

# VISUAL ANALYSIS OF OPTICAL ILLUSION APPLICATIONS ON PLUS SIZE HOURGLASS FEMALE BODY SHAPES

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## **Abstract**

Fashion is a play with the human body. The shape of the body plays an important role in fashioning the body. Western philosophers define female body is more than biological difference than men but also more natural than men. The seven category of female body shapes separate hourglass body shape as top hourglass and bottom hourglass. Though hourglass body shape is accepted to be the perfect body shape plus size hourglass body consist with large breast and hips where they find difficult to fashioning their body to look perfect. However, optical illusions are more often visual illusions which can be used to change the body perception. This research is based on how selected types of optical illusion applications changes the perception of plus size hourglass body. A qualitative approach was taken with studio work to visually analyze how the perception changes are happening. Experiments were carried out on a plus size hourglass female dummy to see how style lines changes the focal point of the body. At the end of the research visual perceptions were experienced on how to visually hide and highlight certain parts of the plus size body to make it look perfect.

## **Keywords**

Female Body, Plus Size, Hourglass, Optical Illusion, Fashion

## **Introduction**

Fashion basically plays with the human body and there are two major components to be considered in fashion designing.

- I. Body shape
- II. Style personality

In terms of visual perception particular set of body characteristics are considered to be the symbols of an attractive body. It is a social viewpoint that can be varying dramatically across cultures and across time.

Body shape plays an important role in fashion industry, as it is a key factor in consumers purchasing decisions. Basically, adjusting body proportions through usage of style lines and colours with optical illusion can help to create a balanced silhouette. This research is to visually analyses the optical illusion applications on plus size female body shapes. "Visual perception" is in the first ranking between the types of perception. Fashion should be reachable to everybody disregarding the shape or skin colour. Fashion optical illusion can play a vital role in changing the perception of imperfect bodies. Designers need to address the dressing issues of plus size customers in a creative way. Optical illusion created with lines and colours can made various effects on plus size body shapes. They can be used to hide or to highlight certain parts of the body. Therefore, this analysis will be an advantage for plus size women in Sri Lanka in making their purchasing decisions on fashion as well as to the designers, stylists and manufacturers in fashion designing and fashion marketing.

## Objectives

1. To identify various applications of optical illusion forms to change the female body perception
2. To study how various forms of optical illusions combine to change female body perception
3. To recommend few style lines/printed lines for garments to change the perception

## Methodology

A qualitative approach was taken based on studio work to apply selected optical illusion theories on female body to develop new style lines to change the perception of plus size female body shapes. Apart from the studio work Adobe Photoshop and Illustrator software were used for the design development process. Existing literature on books, research/journal articles and online books were also used in data gathering process.

Plus size hourglass female body shape was divided into two pieces as upper body and lower body. The front view of the female body was selected for the research as it is the main area of female body with high diversity of body proportions and shapes. Breasts and fashion go together like snow and train schedules: the latter just doesn't take the existence of the former into account, despite the high likelihood that it will encounter it at some point. Also, the perception mainly depends on the front view.

The deviation made the waistline as a focal point and it was kept as a focal point in creating style lines. The waist line was selected as it is the smallest part in hourglass body. Oppel-Kundt Illusions, Bezold Effect and Bending / Hering Illusion types were selected for style line development. A visual comparison was done to identify perceptual changes.

## Data Analysis

### *Female Body*

Human body is accepted as a symbol and a major form of cultural communication. It can be further defined as a combination of person's perceptions, feelings and thoughts about his/her body outlook. Especially when it comes to female body; the proportions of female body play an important role in every culture. Beauty of a woman has been defined differently in various cultures. "Nobody can escape either the imprint of culture or its gendered meanings" (Brodo, 1993).

In terms of the history of western philosophy, the philosophy of personification is relatively recent. "Women are somehow *more* biological, *more* corporeal, and *more* natural than men" (Grosz, 1994). Such enmeshment in corporeality was also attributed to colonized bodies and those attributed to the lower classes (McClintock, 1995; Alcoff 2006). The concerns of feminists have also required an engagement with the philosophy of biology, as naturalizing accounts of embodiment have been resisted, while the distinctive materiality of our embodied situations in the world has nonetheless been respected (Birke, Bleier, Fausto-Sterling, Grosz, Haraway, Tuana). However, Lee JY (2007), Istook CL (2007), Nam YJ (2007), carried out a research on "Comparison of body shape between USA and Korean women and suggest a criterion to identify seven female body shapes. They divided hourglass as top hourglass and bottom hourglass as well. This research would be focused on the plus size hourglass body shape woman. The hourglass body can be divided into three parts.

1. Hourglass body (small waist, hips and bust almost similar width)
2. Upper hourglass body (large bust, small waist and narrow hips comparing to large bust)
3. Lower hourglass body (small bust, small waist and wide hips comparing to bust)

Harris and Harris (1992) reported that thinness in both men and women was preferred across a wide range of age, ethnicity, and genders. Cultural values which influence gender, age and social attitudes dictate what is perceived to be the ideal body shape and size at a particular point in history (Apeagyei et al., 2007; Fallon, 1990). In modern days in fashioning the body; the utmost beauty is having a skinny figure. The use of technology and special effects allows for images to be yet more perfect and idealized than real life. These unrealistic and idealized images play a significant role in facilitating self-comparisons among women, resulting in an upward shift of individuals 'personal image expectations (Blowers, Loxton, Grady-Flesser, Occhipinti, & Dawe, 2003). Thin body shape and low body weight is considered as the most valuable asset of beautiful women.

Body image develops partly as a function of culture in response to cultural aesthetic ideals (Rudd & Lennon, 2001). For example, in Westernized societies such as the United States, people tend to perceive thinness and attractiveness as desirable physical traits for women (Silverstein, Perdue, Peterson, & Kelly, 1986). In Sri Lankan society the slimness dominates as the norm and any woman or man who looks plump immediately labeled as fat. People assume the plump men and women are lazy/lethargic, slow/sedentary, stupid, lacking in will power, predisposed to over-eating, generally complacent and over- emotional. In Sri Lankan society marriage is the ultimate social delicate for a woman and slim body is being considered as a weapon in fighting for a man. Contemporary Sri Lankan culture, body image seems to singularly dictate the individual worth of women as opposed to traits like intelligence, talent, compassion, generosity, sensibility, humility, humor and perseverance (De Mel, 2016). It follows that in accordance with these shallow societal ascriptions of female worth, plump women are to be punished for their crime in refusing to fit the 'norm'. Further she describes that antiquarian depictions of the female body in Sri Lankan and South Asian art were curvaceous and voluptuous. Bountiful bosoms, hips and protruding bellies graced numerous artifacts venerating the female figure for its fertility and life-giving potential.

### ***Plus Size Fashion Market***

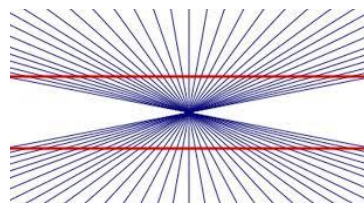
Women at 90% of time, crucial when deciding what to wear. The most sophisticated parts of the industry catwalks, magazines, and smart boutiques always highlight teeny tiny outfits on ultra slim models. The media portrayal and fashion industry use underweight models promoting an unrealistic body size has come under scrutiny in recent years. Plus size market is a growing market segment with potential high sales, which is highly attracted by designers and retailers (Dilea, 2013; Plunkett Research, Ltd., 2013). Plus-size: "sizes in women's apparel that are at the upper range of sizes manufactured. Generally, retailers place size 14 and above in this category" (Calasibetta and Tortora, 2003). Plus-size apparel is designed for people whose girth measurements exceed those of average-weight individuals of defined height. As compared to Shim, et al.'s findings about men's body-cathexis (1990), female consumers appeared to feel less satisfied with their bodies. This is consistent with previous research in that women were significantly less positive about their bodies than men (Rook, 1985). In order to produce garments for a target customer, it became necessary to standardize sizes according to body types based on statistical averages derived from anthropometric surveys (Moore, Mullet & Young, 2009). In 2011 sales of women's and girl's plus-size apparel had become a \$47 billion a year industry (Kids plus-size, 2011). According to the market research conducted by the NPD group the plus size apparel market generated \$17.5 billion sales during May 2013 and April 2014 which shows a 5% growth rate comparing to the previous year. But despite the booming sales retailers are disappointed at a certain point in satisfying their frustrated consumers. That is the biggest challenge for most designers and retailers.

Sarah Conley, a plus size fashion blogger and social media marketing consultant states that the plus size women have been purchasing clothing from a place of utility and that they have no fashion options which suites to them in terms of fit and style. According to Chase it is a blue ocean and vicious cycle for retailers, which makes them scared to step into water. He also points out that plus size clothing has not always been fashionable, trendy or well- made and often displayed in dismal areas of the retail stores. Ultimately the above two factors have made shopping for plus size clothing is an unpleasant experience.

### ***Fashion Optical Illusion and its Impact on Fashioning the Body***

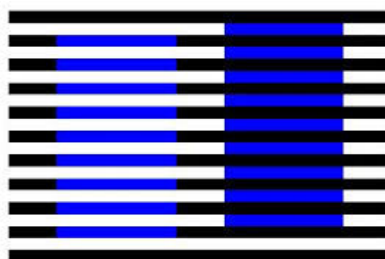
Optical illusions are more often visual illusions where the visual deception involves due to the arrangements of colours, light sources or another variable. Normally the blind spot of human eye helps the brain to gather the signals coming from the optic nerves in a wrong way. When eye and brain are trying to figure out the reality a perceptual or an optical illusion can be created. Altogether it makes a misleading visual effect, which we call as an optical illusion. It involves a great deal about working of the brain. According to the studies of Bugdayci (2008) both physiological and psychological processes are effective in this illusion process. Optical illusion work differently on everyone as some people’s brain doesn’t respond them to at all while some people are very sensitive on it. Due to the lack of theoretical explanations it is not easy to classify the illusion types. However, Bugdayci (2008) has suggested dividing it according to brightness and contrast, motion, geometry and perspective, interpretation of 3D images, cognitive conditions and colour. For this research four types of optical illusion techniques were selected in developing style lines.

#### ***Bending / Hering Illusion***



**Figure 1: The physiologist Ewald Hering found this illusion in 1861.<sup>1</sup>**

It includes vertical red lines constituting two parallel line segments. However, these lines look bent outwards due to the inaccurate depth perception and perspective caused by the lines with angles on the background. Therefore, the illusion is also called as “the Bending Illusion” (Sarniç, 2011).

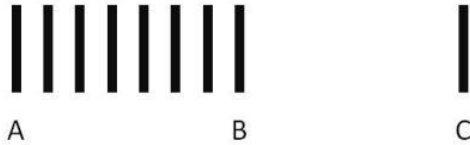


**Figure 2: Bezold Effect: A professor of meteorology, Wilhelm von Bezold discovered this effect.**

<sup>1</sup> All drawings and schemes are modified and extracted by the authors.

It is based on the fact that colors perceptually behave differently depending on the color of background. The blue color on a white background appears lighter, and the red color on a black background appears darker.

***Oppel-Kundt Illusions***



**Figure 3: The Oppel-Kundt Illusion is a very primary type of an illusion.**

In this illusion B can be found as a line, which divide A, and C vertical lines into equal spaces. Also, the space between the lines A and B has been subdivided into equal vertical lines with equal intervals. Space between B and C remains empty. As a result of illusion, the interval between A and B is perceived as wider than the interval between B and C.

**Results and Discussions**

As we move eye from left to right in figure 04 according to Oppel-Kundt Illusions (fig. 03) the upper body area with more horizontal lines appears as slim comparing to the lower body with less horizontal lines. Narrow closed by horizontal lines in upper body creates an illusion as the upper body is shorter than lower body. Also, it appears as the upper body is gradually getting wider towards shoulder line. The lower body consists with equally spaced horizontal lines wider than the upper body horizontal lines. It appears as lower body is wider and more rectangular by hiding wide hips. This can be used to adjust the bottom hourglass figures who are having wider hips. Also, it seems the lower body is longer than the upper body.



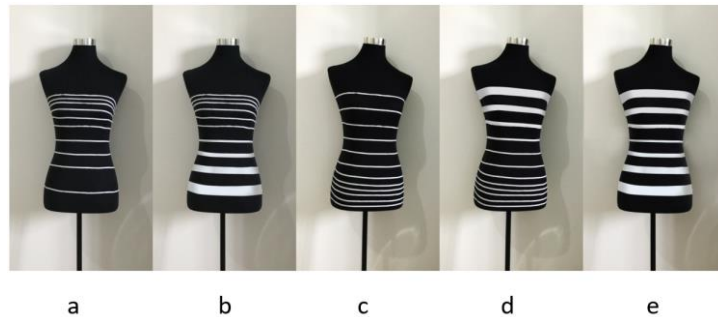
**Figure 4: Lining.**

Oppel-Kundt Illusions technique (fig. 03) was again applied to the lower part of the body. Moving the eye from left to right in figure 05 the more -style lines added the more slim and shorter the lower body appears (figure 05). More lines were added to the hip area to cut off the look of wide bust of plus size hourglass figure. At the same time the upper body was divided into equal sizes with horizontal lines, so the upper body appears as longer comparing to lower body. The wide bust and smaller hip of the plus size top hourglass body could be perceptually changed using these style lines.



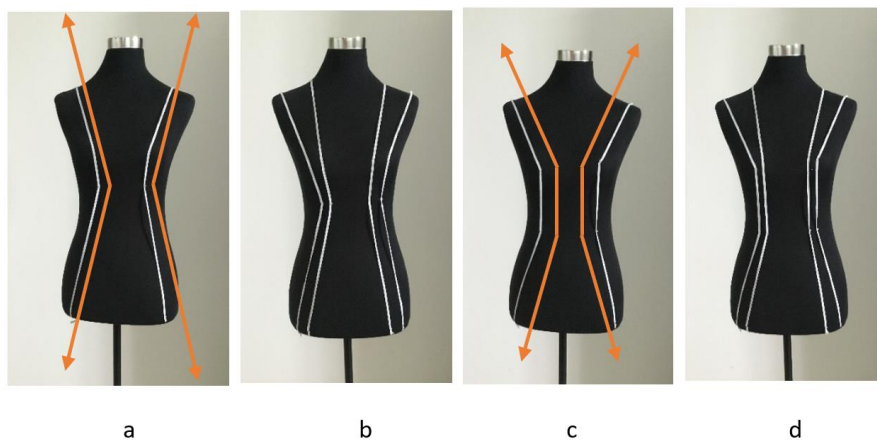
**Figure 5: Modified Lining.**

Further experiments were done to identify the impact of the width of the lines to change the appearance of the body. Observing figure 6 moving eye from figure 6a-6e the areas with thicker lines were more eye catching and looks bigger comparing to the areas with narrow lines. Figure 6b,6d and 6e were more eye catching than others. Top hourglass figures with larger bust can use figure 6b type illusion to make wider their narrow hips comparing to large bust to make it look balanced. Bottom hourglass figures can use figure 6d illusion type to hide wide hips and visually enlarge the bust area.



**Figure 6: Other illusion types.**

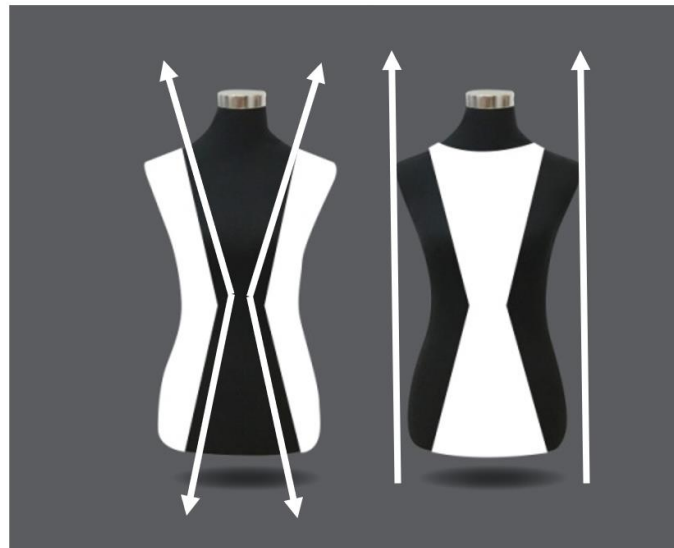
Bending / Hering illusion (fig 01) was applied to female body to observe the behavior of lines. The negative space created by angular lines changes the perception of the body. In figure 7a and 7b the lines gather at the waist line and they emphasis a tiny waist and the narrow white lines visually enhance the bust and hips. In the figure 6c and 6d the lines become straighten towards and outwards waist line making the body seems longer than the actual body. Also, it slightly hides the curves of the plus size hourglass female body into a more rectangular body frame. Hence, figure 7 c and 7d is recommended for plus size hourglass females to reduce their large bust and hips.



**Figure 7: Modifications in front view.**

The same style lines can be tried out using both Bending / Hering illusion (Figure 1) and Bezold effect (Figure 2) to see the change of the body perception. In figure 8 when the lighter colour

option placed at the side seams the figure looks slimmer and narrower. When the lighter colour option shifted to the middle panel the figure looks wider with wide hips and large bust and shoulders. According to Bending / Hering illusion effect this happens when the lines flows to out wards.



**Figure 8: Modified illusion.**

Oppel-Kundt Illusions (Figure 3) and Benzold effect (Figure 2) can also applied together with vertical lines in different sizes as well. An experiment was carried out using lines with different sizes to observe the visual perception. In figure 9 thicker vertical lines appears to be fat than figure with slim vertical lines. Using slim vertical lines, the plus size hourglass body can be converted into a slim rectangular appearance.



**Figure 9: Another modification.**

The focal point can be changed by adding style lines in various ways and below are some more experiments on focal point change on plus size hourglass body. In figure 10a the waist line has become the focal point with narrow lines appearing narrower bust and hips. In figure 10b the shoulders have become the focal point appearing more rectangular body. Figure 10c and 10d both having multiple focal points to distract wide bust and large hips of plus size hourglass female body.



**Figure 10: Experimental style lines.**

## Conclusion

This experimental research was based on the intension of finding new style lines to change the body perception of plus size hourglass female body shapes. The plus size hourglass females have large bust and hips and they want to reduce their curves by changing the focal point of their body. The application of selected optical illusions was successful in changing the body perception. However, with the limited time frame the number of experiments were narrowed down by applying only three optical illusion techniques. In the next stage the style lines developed at the studio should be tried out in the process of creative pattern cutting. The findings can be applied in plus size female apparel designing specially for plus size hourglass female category who are having a large bust and hips.

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