Effects of Form Features on Image Perception

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ABSTRACT

This study attempts to explore the mechanisms people use in 3D form identification in different situations. There are three experiments in this study: (1) Affective images of structuralized form feature perception, (2) Effects of form feature structure on similarity identification, (3) Effects of geometric form features on categorical perception. The results from each experiment will indicate the characteristics of form identification relating to form features in different experiment tasks.

The first experiment intended to investigate the consumers' affective responses by using the semantic differential method to evaluate 3D form features in prisms. From the shared common form features in each group, the relative influences of combined form features to affective responses were identified. The results demonstrate an evident structural relationship between the abstract affective image distribution patterns and structuralized form features. It confirms that there is a close tie between the affective response and cognitive process of visual perception.

The second experiment was emphasized on the behavior of similarity identification relating to form features. The results indicated that subjects could precisely perceive the similarity according to the salience of form features. It was found that people made decisions on similarity judgment by feature matching behavior. This kind of feature matching process was closely related to the differences in salience between various form features. Results of the study demonstrated that in dealing with the similarity identification task, human beings were able to use their structural ability to handle effectively the visual information that looks complicated but possesses specific relations between form features.

The third experiment was emphasized on the effect the structure of 3-D form features has on the categorizing process. The results indicated that subjects' classification process was strongly related to the prisms' compounded features. The attention weighting of each individual feature was calculated and indicated that each feature had a different effect on the categorizing process. The analysis of the relations between the number of feature identities and overall similarity indicated the distribution curve skewed to multiplicative distribution, it suggested that subjects classify the features in a holistic manner.

The results demonstrated the characteristics of form identification in different situations. It provided an important reference to industrial designers dealing with form design. With carefully analysis the situation of new forms identification, either for affective responses, similarity comparison, or product categorization, designers can effectively manipulate the changes of features in new form for the market.

Key words: form features, identification, semantic differential method, similarity, categorization