A Multidimensional Scaling Analysis in Spatial Images of Gender Differences:
Taking Popular Illustrations as Stimuli

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Summary

Art education research in Taiwan seems to pay more attention on the development of curriculum and instruction design in schools. The issue of gender is somehow not well attended and often attached to other studies. In addition, research of gender differences in artistic perceptions that used oral interviews and semantic questionnaires only acquire the psychological differences on a variety of single items between individuals but fails to concern about their overall thinking patterns. Therefore, this study attempts to explore the gender differences of perception in images through experimental methods, establish an analysis model for the classification of styles of popular illustrations, and obtain relevant experimental data to collate them with the literature of gender differences. With the following results, it can help researchers to construct the mutual mode of biological, psychological, and environmental mechanisms in individuals, and further deduce the relevance with design and art, as well as provide the creator with a reference to the choice of styles.

A total of 78 and 82 participants were recruited from the industrial and commercial design department of an institute for two periods. The perception mappings of similarity and preference in spatial images of genders to the popular illustration styles were established by the Multidimensional Scaling Method (MDS) through the pairwise comparison scales and the preference score ones. On the whole, the judgments of style have two main axes: theme and form, and this echoes previous studies. Although this model cannot be precisely shown in the experimental data, an approximate pattern can still be observed in the perceptual maps. However, the overall difference

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between similarity and preference perception is that similarity judgment seems to have a criterion of positive or negative images, but this phenomenon does not exist in preference judgment. It shows that the categorization of illustration styles in preference is not judged though positive or negative imagery and subverts our imagination that there should be a positive meaning for popular objects. Actually, popular illustrations featuring various visual elements and artistic qualities should be considered as important, superior art teaching materials. In terms of gender, it can be found a clear pattern of style judgements as that male participants tend to utilize "form" as the main criterion and "theme" as secondary, while female counterparts utilize "theme" as the main one and "theme-form-mixture" as secondary. In addition, the pattern of spatial images to popular illustration styles in males verified by statistical calculation is extremely firm, and can be achieved fairly consistent results in different males. On the other hand, females seem to judge illustrations by their feelings, and there is less consistency on the perceptual patterns between different females. Moreover, female participants tend to include "3D figure" and "comic" in the same classification, but male participants seem to separate "3D figure" from the classification of "comic." This is also quite consistent with the general impression of genders. The above results can be linked to the previous literature mentioned that males think specifically and are good at deductive reasoning and cognitive performance in space, while females think diversely and are good at communication and inductive coordination. Therefore, through the discussion of styles in popular illustrations, art education may provide a platform to promote greater gender awareness and understanding. Finally, female participants tend to include "athletic competition" and "violent combat" in the same classification of similarity, and distribute "sporty athletics" to the preference category, while male participants seem to refer "sweet romance" to one classification in both similarity and preference assessments. This finding certainly challenges the stereotype of that males value manliness while females care about femininity. The above results suggest that the effects of congenital physiological traits and acquired social constructs are mixed.

From the results, it is speculated that too many stereotypes lead to the previous relevant research imposing restrictions on themselves. The researchers should use more methods to inquiry and recapture the truth of gender differences and provide excellent creations and teaching materials to achieve gender equality and reciprocity for art educators. The meaning of image is the result of the interaction between image, viewer, and context. The pattern of view reflects not only the object itself, but also the relationship between object and viewer. In other words, the viewing behavior is not passive acceptance of the message. It is initiative search for the relationship between images and audience. This process may be able to unscramble some implied

meaning and expose the unknown viewing context. In the present era of advances in information technology, students are bound to constantly extract visual messages which hide a wide range of gender-related ideas from cultural environments. Art education of visual culture emphasizes teaching the way of viewing and then extends to explore the social context of images and promote the viewer's thinking and criticism on the messages. Art education related to gender can help students to check the visual appearance and explore the ideology behind the visible code of physiological structure and social construction. The creation of popular illustration styles derives from the contemporary social and cultural system. We should not only understand the students' thinking about gender from their creations, but also observe the essence of gender differences from the popular illustrations. Through the provision of art education, students should be taught to inspect the observation pattern of gender and its meaning constructed from social system.