

CHRISTIAN VON EHRENFELS (1859-1932) AND EDGAR RUBIN (1886-1951)

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Introduction

Christian von EHRENFELS was an original and creative thinker. His *On 'Gestalt Qualities'* is an early work that had an immediate impact on the small world of German psychologists. When he was professor at the German University of Prague, he wrote several books, including an opus on sexuality. Like many academics, he had the tendency to be radical and his views on sexuality would not be shared by his contemporaries or by later generations. Hence, his first article on Gestalt perception was his only paper that resonated; all his other studies seem to have had no effect on psychology.

I will compare EHRENFELS' notions on Gestalt perception as he developed them in his seminal article with Edgar RUBIN's (1886-1951) explanation of the figure-ground phenomenon. RUBIN was a Danish psychologist and a student of Harold HÖFFDING (1843-1931). He worked for two years in G.E. MÜLLER's laboratory at Göttingen, and in 1915 he published the results of those experiments in Danish (*Synsoplevende Figurer*). This book was translated into German in 1921 under the title *Visuell wahrgenommene Figuren*. It is this translation that I will refer to. Michael WERTHEIMER made an abridged English translation of the German version (*Figure and Ground*). RUBIN had a considerable influence on Gestalt psychology; KOFFKA wrote a review of RUBIN's book in 1922, and KOFFKA devoted a whole chapter to the figure-ground phenomenon in his *Principles of Gestalt Psychology* (1935).

The comparison between RUBIN and EHRENFELS will also illustrate the difference between the theoretical or armchair psychology practised at the end of the 19th-century (by EHRENFELS) and the experimental psychology practised at the beginning of the 20th-century (by RUBIN). We will see that the research methods of the late 19th and early 20th century psychologies differ, but that the psychological theories of the two periods were remarkably similar.

HÖFFDING's psychology stood in the tradition of Johann Friedrich HERBART (1766-1841). HERBART postulated that the soul contains presentations [*Vorstellungen*] and that each presentation has a variable strength or intensity. It becomes conscious when its strength surpasses a certain threshold value. HERBART also assumed that the forces of attraction and repulsion are working among presentations. Presentations may attract each other, for instance, a picture of the Vatican calls into our mind the name 'Rome.' And they may oppose each other; nowadays we would say that they inhibit one another. This characteristic of presentations can, for instance,

explain concentration; when we read a book, the presentations arising from reading would keep other, non-related thoughts away from consciousness.

HERBART assumed the existence of many presentations and, hence, he had to account how they appeared in proper order in consciousness. HERBART did not postulate the existence of integrators. It was the elements themselves that took care that the right order was followed, or that each one appeared in consciousness at the right moment. The absence of integrators in HERBART's model becomes very clear where he discussed the appearances of words as a series of letters in consciousness. HERBART gave as an example the word "Hamburg," the name of a German port. The presentation of each letter, *H*, *a*, *m* and so on must come one after the other and that in a specific order, or, as HERBART noticed, the *a* must come before the *u* and not the other way around, not the *u* before the *a*. HERBART assumed that the presentations themselves dictated the order. The *H*, according to HERBART, would pull the *a* in consciousness and to a lesser degree also the *m* and so on, the *a* would pull the *m* and to a lesser degree the *b* and so forth. In this model no presentation exists on its own; presentations exist only with other presentations and the interplay of attracting and opposing forces determine the magnitude of an individual presentation. In HERBART's theory, the surrounding presentations have an influence on an individual presentation. However, HERBART explained complex phenomena solely in terms of elementary ones. His approach is strictly from elements upwards to the whole and consequently his approach is anathema to Gestalt theory. The whole as such exercises no causal influence whatsoever.

We can detect HERBART's influence on HÖFFDING (1892) in phrases like: presentations that struggle with each other to come into consciousness, series of presentations and thresholds of consciousness (see p. 111-112). There are, however, also remarks on the importance of the relatedness and relativity of presentations that we do not find in HERBART's writings. It could well be that these insights are the foundation of RUBIN's experimental work. HÖFFDING, as we saw, recognized the importance of the surrounding for the experience of an individual's stimulus. Yet, he was not a Gestaltist and neither was G.E. MÜLLER in whose laboratory RUBIN carried out his experiments. G.E. MÜLLER's thinking was also more in line with HERBART's.

On 'Gestalt Qualities'

In his article *On 'Gestalt qualities'* EHRENFELS demonstrated an excellent grasp of the problem of Gestalt perception and an originality in its solution. He started his essay with a the following remark: "The discussion which follows has the aim of giving scientific expression to a psychological problem often noticed in philosophy but not yet, as we believe, made fully precise" (p. 82). Simply put, EHRENFELS intention was to explain how many individual parts are combined to form whole perceptual objects that are made up of parts. This problem, of course, is an age-old problem. PLOTINUS (204-270), for instance, noted that:

"It is in virtue of unity that beings are beings.... What could exist at all except as one thing? Deprived of unity, a thing ceases to be what it is called: no army unless as a unity: a chorus, a flock, must be one thing. Even house and ship demand unity, one house, one ship; unity gone,

neither remains: thus even continuous magnitudes could not exist without an inherent unity, break them apart and their very being is altered in the measure of the breach of unity” (Ninth Tractate of book VI of the *Enneads*, paragraph 1).

PLOTINUS recognized that groups and individual objects are, on the one hand, units and, on the other hand, made up of parts. However, we do not perceive the bond that unifies the parts in the same manner that we recognize the spatial arrangement of a chorus, the smell of a flock of sheep, the size of the horse or the colors of the ship. The question, then, arises where the unity of the being is; is it in the chorus, flock, horse or house, or is it in the mind of the observer? PLOTINUS believed that the unity is a characteristic of the chorus, flock, horse or house, and that the human soul recognizes somehow the unity but that the soul does not create the unity itself. Unity of a being, according to PLOTINUS, is not directly given in perception, but recognized in a cognitive act by the soul:

“Come thus to soul - which brings all to unity, making, moulding, shaping, ranging to order - there is a temptation to say, ‘Soul is the bestower of unity; soul therefore is unity.’ But soul bestows other characteristics upon material things and yet remains distinct from its gift: shape, Ideal - Form, and the rest are all distinct from the given soul: so, clearly with this gift of unity; soul to make things unities looks out upon the unity just as it makes man by looking upon Man, realizing in the man the unity belonging to Man” (Ninth Tractate of book VI of the *Enneads*, paragraph 1).

I do not believe that EHRENFELS had this remark of PLOTINUS in mind when writing his article. I quoted PLOTINUS just to show how old the problem was that EHRENFELS discussed. EHRENFELS, however, was a student of Franz BRENTANO (1838-1917) and he must have surely thought about him when writing his opening sentence. BRENTANO studied ARISTOTLE at length and before we can discuss BRENTANO’s influence on EHRENFELS, we must briefly look into ARISTOTLE’s analysis of perception.

Aristotle’s Notion of Perception

Perception, according to ARISTOTLE, depends on a process of movement in a medium originating from outside the organism. That movement, in its turn, sets the perceptual organ into motion. Each perceptual organ has its unique proper object: seeing for the eye, hearing for the ear, and so forth. If different systems perform different functions, then the need arises to combine their specialties. Somewhere, sight and hearing have to be integrated, or in ARISTOTLE’s example of seeing and tasting: “Since we also discriminate white from sweet, and indeed each sensible quality from each other, with what do we perceive that they are different?” (426 b10). There has to be a single agency that detects the sweetness as well as the whiteness of sugar and also notes that whiteness and sweetness differ from one another. ARISTOTLE located this connecting agent in a second-level perceptual system, namely in the ‘sense that is common.’ Every perceptual organ sends its information to the sense that is common, where they get integrated. The sense that is common also registers where the incoming information comes from; thus it notices whether one is ‘seeing’ or ‘hearing.’

Awareness of our seeing and hearing arises, according to ARISTOTLE, at a late stage when the incoming information gets combined.

In Aristotelian psychology, the perceptual system detects the stimuli and integrates stimuli from different sense modalities. ARISTOTLE, however, did not realize that an integration of perceptual stimuli must also take place within one sense modality. He must have overlooked that the integration within a single modality is a far from trivial matter.

Brentano's Holistic Point of View

BRENTANO's importance for the holistic movement becomes evident when we look at his following train of thought. BRENTANO (1874) remarked: "We do compare colours which we see with sounds which we hear" (p. 159). Then he asked himself, "How would this presentation of their difference be possible if the presentations of colour and sound belonged to a different reality?" (p. 159). A little further he wrote:

"In fact, it would be like saying that, of course, neither a blind man nor a deaf man could compare colours with sounds, but if one sees and the other hears, the two together can recognize the relationship. And why does this seem so absurd? Because the cognition which compares them is a real objective unity, but when we combine the acts of the blind man and the deaf man, we always get a mere collective and never a unitary real thing" (p. 159) ...

"Only if sound and colour are presented jointly, in one and the same reality, is it conceivable that they can be compared with one another" (p. 159).

BRENTANO believed that perceptual phenomena are experienced unified. This means that the mental phenomena present at a certain moment are grouped together and experienced as a single whole. An example can make this clear. Someone is at a concert enjoying the music, while sitting in a most uncomfortable chair. The music and the discomfort are detected by different perceptual systems. Each percept on its own has an effect in the mental realm. Still, the psychological experience of that event is unitary and, therefore, the percepts coming from the auditory and the tactile senses have to be integrated somewhere into the unitary experience of listening to beautiful music in an uncomfortable position. That experience has parts - the music, the sitting and so on -, but the experience as such has a unified character. That is a central point in BRENTANO's psychology and he formulated it as follows:

"Our investigation leads to the following conclusion: the totality of our mental life, as complex as it may be, always forms a real unity. This is the well known fact of the unity of consciousness which is generally regarded as one of the most important tenets of psychology" (p. 163) ...

"The unity of consciousness as we know with evidence through inner perception, consists in the fact that all mental phenomena which occur within us simultaneously, such as seeing and hearing, thinking, judging and reasoning, loving and hating, desiring and shunning, etc., no matter how different they may be, all belong to one unitary reality only if they are inwardly perceived as existing together. They constitute phenomenal parts of a mental phenomenon, the

elements of which are neither distinct things nor parts of distinct things but belong to a real unity. This is the necessary condition for the unity of consciousness and no further conditions are required" (p. 163/164).

One finds in BRENTANO's work only reference to cross-modality integration. It seems that BRENTANO, just like ARISTOTLE before him, did not consider the possibility of within modality integration.

Ehrenfels' Remarkable Insight

EHRENFELS did not name any philosophers who were aware of the problem of the perception of unified phenomena. He informed us that his analysis was prompted by remarks made by Ernst MACH (1838-1916) in MACH's (1886) *Contributions to the Analysis of the Senses*. Therein MACH stated that we experience directly, without a mediating step or an intellectual processing, space Gestalten and tone Gestalten. That could very well be true. Still, EHRENFELS' remark should not obscure for us the differences between the two men. MACH (1886), for instance, proposed a "complete parallelism of the psychical and physical" (p. 30). He recognized "no gulf between the two provinces" (namely between the psychical and the physical area) (p.30). Strictly speaking, parallelism does mean that psychical phenomena cannot be collapsed on physiological ones. Nevertheless, that seems to be exactly MACH's position, who contributed, after all, to the journal *The Monist*. EHRENFELS' article appeared in the *Vierteljahrschrift für Wissenschaftliche Philosophie*, which was edited by Richard AVENARIUS. EHRENFELS visited AVENARIUS a couple of years before he wrote his article (see FABIAN, 1986), and AVENARIUS must then have explained the ideas of MACH, whom AVENARIUS admired, to his young visitor. EHRENFELS' reference to MACH may have been intended to elicit the editor's sympathy. Later, when EHRENFELS was a professor at the German university at Prague, he was for a time a colleague of MACH and these two men, then, must have had some contact with each other. That, however, was years after EHRENFELS' Gestalt article appeared.

EHRENFELS introduced the subject matter of his article through a question: "Is a melody (i) a mere sum of elements, or (ii) something novel in relation to this sum, something that certainly goes hand in hand with, but is distinguishable from the sum of elements?" (p. 83) We find the same question stated differently two pages further.

"Let us suppose, on the one hand, that the series of tones $t_1, t_2, t_3, \dots, t(n)$, on being sounded, is apprehended by a conscious subject S as a tonal gestalt (so that the memory-images of all the tones are simultaneously present to him); and let us suppose also that the sum of these n tones, each with its particular temporal determination, is brought to presentation by n unities of consciousness in such a way that each of these n individuals has in his consciousness only one single tone-presentation. Then the question arises whether the consciousness S, in apprehending the melody, brings more to his presentation than the n distinct individuals taken together. An analogous question can clearly be raised also in regard to spatial shapes" (p. 85).

The similarity of EHRENFELS' train of thought to BRENTANO's rhetorical asking if one can unite the hearing experience of a blind man with the seeing experience of a deaf, is, of course, striking. And BRENTANO's rhetorical question must

be inspired by ARISTOTLE's remark about the discrimination of white from sweet. Indeed, what seems to be original in EHRENFELS' thinking is precisely that the approach is applied to a single modality, such as audition. Hence, it was EHRENFELS who wrote the seminal paper on within modality integration. The later Gestalt psychologists would research mainly the phenomenon of the integration within one sense modality. This shift from cross-modality integration to integration within one sense modality forms, I believe, an important dividing line between the Gestalt theorists and the earlier holistic thinkers.

Sometimes, to ask a question is to presuppose a certain type of answer, as is the case here for EHRENFELS. A melody is different from an assemblage of its elements. Why does he think so? Because a melody can be played in different tunes; it fulfils the criterion of transposability. One can play a melody in a certain key. Remarkably, the same tune is recognized when played in a different key and even with a different instrument. We hear the identical piece of music, although the tones are quite different in each presentation. The musical keys differ and therefore so do the tones, but not the melody. A melody, then, cannot be equal to the sum of the individual tones. Harry HELSON (1925) formulated EHRENFELS' position as follows: "A configuration possesses properties over and above its parts and not derivable from them; the configuration is transposable since it does not depend on any given set of elements" (p. 360).

EHRENFELS also noted that it is easier to reproduce a melody than an individual note. If someone needs a high C, for instance, the singer will sing a piece of music that will lead to that note, instead of singing that tone immediately, without the help of a tune. Directly hitting a high C is only possible for those who have perfect pitch. It seems that we have easier access in our memory to a tune than to one of its elements. A Gestalt, in other words, is easy to remember and sometimes to recall with less difficulty than its individual elements.

Rubin's Experiments

RUBIN showed his subjects pictures or slides with two meaningless coloured fields. Those fields were so situated that one field enclosed, or encircled, the other. The experiment consisted of two phases. During the first or learning phase, the subject was shown a series of slides and instructed to direct his attention to one of the two fields. One could pay attention to the field that surrounded, or to the one that was enclosed - whichever field was attended became the 'figure', whereas the other became 'ground'. In the testing phase of the experiment the subject was shown the same slides again in random order intermingled with new but similar slides. He was then asked some questions regarding the figure or the ground. I do not know if someone gave RUBIN the idea for his experiments, but I have not found anyone claiming that. The best explanation seems to be that RUBIN's exploration on the effect of background on perception of a stimulus and vice-versa were inspired by remarks of HÖFFDING, who (1892) thought that "there is no series of absolutely independent sensations but every sensation is determined by its relation to the one experienced immediately before it or at the same time" (p. 112). The experience of every sensation, according to

HÖFFDING, is relative to earlier sensations and also dependent on the surrounding sensations. HÖFFDING's law of relativity was an invitation for experimental work on the relation between background and stimulus.

RUBIN noticed that if the subject focused his attention on a particular field during the learning, the subject was inclined to perceive that same field as figure on subsequent exposures. Thus, whichever field one was instructed to attend to - the surrounding or enclosed - was the same field that one saw as figure in subsequent presentations. There was thus no shift between the fields. RUBIN denied that this phenomenon could be explained by the theory of associationism and he gave a simple reason for his rebuttal. The figure has some sort of object status, whilst the ground is an undifferentiated background. In other words, there exists only one element, the figure, and not two between which a connection can be formed. This, according to RUBIN, excluded association as the mechanism responsible for the figure-ground phenomenon. An association presupposes the existence of more elements between which a link will be established, whereas here only one element was present.

Yet another one of RUBIN's experimental findings concerned recognition. The figure was always recognized better than ground for both learning and test trials when the figure-ground relations remained constant. Subjects performed slightly less well on fields which were ground during both learning and test trials. The performance dropped dramatically, however, when the fields reversed their roles. Fields that were figure (ground) during the learning trials and later tested as ground (figure) were almost never recognized. In these cases "these fields will not be recognized again during the testing" (p. 26). RUBIN concluded that: "The experiments show that recognition depends completely on how the differentiation takes place" (namely the differentiation between figure and ground during the learning trials) (p. 27).

RUBIN's experiments show that, mentally, a difference exists between fields experienced as figure and as ground. The experienced figure and the experienced ground are two differently experienced perceptual objects that can be evoked by one and the same objective stimulus condition [*objektiven Gegenstand*] (p. IX). This finding resulted in more questions, such as: Are there "probability rules that an area is perceived as a figure?" (p. 79). This is an empirical question and RUBIN found the answer through empirical means. Not surprisingly, he found that such rules indeed exist. "If one of two homogeneous, differently coloured fields is appreciably larger than the other one, and if it surrounds that other field, then there exists a great probability that the smaller enclosed field is perceived as a figure" (p. 79). Notice that in RUBIN's experiments, one field was always surrounded with another. RUBIN detected that the enclosed field had a higher chance of being seen as figure than the surrounding one. A subject, however, could overcome this tendency and treat the other, surrounding field as figure.

RUBIN also found that with a repetition of motifs, all the motifs are experienced the same way, all as figure or all as ground. Perhaps the example of wallpaper with a repetition of several motifs, for instance, blue stripes and green stripes can make this clear. One motif, say the blue stripe, stands out as figure for the whole wall while the others, say the green colour form the background. One does not see this motif (blue stripe) at this spot and that one (green stripe) somewhere else. The same is true for "a

coherent, monochrome field” (p.83). The whole field is seen as figure, or as ground. It is thus not the case that a part of a field is seen as figure and the rest as ground.

Knowing now that a difference between figure and ground exists, and having a better idea what makes a field a figure or a ground, RUBIN wanted to know “what does this difference consist of?” (p. 36). This question calls for a more qualitative answer. RUBIN formulated it this way: “The experienced figure and the experienced ground do not both have form in the same manner, since the experienced ground has in a certain sense no form” (p. 36). Or, otherwise formulated: “The figure has more the trait of an object and the ground more the trait of a material” (p. 48). Another relevant quote reads: “That the experienced object, when it is a figure, by and large is more vivid than when it is a ground, and ... it prevails or dominates in consciousness” (p. 67). RUBIN also had this to say about the difference between figure and ground: “From a psychological perspective the experimental figure is so to speak more processed than the experienced ground” (p. 96). He noted as well that the figure has “a certain independence” (p. 70), since “it is of little importance for an experienced figure if it is seen against one ground or another” (p. 70).

Ehrenfels' Explanation

After having demonstrated with his example of a melody that the whole is not a mere sum of its elements, EHRENFELS must now come up with an explanation: the Gestalt quality. That is, a perceptual property attached to a number of distinguishable perceptual elements. “Gestalt qualities are given in consciousness simultaneously with their foundations, without any activity of the mind specifically directed towards them” (p. 112). EHRENFELS thought of a Gestalt quality as a “new positive element of presentation” (p. 92). EHRENFELS also gave the following description of a Gestalt quality:

“By a gestalt quality we understand a positive content of presentation bound up in consciousness with the presence of complexes of mutually separable (i.e. independently presentable) elements. That complex of presentations which is necessary for the existence of a given gestalt quality we call the foundation of that quality” (p. 93).

In Edwin BORING's (1929) words EHRENFELS “thought of the form-quality as distinctly secondary to the fundamente, as variable independently of them, but not independently given” (p. 443/444).

To understand all of this, we have to keep in mind EHRENFELS' principal example of a melody. A melody is made up of distinguishable perceptual elements, the notes. EHRENFELS believed, however, that with those notes there is something else given to consciousness, namely the Gestalt quality. Max WERTHEIMER (1925) explained EHRENFELS' solution as follows:

“When a melody is made up of six tones, and I reproduce it, playing six totally different tones, and it is recognised - what remains? Quite certainly, these six elements must be assumed to be a sum there...; but besides those six a seventh, as it were, would be assumed, that is the gestalt quality. The seventh is that which makes it possible for me to recognise the melody” (p. 10).

WERTHEIMER, of course, described above EHRENFELS's theory of the basis of the perception of Gestalten and not his own. Barry SMITH (1988) gave an explanation similar to WERTHEIMER's, although stressing the atomic aspect of EHRENFELS' notion. Gestalt qualities "are additional unitary objects, existing alongside the unitary elements with which they are associated" (p. 17).

If a Gestalt quality exists, how do we perceive it? Is there a specialized organ, or is the Gestalt quality of a melody perceived by the ear just as the regular tones? EHRENFELS did not believe that the senses perceive Gestalt qualities. He said, however, that the perception of a Gestalt quality could be the result of an interaction of brain states, each caused by an individual note. A togetherness of stimuli could be the physiological base for the emergence of a new mental element. Togetherness of stimuli, however, does not automatically result in a Gestalt quality. At the end of his article EHRENFELS formulated another law concerning the emergence of Gestalt qualities, namely contrast from its surroundings. In other words, EHRENFELS believed that the brain functions in such a way that it evokes a new mental element, the Gestalt quality, when the right kind of sensory information reaches it. Notice that the emergence of a Gestalt quality, according to EHRENFELS, takes place in a mechanistic way.

WERTHEIMER used the term 'seventh' to express EHRENFELS' notion of Gestalt quality. No doubt that description points in the right direction, but it should not confuse us in considering a Gestalt quality as an extra note, the seventh one. It has to be distinguished from the elements. A melody is transposable, exactly because the Gestalt quality does not depend on any given set of elements. If there is this Gestalt quality, then the notes will be heard as that particular melody. The notes depend on the Gestalt quality to be recognized as that piece of music. The other way around, however, does not hold. If the notes are there, but the Gestalt quality is absent, then there is no melody. Therefore a melody can be presented without that particular foundation or these tones, but not that foundation or those tones without this particular Gestalt quality.

Consciousness perceives the Gestalt quality directly and passively. A Gestalt quality exists with the notes, and one experiences it without any effort. In some cases, such as looking at a huge painting, our effort is oriented towards the perception of the underlying stimulus complex. Still, the Gestalt quality itself emerges without a conscious effort aimed at the production of the Gestalt quality. The Gestalt qualities are mentally given with their perceptual elements. The Gestalt quality does not depend on consciously directed activity on the part of the perceiver. To support his last remark, EHRENFELS could have pointed out that one cannot choose not to hear the melody if the sequence of notes is presented.

How do we know that this series of notes has a Gestalt quality and that one not? How do we know if a mental content is based on a Gestalt quality or not? The answer can be found in EHRENFELS' definition of Gestalt quality. If the elements can be transposed without altering the mental content, then a Gestalt quality is present. If, on the other hand, the elements cannot be transposed, then there is no such quality in the stimulus complex. So, if we can play a series of notes in another key, without losing its identity, then the notes are accompanied by a Gestalt quality.

EHRENFELS used the word Gestalt only once or twice on its own, without adding

the word quality. He points out that a Gestalt, or a whole, is made up - paradoxically - of distinguishable, and even independently existable parts. Quality is a term equally used for the perceptual level. We can have the quality of colour, or of tone, for instance. Both words belong properly in a theory of perception. To clarify this remark, we have to go back to ARISTOTLE's theory of perception. ARISTOTLE argued that information across senses must be integrated, before we can judge what the object is. First, we have to make a multi-modal image of a dog (colour, bark, form etc.) and then we can judge it to be Freddie. EHRENFELS likewise proposed that first we have to integrate the tones into a unit before we can identify these tones as forming this particular tune. In other words, EHRENFELS believed that a melody is detected at the perceptual level from its constituent parts. In the Aristotelian psychology, the sense that is common integrates stimuli coming from different sense organs into one object. EHRENFELS argued that stimuli within one sense modality must be recognized as well as belonging to one object at the perceptual level, and he gave the task of integrating presentations belonging to the same sense to the Gestalt quality.

Higher Order Gestalt Qualities

EHRENFELS also discussed the existence of higher order Gestalt qualities, where he distinguished between several types. In smell, elements from two different fields, pressure and temperature, are combined. The taste Gestalt is a mixture of three kinds: pressure, temperature and smell. Another example of a higher order Gestalt is ballet. EHRENFELS asked himself rhetorically: "Whether a complex of melody and visible movement may not yield Gestalt qualities of a higher order?" (p. 107) Thus, EHRENFELS believed that higher order Gestalten integrate the various individual Gestalten obtained from the individual senses. Thus, according to EHRENFELS, ARISTOTLE's sense that is common creates higher order Gestalten.

Another highly instructive kind of higher order Gestalt is a unity such as animal species. Presumably EHRENFELS has in mind that a species forms a higher order unity in that its members all share the same specific nature. What EHRENFELS may have been reaching for is that Gestalten do not just exist in the world of immediate experiences, but also in the world of ideas. The visual image of Freddie, the dog, then, would be a Gestalt. The concept 'dog' would be a higher order Gestalt and, presumably, the concept 'animal' a still higher order Gestalt.

RUBIN's Notion of Psychological Experiments

RUBIN had established the figure-ground phenomenon through experimental means. There exists thus a fundamental difference between the field perceived as figure and the one perceived as ground. The figure is that which we see; the ground just that, background. Now he had to offer an explanation. This brings us to the point where RUBIN believed that experiments are no longer applicable. It is perhaps surprising for the modern reader to note that experiments are absent in this phase of RUBIN's project. That was, however, the practice in early German experimental

psychology. The first generation of Gestalt theorists received their psychological experimental training under Carl STUMPF. RUBIN's experimental method, however, did not differ from STUMPF's. STUMPF, however, would explain his method in one of his books. It is therefore worthwhile to examine STUMPF's experiments and the notion that lie behind them.

STUMPF's main experimental work is *Tone Psychology* which first volume appeared in 1883 and the second one in 1890, the year of EHRENFELS' publication. The book is titled *Tone Psychology* "because it intends to describe the mental functions, which are evoked by tones" (*Tone Psychology, vol. I, p.V*). *Tone Psychology* is thus STUMPF's attempt to establish the scientific study of mental phenomena, especially the ones caused by physical tones. In the *Tone Psychology* STUMPF moved, as he wrote in his autobiography (1924) "from theory to observation, from meditation to facts, from my writing desk to the laboratory" (p. 397). From what has been said, the modern reader would expect to find descriptions of experiments as well as conclusions based on them. The first volume, however, does not mention a single one, and only far into the second volume do we find reports of experiments. That is not as surprising as it might seem at first. The mental realm is open for inner perception - to be precise, STUMPF's inner perception. But this raises a question, would STUMPF's inner perception match those of other persons? The only way to find that out is by empirical means, to ask (other) subjects to report their auditory perceptions.

"In order to control my own judgement, I have taken yet another route" (*Tone Psychology, vol. II, p. 142*), namely the route of experiments. Of course, no one has direct access to the inner perceptions of others. Those perceptions cannot be observed externally. The best one can do is to ask subjects about their experiences. The experimenter can increase the reliability and usefulness of those reports by (1) controlling the environment in which the perceptions are evoked, and (2) standardizing the reports of those perceptions. That is exactly what STUMPF did. The experiments were thus carried out to get an idea of the inner perception of (other) subjects. We saw that STUMPF wrote in his autobiography that he started to occupy himself with facts and laboratory. Facts are the contents of inner perceptions. And laboratory is not restricted to some specially-equipped room in a university; it is any setting to elicit reports of inner perceptions.

STUMPF used his experimental method for the experiments described in *Tone Psychology*, but he explained it in his next book, *The Speech Sound* (1926). There, he defines a subject as an "observer, whose task is the description of a perceived appearance" (p. 49). STUMPF saw psychology as the scientific study of psychological processes, the study of which respects the internal appreciation of reality. Internal perception of whatever kind, obviously, is not grasped by the methods of the physical sciences. That forces psychological experiments to be different from them. In the experiments done by physical scientists, intuition of the object studied does not play a role. Intuition, however, is essential in psychological experiments. STUMPF explained the difference between his type of experimental science and that of biology by contrasting his subjects with frogs. The contrast is, of course, that the task of STUMPF's subjects was to describe their experience, while the biologist is not interested at all in the frog's experience. Remember that STUMPF defined his subjects as observers!

STUMPF examined tone fusion, RUBIN the figure-ground phenomenon. Both gave a theoretical explanation of their findings. Those explanations were thought to be subjective, based on the creative insight of the researcher. Facts were thought to be objective, not their explanation. In this view, explanations cannot be experimentally proven and neither STUMPF nor RUBIN would put their explanation to a test. Early German psychological experiments were solely carried out to elicit mental phenomena, not to verify or falsify a theory.

BÜHLER (1927) noted that it was the belief held by STUMPF and his generation that the theory of impressions or presentations [*Theorie der Empfindungen*] should be constructed with the help of experiments (see p. 5). BÜHLER also noticed that there was no agreement among psychologists at the beginning of the 20th-century on the theory of consciousness, or on axiomatic issues [*Axiomatik*], but there was consensus on how to proceed [*Methodik*]. BÜHLER could have added that this agreement about how to tackle the problem of consciousness would not only exist within STUMPF's generation, but would also extend to the next generation. STUMPF's students - among whom we find KÖHLER, KOFFKA and WERTHEIMER - would disagree with his ideas, but not with his way of experimenting. The debate between the Gestalt psychologists and their contemporary opponents was never on the methods used, but on ideas how humans 'tick.' The disagreement at the beginning of the century relating to concepts reflected, according to BÜHLER, a foundation-less psychology; that is, psychology did not have a foundational notion, an axiom, such as DARWIN's theory of evolution for biology or EINSTEIN's notion of relativity in modern physics; a notion which most psychologists would agree on and which would unify psychological theories and research.

Rubin's Explanation

RUBIN thought that the 'contour' between the figure and its ground played an important role in visual perception. Contour should not be confused with 'border.' The border between two countries is a no-man's-land between those countries. It belongs to both, or, if one prefers, to no one. That, however, is not the case with RUBIN's contour, even though not far into his book he defined contour as a border, or "as the mutual border of both fields" (p. 36). This definition, however, does not seem accurate. RUBIN conceptualized contour as an active entity - it does something, it has "a moulding effect" [ein formendes Wirken] (p. 36). We, however, do not notice the moulding, but only its result. "The figure is especially affected by this moulding effect, and not so much the ground" (p. 37).

Therefore the contour is the demarcation of the figure, not of the ground. A contour is thus not the mutual frontier of both fields but only that of the figure.

"The mutual contour has significance for the field that stands out as a figure, because it is that field's border, which says: here that thing comes to an end, this mutual contour seems to have so little in common with the ground that one can continue to exist freely past the contour" (p. 39).

The contour denotes the ending of the figure; it belongs to the figure. As a consequence, "the contour is more relevant to the field experienced as a figure than to the

one experienced as ground” (p. 41). Since the contour belongs to the figure, it cannot be the case “that the mutual contour has a different meaning for the experienced figure and the experienced ground” (p. 41). Here, RUBIN denied that the contour has one meaning for the figure (namely the end of the field) and another one for the ground (whatever that may be). It seems thus that RUBIN believed that the contour has no meaning whatsoever for the ground.

Till now we have used quotes suggesting that the contour could be a real physical object. RUBIN’s following remark, however, contradicts that. He said that a contour is “not a surface, it encloses an area, but it does not constitute one, it has length but no width” (p. 106). There are some obvious consequences of this view. Since a contour has no width, it also cannot have colour (see p. 106). But it has a length, so we can track it with our eyes, and that, of course, can take time (see p. 153/160).

To recapitulate, RUBIN used fields with different colours in his experiments. There was thus an edge where those colours met, where one field finished and the other started. That, however, was in RUBIN’s eyes not the contour. A contour is a non physical - since it has no width - but nonetheless active entity demarcating the figure. It should therefore also not be confused with the black lines one finds in children’s colouring books separating the figures from each other and the background.

RUBIN’s conceptualization of what a figure is also goes against our common sense notion. A figure, according to RUBIN, is a complex made up of parts. So far, so good. An example will illustrate what RUBIN meant with this statement. A hand has a palm and five fingers. RUBIN’s parts, however, were not the palm and those five fingers. He distinguished between the field (in the form of palm and fingers) and its contour. Both entities, field and contour, play a role in forming the figure of a hand.

“There is a difficulty for the relation between figure and contour in that the normal experience of figure consists of a complex of two kinds of objects, the experienced surface figure and the experienced contour; and it is a difficult task to make clear that there are different objects here with which one has to deal” (p. 145).

RUBIN’s subjects were presented with two neighbouring fields. They saw, however, a figure against a background. Physically there seems to be no difference between the fields, but mentally there is one. RUBIN even showed experimentally that one and the same field can be perceived as figure or as ground. In his words there are “two different experienced things, which, under different subjective conditions can depend on one and the same objective stimulus condition” (p. 101). The distinction between figure and ground does not stem “from the nature of things” (p. 94). The only explanation, according to RUBIN, is the fact “that the inner life is by and large so equipped” (p. 95). RUBIN, in other words, considered that the mental is different from the physical. That was at that time a more widely held view. RUBIN also contemplated why “our inner life is so equipped” (p. 94). He concluded, not unreasonably, that this arrangement must be beneficial to the observer. But he did not explain why it came to be. Therefore RUBIN cannot be considered, at least not from this text, as a forerunner of today’s evolutionary psychologists.

We find another example where RUBIN differentiated between mental and physical phenomena in his discussion about the perception of a line. RUBIN’s research led

him to the conviction that: “Under certain circumstances the line can be experienced as having no width, namely when the visual angle is sufficiently small” (p. X). In his treatment of visual objects without expansion [*Ausdehnungslose Gesichtsgegenstände*] RUBIN wrote:

“It is a fairly often discussed question, if the contour or the line is an actual sensory visual shape or not. Considering that, it is surely not emphasized in the more recent psychological literature that the specific line differs from a stripe essentially in that the line can be one-dimensional. It is true, one has spoken of lines without width, but one considered that as something that cannot be seen, something abstract, what emerges from a kind of border crossing. One has not noticed that lines without width, although unthinkable as objects of nature, can be experienced sensorial” (p. 193).

In other words, lines without width are physically impossible but, nonetheless, they can be seen. Note that RUBIN discussed here the perception of lines, his use of the word contour notwithstanding. This passage, therefore, should not be confused with his treatment of the role of contours in the figure-ground phenomenon. The difference between the mental and physical is also evident in the following quote: “Since we are inclined to think the mental in analogy with the objective, an inclination ensues to avoid that which belongs [exclusively] to these [mental] facts” (p. 192). RUBIN claimed that mental phenomena have certain characteristics that distinguish them from physical ones. If certain characteristics are not shared with the physical ones, then we will lose them if we treat the mental as identical to the physical.

The ending of RUBIN’s book is rather surprising to a modern reader. He finished his description of his experimental work with an excursion into philosophy. RUBIN believed that his findings shed some light on HUME’s work and his conclusion reads like a comment on HUME. HUME’s analysis of the mental, according to RUBIN, was unhindered by preconceptions derived from knowledge of the physical realm. HUME studied only the mental, and RUBIN approved of that approach. RUBIN (1930), in a small review article which is of no further interest to us, repeated that stimulus and experience should not be confused with one another, but be kept distinct at all times. They should, then, also be studied separately.

Differences and Similarities Between Ehrenfels’ and Rubin’s Approach

It is worthwhile to compare RUBIN’s book with EHRENFELS’ (1890) article and we start by noting some obvious differences between EHRENFELS’ and RUBIN’s writings. EHRENFELS started with a thought experiment on melodies; RUBIN did experiments with visual figures. EHRENFELS used Gestalten that have meaning, whereas RUBIN employed so called “nonsense figures.” The method as well as the material thus differed between the two psychologists. Those differences had a bearing on the questions the researchers can legitimately ask themselves. EHRENFELS’ material makes it feasible to discuss the results of changes in part(s) of the Gestalt. That is not possible in RUBIN’s case. One can study what happens when one makes small changes in meaningful units such as melodies. However, it makes no sense to ask if a figure without a meaning remains the same or not after a small alteration. Important as they are, these differences do not hit the heart of both theories.

Besides, a Gestalt quality, according to EHRENFELS, can only be present in the case of several perceptual elements (p. 252). Indeed, there is no melody when there is only one note; melodies demand several notes. A contour, on the other hand, is the contour of only one field. There is thus only “one perceptual element” present. This difference could explain another one. EHRENFELS contemplated the existence of higher order Gestalten. RUBIN’s research, however, did not easily lead to the idea of higher order contours. RUBIN limited himself to figures consisting of one element. The qualification ‘higher order’ implies the presence of several elements. If we start with figures made up of more elements - EHRENFELS’ departure - it is no big step to think of Gestalten made up of even more elements. If, on the other hand, one starts, like RUBIN, with a one-element figure, the step to a figure made up of several figures comes close to a contradiction in terms. In any way, it is a bigger step than EHRENFELS had to take.

There is, however, a case to be made that figures and grounds may be hierarchically structured, although, as far as I know, RUBIN did not mention it. Imagine a piece of white paper with a green spot on it and on that spot there is a red dot. In RUBIN’s analysis the red dot would (most likely) be seen as figure. Now one can argue for the following structure of figures and ground. First, the green spot with the red dot are separated from the rest of the paper. The green spot, being the smaller enclosed entity, is figure, while the rest, the surrounding paper, is field. At the second level, the entity of the green spot and red dot is decomposed, and the smaller, enclosed, red dot is separated as figure from the larger, surrounding background of the green field. In this analysis, there exists a hierarchy not dissimilar to EHRENFELS’ proposal.

The similarities between the Gestalt quality and the contour are striking. First of all, both concepts are intended to explain the perception of form in a single modality. One of the ways EHRENFELS described a Gestalt quality was as an enfolding united band [*Umschlingendes einheitliches Band*] (p. 281). This is, of course, also a fitting description of RUBIN’s contour. Besides, there is a dialectic relation between the Gestalt quality and the contour on the one hand, and their perceptual basis on the other. The Gestalt quality and the contour play a role in defining the perceptual basis. They make a tune out of a series of tones and a figure out of a field. The Gestalt quality, however, depends also on its foundation, and the same holds for a contour. A Gestalt quality is present together with the perceptual elements and the contour with its field. Furthermore, both the Gestalt quality and the contour do not depend on our own inner powers of interpretation. A melody or a figure, according to EHRENFELS and RUBIN, is not the result of our own productive powers; it exists on its own. A melody and a figure are more than the sum of their perceptual elements; a Gestalt quality is added to the notes, and a contour to the figure-field. This, at least as far as their theories is concerned; we have no empirical evidence that there is no act of interpretation involved.

The Gestalt quality and the contour hold the same position with respect to their perceptual element(s), the tones or the figure-field. A melody does not need these special notes. It can be played in different keys, thus with different tones. A melody is a combination of a Gestalt quality and the tones. The same is true for the contour and its figure field. A figure field can have different colours, but as long as it is surrounded by the same contour, it is the same field.

Finally, the properties of the unity of a melody or a figure cannot be explained through their perceptual elements, the notes or the figure-field. The Gestalt quality or the contour has to be taken into account as well. They are, according to EHRENFELS and RUBIN, the cause of unity.

A Gestalt quality is not a melody and a contour not a figure, hence an important difference from the notion of Gestalt itself. A melody is a compound of a Gestalt quality and tones, and a figure of a field and a contour. The tones or the field is the aspect that makes the melody, or figure, a particular, unique, individual thing. It makes it this melody, played in this key, by this instrument, or this field, in this colour, with this hue. The Gestalt quality or the contour provides the universal aspect. It makes these notes BEETHOVEN's Fifth Symphony, or this field a face. EHRENFELS and RUBIN believed that the universal aspect is not a creation of our minds. Instead they considered it a real entity. This could explain why a Gestalt quality and the contour were described in physical terms. In a certain sense, they are out there. Both thinkers believed that we capture passively and directly both the individual and the universal aspects of the things in the world. As we hear tones, we hear its Gestalt quality; as we see a field, we see its contour.

Both thinkers stressed that, from the perceptual element(s), a Gestalt or figure is formed by something outside us, something that operates on the perceptual elements. EHRENFELS described it as an extra element, a kind of extra tone. RUBIN described it as a line. One can argue that neither description is well chosen, since a Gestalt quality performs functions quite remote from the tones of a melody. RUBIN acknowledged that a contour is not a real line, and it too performs a function different indeed from an ordinary contour. A Gestalt quality forms a melody and a contour a figure. Both thinkers used physical terms to point to that which organizes something into a whole.

Perception of a melody or figure implies that we perceive the Gestalt quality, or the contour in addition to the perceptual elements. Remember that the Gestalt quality and the contour are entities 'out there,' not the result of processes 'within us.' Although EHRENFELS acknowledged that we have no specialised sense organ to perceive Gestalt qualities, he believed that the brain is built so that Gestalt qualities are noticed there. Remember that perception of Gestalt qualities takes place passively. RUBIN believed that we see the contour. That can take place in the eye or higher up in the brain. Wherever, that perception is also a passive process.

Can it be that RUBIN's contour is EHRENFELS' notion of Gestalt quality for the special case of only one element? EHRENFELS' description of an enfolding uniting band expresses that the Gestalt quality separates the elements that fall within the Gestalt from all other elements. A melody is separated from the noise we hear, albeit not by an audible envelope; a figure pops out from its background. Therefore, a Gestalt quality could well be the contour of one element. The thesis that the contour is a special case of a Gestalt quality, however, was challenged by RUBIN himself! RUBIN points to an example where the contour can be altered without affecting the figure. The example is that of a stamp with a zigzag contour. One can change the zigzag line for a straight one without, according to RUBIN, changing the figure of the stamp. If we assume that a contour is a special case of a Gestalt quality, then the alteration of the border of the stamp would mean that we can change the Gestalt quality without af-

fecting the experience of the Gestalt! We would thus change the Gestalt quality while hearing the same melody. Since that cannot be the case, a contour is not a Gestalt quality for the case of one perceptual element, except, however, if we accept that in that unique case one may change the contour without affecting the Gestalt. That exception may be motivated on the grounds that the element will stay the same and therefore so will its (Gestalt) perception. In the case of one element, the Gestalt quality needs only to separate the field from its background, while in the case of more elements, the Gestalt quality has the additional task of uniting the elements. Although SMITH (1988) did not mention RUBIN, he had something to add to the above discussion. "From EHRENFELS' point of view, a Gestalt quality (whole property) disappears when we isolate its parts" (p. 56). SMITH argued that there is no special case of a one-element Gestalt quality, and as a consequence a contour cannot be that special case. Note that one function of a Gestalt quality, to isolate the constituent elements from the surrounding, must still be performed in the one-element case.

Let us return now to the example of a stamp and see where we arrive when we assume that a hierarchical organization of figures and grounds exists. First we must 'translate' the stamp into this model. The stamp has a white zigzag border, with a coloured interior, and in that interior there is a figure (for instance the face of a queen) and at the top right corner a number representing the value of the stamp. At the first level of analysis the coloured interior is separated from the white zigzag border. At the second level the numeral and the face are separated from the background. As far as the white zigzag border is concerned, there can be a further, second-level separation of the straight inner edge of the coloured interior from the outer zigzag edge. Now, the change of one element, in this case the zigzag edge, does not influence the other contours and therefore the overall 'feeling' of the stamp remains the same. A change in one of the elements (the zigzag edge) does not affect the Gestalt quality of the whole stamp. It seems that RUBIN's model can be reformulated in hierarchical terms. Then 'contour' and 'Gestalt quality' express the same function, namely the experienced unity.

Koffka Concentrated on Rubin's Experimental Findings

KOFFKA (1922) in his review of RUBIN's work credited RUBIN with having shown that the figure-ground distinction is a fact on its own and cannot be explained through mechanisms such as observation or attention. KOFFKA also noted that this distinction is fundamental to psychology. KOFFKA ended his review by remarking that meanwhile - that is, between the Danish publication of RUBIN's book in 1915 and the review in 1922 - KÖHLER had shown that this distinction could be understood theoretically. The last remark shows in my eyes that KOFFKA ignored RUBIN's explanation. KOFFKA had shown in other reviews to be fair and intelligent in treating other scholars' works. KOFFKA was, no doubt, capable of dealing with RUBIN's theoretical notions, however, in this case he decided to concentrate on RUBIN's experimental work and the convincing way the problem of form was shown.

Ehrenfels' Explanation of the Perception of Similarities

EHRENFELS recognized, besides its unifying aspect, another function for Gestalt quality, namely to apprehend similarities. For instance, we can recognize the composer of a new song because we heard his or her songs before. And at a party we are able to recognize as brothers two men who are complete strangers to us.

“Thus we recognize the composer of a melody through its similarity with other, familiar melodies, through without our being in a position to specify more precisely in what this similarity consists. We recognize the relatives in a family in a resemblance manifested in their whole physical nature and bearing, a resemblance which often stubbornly resists analysis into relations of identity between individual constituent parts” (p. 106).

It seems that EHRENFELS had in mind that we perceive Gestalt qualities. In the case of the songs or of the brothers the Gestalt qualities have a similarity that is noted. The elements of the cognitive operations are then not the tones or the physical characteristics of the two men, but their Gestalt qualities.

EHRENFELS could have referred here to the doctoral thesis of his teacher and friend Alexius MEINONG. MEINONG (1877) noted in his HUME studies I (see p. 61) that members of a family or inhabitants of a nation can share certain characteristics. When writing his thesis, MEINONG believed that we really observe those resemblances. He discarded the notion that those observations are the result of mechanisms of inner processing of information, a solution offered by the theory of associationism. EHRENFELS' explanation of the noticing of similar characteristics through the agency of Gestalt quality is in line with MEINONG's thesis.

It is doubtful that EHRENFELS' explanation suffices here, since he did not explain how one recognizes similarities of Gestalt qualities. In order to recognize a similarity, we need something that determines what characteristics we have to look at; what are the relevant attributes that tell us that things are or are not the same. Gestalt qualities, obviously, will not do that. In many cases, noticing similarities is not an immediate perceptual process, as EHRENFELS assumed, but must involve conceptual work on the part of the observer; the similarity is, as it were, imposed on the perceptual stimuli.

EHRENFELS also believed:

“That the larger part of both our everyday and our scientific vocabulary designates gestalt qualities Thus gestalt qualities comprise the greater part of the concepts with which we operate” (p. 108).

Here EHRENFELS linked Gestalt qualities to our concepts. His view seemed to be that we recognize similarities in the Gestalt qualities and that we give those similarities a name, that is a designation in words. EHRENFELS had come a far way from the raw experience of notes and their melody from which he departed.

EHRENFELS came up with Gestalt qualities to explain the recognition of melodies. Then he applied the same concept to our recognition of family members, or nationalities. Thus, we need a Gestalt quality to note the similarity of pieces of music. Don't we then also need a Gestalt quality to note the similarity of Gestalt qualities? And does this not lead to an infinite regress of needs of Gestalt qualities?

EHRENFELS assumed that the brain is structured in such a way that it notices Gestalt qualities. EHRENFELS, then, must also assume that the brain will notice similarities between Gestalt qualities. However, I believe that this assumption cannot hold up. Sensory elements can influence the brain, but how can a Gestalt quality, a non-sensory element, an element in consciousness, stimulate the brain? It seems, therefore, that EHRENFELS could not explain how one detects similarities of Gestalt qualities.

What Does the Future Have in Store?

EHRENFELS ended his article with the thought that tones, colours, and so forth could very well be made up of more simple elements. He arrived at this conclusion with the following argument: With practice one can discriminate the individual sounds in a chord. If one continues this decomposition it would be at least theoretically possible to “finally arrive at a single proto-quality or at least a single quality continuum” (p. 115). The experience of colour, tone, etc. would emerge out of these simple elements. Since our knowledge must respect this chemistry, “it follows that the derivation of all contents of presentation from a common proto-element would yield the possibility of comprehending the whole of the known world under a single mathematical formula” (p. 116). EHRENFELS very likely had an analogue with chemistry and physics in mind. Water, wood, iron, and so forth can be broken down into molecules, and further into atoms, then in protons and electrons and so on. The wide diversity of matter is based on some common-proto elements. Those elements have relations to each other and those relations are mathematically describable. The same, according to EHRENFELS, must be true for consciousness. This leads to the conclusion that the mental inexistence of objects can be described as well in mathematical terms. In this view, mental objects are made up of proto-elements (which, I assume, are not conscious), elements, Gestalten, and higher order Gestalten.

SMITH (1988) pointed out that the language of this passage is fundamental atomistic, “the world as a whole is ultimately atomic in structure” (p. 16). These atomic units are in relation to one another. Those relations, according to EHRENFELS, can be formulated exactly. Psychology, the study of the mental, is then a science and will lead to scientific laws.

We perceive form, although form has no “comprehensible stimulus equivalent” (J.J. GIBSON, 1950, p. 19) reaching the perceptual organ. The problem of the perception of form was well stated by EHRENFELS and experimentally supported by RUBIN. However, their solution, Gestalt quality or contour, proved unsatisfactory for succeeding psychologists.

Summary

EHRENFELS introduced the term ‘Gestalt quality’ to explain our perception of melodies. RUBIN, on the other hand, carried out experiments wherein he proved that we see figures against a background. RUBIN employed the term ‘contour’ to explain the figure-ground phenomenon. The author analyzes in detail the exact meanings of these two terms and he notices striking similarities between the explanation of Gestalt perception by EHRENFELS and the one by RUBIN.

Zusammenfassung

EHRENFELS führte den Begriff der „Gestaltqualität“ ein, um unsere Wahrnehmung von Melodien zu erklären. RUBIN seinerseits erfand Experimente, mittels denen er bewies, daß wir Figuren von einem Grund abgehoben sehen. RUBIN verwendete den Terminus „Kontur“, um das Figur-Grund-Phänomen zu erklären. Der Autor analysiert im Detail die genaue Bedeutung dieser beiden Begriffe und hebt auffallende Ähnlichkeiten zwischen der Erklärung der Gestaltwahrnehmung bei EHRENFELS und jener bei RUBIN hervor.

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