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Original Contributions - Originalbeiträge

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# Vittorio Benussi, the Gustav Mahler of Psychology*

## 1. Vittorio Benussi, a Forgotten Genius of Psychology

There are only a few figures in the history of psychology whose work continues to be relevant over the span of a century, and Vittorio Benussi (1878–1927) is one of them. As an outstanding member of the Graz School of Psychology and Object Theory, which gathered around Alexius Meinong, and as the founder of the Italian tradition of Gestalt psychology, Vittorio Benussi was one of the foremost experimental psychologists of his time. His contributions were particularly relevant in the fields of visual, temporal, and haptic perception; forensic psychology; hypnosis and suggestion; the unconscious; and emotions.

In 1978, the philosopher Stephen Toulmin consecrated Lev Semyonovich Vygotsky as "the Mozart of psychology," a genius comparable to the great musician whose ideas could have produced even more extraordinary results had he not died prematurely (Toulmin, 1978). Taking up this musical metaphor, I would like to celebrate Benussi as "the Gustav Mahler of psychology." Both offspring of the Habsburg Empire, interpreters of a world in crisis and close to dissolution, Mahler and Benussi shared a common destiny. During his lifetime, Mahler achieved extraordinary fame as a conductor, while his work as a composer was hindered by prejudice and misunderstanding. His contribution to the renewal of musical language was recognized only after the Second World War. Mahler, therefore, proudly attributed to himself an "out-of-date" nature, repeatedly uttering the well-known phrase "*Meine Zeit wird kommen*" (My time will come). A similar argument can be advanced for Benussi, whose fame as a brilliant experimenter was unanimously recognized in his time, while his ideas and major research projects only now has begun to be recognized in all their scope and value.

Benussi's work is impressively transformative because of its rigor and energy, range of approaches, experimental skill, wealth of findings, and quality of the theoretical insights. To confine ourselves to some of his discoveries:

– Benussi was one of the first to experimentally investigate the issue of Gestalt perception (Benussi, 1902, 1904, 1906, 1907a, 1909, 1911, 1912;

* The paper resumes and develops the lecture "Vittorio Benussi and Gestalt Psychology. Variations on a Theme" given in Trieste on July 7, 2022 at the Metzger award ceremony of the 22nd meeting of the Society for Gestalt Theory and Its Applications.

see Antonelli, 2018, § 4.3), about 10 years before Wertheimer's famous 1912 essay on apparent movement and the so-called φ-phenomenon (Wertheimer, 1912), which gave rise to Berlin Gestalt psychology.

– He discovered around 1907 what Harry Helson (1930) labeled the *Tau effect* (as well as the complementary *Kappa effect*), that is, the mutual influence of temporal and spatial data in spatial and temporal comparative processes, respectively (Benussi, 1907b; see Antonelli, 2018, § 4.4.5).[1]

– He experimented with ambiguous or reversible figures quite some years before the publication of Edgar Rubin's famous 1915 doctoral thesis (Rubin, 1915; see Antonelli, 2018, § 4.3.6) (see Figure 1).

– He discovered in 1912 *S*-movements (which Koffka renamed α-movements [Koffka & Kenkel, 1913]), that is, those complex apparent movements can be traced back to a twofold source: the objective difference of the successive positions and localizations of the figures, and their apparent, gestaltically induced differences (Benussi, 1912; see Antonelli, 2018, § 4.6.1) (see Figures 2 and 3).

– With his investigation of the "respiratory symptoms of lying" of 1914 (Benussi, 1914a; see Antonelli, 2018, § 4.7.6), he anticipated the lie detector, which was developed a few years later by William Marston (1917, 1920, 1921) (see Figure 4).

**Fig. 1.** Meander: "a white figure that develops endlessly on a black background," or "a figure formed by two series of hooks opposite each other on a white background"? (Benussi, 1914d, p. 398 [343]).

[1] By comparing spatial distances limited by temporally successive light impressions (• • •), the temporal distances between light stimuli exert a marked influence on the spatial distances to be compared. By placing spatial distances in conflict with time distances, the comparison result is significantly altered. In other words, a kind of fusion between the spatial and the temporal data occurs during the comparative process that takes place in the phenomenal present. The same effect occurs by using weights falling at different distances and at different time intervals on the forearm of the subject (Benussi, 1914c, 1917). The results do not change: the "modification of the apparent difference [between the points] is a consequence of their spatial *and* temporal position" (Benussi, 1907b, p. 411). Whereas in the Tau effect the temporal interval between successive stimuli influences the perceived spatial distance, in the Kappa effect the elapsed time between sensory stimuli is influenced by their sequential presentation at different locations. See Antonelli (2018, § 4.4.5).

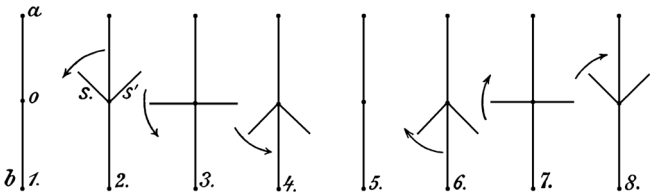


**Fig. 2.** Frames of the Müller-Lyer illusion used by Benussi for the study of S apparent movement (Benussi, 1912, Figure 6). If these frames are presented stroboscopically at a speed of about half a revolution per second, the oblique appendices pivot around the central point, rotating around it at about 90°. But in addition, a second type of movement can be seen: an upward and a downward oscillatory movement of the central point, a movement that is not of a stroboscopic origin since the position of the point objectively is still the same (i.e., both at proximal and distal levels) during all projections.

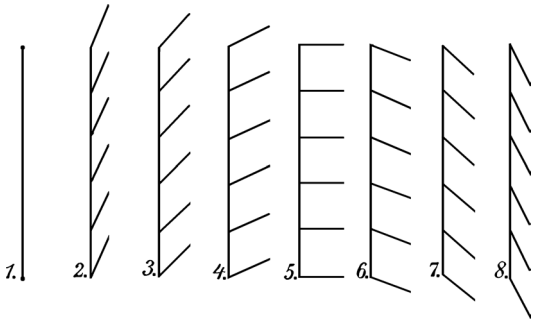


**Fig. 3.** Frames of the Zöllner illusion used by Benussi for the study of S apparent movement (Benussi, 1912, Figure 10). The effect described before can be achieved by stroboscopically presenting frames taken from the Zöllner figure. In this case, while the transverse segments appear to rotate around the vertical line (a stroboscopically induced movement), the latter starts an oscillatory movement from the top left to the bottom right to one that develops in the opposite direction (a non-stroboscopically induced movement).

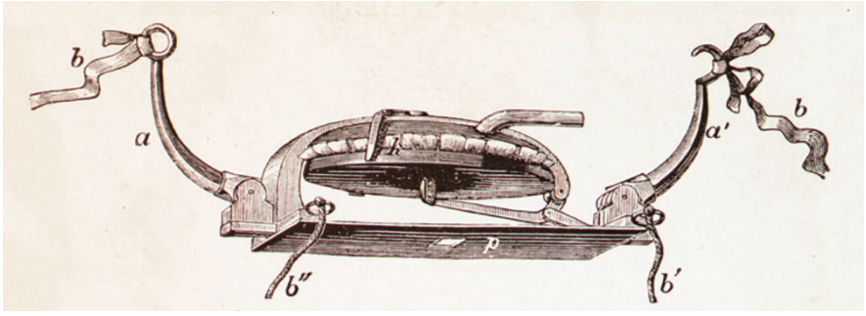


**Fig. 4.** Marey pneumograph produced by the Zimmermann company in Leipzig and used by Benussi in his research on the "respiratory symptoms of lying." It records the cyclical expansion and contraction of the rib cage during respiration. The truly innovative feature of Benussi's experimental research was that he, unlike his predecessors, did not identify the psychophysiological correlates of the investigated mental states in specific attributes of individual breaths (e.g., in the frequency or depth), rather in the overall structure of the different respiratory phases, that is, in a word, in the respiratory "Gestalt."

Benussi considered the participants' respiratory graph relative to 3–5 breaths immediately before a specific deposition and to 3–5 breaths immediately following the end of the statement. During these two periods, the subjects had to remain calm and peaceful. For each of these breaths, the Störring *Q* quotient was calculated, that is, the ratio between the duration of inspiration and duration of exhalation (I/E) and the quotients prior to (*Q*a) and following (*Q*s) the deposition were averaged. Thus, it was possible to see that in the case of a sincere witness *Q*a > *Q*s, whereas in cases of a lie *Q*a < *Q*s. Figure 5 displays the relationship for a lie.

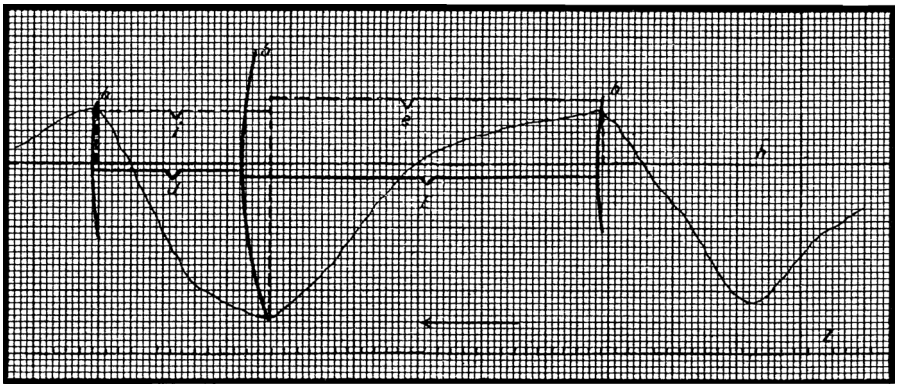

**Fig. 5.** Example of a breathing curve (Benussi, 1914a, Figure 2). In the experiments carried out by Benussi, these ratios were found in almost 100% of cases. Based on these results, he postulated the "quotient laws of lies and sincerity" (*Quotientengesetze von Lüge und Aufrichtigkeit*: Benussi, 1914a, p. 253 [374]), according to which exhalation slows down and thus lengthens after one has told the truth, whereas it becomes faster and shorter after a lie. This occurred so regularly that it would often be sufficient to compare only two breaths, the one immediately preceding and the one immediately following a statement deposition. Any effort to alter, inhibit, or even reverse the respiratory symptoms of falsehood and truth was unsuccessful, and this represented a decisive factor in favor of the validity of the diagnostic procedure and its practical use.

– He discovered combined and relative apparent movements (Benussi, 1918, 1925; see Antonelli, 2018, § 5.3.4.1), that is, the trajectory changes suffered by an apparent movement under the influence of a second apparent movement perpendicular to it, and their dual nature (see Figure 6).

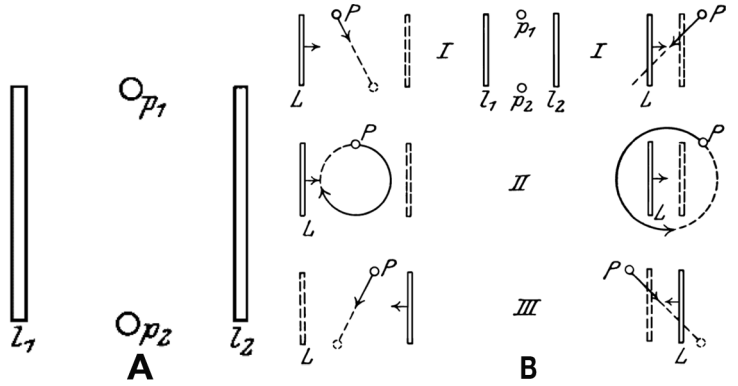


**Fig. 6.** **(A)** Stimuli used by Benussi in his 1925 research on combined apparent movements (Benussi, 1925, Figure 21). **(B)** Different perceptual outputs discovered by Benussi (Benussi, 1925, Figure 16). Projecting tachistoscopically at a relatively low frequency first $l_1$ and $p_1$, then $l_2$ e $p_2$, two apparent movements intersecting one another were obtained: one movement developed between the two points arranged vertically and the other, orthogonal to the first, between the two vertical segments. When the tachistoscopic projection of the left line (L) and the point (P) at the top and the projection of the dotted right line and dotted bottom point (cf. Figure 6B) were synchronous, without differences of phase and at an optimal frequency (500 ms < t < 1200 ms), two different perceptual situations were produced. These alternated with each other, independently from the subject's preferences or intentions. In the first case (Figure 6B, on the left), one sees a single point moving from the upper left side to the lower right (combined or resulting movement, corresponding to what would be the kinematic combination of the two movement); in the second case (Figure 6B, on the right), the point moves from the upper right to the lower left side (relative movement, corresponding to the relative position of the point to the perceived line).

– He discovered stereokinetic phenomena, that is, the peculiar three-dimensional impressions obtained from specific plane figures drawn on a black disk placed in rotational movement (Benussi, 1922–1923, 1927; see Antonelli, 2018, § 5.3.4.2) (see Figures 7 and 8).

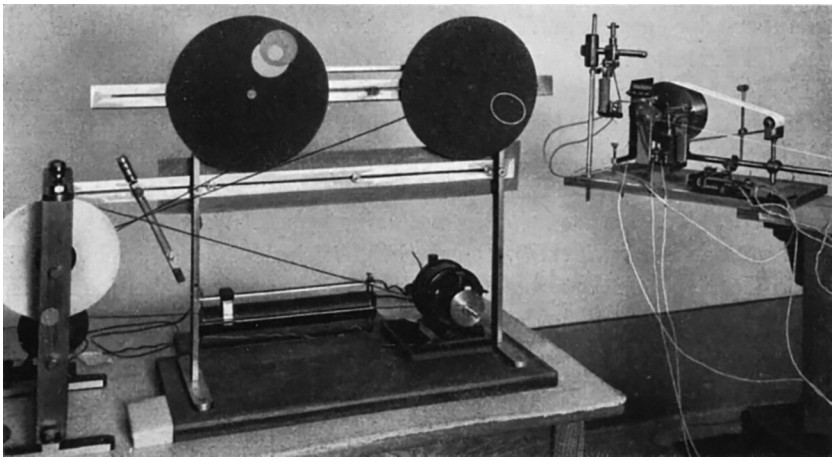

**Fig. 7.** Device built by Benussi for the study of stereokinetic phenomena (Benussi, 1927, Figure 3).

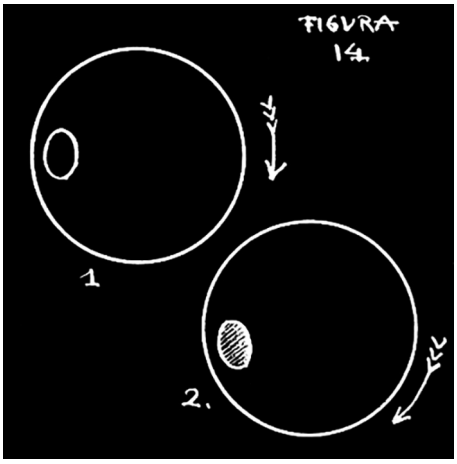


**Fig. 8.** Two main stimulus configurations used by Benussi: (1) a circle with an ellipse on the inside, and (2) a circle with an eccentric elliptic spot located on the inner border (Benussi, 1922–1923, Figure 3).

When the figures are motionless, they do not give rise to a three-dimensional impression. But if one rotates the black disk slowly (approximately one cycle per second), after a while, the perceptual output changes considerably: the ellipse assumes the form of a rotating hard disk, whereas the circle with an eccentric spot becomes a rigid cone in motion with its vertex sometimes directed toward the observer and, at other times, in the opposite direction.

– With his studies on "meaningful assimilation" and "emotional causal reversal" (Benussi, 1922–1923; see Antonelli, 2018, § 5.3.4.3), Benussi approached the psychodiagnostic and projective techniques that Hermann Rorschach was developing around the same time (see Figure 9).

**Fig. 9.** Slide used by Benussi for the study of meaningful assimilation and emotional causal reversal (Benussi, 1922–1923, Figure 19). Tachistoscopically presenting this schematic scene, the participants unanimously considered that different figures were projected. In addition, it was possible to detect a precise correspondence between the participants' states of mind and the figures' expressive elements. The subjects interpreted this correspondence as being due to the figures' influence on their mood. However, since the figure was objectively always the same, Benussi concluded that the actual causal relationship was the opposite. The subjects' mood influenced the interpretation of the figure, not vice versa. Benussi, therefore, called this phenomenon "emotional causal reversal."

– In the framework of his research on "functional emotional autonomy," he discovered that besides the dynamic unconscious of psychoanalysis—thus anticipating recent trends in cognitive sciences and affective neurosciences—there is another type of unconscious even more complex and layered: the "physiological unconscious," as he named it, which today we would call the emotional unconscious (see Antonelli, 2018, §§ 5.3.2, 5.3.3) (see Figure 10).

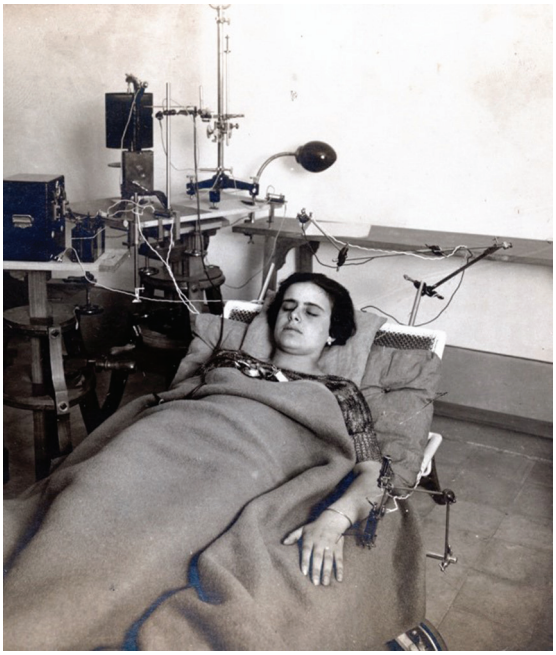

**Fig. 10.** Margherita Signorelli, the favorite experimental subject for Benussi's research on emotional functional autonomy, carried out using hypnosuggestive methods (Benussi Archive, box 15, file 4).

Benussi was indeed a genius of psychology, a genius unfortunately long misunderstood. Many unfavorable circumstances converged to obscure Benussi, including the peripheral role of the Graz School when compared to the main European research centers; the upheavals following the First World War and the collapse of the Austro-Hungarian Empire; his move to Italy, which was located on the fringes of international psychological research; his reserved character; his writing style, which would discourage any reader; and finally, his premature death.

The scientific activity of Benussi was therefore destined to be ignored. With the gradual emergence of the Berlin Gestalt School, Benussi had to settle for the role

of being their mere forerunner, as predicated by the text books, although he had been among the first to experimentally investigate the perception of Gestalt. Even his subsequent research, carried out during the Padua period, in which he resorted to suggestion and hypnosis, did not have the resonance it should have had. On the one hand, it was regarded with suspicion by experimental psychologists as it seemed to come too close to psychoanalysis, which was considered disreputable; on the other hand, it was viewed with suspicion by psychoanalysts since it was carried out with the strict method of an experimentalist.

Only in recent years—after cognitive psychology, going back to its origins, has revalued classical psychology—has there been a reawakening of interest in Benussi's work; not only historical interest in one of the forgotten figures of the psychology of the past but also in the relevance of his research programs. In particular, some of Benussi's major scientific projects (such as the psychology of perception, the psychology of time, the induction of emotional states through the modification of breathing rhythms, and the psychology of testimony) reveal, in light of today's research, an unsuspected topicality.

In highlighting this topicality, I will focus on Benussi's two main scientific projects, developed during the Graz and Padua periods, respectively: the psychology of perception and the psychology of emotions.

**2. Perception**

Benussi's psychology of perception has long been regarded (starting from Boring [1929]) as a mere foreshadowing of the discoveries and theories of Berlin Gestalt psychology. This interpretation, on closer examination, proves to be inaccurate.

The relationship between Benussi and the Berlin School was complex. As is well known, Kurt Koffka wrote a polemical paper in 1915 against Benussi and the Graz school (Koffka, 1915). However, that article missed the target insofar as Benussi's theories were interpreted through the lens of the views of his school, from which he instead had progressively distanced himself. When he met Wertheimer at the Göttingen congress of the Society of Experimental Psychology in 1914, this latter underlined in a letter to his teacher Christian von Ehrenfels that during their "long and pleasant conversations," they were in excellent agreement, not only on a personal but also on a theoretical level.[2] After the unavoidable interruption of relations during the First World War, Benussi received a warm welcome from

[2] "Vom Congress hier möchte ich dies berichten, dass sich zwischen Benussi und mir lange Gestaltgespräche ergaben, die mich sehr freuten: Benussi, den ich früher nicht näher kannte, scheint mir ein höchst erfreulicher Mensch! Wir verstehen uns auch theoretisch ausgezeichnet miteinander, wie wir zu unserem beiderseitigen Erstaunen erfreut […] weiter feststellten." Letter of Max Wertheimer to Christian von Ehrenfels, Göttingen, 10.04.1914, Ehrenfels Nachlass, Forschungsstelle für österreichische Philosophie, Graz.

Wertheimer, Köhler, and Koffka at a congress in Germany, as Fritz Heider reports (Heider, 1970, p. 136). Furthermore, in 1928, the year after his tragic death, *Psychologische Forschung*, the journal of the Berlin group, published an obituary celebrating one of the "most productive researchers" who "devoted his brilliant energy to his tireless work and always addressed essentials" (Anonymous, 1928). As Fritz Heider, a student of both Benussi's and Wertheimer's, effectively wrote, Benussi's tragic destiny was to be a "marginal man" who was geographically "between Austria and Italy" and theoretically "between Graz and Berlin" (Heider, 1970, p. 137). Today, we can finally evaluate, with greater historical detachment and subtler understanding, the affinities and differences between Benussi's positions and those of the Berlin school.

Undoubtedly, the Berlin Gestalt theory was the most authoritative and ambitious attempt to establish an experimental phenomenology of perception and, subsequently, of all mental life, describing and explaining its various aspects. Starting from the phenomenological principle of the primacy of structured wholes, Gestalt theorists proposed a field model in which, through the dynamic self-distribution of the forces elicited by sensory input, phenomenal units are generated, with their characteristics of color, size, shape, three-dimensionality, motion, expressiveness, etc. Their empirical research has focused on the search for the autochthonous principles or factors that this self-distribution obeys: proximity, similarity, closure, continuity of direction, common destiny, and so on. Factors that can be traced back to a more general principle: perceptual organization spontaneously tends toward the state of *Prägnanz*, being inclined to the utmost balance between the forces at play and, therefore, to the most significant amount of stability and resistance to change (Wertheimer, 1922, 1923). Of course, underlying these assumptions was a very specific neurophysiological theory, according to which brain processes aim to produce the maximum homogeneity compatible with peripheral stimulation conditions. This idea, advanced as a hypothesis by Wertheimer in 1912, was developed further by Wolfgang Köhler in *Die physischen Gestalten* (Köhler, 1920) into the assumption of physiological forms that depend on the dynamic stimulus configuration and are "correlated" to the phenomenal Gestalten, that is, the postulate of psychophysical isomorphism. Hence, he considered the specific dynamics of the neurophysiological—and more generally biological—realm as extremely complex variants of the phenomena of diffusion, propagation, flow, charge, and distribution, which can be found in inanimate nature. Furthermore, the Gestalt theory could establish a functional analysis of phenomena and of the dynamic properties of the Gestalten on the basis of the principle of a structural isomorphism existing between perceptual, emotional, and behavioral dynamics, as well as of the principle of general transposability of forms. This is because percepts, feelings, and values, whether ethical or aesthetic,

are both subjective and objective entities, relational structures that inscribe the self and other persons along with surrounding objects in a common field structure. Thus, the field model of the Gestalt theory does not consider subjects to be absolute entities, independent of the objects surrounding them. As a mere internal partition of the total field of experience, the phenomenal ego neither has absolute consistency nor does have sharp boundaries. Rather it takes shape within time, depending on the overall situation of the field, and it is, therefore, subject to the very same laws that regulate the formation of perceptual units.

Benussi's model, however, leaving aside the more marginal role of physiological hypotheses, attempts to combine a phenomenology of the perceptual field, consistent with the Gestalt theoretical principle of self-organization according to autochthonous factors, with a phenomenology of the subject, of which it traces the emergence at the latent level in the folds of the perceptual process. The emergence of the percept as a segregated and meaningful unity, in this way, is matched by the emergence of the subject or ego as an active, attentional center, from which the tendencies that drive the segregation of the perceptual field radiate. The ego is thus committed to an active clarification of the connections that emerge from the automatic segregation of the field, assuming, so to speak, the "responsibility" for what emerged independently from its activity.

This key role of subjectivity goes hand in hand with the fundamental function that Benussi ascribes to temporality in constituting perceptual experience (Benussi, 1913), to that "psychic presence time" (*psychische Präsenzzeit*, as William Stern [1897] had named it), which is, so to speak, the stage on which every experience proceeds and within which genetically distinct data are fused into parts or moments of a single dynamic Gestalt. Whereas the Gestalt theory promotes an essentially synchronic phenomenology that aims to illuminate the internal structural connections of actual perceptual experience, Benussi programmatically aims at a genetic phenomenology that seeks to reconstruct the diachronic laws of formation and development of perceptual phenomena (Benussi, 1914b), their meaningful structure unfolding in time.

The perceptual system is not a camera snapping static pictures of the surrounding world. According to Benussi, the perceptual world, in fact, is made not so much of objects, but rather of more or less stable events, which are always temporally structured. Furthermore, the perceivers themselves are never static but essentially dynamic, actively exploring the environment and moving within it. Even when stationary, they constantly change their observational perspective through their eye movements.

Here one can detect an affinity with Husserl's genetic phenomenology, which emphasizes the fundamental role of kinesthesia, that is, motion sensations and

self-affection, in constituting the perceptual world. For both Husserl and Benussi, seeing is essentially an exploratory activity and as such is integrated into the broader set of motor activities. From this perspective, Benussi's approach is close to contemporary enactivism, which also conceives perception as an exploratory activity mediated by a complex of sensorimotor functions, by know-hows, and by a complex of activities matured with experience. In this view, perception and action intersect and overlap inextricably, and the perceptual processes do not consist of the simple reception of information which, once processed, is translated into action. Rather, the spectrum of possible interactions of the perceiver with the object is already constitutively included in the perception of objects.

Benussi's discourse does not stop at perception but extends to the whole cognitive system, recognizing in behavior and action, and thus in the body and its control systems, the driving force of any cognitive process (Benussi, 1922–1923). For Benussi, cognitive processes were highly constrained by the ecological contexts in which organisms evolved and were, therefore, more or less automatized answers to tasks imposed by the environment on the organism, with essentially adaptive functions (see Figure 11).

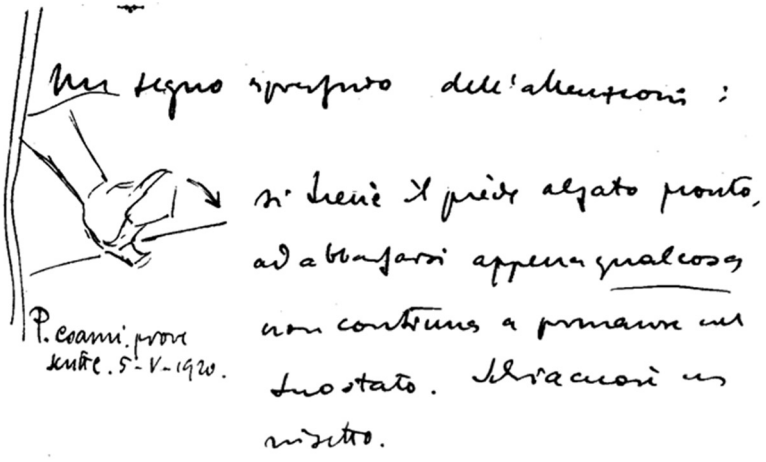

**Fig. 11.** "An expressive sign of attention: the foot remains raised and is ready to fall, as soon as something changes. To crush an insect" (Benussi Archive, Lessons, 1920, box 7, file 14). This sketch illustrates an expressive residue associated with a "fragment of action" of the attentional type, thus of a cognitive nature, consisting in the drumming movement of the foot, performed by a student of Benussi during an experimental session. According to Benussi, all mental states (including cognitive states) can be interpreted as "fragments, or schematic summaries, or sketches of real actions, that is, particular forms of somatic behavior, imposed by particular environmental conditions" (Benussi, 1925, p. 82 [278]). They are a kind of "pure behavior," a thought, not yet acted upon, in many respects comparable to the modern conception of preparation for action. These residues or fragments of action are "useful for thinking:" insofar as their voluntary reproduction facilitates the mental states associated with them, they can also stimulate mental operations.

By considering the dynamic, flexible, and adaptive nature of biological mechanisms in evolutionary terms, Benussi sees the cognitive system as a "projective" instrument, a generator of hypotheses and simulations that constantly generates models projected onto the ever-changing environment as a function of the expected consequences of the action.

Benussi's outline of an experimental genetic phenomenology and a biologically based cognitive theory, despite its historical defeat, or perhaps thanks to it, currently reveals its strengths and extraordinary relevance. This is most notable in its ability to facilitate a dialogue between the phenomenological-experimental model and the model presently prevailing in psychology and cognitive science. In fact, Benussi's framework ensures the autonomy of the phenomenon and its irreducibility both to the physical dimension of the stimuli and to the neurophysiological dimension of neural correlates of mental facts. However, it is also open to the demands of psychophysics and physiological research, systematically pursuing the study of the correlations between these different levels. In addition, compared to the traditional view according to which phenomenology describes (in a first-person perspective), while psychophysics and physiology or neuroscience explain (in a third-person perspective), Benussi's genetic phenomenology combines descriptive and explanatory instances, bringing back the phenomena, regressively, to the conditions of their occurrence. Benussi's genetic phenomenological method leads from the phenomena, as they manifest themselves in a crystallized form in direct conscious experience, to their emergence from a still indistinct magma as manifestations of a pre-conscious dimension, within which the boundaries between physical and psychological—body and mind—are indistinguishable, employing a regressive analysis. The physicality or embodiment at issue refers not only to the neurophysiological dimension but also includes the experienced and experiencing body (*Leib*), understood as a whole.

### 3. Emotions and Unconscious

This research model was adopted by Benussi not only in his analysis of perception and cognition but also of the affective sphere, which became central during his Padua period (1918–1927). Far from abandoning his studies on perception, Benussi's research perspective has now expanded to an overall analysis of mental life. It was most likely the lack a well-equipped laboratory, like the one he had in Graz, that motivated him to take a new and original path: the use of suggestion and hypnosis as methods for psychological investigation. Also, during his last years in Graz, Benussi had begun to divide his activity between laboratory research and psychoanalysis, attempting to link these two fields of psychology, despite their profound differences, by using hypnosuggestive methods.

When compared to the use of hypnosis as a clinical-therapeutic tool by Mesmer, Charcot, Bernheim, and Freud himself, Benussi employed it as a "means of real mental analysis," that is, as a "material" instrument, designed to disassemble the phenomena of mental life from their global functional unity. Benussi thus compared the work of psychologists to that of physicists or chemists (Benussi, 1925, p. 3 [214], 1927, p. 198). The core of Benussi's real mental analysis was his research on the functional autonomy of emotions, designed to demonstrate the fundamental independence of emotional functions from the cognitive components that usually accompany them. He supposed that hypnosuggestive tools allowed him to obtain a condition of pure emotion, without premises, justifications, or motives of an intellectual nature.

With his thesis of the autonomy of affects, Benussi also naturally discusses Freud and psychoanalysis—which he had been approaching since 1906—which consider the splitting of representation from the related affects a fundamental dynamic of psychic life, which, however, due to its essentially unconscious nature, could not be empirically proven. Benussi, with his real mental analysis, tried instead to provide experimental proof of this splitting.

But how can emotional states arise in a pure isolated form, that is, without being anchored to causes or other mental processes, which may justify them in some way? How can states of mind arise without the mediation of other mental functions? The emergence of emotional states in pure forms was made possible by Benussi's discovery of a particular hypnotic state that he named "basic sleep" (*sonno base*). This was characterized by the absence from the subjects' consciousness of any images, ideation, or thought developments, without the abolishment of mental life or of the self. In other words, in basic sleep, the intellectual life of subjects is canceled, while their emotional life remains relevant and efficient. During the basic sleep, the participants were asked to experience emotions isolated from all cognitive and imaginative experience so as to produce what can be assumed to be physiological responses driven by emotion only.

In order to obtain empirically based results, Benussi was aware that he had to establish, as we would nowadays term it, a convergent validity between introspective and psychophysiological data related to emotions. This was made necessary in order to ascertain whether, and in what form, the suggestively induced changes in the states of mind actually took place. The results obtained in Graz in his studies on the respiratory correlates of lies and truthfulness had convinced Benussi of the utility of using the analysis of respiratory behavior, that is, the analysis of peculiar forms of breathing accompanying suggestively induced states of mind. Changes in the respiratory profiles, induced by the hypnotic tasks, might provide proof that the suggestive command had been fully understood and carried out by the subject.

The control was carried out using a Marey pneumograph, which could detect the thorax movements of expansion and contraction during breathing and thus the entire respiratory cycle. Since Benussi realized that breathing, unlike other physiological responses, is an extremely complex parameter, varying significantly along a complex system of temporal and volumetric dimensions, he conceived the idea of translating the two-dimensional parameter represented by the pneumographic profile of a respiratory cycle (Figure 12) into a "respiratory silhouette," that is, into an irregular polygon (Figure 13). The polygon was obtained by connecting the points of the graphic record together, marking the beginning of inhalation ($m_1$), the inhalation level reached at midinhalation ($m_2$), transition from inhalation to exhalation ($m_3$), midexhalation ($m_4$), and maximum exhalation ($m_5$).

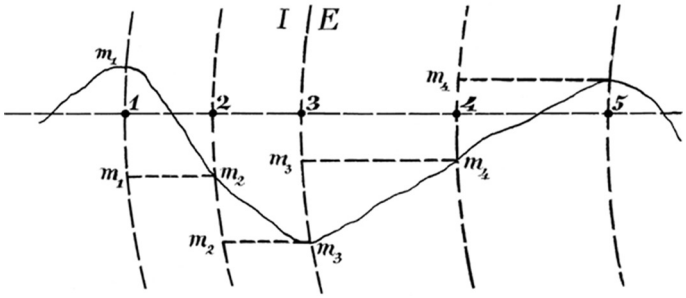


**Fig. 12.** Respiratory profile, or pneumogram, corresponding to a single breath (Benussi, 1925, Figure 3). The dotted horizontal line represents the time axis and corresponds to the line that was traced by the pen of the tympanum with the writing lever of the Marey pneumograph in the resting position (Benussi, 1925, p. 18 [226]). The vertical axis shows the rising and falling of the writing lever during a single breath. The five vertical dotted arcs (isochronous lines) intersect the horizontal line at the point of the beginning of inhalation (1), semi-inhalation (2), the beginning of exhalation (3), semi-exhalation (4), and at the end of exhalation (5), respectively. The pneumogram is upside down because the writing pen of the Marey pneumograph flexed downward during the inhalation phase and upward during the exhalation.

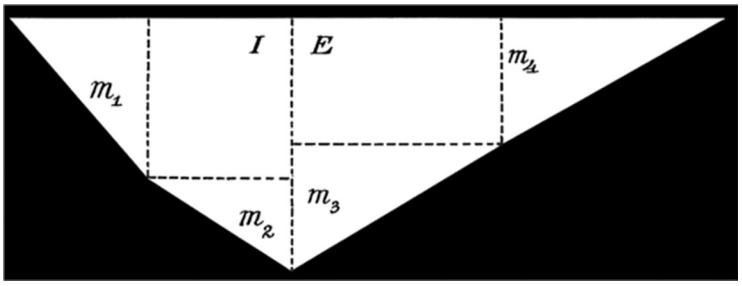


**Fig. 13.** Reduction of the pneumogram illustrated in Figure 12 into a respiratory silhouette. The silhouette, obtained by joining the points in which the isochronous lines intersect the pneumographic profile, has a somewhat concave–convex shape. The dotted line segments divide the respiratory silhouette into rectangles and triangles, being useful for calculating the silhouette area (Benussi, 1925, Figure 4).

Benussi construed respiratory silhouettes for 50 emotional states, which he then cut from a cardboard and grouped in an orderly manner, according to their similarities, obtaining an exact geometric order of the emotions studied (Benussi, 1925, Figure 13; 1927, Figure 10). The qualitative affinity found among the various emotional states, attested by the introspective protocols, was precisely matched by the formal affinity of the corresponding respiratory silhouettes; both seemed to suggest a true geometry of emotional states (see Figure 14).

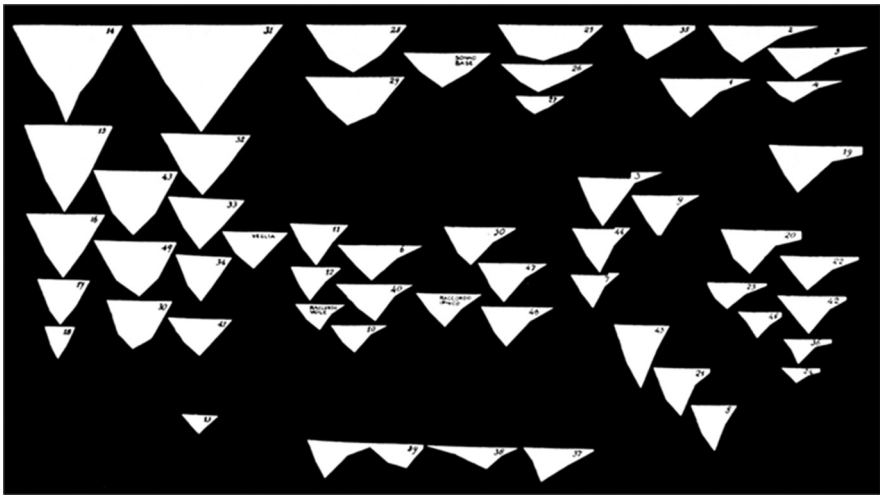

**Fig. 14.** Geometry of the respiratory correlates of emotional and pseudo-intellectual states. The order of the respiratory silhouettes of the 42 emotional and 12 pseudo-intellectual states analyzed by Benussi is based on the criterion of figural similarity. Each formal type thus obtained was, in turn, divided into subgroups as a function of the area size, the Störring quotient, and the capacity index (concave–convex, convex–concave, bi-convex, etc. silhouettes) (Benussi, 1925, Figure 13).

In this way, Benussi believed he had experimentally demonstrated the autonomy of emotional functions,[3] which are rooted in the unconscious dimension of the psyche—not, however, in the dynamic unconscious of the psychoanalytic tradition but in a physiologically understood unconscious. He pointed out, in fact, that "a disruption in the balance of the endocrine system or between the endocrine and nervous systems may lead to a temporary or constant hypersensitivity of

[3] It should be emphasized that Benussi carried out his experiments on no more than three subjects, and in a complete way on only one subject (Benussi, 1927, p. 233). Therefore, his results cannot be considered to be valid or reliable according to the current standards. However, his research has recently been replicated using methodological and technical updates derived from current knowledge. The study found evidence for a specific respiratory profile for each of the emotions examined, thus confirming Benussi's idea of a "geometry of emotional states," although not in terms of Euclidean but fractal geometry (Antonelli, Cattaruzza, & Strano, 2020).

emotional functions, in the sense of a decomposition and autonomy" (Benussi, 1927, p. 243).

Today, Benussi's thesis of a "physiological unconscious," distinct from the repressing unconscious of psychoanalysis, seems to be gaining ground among psychoanalysts, among those at least most open to dialogue and confrontation with neuroscience and cognitive science after the increasingly marked crisis of Freudian metapsychology.

Neuroscience, in fact, after having made remarkable progress in its understanding of the brain structures involved in cognitive functions, has opened a new research frontier in relatively recent times. This new frontier, relating to the brain mechanisms of emotion, has revolutionized neurophysiology and produced a large body of knowledge, which is also useful to the understanding of mental disorders, many of which involve an alteration of the normal control mechanisms of emotional reactions.

Within this new research perspective, emotion becomes the primary response pattern with which our organism faces any possible stimulus, internal and external, a biologically predetermined pattern, established during evolutionary history, although revisable through learning and culture. Research in this field showed that emotional responses can occur without involving higher processing systems, without thinking, reasoning, and consciousness, that is, in an unconscious dimension—the emotional unconscious. This is distinct from the Freudian dynamic unconscious, which resulted from the conflict between instinct and civilization, animal inheritance, and social responsibility.

A decisive impulse in this direction was given by the so-called affective neuroscience (Panksepp, 1998). This discipline intends to provide a neurological understanding of the basic emotional operational systems of the mammalian brain and of the various internal states—conscious and unconscious—they generate. The scientists who first promoted this type of study—above all Jaak Panksepp, in a research field prepared by Damasio (1994, 1999) and LeDoux (1996, 2002)—differ in the importance attributed to the phenomenological feature of emotions; nonetheless, all consider emotional states primarily from a biological, in particular neurobiological, point of view. Damasio, LeDoux, and Panksepp suggested that emotions were developed to facilitate the adaptation of the organism to the complex challenges posed during its evolutionary past. Every organism, in fact, in order to be able to select—from a myriad of stimuli—those stimuli useful for its own needs and those potentially threatening its survival, needs an intact cognitive and affective system. In fact, cognitive processes would be directionless without emotions, and emotions would be raw and primitive without cognitive processes. The objective of affective neuroscience is to highlight the importance

of affectivity at various levels of cognition, integrating cognitive and emotional processing systems into a meaningful unity.

Among the theoretical proposals just mentioned before, Panksepp's proposal is undoubtedly the most radical. In his view, Damasio's and LeDoux' theories are still "interpretation" or "read-out theories" (Panksepp, 1998, p. 34; Panksepp & Biven, 2012, pp. 13 f.; 16 f., 64 f., 67–73, 79–81, 128, 400), that is, theories in which, in order to have an emotion in the full sense of the word (an affect for LeDoux, a feeling for Damasio), a cognitive process is needed, one neurophysiologically located in the neocortex, which gives sense to the raw emotional reaction produced by subcortical areas. Panksepp, instead, claims that an emotion is also given in the absence of neocortical interventions, and that we can experience an emotion even when it does not enter the domain of the "thinkable." He thus inscribes emotions in a new horizon of meaning, the so-called "affective neuroscience," which attributes the deserved mental and developmental primacy to affects. Emotions are primary, pre-linguistic experiences, accompanied by a consciousness that is already affective, which can certainly be represented and interpreted by the neocortex and higher cognitive functions, but which does not need these in order to configure experiences having an intrinsic subjective and phenomenological relevance, which are, thus, in Benussi's terminology, *functionally autonomous*.

Starting from the fact that even primary affective states, the main subject of his scientific research, are accompanied by a form of phenomenal consciousness, Panksepp faces the issue of consciousness and of the nuclear self (Panksepp & Biven, 2012). The hypothesis he proposes was already summarized in the expression "I feel, therefore I am" (Panksepp, 1998, p. 309, 420). According to Panksepp, the neural circuits that give rise to raw emotional experiences also constitute the neural basis of the nuclear self, conceived as a label for those subcortical processes that produce the organism's coherence and consistency. The nuclear self and nuclear emotions are accompanied by a form of consciousness, an emotional consciousness. This is, of course, a pre-propositional and non-verbal consciousness: a non-reflexive, anoetic, automatic, and enactive (pertaining to the intentions-in-actions) consciousness. At this level, affective-anoetic consciousness precedes our cognitive understanding of the world. These processes, the nuclear self and affective-anoetic consciousness, are the foundations of higher mental processes and of idiographic consciousness. Developing out of the interaction between our primary processes and our higher mental faculties, the nuclear self and affective-anoetic consciousness result in the gradual production of more and more complex forms of affect and consciousness. Panksepp, therefore, proposes a dimensional conception of consciousness. There are no forms of consciousness conceivable as discrete entities. Consciousness emerges as a process; one that develops from

an elementary and crude form to more refined ones. Within this framework, as is well known, Panksepp seriously engaged in the integrative project of neuropsychoanalysis, aimed at identifying the neural correlates of specific psychodynamic mechanisms.

This is perfectly in line with Benussi's basic theses; thus, his pioneering project of reconciling experimental psychology and psychoanalysis emerges today in all its unsuspected relevance. This confirms, especially in reference to the last, troubled, phase of his work, the genius of the psychologist from Trieste. Benussi was capable not only of extraordinary insights that were ahead of their time but also of translating them—even with the scarcity of resources at his disposal—into an operational project to be pursued through patient and tireless research work. In light of this, in Mahler's words, we can say that Benussi's time has now finally come, that all phenomenologically and gestalt theoretically minded researchers should welcome this, and that the city of Trieste can be proud of such a brilliant son.

**Summary**
The paper celebrates the person and work of Vittorio Benussi, a forgotten genius of psychology. In particular, it addresses the two most important scientific projects that Benussi developed during his time in Graz and Padua, respectively: the psychology of perception and the psychology of emotions and the unconscious. It highlights the originality and topicality of Benussi's work and emphasizes its proximity to the latest trends in these research fields.
**Keywords:** Vittorio Benussi, Gestalt perception, emotions, unconscious.

## Vittorio Benussi, der Gustav Mahler der Psychologie

**Zusammenfassung**
Der Aufsatz würdigt die Person und das Werk von Vittorio Benussi, einem vergessenen Genie der Psychologie. Er geht insbesondere auf die beiden wichtigsten wissenschaftlichen Projekte ein, die Benussi jeweils in seiner Zeit in Graz und in Padua entwickelt hat: die Psychologie der Wahrnehmung und die Psychologie der Gefühle und des Unbewussten. Er hebt die Originalität und Aktualität von Benussi's Werk hervor und betont dessen Nähe zu den jüngsten Trends in diesen Forschungsbereichen.
**Schlüsselwörter:** Vittorio Benussi, Gestaltwahrnehmung, Emotionen, Unbewusstes.

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