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Jan Strelau
Faculty of Psychology
Warsaw School of Social Sciences
and Humanities, Poland

BIOLOGY—PSYCHOLOGY:
INTEGRATION FROM THE PERSPECTIVE OF NATURAL
GESTALT PSYCHOLOGY AND THE SYNERGETIC APPROACH
COMMENTS ON L.A. PERVIN'S PAPER

The currently debated relationship between biology and psychology seems to be similar to the one which Max Wertheimer, the founder of gestalt psychology, experienced during his time of studies. Kurt Koffka (1935, p. 18) mentioned that Wertheimer wrote his doctorate dissertation during a climate of dilemmas plaguing German psychology. On the one hand, for him it was an attractive psychology performed according to the methodological assumptions of physics and physiology in W. Wundt's experimental laboratories, on the other hand he did not want to resign from the German idealistic tradition and its intellectual climate of *Geisteswissenschaften*, the humanistic and moral sciences dealing mostly with understanding the meaning or significance of culture.

Perceiving the merits and faults of both sides, as Koffka (p. 20) states, Wertheimer devoted his efforts to re-examination of the fundamental scientific concepts which are specific for each of the respective scientific fields: physics, biology and humanities. Next, he searched for the foundations of their integration on the basis of psychology as a science of the behavior of living beings. In this way he discovered that for physics, the *quantitative* approach is specifically used to research the properties of matter and energy. On the other hand, in biology, this function is fulfilled by the category of *order* in organizing organic processes and the development of life, and in humanities it is the category of *meaning* or *sense*.

Wertheimer (1912) claimed that the preferred mode of thinking in the European culture of the idea of universal *transferability-abstractness* is at the basis of difficulties in integrating these three research approaches. In these relations, one grasps the formal properties of objects and phenomena according to abstract concepts (number, measure or reasons), which are at the same time isolated from their natural environment. As a result, complex structures are treated as either a random result of the organization of the originally meaningless—*raw data* elements of the composition (the materialistic or vitalistic approach), or as the effects of external mystical organizing forces (the spiritualistic approach). Each of these approaches, if it is practiced separately, according to Wertheimer, has a reductionism tendency.

However the complex structures occurring in nature are significant only in their natural groups and relationships between their parts and the whole which they create, Wertheimer claimed (1912/1974, p. 266). For example, such natural groups as a pair of eyes, hands or legs are based on the biological symmetry and mutual *use-relationships* for performing their appropriate activities.¹ At the basis of the properties of such natural structures (*Gebilde, Gestalt*) is not just some uniformity of identical objects, but such kind of unity of different objects which, *belonging together*, co-create a functional whole.

Koffka (1935) mentioned that while participating in experiments carried out in 1911 by Wertheimer, he was impressed by the hypothesis of the Professor: “Let us think of the physiological processes not as molecular, but as molar phenomena. (...) For if they are molar, properties will be the same as those of the conscious processes which they are supposed to underlie. And if that is so, our two realms, instead of being separated by an impassable gulf,

¹ Another of Wertheimer’s examples: a horse + a man → rider, horse + horse → two horses; dog + cat → animals, or → enemies.

are brought as closely together as possible with the consequence that we can use our observations of the behavioral environment and of behavior as data for the concrete elaboration of physiological hypotheses.” (p. 56)

Koffka continues to note that within the field of this research trend, Köhler (1920) tried to show that physical processes are also of a molar nature. Koffka counted out that their viewpoint in this matter differed from the assumptions of E. Tolman’s molar psychology, who maintained that physical as well as physiological processes are originally of a molecular nature, and only in the second place—a result of the relationships and processes occurring between them and their transformations, when the whole with new molar properties emerges.² Finally, according to Koffka (p. 27) the most general statement about that kind of *molar behavior* is that “it takes place in an environment, whereas molecular behavior takes place within the organism and is only initiated by environmental factors, called the stimuli.” Similarly, Wertheimer (1925, p. 6) emphasized: “The stimulus-sensation connection must be replaced by a connection between alteration in the field conditions, the vital situation, and the total reaction of the organism by a change in its attitude, striving, and feeling.”³

Moreover, Wertheimer and Koffka crated foundations for the description of natural gestalts in terms of the principles of their differentiation and structural organization. It is believed that the natural gestalts have parts, which (a) are relatively independent holistic units directly participating in creating a functional whole, (b) are diverse—gestalt is “a unity in diversity” (*Unitas multiplex*), (c) are distributed in natural dimensions for a given gestalt (for example, an animal or a human), and (d) are organized according to one common superordinate principle (cf. Uchnast, 1994).

² Cf.: “In spirit I remained an associationist and even though I was convinced that the whole to some degree determines its parts, however I judged that these wholes were acquired in the process of learning, and not autochtonically given.” (Tolman, 1959, p. 95)

This type of understanding of the whole is currently accepted and popularized in the trend of cognitive psychology. For example, according to M. Kofta and D. Dolinski (2000, p. 565): “If it were not for the operating of special psychological mechanisms in us, ensuring the integration of our person, then—being unceasingly bombarded by new information and confronted with new experiences—we would most certainly ‘break-down’ into structures and processes unrelated to each other.”

³ Accepting Wertheimer’s emphasis on the differences between molecular and molar approaches in psychology of behavior one can better understand the basis for the increasing crisis in the relations between biology and psychology. Indeed, this problem apparently escalates critically for psychology when biological science is reduced merely to neuroscience or neurochemistry.

According to Koffka, that type of natural gestalt can be described in terms of three basic categories of the scientific approaches, i.e. quantity, order and meaning. For this reason, gestalt psychology can comprise the basis for integrating the approaches practiced in physics, biology or humanities. In addition, according to Wertheimer and Koffka, the organism and its direct *behavioral environment* is treated as a part co-creating life events, the gestalt, the living individual whole (cf. Uchnast, 1994, 1995). That is due to the human predisposition and natural competence of self-awareness and consciousness of one's own experienced world that from which the *Great Ego-field gestalt* is formed (Koffka (1935, p. 421). In continuing this way of thinking, it ought to be mentioned that man reveals not only the ability to experience the surrounding world and adapt to it, but also to create his/her world according to the values and convictions recognized and accepted by him/herself, the world of material and spiritual culture, which makes it possible to actualize the uniquely human abilities on personal, community and social dimensions.

Therefore, the psychological analysis of the structure of the *natural great gestalt* (organism—living being—environment—experienced world) ought to fulfill the four requirements formulated above (a, b, c, d) for differentiating the parts in the natural gestalts. Of particular importance in this respect seems to be fulfilling the fourth requirement (d), which is fulfilling or, in case of the human being, mastering of the superordinate principle of self-organization as a functioning whole in a given lived world.

As the basic and original principle of organizing the natural gestalt, one can distinguish the principle of a synergic relationship between its diverse parts in the aspect of obtaining new functional qualities of a given gestalt, which are not contained by their component parts. In this way, a pair of eyes or hands, treated by Wertheimer as an exemplary gestalt, possesses a natural disposition to function synergistically while performing activities, which make them possible to obtain a new quality of the perceptual or motor activity: perceiving the perspective or also perfecting the precision of making contact with and manipulating objects. Similarly, the principle of creating synergetic interpersonal or social relationships can be acknowledged as a natural human accomplishment, which can ensure the quality development of a culture of individual and social life in the experienced world (cf. Maslow, 1964; Uchnast, 2008).

In summary, it seems that the critical evaluation expressed by L. A. Pervin of the increasing tendency to introduce division between biological and psy-

chological sciences is completely justifiable. Contrasting these research fields or even striving for their complete division can be damaging to each of them.

Nevertheless, Pervin's proposition concerning the need to specify the levels of research competency as to the principles of describing and explaining the relationship between the respective levels of the description in the area of particular academic fields seems to have a character of compromise rather than a creative resolution to the issues debated. Referring to the quality of emerging properties of the structures of the higher levels in relation to the lower ones does not seem to have a sufficiently fundamental base, since the proposed process of clarifying is limited to describing the cause and effect relation between the distinguished levels of the psychological or biological description.⁴

Meanwhile in the psychology of natural gestalts one not only speaks of levels but rather about dimensions (i.e. biological, psychological, personal, and social), which participate in organizing adequate human functioning in the experienced world. The emerging properties of the activities performed have their basis in the synergic quality of the relation between the physiological structures differentiating among themselves and next between the functioning whole of physiological structures and psychic structures. In this type of approach one could describe the meaning of the functioning organization of the neuro-physiological structures in relation to behavior and its variability in respect to the properties of the available *behavioral environment* of given types of living beings. This perspective emphasizes significance of the systematic research on the quality of the environment directly available for the studied living beings and quality of the directly experienced world and its function in organizing the behavior of the human being as agency subject in a lived world.

⁴ Cf. I would like to add a significant Michael Polanyi's (1968) statement: "The natural world consists of a hierarchy of 'levels' that can be identified empirically in relation to distinct 'boundary conditions' that impose more or less inclusive constraints on the laws of nature. Each level works under principles that are irreducible to the principles governing lower levels. Thus, the 'laws' governing the properties of DNA are not reducible to the laws of physics and chemistry. Nor are the principles governing morphogenesis reducible to those that govern nucleic acids."

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Zenon Uchnast
Department of Psychology
WSB-NLU in Nowy Sącz, Poland