Gestalt psychology and the philosophy of mind

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ABSTRACT   The Gestalt psychologists adopted a set of positions on mind–body issues that seem like
an odd mix. They sought to combine a version of naturalism and physiological reductionism with an
insistence on the reality of the phenomenal and the attribution of meanings to objects as natural
characteristics. After reviewing basic positions in contemporary philosophy of mind, we examine the
Gestalt position, characterizing it in terms of phenomenal realism and programmatic reductionism.
We then distinguish Gestalt philosophy of mind from instrumentalism and computational functional-
ism, and examine Gestalt attributions of meaning and value to perceived objects. Finally, we consider
a metatheoretical moral from Gestalt theory, which commends the search for commensurate descrip-
tion of mental phenomena and their physiological counterparts.

Gestalt psychology has a curious relationship to traditional categories in the philos-
ophy of mind. The Gestaltists are notorious for insisting on physiological expla-
nation (if not reduction), and yet they also insist on the reality of the phenomenal.
They advocate naturalism in psychology while stressing the importance of value and
meaning as psychological data. And they reject dualism without subscribing to
traditional materialism or to any of the more recent alternatives.

Taking Koffka and Köhler as guides [1], we examine the relationship between
the Gestalt position and recent philosophy of mind. The Gestaltists' philosophy of
mind retains its interest precisely because it cuts across the usual boundaries and
thereby calls them into question. Further, it offers insights of contemporary rel-
evance in its realist attitude toward phenomenal experience and its simultaneous
advocacy of physiological explanation.

1. Basic positions in contemporary philosophy of mind

Philosophical theories of the mind–body relation have undergone considerable
development in recent decades. The older position of substance dualism has been
rejected outright. Originally, the prime contender for its replacement was reduction-
ism and the identity theory. Currently, two positions are vying to replace reduction-

ism: eliminative materialism and functionalism. The one tries to eliminate psychology in favour of physiology, while the other asserts psychology's autonomy.

According to reductionism, there is nothing necessarily wrong with psychological theorizing, it is merely redundant. Reductionism maintains that anything that can be predicted or explained psychologically can be predicted or explained through physiology alone. Psychological theories can be reduced to physiological ones because the theoretical taxonomy and explanatory generalizations of psychology can be mapped, one-to-one, into the taxonomy and generalizations of physiology. Identity theorists then claim that psychological entities and processes should be straightforwardly identified with physiological entities and processes. By reductionist lights, the continued use of the terms and theories of psychology either indicates slow progress in physiology or is merely a matter of convenience.

Eliminative materialism holds that this view of psychology is too optimistic. According to eliminativism, psychology is incurably infected with scientifically-intractable mentalistic concepts. Consciousness, qualitative experience, mental attitudes and other mentalistic notions cannot be excised from psychology. This is unfortunate, for, as the eliminativist sees it, such notions can never generate scientific explanations in their own right, nor are they subject to scientific treatment through reduction. Consequently, such notions are best jettisoned outright (Quine, 1974, Part 1). Since these notions are taken to be central to (allegedly) "scientific" psychology, that must be rejected, too, and replaced with explanations couched in physical or physiological terms (P. M. Churchland, 1981, P. S. Churchland, 1986, Chapter 9). Hence the "eliminativism" in eliminative materialism.

Functionalism rejects both eliminativism and reduction. In its traditional guise, functionalism argues that there are credible psychological generalizations, and that these are formulated at a level of analysis distinct from physiology (Putnam, 1967). According to the usual argument, the taxonomy of psychology cross-classifies the taxonomy of physiology, so that there is no one-to-one relation between psychological and physiological kinds (Fodor, 1975, Introduction). Functionalism contends that the same psychological process can be realized in a variety of nervous systems, just as the same computer software can run on different hardwares. The process therefore has an integrity independent of its particular instantiation. Psychological processes such as perception are to be defined and understood in their own right, not by equating them with the brain mechanisms by which they are instantiated. Although there may be reason to modify traditional functionalism (Hatfield, 1988), it remains the dominant position in contemporary philosophy of mind (Lycan, 1990, Part 1).

Despite these disagreements over reductionism and its successor, philosophers of mind largely agree on one credo: that scientific psychology should be naturalistic. Stated simply, naturalism maintains that psychological processes are part of the natural world and hence are subject to natural-scientific investigation. So stated, the position may well seem uncontroversial. But what are the features of "the natural", and how shall the limits of its domain be determined? The most straightforward answer is ontological: the domain of the natural is coextensive with the physical. In the philosophy of mind, this leads to *metaphysical* or *materialistic naturalism* (Hatfield,

1990, Chapters 1 and 7), the thesis that psychological processes are part of nature because materialism and reductive physicalism are true: psychological processes can be reduced to physiology and ultimately to physics. Materialistic naturalism demands reduction or, if that is not possible, elimination. A less simple but more plausible means of delimiting the natural is provided by *methodological naturalism* (Hatfield, 1990, Chapters 1 and 7), according to which the domain of the natural includes just those entities and processes that can be investigated (and explained or understood) using the methods of natural science [2]. The notion of natural-scientific method is itself vague, but this criterion has the advantage of not presupposing the correctness of reductionism or eliminativism. Functionalist arguments against reduction typically proceed methodologically; they assert that there are or can be scientifically successful psychological theories that do not reductively map onto physiological or physical theories. These arguments thus refuse to equate the domain of the natural-scientific description with the taxonomies of physics and physiology.

Finally, some philosophers of mind maintain that psychology should be naturalistic, but they stop short of extending the naturalistic position to all aspects of the mental. These philosophers are not closet dualists, nor do they hold that human actions violate the laws of physics (or of psychology, for that matter). In common with functionalism they regard the mental as an autonomous level of description, even if all mental processes are instantiated by brain processes. Going beyond the usual functionalist position, however, they hold that portions of the mental should be conceived as fundamentally *normative* (Hatfield, 1990, Chapter 1). They hold that mental abilities such as judgment and reasoning are best conceived as achievements, and that they therefore should be analysed in accordance with ideal standards that abstract from actual performance (Ryle, 1949; Sellars, 1963). The standards for such achievements are not determined by empirical observation of behaviour, and could not be so determined; for whether a given behaviour counts as a certain type of achievement—as a reasonable judgment, say—is itself determined by application of normative standards. One might empirically determine the conditions that favour or hinder performance that meets such standards, but the standards themselves are brought to, not derived from, empirical investigation. An interesting feature of the Gestalt programme is its attempt to naturalize even the normative aspects of the mental.

2. The Gestalt stance

Unlike their psychophysical isomorphism and their emphases on perceptual organization and wholes over parts, the Gestalt position on the mind–body problem and on the place of mind in nature is difficult to characterize. This stems largely from the fact that the Gestaltists attempted radically to reformulate previous conceptions of the mind–body problem and of the domain of the natural.

On first consideration, the Gestalt philosophy of mind seems paradoxical. Notoriously, the Gestaltists considered their focus on undistorted phenomenal experience to be a distinguishing feature of Gestalt psychology (Köhler, 1947,

Chapters 1–3; Koffka, 1935, pp. 31–41). It separated them from the behaviourists on one side and the analytic introspectionists who analysed consciousness into microelements on the other. At the same time, they maintained that explanation in psychology must ultimately be physical or physiological. As Koffka put it, while it is of great use to the psychologist to begin from the world as it is perceived and mentally represented by organisms, explanations must ultimately appeal to "occurrences in the real physical organism" (1935, p. 49).

The resolution of the paradox is straightforward. The Gestalt psychologists were at once *phenomenal realists* and *programmatic reductionists*. By "phenomenal realism" we mean the position that phenomenal experience is real, that it is not illusory or suspect in any way. By "programmatic reduction" we mean a position that sets as its goal the complete explanation of all psychological phenomena by appeal to physiological states and processes, but that does not assert conclusions based on the assumption of reducibility prior to producing the envisioned explanations.

In the hands of the Gestaltists, phenomenal realism and programmatic reductionism each served to mitigate the other. Thus, Koffka (1935, p. 11) and Köhler (1938, pp. 401–410) forthrightly rejected extreme reductionism in the form of eliminative materialism, insisting that the facts of phenomenal consciousness should not be sacrificed on the altar of behaviourist epistemology or materialist metaphysics. Köhler argued that the behaviourists' preference for physical descriptions and their denial of direct experience resulted from misplaced epistemological purity; he contended that strictly speaking, the existence of an objective world independent of direct experience is just as much in doubt as is the direct experience had by other organisms. He chose to posit both other people's direct experience and a physical world, and challenged the behaviourist to show why one was more dubious than the other (1947, pp. 31–33). Koffka, responding to the charge that the Gestalt emphasis on physiology was thinly-veiled materialism, rhetorically asked whether Gestalt theory was in fact "purely physiological" (as he himself had characterized it). His answer is instructive: "Would it not mean an abandonment of fact if it were? For the physiological processes which we construct as the correlates of consciousness are known to us in the first place through their conscious aspect. To treat them as though they were purely physiological, without this conscious aspect, would be to neglect one of their outstanding characteristics" (1935, p. 65). The Gestaltists insisted that the denial that organisms have direct experience would be the denial of a basic fact.

At the same time, owing to their penchant for physiological explanation, the Gestaltists denied independent causal power to consciousness or experience. They limited the role of conscious experience in psychology to the status of given fact and object of explanation. In their estimation, aspects of consciousness experience could be explained by appeal to physiology; but a conscious state could not itself explain anything, even another conscious state (Koffka, 1935, p. 65; Köhler, 1938, p. 362). Explanation always flowed from brain processes to experience. The latter could serve as evidence for the character of brain processes, and nothing more. This evidential role must not be underestimated, however. The Gestaltists adduced their

speculative physiological explanations from their descriptions of phenomenal facts (Köhler, 1929, Chapters 4–5; 1940, Chapter 2; Koffka, 1935, Chapter 4), together with their beliefs about the general characteristics of brain physiology (beliefs based in Gestalt physics, Köhler, 1920).

Given the ineliminability of the phenomenal and the primacy of physiological explanation, it is natural to ask whether physiology actually can explain consciousness. The Gestaltists contended that physiology as traditionally conceived could not do the job; they rejected traditional forms of naturalistic or physiological reduction (Koffka, 1935, pp. 11–12; Köhler, 1938, Chapters 6 and 9). By their lights, the fault lay in traditional physiology and the attendant form of naturalism, not in the goal of achieving physiological explanation *per se*. Previous theorists, when faced with a "gap" between naturalistic physiology and mental phenomena, sought to reconstruct mental phenomena in accordance with theoretical preconceptions, or even to deny their reality completely. The Gestaltists, when faced with the same gap, sought to close it by reworking the concepts of the natural and the physical, and hence of the physiological. They argued that when properly conceived, nature contains states and processes that are not merely correlated with the mental, but that exhibit properties previously assigned only to the mental realm. As Köhler put it, "I have been unable to find that the physical world is quite as different from the phenomenal world as it is now said to be" (1938, p. 372); indeed, "there is no reason a priori why certain aspects of the phenomenal world should have no counterparts in the physical world" (p. 374). He was not proposing a return to vitalism or animism. Rather, he was proposing that the nature of the physical should be reconceived to include direct counterparts of phenomenal properties.

The proposed reconception of the natural or the physical began from the Gestaltists' familiar criticism of previous brain physiology. By their lights, previous physiology was couched at the wrong level of physical analysis, at the level of micro events to the exclusion of macroscopic wholes (Koffka, 1935, Chapter 3; Köhler, 1938, Chapters 5, 6). Their aim was not to deprecate the microscopic but to affirm that the distinguishing characteristics of mental life are properties of macroscopically organized states. These mental states are not observed at the microscopic level nor can they be derived from exclusive scrutiny of the microscopic elements. (For an independent contemporary affirmation of this stance see Rumelhart & McClelland, 1986, pp. 127–128.) Accordingly, it is at a molar level of description that commonalities will be found between mental states and the states of a physical system (such as the brain).

The appropriate descriptions will be in the language of dynamic structures. The description of such structures refers to "a functional aspect of processes, to the distribution of such processes, a distribution which they assume, and may also maintain, as a consequence of the dynamic interrelations or interactions among their parts" (Köhler, 1969, p. 92). The postulation of commonness of structure between the mental and the physical was expressed in the doctrine of psychophysical isomorphism. In its narrow construal the doctrine has been taken to refer to a hypothesis about the relationship between perceptual (mental) facts and brain (physicochemical) facts. It is supposed that the structural properties of the percep-

tual world resemble the properties of brain processes that are correlated with them. The paradigm case of isomorphism involves simplicity: "perceptual distributions assume regular and simple structures, [and] the same happens to the distribution of corresponding brain processes" (Köhler, 1969, p. 90). Continuity is another example: "Continuity is a *structural* trait of the visual field. It is also a *structural* fact that in this field circumscribed particular percepts are segregated patches, figures and things. In both characteristics, we have found, the macroscopic aspect of cortical processes resembles visual experience. To this extent, therefore, vision and its cortical correlate are isomorphic" (Köhler, 1938, p. 217).

The claim that there is a resemblance between structural properties of perceptual fields and correlated cortical processes is straightforward enough. Everyone would agree that there is an intimate relationship between perceiving and cortical properties, and the hypothesis that the relationship is characterized by isomorphism is not implausible. Certainly it retains adherents today (1990), as well as detractors (Uttal, 1978, pp. 360–361). The Gestaltists did not, however, limit their hypothesis to explanations of perceptual organization; they included mental states involving meaning and normativity. An example is what Köhler called "requiredness", by which he meant the sense that a state or event is right or wrong: "From the phenomenological point of view requiredness involves *acceptance* or *rejection* of one thing by another or by a context of others. The thing which is accepted or rejected *fits* or *fails to fit* given conditions" (1938, p. 335). Köhler contended that physical forces provide a precise counterpart to such requiredness: "quite apart from their thoroughly dynamic nature, requiredness and forces occupy structurally identical positions in their respective contexts ... This structural resemblance extends ... to the *dynamic* characteristics of demands and forces. To repeat: We find that 'dynamic maintenance within a balanced state' is the homologue of 'acceptance within a phenomenal context'; that the 'positive pressure' of forces which point toward increased balance is the homologue of a 'positively correcting demand' in the with total success:

> For the moment I see no possibility of applying the concept of isomorphism to, say, phenomenal color on the one hand and microscopic chemical events in the brain on the other hand. Monism in the historical sense is not disturbed by such difficulties; it postulates an identity even though in experience there is a striking dualism. I have no interest in any Monism of this kind. Colors and many other phenomenal qualities appear to me as different from all the microscopic and macroscopic processes with which the physicists deal. Why, then, should we conceal this fact behind the name of a metaphysical doctrine that expressly denies the fact as such? If we did adopt this name it would merely make us ignore a particularly intriguing problem of natural philosophy. To be tranquilized by the familiarity of a term is not a commendable attitude. (1938, pp. 412–413)

Köhler is unwilling to sacrifice the facts of phenomenal experience to the programmatic interests of physical or physiological explanation.

The Gestaltists set physiological reduction as a goal, but were willing to

acknowledge in advance that the goal may be unattainable. They thereby avoided the typical reductionist habit of making final claims about the relationship between phenomenal experience and physiology in advance of actual explanatory results. In our view, this programmatic form of reductionism resulted from the Gestaltists' application of methodological naturalism to temper the excesses of materialistic naturalism. In agreement with materialistic naturalism, they insisted that ultimate explanations must be couched in the language of physics, albeit a language that has been expanded to include Gestalt physicochemical properties, and so to include organizational and dynamic properties that are precise counterparts of some mental states. Yet they also conceded that some questions about phenomenal experience are difficult to reconcile with even this vocabulary, and they refrained from preempting those questions through premature metaphysics. Here, they adopted the position of methodological naturalism in delimiting the domain of psychology (see Köhler, 1944/1971, p. 363): its domain includes all facts that can meet the epistemological standards of natural science. Statements about direct experience meet the same standard as statements about physical objects; hence, the facts of consciousness should remain part of the data of (natural-) scientific psychology, even if they are never explained in the canonical vocabulary of physiology. This retrenchment in favour of the facts of consciousness strikes us as admirably bold by comparison with the easy tranquillity of reductive or eliminative materialism.

3. The Gestalt stance and the contemporary scene

The single tenet that most distinguishes Gestalt psychology from the usual outlook in recent philosophy of mind is its phenomenal realism, that is, its insistence that phenomenal experience is real and that natural science should acknowledge this fact outright. Indeed, this tenet serves to distinguish the Gestalt stance from the two contemporary positions that it *prima facie* seems nearest: instrumentalism and functionalism.

Instrumentalism is a pragmatic version of eliminativism. As promoted by Dennett (1978a, 1987), this position denies that mental states are causally active or indeed that they are real in any way at all [3]. Talk of mental states simply takes advantage of a useful vocabulary for systematizing descriptions of behaviour; thus, ascription of sensations, feelings, beliefs and desires to organisms may support useful predictive generalizations. But such ascriptions are of merely instrumental value; they do useful work, but the *as if* stance should not be confused with the *as is* stance. From this perspective, our own descriptions of conscious states are like stories or myths about a fictional being; to the extent that such myths have some basis in the actual conditions of life (i.e. some relation to actual patterns of behaviour), they can serve a predictive function. But the central character in the stories—phenomenal experience—is no more real than the tooth fairy (Dennett, 1978b).

We have seen that, in common with instrumentalism, the Gestaltists deny causal efficacy to mental states as such. Further, they justify the introduction of mental representations by appeal to its systematizing and predictive value: "the relation between the geographical [physical] environment, or the stimulus pattern

[optical input], and behavior is tremendously simplified by the introduction of the behavioral environment [perceptual representations, beliefs] as a mediating link" (Koffka, 1935, p. 34). Nonetheless, they hold that phenomenal experience is real. Because it is real, it can safely be inferred that those brain states accompanied by phenomenal experience must differ physiologically from those that do not. Koffka argued that although the "conscious side of the process does not enter into our causal explanations", it must "be recognized as a fact nevertheless". From this he concluded that "consciousness can no longer be regarded as a mere epiphenomenon, a mere luxury, which might just as well be absent. For in an aspect we do not know, these processes would be different, were they not accompanied by consciousness" (1935, p. 65). States of consciousness are real. Their instrumental value might well be explained by the fact that they in turn reveal real, if not fully known, characteristics of brain physiology.

The Gestalt stance is similar to functionalism in its paired commitments to the ineliminability of psychological descriptions and to the assumption that psychological states are realized in physical systems. But Gestalt theory differs from the most common form of functionalism, the computational or Fodorean variety, in two important respects. First, Fodorean functionalism adopts a symbolist theory of the mind modelled after standard digital computers (Fodor, 1975, Chapter 2; see also Kosslyn & Hatfield, 1984). As such, it is an instance of what the Gestaltists called a "machine theory" of the mind: a theory committed to rigid constraints on the sequential development of psychological processes. The Gestaltists proposed to understand psychological processes as the dynamic outcome of multiple forces: external constraints provided by stimulation, internal constraints of brain structure, and dynamic processes of physiological fields. Gestalt theory is thus closer in spirit to contemporary connectionism than to symbolist theories (Hatfield & Epstein, 1985; Epstein, 1988).

Second, Gestalt theory conceives the object of explanation and the explanatory structure of psychology differently than Fodorean functionalism. Fodorean functionalism takes the object of explanation in psychology to be behaviour (Fodor, 1975, p. 52; 1981, pp. 3–10). It differs from behaviourism in that it posits mentalistically characterized internal processes in its explanations. There are two separate motivations for denominating such processes as "mental": either they are assimilated to a symbolic representational system and are deemed mentalistic through their analogy with natural language, or the processes themselves are treated as microversions of "reasonable" human behaviour (Fodor, 1975, Chapters 1 and 2). In either case, Fodor's position turns out to be a species of what we term "cognitive behaviourism". Cognitive behaviourism describes behaviour in mentalistic terms and seeks to explain behaviour through postulated internal mechanisms that likewise are described in mentalistic terms. But, as critics have noted, it is perfectly compatible with the elimination of phenomenal states (Block, 1978). Cognitive behaviourism differs from original behaviourism in its explanatory vocabulary, but it agrees with its ancestor in taking behaviour to be the explanandum of psychology to the exclusion of phenomenal experience.

By contrast, phenomenal experience entered into Gestalt psychology in two

important ways: (a) as an object of explanation in its own right, and (b) as a source of information about how the organism was related to the environment. In the first instance, the Gestaltists treated the structural properties of phenomenal experience as a candidate for explanation through postulated physiological processes exhibiting psychophysical isomorphism. In the second, they contended that organisms are related to environments not only in virtue of their actual physical relations to the real physical environment (Koffka's "geographical environment"), but also, and importantly, in virtue of their structured perceptual and cognitive representations of that environment. Indeed, they argued that for the purpose of explaining behaviour, the second relation is the more important. *Prima facie*, this point seems similar to the familiar Fodorean dictum that behaviour is best explained when one understands how the organism represents the environment (Fodor, 1975, Chapter 1). But in actuality, the representations Fodor has in mind are linguistic structures inferred from behaviour. The Gestaltists work at a level of description that is at once more general and more fundamental than Fodor's hyper-cognitivized language of thought: they work at the level of perceptual organization, a level characteristic of mental life across a large segment of the animal kingdom, and one that surely must condition conceptual and linguistic representations.

The uniqueness of the Gestalt position lies in its pairing an insistence on physiological and physical explanation with an equal insistence on the reality of phenomenal experience. The Gestaltists understood that on the usual way of understanding naturalism and physiological explanation, this pairing creates a certain tension. Others resolved this tension by advocating unyielding reduction or complete elimination of the mental and the phenomenal. The Gestaltists offered instead a twofold response to this tension. First, with their programme of Gestalt physics and macrophysiological explanation they sought to enrich the explanatory resources of physiology and thereby to render physiological explanation of mental phenomena more plausible. But, second, they also adopted the methodological position that failure to reduce or explain the phenomenal through physiology should not lead to a denial of its reality. They thus avoided the "easy tranquility" of the reductionist or eliminativist who proposes identity or elimination based on the future success of physiological explanations, but in advance of actual delivery of the goods. The Gestaltists adopted physiological reduction as a programmatic goal. They tempered this programme with an insistence on the factuality of phenomenal experience, and they contended that even if the phenomenal cannot be explained physiologically, it must not be denied. The Gestalt philosophy of mind maintains that the facts of phenomenal experience place absolute limits on any future metaphysics of the mind–body relation. It gives priority to the methodology of natural science over the metaphysics of materialism or reduction.

4. A matter of meaning

According phenomenal experience full status has a significant formative influence on the science of psychology. The Gestaltists followed the lead of phenomenal

experience beyond the usual examples of perceptual organization to the matter of meaning.

At the time that the foundations of Gestalt theory were being set, it was the practice, already venerable, to distinguish between two levels of experience that had their origins in sensory stimulation: sensation and perception. The former was an unmediated response of the vision system to optical input; the latter was an elaboration of primitive sensational representations created by drawing on stored knowledge. It is well known that the Gestalt theorists rejected the sensation–perception dichotomy. They could find nothing in ordinary perceptual experience that satisfied the description of sensation nor could they find any evidence in phenomenal experience of a transformation from sensational to perceptual representations. They argued that sensations were observational artefacts, creatures of the favoured methodology of the day, analytic introspection, and that the belief in representational transformation was parasitic on the mistaken belief in the reality of sensations (Köhler, 1947, chapter 3; Koffka, 1935, pp. 84–90).

This is familiar history. Less widely known is that the Gestaltists marked a third category of perceptual experience and that with respect to this third kind they also took up a counterestablishment position. In the traditional bipartite division the reference to perception was reserved for what may be called "simple seeing" (Dretske's "nonepistemic seeing": 1969, chapter 2; 1981, chapter 6). The contents of the perceptual world were the shapes, sizes, colours of objects and their spatial arrangements in 3 space. But, so argued the Gestaltists, if phenomenal experience is consulted and if perceptual experience is taken seriously we must recognize that the experience of seeing includes the perceiving of meanings and values. To "simple seeing" we must add epistemic seeing or "seeing that". In the received view "seeing that" was not a perceptual achievement; "seeing that" was considered a species of cognitive achievement—the product of a cognitive operation of attaching meanings to perceptual representations of physical entities that were inherently meaningless and value-free. The belief that meanings are perceived is grounded in illusion.

The Gestalt theorists could not concur. Consulting phenomenal experience they found no differences that mapped on to the conceptual distinction between "simple seeing" and "seeing that". Meaning and values are perceived as immediately and effortlessly as shapes, colours and spatial layout. Indeed, in a claim that parallels the well-known Gestalt dictum that perception of wholes has priority over perception of parts, Gestalt theory implied that the perception of meaning is more primitive than the perception of sensory qualities: "we must assume that features like 'threatening' or 'tempting' are more primitive and more elementary contents of perception than those we learn as 'elements' in the textbooks of psychology" (Koffka, 1928, p. 150).

In claiming that meanings are immediately or directly perceived, the Gestaltists were careful to explain that in the first instance they are perceived as part of the "behavioural" or "perceptual" environment. Köhler and Koffka each noted that it is common to attribute emotional qualities to external objects, to experience thunder as "menacing" (Köhler, 1947, p. 244) or a landscape as "sad" (Koffka, 1935, p. 326). In so doing, they were not in the first instance attributing these emotional

qualities to what Koffka termed the "geographical" landscape, or Köhler the "physical" object. As Koffka put it, "Sadness and glee, and other characteristics we have employed, apply in these descriptions primarily to *behavioural* objects, and not to geographical ones" (1935, p. 326). Such qualities are "ego-related", in Koffka's terms. However, he did not mean by this that values and meanings are projected onto objects by the perceiver. Rather, they are experienced directly as a property of certain objects. They therefore have the same ontological locus as the standard objects of perception, that is, they reside in the behavioural environment, or the domain of perceived objects. Köhler expressed this point as follows: "value appears as an attribute of things and events themselves rather than as an activity of the self or as the result of such activity. We should therefore falsify our primary observational data if we were to say that the essence of value is valuation. Phenomenologically, value is located in objects and occurrences" (Köhler, 1944/1971, p. 364). Some of these values, such as those associated with a letter box (when one wants to post a letter), can only be the result of learning. But other values—denominated by Koffka as "physiognomic characters"—are intrinsic to objects from our first experience of them. Examples include objects that are naturally threatening or tempting; for some organisms, this will include certain kinds of food, or conspecifics with certain sexual characteristics (Koffka, 1935, pp. 354–363).

In insisting that meaning and value are not constructions of the perceiver it was not intended that consideration of the perceiver is irrelevant to a treatment of meaning. The perceiver enters in three ways (Koffka, 1935, pp. 353–367; Köhler, 1944/1971). (1) Because values are ego-related, the ego or self must be included in the description of the field organization which determines meanings and values. (2) Although the meaning inheres in objects and events the detection of meanings and values will depend on further organizational processes that occur in the brain field of the perceiver; the execution of meaning-appropriate actions will depend on the motivational state of the perceiver, which determines the "demand character" of an object or event: "The things in our environment may tell us what to do with them" (Koffka, 1935, p. 353), but we don't always attend. Given the congruent motivational state the meaning will have a demand characteristic, i.e. will call for specific action. When the action is successfully executed the demand characteristic typically is eliminated but the meaning remains intact. (3) The perception of value and meaning in the behavioural environment is a function of the geographical or physical object and the organism itself. For objects whose value is learned, this perceived value results from the particular history of the organism. But the "physiognomic" values depend on the interaction of the geographic object with the geographic organism: they arise in the interaction between physical object and brain field. This third relation raised the question of the origin of unlearned or physiognomic values. Koffka pleaded ignorance to this question (1935, pp. 362–363). Köhler was more bold. He argued that the unity of science demands that in certain cases the value found in the perceived object is to be attributed to the value property of the physical object itself (1944/1971, pp. 373–374).

We think that the Gestalt observation that value and meaning are found in ordinary direct experience is worthy of attention in contemporary perceptual

science. Let us say quickly that neither the Gestalt theorists nor we assert that all meanings and values are perceived directly. Moreover, as the Gestaltists observed, not all meanings are natural facts and those that are historical facts cannot have their origins entirely in general processes of perceptual organization but must be explained through learning (see Koffka, 1935, pp. 348–350). The Gestaltists did little to describe how this learning takes place. We would further observe that phenomenology does not distinguish between natural and historical meanings. A principled distinction can only be made by individuating the potential natural meanings for a defined perceptual system. Indeed the nature of the perceptual process and the nature of the objects of perception must be coarticulated. Although the Gestalt theorists did not execute the articulatory programme in a very satisfying way they did recognize the requirement to do so.

These remarks lead us inevitably to a consideration of J. J. Gibson's (1979a, Chapter 8) theory of affordances. The theory of affordances is nothing less than an effort by Gibson to redefine the objects of perception or, to put it in the context of the theory of direction perception, to describe the objects of direct perception. It is revealing that Gibson introduces the construct of affordance early in the *Ecological Approach* in the course of developing a new taxonomy of the environment: "The world of physical reality does not consist of meaningful things. The world of ecological reality, at least as I have been trying to describe it, does. If what we perceived were the entities of physics and mathematics, meanings would have to be imposed on them. But if what we perceive are the entities of environmental science, their meanings can be *discovered*" (Gibson, 1979a, p. 33, emphasis in original). So if the environment is defined at the appropriate level, at the level of "ecological reality", meanings will be found to inhere in that reality.

To advance along this line Gibson needs to offer a description of the environment that will support progress. Moreover, the taxonomic principles that rule the description should be explicit so that agreement can be achieved. But in fact, no such set of principles is provided by Gibson. He bases some of his descriptions on conjectures about the effect of ecological regularities on the evolution of perception–action systems in animals. He suggests that organisms have been "tuned" to certain environmental regularities (1966, p. 5 and Chapter 9; 1979a, p. 246), such as the characteristics of walkable surfaces (1979a, Chapters 3 and 8). But often Gibson seems to be guided by the very general rule of describing the environment from the perspective of the environed organism. We cannot shake the impression that the "world of ecological reality" is largely coextensive with the world of phenomenal reality, and that the description of ecological reality, although couched in the language of "ecological physics", nonetheless is an exercise in phenomenology (e.g. J. J. Gibson, 1982, p. 156). Gibson's distinction between ecological reality and physical reality parallels the Gestalt distinction between the behavioural environment and geographical environment.

Gibson would in fact strenuously resist our construal of his enterprise (1979a, pp. 138–139) and others (e.g. Fodor & Pylyshyn, 1981, pp. 148–150) would consider it to be an indictment of his position, but we offer our reading in a friendly spirit. On a number of occasions Gibson (1971; 1979a, Chapter 9; 1979b) has

recognized his indebtedness to Gestalt theory (see also Natsoulas, 1991). And in developing his theory of affordances the Gestalt example has been important again. By taking phenomenal experience seriously, by not falsifying the primary observational data, Gibson was inspired to set his theory on a new course, one that is being tracked by the current generation of ecological realists.

Drawing attention to this commonality between Gibson and the Gestalt theorists serves to highlight again a limitation of phenomenal experience which the Gestaltists recognized from the outset. Phenomenal experience is the source of constraints on the description of the facts of psychology but it provides only weak constraints on the form to be taken by an explanation or a process model. This is manifestly obvious in the present case. We are confident that the Gestalt theorists would have endorsed Gibson's redescription of the environment but we can also be sure that they would have been unhappy with his "resonance" theory of perceiving. And it should be noted that in Gestalt theory phenomenology does not constrain the process model directly, but only once the principle of isomorphism has been assumed.

More generally, it should also be observed that neither the Gestaltists nor Gibson have provided a framework in which all aspects of meaning could be treated with equal success. The Gestaltists propose that their "physiognomic character" has a basis in the Gestalt physical properties of things, but without clearly specifying either general features of such properties or detailed analyses of particular cases. Moreover, they acknowledge that many values and meanings are the result of learning, and they do not shy away from observing that often such meanings are bound up with culturally transmitted traditions. It was their hope to render the study of even this type of meaning into the idiom of their expanded naturalism, yet they admittedly could offer no specific directives about how this might be done (Köhler, 1938, p. 411; Koffka, 1935, pp. 18–21, 676–679). Similarly, Gibson's approach is at its strongest when dealing with biologically constrained affordances, for which stable ecological regularities can be determined. He treats culturally evolved affordances with less success (1979a, pp. 133–135).

Despite these disclaimers, we propose that the Gestalt doctrine that adoption of an appropriate level of description of experience is propadeutic to good psychological and neurophysiological modeling is a doctrine which current cognitive neuroscience would do well to consider. Honest examination of the facts of phenomenal experience can guide the development of physiological hypotheses and can even lead to the discovery of physiological mechanisms. As Julesz remarks (1971, pp. 12–13), in the area of depth perception psychological findings guided the search for physiological explanations. Indeed, Hochberg (1988), writing in Stevens' *Handbook*, has observed that "phenomenology has predicted more of recent neurophysiology than vice versa" (p. 282). We haven't been keeping score but this assertion doesn't seem to us wildly off the mark.

5. Implications for cognitive neuroscience

The growing conviction among contemporary neuroscientists that the brain is a massively interactive self-organizing system would have pleased the founders of

Gestalt theory. And the development of technologies for observing this highly interactive system as well as formalisms for characterizing events in dynamic systems would have been received with excitement. One can only admire Köhler's innovative intelligence and the tenacity with which he sought to evaluate his formulations of brain processes over the 50 years that spanned the publication of *Die Physischen Gestalten* in 1920, his investigations of cortical currents (Köhler *et al.*, 1952), and his final restatement in the 1966 Langfield lectures at Princeton (published posthumously as *The Task of Gestalt Psychology*, 1969). Nor is our admiration qualified by recognition that neither the technological nor the conceptual tools that were available to Köhler were up to the tasks he had assumed [4]. Very few individuals would count Köhler's enterprise as a success. So although the Gestalt model of brain processes may rightly be considered as an anticipation of contemporary developments, Köhler's views cannot be considered as precursors; current conceptions of brain process have not been inspired by the example of Gestalt theory. Nevertheless, there is a fundamental lesson taught by Gestalt theory which ought to be pondered by contemporary cognitive neuroscientists.

Recall that the Gestalt assertion of the commonality between the physical (e.g. brain processes) and the mental (e.g. cognitive phenomena) was not unqualified. The commonalities will emerge only if an appropriate and commensurate level of description and conceptual vocabulary is adopted for both nominal domains. Only when the macroscopic level of description is adopted and the language of dynamical systems is applied will the commonalities which are manifest in virtue of shared dynamics become evident.

If we apply this lesson to the cognitive neuroscience enterprise, we become aware of an important shortfall in current efforts. While conceptions of brain process are undergoing radical reformulation, conceptions of the mental have not kept pace. Various perspectives on the mental may be discerned: (a) Cognitive neuroscientists are naive realists when it comes to the mental; the mental is what it is and it presents itself in obviously articulated form. (b) The description of mental life is taken over from folk psychology. (c) The characterization of mental life is shaped by the adoption of a machine metaphor, e.g. the computer. All of these approaches seem to reflect adherence to the tacit premise that the physical and the mental are independent ontological categories. Consequently, commensurability of level of description is no concern. The immediate aim of the cognitive neuroscience enterprise is to establish correlations between brain and cognition and success in achieving this goal will not be affected by the choice among (empirically adequate) descriptive systems for cognition.

But our rendering of Gestalt theory suggests a contrasting view. Adoption of a framework and vocabulary for describing mental life is a consequential decision for the development of a fruitful cognitive neuroscience. And if the premise of ontological independence of the physical and the mental is abandoned in favour of the assumption of commonality the implication is that we should seek a descriptive system and vocabulary for the mental that will also be natural for the processes in the brain that are the complements of the mental. From a Gestalt perspective, the language of dynamic systems should be applied to

both domains. When this is done there will be the prospect that correlations between brain events and cognitive events may be understood in a principled way by reference to shared dynamics. In the present circumstances of cognitive neuroscience, correlations between brain and cognition often have little force, owing in considerable measure to the absence of a common framework for considering the correlated events.

Can this promissory note be cashed out? We don't pretend to know. But we can point to one contemporary approach to cognitive neuroscience that encourages guarded optimism. Although it has been developed independently of direct Gestalt influence, the framework adopted by Kelso *et al.* (Kelso, 1990; 1991; Kelso *et al.*, 1984, 1991, 1992) is an example of an actual implementation of an approach that is compatible with the general tenets we have attributed to Gestalt theory [5]. Inspired by the theoretical concepts of synergetics (Haken, 1981/1984, 1988), a theory of pattern formation and self-organization in open, non-equilibrium systems, and exploiting the tools and techniques of non-linear dynamical systems, Kelso has been developing and evaluating a framework for cognitive neuroscience which has a decidedly different cast than standard cognitive neuroscience. Both brain processes and behaviour are described in a common theoretical language and the guiding heuristic is that "the linkage between coherent events at the ... neuronal ensemble level ... and events at the 'macroscopic' behavioural level is by virtue of shared dynamics, not because any single level has ontological priority over another" (Kelso *et al.*, 1991, p. 98). Although Kelso's early assessments involved motor coordinative structures, more recent empirical investigations have included studies of visual and auditory (speech) dynamic pattern perception, effects of intention, and aspects of learning (summarized in Kelso, 1990).

It may need be said that while we find Kelso's programme to be appealing the foregoing cursory exposition is not in fact intended to promote Kelso's programme. We have introduced it to serve in the manner of an existence demonstration, that is, to show that there exists at least one programme which is compatible with Gestalt theory and that is yielding a promising return. But a specific implementation is not to be confused with a general metatheoretical premise, and it is the metatheoretical premise which we have gleaned from Gestalt theory, concerning commensurate description, that we wish to bring to the attention of contemporary cognitive neuroscience.

Epilogue

Gestalt psychology gives pride of place to immediate or direct experience. We find this tendency salutary. The Gestalt conception of such experience must, however, be distinguished from another conception of phenomenal experience—and of the mental more generally—that has received much criticism of late (only some of which has been deserved): that of folk psychology. The Gestalt penchant for unvarnished phenomenal experience as a starting place for psychology must be sharply distinguished from so-called folk psychology. According to its critics, folk

psychology is an implicit theory of human behaviour that describes and explains such behaviour using "folk" categories (see Churchland, 1986, Chapter 7). The paradigmatic folk psychological explanation explains behaviour by attributing beliefs and desires to behaving subjects. In its most objectionable form, folk psychology allegedly treats ordinary or "folk" attributions of mental states as incorrigibly correct, and hence as immune from revision in light of scientific findings. These "every-day" descriptions are taken as authoritative and hence as determinative of the domain of the mental.

The Gestalt attitude toward phenomenal experience differs on two counts. First, by contrast with folk psychological attributions of mental states, the Gestaltists don't treat the attribution of phenomenal states as explanatory; they reserve the power of explanation for physiology. Second, the Gestaltists don't treat any one description of phenomenal experience as authoritative. They were realists about perceptual organization: they believed (and rightly, by our lights) that perceptual states really are organized into wholes, which they termed "*Gestalten*". However, they accorded fixed reality to the perceptual states themselves, not to the investigator's descriptions of them. Thus, they were willing to introduce and revise descriptions of organized experience, including their "field theory" of perceptual organization (Koffka, 1935, Chapters 4–7). As a description of phenomenal experience, field theory was an attempt to describe an aspect of that experience in such a way that it could be explained by posited field events in the brain. As a description, field theory could turn out to be inadequate to the facts of actual perceptual organization, just as postulated brain processes could turn out to be inadequate to explain perceptual organization. The Gestaltists were fully prepared to develop and test a variety of descriptions of organized experience.

In suggesting that the Gestalt philosophy of mind, with its emphasis on phenomenal experience, contains something of value for contemporary research, we are not endorsing the folk psychological stance. But in opposition to the most vocal critics of folk psychology, we are endorsing the phenomenal realism of the Gestaltists. Anything else seems like a denial of plain facts.

Acknowledgement

Notes

[1]   Koffka (1935) and Köhler (1920, 1938, 1947) provide the most sustained and coherent articulations of a Gestalt philosophy of mind. But it should be noted that from early on Wertheimer (1912) expressed the goal of non-local physiological explanation.

[2]   Lest the reader judge that this second conception of naturalism is circular in a way that the first is not, we observe that materialistic naturalism is defined with reference to physics, which itself may be thought of as the "the science of nature", or "the most basic natural science". Application of each of the proposed criteria thus requires an antecedent ability to apply a notion of *nature* or *natural*; the distinction as stated simply contrasts two criteria of the natural, but does not attempt to define "the natural" in a neutral vocabulary.

[3] Dennett (1987) attempts to qualify his instrumentalism by comparing belief and desire attributions with abstract calculating formalisms in physics such as centres of gravity. We believe that the comparison is not apposite, but in any case Dennett still maintains that on his view, it is not true that organisms literally have mental states (1987, p. 72).

[4] As illustration, on the technological side compare the crude devices available to Köhler with the power of the multisensor SQUID (Superconducting Quantum Interference Device) which allows direct measurement of intracellular dendritic current flows over large areas of neocortex. On the conceptual side there have been advances in the physics of non-equilibrium systems as applied in current formulations that were not available to Köhler.

[5] There are important differences between Kelso and the Gestaltists. We cannot remark on the implications of these differences. For example, Kelso's models provide detailed specifications of vector fields and phase transitions. Nevertheless, we would like to comment on one apparent difference between the foundational premises of Gestalt theory and Kelso's approach. As we have remarked the Gestaltists assigned special status to the macroscopic level of analysis. Kelso might seem at odds with Gestalt theory in this respect: "understanding is sought not through some privileged scale of analysis but within the more abstract level of essential, biologically relevant variables and their dynamics regardless of scale or material substrate. There is no ontological priority of one observational scale over another" (Kelso et al., 1992, p. 399). Kelso's position is that regardless of the level of analysis the concepts of self-organization and the language of dynamics apply. However, we suspect that the Gestalt theorists would not take exception to Kelso's position. The dynamics of systems will be observed only if the macroscopic style of analysis is adopted (as the Gestaltist insisted) but what is taken as macroscopic will depend on the stratum that the scientist chooses to scrutinize. The Gestalt doctrine may be read to mean that at all strata the macroscopic style of analysis will be privileged; that is, this style will reveal significant characteristics that will be missed if the microscopic style is adopted. Moreover, at all strata, the same system principles will apply. The emphasis in Gestalt theory on the commonality between biological and non-biological physicochemical events is grounded in the belief that there are common principles of organization that are multiply instantiated in these nominally distinct domains. On the foregoing interpretation of Gestalt theory the positions of Gestalt theory and Kelso may be closer than appears.

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