PSYCHOLOGY DRIVEN WEB DESIGN
SECTION 4 SUMMARY

SECTION 4: GESTALT PSYCHOLOGY FOR WEB DESIGN
⊙ *Learn to use gestalt principles for creating better websites.*

A field of study under cognitive psychology today, gestalt psychology was developed in Germany during the first half of the 20th century as a reaction to structuralism. It is built upon the notions that the whole is different than the sum of its parts; that we perceive whole objects, before their constituents; and that it is perceptual organization that underlies human perception.

The gestalt principles we studied in this section can help us design websites that are more appealing to the subconscious mind and easier to navigate, resulting in better web user experiences. Learning how to account for perceptual biases in our designs is a key aspect of the psychology driven approach and can elevate our designs over those of others.

We learnt that there are four concepts and twelve principles in gestalt theory. The concepts describe how the main processing capability of the brain, its pattern matching mechanism works at a deep level. They explain item perception. The principles describe scene perception and have practical applications in any field where visual design is involved, including web design.

As a general remark valid for all gestalt concepts and principles, please remember that there is no universally agreed upon wording for these, so I have provided here what I deem to be the best expression in each case. Therefore, if you encounter different names for these elsewhere, don't be surprised.

Please note also, that the sequential numbering of the gestalt concepts and principles I have used in this course has no significance. There is no particular order in which they are generally numbered.

LECTURE 4.1: Introduction to Gestalt Psychology
⊕ *Understand the basic assumptions of and the objectives for learning gestalt psychology.*

This lecture was a brief introduction into gestalt psychology, which tries to describe the processes involved in human visual perception. We discussed its meaning, its origins, its basic assumptions, how understanding its principles can help web designers, and the different ways its principles can be utilized. These thoughts were followed by a brief summary of the section objectives and the objectives of the individual lectures.

THE TAKEAWAY

Gestalt psychology, which, translated from German means psychology of form, is built upon the premise that the whole is different than the sum of its parts and assumes that we perceive whole objects before their constituents, and that it is perceptual organization that underlies human perception.

Gestalt psychology can help web designers to use the biases and quirks that characterize human visual processing in order to achieve superior designs, and thus to structure visual information in a manner that will make it easy for users to pursue their goals, while also having a good user experience.

Imposing a proper structure on a website helps to frame and group information, so visitors can find what they are looking for faster, it helps to highlight and prioritize information, so visitors' attention can be redirected as desired, and it helps to chunk and order information, so the display can be simplified, making it visually more appealing.

For most gestalt principles there are two sides: You can concur with the assertion of the principle, in a positive sense, to identify and structure, or go against the assertion, in a negative sense, to distinguish and highlight. All principles in essence help the overarching goal of achieving perceptual simplicity.

LECTURE 4.2: Emergence and Meaningfulness
✤ *Learn how to use the gestalt principle "meaningfulness" in web design.*

In this lecture we studied the gestalt concept "emergence" and the gestalt principle "meaningfulness" and learnt how to apply that principle in web design.

THE TAKEAWAY

Gestalt psychology is built upon four concepts and twelve principles. The concepts describe the nature of perception, whereas the principles describe features of perceptual organization that can be applied to design.

The first concept of gestalt psychology is "emergence" and states that perception occurs immediately and without conscious effort, when the brain recognizes a familiar pattern.

Human visual perception is not the sum of images of constituent parts of objects, but the association of whole object images with familiar, meaningful patterns.

The first gestalt principle of perceptual organization is the principle of "meaningfulness" and states that we group visual elements together to form meaningful or personally relevant scenes.

We do this by associating these elements with familiar patterns.

Familiar patterns can be classified into two groups: (1) Inherent patterns, which are comprised of representations based on our (a) biological recognition capabilities and (b) archetypes and (2) Learnt patterns.

The first of the categories under inherent patterns includes abilities such as face recognition and recognition of body parts.

Archetypes are primitive mental images which we have inherited from our earliest human ancestors, and which are present in the collective unconscious of humanity. Examples of archetypal patterns are colors, certain shapes such as circles, ovals, squares, equilateral triangles, regular hexagons etc., the Sun, the Moon, fire, water, trees, certain animals such as snakes, ravens, doves etc., and images that associate with certain symbols and concepts such as the self, shadows, male, female, sexuality, mother, father figure, old age, heroism etc.

Learnt patterns are all the memories and mental representations that we have stored throughout our lives, having identified them as meaningful and significant. Such oft-encountered signs as numbers and letters of the alphabet have priority over other patterns.

From the design perspective, the "meaningfulness" principle emphasizes the relative importance of the overall display over details, the power of inherent patterns and the supremacy of subjectively interpretable content.

LECTURE 4.3: Conciseness and Invariance
⊕ *Learn how to use the gestalt principle "conciseness" in web design.*

In this lecture we studied the gestalt concept "invariance" and the gestalt principle "conciseness" and learnt how to apply that principle in web design.

THE TAKEAWAY

The second gestalt principle of perceptual organization is the principle of "conciseness" and states that we try to reduce reality to the simplest form possible.

In German, this is called the "Prägnanz Prinzip", and so many people use this term also in English.

When something is concise, it is as simple as possible, but not simpler.

Conciseness of a design means that it is well formed, precise, and contains what it should, not more and not less.

Concise displays are easier to visually process, easier to remember and perceived as more orderly.

Simplifying perception is essential for seeing order and regularity in a world of constant distractions and visual competition. Conciseness also means that we can extrapolate from one situation to another. It not only benefits the allocation of limited processing and attentional resources; it helps the majority of us to see things in similar ways.

A simple, well-defined, to-the-point depiction will always be more efficient in communicating things than a detailed one with hard to recognize features.

The second concept of gestalt psychology is "invariance" and states that we recognize most shapes and figures in spite of considerable natural and artificial variation.

Emergence has a higher priority in human perception over invariance.

LECTURE 4.4: Symmetry
✦ *Learn how to use the gestalt principle "symmetry" in web design.*

In this lecture we studied the gestalt principle "symmetry" and learnt how to apply it in web design.

THE TAKEAWAY

The third gestalt principle of perceptual organization is the principle of "symmetry" and states that we have the tendency to perceive visual elements as grouped when they are part of a symmetrical arrangement.

Symmetrical arrangements appear easier for the human brain to understand, due to the feeling of simplicity, regularity and structure that symmetry conveys, while asymmetrical arrangements are perceived to be unusual and sophisticated.

We distinguish between reflectional, rotational and translational symmetry.

Even though we cannot create symmetrical websites in a strict, mathematically correct sense, we can still convey the sensation of symmetry by the layout we choose and the general look of the display. The appearance of symmetry emerges where there is balance between parts of a scene. It is in a way a property of visual equivalence among elements.

Use symmetry in design to convey balance, harmony, and stability. Do not use elements in a symmetrical arrangement, if they don't share a meaningful relationship. All elements that break the symmetry in a symmetrical arrangement draw our attention and so this can be used to highlight those elements.

Opposite views about an issue are immediately recognized as such when they are arranged symmetrically on the left and the right of the screen.

LECTURE 4.5: Multistability and Figure / Ground Distinction
✦ *Learn how to use the gestalt principle "figure/ground distinction" in web design.*

In this lecture we studied the gestalt concept "multistability" and the gestalt principle "figure/ground distinction" and learnt how to apply that principle in web design.

THE TAKEAWAY

The third concept of gestalt psychology is "multistability" and states that we alternate between different interpretations of a scene, if the visual clues available are not sufficient to resolve it.

Multistability occurs when the distinction between the foreground and the background is not clear and our perception is primarily influenced by our focal point.

The fourth gestalt principle of perceptual organization is the principle of "figure / ground distinction" and states that we perceive an object either as a figure in the foreground, or as part of the background.

The brain determines the figure / ground relationship before it makes any other resolutions about what it sees. Using its innate ability to see in 3D, it separates what is in the front and what is in the back. Thus, by filtering out what is not immediately important, it simplifies its perceptual field and can focus on relevant elements.

Unless there are specific reasons to go against the figure / ground distinction, web designers should pay utmost attention to clearly differentiate between figure and ground, in order to focus the attention of users and to minimize perceptual confusion. Key elements should be made figures in the composition to increase their probability of recall. As a general rule, elements in the lower regions of a design are more likely to be perceived as figures, whereas elements in the upper regions are more likely to be perceived as ground.

When an element or a colored area overlaps a larger one, we tend to perceive it as the figure and the larger area as the ground. Similarly, a region that has higher contrast than its surrounding, an image that is symmetrical, or an area that is textured will usually be seen as figure. We generally perceive contours as belonging to the figure. This is a concept referred to as "boundary-ownership".

It is possible to intentionally go against the principle of "figure / ground distinction" and to use the negative space of the background as part of the foreground, to achieve specific effects. The incorporation of negative space into an image is one of the most widely used concepts in logo design.

LECTURE 4.6: Reification and Closure
⊕ *Learn how to use the gestalt principle "closure" in web design.*

In this lecture we studied the gestalt concept "reification" and the gestalt principle "closure" and learnt how to apply that principle in web design.

THE TAKEAWAY

The fourth concept of gestalt psychology is "reification" and states that we perceive whole, meaningful, concrete objects when recognition occurs.

Our visual system attempts to construct a complete image in the mind to make a scene more meaningful and less confusing, even when we are only provided with parts of that scene, such as when objects are obscured by other objects.

The fifth gestalt principle of perceptual organization is the principle of "closure" and states that we process available visual information in light of our stored perceptions to form whole, meaningful scenes.

We add information to the incoming sensory data to create complete objects. The biasing effects of human perception help us see the world as whole and complete. Our tendency to perceive information in this way is automatic and unconscious.

Closure means that images we provide do not have to be whole or complete in order for our users to successfully identify them.

Closure allows users to immediately grasp the interior layout of a page.

Closure is strongest when elements approximate simple, recognizable forms, such as geometric shapes, and are located near one another. In situations where more complex forms need to be used, you can create closure through transitional elements, subtle visual cues that help direct the eye to find the pattern.

A few short line segments, dotted lines, or even imaginary contours of aligned text are usually sufficient to identify group borders.

The closure principle is often applied to display several images at once. Just showing one whole object and the edges of others behind it is enough to make users perceive a stack of objects.

Closure lets users participate in the completion of patterns, thereby achieving more interactive and interesting designs.

When designs involve obvious patterns, consider removing some elements that can be mentally supplied by viewers. When designs involve more complex patterns, consider the use of transitional elements to assist viewers in finding or forming patterns.

Icons are great UI tools that can convey messages and reinforce concepts within small spaces. For this purpose, they need to be simple and stripped down to their basic elements so people can quickly understand their meanings. Closure works well in the creation of icons, as of logos, utilizing positive and negative space together to decrease complexity.

The closure principle works not only in a spatial but also in a temporal sense.

Many forms of storytelling leverage closure as well. When discrete scenes in time are presented to viewers, they will supply what happens in between.

LECTURE 4.7: Continuity
✤ *Learn how to use the gestalt principle "continuity" in web design.*

In this lecture we studied the gestalt principle "continuity" and learnt how to apply it in web design.

THE TAKEAWAY

The sixth gestalt principle of perceptual organization is the principle of "continuity" and states that the brain follows smooth, predictable paths and assumes constancy of objects. Sometimes it is also referred to as the "principle of good continuation", looking from the perspective of design.

The brain follows lines, curves, and sequences of shapes on smooth paths in order to determine a relationship between the different elements of a scene and to unify our complete perceptual experience.

The gestalt principles closure and continuity are related and work together. Continuity assumes constancy of objects and tries to lead the eye from one part of a scene to another to get the whole picture, while closure seeks to predict what the missing parts might be.

Continuity is generally the reason why handwriting and script-fonts appeal to the brain. The better legibility of long passages of text in serif fonts in comparison with sans-serif fonts also has to do with this principle.

The first and foremost use of continuity in web design is to subtly lead the user's focus of attention. By indicating trails on the website, the focus of the visitor can be guided based on the information priority structure of the page.

You should use good continuation to indicate relatedness between elements in a design. Arrange elements such that their alignment corresponds to their relatedness and arrange unrelated or ambiguously related items on different alignment paths.

Another common use of continuity in web design is presented by the integration of image carousels or similar elements. Users can extrapolate to missing parts even when images are partially covered, thereby making it possible to condense a lot of visual information into a relatively small space.

The continuity principle can also help to regroup items that were grouped by other methods.

LECTURE 4.8: Grouping by Proximity
✤ *Learn how to use the gestalt principle "proximity" in web design.*

In this lecture we studied the gestalt principle "proximity" and learnt how to apply it in web design.

THE TAKEAWAY

The seventh gestalt principle of perceptual organization is the principle of "proximity" and states that we group visual elements that are close to one another and consider those that are further apart as separate. The interpretation of proximity is based on relative distances between elements.

You should place related elements in close proximity, but make sure elements that share no meaningful relationship are placed a distance apart that prevents erroneous detection of grouping.

Grouping is a very important aspect of the meaning making ability of our brain. It lets us see patterns. The arrangement of items that we perceive directly influences what sense we make out of them. Their location says something about their mutual relationship.

The closer two or more groups are to one another, the slower we are to detect distinct groups or determine to which group each item belongs.

In web design, it is the negative space between the elements which determines proximity. The closer items are to one another, the more likely they will be perceived as grouped. On the other hand, when items are crowded into too small a space, users' speed of scanning the display drops. Therefore, designers have to find a good compromise between too much and too little whitespace. You should use small and consistent spacing to ensure the user can distinguish separate elements but can also quickly jump from one item to another.

Spacing frames, images or other graphical elements far away from the corresponding information requires eye movements, or saccades, from one to the other, which places an unnecessary burden on the user.

This is especially important to remember when designing forms. Labels should be near the elements that they describe. Similarly, you should opt for direct labeling on graphs over legends or keys, whenever possible.

The proximity principle too can be used to highlight, when used in the negative sense, by increasing the whitespace around the item to be highlighted.

Proximity is one of the most powerful means of indicating relatedness in a design. This holds true for design elements as well as for content.

The proximity principle together with the use of our understanding of personal space lets us tell if there is intimacy, friendship, or a formal relationship between people, or even between people and animals or objects. Thus, proximity expresses not only a spatial relationship but also an emotional one.

LECTURE 4.9: Grouping by Similarity

⊕ *Learn how to use the gestalt principle "similarity" in web design.*

In this lecture we studied the gestalt principle "similarity" and learnt how to apply it in web design.

THE TAKEAWAY

The eighth gestalt principle of perceptual organization is the principle of "similarity" and states that we group visual elements that are similar in color, size or shape, or more generally, that share superficial characteristics.

There is a context dependent, fluid hierarchy of the order with which we perceive groups of similar items. For scenes of moderate complexity, the highest ranking is usually achieved by color, then by size, then by shape.

Grouping by size is an especially appropriate strategy when the size of elements has additional benefits, for example using large buttons for action items or frequently used links, or using larger font sizes for headers, which also determine textual hierarchy. Grouping by shape is most effective when used in conjunction with size and/or color.

Proximity will generally overwhelm similarity. However, the grouping bias for similar items works also when these are not together, so long as they remain within the same visual display. In simple instances, the grouping even works across several screens.

Similarity immediately brings structure into any visual scene. It helps us recognize patterns in complex environments and easily organize these.

The principle of similarity plays an essential role in maintaining consistency in web design, which enables users to quickly infer the logic of a website and determine what items serve what purpose.

The principle of similarity is very effective and therefore, when things appear similar by chance rather than intention, users may perceive groupings erroneously. It is important to take into consideration the potential for confusion when non-grouped items share superficial characteristics.

Use similarity to structure and group related items; take care that items that are unrelated are not similar; and make items you want to highlight intentionally dissimilar.

When you want the user to fixate on one particular element or part of a website, decreasing the similarity to the rest of the display will instantly catch the user's attention.

Similarity is not only important for structure but also for content. In the positive sense it captures orderliness, rhythm, and structure. In the negative sense, dissimilarity can be used to highlight differences. Similarity is often used to contrast order with disorder and similar with dissimilar. It serves to capture uniformity or the lack thereof in an image.

LECTURE 4.10: Grouping by Connectedness
✦ *Learn how to use the gestalt principle "connectedness" in web design.*

In this lecture we studied the gestalt principle "connectedness" and learnt how to apply it in web design.

THE TAKEAWAY

The ninth gestalt principle of perceptual organization is the principle of "connectedness" (often referred to as "element connectedness") and states that we perceive physically connected items as grouped.

The principles of continuity and connectedness are related, but while the former describes a search strategy of the mind, the latter describes a grouping strategy.

Connectedness can serve to indicate all types of relations between items, including spatial, temporal, contextual, and functional relations, in the world of design as in real life.

Where connectedness is at odds with proximity or similarity, the elements that are connected will appear more related than either the proximal or similar elements.

Using the principle of element connectedness is a simple but highly effective way of bringing structure into a web page. It can prove especially useful when related items are located at a distance on the screen, such as when text corresponding to an image cannot be placed next to it. Simple lines, even when just implied, can bind a composition together.

Connectedness is often used to depict procedural steps to be taken to achieve a certain end in addition to sequences.

Connectedness can be used in the negative sense, to express the idea that unconnected items are of secondary importance or of a supplementary nature.

LECTURE 4.11: Grouping by Common Region
✦ *Learn how to use the gestalt principle "common region" in web design.*

In this lecture we studied the gestalt principle "common region" and learnt how to apply it in web design.

THE TAKEAWAY

The tenth gestalt principle of perceptual organization is the principle of "common region" and states that we group visual elements which share a clearly delineated region of space.

It is the most common, unambiguous and overpowering grouping strategy in design. Where it is at odds with proximity, similarity, or connectedness, the elements that are in a common region will usually appear more related than either the proximal, the similar or the connected elements.

A region can be defined by a frame (a clear border, an indicated border, a separator line, a uniform margin to neighboring elements etc.), or a background (established by a uniform color, a color gradient, a texture fill, an image, etc.) that is different than the overarching background, or a combination of these.

The browser window itself is nothing but a frame and so is every pop-up message.

Making use of the principle of common region is most important when there is a lot of information that could be confused if no structural elements were included.

When one set of options in a design should be seen as more important than the rest, dividing the display into sections and then making the section containing the important information more eye-catching and the other sections more muted is a good strategy.

More generally, the principle of common region can be used to divide the content into sections, to create a layered viewing hierarchy. This provides the opportunity to guide the user through the interface and to make sure they understand which information belongs together.

Many websites are based on the design by grid concept where all elements are laid out in cells of a common, predetermined grid. This necessitates making extensive use of the principle of common region.

Because common region can overpower other grouping principles, framing is especially useful when correcting ambiguously designed configurations that would otherwise be difficult to understand.

LECTURE 4.12: Grouping by Common Fate
⊕ *Learn how to use the gestalt principle "common fate" in web design.*

In this lecture we studied the gestalt principle "common fate" and learnt how to apply it in web design.

THE TAKEAWAY

The eleventh gestalt principle of perceptual organization is the principle of "common fate" and states that we group visual elements that appear to be moving in the same direction.

It helps us to detect outliers fairly quickly.

While it is not necessary for items to be actually moving and an implied motion is sufficient for us to mentally group them, perceived relatedness is strongest when they are in motion and move at the same time, with the same speed, and in the same direction.

Any motion of items on a static background immediately draws the attention of users and can serve to distinguish these from the rest of the display.

When elements within a region move together with the bounding edge of the region, the elements and the region will be perceived as the figure.

Our tendency to interpolate missing scenes of things in motion causes us conversely to extract meaning out of similar subsequent patterns, interpreting them as being part of motion, where there is none. This is called the phi effect.

The principle of common fate provides a great way of expressing common intent, sometimes even determination in images.

People rushing in one direction are immediately recognized as having a common purpose. People don't even have to walk or point in the same direction to be grouped; it is sufficient if they look in the same direction.

On the other hand, showing someone going against the crowd is a great way of highlighting rebels, people who do things differently.

LECTURE 4.13: Grouping by Synchrony
⊕ *Learn how to use the gestalt principle "synchrony" in web design.*

In this lecture we studied the gestalt principle "synchrony" and learnt how to apply it in web design.

THE TAKEAWAY

The twelfth gestalt principle of perceptual organization is the principle of "synchrony" and states that we group visual elements that represent a synchronous event.

The principle of synchrony is related with the principle of common fate. While common fate captures sameness of directional aspects of motion, synchrony captures sameness of time of occurrence. Accordingly, we group items that appear to be associated with one and the same event.

When one event seems to occur independent of all others, it draws attention, which means that the principle of synchrony can be used in the negative sense to highlight.

One obvious use of the principle of synchrony in web design is for creating mouseover effects. But the principle of synchrony is involved in almost all event handling in user interface design.

We have the tendency to assume that people posing in similar ways are related in some way.

Capturing similar poses of people offers a great way of identifying relationships. Synchrony can help to recognize common intent, togetherness, common cause etc.

Synchrony can create dynamism in images, in that we extrapolate from the poses that have been captured.

When a massive solid and a thin line are put together, the contrast automatically creates two concepts: one static, the other dynamic.

A slightly oblique angle gives the expression of dynamism, as opposed to a vertical line, which appears as static. Accordingly, italic text appears as dynamic.

Convex curving of a shape can be an expression of an active movement, pressing forward, whereas concave curving usually represents a regressive movement, retrospective than prospective.

LECTURE 4.14: 3D Vision
⊕ *Learn how to use the monocular cues for depth perception in web design.*

In this lecture we learnt about the heuristics that the brain uses in addition to the perceptual biases explained by the gestalt theory to capture the 3D content in 2D images.

THE TAKEAWAY

As stereovision cannot be used to judge 2D images, the brain applies heuristics to obtain the 3D information contained in them. The resulting faculty we call 3D vision.

As graphics capabilities of computers, tablets and smartphones become more and more advanced and immersive experiences gain in importance, 3D vision is going to become more ubiquitous not less.

According to cognitive psychology, the brain uses seven monocular cues for depth perception.

Linear Perspective: When two nearly vertical lines converge near their top ends, the converging ends of the lines are perceived to be farther away than the diverging ends.

Relative Elevation: When two objects are presented at different vertical locations, the object at the higher elevation is perceived to be farther away.

Relative Size: When two similar objects of different size are presented together, the smaller object is perceived to be farther away than the larger object.

Texture Gradient: When the texture of a surface varies in density, the areas of greater density are perceived to be farther away than areas of lesser density.

Atmospheric Perspective: When multiple objects are presented together, the objects that are bluer and blurrier are perceived to be farther away than the objects that are less blue and less blurry.

Interposition: When two overlapping objects are presented, the overlapped object is perceived to be farther away than the overlapping object.

Shading: When an object has shading, the dark areas are perceived to be the farthest away from the light source and the light areas are interpreted as being closest to the light source.

The "top-down lighting bias" is found across all age ranges and cultures, and likely results from humans evolving in an environment lit from above by the Sun.

Since most people are right-handed, and therefore prefer light coming from the upper left when writing, it has become customary to drop or throw the shadow of a user interface element to the lower right side of an apparently raised object.

There are two additional depth cues which we use in conjunction with moving objects.

Motion Parallax: Objects that move by fast are near and objects that remain in our visual field a long time are far.

Optic Flow: When the apparent size of an object in motion is increasing, it is approaching and when it is decreasing it is moving away.

LECTURE 4.15: Section Summary
✠ *Revise the concepts and principles studied, in the overall framework of gestalt theory.*

In this lecture we looked back at the gestalt concepts and principles as they interrelate within the overall framework of human visual perception.

THE TAKEAWAY

The twelve gestalt principles describe how humans perceive scenes and have practical applications in any field where visual design is involved, including web design.

There are basically four types of actions that are involved simultaneously in recognition: We simplify by grouping items, we explore the scene, we supplement missing information, and all the while, as an overarching action accompanying all the others, we try to recognize meaningful things choosing the most concise from among the possibilities.

Following are the gestalt principles that we use for grouping, named in the order of priority they are usually applied: Common region and figure / ground distinction have the highest priority and work together, as backgrounds can define regions and each region itself can be cause for figure / ground

distinction. The principles next in the hierarchy are connectedness, followed by symmetry and then by proximity. As common fate and synchrony in a way express similarity caused by motion, these three principles together share the lowest ranking. The hierarchy of similarity features goes from color, to size, to shape.

There are two sides to using the gestalt principles: The use in the positive sense can help to organize and structure a website while the use in the negative sense can highlight a specific element.

The best results in terms of usability are achieved when several grouping rules are used consistently together.

Because the perceptual biases that gestalt principles express are very strong, and with all the gestalt principles operating at once, unintended visual relationships can be implied by a design. A recommended practice, after designing a display, is to view it with each of the gestalt principles in mind to see if the design suggests any relationships between elements that you do not intend.