

## A Brief Introduction to Gestalt, Identifying Key Theories and Principles

The Gestalt movement, pioneered by Max Wertheimer (1880 – 1943), Kurt Koffka (1886 – 1941) and Wolfgang Köhler (1887 – 1967) emerged in Germany in 1912 and, until 1933, exercised “a dominating influence on German psychology”<sup>1</sup>.

Key Gestalt papers focused on the perception and interpretation of grouped objects, and smaller objects located within larger objects or environments. These largely relate to the tendency to group or organise objects which may or may not be associated. Their theories generally “stress[ed] the predominance of the whole over the parts”<sup>2</sup>, proposing that observers tend to perceive any object only in relation to its surroundings:

“There are wholes, the behaviour of which is not determined by that of their individual elements, but where the part-processes are themselves determined by the intrinsic nature of the whole. It is the hope of Gestalt to determine the nature of such wholes.”

- Wertheimer, Max<sup>3</sup>

Wertheimer proposes that the individual considers himself only in relation to his community or society, and acts with regard to “their mutual concern”<sup>4</sup>. These same principles are applied to our perception of other objects, including abstract patterns and shapes. Gestalt theories can broadly be broken down into two “underlying principles”, firstly “the mosaic or ‘bundle’ hypothesis” (that “every ‘complex’ consists of elementary contents or pieces”), and secondly “the association hypothesis” (that if any object or scenario is frequently experienced alongside another, there is a tendency for one to “call up” the other)<sup>5</sup>.

Wolfgang Köhler’s 1920 paper, ‘*Physical Gestalten*’<sup>6</sup>, introduces us to “Gestalten”<sup>7</sup>. Gestalten are defined as being “processes”<sup>8</sup> or “whole-phenomena” which “disclose properties that are ‘more than the sum of their parts’”<sup>9</sup>. In his further paper, ‘*Some Gestalt Problems*’, this is illustrated with the example of “the visual field”<sup>10</sup>. Within any ‘visual field’ one observes varying hues and tones, perhaps many thousands, however, we do not perceive each of these different visual experiences as separate

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<sup>1</sup> Murray, David J., *Gestalt Psychology and The Cognitive Revolution*, Harver Wheatsheaf, Hertfordshire, 1995. p.1.

<sup>2</sup> Ibid. p.12.

<sup>3</sup> Wertheimer, Max, *General Problems*, Section 1: Gestalt Theory, (‘Ügestattheorie’) [an address before the Kant Society, Berlin] 17<sup>th</sup> December 1924. English translation found in Ellis, Willis D., *A Source Book of Gestalt Psychology*, Routledge & Kegan Paul Ltd., London, 1938. p.2.

<sup>4</sup> Ibid. p.6.

<sup>5</sup> Ibid. p.12.

<sup>6</sup> Köhler, Wolfgang, *Physical Gestalten*, (‘Die physischen Gestalten in Ruhe und im stationären Zustand’), *Eine naturphilosophische Untersuchung*, Erlangen, 1920. English translation found in Ellis, Willis D., *A Source Book of Gestalt Psychology*, Routledge & Kegan Paul Ltd., London, 1938. pp.17 – 54.

<sup>7</sup> Ibid. p.17.

<sup>8</sup> Ibid.

<sup>9</sup> Ibid.

<sup>10</sup> Köhler, Wolfgang, *Some Gestalt Problems*, (‘Gestaltprobleme und Anfänge einer Gestalttheorie’), *Jahresbericht ü. D. ges. Physiol.*, 1922, 3, 512-539. English translation found in Ellis, Willis D., *A Source Book of Gestalt Psychology*, Routledge & Kegan Paul Ltd., London, 1938. p.56.

objects - Instead, we associate different areas within our field of vision with one another, arranging them into groups that we are able to perceive as whole objects<sup>11</sup>. For example, in any given landscape there may be hues of blue, brown and green, but they do not tend to be acknowledged as separate elements. Instead, we group these elements, perceiving them as contributions to whole objects (“sky, house and trees”)<sup>12</sup>. Our ability to associate visual elements in this way is largely unaffected by “changes in size [or] place”<sup>13</sup>.

Köhler also notes that the “specific function of [an] individual part” is perceived according to its location relative to other parts<sup>14</sup>. A single point, for example, can be perceived as “a corner because of its location relative to the lines constituting a seen rectangle”<sup>15</sup>.

In 1923, Wertheimer discussed “organization of perceptual forms”<sup>16</sup>. In this paper, Wertheimer lays out laws central to the Gestalt movement, noting that, given “a number of stimuli”, we tend not to perceive independent, individual objects or experiences but “larger wholes separated from and related to one another”<sup>17</sup>. The reasons for and methods of association are identified in several laws:

- *‘The Factor of Proximity’*<sup>18</sup>  
This law states that objects that are located close to one another will be perceived as being associated with one another, i.e. as belonging to a group, or as parts of a larger whole.
- *‘The Factor of Similarity’*<sup>19</sup>  
Objects which share similar properties are assumed to have association with one another. These similar properties may be, for example, visual properties such as shape or colour.
- *‘The Factor of Uniform Destiny’* (or *‘Common Fate’*)<sup>20</sup>  
This occurs when multiple factors ( or multiple, different instances of a single factor) come into conflict. One factor is dominant, and overrides the other.
- *‘Prägnanzstufen’* (also known as *‘The law of Prägnanz’*, *‘law of good configuration’*, *‘law of simplicity’* or *‘law of pregnancy’*)<sup>21</sup>  
The simplest arrangement of elements is likely to be perceived first: When presented with a series of complex elements, we are likely to perceive them as being parts of a simpler whole<sup>22</sup> (where ‘simple’ arrangements are those “having fewer rather than more elements, having symmetrical rather than asymmetrical

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<sup>11</sup> Ibid. p.56.

<sup>12</sup> Ibid. p.71.

<sup>13</sup> Ibid. p.58.

<sup>14</sup> Ibid. p.59.

<sup>15</sup> Ibid.

<sup>16</sup> Wertheimer, Max, Special Problems: First Group: Perception, A. Perception and Organisation, Section 5: Laws of Organisation of Perceptual Forms (‘Untersuchungen zur Lehre von der Gestalt’), II, Psychol. Forsch, 1923, 4, 301-350. English translation found in Ellis, Willis D., A Source Book of Gestalt Psychology, Routledge & Kegan Paul Ltd., London, 1938. pp.71-88.

<sup>17</sup> Ibid. p.72.

<sup>18</sup> Ibid. p.74.

<sup>19</sup> Ibid. p.75.

<sup>20</sup> Ibid. p.78.

<sup>21</sup> Butler, Jill, Holden, Kritina and Lidwell, William, Universal Principles of Design, Rockport Publishers, Inc. China, 2003. p.120.

<sup>22</sup> van Wagner, Kendra, Gestalt Laws of Perceptual Organisation: The Law of Prägnanz, About: Psychology, 2006, [http://psychology.about.com/od/sensationandperception/ss/gestallaws\\_3.htm](http://psychology.about.com/od/sensationandperception/ss/gestallaws_3.htm), visited 30/10/06.

compositions, and generally observing the other “Gestalt principles of perception”<sup>23</sup>).

- *‘The Factor of Direction’*<sup>24</sup> (or *‘the law of continuity’*<sup>25</sup>, or *‘good continuation’*<sup>26</sup>)  
When a line (or objects arranged in a way that indicates a line) is perceived, which appears to have one or more branches, the branch which follows the direction of the original line most faithfully is perceived as being the continuation of the original path<sup>27</sup>, and others are perceived as appendages<sup>28</sup>.
- *‘The Factor of Closure’*<sup>29</sup>  
Objects that are close together are perceived as being part of a whole<sup>30</sup>, to the extent that gaps between them may be imagined to be ‘closed’, forming complete shapes or borders<sup>31</sup>. Wertheimer notes that in many cases this is not the dominant factor – Others may predominate.
- *‘The Factor of the ‘Good Curve’*<sup>32</sup>  
If continuity from one line to another is perceived (for example, if the angle or direction of a single line is continued into another), this may override other perceived shapes or groupings, as would otherwise be perceived according to Gestalt laws.

Perception, as affected by these Gestalt laws, has the potential to conceal the existence of a shape, as other shapes or lines distract from that original shape<sup>33</sup>. Additions to a shape may be “indifferent” (in that they do not change the perception of the original shape) or they may cause in the observer to view the original shape as having changed or disappeared<sup>34</sup>. For example, if an original shape is placed overlapping a second shape, the whole figure may be observed as being constructed of entirely different shapes, when component parts of the shapes react according to any of the above Gestalt principles.

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<sup>23</sup> Butler, Jill, Holden, Kritina and Lidwell, William, Universal Principles of Design, Rockport Publishers, Inc. China, 2003. p.120.

<sup>24</sup> Wertheimer, Max, Special Problems: First Group: Perception, A. Perception and Organisation, Section 5: Laws of Organisation of Perceptual Forms (‘Untersuchungen zur Lehre von der Gestalt’), II, Psychol. Forsch, 1923, 4, 301-350. English translation found in Ellis, Willis D., A Source Book of Gestalt Psychology, Routledge & Kegan Paul Ltd., London, 1938. p.81.

<sup>25</sup> van Wagner, Kendra, Gestalt Laws of Perceptual Organisation: Law of Continuity, About: Psychology, 2006, [http://psychology.about.com/od/sensationandperception/ss/gestaltlaws\\_5.htm](http://psychology.about.com/od/sensationandperception/ss/gestaltlaws_5.htm), visited 30/10/2006.

<sup>26</sup> Silla, Samba, Gestalt Rules the Corner of your Eye, 2003, <http://www.psych.nyu.edu/pelli/docs/SambaSillaIntel.pdf>, p.5.

<sup>27</sup> Ibid.

<sup>28</sup> Wertheimer, Max, Special Problems: First Group: Perception, A. Perception and Organisation, Section 5: Laws of Organisation of Perceptual Forms (‘Untersuchungen zur Lehre von der Gestalt’), II, Psychol. Forsch, 1923, 4, 301-350. English translation found in Ellis, Willis D., A Source Book of Gestalt Psychology, Routledge & Kegan Paul Ltd., London, 1938. p.81.

<sup>29</sup> Ibid. p.83.

<sup>30</sup> Ibid.

<sup>31</sup> Silla, Samba, Gestalt Rules the Corner of your Eye, 2003, <http://www.psych.nyu.edu/pelli/docs/SambaSillaIntel.pdf>, p.5.

<sup>32</sup> Wertheimer, Max, Special Problems: First Group: Perception, A. Perception and Organisation, Section 5: Laws of Organisation of Perceptual Forms (‘Untersuchungen zur Lehre von der Gestalt’), II, Psychol. Forsch, 1923, 4, 301-350. English translation found in Ellis, Willis D., A Source Book of Gestalt Psychology, Routledge & Kegan Paul Ltd., London, 1938. p.83.

<sup>33</sup> Ibid. p.86.

<sup>34</sup> Ibid. p.85.

Even when component elements are recognized individually (as commonly experienced objects), their placement alongside one another, if Gestalt principles interfere, may result in the observer being oblivious to the usual form or function of those component parts<sup>35</sup>. In Wertheimer's example, two letters placed so as to form a simple (symmetrical) pattern cease to be recognisable as letters, and are instead perceived as abstract elements of the simple whole<sup>36</sup>.

Wertheimer also describes situations in which multiple Gestalt principles can be applied. Multiple laws may reinforce a grouping, or may come into conflict<sup>37</sup>. For example, if there exists a group of objects of varying appearance are located in close proximity, and another group, containing objects that are similar in appearance to those in the first group but are further away, there arises a conflict between the *factor of proximity* and the *factor of similarity*.

Kurt Gottschaldt expands on Wertheimer's principles in 'Gestalt Factors and Repetition'<sup>38</sup>. Gottschaldt conducted experiments to explore the affects of memory and familiarity on Gestalt perception, theorizing that familiarity with a shape may make it "easier... to apprehend... when it appears in a larger one."<sup>39</sup>

Gottschaldt's study found that frequent exposure to a shape only increases the chance of it being identified within a larger whole by 0.6%<sup>40</sup>, concluding that "mere difference in frequency of past experience"<sup>41</sup> is unlikely to override perception affected by Gestalt laws. He did find, however, that observers were significantly more likely to identify a shape if they are specifically asked whether it is present<sup>42</sup>.

Having concluded that familiarity does not influence perception in such instances, Gottschaldt expanded on Wertheimer's laws, referring specifically to cases in which an original shape is used as a component of a larger shape or pattern. He concluded the following:

- Changing the apparent function of "contour line", has a tendency "to bring about a dissolution" of the original shape<sup>43</sup>. For example, if the original shape appears to present a three dimensional object (with its lines apparently forming the edges of planes), but the addition of other lines and shapes changes the function of the original lines so that they appear to be lines within a planar pattern, the 3D form will no longer be detected.<sup>44</sup>
- It is also difficult to identify the original shape if the boundary (external) lines become interior lines.<sup>45</sup>
- The original shape is not likely to be identified in the new shape/pattern if that new shape/pattern implies possible division of parts in ways that would not result

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<sup>35</sup> Ibid. p.87.

<sup>36</sup> Ibid.

<sup>37</sup> Ibid. p.76.

<sup>38</sup> Gottschaldt, Kurt, Gestalt Factors and Repetition ('Über den Einfluss der Erahrung auf die Wahrnehmung von Figuren, I.: Über den Einfluss gehäufte Einprägung von Figuren auf ihre Sichtbarkeit in umfassenden Konfigurationen'), Psychol. Forsch., 1926, 8, 261-317. English translation found in Ellis, Willis D., A Source Book of Gestalt Psychology, Routledge & Kegan Paul Ltd., London, 1938. pp.109-122.

<sup>39</sup> Ibid. p.110.

<sup>40</sup> Ibid. p.112.

<sup>41</sup> Ibid. p.113.

<sup>42</sup> Ibid.

<sup>43</sup> Ibid. p.116.

<sup>44</sup> Ibid. pp.116-118.

<sup>45</sup> Ibid. p.119.

in the extraction of the original shape<sup>46</sup>. For example, if a new pattern strongly implies construction from components that are of a shape/size/direction other than those seen in the original shape.

- The original shape is unlikely to be recognized if “asymmetrical portions of it are enlarged into symmetrical parts of” the new shape/pattern<sup>47</sup>. This acts as an extension of *the law of Prägnanz*, in that it expects the simplest form to be the most identifiable. Asymmetrical parts (or parts of parts) are effectively ‘swallowed’ by the more complex areas of the pattern.
- If, in the original shape, a part is “figurally emphasized”, but this part is not emphasized when the original shape is included in the later whole, the original shape is more difficult to recognize. Or, if, in the original shape, each line or part is presented as “equally important in supplying the character of that figure”, but when placed within a new shape/pattern any part of the original is given higher or lesser ‘rank’ than others, the original shape may not be identified.<sup>48</sup>

Later, Josef Ternus’s paper, ‘The Problem of Phenomenal Identity’<sup>49</sup>, helped to extend Gestalt theory into the realms of perceived motion.

He notes that if an observer is exposed to a number of points, then immediately afterwards exposed to an identical set of points in a different location, the first set of points are perceived as having moved to a new location. The second set are perceived not as being identical (but different) to the first set, but as being the actual first set, transposed. Ternus termed this the ‘*exchange phenomenon*’<sup>50</sup>.

Karl Duncker further discussed perceived motion in his paper, ‘Induced Motion’<sup>51</sup>, in 1929. Duncker introduced ‘*the principle of phenomenal frame of reference*’<sup>52</sup>, whereby the motion of one object can create the perceived motion in another. Duncker’s experiments showed that when a small, static, point of light is projected onto a moving backdrop, the light is perceived as having motion in the opposite direction to that of the backdrop<sup>53</sup>.

However, “if the [backdrop] is moved back and forth rapidly and in quick succession, the point itself will often come to a standstill. This is because the point loses... its phenomenal relation to the [backdrop] as its sole background... There occurs a spontaneous shift bringing the point into direct contact with the room environment where it becomes anchored.”<sup>54</sup>

If the original roles of the light and the backdrop are reversed, the light is set in motion and the backdrop remains still, no movement is perceived in the backdrop.

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<sup>46</sup> Ibid. p.120.

<sup>47</sup> Ibid.

<sup>48</sup> Ibid. p.121.

<sup>49</sup> Ternus, Josef, The Problem of Phenomenal Identity (‘Experimentelle Untersuchung über phänomenale Identität’), Psychol. Forsch., 1926, 7, 81-136. English translation found in Ellis, Willis D., A Source Book of Gestalt Psychology, Routledge & Kegan Paul Ltd., London, 1938. pp.149-160.

<sup>50</sup> Ibid. p.150.

<sup>51</sup> Duncker, Kark, Induced Motion (‘Über induzierte Bewegung (Ein Beitrag zur Theorie optisch wahrgenommener Bewegung)’), Psychol. Forsch., 1929, 180-259. English translation found in Ellis, Willis D., A Source Book of Gestalt Psychology, Routledge & Kegan Paul Ltd., London, 1938. pp.161-172.

<sup>52</sup> Ibid. p.161.

<sup>53</sup> Ibid.

<sup>54</sup> Ibid. p.162.

This is because the backdrop is “anchored” in its own “environmental background (the room in which the experiment has taken place)<sup>55</sup>. The light is “located relative to the room, just as the point is relative to the [backdrop]”<sup>56</sup>.

A similar effect can be observed in “rotating fields”<sup>57</sup>. When a small, static disk is located within a larger, rotating disk, both disks are “seen to move (in opposite directions).”<sup>58</sup> “In order to compensate for its induced motion”, the small disk must be rotated in the same direction as the larger disk, at a slower pace<sup>59</sup>, only then will the small disk appear to be static. The phenomenon can be cancelled by “increasing the speed of the larger disk [or] by increasing the exposure” to the experiment<sup>60</sup>. In these circumstances, the perceived motion is cancelled “due to an increased conflict with the observer’s own phenomenal status of motion or rest.”<sup>61</sup>

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<sup>55</sup> Ibid. p.162.

<sup>56</sup> Ibid.

<sup>57</sup> Ibid. p.165.

<sup>58</sup> Ibid. p.166.

<sup>59</sup> Ibid.

<sup>60</sup> Ibid.

<sup>61</sup> Ibid.