Chapter 14
The Impact of Perceived Visual Complexity, Gender, and Cognitive Style on Children’s Aesthetic Preferences for Learning Web Pages

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ABSTRACT
This chapter examines children’s aesthetic preferences for learning Web pages designed for them. It applies Berlyne’s theory of aesthetic preference to these Web pages: a theory that suggests that people prefer a medium level of stimuli to a low or high level of stimuli. The experiment employs a 3 x 2 x 2 between-subject design; it explores perceived visual complexity, gender, cognitive style, and aesthetic preference. A total of 120 children (60 boys and 60 girls) aged between 11 to 12 years-old take part in the experiment. The children are asked to rate learning Web pages of different levels of perceived visual complexity for aesthetic preference. These Web pages have been created by the authors. The results of the experiment show that overall the children prefer Web pages that display a medium level of perceived visual complexity to those that display a high or low level of perceived visual complexity. Thus, the results support Berlyne’s theory. However, when aesthetic preference is analysed with respect to gender, it is found that different levels of perceived visual complexity have an impact on boys’ aesthetic preferences but not girls’. In other words, Berylne’s theory is only partly supported. Likewise, Berylne’s theory is only partly supported when aesthetic preference is analysed with respect to cognitive style. Here, imagers prefer a high level of perceived visual complexity and verbalisers prefer a medium level of perceived visual complexity. This chapter should be of interest to anyone who designs learning Web pages for children.
1. INTRODUCTION

Many children’s educational establishments have learning web-pages. In order for these web-pages to be useful they need to be informative; they also need to be usable and attractive. However, while much research has been conducted into the usability of web-pages (e.g. Hart, Chaparro & Halcomb, 2008; Haak, Jong & Schellens, 2007; Battleson, Booth & Weintrop, 2001), little has been conducted into their aesthetics. This area deserves more exploration as aesthetics impacts on many areas of HCI including usability, overall impression and users’ experiences (Tuch, Bargas-Avila & Opwis, 2010). Furthermore, and perhaps more importantly as far as children’s learning web-pages are concerned, aesthetics impacts on children’s learning motivation: children are more motivated by web-pages with good aesthetics than web-pages with poor aesthetics (Zain, Tey & Goy, 2007).

Research into aesthetics that has been conducted includes studies into first impressions (Lindgaard, Fernandes, Dudek, & Brown, 2006; Tuch, Presslaber, Stocklin, Opwisa, & Bargas-Avila, 2012), the importance of aesthetics with respect to mode of use (Schaik & Ling, 2009) and the affect of colour on emotions (Cyr, Head & Larios, 2010). Research has also been conducted into users’ preferences with regard to perceived visual complexity in web-pages; however, most of this work has involved adults (see Michailidou, Harper, & Bechhofer, 2008; Pandir & Knight, 2006; Tuch, Bargas-Avila, & Opwis, 2010). As such, little is known as to whether perceived visual complexity impacts on children’s aesthetic preferences of web-pages or whether gender or cognitive style plays a role.

An increasing number of organisations that create web-pages for children design them with children (e.g. Children’s International Library; see Hutchinson, Bederson & Druin, 2006). However, unfortunately, many do not. Indeed, Nielsen (2010) states that much website design for children is based “purely on folklore” or, at best, with “insights gleaned when designers observe their own children”. Certainly, the authors have found this to be the case in Taiwan where websites are frequently developed on extremely tight budgets. However, while the authors do not want to discourage companies that can afford to undertake user research from doing so, better results would be undeniably be obtained if those designers who do not have the funds to conduct research based their decisions on information attained through empirical research.

2. BACKGROUND OF STUDY

2.1 Aesthetic Preference, Perceived Visual Complexity and Berylene’s Theory

Many factors influence people’s aesthetic preferences for web-pages including typography, pictures, sound and perceived visual complexity (Reinecke et al., 2013; Thorlacius, 2007); of these aspects, many researchers argue that perceived visual complexity may have the biggest impact (see Reinecke et al., 2013 for references). While no agreed definition of perceived visual complexity exists with relation to web-pages (Harper, Michailidou & Stevens, 2009), a number of researchers refer to Heaps and Handel’s (1999) definition; this states that perceived visual complexity is “the degree of difficulty in providing a description of an image”. One researcher who cites this quotation and has carried out much research into perceived visual complexity is Michailidou (2008). In her work, she describes web-pages that are dense and contain a high number of diverse elements as having a high level of perceived visual complexity and web-pages that are sparse and contain a low number of diverse elements as having a low level of perceived visual complexity (Michailidou, 2005). The authors of this chapter use this distinction in this chapter.
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