

MUSIC, THINKING, PERCEIVED MOTION: The Emergence of Gestalt Theory

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Histories of psychology typically assert that Gestalt theory began with the publication of Max Wertheimer's 1912b paper on the phi phenomenon, the compelling visual apparent motion of actually stationary stimuli. But a holistic perspective was already a part of Wertheimer's upbringing, and it was strengthened by his studies with Christian von Ehrenfels and Carl Stumpf. Wertheimer's first paper with a clear Gestalt orientation, based on work in Stumpf's Berlin Phonogram Archives, was actually published in 1910 (Wertheimer, 1910); it concentrated on the sophisticated sensitivity to structural features of melodies in the "primitive" music of the Vedda. A long article by Wertheimer published in 1912a before the phi paper contains dozens of examples of structurally insightful thinking processes in the everyday use of numerical concepts by aboriginal peoples. The first explicit published reference to "M. Wertheimer's Gestalt theory" occurs in a lengthy footnote to the opening sentence of a 1914 monograph on the Christian personality by Gabrielle Countess von Wartensleben (1914). The core of Wertheimer's Gestalt theory is not that the whole is more than the sum of its parts as von Ehrenfels had proposed in 1890, but that the whole is entirely different from a mere sum; it is prior to its parts. The nature of the whole determines what its parts are, and determines each part's place, role, and function within that whole.

Where did Gestalt psychology come from? What were its origins? Most histories of psy-

chology declare that it started in perception, because the Gestalt theorists considered sensory and perceptual psychology as the stronghold of the rival then-dominant Wundtian approach to psychology. And Max Wertheimer's 1912(b) paper on the phi phenomenon is widely viewed as the document which "founded" the Gestalt school. The paper dealt with apparent motion, the compelling perception of movement when the stimuli are in fact two stationary successively exposed objects a short distance apart.

Does this account fit the historical record? Only to a slight extent. A closer look suggests that Gestalt theory has a more complex background, rooted in a holistic tradition that can be traced back thousands of years, in musicology, and in the psychology of thinking.

Consistent with the theme of the celebratory centennial symposium honoring Max Wertheimer, one may accept for now the view that it was he (later ably aided by his colleagues Wolfgang Köhler, Kurt Koffka, and eventually others) who deserves the title of "Founder of Gestalt Theory." How and when did the Gestalt approach emerge in the thought of this young central European scholar who was born in 1880 in Prague, then part of Austria-Hungary?

Early Greek culture contributed a holistic perspective that has imbued aspects of the philosophical orientation of Western thought for millennia. Such a perspective was also part of the everyday *Weltanschauung* of the late nineteenth-century Jewish subculture within which Max was raised. The universe was seen as a complex dynamic structure characterized by order, reason, and purpose. Its parts are all interdependent and interactive. The parts of any whole are in a dynamic equilibrium and are incomplete in isolation; each part must be understood *as* part of the whole to which it belongs.

This holistic bent was bolstered by Max's studies at the University of Prague with Christian von Ehrenfels, who had published a mono-

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graph in 1890 on what he called Gestalt qualities: qualities of wholes that exist in addition to the sum of the elements, the parts, of a whole. The whole, Ehrenfels insisted, is *more* than the sum of its parts. A melody is the sum total of the notes composing it, *plus* the theme of the melody.

A square is not just the sum total of four equal straight lines plus four right angles, but those eight “elements” plus one more: squareness. Rotate the whole diagram by 45 degrees and it becomes a different whole, a diamond. The constituent initial elements are the same lines and angles as before, but now the additional element, the Gestalt quality of diamond, is different. And you can even change every one of the elements but retain the same Gestalt quality, as when you transpose a musical melody to a different key; now all the elements, the specific notes, are different, but the melody is recognizably the same.

Then at the University of Berlin, Wertheimer encountered Carl Stumpf, whose phenomenological approach also emphasized the holistic qualities of mental phenomena, including the making and the appreciation of music. Wertheimer joined Erich von Hornbostel, at the time Stumpf’s assistant, in working at Stumpf’s phonogram archives, a rich collection of samples of music from around the world. (Indeed von Hornbostel is now recognized as the father of ethnomusicology, the study of the role that music plays in cultures throughout the world.) Wertheimer’s work at the phonogram archive during the first decade of the 20th century led to his first publication with a clear hint of Gestalt thought in it. He had published a few scholarly articles before, but none of them had the Gestalt tinge which clearly permeated his 1910 paper on the music of the Vedda, a so-called “primitive” tribe in Ceylon, now Sri Lanka.

Far from considering Vedda songs primitive or unsophisticated, as a previous psychologist had characterized them, Wertheimer begins by admiring the structural features inherent in the music. He describes the way in which earlier parts of a melody set up requirements that are fulfilled in later parts, and other ways in which the melodies have a clear structure. He discusses what he calls the rhythmic-melodic construction of songs, the articulation of which follows specific structural rules. The music consists of “patterns that are rhythmically and me-

lodically strict.” Although it is not often identified as such, this paper could be considered the first published instance of the Gestalt approach to a problem.

The Gestalt perspective appears still more compellingly in Max Wertheimer’s 1912a article on the numerical thinking of aboriginal peoples. This 67-page paper focuses on the use of numbers and “number structures” (Zahlgebilde) in the thought of so-called “primitive” people from many parts of the world. Wertheimer admires the ingenuity and usefulness of ways in which their numerical thinking transcends the automatic and bland use of quantitative concepts typical of western society. He does not ask what features of industrial society’s use of inert numbers aboriginal numerical thinking displays; that is much too ethnocentric. Rather, one should ask what thought systems are used in this or that specific case, for what specific purpose. What does this way of thinking achieve?

The 19 sections of the paper deal with many concrete examples from many different cultures. They range from such simple matters as that, although one horse plus one horse equals two horses and one person plus another person equals two persons, one person plus one horse may equal a rider, to such intricacies as a builder’s conception of how many pieces of what kind of wood, of what width, length, strength, and size, are needed to frame a hut. Often approximate quantification is more appropriate than counting (as in grains of rice for a meal); such concepts as a bunch, a handful, roughly so or so many make good sense. To mention just one of the dozens of issues he explores, consider the successive division of a chain eight rings long. If I divide it in half, I have two chains of four rings each. If I divide those, I have four batches of two rings each. Still a chain? How about dividing in half again? Clearly there is no longer a chain but eight separate rings. And with one more division in half, what do I have? Sixteen C-shaped pieces. The idea of a chain is long gone.

There is no need to elaborate further on this article—published several months before the 1912b paper on the phi phenomenon—because Riccardo Luccio (2012) of the University of Trieste showed how replete with Gestalt thought this early largely neglected article truly is.

For Wertheimer a structured whole, a Gestalt, is not merely *more* than the sum of its parts, but

fundamentally *different* from the sum of its parts. To repeat, the whole is *not* “more than the sum of its parts”; the whole is entirely *different* from just a sum of its parts plus something else. It is *prior* to its parts. It is the whole that determines the nature of its parts, on the basis of each part’s place, role, and function within that whole. This has nothing to do with summation of parts. A whole is not equal to the sum of its parts. But it is not more than the sum of its parts either. It precedes its parts and by its own nature determines what its parts are and what their attributes and interrelationships must be.

Next comes Max Wertheimer’s 72-page paper of 1912b, on his extensive experimental studies of the seeing of motion, the one usually viewed as having launched the Gestalt school. There is no need to elaborate on this article either, since it has been thoroughly discussed by many commentators already.

The notion of a “Gestalt theory” as such existed only orally until 1914. In that year, Gabrielle Gräfin (Countess) von Wartensleben published a somewhat obscure 71-page monograph entitled “The ideal Christian personality: A description from the perspective of psychology” [“Die christliche Persönlichkeit im Idealbild: Eine Beschreibung sub specie psychologica”]. The author had obtained her PhD from Friedrich Schumann at Frankfurt the year before, had begun teaching there, and had held many conversations with Wertheimer. The first sentence of her monograph reads, “The word personality, one of the weightiest, most problematic words in the language, means—from a psychological point of view—neither more nor less than a Gestalt of a particular kind, in the proper and absolute sense of the word.” The word “Gestalt” in that sentence bears a superscript No. 1, and lengthy footnote 1 fills most of the next few pages. In it she refers to “M.

Wertheimer’s Gestalt theory,” and presents many of its principles in rudimentary form.

And that is the story of the origin of Gestalt theory, as told by the historical record. Its basis in part in perception is undeniable, but its roots lie not only in perception, but also in a generally holistic *Weltanschauung*, in musicology, and in the psychology of cognition.

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