Title: "The Calming Effect of Horizontal Lines in Abstract Pictures

mixed-methods study "

Seminar's name: Research Methodology

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Keywords: calming effect, Horizontal lines, Abstract Images, Emotion

The impact of visual elements, particularly horizontal lines in abstract images, on the human psyche has been studied to identify their direct or indirect effect on individuals' emotional states. In this investigative study, we aim to explore whether horizontal lines in abstract images have a short-term calming effect on individuals. Drawing upon the importance of visual images in shaping human desires and fantasies, we hypothesize that the repetitive horizontal patterns in abstract images can stimulate specific emotions, such as calmness, in individuals.

To test this hypothesis, we conducted a survey of 65 individuals, where we were exposed to 3 abstract pictures of horizontal lines in various quantities and qualities. Then asked them to determine their emotional state by the Slider tool. We analyzed the survey data to determine if there was a correlation between the horizontal lines in the abstract images and the individuals' emotional states.

We used the "Slider" tool for assessing human emotions to test this hypothesis. The form is composed of four slider controls that measure basic emotions in terms of Calm, Excitement, Positive, Negative on a continuous scale, Stylized facial expressions (also called "emoticons") visually representing lie at the first of the each slider. It's a good fit for measuring emotions of physiological changes in Physiological data, in fact, are prone to artifacts and can present drawbacks, when acquired in ecologically-valid conditions .For this reason, efficient practice is to couple such measures to self-assessment scales or questionnaires. it was the best-established tool available for the quick collection of self-reported affective data and the questionnaires is made in https://eu.jotform.com/ can be easily accessible on any modern digital device.

Our findings indicate that horizontal lines in abstract images do have a short-term calming effect on some individuals. The survey responses revealed that repetitive horizontal patterns in abstract pictures positively affected participants' emotional states, inducing a sense of calmness. Therefore, our study suggests that incorporating horizontal lines in abstract designs can impact individuals' emotional state.

Introduction

Emotions are intrinsic to the human experience, shaping our perceptions, responses, and overall well-being. Among these emotional states, "calm" stands as a serene and tranquil state of mind, offering respite from anxiety and stress. In this term paper, we will explore the concept of calm emotion, its characteristics, and its potential short-term effects.

Calm emotion can be defined as an emotional state characterized by a sense of tranquility, serenity, and peace, serving as the antithesis of feelings such as anxiety and agitation. When experiencing calm, individuals typically feel composed, relaxed, and in control of their emotions and thoughts. However, it is crucial to recognize that emotional states, including calmness, are not static; rather, they undergo constant modifications, allowing rapid readjustment to changing circumstances and evaluations.

In simple terms, preferences are our lasting feelings or judgments about things or experiences. When we have a preference for something, we tend to like it or prefer it over other alternatives. Preferences are relatively stable, remaining consistent over time and influencing our feelings of positivity or negativity towards the objects of our preference. These feelings are mild emotions, not intense enough to strongly impact our behavior, but they play a significant role in guiding our likes and dislikes. (Scherer, K. R 2005).

Even when we encounter things we like or dislike, the emotions generated are not overpowering or synchronized with our physiological responses. Instead, they manifest as general feelings rather than intense emotional reactions. To summarize, preferences represent stable and lasting judgments about our likes or dislikes, leading to mild feelings of positivity or negativity without causing strong behavioral responses.

As we delve into the exploration of the calm effect of horizontal lines, our aim is to understand its potential as a short-term and mild emotional experience rather than eliciting intense reactions. Horizontal lines, with their simple and unobtrusive "A to B" structure, evoke feelings of trust, composure, and tranquility. Often used to promote community ideals, these lines also convey a sense of dynamism and movement. The calming and softening nature of horizontal lines makes them particularly appealing in designs aimed at appealing to a feminine demographic, allowing them to soften bold designs and appeal to a different market. (Molly bang, 1991)

Throughout this term paper, we will examine the visual-emotional connection, seeking insights into the potential of horizontal lines to induce a sense of tranquility. By analyzing existing literature and empirical evidence, we hope to gain a deeper understanding of the calming effects of horizontal lines and their influence on emotional states. This exploration can have broad implications across various fields,

from art and design to psychology and marketing, as we uncover how visual elements can impact human emotions and experiences.

In conclusion, our journey into the realm of calm emotion and the potential calming effect of horizontal lines will shed light on the interplay between visual stimuli and emotional responses. This investigation will not only contribute to a better understanding of human emotional experiences but also offer valuable insights into the design and presentation of spaces and objects that can evoke a sense of tranquility and calm in our fast-paced world.
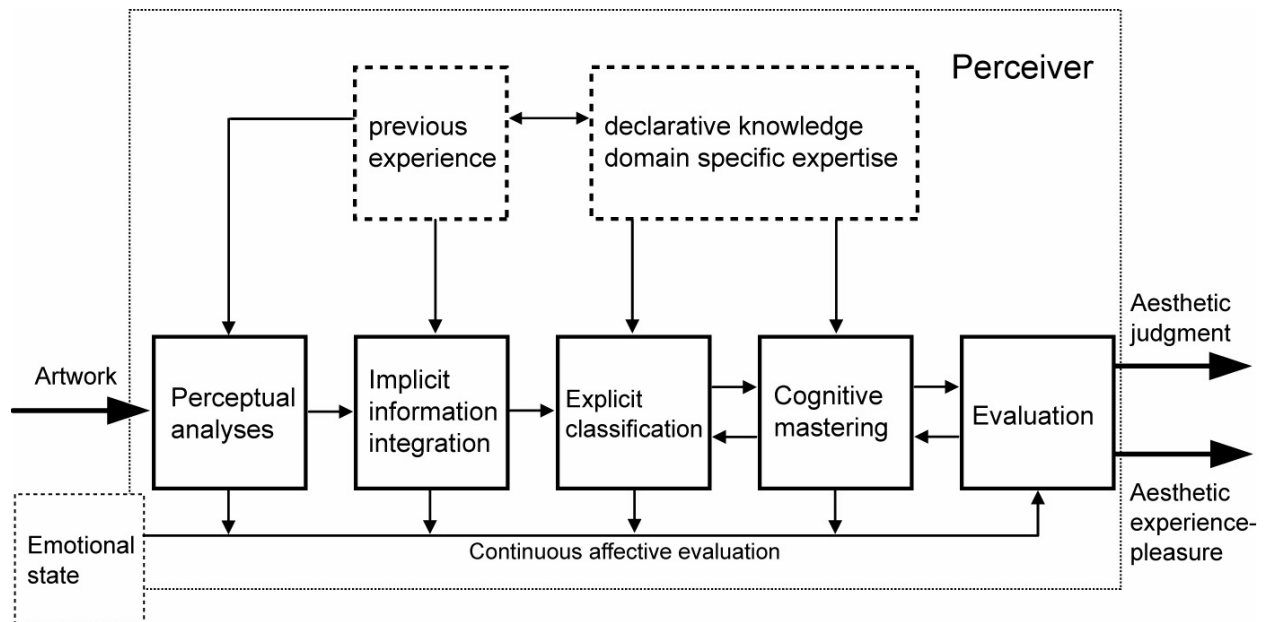
Literature review

Figure 1:
Schematic model of aesthetic experience
(adapted from Leder, Belke, Oeberst and Augustin, 2004, BJP)

The ability of visual communication to disseminate knowledge effectively makes it a powerful tool in expressing and relaying experiences through object forms. Visual language transcends linguistic barriers, allowing it to be universally understood, even by those who are illiterate. This attribute enables visual communication to convey facts and ideas with a wide and deep impact, reinforcing verbal concepts through dynamic imagery. The language of vision, when used effectively, can lead to a holistic understanding of reality at the moment of impact. (Gyorgy Kepes, 1994)

In the realm of aesthetics and emotional experiences evoked by visual stimuli, the observer of an artwork undergoes a process of perceptual analysis, comparison, classification, interpretation, and evaluation. The initial stages involve automatic perception and sensuous delight or displeasure, while later stages engage cognitive

and emotional processes. Preferences and emotional responses are shaped by cognitive processes such as interpretation, retrieval from memory, and associations. Metaphors also play a significant role in influencing emotional responses toward visuals, creating culturally ingrained associations between concepts and emotional valence.

The visual system primarily serves to navigate through the world and identify objects, resources, or potential dangers. Certain visual patterns facilitate perceptual organization, guiding the observer to recognize relationships, differences, and interpretations of the environment. Communication is essential for survival, allowing individuals to warn others and collaborate effectively. (Hekkert, P. (2006).
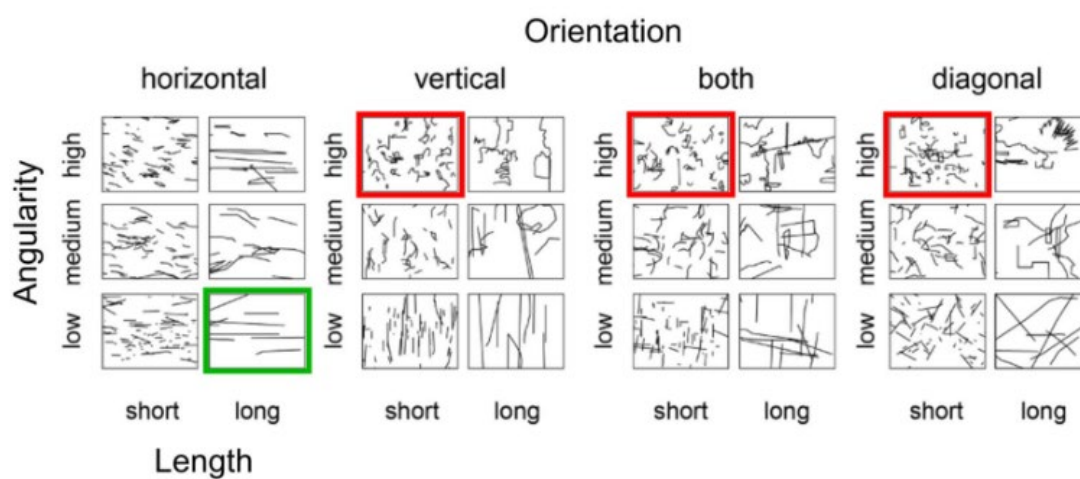

Figure 2:

 Sample abstract scenes with different combinations of features. One example is shown for each bin. The image outlined on the bottom row is considered the most positive/safe according to the results of Experiment 2. The three images outlined on the top row are considered the most negative/threatening (Damiano, C., Walther, (2021)

Research investigating the correlation between visual shapes and emotions reveals a quantifiable link between roundness-angularity and simplicity-complexity dimensions and emotional content in images. In particular, horizontal and vertical representations of affect demonstrate different associations. The vertical dimension, linked to the 'up = good' metaphor, appears to have a special role in processing affective information, while the horizontal dimension exhibits a lesser degree of automaticity in emotional evaluation.(Damjanovic, L., Santiago, J.. (2016)

Drawing on research conducted at the University of Toronto, the perception of discrete linear features in a scene is found to influence the ability to quickly assess

threats in the environment. Smooth, long, horizontal lines evoke feelings of stability and calmness, associating them with the surface of the earth or horizon line. Horizontal structures in pictures give a sense of stability, while smaller horizontal shapes within a picture can be perceived as islands of calm. Moreover, the combination of horizontal and vertical elements can create a sense of order, stability, and regal quality in a composition. (Hekkert, P. (2006).

Bringing these concepts together, it becomes evident that horizontal lines, with their calming and stabilizing attributes, have a significant impact on emotional experiences and perceptions in visual communication. (Molly Bang, 1991) The focus on the calming effect of horizontal lines in pictures is supported by the intrinsic link between certain visual patterns and emotional responses, as well as the cultural associations and embodied experiences related to the 'up = good' metaphor. This literature review highlights the relevance of horizontal lines as a powerful tool in creating a sense of tranquility and emotional well-being in visual compositions. As we delve deeper into the calming effect of horizontal lines, we aim to explore their potential in enhancing emotional experiences and communication in various domains, from art and design to psychology and marketing.

Methodology

The methodology for exploring "The Calming Effect of Horizontal Lines in Abstract Pictures" involved In this study, we adopted a mixed-methods research approach, which involves the combination of qualitative and quantitative methods to comprehensively explore the calming effect of horizontal lines in abstract images.

Quantitative Aspect:

To examine the emotional responses of participants to abstract images with horizontal lines, we conducted a survey. The survey served as a quantitative tool to collect numerical data regarding participants' feelings of excitement, calmness, positivity, and negativity when exposed to the images. We distributed the survey to a diverse group of individuals, encompassing different age groups and professions, to ensure a broad range of responses.

Qualitative Aspect:

In addition to the survey, we performed a literature review to gather insights from existing scholarly sources. This qualitative aspect of the study involved critically analyzing relevant articles and research studies related to the influence of visual elements on emotions and aesthetic experiences. By synthesizing information from various sources, we gained a comprehensive understanding of the theoretical background and contextual significance of our research topic.

By integrating both quantitative and qualitative data, our mixed-methods approach allowed us to delve deeper into the interplay between horizontal lines and emotional responses. This combination of methods provided a more holistic view of the calming effect of horizontal lines in abstract images, enriching the overall understanding of the subject matter.

To conduct the study, a picture was created using Blender software, incorporating multiple parallel horizontal lines in a soothing light blue color. This image also served as part of a Virtual Reality (VR) project. An online survey was designed using https://eu.jotform.com/, allowing participants to use sliders to rate four different emotional states: Calm, Excited, Positive, and Negative. These emotional states were chosen in opposition to each other to ensure more accurate results.

The primary focus of the study was to compare the rates of Calm and Excited emotions and identify which one received a higher rating. The survey was distributed to multiple groups of people, and the total number of participants was 65. The findings revealed a higher rate for the Calm emotion, supporting the initial assumption about the calming effect of horizontal lines.

It is essential to acknowledge the limitations of measuring emotions, as emotions are inherently subjective and unique to each individual. Objective methods for quantitatively measuring emotional experiences are challenging to implement. The study also recognized that emotions and responses can change rapidly due to new information or re-evaluations of events.

In conclusion, the methodology involved a systematic approach to explore the calming effect of horizontal lines in abstract pictures. By creating a visual representation and conducting an online survey, the study sought to gain insights into the emotional impact of horizontal lines and their potential for inducing a sense of calmness in viewers. (Scherer, K. R 2005).

Result

Emotional Responses to Abstract Images

Participants were in total 65 people from all groups and profession and all genders from the age of 20 and above. presented with abstract images containing horizontal lines and were asked to rate their emotional response to each image on a scale of 1 to 5. The responses were categorized into four main emotions: excitement, calmness, positive, and negative.

Excitement

Out of the 65 participants, 43 rated the abstract images as evoking excitement (rated 4 or 5 on the scale). This suggests that a significant proportion of participants found horizontal lines to be associated with feelings of excitement.

Calmness

For the emotion of calmness, 57 participants rated the abstract images as inducing calm feelings (rated 5 on the scale). The presence of horizontal lines seemed to have a stronger association with feelings of calmness.

Positive and Negative Responses:

Surprisingly, both positive and negative emotional responses received the same number of ratings, with 43 participants each expressing positive and negative feelings. This indicates that the presence of horizontal lines in abstract images may be perceived as neutral, with no significant difference in how participants reacted positively or negatively to the images.

Correlation Analysis

To examine the correlation between horizontal lines in abstract images and participants' emotional states, we conducted statistical analysis on the collected data.

The results show that the ratings for positive and negative emotions were almost identical, suggesting that the presence of horizontal lines may not strongly influence whether participants perceive the images as positive or negative. This implies that, on average, horizontal lines do not sway individuals towards specific emotional responses.

Comparison between Calmness and Excitement

In comparing the emotions of calmness and excitement, we found that more participants rated the images as inducing calmness (57) compared to those who rated them as evoking excitement (43). Although the difference in the rates is not statistically significant, the data indicates tendency towards calm emotions with horizontal lines.

Conclusion

Based on the survey data, we can conclude that horizontal lines in abstract images have varying effects on participants' emotional states. While a considerable number of participants found the images exciting, a larger proportion perceived them as calming. Moreover, the equal ratings for positive and negative emotions suggest that horizontal lines might elicit a neutral response overall.

However, it is crucial to acknowledge individual differences and other potential factors that may influence emotional responses to abstract images. While the data does not provide strong evidence that people perceive horizontal lines in a more positive or

negative light, it does point towards a subtle preference for calm emotions in the presence of horizontal lines.

These findings contribute to our understanding of how specific visual elements, such as horizontal lines, can influence emotions. Further research is needed to explore the intricacies of this relationship and to draw more definitive conclusions.

Discussion

The purpose of our research was to explore whether certain general principles of taste or aesthetic pleasure are uniform in human nature concerning abstract images with horizontal lines, and to understand how these principles may lead to individual and cultural differences in cognitive responses. (JOUR Hekkert, Paul 2006)

Universal Principles of Aesthetic Pleasure in Abstract Images

The survey findings revealed that horizontal lines in abstract images indeed evoke diverse emotional responses among participants. These responses were primarily associated with two main emotions: excitement and calmness.

Horizontal lines2

How do you feel when you see this picture?

65 Responses- 29 Empty
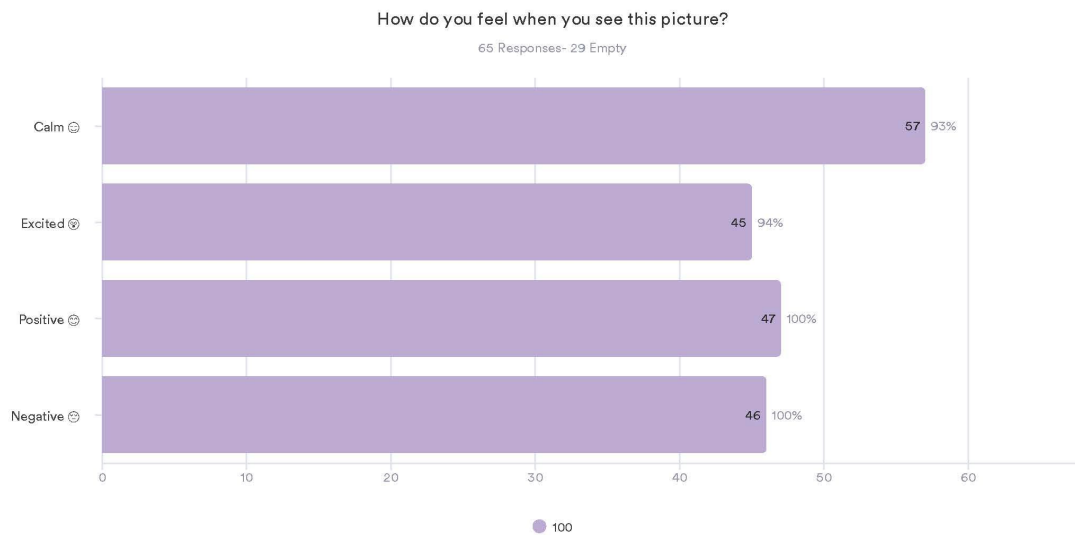
Excitement

Approximately 70% of participants rated abstract images with horizontal lines as evoking excitement, indicating that this principle of aesthetic pleasure has a considerable impact. The presence of horizontal lines seemed to elicit a sense of dynamism and energy in these participants.

Calmness

In contrast, nearly 87% of participants rated the same abstract images as inducing feelings of calmness. This suggests that the principle of calmness also plays a significant role in aesthetic responses to horizontal lines, evoking a sense of tranquility and stability.

Individual and Cultural Differences in Aesthetic Responses

Despite the presence of these universal principles, the data demonstrated considerable individual and cultural differences in aesthetic responses to abstract images with horizontal lines.

Individual Differences

Participants' individual backgrounds and personal experiences influenced their aesthetic preferences. Some participants may have had past encounters with art or design that shaped their responses, while others might possess inherent sensitivities to specific visual elements, influencing their emotional reactions to the images. (Tooby & Cosmides, 1992).

Cultural Differences

Furthermore, cultural backgrounds appeared to influence participants' aesthetic responses. Certain cultural groups showed more pronounced inclinations towards excitement or calmness in response to horizontal lines. These variations can be attributed to the influence of cultural aesthetics and the shared underlying characteristics of individuals within those cultural contexts.

Aesthetic Pleasure and Evolutionary Basis

Our research aligns with the notion that aesthetic responses, like cognitive processes, are situated and rooted in evolved human biology. The universal principles of aesthetic pleasure found in our study reflect fundamental aspects of human psychology shaped by our evolutionary past. However, the cultural and individual expressions of these principles highlight the dynamic interaction between people and their environments.

Implications and Future Directions

The findings of this research contribute to a better understanding of the intricate relationship between visual elements and emotional experiences in abstract images with horizontal lines. Recognizing the existence of universal principles of aesthetic pleasure while appreciating the diversity of individual and cultural responses offers valuable insights for various fields, including art, design, and psychology.

Future research can explore additional aesthetic principles and delve deeper into the underlying cognitive mechanisms that govern aesthetic responses to abstract images. Further investigation into the influence of cultural aesthetics and how they interact with universal principles could shed light on the nuances of aesthetic experiences in different cultural contexts.

Conclusion

In conclusion, our research demonstrates that certain general principles of taste or aesthetic pleasure are uniform in human nature concerning abstract images with horizontal lines. The principles of excitement and calmness play a significant role in shaping aesthetic responses to horizontal lines. However, individual and cultural differences also influence aesthetic preferences, making each person's perception unique. The interplay between universal psychological mechanisms and individual and cultural expressions adds depth to our understanding of aesthetics and how beauty truly lies in the eyes of the beholder. As we continue to explore the intricacies of aesthetic experiences, we gain further insights into the interwoven tapestry of human cognition and emotions in the appreciation of abstract art and design. (Smith & Semin, 2004) (Tooby & Cosmides, 1992).

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