Some men like it black, some women like it pink: consumer implications of differences in male and female website design

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- *The World Wide Web doubles in size roughly every 2–3 months and dramatic claims are made about the effectiveness of Web-based commercial efforts. The centrality of non-price mechanisms of differentiation to the perception, enjoyment and ease of use felt using websites is acknowledged but the only statistically rigorous studies of factors such as form and content have been conducted within a universalist paradigm of aesthetics. This paper reports on an interactionist approach to web aesthetics involving an analysis of 60 male- and female-produced websites. The analysis reveals statistically significant differences between the male- and female-produced websites on 13 out of the 23 factors analysed. These differences span issues of navigation as well as linguistic and visual content. The paper argues that the appeal of websites can be maximised if they mirror the needs and interests of their target populations and that websites targeted at male or female dominated markets need to reflect the aesthetic diversity found in the male- and female-produced websites analysed here. It also presents information on the demographics of the IT profession, showing that there is a potential imbalance between the percentage of women involved online and those involved in the IT profession. This suggests that the male domination of the IT profession could be a barrier to the effective mirroring of female Website preferences.*
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Introduction

The World Wide Web is estimated to double in size roughly every 2–3 months (Hoffman *et al.*, 1995) with internet web usage growing at a rate of 20 per cent per year (Van Iwaarden *et al.*, 2004). The Computer Industry Almanac estimates that the Internet user population reached 934 million people worldwide in 2004 and is likely to increase to 1.35 billion in 2007 (Clickz, 2005). It is an integral part of the marketing mix (Strauss and Frost, 1999) with a 'powerful' role to play in product promotion, sales and distribution (Melewar and Smith, 2003). Where promotion and sales is concerned, its effectiveness relative to traditional

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media channels is estimated to be such that ten times as many units can be sold with one tenth of the advertising budget (Potter, 1994). Further advantages include flexible response, an advantage with shrinking product life cycles (Institute for Information Technology Applications, 1994), and the facilitation of customer retention (Van Iwaarden *et al.*, 2004).

In terms of customer profiles, recent surveys reveal both men and women to be important users of the web. In the US, similar proportions of men and women are said to be using the web (Jupiter communications, 2002), with women accounting for about 51 per cent of the total online adult population. European usage revealed female usage of the web to be an average of 38 per cent (Jupiter communications, 2002) with usage at 42 per cent in the UK. This average is higher in Sweden (at 46%) but lower in Germany and France (at 39%), Italy (31%) and Spain (29%).

Attracting customers

Achieving marketing objectives relies on informing, persuading and reminding users (Anderson and Rubin, 1986) as well as sustaining traffic, that is attracting the casual surfer to linger (Schenkman and Jonsson, 2000) and revisit the site (Joergensen and Blythe, 2003). Given the competition for the user's attention as well as the shift to consumer-controlled interaction (Wedande *et al.*, 2001), it is important to understand the factors that might lead users to stay or move away from a site.

The literature emphasises the centrality of non-price mechanisms of differentiation (Gupta, 1995) and the fact that the perceived visual attractiveness and content of the website (Coldsborough, 2000) can influence perceptions as to the site's usefulness, enjoyment, ease-of-use (van der Heijden, 2003) and satisfaction (van Iwaarden *et al.*, 2004). Relevant factors are likely to relate to technical issues (e.g. speed of loading), content (Joergensen and Blythe, 2003) or form (Schenkman and Jonsson, 2000; Lavie and Tractinsky, 2004). Where the visual element is concerned, gra-

phics is listed as one of the ten factors causing dissatisfaction for users in the US and Netherlands (van Iwaarden *et al.*, 2004), leading Human Computer Interaction (HCI) specialists to attempt to understand the elements (visual and content) in web design that are valued and those that currently produce a deficit between expectations and experience.

There are analogies with traditional retailing where the form and content of store atmospherics has become an established field of research study. There is wide acceptance of the importance of the retail environment (Bitner, 1992) and physical form of a product (Bloch, 1995) in creating certain effects in buyers (Kotler, 1973–1974; Bitner, 1992). Where products are concerned, research shows that products perceived as pleasurable are preferred (Yahomoto and Lambert, 1994) and used more often than those not perceived as pleasurable (Jordan, 1998), leading to enhanced purchasing (Groppel, 1993; Donovan *et al.*, 1994).

Web atmospherics

There is a relatively small corpus of work (Lavie and Tractinsky, 2004) on web atmospherics. Those studies that have been conducted have been anchored in one or more number of traditions:

(i) *The tradition of 'experimental aesthetics' (Berlyne, 1974)*. This seeks to identify the isolated elements (or 'collative variables') in the evaluated objects that elicit particular reactions. Thus Schenkman and Jonsson (2000) tested the importance of different measures in the experience of a web page, finding a combination of pictures and beauty to be important constituents in appeal.

(ii) *The exploratory tradition.* This evaluates complete and natural stimuli rather than manipulated and artificial ones (Nasar, 1988a). Thus Schenkman and Jonsson (2000) used 13 commercial websites as stimuli while Lavie and Tractinsky (2004) used one or two websites as stimuli for each of four studies.

(iii) *The Kantian view of aesthetics*. This assumes aesthetic preferences to be universal (Kant, 1978). Given the presumption of universally held values, a number of studies of web aesthetics seek universal rather than segmented values (Schenkman and Jonsson, 2000; van der Heijden, 2003; Lavie and Tractinsky, 2004).

(iv) *The interactionist position*. This sees aesthetic perceptions as a function of individual perception (Porteous, 1990) rather than universal values leading to the search for segmented values (Leong, 1997; Miller and Arnold, 2000; Flanigan and Metzger, 2003; Oser, 2003). This tradition links with the 'empathy principle' according to which aesthetic value does not inhere in objects but is the product of empathy between object, perceiver and artist (Crozier and Greenhalgh, 1992). This corresponds to the notion of mirroring, a notion which echoes in several studies. Taking a process perspective, it translates into the view that products should be shaped around the 'unique and particular needs' of the customer (Hammer, 1995). In the field of branding, it translates into the view that there should be congruence between the brand personality and the consumer's self-concept on the basis that purchases are thought to offer a vehicle for self-expression (Karande *et al.*, 1997). In communications, it translates into the notion that persuasiveness can be enhanced by similarity between source and receiver (Brock, 1965). In social psychology, it translates into the 'matching hypothesis' or 'similarity-attraction' paradigm according to which increased similarity leads to increased attention and attraction (Byrne and Nelson, 1965; Silverman, 1974; Berscied and Walster, 1978).

The importance of the mirroring principle and the need to shape products or services around the 'unique and particular needs' of the customer (Hammer, 1995) places a premium on the interactionist position over the universalist tradition. Unfortunately, the quantitatively rigorous studies of web aesthetics (Schenkman and Jonsson, 2000; van der Heijden, 2003; Lavie, and Tractinsky, 2004) have been rooted in the universalist position and have consequently failed to test for an interactionist effect. In contrast, the studies that have been conducted in the interactionist paradigm (Leong, 1997; Miller and Arnold, 2000; Flanigan and Metzer, 2003; Oser, 2003) have serious methodological flaws.

One of these studies (Miller and Arnold, 2000), claiming to examine the influence of gender on web aesthetics, reported on two studies by the authors, both of which were said to involve the comparison of men and women's web pages. The first study laid claim to the finding that men's pages were shorter than women's. However, beyond stating that an opportunistic sample of pages from a non-institutional setting was used, no details were supplied as to methodology, and definitions of terms were not provided (e.g. no details are provided as to whether the term 'page' is deemed to refer to an individual page or a number of linked pages. Moreover, conclusions (e.g. those female-produced pages make greater reference to the reader than male-produced pages) are not rooted in quantifiable data. The second study appears similarly flawed with 'opportunistic and haphazard' (author's words) sampling of pages and no information on the number of sites consulted and rating methods used. The authors' claim that 'gender differences (. . .) intrude in cyberspace' cannot therefore be relied upon.

The absence of a robust methodology reduced the value of three other studies. Leong (1997) emphasises the importance to women of ease of navigation, but her evidence is anecdotal; Flanigan and Metzger (2003) draw attention to the fact that opposite-sex credibility evaluations are higher than same-sex credibility evaluations but base their conclusion on reactions to two websites, a sample too small to offer validity, and moreover created by men. Finally, Oser (2003) provides echoes of Leong in emphasising women's preference for ease of navigation, but her evidence, like Leong's, is anecdotal.

Importance of women as web users and consumers

The absence of credible interactionist research on men and women's web aesthetics is one of the drivers to the research reported in this paper. Another is the increasing importance of men and women as consumers and internet users, and the growing importance attached to gender as an issue. Traditionally, the groupings receiving most attention in interactionist studies have been social class, age and geographical location with gender left to the sidelines (Hirschman, 1983) but in recent years, there has been a growing interest in gender, inspired by the belief that the needs, desires and values of women increasingly drive the political and business worlds (Peters, 1996; Bennett, 1998; Leyden and Schwartz, 1998; Mitchell and Walsh, 2004).

The relatively recent interest in gender may be responsible for the uneven quality of the statistics on gender and web usage. Where across the board usage of the internet is concerned, reliable data exists showing the percentage of women users to be equal or close to the number of male users. However, sector-wise information on web usage is unreliable. Research under the direction of Professor Donna Hoffman (Cyber Dialogue, 1998), for example, reveals by sector the percentage of men and women in the US making monthly on-line visits. The survey base, 1000 randomly identified internet users aged 18 but is problematic insofar as no information is provided on the areas covered by the content area (e.g. the banking and investment category is not defined and is broad in scope) and there are substantial gaps in the content areas listed (e.g. absence of any reference to the grocery sector) as can be seen in the data collated in **Table 1**.

These shortfalls make it difficult to use this data alongside other data. Commerce Net/ Nielsen (1997) for example, shows slightly more women than men using the web to check bank account information, a finding consistent with survey information (Electronics Weekly, 2002) showing that women are more likely

Table 1. Cyber Dialogue: percentage of men and women making online monthly visits by sector (Cyber Dialogue, 1998)

Site content	Women visiting once per month (%)	Men visiting once per month (%)
National news	62	77
Health/medicine	58	48
Family	48	24
Children	43	21
Banking/ investment	26	45
Sports	25	47
Fitness	20	12
Fashion	19	6

than men to use the web for online banking. These findings are not in line with Cyber Dialogue's (1998) finding regarding the relative usage of the web by men and women for finance and investments.

A confused picture emerges, again, where propensity to engage in e-commerce is concerned. According to one study, men are said to be more likely than women to purchase products or services from the Web (Van Slyke *et al.*, 2002) but research by the consultancy Verdict (2004) claims that women have an edge over men in terms of online spending. According to this second report, women spend more than men on goods ranging from groceries, health and beauty, clothing and footwear, furniture, homeware and books.

The confusion over men and women's participation in e-commerce, as well as its potential importance, makes it important to find sources of information on men and women's roles in purchasing and decision-making more generally. One estimate positions women as 80 per cent of purchasers (Greer, 1999), stating that 'modern economics depend at least as much upon women's consumption of goods and services as upon production of any kind'. Another estimate has women in the United States dictating at least 60 per cent of consumer spending power (Carter, 1997).

Research on women's involvement in consumer decision making processes backs this up. On the first, research (Davis and Riguax,

1974) shows that across all sectors and across all stages of spending, women are dominant in 72 per cent of cases. In the household sector (food, clothing, furnishings and kitchenware), women's role in decision-making is said to be dominant, while in the insurance sector, men are said to have a dominant role in decision making. Other research has highlighted the extent to which lack of consensus is the norm in joint decision making (Kim and Lee, 1996) and the extent to which this conflict is managed by the female partner to ensure that the outcome follows her expectations (Ward and Sturrock, 1998).

The significance of women's overall involvement in spending decisions is corroborated by data on men and women's involvement in household spending. In the 1990s, women were likely to have some degree of involvement in the spending of household income in 72 per cent of cases, and sole control in 12 per cent of cases (Vogler and Pahl, 1993). More recent research (Pahl, 2000), analysing data from the 1993–1994 family expenditure survey (FES), has revealed spending patterns in couples; where both the man and the woman are in full time employment, women are responsible for 76 per cent of spending on food, 59 per cent on household goods, 49 per cent on holidays and 38% on motor vehicles. Amongst non-working women, the involvement in food spending increases to 84 per cent, but reduces somewhat in the other areas.

Aside from data on spending and the decision making process, there is market-specific data on purchasing behaviours. Unfortunately the published data suffers from a lack of precision (it fails to distinguish between the act of purchase and the act of making a purchasing decision and fails to distinguish whether the purchases made are made in gatekeeper or in provider mode) and from being collected piecemeal. Examples include data from the National Association of Estate Agents (NAEA) indicating that 76 per cent of estate agents surveyed considered women to be the key decision makers in house purchases (Moss, 1999). Where female fragrances are concerned, 91 per cent of purchasers are said to be female (Nielsen, 1997) and the percentage

of female purchasers of new cars in the United States is said to have risen from one in three to one in two in 1995 (Schiffman and Kanuk, 1994). A UK survey bears out the importance of the female consumer of cars, revealing that 60 per cent of new car sales are to women (Conde Nast, 1996). Another UK survey has referred to parity of purchasing amongst men and women where major household white goods are concerned, but a predominance of male consumers where brown goods are concerned (Research and Markets, 2002).

The database can be increased through primary research. Information from the retailer Tesco in 1999 revealed that 80 per cent of grocery shoppers there are female while 76 per cent of the users of their petrol stations are male. Statistical analysis of the FES reveals that while men predominate as purchasers of alcohol, diesel oil, garden tools, petrol, records and cassettes, sports goods and video cameras, women predominate as purchasers of books, china and glass, cosmetics, kitchen equipment, jewellery, photographic equipment, small electrical goods, stationery and toys. Products for which there are no significant differences in purchasing propensity by sex included telephones, and major electrical goods. The polarisation of markets by gender is apparent also from data from the target group index (TGI), an annual survey of the purchasing patterns of UK adults. This shows that males are significantly more likely to purchase computers, refrigerators, washing machines and SLR cameras than females, and females more likely to purchase chocolate, china and glass, electric kettles and furniture (Moss, 1996b).

One of the problems in comparing these two sets of results is that product categories vary across surveys, making cross-survey comparisons difficult. Thus, the FES has 'kitchen equipment', 'small electrical goods' and 'major electrical goods' where the TGI has 'electric kettle', 'fridge' and 'washing machine'. It is reassuring that where categories overlap—the case with the category 'China and Glass'—the findings cohere. The limitations of these surveys should not therefore detract from the insight they offer into the significant involvement of both sexes in

purchasing. Taken with data on decision-making, it can be seen that both men and women have important roles in purchasing decisions, with their importance varying by sector.

The importance of men and women as consumers and web users, taken with the paucity of research studying website aesthetics from an interactionist, gender-focused point of view, constitutes an important gap.

An interactionist approach to web aesthetics

In order to progress an interactionist approach to web aesthetics and establish whether there are differences between men and women's aesthetics, a comparison was made of the personal websites produced by males and females at Oxford University. Five factors favour such an approach:

(i) The number of websites available at Oxford University is very large. A random selection of every other functioning personal website produced by 30 males and 30 females produced a normal sample of 60 sites, allowing of subsequent generalisation of results.

(ii) The sample is reasonably homogeneous in terms of academic level.

(iii) The students and authors of the sites are not students of design and therefore their responses offer an untutored view of male and female Website productions and preferences.

(iv) People's auto-produced personal websites are likely to offer tangible evidence of their creators' aesthetics.

(v) People's auto-produced personal websites may offer a wider range of aesthetic stimuli than the small number of stimuli used in the previous work on web aesthetics (Schenkman and Jonsson, 2000; Lavie and Tractinsky, 2004).

Methodology

The method consisted of rating these sites against a number of different criteria and comparing the ratings achieved by the male- and female-originated sites using the chi-square test of association (with $p < 0.05$ considered as the threshold for significance). The three main criteria used derived from research on design or Web site aesthetics:

(i) Criteria concerning navigation issues.
(ii) Criteria concerning language, its register and the amount of self-promotion.
(iii) Criteria relating to visual elements.

All the criteria used were amenable to objective rating and the selection of criteria was researcher neutral in having been derived from earlier work. An examination of the three main criteria will bring this out.

Navigation issues

As was seen earlier, one of the few earlier pieces of writing on male and female web preferences noted women's preference for quick and simple navigation, with an element of fun (Leong, 1997; Oser, 2003). In order to put these hypotheses to the test, sites from the Oxford site were rated according to the following criteria:

- The number of links on the home page and within those sites, links being originated by the respondent.
- The existence of a site map, defined in webopedia (2005) as a visual model of the pages of a site. The model remains in view when different parts of the site are navigated.
- The existence of a contents page. This is an ordered list of topics, subjects or areas of interest, appearing as hyperlinks.
- The number of separate subject areas covered. A subject is defined as a discrete area of interest.

Language

Language is the thread running through the second set of criteria. One body of work (Tannen, 1990 and elsewhere) speaks of a male and female style of discourse, with males tending to a competitive style (emphasising their status and expertise) and females to a

less overtly competitive style. In order to test whether this difference is reflected in the language on the web, five factors were rated:

(i) *Extent of the use of abbreviations*. This term was understood as including all abbreviated grammatical forms and was construed as a barometer of informality.

(ii) *Amount of self-denigration*. This term is understood as including the use of language or visuals that detract from the self-importance of the writer and was construed as a barometer of competitiveness. It is assumed that high levels of self-denigration will point to low levels of overt competitiveness and low levels of self-denigration to high levels of overt competitiveness.

(iii) *Amount of expert language used*. Expert language is defined as language which is exclusive to a particular body of expertise, and formal rather than informal in character. It is assumed that high levels of expertise point to high levels of overt competitiveness, and low levels to low levels of overt competitiveness.

(iv) *Inclusion of references to own achievements*. It is assumed that high and low levels will work as for expert language above.

(v) *Register of the language*. Whether formal or informal or both.

Visual elements

Finally, a number of factors relating to visual elements were tested with criteria taken from earlier work on the topic (Moss, 1995, 1996a, 1996b, 1999, 2001). Two main criteria were used: thematic content, and non-thematic content. On the first, the literature discusses four main features (Moss ibid.):

(i) Choice of male or female images with each sex tending to feature its own sex.

(ii) Inanimate versus animate themes with males more likely than females to depict inanimate objects.

(iii) Self-propelling versus stationary objects with females showing a greater tendency to depict the stationary.

(iv) Serious versus light-hearted themes with females tending to more light-hearted themes than men.

Where non-thematic content is concerned, three main features are discussed in the literature (Moss, ibid.):

(i) Tendency for male designs to favour a 3D over a 2D look.

(ii) Tendency for male designs to employ straight lines, and female designs rounded ones.

(iii) Tendency for male designs to employ fewer colours than female designs over a given surface area.

These features were reflected in the following rating factors:

A. In respect of thematic content, the following elements were rated:

(i) Whether the images showed self-propelling or static objects.

(ii) Whether the objects were inanimate or animate.

(iii) Whether a crest was shown.

(iv) Whether male or female subjects were used in photographs.

B. In respect of non-thematic content, the following elements were rates:

(i) Extent to which design elements appear either 3D or 2D or both.

(ii) Predominance of straight or rounded lines or a mixture of both.

(iii) Appearance, or not, of a horizontal line in the layout.

(iv) The number of colours used in the typeface, whether a single colour, two to three colours or four to six colours.

(v) Number of colours used in the background or frame, whether black or white, or a single non- black or white colour, or two or more non- black or white colours.

(vi) Regularity or irregularity of the typography (formality regularity denoting evenness in spacing and height, and following a horizontal line).

Table 2. Navigation issues: a comparison of the male and female results

		Female (%)	Male (%)
Number of pages	1 only	6.7	10
	2–5	40	20
	6–8	13.3	13.3
	9–14	16.7	10
	< 15	23.3	46.7
Existence of a site map	Yes	33.3	46.7
	No	66.7	53.3
Existence of a contents page	Yes	66.7	33.3
	No	60.0	40.0
Consistency of pages	High	10	3.3
	Medium	6.7	6.7
	Low	6.7	10
	n/a	26.7	30
Number of separate subject sites to which the site is linked*	1 only	23.3	40
	2–5	53.3	56.7
	6–8	6.7	3.3
	9–14	3.3	0
	> 15	13.3	0

(vii) Formality or informality of the images shown.

(viii) Type of typeface colours used and whether blue and black (exclusively), or pink, mauve and yellow.

All the criteria were clearly defined and were amenable to objective rating.

Results

1. Navigation issues

The following results in **Table 2** were obtained with respect to the issues concerning navigation.[1]

Of these navigation issues, only that concerning the range of subjects reflected in the linked sites yielded a statistically significant difference between the male and female

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[1]Throughout this paper we indicate significance as follows:
*refers to 95% level or < 0.05;
* *refers to 99% or < 0.01;
* * *refers to 99.9% or < 0.001;
No *indicates no significance and each level of significance represents the complete set of data for that variable.

results and then in ways not predicted by the earlier literature (Leong, 1997; Oser, 2003) since females showed a significantly greater likelihood than males to have links to a larger number of subjects than males. This indicates that the hypotheses generated from earlier literature as to the greater likelihood of women to seek ease of navigation is not borne out by the results of this study. In fact, the reverse could be said to be the case with female-designed sites being linked up to a wider range of subject sites. These results are shown graphically in **Figure 1.**

Language issues

Based on the work of Tannen (1990), it was hypothesised that the language used in the male-produced websites would contain more features indicative of overt competitiveness than the female-produced sites would. As the results in **Table 3** indicate, this finding is also borne out by the present study:

The results reveal statistically significant differences on four of the five language elements, with females showing a statistically greater tendency than the males to employ abbreviations, self-denigration, non-expert and informal language. These differences suggest greater overt competitiveness on the part of the males in the sample than the females.
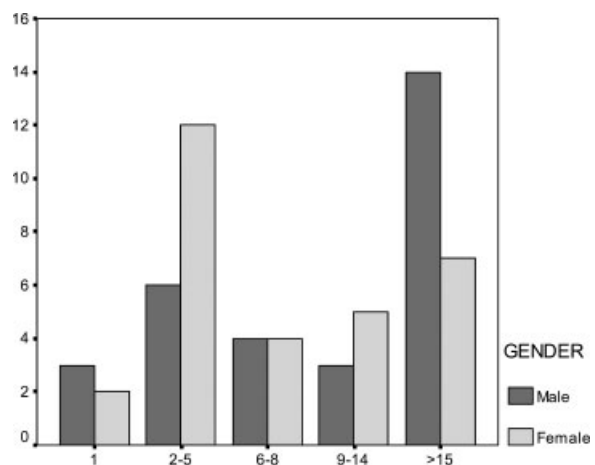
Figure 1. A comparison of the number of separate topic sites to which the male and female produced websites make reference.

Table 3. Language issues: a comparison of the male- and female-produced websites

		Female (%)	Male (%)
Use of abbreviations**	Some	50	16.7
	None	50	83.3
Amount of self-denigration***	Some	53.3	3.3
	None	46.7	96.7
Extent of expert language***	Some	23.3	80
	None	76.7	20
References to own achievements	Some	46.7	66.7
	None	53.3	33.3
Use of informal language***	Some	63.3	13.3
	None	23.3	70.0
Welcome message	Yes	47	37
	No	53	73

Visual issues

A distinction was made earlier between thematic and non-thematic elements, and statistically significant differences emerged on many of these features. These (**Table 4**) are the results for thematic elements.

There are statistically significant* tendencies for men to use crests and for each gender to depict images of people of their own gender.

Where non-thematic elements are concerned, there were statistically significant differences in five out of the seven elements (see **Table 5**).

In statistical terms, females are statistically significantly more likely than males to use

rounded rather than straight shapes to avoid a horizontal layout, to use more colours for typography irregular typography, informal images and more of certain specific colours (white, yellow, pink and mauve) for typography.

Discussion

A total of 23 features were rated in the websites and 13 of these (56%) produced statistically significant differences in the extent to which they were used by males and females. Most of the differences occurred in the areas of visuals and language, with one difference occurring in the area of navigation. The four factors of self-denigration, expert language, the use of particular text colour, and the use of horizontal layout produced the largest statistical difference between the two genders. Also differences centred on the use of blue/black typography, abbreviations, informal language and the formality of the images, and centred on the use of crest, a male figure, and formal typography.

These results present evidence in favour of an interactive model of web aesthetics, a model which contrasts with the universalistic model presented in earlier work (Schenkman and Jonsson, 2000; Lavie and Tractinsky, 2004). This new model has implications for our understanding of web aesthetics, as well as for commercial web design, and the ability of

Table 4. Visual issues: a comparison of the visual elements in the male- and female-produced websites

		Female (%)	Male (%)
Images static, dynamic or both	Static	66.7	53.3
	Dynamic	6.7	10
	Both	10	3.3
	n/a	16.7	33.3
Objects inanimate or not	Inanimate	6.7	26.7
	Animate	63.3	23.3
	Both	10	13.3
	n/a	20	36.7
Whether a crest is shown*	Crest	3.3	20
	Own Logo	0	0
	No crest	96.7	80.0
Male or female figures shown in photos*	Male figure(s)	43.3	76.7
	Female figure(s)	13.3	0
	Male and female figures	43.3	23.3

Table 5. Visual issues: a comparison of the male and female results

		Female (%)	Male (%)
Extent to which design looked 3D or 2D	Mainly 3D	6.7	6.7
	2D and 3D	5	6.7
	Mainly 2D	16.7	6.7
	n/a	71.7	80
Number of straight or rounded lines*	Straight	40	76.7
	Mixture	13.3	6.7
	Round	13.3	0
	n/a	33.3	16.7
Appearance of horizontal lines***	Yes	36.7	93.1
	No	63.3	6.9
Number of colours in the typeface***	1	23.3	26.7
	2–3	46.7	70
	4–6	26.7	3.3
	> 7	3.3	0
Number of colours in background/frame	B&W	33.3	40
	Single B&W	36.7	43.3
	Colour in frame	6.7	10
	> 2 colours	23.3	3.3
	None	0	3.3
Formality of typography*	Formal	86.7	100
	Informal	13.3	0
Formality of images***	Formal	10	40
	Informal	50	13
	Mixture	23	10
	n/a	17	37
Whether blue/black or pink/mauve/yellow used***	Mainly black/blue	50	100
	Mixture of both	13.3	0
	Mainly pink/mauve/yellow	36.7	0

the Information Technology (IT) industry to make necessary changes. Each of these points will be taken in turn.

Understanding of web aesthetics

The earlier work on web aesthetics (Schenkman and Jonsson, 2000; Lavie and Tractinsky, 2004) adopted a universalistic rather than interactionist approach to aesthetics, an approach reflected in their methodologies (provision of a limited range of aesthetic stimuli) as well as in their results (both studies concluded with the importance of universal features such as 'beauty' and 'visual clarity'). An interactionist approach comparing male- and female-produced websites yields a more complex picture with evidence of a male and female aesthetic continuum, with men and

women selecting elements that are common as well as divergent. These findings highlight the limitations of a universalist approach to web aesthetics.

Practical applications for commercial web design

Data on consumer behaviour indicates that men and women both have important roles as consumer decision makers, whether online or offline. The results of the study reported here can be used to hone websites at their target markets, thereby shaping the websites around the 'unique and particular needs of the customer' (Hammer, 1995). The grocery and banking sectors are discussed in **Table 6** by way of example since men and women are thought to have online

Table 6. A comparison and evaluation of websites in relation to their target markets

Sector	Market information: relative importance of men and women as consumers (plus source)	Market leaders and description of the websites of market leaders	Evaluation of the websites in the light of the findings presented in this paper
Grocery	Online parity between men and women shoppers (Research and markets, 2002).	Tesco — market leader in UK with 27% of the market, 10% above its nearest rival (TNS, 2004). Its website uses features exclusively characteristic of the male aesthetic (e.g. predominance of straight lines and box shapes).	Tesco places too much emphasis on masculine features for an online market that is split equally between men and women. Improvements to the website could be made.
Banking	Women are more likely than men to use the web for online banking (Electronics Weekly, 2002).	Smile is the top scoring online bank whereas HSBC has fourth place (Virtual Online Banking survey, 2002). Smile uses several elements from the female aesthetic (pink background with rounded decorative shapes and non-square icons); HSBC has several visual features (for example straight lines) associated with the masculine visual aesthetic.	Smile is better adapted visually to a female market than HSBC's site.

parity in the grocery sector (Research and markets, 2002) while women are thought to dominate online banking (Electronics Weekly, 2002).

The gender balance of IT professionals

The design of websites can most easily be affected by IT professional. In the US, the proportion of women among US computer professionals fell in the 1990s from 35.4 to 29.1 per cent. In the UK, in 1994, women made up 30 per cent of computer scientists, 32 per cent of systems analysts, 35 per cent of computer programmers, 10 per cent of ISS directors, 18 per cent of project leaders and 14 per cent of applications development managers (Baroudi *et al.*, 1994) and the trends downward. The 1980s saw an influx of women into IT, with a fourfold increase between 1980 and 1986 in the number of women awarded bachelor's degrees in computer science, and a threefold increase in the number of women awarded master's degrees (Igbaria and Parasuraman, 1997).

Recent years have seen a sharp decline in the number of women pursuing degrees in computer-related fields, Together with a reduction in the numbers of women taking advanced-degree programmes (Igbaria and Parasuraman, 1997). In 2002, the percentage of male and female employees as reported for the IT profession are presented in **Table 7**. (Facts about men and women, UK, 2002).

The male domination of the IT profession raises the issue of whether the male and female aesthetic can be equally well produced by IT professionals of either gender. This is a question for future research.

Table 7. Percentage of men and women in the IT profession, Facts about women and men in Great Britain 2002, Equal Opportunities Commission, 2002

Occupation	Males (%)	Females (%)
Software professionals	84	16
ICT managers	83	17
IT operations, technicians	71	29

Conclusions

The results presented in this article are based on an intensive analysis of a normal data set and suggest that there are statistically significant differences between male- and female-originated websites. These differences are seen in 13 out of 23 factors that were rated. The mirroring principle suggests that the efficacy of tools or messages can be maximised by ensuring that they contain features that mirror the preferences of the target market. In the case of web design, this would mean designing web pages so that they contain features that typify the web productions of the target market.

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