

A Critical Evaluation of Literature on Visual Aesthetics for the Web

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This paper reviews the current state of literature on visual aesthetics for the web. This was done by referring to recent contributions of authors in the area of visual aesthetics. Specific focus areas included: authors' perception of the importance of visual aesthetics; how visual aesthetics affect communication; and guidelines and suggestions on how to apply visual aesthetics. The authors also briefly suggest an appropriate research approach when studying visual aesthetics.

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1. INTRODUCTION

The World Wide Web has had a massive growth spurt since its inception decades ago. It has now assumed a central role in many aspects of our environment. These aspects include business and e-commerce, healthcare, government, and education [Schmidt, Bauerly et al, 2003]. This has created a need for websites to look for new ways to stay competitive, to draw users, and, thus, increase revenue. Recent developments in broadband Internet (e.g. Sentech) also hint that knowledge on visual aesthetics and its purpose will become more important since download speed will not be a concern as it has been in the past.

This article focuses on visual aesthetics. Humans continuously make aesthetic choices (consciously and unconsciously) and it is important to have a framework on visual aesthetics, knowledge of principles and guidelines and to be able to apply visual aesthetics to most effectively support intended communication.

1.1 Defining Visual Aesthetics

According to Merriam-Webster Online Dictionary [2004], aesthetics is defined as

- a branch of philosophy dealing with the nature of beauty, art, and taste and with the creation and appreciation of beauty;
- a particular theory or conception of beauty or art; a particular taste for or approach to what is pleasing to the senses and especially sight;
- a pleasing appearance or effect.

The major function of visual aesthetics however is based on the original meaning in Greek which points to perception [Zettl 1999]. Even this fact has not prompted researchers to investigate visual aesthetics and its role in web design. Traditionally, aesthetics concerned itself with beauty, and the judging thereof [Zettl 1999]. Tractinsky and Lavie [2003] expanded on this definition by stating that aesthetics is also concerned with the importance of beauty. Zettl [1999] further states that aesthetics is not an abstract concept, but a process by which people examine a number of visual elements, and their reactions to them. Aesthetics involves a process whereby a viewer clarifies, intensifies, and interprets events in his/her visual environment.

Visual aesthetics, and the process of applying it, involves selecting elements and techniques that are most appropriate for shaping a message or content to make it as effective as possible [Zettl 1999]. Applied visual aesthetics is about effective communication. Through the use of elements of visual aesthetics the perceptions of the viewer are manipulated. The aim of visual aesthetics is to induce the user to unknowingly, unconsciously, and unsuspectingly choose to become involved in the message and the website of concern [Krauss, 2004]. This is achieved by involving the user in the communication process using elements of visual aesthetics in concert to support the intended message. It is important to note that elements of aesthetics rarely operate alone [Zettl, 1999] and that they work together to create an overall visual effect. This is an important consideration when deciding which research approach to follow when studying visual aesthetics.

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Applied visual aesthetics differs from traditional aesthetics in that it is no longer limited to primarily dealing with the understanding and appreciation of beauty. Visual aesthetics considers art and life as mutually dependent. Media is no longer considered a neutral means of message distribution, but essential elements of the aesthetic communication system. Applied visual aesthetics can be used for content synthesis as well, whereas traditional aesthetics is limited to analysing existing art [Zettl, 1999].

2. PROBLEM STATEMENT

There is a distinct lack of existing literature on visual aesthetics for the web to build onto. Many authors have studied website quality and specifically usability aspects [Tractinsky et al, 2003] but in the process neglected the importance of aesthetics. Relatively few authors [Tractinsky & Lavie, 2003; Haig & Whitfield, 2001] have studied visual aesthetics for the web compared to website usability and quality of content. When authors do relate visual aesthetics and web design, the emphasis is on issues such as beauty, delight, perception, site preference and usability. Van der Heijden [2003] for example found that attractiveness contributes to ease-of-use, enjoyment, and usefulness.

Despite its centrality to human thought and practice, aesthetics has for the most part played a petty role in Human Computer Interaction (HCI) research. Traditionally, the field of HCI's main emphasis has been on efficiency considerations [Tractinsky & Lavie, 2003]. The ubiquity of web-based applications has generated a large body of research in HCI regarding the design of applications. With few exceptions, though, this research has neglected the aesthetic dimension of websites [Tractinsky & Lavie, 2003]. Only a few studies report on the influence of aesthetic judgment on the evaluation of a user interface [Karvonen, 2000]. Anyone who does research on visual aesthetics for the web might experience difficulty to find information on the topic.

Authors often try to identify the different dimensions of applied visual aesthetics, and test or evaluate them separately. According to Reeves and Nass [1996, as cited by Lavie et al, 2003] and Jung [1995, as cited by Remenyi, 2004], Human Computer Interaction is essentially a social event and that working with a concept of averages is far too general to do justice to the subjective variety of an individual life. Human perception and conceptual operations occurring in the minds of people, during knowledge construction processes, cannot be fully explained by numbers and systems [Krauss, 2004]. This reveals a need to study visual aesthetics and its effect on communication intent using an interpretivist approach where researchers aim to explore the combined effect of elements of visual aesthetics on the message rather than isolating elements of visual aesthetics. In a study on visual aesthetics and its impact on human perception, Krauss [2004] suggested that empirical research with an interpretivist approach is the way to go. "Empirical research with an interpretivist approach draws on experience or primary evidence in order to understand a phenomenon. It basically means to learn from experience rather than from making conclusions based on averages" [Krauss, 2004]. We will therefore refer to the work of Zettl [1999] frequently, since it is an excellent example of how visual aesthetics has been successfully studied and applied in the area of Television and film production.

Communicators often neglect the importance of the medium and the message is often evaluated separately from its medium. Media (including visual computer displays) are no longer considered neutral means of simple message distribution, but essential elements in the aesthetic communication system. The message is fundamentally supported by the aesthetic quality [Zettl, 1999]. Although evidence exists on how important media is in shaping the message, very few researchers relate visual aesthetics and communication intent for the web.

The purpose of this paper is to evaluate existing literature on visual aesthetics for the web, with emphasis on differences from traditional aesthetics, the importance of applied visual aesthetics, the impact of visual aesthetics on the message, and the availability of guidelines and principles for applying visual aesthetics.

3. RESEARCH METHODOLOGY

An initial literature survey was conducted to gain insight into the current state of literature on applied visual aesthetics for the web. This was followed up by a second literature review to identify leading authors in the field of visual aesthetics, in order to review their insights and findings. These findings were critically analysed to determine to which degree visual aesthetics for the web are addressed and whether authors related visual aesthetics to communication success.

4. VISUAL AESTHETICS AND ITS ROLE IN EFFECTIVE COMMUNICATION

According to Zettl [1999], visual elements (such as light, space, time/motion, and sound) of applied media aesthetics interact to produce the final message. Furthermore, Klett's [2002] findings indicate that certain visualisations tend to attract attention and cause inquisitiveness due to the presentation of facts through sensuous stimuli, thereby leading to an increased awareness of the message. Klett [2002] also states that 'visualisation concerns the visual representation of data, objects, and systems in order to enhance communication and thus understanding.' Klett describes visualisations as the most important aid in providing information. Haig and Whitfield [2001] state that visual aesthetics permeate all cultures and the objects that they produce, and that this is true to such a degree that it is difficult to identify a manufactured object that is without a designed aesthetic quality.

From literature a debate arises that pertains to the question of whether aesthetics should be viewed objectively or subjectively. During the Renaissance era beauty was evaluated objectively, and objects' attributes were examined to determine what made it beautiful. Thus certain attributes, such as order and symmetry, were emphasised [Fenner, 1996 and Osborne, 1968, cited by Tractinsky & Lavie 2003]. This led to the creation of mathematical formulae (such as the Golden Section) which attempts to quantify beauty. The viewpoint that elements of visual aesthetics should be separated and examined independently is adopted by other authors as well. Swede [1994] and Martindale et al [1990], cited by Tractinsky and Lavie [2003], argue that progress in understanding aesthetics can only be achieved by isolating and manipulating elements (e.g., polygons) or artistic characteristics (e.g., complexity and interestingness) of works of art and studying their effects on the observers' preferences.

On the other hand, Zettl [1999] argues that the effect of visual aesthetics on a person is subjective. The elements of visual aesthetics are interdependent and should be studied accordingly (the total is greater than the sum of its parts). Hence, a quantitative research approach is not the way to investigate visual aesthetics. Arnheim [1992, as cited by Tractinsky & Lavie, 2003] states that it is important to perceive whole objects as meaningful forms rather than isolated elements. Arnheim [1988, cited by Tractinsky & Lavie, 2003] further argues that dynamic forces, rather than "things" or isolated elements, determine an aesthetic experience.

There is a change in requirements for computer systems. According to Tractinsky and Lavie [2003] the focus previously was more on the functional such as usability features. New and additional requirements such as desirability are emerging. Visual appeal and aesthetics are gaining in importance. This is confirmed by Zettl [1999], who states that visual aesthetics for the web is of prime importance, because visual aesthetics influences the understanding of the viewer through manipulating their perceptions and intensifying and interpreting events.

Zettl [1999] further states that various categories of applied visual aesthetics interact to produce the final message (examples of these include the effect of light, space, time or motion, and sound). The message is greatly influenced by its context; i.e. the context can change the way the message is received or interpreted. The message medium impacts the decoding process of the message [Zettl, 1999]. It is therefore important to investigate the effect of visual aesthetics on communication intent [Zettl, 1999; Klett, 2003]. Visual aesthetics should reinforce the overall communication intent. Klett's [2003] evaluation of the virtual learning space, Ed-Media, accounts for an excellent example of how visual aesthetics can be applied to stimulate and interest learners, and to support memory retention of presented information.

Haig and Whitfield [2001] argue that the visual performance of objects exerts a strong influence on prospective clients of a website, and that visual performance has become a means of product differentiation and brand identification. This corresponds to Zettl's [1999] argument that applied visual aesthetics significantly impacts a viewer's decision-making process. This is further emphasised by Karvonen [2000], who identifies trust as a deciding factor of aesthetically pleasing sites when considering whether or not to trust a service enough to conduct business online. Trust inspired by an aesthetically pleasing site is very important, especially in e-commerce. Further thoughts focus on the need to analyse the reasons users are more willing to trust aesthetically pleasing sites. Agreeing with Zettl [1999], Karvonen [2000] states that even 'rational' people are susceptible to aesthetic factors. Often such aesthetic choices are decided on a subconscious level.

Visualisations, which guide the viewer's eye to unimportant parts of the image, may cause the overlooking or ignoring of significant parts [Klett, 2002]. This confirms the statement of Zettl [1999] that elements of visual aesthetics should work in concert to support the message else it is ineffective communication. One example of where visual aesthetics is addressed in Klett [2002] is the statement that possible features to focus the human eye could be brightly or highly saturated colour parts, moving or changing options, or accentuated boundaries.

Tractinsky and Lavie [2003] conduct a study to determine users' perceptions of the aesthetic qualities of websites. The study identifies two important aesthetic dimensions; visual clarity [Nassar, 1999, as cited by Tractinsky & Lavie, 2003] which refers to clean, clear, and symmetrical designs; and visual richness [Nassar, 1999, as cited by Tractinsky & Lavie, 2003], which refers to creativity and originality aspects of websites. The impact of visual aesthetics on the message is not investigated.

Zettl [1999] delivers a comprehensive explanation on visual aesthetics, with references to all the major aesthetic elements. Sufficient detail is included to enable designers to apply principles and techniques detailed in the text. Major aesthetic divisions include the use of light, space, time and motion. The effect of visual aesthetics on communication intent is a pertinent objective of Zettl's [1999] writing, as is the importance of a holistic view when measuring the effect of visual aesthetics on the user. Karvonen [2002] highlights the fact that aesthetic differences in taste across continents and nations have to be taken into account, especially when working on such a global scale as the Internet offers. Zettl [1999], however, argues that visual aesthetics has similar impact on user perceptions regardless of age, discipline and social background especially when elements of visual aesthetics all point to the same communication goal.

A paper by Lee et al [2001] narrates an overview of the gradual change from focusing on functionality and usability issues, to emotional aspects of websites [Picard & Andrew, 1998 as cited by Lee et al, 2001], i.e. to emphasise the message of a website with emotional appeal [Schenkman & Jonsson, 2000, as cited by Lee et al, 2001]. Once again, this is exactly what Zettl [1999] is proclaiming – that aesthetic elements can reinforce the message of a website. Lee et al [2001] identifies design factors that induce website visitors to feel certain emotions. Some design factors that impact on

emotions are identified. The study has several limitations in that emotional impact is recorded, but the reasons for these emotions are not. A further problem is that only local populations are sampled, which might bias the results.

5. LIMITATIONS OF CURRENT LITERATURE

Many authors still place emphasis on usability features of websites, with little regard of the importance and practical considerations of visual aesthetics [Lee et al, 2001; Zettl, 1999]. The focus is more on the structure and usability of websites as opposed to the aesthetic elements. Visual layout is discussed with regards to the usability implications. Heimlich and Wang [1999] touch on aesthetics stating that it can be used to attract and keep users on a website.

Relevant aesthetic elements differ from site to site, depending on the purpose of the site [Heimlich & Wang, 1999]. Information-delivery sites have different needs than sites designed for casual surfing. Specialist information sites have entirely new sets of needs. This reinforces Zettl's [1999] arguments that appropriate application of visual aesthetics can enhance the effectiveness of a site. Heimlich and Wang's [1999] article features few, very general observations and trends about visual aesthetic features on websites. These identified features are not tested. The overall focus remains on usability.

Klett [2002] sheds light on the importance of visual aesthetics in the web-based learning environments but argued under the topic of visual communication. In fact the word "aesthetics" is mentioned once in the introduction but never elaborated on [Krauss, 2004]. The conclusions may relate in many ways to that of Zettl [1999]. As in other literature the need for studying visual aesthetics for the web is insinuated but the 'how' is addressed in very little detail. Designing a 3D learning environment that limits 'cognitive overhead' [Klett, 2002] is recognised as important, but the detail of what goes on in the mind of the user and how to facilitate understanding is not dealt with significantly.

Norman [2004] describes the necessity of positive emotions. These are labelled as critical to learning, curiosity and creative thought. 'Happy people are more effective in finding alternative solutions and, as a result, are tolerant of minor difficulties' – Norman [2004]. Norman provides information on the emotional and philosophical aspects of aesthetics. It does not, however, include much concrete information on visual aesthetics.

Zettl [1999] states that it is important to correctly apply principles of visual aesthetics. The aim should be to support the message. If aesthetics is used in design but it does not support the message or contradicts the intended communication, then a site may look beautiful but it has missed its goal and will have ineffective communication. In such a case aesthetics or beauty will be a disadvantage [Krauss, 2004]. This may explain why many authors do not recognise the importance of visual aesthetics in supporting communication intent.

Overlooking communication issues, Tractinsky and Lavie [2003] relate aesthetics with various other website quality issues. Tractinsky and Lavie [2003] note that research suggests that aesthetics is the primal factor affecting other perceptions [e.g., Tractinsky et al, 2000, van der Heijden, 2001, as *cited* by Tractinsky & Lavie, 2003]. Aesthetics is related to pleasure and perceived usability. Findings are that perceptions of aesthetics and usability are highly correlated [Kurosu & Kashimura, 1995, Tractinsky, 1997, and Tractinsky et al, 2000, *cited* by Lavie et al, 2003]. The results of Tractinsky and Lavie [2003] not only confirm those findings, but they also shed light on the usability-aesthetics relations. These observations are important and serve to provide perspective on visual aesthetics. It is significant however to note that it supports the argument that dimensions of quality (including visual aesthetics) cannot be isolated from each other. E.g. a company's website may have excellent usability but has no business case or useless information. Putting visual aesthetics into perspective of overall quality means that all elements of quality (usability, aesthetics, download speed, information quality, to mention a few) should work in concert to produce a site of high quality [Krauss, 2004]. Any research investigating visual aesthetics should build on this perception.

6. CONCLUSION

The presence of web-based applications has generated a large body of research in web usability and HCI regarding the design of such applications. With a few exceptions, though, research has neglected the aesthetic dimension of websites. In general aesthetic criterion is an integral part of effective interaction design [Tractinsky & Lavie, 2003]. It is argued that modern design has placed too much emphasis on performance issues and not enough on aspects, like aesthetics. Studying the effect of aesthetics on communication intent is totally neglected [Krauss, 2004].

It is clear that there is a need for more work to be done to fill the gaps regarding the identification of important aesthetic elements and the effect of visual aesthetics on viewers' perceptions [Klett, 2002; Tractinsky & Lavie, 2003; Karvonen, 2002]. Some important elements of visual aesthetics keep recurring in literature. These are primarily the use of colour [Lee et al, 2001], and the visual clarity of the site [Tractinsky & Lavie, 2003]. Although Zettl [1999] proves that the effect of visual aesthetics on communication intent is very important there is very little research available on this topic [Zettl, 1999; Klett, 2003].

This study aims to provide an overview of current literature on visual aesthetics. It is by no means intended to be exhaustive. This study can serve as a starting point for more research on visual aesthetics and its impact on communication intent.

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