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TEXTILE PATTERN FOR DIFFERENT LOOKS

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Abstract

The desire for perfect body figures is ubiquitous across the world. The beauty standards are intangible characteristics, which is very subjective. This research looks into types of design patterns – acting as optical illusions – that can affect viewer perceptions of body size. Some theories are stating that certain patterns can influence how broad or thin the wearer looks. The study proposes to develop different types of design to assist the manipulation of visual perceptions of the wearers' actual size through a mediation of printed textile design pattern. Our overall approach is to create patterns by manipulating horizontal and vertical lines in creating design patterns to aid viewer perceptions of body size. The methods used were of quantitative and involved mind- measuring investigation. The data is taken from psychometric scaling – paired comparison and magnitude scaling method. Paired comparison is a simple way to approach respondents from all age groups and by using magnitude scaling, participants can save time by viewing four designs simultaneously for assessing. In this paper we have discovered possibilities of patterns, with different positioning and placement of patterns visually manipulates sizes of female and male silhouettes through the mediation of horizontal and vertical patterns.

Keywords: Design, textile pattern, visual illusion, shape perception, methodology

1 Introduction

Different styles and standards for physical attractiveness differ from one person to another. Fashion styles have developed throughout times and era, but the usage of stripes as patterns is consistent in designing throughout the years. Horizontal and Vertical stripes show high potential value in aiding illusion and its possibility towards the fashion industry. Today, slim and tall figures are the ideal body trends. Most people wish to look slimmer and taller, but fast food industries, contemporary living, and hectic lifestyles are some of the factors that make it difficult for people to achieve their desire.

Patterns can beautify a look. It can balance the shape of a body, create focus points or powerful illusions to accentuate assets or downplay challenges and visually lengthen or widen a given form. Patterns will indirectly affect the overall appearance of an outfit. Among the

commonly used patterns in designs are striped. In making a statement, stripes are a dominant symbol to portray offensive messages. The high visual contrast of lines lures designers and artists to use them in their products. The fundamental ability of stripes to highlight and distinguish an object from its surroundings has been used throughout history in the form of clothing and products.

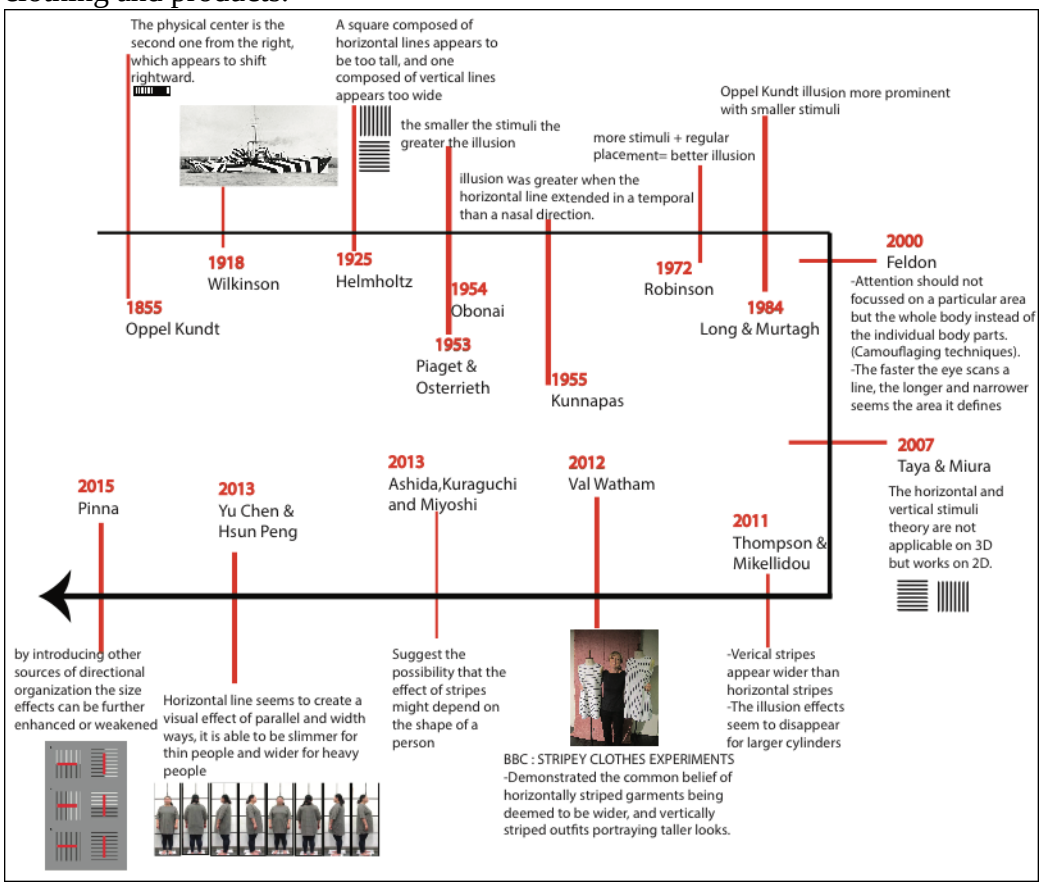

Figure 1. History of studies regarding horizontal and vertical lines.

Figure 1 briefly portrays the previous collection of researchers regarding horizontal and vertical illusion. The timeline pictures the illusion on horizontal and vertical stripes, starting with the early study of Oppel-Kundt illusion (Oppel,1855) of horizontal lines with inserts of strokes appearing longer against a plain line of the same length . Studies on horizontal and vertical lines were developed through out the years. Among factors affecting illusions of horizontal and vertical lines are stimuli sizes (Piaget,1953), the number of stimuli and its placement (Robinson,1972), the surface dimensions of objects (Taya Maura,2007)(Thompson & Mikellidou,2011) and the human body shape (Ashida et al, 2013). Hermann Von Helmholtz (1925) reported that an identical square made of vertical lines seem wider and shorter than a square comprised of horizontal lines. He states that a filled space perceived as larger than unfilled space. He mentioned that covered pattern wall appearances larger than one painted in one plain colour. The additional pattern affects the appearance of an object. Helmholtz has also stated that a square consisting of horizontal lines show taller and narrower looks than an identical square made of vertical lines and Thompson and Mikellidou (2011) supported the statement. Thus, this paper can be conceived as an attempt to further advance the pioneering work by Helmholtz of horizontal and vertical stripes, especially, and to explore in greater detail of the illusion theory through patterns on human figures.

2 Aims and objectives

This study aims to further advance the pioneering work by Helmholtz of horizontal and vertical stripes, especially, and to explore in greater detail the illusion theory performed on different 2-D figures and sizes for fashion usage.

The objectives are: -

i) To investigate the illusion effect of horizontal and vertical pattern on 2-D figure sizes, comprising of male and female figures.
ii) To investigate the possible illusion effect of mixed orientation of horizontal and vertical pattern on different 2-D figure sizes, consisting of male and female figures.

3 Method

The main method used, was psychometric scaling where we experimented with two different sub-methods. Method 1 was paired comparison and method 2 was magnitude estimation. Both experiments use psychometric scaling techniques. Psychometric Scaling is mind-measuring techniques to evaluate product development. The psychometric scaling used were of paired comparison and magnitude estimation approaches. These methods act as a tool to assess the human perception on illusion. Perception judgment is an estimation of 'ness' the stimuli attributes per images. “Ness” is used to characterize customer perceptions. In this study, the “nesses” we seek were for wideness and thinness in customer perception. Both of the experiment uses horizontal and vertical lines as the stimuli. Participants were university students consisting of graduates and undergraduates student and all willingly volunteered to participate in answering the questions. The participants were given a link attached to software -QuestionPro to answer the questions through online as its medium. The survey was conducted on 194 youth of ages from 18 - 40 years old.

3.1 Experiment 1 : Paired Comparison

Application of the paired comparison requires all pairs to present to the observer in a sequence of two-sample comparisons. The objective is to generate scale values and to estimate the psychometric function. Psychometric function predicts the point at which wideness can be detected based on its parameters. The method asks the participant to choose a sample, to determine the just-noticeable differences of stimuli. Both stimuli were present at the same time between the ‘left-right’ in pairs. The reason for using this particular method is its simple way of approaching respondents from all age groups. However, the downside of this approach is that with a larger amount of scale to examine, the number of questions also increases. It can be time consuming because, with 20 samples, the number of judgments climbs rapidly to 190 questions. This pairwise presentation repeats for all possible $n(n-1)/2$ pairs, the number of all possible combinations of n objects taken two at a time. (Where n is the number of values being compared). The observers were to select the sample with the highest visible ‘ness”.

Figure 2. Figures used in experiment 1 (paired comparison).

Figure 2 shows the images used in conducting the questionnaires for the first experiment. Figures were divided accordingly between silhouettes with the application of different patterns of horizontal and vertical stripes. There was a total of 28 questions for experiment 1. Questions vary from pattern orientation (horizontal and vertical), stimuli sizes (bigness and smallness)| and figure sizes (shapes, female and males).

As an example, the question following paired comparison stimuli is as follows: “Select an image that seems wider. Is it image a or image b?”

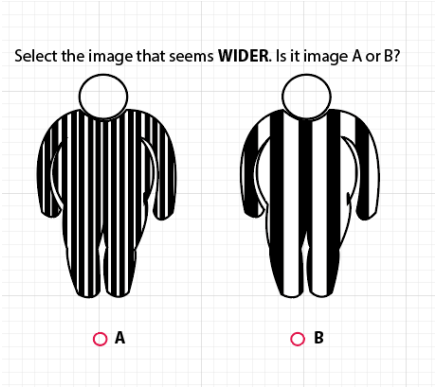

Figure 3. Example of paired comparison question.

3.2 Experiment 2 : Magnitude Estimation

In magnitude estimation, participants are required to set numerical answer in proportion towards the strength of the “ness”. “Ness” here is to characterize customer perceptions of image wideness. Magnitude estimation will reduce the number of questions compared to paired comparison. However, this method requires the participant to consider critical scaling values which can be time-consuming and difficult.

In experiment 2, horizontal and vertical lines were developed and combined to become patterns. The lines were added in segments of golden ratio (refer figure 4). Golden ratio acts as a medium for lines to merge together before applied on 2-D human figures. The patterns were divided into four different patterns with two sets of same size patterns A-B and C-D. Patterns were rotated 180 degrees and enlarged by 0.25cm (refer figure 5). A total of six 2D figures were chosen with three of female figures and 3 of male figures. The total collection of figures with completed looks is as shown in Figure 6.

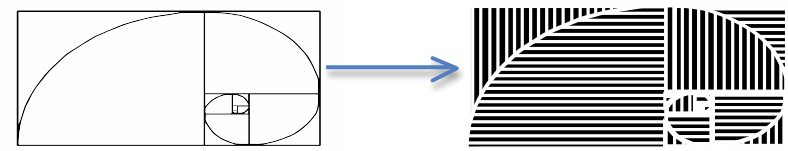

Figure 4 Horizontal and Vertical lines in segments of golden ratio.

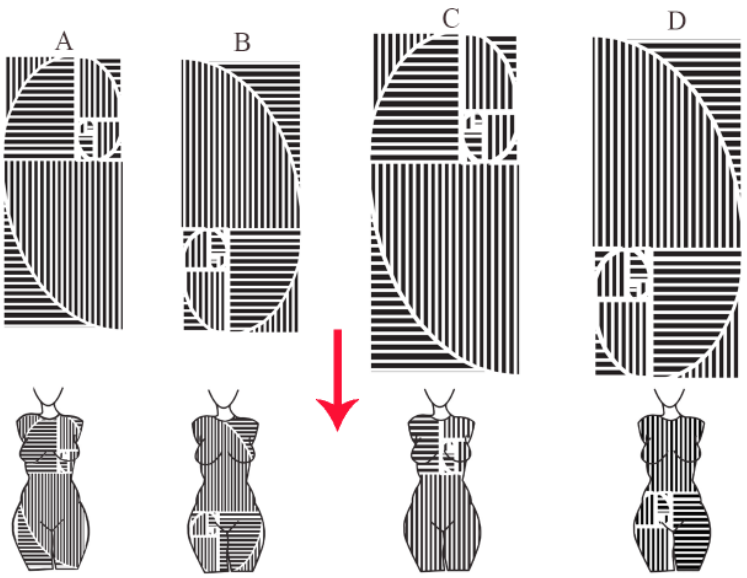

Figure 5 Figures with the implementation of a combination of the same thickness and diameters of horizontal and vertical lines. The patterns were oriented 180 degrees and enlarged by 0.25 cm.

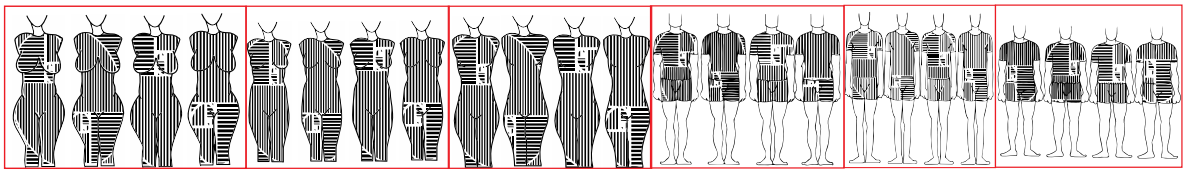

Figure 6 Collection of figures used in experiment 2, Magnitude estimation.

The questions following magnitude estimation are as follows: “Mark the scale value from smallest to widest.”

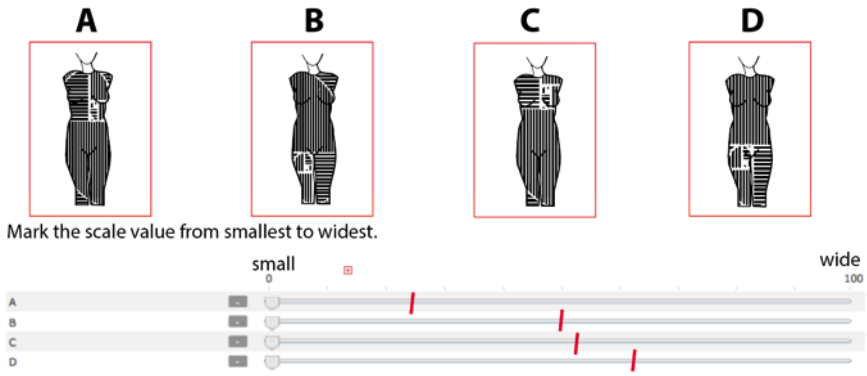

Figure 7 Magnitude estimation sample question. The technique displays four visual images with different applied stimuli simultaneously and attached with a scale bar for value scaling assessment.

4 Procedures

The participants were approached in their computer classrooms at their University in Malaysia. Before the experiment, we have informed the lecturer regarding the questionnaire conducted. The participants were given prior notice regarding the conduct and were given a say to participate or not. As the conduct was done after the class has ended, participants were given the opportunity to exit the classroom and not participate in the questionnaires. Before starting the questionnaires, we have briefly explained how to answer the questions, which were by clicking and sliding on the images that seem widest in their eyes. All the participants were given a link to their computer, which was connected to software QuestionPro. Participants were welcome to ask questions throughout their answering and after finishing the questions, they were allowed to leave the room.

5 Results And Analysis

5.1 Paired comparison

From experiment 1 of paired comparison method, here are the results. Figure 12a, 12b, 12c, 12d shows the image wideness scale from -4 to 3 using paired comparison method.

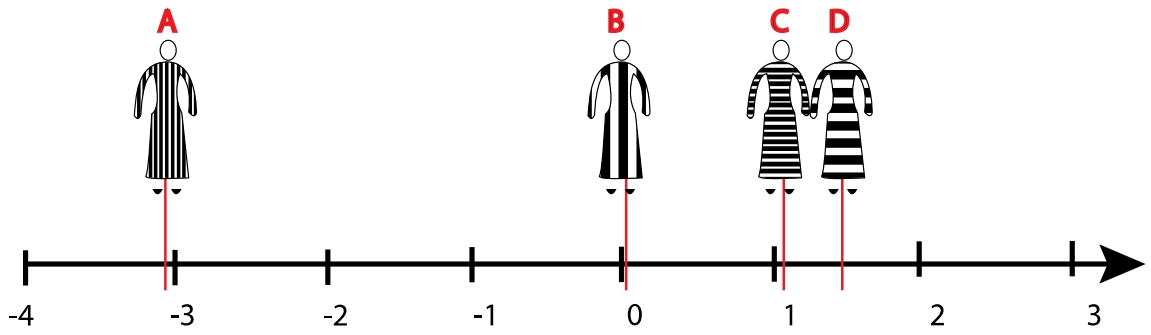

Figure 8a show the scale bar of female, thin figures. A big horizontal pattern illustrates the widest looks of all patterns, followed by small horizontal patterns, big vertical patterns and with small vertical patterns illustrating the slimmest.

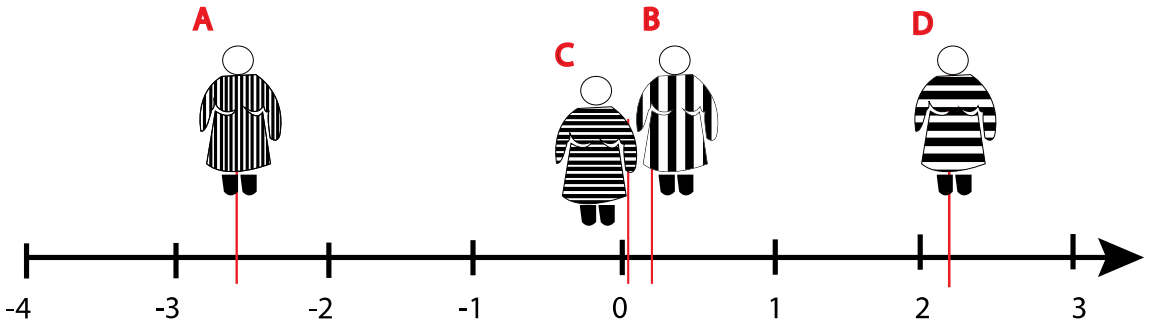

Figure 8b shows the scale bar of female, wide figures. A big horizontal pattern illustrates the widest looks of all patterns, followed by big vertical patterns, horizontal small patterns and with small vertical patterns illustrating the slimmest.

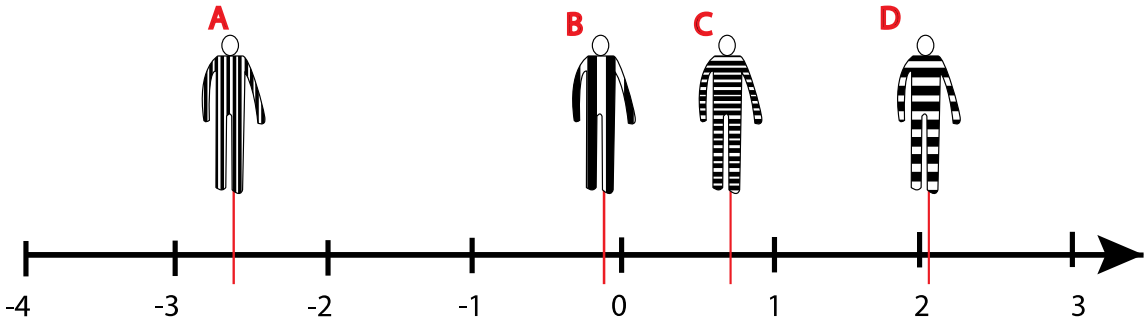

Figure 8c Shows the scale bar of male, thin figures. A big horizontal pattern illustrates the widest looks of all patterns, followed by small horizontal patterns, vertical big patterns and with small vertical patterns illustrating the slimmest.

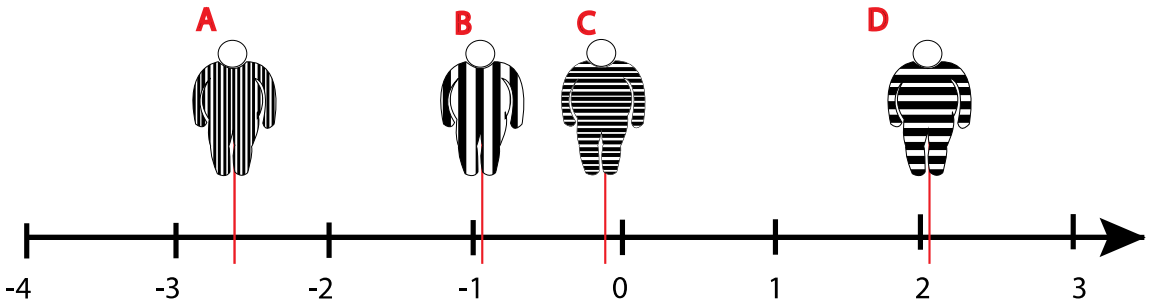

Figure 8d Shows the scale bar of male, wide figures. A big horizontal pattern illustrates the widest looks of all patterns, followed by small horizontal patterns, vertical big patterns and with small vertical patterns illustrating the slimmest.

5.2 Magnitude estimation

From experiment 2 of magnitude estimation method, here are the results. Figure 13a, 13b, 13c, 13d and 13e show the image wideness scale from 0 to 60 using magnitude estimation method. The scale represents values collected from participant's assessment in the survey.

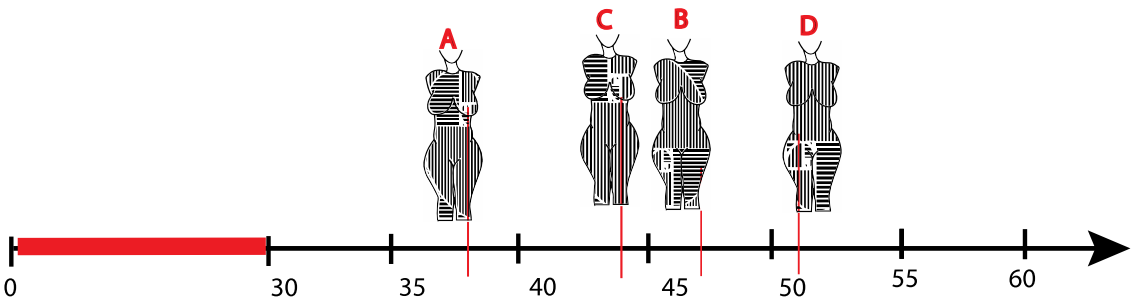

Figure 9a. Shows the scale bar of curvy female figures. Female figures with enlarged patterns illustrate the widest looks with heavy patterns on the bottom body also

contributed to wider appearance. Small patterns with heavy pattern placement at the top body illustrate the slimmest.

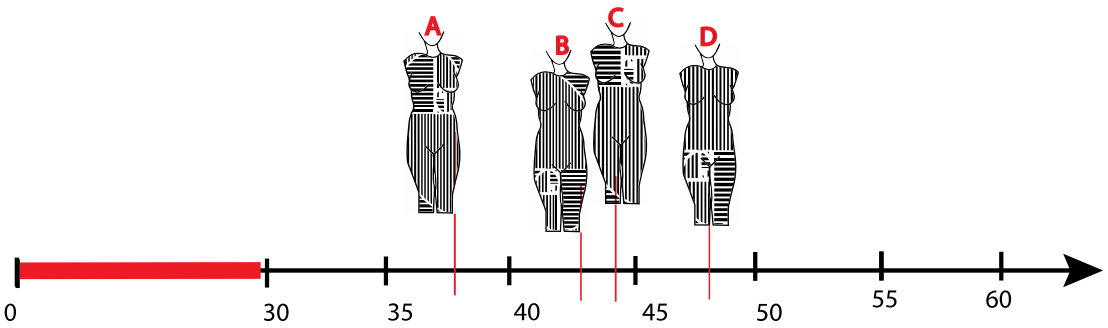

Figure 9b. Shows the scale bar of apple shaped female figures. Female figures with enlarged heavy patterns on the bottom body illustrate the widest looks. Small patterns with heavy pattern placement at the top body illustrate the slimmest.

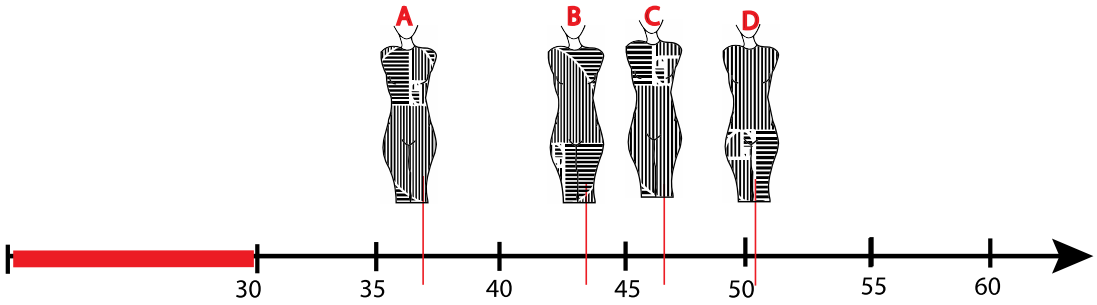

Figure 9c. Shows the scale bar of athletic shaped female figures. Female figures with enlarged heavy patterns on the bottom body illustrate the widest looks. Small patterns with heavy pattern placement at the top body illustrate the slimmest.

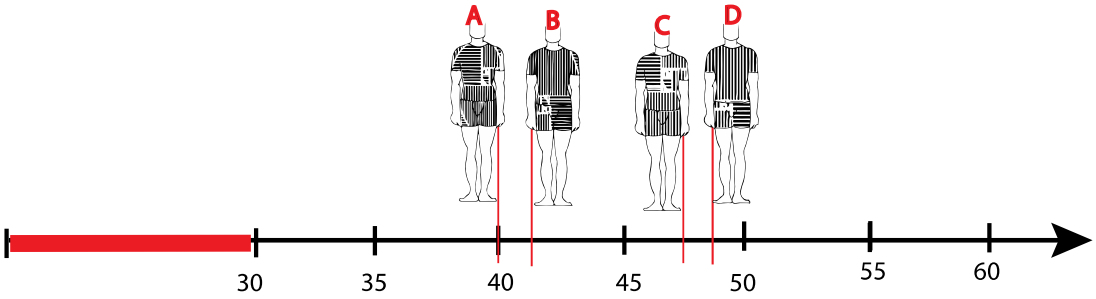

Figure 9d. Shows the scale bar of regular shaped male figures. Male figures with enlarged heavy patterns on the bottom body illustrate the widest looks. Small patterns with heavy pattern placement at the top body illustrate the slimmest.

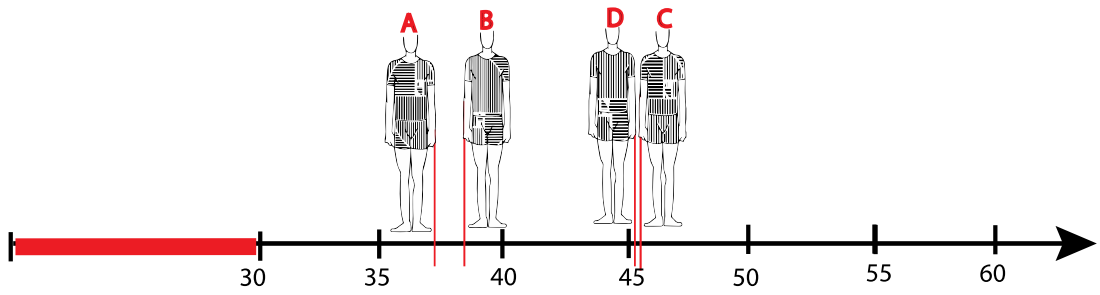

Figure 9e. Shows the scale bar of regular tall thin male figures. Male figures with enlarged heavy patterns on the top body illustrate the widest looks. Small patterns with heavy pattern placement at the top body illustrate the slimmest.

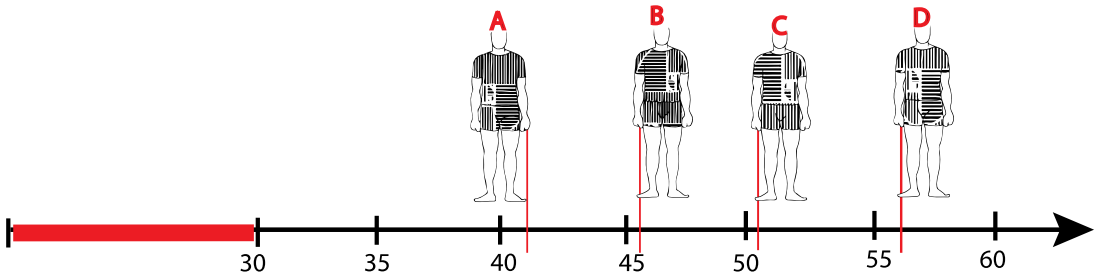

Figure 9f. Shows the scale bar of athletic built shaped male figures. Male figures with enlarged heavy patterns illustrate the widest looks. Small patterns illustrate the slimmest.

6 Conclusions

From experiment 1 of paired comparison method, it can be concluded that different sizes of patterns can trigger different visual outcome. Figures with a bigger thickness of stimulus and figures consisting of horizontal patterns shows the optical illusion of being wider than vertical. Also, vertical stimuli show the optical illusion of being the slimmest in all four different human figures. This shows that shapes, with the application of the same pattern will look differently from one another.

From experiment 2 of magnitude estimation method, it can be concluded that mixed orientation of patterns can trigger illusion of visual perception. Figures with the application of bigger thickness of stimulus portray the optical illusion of being wider. Also, female figures with heavy patterns on the bottom body create a wider presence. The data show that the scale difference between the images varies and with the most-white (clear) partition being seen as to triggers most votes on scale wideness.

Both of the experiments showed the differences in looks when the same pattern applied to different body figures. In addition, the shapes of male and female figures resulted in different visual outcomes when patterns are applied.

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