Ansatzes. Die empiristische Psychologie (hier erläutert an den Beispielen Külpe und Titchener) hatte einen reduktionistischen Kern: Das Mentale bestünde aus nichts weiter als aus den Sinnes-Daten des Bewusstseins. Es existierten keine „höheren Ebenen“ des Mentalen, die außerhalb der Reichweite experimenteller Untersuchung oder der Erklärungsmodelle der Naturwissenschaften lägen. Empfindungen – die Bausteine des Mentalen – wurden als reine Qualitäten betrachtet, die sich hinsichtlich ihrer jeweiligen Intensität, Dauer und Ausdehnung entsprechend der Aktivität eines bestimmten Nerven-Organ verändert. Mit der Konzeptualisierung der bewussten Erfahrung als einem Mosaik atomisierter, untereinander nicht verbundener Elemente (in einer Eins-zu-eins-Beziehung zu ebenso atomisierten Teil-Stimuli) hatte man allerdings bald die Diskrepanz zwischen den wirklichen Bestandteilen des Bewusstseins und der Bewusstheit zu akzeptieren. Köhler wies darauf hin, dass diese auf der *Konstanz-Hypothese* beruhenden Ansätze nur mit Hilfe einer ganzen Batterie von Strategien des 'Weg-Erklärens' überleben konnten, die wiederum eine rationalistische Auffassung des Mentalen stärkten. Die empiristische Psychologie schlug zwei Richtungen ein: die des Behaviorismus und die der Gestalttheorie. Köhler und Koffka arbeiteten schonungslos heraus, dass es dem Behaviorismus, indem er bewusste Phänomene ignorierte und die wahre Natur des Bereichs des Bewusstseins nicht erkannte, nicht gelang, sich von den rigiden und mechanistischen Konzepten von Wahrnehmung und Kognition zu lösen, die er von seinen empiristisch orientierten Vorgängern übernommen hatte – auf diese Weise konnte sich die Psychologie nicht von den rationalistischen Auffassungen des Mentalen lösen.

Summary

In three interconnected articles I explore two diverging perspectives on psychology. In the first article (*Gestalt Theory* 29, 40-58) I sketched out typical traits of the rationalist analyses of mind with examples taken from Helmholtz, Wundt and Husserl (Sundqvist 2007). In this second paper, typical traits of empiricism are examined, as well as some of the predicaments of the approach. The empiricist psychology (here exemplified with Külpe and Titchener) had a core based on reductionism: Minds are nothing but the sensuous elements of consciousness. No 'higher levels' of mind exist that are beyond the reach of experimental study or beyond the explanatory frames of natural science. Sensations – the building blocks of mind – were considered to be pure quality, with a certain intensity, duration, and extension, co-varying with the events of a specific nervous organ. With a conception of conscious experience as a mosaic of atomized non-connected elements (standing in a one-to-one relationship with equally atomized fractions of stimuli) one soon has to accept the discrepancy between the real constituents of consciousness and awareness. Köhler pointed out that the approaches based on *the constancy hypothesis* survived with the help of a battery of 'explain away' strategies that reinforced a rationalist

perspective of mind. Empiricist psychology went in two directions: Behaviourism and Gestalt theory. As Köhler and Koffka relentlessly pointed out, by ignoring conscious phenomena and by not realizing the true nature of conscious compounds, behaviourism failed to free it self from the rigid and mechanistic conception of perception and cognition taken from their empiricist predecessors – thus, psychology could not free it selves from rationalist analyses of mind.

References Part II

- Ash, M.G. (1995): *Gestalt psychology in German culture, 1890-1967: Holism and the quest for objectivity*. Cambridge: Cambridge University Press.
- Boring, E.G. (1950): *A History of Experimental psychology*. 2nd ed. New York: Englewood Cliffs.
- Ellis, W. D. (ed) (1938): *Source Book of Gestalt psychology*. New York.
- Fodor, J. (1983): *The Modularity of Mind*. Cambridge, Mass: MIT Press.
- Gelb, A. (1938 [1929]): “Color Constancy”. In W. D. Ellis (ed) (1938). (translation from Gelb A. 1929, “Die Farbekonstanz der Sehdinge”, in Bethe A., et al., (eds.) 1929, *Handbuch der normalen und pathologischen Physiologie*. 12/1, Berlin, pp. 594-677).
- Henle, M. (1986): *1879 and All That. Essays in the Theory and History of Psychology*. New York: Columbia University Press.
- Hering, E. (1965 [1878]): Anticipation of Psychophysiological Isomorphism. In R.J. Herreinstein & E.G. Boring (eds.) (1965) 253-256. (translation from Hering E. 1878, *Zur Lehre vom Lichtsinne*. Vienna).
- Herreinstein, R.J. & Boring, E.G. (eds.) (1965): *A Source Book in the History of Psychology*. Cambridge, Massachusetts: Harvard University Press.
- Husserl, E. (1910-1911): Philosophie als Strenge Wissenschaft, *Logos*.
- Koffka, J.A. (1991): *The Semantic Tradition from Kant to Carnap. To the Vienna Station*. Cambridge: Cambridge University Press.
- Külpe, O. (1999 [1895, 1893]): *Outlines of Psychology*. In R.H. Wozniak (ed) (1999). Reprinted from Külpe O. 1895, *Outlines of Psychology*. London, New York. Translation from Külpe O. 1893, *Grundriss der Psychologie. Auf experimenteller Grundlage dargestellt*. Leipzig.
- Köhler, W. (1947 [1929]): *Gestalt Psychology*. New York: Black and Gold Library.
- Köhler, W. (1971 [1913a]): On Unnoticed Sensations and Errors of Judgements. In M. Henle (ed.) (1971): *The Selected Papers of Wolfgang Köhler*. New York: Liveright, 13-39. (translation from Köhler W. 1913a, Über unbemerkte Empfindungen und Urteilstäuschungen, *Zeitschrift für Psychologie* 66, 51-80),
- Mach, E. (1999 [1897, 1886]): Contribution to the Analysis of the Sensations. In R.H Wozniak (ed.) (1999). Reprinted from Mach E. 1897, *Contribution to the Analysis of the Sensations*. London. Translation from Mach E. 1886, *Beiträge zur Analyse der Empfindungen*. Jena.
- Mandler, J.M. & Mandler, G. (eds.) (1964): *Thinking: From Association to Gestalt*. New York, London, Sydney: John Wiley & sons, Inc.
- Mill, J. S. (1965 [1843]): On Mental Chemistry. In R.J. Herrnstein & E.G. Boring (eds.) (1965), 377-380. (from Mill J. S. 1843, *A System of Logic, Ratiocinative and Inductive, being a connected View of the Principles of Evidence, and the Methods of scientific Investigation*. London, Vol. II, bk. VI, Chapter 4)
- Müller, G. E. (1965 [1896]): On the Psychophysical Axioms. In R.J. Herrnstein & E.G. Boring (eds.) (1965), 257-259. (from Müller G. E. 1896, Zur Psychophysik der Gesichtsempfindungen, *Zeitschrift für Psychologie* 10, 1-4)
- Sundqvist, F. (2003): *Perceptual Dynamics. Theoretical Foundations and philosophical implications of Gestalt Theory*. Göteborg: Acta Philosophia Gothoburgensia 16.
- Sundqvist, F. (2007): The Gestalt phenomena and Archetypical rationalism. The crossroads between Empiricism and Rationalism: Part I. *Gestalt Theory* 29, No.1.
- Titchener, E.B. (1964 [1909]): “The Problem of Meaning”. In J.M. Mandler & G. Mandler (eds.) (1964), 179-184. (from Titchener E.B. 1909, “Lectures on the experimental psychology of the thought-processes”. New York).
- Titchener, E.B. (1999 [1896]): *An Outline of Psychology*. In R.H Wozniak (ed.) (1999). Reprinted from Titchener E.B. 1896, *An Outline of Psychology*. London.

- Wertheimer M. (1925a [1912a]): Experimentelle Studien über das Sehen von Bewegung. In M. Wertheimer (1925a): *Drei Abhandlungen zur Gestalttheorie*. Erlangen: Philosophische Akademie, 162-163, 221-227. Reprinted from Wertheimer M. 1912a, Experimentelle Studien über das Sehen von Bewegung, *Zeitschrift für Psychologie* 61, 161-265.
- Wozniak, R.H. (ed.) (1999): *Classics in Psychology, 1855-1914. A Collection of key works*. Bristol: Thoemmes. Tokyo: Maruzen.
- Wundt, W. (1999 [1897]): *Outlines of Psychology*. In R.H Wozniak (ed.) (1999). Reprinted from Wundt W. 1897, *Outlines of Psychology*. Leipzig, London, New York. Translation from Wundt W. 1896, *Grundriss der Psychologie*. Leipzig.

Address of the Author:

Dr. Fredrik Sundqvist
Dahlströmsgatan 46
S-414 65 Göteborg
Sweden
Email: fredrik.s@www.phil.gu.se