Original Contributions - Originalbeiträge

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Gestalt and Movement between Music and Dance

This contribution starts out from several stimulating thoughts that Christian von Ehrenfels presented in his classic study dedicated to the *Gestaltqualitäten*. Among these stands out the exemplary case of *melody*, compared with other types of Gestalt belonging to different sensory fields, primarily the visual. In this regard, the attention paid to dance is particularly instructive. We will therefore present some research perspectives, both artistic and scientific, which, starting at the end of the nineteenth century, enriched the epistemological framework related to the spatial and temporal dimensions of movement. With these perspectives, we will indicate the role of acoustic as compared with visual perception, which is also evident in the experimental and psychological investigations of our own times (Figure 1).

The famous essay by Christian von Ehrenfels, *Über Gestaltqualitäten* (1890), opens up, as is well-known, an important seam not only in the psychology of perception but also of aesthetics, of the psychology and philosophy of music, art and language. Here, in fact, the form understood as ‘Gestalt’ is something concretely audible and visible and not simply a formal abstraction. It is about a

Fig. 1: Christian von Ehrenfels (1859–1932).

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pioneering programme, rich in ideas and original connections. The author does not mean simply to define the meaning of the concept of Gestalt, but he also sets out a fertile variety of extraordinary applications. In the first place – following a suggestion of Ernst Mach's (1886) – he indicates an application in the field of music, in particular in the exemplary case of melody. Melody is perceived as a unity of a new kind (not simply summative) through the succession of sounds. These are necessary but not sufficient in themselves, since melody as a 'Gestalt quality' can be made with different sounds by transposing that melody to a different scale. Let us consider, by following Ehrenfels's suggestion, the dialectal folk song 'Muss i denn, muss i denn zum Städle hinaus'. In the key of C-major, it contains the notes from E (Mi) to A (La) (Figure 2).

However, in the transposition into F-sharp, we come across completely different notes: A-sharp (La diesis), B (Si), C-sharp (Do diesis) and D-sharp (Re diesis). Therefore, we have two compositions formed by different elements that, nevertheless, produce the same melody (Figure 3).

As will later be said: 'The whole is different from the sum of its parts'. It is clear that the author gives importance to the connection, to the relation between the parts and therefore to the interval between the notes as regards the content of the individual note. Hence the following subject: what does it mean to recognise to remember a melody? It is important to remember the Gestalt as a succession of sounds and not as the sum of individual sounds.

When considering tertiary qualities being used as a powerful evocative tool, we see that the timbre difference in orchestration is of great importance: the same musical theme – let us think, for example, of Wagner's *Leitmotive* – despite its unique and distinctive relationship to a character or situation – takes on different expressive shades depending on which instrument is used to 'expose' it. Similarly, the choice of particular orchestral sound clusters has an effect on the audience's listening experience, as it causes a certain kind of emotional responses: in a way

that we might define as both physiological and cultural, these responses are related to the representative models of the canons that had been practised and codified by Western art music.

Hence, as P. Cornelius and E. Mach already suggested, to correctly reproduce a note, for example – as the author suggests – a rising fourth, it is useful to keep in mind the melody of the overture to *Tannhäuser* which, in fact, begins with this interval. Indeed, this approach, recommended by philosophers, was put into practice by singers. This way, recalls Ehrenfels, a friend of his was able to produce a C-major with greater certainty by recalling the prelude to the first act of the *Meistersinger* or the D flat major which in return recalls the *Walhall* motif also by Wagner, Ehrenfels' favourite composer, rich in evocative harmonies. Here is where the apparent difficulty in reproducing absolute notes lies, where one can 'retrieve' them by re-invoking certain melodies. These last, in the area of acoustic temporal sequence, represent 'timeless forms' of immediate understanding and impact.

In this sense the melody, as a temporal Gestalt, is a more fitting illustration of Gestalt than a spatial Gestalt (e.g. of a geometric figure). Melody, being a temporal Gestalt quality, expresses to the maximum degree the principle of 'transposability', which turns out to be a fundamental criterion of totality and therefore plays an essential role. According to the Ehrenfelsian classification, there are the timeless Gestalt qualities, such as timbre, chord, etcetera, which come closer to the visual-spatial qualities (e.g. one can talk about 'the harmony of colours'), but in this case the transposability principle is not as noticeable. Ehrenfels, in fact, stated:

The vast variety of timeless Gestalt qualities that the eye can perceive is relatively limited compared to our capacity for grasping the temporal ones which, one could say, almost add a new dimension to the former. At least, in the gathering of temporal segments of changes in an overall image, hearing is greatly superior to sight (von Ehrenfels, 1890, p. 270).

But in other cases, as for instance in the case of perception of movement, both temporal and spatial, Gestalts are admitted. A characteristic example is provided by dance. Here each movement possesses an expressive quality: a fluid movement, broad, leaping, circular and so on. However, it is not stated that the Gestalt quality has the same characteristics in every sensory field: according to Ehrenfels the acoustic-melodic Gestalt, with its succession of sounds, can be more easily recalled to memory than the dancing Gestalt, with its succession of steps.

Ehrenfels proposed the example of a ballerina who performs a succession of non-repetitive movements, articulated on the basis of the sound of a melody. Many listeners who suggested the author would now be able to recall the melody after having only listened to it once, but very few would be capable of repeating the movements performed by the ballerina during that melody (Figure 4).

Fig. 4: Image from the ballet 'La Bayadère' (L. Minkus).

The composer of the *Bajadera* ballet, Ludwig Minkus, formerly a violin virtuoso in Vienna, became, after his transfer to St. Petersburg in 1853, an orchestral conductor and author of ballets, beginning a fruitful collaboration with the renowned choreographer, Marius Petipa. It is interesting to observe how, in the context of nineteenth-century romantic ballet, Minkus's production developed by carrying out the specific indications of the choreographer who established the movements on stage. It was often necessary to suggest different versions of a single step or a sequence of steps, so as to be able to then pick the most suitable one. This way the musical structure had to be based on a predetermined number of bars, while maintaining, however, a high-quality melodic inspiration.

In this article, we shall investigate the comparison between sound movement and visual-gestural movement, and we shall also be discussing the matter by having recourse to the experience of professional dancers.

These Ehrenfelsian observations, moreover, date back to a period at the turn from nineteenth to twentieth centuries, particularly important for the evolution of dance, which releases itself from the canonical academic tradition and goes in search of new modes of expression and experimental techniques. The study of the body in movement is very important and crucial in the dynamic dramaturgy of the dancer. Among the many artistic and cultural aspects that characterise the modern dance, the 'scientific' study of a dance movement that refuses encoded grammar and searches for new solutions turns out to be very relevant, so not only an appeal to aesthetic intuition, but also to the collaboration with technical-scientific experimentation.

The proposal of the American dancer Loie Fuller, who developed a dance technique greatly in tune with Etienne Jules Marey's studies on movement, was exemplary from this point of view. She was born in Illinois in 1861, was devoted initially to the Skirt Dance, and discovered in New York the so-called 'serpentine

Fig. 5: Loie Fuller in serpentine dance costume, 1898.

dance' that was subsequently replicated and enriched in the theatres of Paris, where the scientist Marey analysed it (Rinaldi, 2006/2007). It involved a circular motion of an ample thin silk skirt which, when lifted up into the air, acquired the magical consistency of a spiral. With the help of some sticks hidden under increasingly large silk garments, she created extraordinary kinetic figures (Figure 5).

The aim of the rhythmic movement of the garments, achieved by a series of steps and pirouettes, was to enhance the lines of the movement with spectacular visual results. To achieve this it was important, as Marey suggested, to make use of dark backdrops in order for the peculiar undulations of movement to appear as clearly as possible, using a suitably placed moving light. It is superfluous to recall, in this regard, Johansson's (1950) renowned experiments, more than half a century later, related to the expressive quality of movement with a play of lights on dark backgrounds.

Johansson's (1973) method, devised to study organic movement, is in fact based on the so-called 'point-light technique' that involves luminous markings being applied to the joints of a body in a black body-stocking that will then move in the dark. The movement of the body arranged this way elicits the meaning of the performed action (e.g. walking) and the identity of the subject who executes it. In short, one gathers, with impressive evidence, the *Gestalt* of mobility, both human and animal, and its expressive qualities. Not surprisingly, in Gestalt literature, the tertiary qualities (i.e. expressive) and the Ehrenfels qualities (i.e. all-inclusive) connect firmly. According to Köhler (1929), the scientifically investigated tertiary qualities play a fundamental role in the aesthetic-perceptive comprehension of an event under observation. So in the context of the Gestalt School of Trieste (Kanizsa, Petter, Bozzi, Vicario and others), von Ehrenfels's pioneering work was studied in this twofold light: the scientific-perceptive contribution and the aesthetic one, even though the contribution of this eminent representative of the

Fig. 6: A man pole vaulting. Chronophotography by Etienne-Jules Marey, 1884.

Habsburg *Gestalttheorie* did not fall within an experimental setting, which was only later embarked on by Witasek and, in particular, by Benussi.

How come a scientist (doctor, physiologist, physicist) of the calibre of Marey was so interested in Fuller's creations? As is well known, he was committed – via appropriate equipment, first and foremost the so-called *chronophotography* – to studying the spatiotemporal coordinates of movement, in particular of those dynamic events like marches or dances that the eye could not catch due to the slowness, the quickness, the complexity of the movement itself. It was necessary, then, that the separate, subtle, discontinuous points became a time continuum of the movement (Figure 6).

In 1885, Marey launched a study dedicated to the representation of bodies in motion, by impressing a photographic plate with images in succession, taken at regular time intervals during the course of an action. The distance between the shapes, or their partial overlapping, revealed the speed of movement, slower or quicker according to the wider or narrower distance between the images. The purpose was to determine, with precision, the 'development' of a movement, obtaining a strict visualisation of its spatial and temporal character. This was the purpose of the chronophotographic device, enabled to also capture hard-to-observe phenomena such as liquid waves, smoke, tremors and phonetic structures. His photographs followed the recording of movement itself rather than of objects in movement. Hubermann (Didi-Huberman & Mannoni, 2020) noted that with Marey the curves of the movement become curves in movement. In his work *Le Mouvement*, Marey did not describe movement in geometrical terms but rather as a 'draprie du mouvement', a pleated fabric that rises in the wake of the gait, a movement like an expansion, like a dance. The latter, in fact – according to Hubermann – is not simply, in this case, a body that dances, but space that moves with the body around it. Hence the importance of the drape as an 'accessory in movement', according to Aby Warburg's definition, as well as the importance of rhythm. The latter plays an essential role because it articulates the movement with both that body and that space. The inventions of the fascinating

Fig. 7: Spiral costume from the triadic ballet, 1926.

dancer-choreographer (Fuller) created expansions of movement that interested Marey also for the ‘delayed’ action effect that the drape caused, demonstrating, we could also say ‘pointing out’, what the eye does not see, making the invisible visible. As both Mach and Ehrenfels himself had already noted, there are movements that escape our current observation because they are either too quick or too slow.

The dynamic expansions defined this way inspired, furthermore, Paul Valéry (1923) in his famous work *L’âme et la danse* from which the symbolist poet Mallarmé in turn drew inspiration. Loie Fuller thus became the model for symbolist, futurist, liberty and art-déco avant-garde art, aimed at abstraction when creating new volumes and unexpected shapes. It comes down to a long wave that touches the avant-garde *Triadic Ballet* conceived in 1922 by the painter Oskar Schlemmer, teacher at the Bauhaus school, with decidedly original costumes (Figure 7). As Elmar Holenstein (1979, p. 44) acutely observes in his instructive excursus on the Bauhaus Movement: “Die Wichtigkeit und in einem gewissen Ausmass auch die Art der Funktion wird nicht mehr konkret personifiziert, sondern abstrakt-metaphorisch signalisiert”.

Moreover, Warburg recognised in the choreographic intensity, in Fuller’s ‘intensified gesture’, an Ancient Greek and then Renaissance-style archaeological motif, which he identified with the so-called *Pathosformel* mythically personified by the dancing figure of the Nymph (Didi-Hubermann, 2002). Two antithetical modes of the figurable united therein: the air and the flesh, the floaty fabric and the organic tissue.

On the other hand, it is generally agreed that it is no coincidence that the tradition of Gestalt experimental psychology began in 1912 with Wertheimer's studies, dedicated to the phenomenon of apparent motion or *phi* motion. The latter had already been noted by the Belgian physicist Plateau, who had observed that two spots of light, fixed at a specific distance and switched on in succession according to a specific interval, created the effect of continuous motion of a single light that moved from one point to the other. In fact, it was that stroboscopic movement which the Lumière brothers made famous through their cinematographic work. Nobody before Wertheimer, however, had set up such rigorous experiments and had put forward such an original theoretical interpretation of the same. Regarding the technical aspect, Wertheimer had availed himself of a more advanced tachistoscope model than that of Wundt, which allowed him to correlate with extreme precision the time frame related to the presentation of two stimuli and the distance between them. In this way, he was able to identify the optimal time interval (of approximately 60 ms) and identify different varieties of phi motion. He furthermore asserted the interpretation of that movement as pure movement, without object, phenomenologically described as 'something in motion', a global and dynamic phenomenon, experienced as an immediate datum by an observer. This explanatory hypothesis *de facto* dismissed the traditional psychophysical hypothesis, the so-called 'constancy hypothesis' related to the univocal, constant logarithmic relationship between stimulus and sensation.

To what extent can these new forms of experience, of knowledge, with their parallel theatrical research, and with the contributions of the phenomenological philosophies, as well as Gestalt psychology in its subsequent versions, give us an answer or at least hint at some theories solving the problem so vividly raised by Ehrenfels, on which we initially based our search: namely, why is it easier to pick up and recall an acoustic movement rather than a visual one; why is our perception of music (but also that of natural sounds, laughter, finger-snapping, voices) so much more memorable than our perception of dance or of a simple walk or run?

Ehrenfels, in fact, in underlining the blatant difference between the replica of the melodic movement and the replica of the movement of the dance, put forward the case of a man walking. It is an illusion – according to him – the thought that we are able to see the *entire* continuum of all the positions of the legs, unless specific expedients interfere, as for example the fixation of the course of the body in motion via the simultaneous presence of all the spatial coordinates put together. What springs to mind here is the chronophotographic expedient operated by Marey, and also the experimental expedient created by Max Wertheimer in his famous study on perceived movement. However, Ehrenfels is here

more interested in noting the differences between the visual and the audible, so he annotated:

It is easy to recognize how our perceptive capacity in the auditory area is more extensive, bearing in mind that the duration of a normal step coincides with the length of a beat in the *andante*; there are, in fact, some melodies learnt worldwide which extend for several measures and each of these measures is composed of three or four beats (von Ehrenfels, 1890, p. 270).

He therefore reaffirmed that in the reunification of several ever-changing temporal segments, considered overall, 'our hearing is amply superior to our eyesight'. In this regard, we may ask ourselves if further specific experiments have been made. Fiorenza Toccafondi (1995), in *I linguaggi della psiche*, a text she dedicated to the theories and laboratory experiences of Karl Bühler, focuses on the chapter related to the perception of the temporal proportions present in the volume *Die Gestaltwahrnehmungen* published in 1913. In fact, after having carried out experiments on the slenderness of rectangles, and thus on the problem of the visual apprehension of bi-dimensional spatial figures, Bühler set up very challenging experiments regarding the perception of the rapport of the temporal distance between two different beats. After having examined the protocols of all the test subjects, the ease with which one manages to structure the intervals in a unitary formation appeared unequivocally. During the longer intervals, the subjects were mainly occupied with picking up the proportion and would sometimes help themselves to do so with some movements of the head and of the right hand with which they tried to keep the tempo. Compared with the longer intervals, the smaller ones unify more closely. Thus: 'two proportionate intervals, or better, three beats that define it, form a tight and easy-to-control whole, and it is precisely this that helps the understanding of the proportion'. Toccafondi emphasised that we are talking about a quantitative physiological theory, extremely original compared with the standard of traditional psychophysics and also compared with the theory of the perceptive field. Taken up and developed by Egon Brunswick, in particular in relation to the study of constancy, at present it appears to be open to new replicas and insights of the perceptive-cognitive-biological sort.

Particularly noteworthy in this regard is some recent research conducted by Tiziano Agostini and his team at the Psychology Unit 'G. Kanizsa' of the University of Trieste. In perceptual-motor literature, there are several observations of a better performance when relying on auditory information than when relying on the corresponding visual information. This is the case both for basic tasks such as simple reaction times and temporal interval discrimination (e.g. Elliott, 1968), and for more complex, sports-related tasks such as the identification of rhythmic sequences and the anticipation of shot power (e.g. Agostini, 2015; Sors et al., 2017; Sors et al., 2018).

Here are some observations that appear to be very pertinent to the topics dealt with, and perfectly congruent with Ehrenfels's approach:

Laboratory experiments highlighted that the auditory system is apter than the visual one in identifying the rhythmic features of simple, precisely timed gestures/movements; this, in turn, promotes a more accurate reproduction of the gesture/movement under investigation when participants can rely on an auditory model than when they can rely on a visual model. Field experiments extended the validity of these observations to the complex movements that characterize sport competitions, revealing that the use of auditory information, either as an augmented feedback or as a model, promotes significant performance improvements in various disciplines (Sors, 2015/2016).

In conclusion, we started off from the definition of Gestalt set forth by the representative of the Habsburg Philosophical-Psychological School – the brilliant student of Brentano and Meinong – von Ehrenfels. And we have paid attention to some of his thoughts on the problematic nature of this same notion in its applications. His suggestions, ingenious and audacious, demonstrate well the wide range of possibility, but also at the same time the difficulties related to the different modalities of the Gestalt qualities and the challenging subject of intermodality. As a result, we have noted some significant experimental attempts carried out in this regard, in both the artistic and scientific fields, from the end of the nineteenth century up until the present day. We will then be able to somewhat jokingly observe that the *Gestaltqualität* is like the 'Well of St. Patrick', of which perhaps one has not yet reached the bottom.

Summary

The famous essay by Christian von Ehrenfels, *Über Gestaltqualitäten* (1890), opens up, as is well-known, an important seam not only in the psychology of perception but also of aesthetics, of the psychology and philosophy of music, art and language. Here, in fact, the form understood as 'Gestalt' is something concretely audible and visible and not simply a formal abstraction. It is about a pioneering programme rich in ideas and original connections. The author does not mean simply to define the meaning of the concept of Gestalt, but he also sets out a fertile variety of extraordinary applications. In the first place – following a suggestion of Ernst Mach's – he indicates an application in the field of music, in particular in the exemplary case of melody. In this sense the melody, as a temporal Gestalt, is a more fitting illustration of Gestalt than a spatial Gestalt (e.g. of a geometric figure). But in other cases, as for instance in the case of perception of movement, both temporal and spatial Gestalts are admitted. And a characteristic example is provided by dance. In this article, we shall investigate the comparison between sound movement and visual-gestural movement, and we shall also be discussing the matter by having recourse to the experience of professional dancers.

Keywords: von Ehrenfels, Gestalt quality, melody, dance, expressive quality.

Gestalt und Bewegung zwischen Musik und Tanz

Zusammenfassung

Der berühmte Beitrag von Christian von Ehrenfels, *Über Gestaltqualitäten* (1890), eröffnet, wie bekannt, eine wichtige Bahn nicht nur in der Wahrnehmungspsychologie sondern auch auf dem Gebiet der Ästhetik, der Musikpsychologie und – philosophie, der Kunst und der Sprache. Hier ist die als “Gestalt” interpretierte Form tatsächlich etwas konkret Hörbares und Sehbares, in keinem Fall etwas formal Abstraktes. Es handelt sich um ein bahnbrechendes, lehrreiches, originelles Forschungsprogramm. Der Autor beabsichtigt nicht nur die Bedeutung des Gestaltbegriffes zu bestimmen, sondern er breitet auch eine produktive Vielfalt ausserordentlicher Anwendungen aus. An erster Stelle – einem Gedanken von Ernst Mach folgend – weist er auf eine musikalische Anwendung, und zwar auf das musterhafte Beispiel der Melodie hin. Von diesem Standpunkt aus bildet die Melodie, als Zeitgestalt, ein adäquateres Beispiel von Gestalt als eine Raumgestalt (z. B. eine geometrische Figur). Aber in anderen Fällen, wie im Falle der Bewegungswahrnehmung, sind beide – Raum- und Zeitgestalten – erforderlich. Ein charakteristisches Beispiel ist der Tanz. In diesem Beitrag vertiefen wir den Vergleich zwischen akustischer und visuell-gestischer Bewegung und benützen in der Besprechung dieser Thematik auch die Erfahrung von professionellen Tänzern.

Schlüsselwörter: Von Ehrenfels, Gestaltqualität, Melodie, Tanz, Ausdrucksqualität.

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