

APPLIED RESEARCH

SUMMARY

- ◆ Provides strong empirical support for the notion that readers ascribe personality attributes both to typefaces and to text passages
- ◆ Establishes a foundation for investigation of the interactions between typeface and text personas

The Rhetoric of Typography: The Persona of Typeface and Text

EVA R. BRUMBERGER

INTRODUCTION

The rapid technological growth of the past few decades has introduced what is essentially a revolution in publishing, with rapid and dramatic changes in publishing technology, accompanied by increased access to that technology. Publishing has moved in great part from the print shop to the desktop, from massive and unwieldy mechanical machines to compact (though still sometimes unwieldy) personal computers. Word processing and desktop publishing software offer countless ways to modify the format of documents, including relatively easy manipulation of an extensive set of standard typefaces. As Lanham (1993) says of desktop publishing, "I can reformat a text to make it easier to read, or, using a dozen transformations, make it hard, or just different, to read. I can literally color my colors of rhetoric" (p. 5).

Software packages also offer ready-made design templates, which often appear to have been created without any understanding of the principles of document design, but which, nonetheless, are widely used. Additionally, thousands of typefaces are available as free downloads from the Internet, more can be purchased for relatively small fees, and still more can be created with font design software.

Reshaping technical communication

These technological developments have reshaped the field of technical communication: communication tasks and media have expanded, and the roles of technical writers are more broadly defined. The converging role of writers and designers is particularly significant. In the past, as Sullivan (1991) suggests, "... writers have not needed to think carefully about how the look of the page will affect the meaning of the text. For them, the meaning of the text has

resided solely in the content of the words" (p. 43).

However, technology increasingly places responsibility for multiple design decisions in the technical writer's domain (Benson 1985; Sullivan 1987). As the roles of designer, writer, and producer converge, visual communication has become a central task for many technical writers (Rainey 1997).

Visual rhetoric and typography

As visual communication becomes more central to our work, it also must become more central to our research. While our field has studied document design and currently is directing more of its attention toward visual rhetoric, little research has been conducted on the role of typography as part of that rhetoric. In scholarly discussions of visual communication, typography has been largely ignored.

As Colin Wheildon (1996), magazine editor and typographer, argues: "the rules of typography [are] largely ancient maxims, with very little, if any, empiricism to support them" (p. 184). They are a form of "craftlore," practitioners' lore, supported by intuition but lacking a theoretical and empirical foundation.

The existing research on typography has focused primarily on readability and legibility issues; only a handful of studies have attempted to investigate the personas of typefaces perhaps because typography has generally been considered transparent. In 1959, typography researcher Cyril Burt concluded that there had been virtually no objective research on the psychological aspects of typeface design and usage. Burt's observation remains true today.

Manuscript received 23 May 2002; revised 22 November 2002; accepted 1 December 2002.

The purpose of this project

It seems likely that as designers, writers, and consumers of information, we wield a sort of intuitive cognition (Arnheim 1969) as we make design choices and as we perceive and interpret documents. That is, our perceptual thinking is often largely unconscious, and we are unaware of the individual components that comprise the whole. However, to better understand the role of visual language, we must shift toward what Arnheim terms an “intellectual cognition” in which we consciously identify visual components and their relationships to one another and to the verbal rhetoric of the document. This project is intended to initiate that shift.

The studies that I discuss in this article begin to address this issue by investigating whether particular typefaces and texts are consistently perceived to have particular personas. The first study looks at typeface persona, establishing persona profiles for a series of typefaces. The second study uses the same methodology to assess whether comparable profiles can be identified for text passages.

While the second study focuses on the persona of text passages, not typefaces, taken together, these two studies form a first step in investigating the rhetorical properties of typography. If personas can be identified for both texts and typefaces, then subsequent studies can pair texts and typefaces according to their persona profiles and can investigate the ways in which persona matches and mismatches affect readers’ interactions with a document.

RELATED LITERATURE

The idea that typefaces convey a visual message is not a new one. In Greece and Rome in the third and second centuries BCE, serif letterforms were considered “symbols of the empire,” whereas sans serif forms were considered symbols of the Republic (Bringinghurst 1996). Such patterns became more evident with the advent of the printing press, and as use of the press spread across Europe, diversity in printed typefaces grew.

Many typefaces created in the Renaissance were later perceived by modern typographers to be imbued with cultural and national characteristics: *Fraktur* for Germany, *Garamond* for France, *Bodoni* for Italy, and *Caslon* for England (Laliberte 1987).

By the 1920s, and the advent of the “new typography” movement, most designers wished to eradicate nationalistic characteristics by creating typefaces that were free of historical and cultural associations. Typographers began to view type as more useful if it lacked this type of “baggage”; they were seeking a “supra-national idiom” (Laliberte 1987). However, they continued to support the idea that typefaces have distinct personas, suggesting that even typography intended to be free of historical and cultural associations can never be entirely free of rhetorical impact.

And, in fact, the new typography had a stronger rhetorical emphasis in the sense that it was intended to be “purpose-driven.”

According to this new school of thought, typified by the Bauhaus school of design, the content and purpose of the text should dictate the design—the form—of a document, and that form, including typography, should express the content just as the verbal text itself expresses content (Kinross 1992). For example, Jan Tschichold (1991), one of the most influential of the 20th century designers, stressed that different typefaces have different personas, and that the character of the type must match the character of the verbal text. He, along with other modern designers, implied that the design of a document, including its type, moves well beyond art toward rhetoric.

This sentiment is echoed in the typographical movements and theories that have followed, and although typography has to a great extent been lost in more over-arching discussions of design and technology in recent years, designers and practitioners continue to argue that typefaces carry with them connotations or personas. However, the theory and research supporting this practitioners’ lore are limited and scattered across several disciplines.

Typeface persona in theory

According to Arnheim (1969), Lanham (1983), and others, we engage in an active and purposeful problem-solving process—a thinking process—whenever we perceive, and the outcomes of this process are judgments about what it is we are perceiving. As Lanham (1983) observes, “To perceive the world is to compose it” (p. 3). These judgments do not take place in a vacuum, but rather are contextually embedded and shaped by prior experiences. Perception therefore determines not only what we see but also the ways in which we see it (Johnson-Sheehan and Baehr 2001).

These perspectives echo current theories on verbal language. Just as we conceive of the reader as an active participant in the reading process, we must conceive of the viewer as an active participant in the viewing process. Similarly, just as prior knowledge, expectations, and experience shape readers’ interactions with verbal language, they will shape interactions with visual language. In neither case is the audience simply a passive recipient of presented information.

Thus, if a document is the perceptual object, readers actively make judgments as they look at the page. Their perceptions of that page and its typeface(s) are determined in part by their prior experiences and by the associations connected with those experiences. It follows logically that readers could ascribe persona to both the typeface and the text itself based on these perceptions and associations.

Typeface persona in practice

Practitioners generally concur with the theoretical stance that the visual attributes of a document have a subtle and often complex impact extending beyond legibility and readability. Kostelnick (1990), for example, argues that the visual language of typography and other elements can convey a "visual texture, tone, and mood," that "visual language suggests a rhetorical stance: serious, conversational, low key, energetic, highly technical, or user-friendly" (p. 199). Kostelnick and Roberts (1998) assert that type can "sound" serious, funny, formal, friendly, personable, technical, and so on (p. 138).

Parker (1997) similarly claims that a typeface "conveys mood, communicates attitude, and sets tone" (p. 60). Shushan and Wright (1994) assert that each typeface has a distinct persona; they suggest that typefaces can be confident, elegant, casual, bold, romantic, friendly, nostalgic, modern, delicate, sassy, with as many possibilities for typeface persona as there are typefaces.

Interestingly, even Warde (1956b) has supported this idea; in an essay that seems to directly contradict her argument that type should serve as a "crystal goblet" (1956a) she suggests that a typeface provides timbre like that of a voice:

Set a page in Fournier against another in Caslon and another in Plantin, and it is as if you heard three different people delivering the same discourse—each with impeccable pronunciation and clarity, yet each through the medium of a different personality. (p. 138, emphasis added)

In short, most practitioners' texts on type design, document design, or desktop publishing include similar statements; there is a clear consensus that typefaces have distinct personas that convey a message to the reader/viewer. Bringhurst (1996) sums up these perspectives concisely: "Letterforms have tone, timbre, character, just as words and sentences do" (p. 22).

Experts on type and document design often attribute typeface persona to physical characteristics. For example, Benson (1985) suggests that sans serif faces are typically perceived to have "a cleaner, more modern look than serif type" (p. 37). Kostelnick and Roberts (1998) similarly find sans serif type more technical than serif type, possibly because of the former's "clean, machine-like look of modernism" (p. 148).

The shape and weight of typefaces are also seen as contributing to persona. For example, Parker (1997) suggests that typefaces with rounded serifs are typically "friendly," whereas typefaces with squared serifs are more "official" in tone (p. 62). Typefaces that are lighter in weight (in width and stroke thickness) are seen as delicate, gentle,

and feminine, while heavier typefaces are strong, aggressive, and masculine (White 1988; Baylis 1955). Sassoon (1993), who created a typeface designed for children learning how to read, suggests that smoother, more flowing shapes with longer ascenders and descenders add a "juvenile and friendly atmosphere to the letterforms" (p. 160).

Some practitioners have even gone so far as to identify specific personas for specific typefaces. For example, among serif typefaces, the old standard Times New Roman is seen as "bookish" and traditional (Kostelnick and Roberts 1998). In contrast, Garamond is described as graceful, refined, and confident (Shushan and Wright 1994), and distinctly feminine (Secrest 1947). Century Schoolbook is labeled "serious yet friendly" (Kostelnick and Roberts 1998), whereas Caslon is attractive but not pretentious, "quietly dignified" and friendly, "a good substantial citizen," and Goudy is "corpulent," "jolly," and "not in the least affected" (Secrest 1947). The Bodoni family of type, meanwhile, is "dramatic and sophisticated," "very urban, with a touch of the theatrical" (Shushan and Wright 1994), "masculine," "dignified," and "decidedly charming" (Secrest 1947).

Fewer affective characteristics are generally attributed to sans serif typefaces, but these typefaces still are seen as having distinct personas. For example, Futura is described as "no-nonsense," "cool," and "restrained," (Spiekermann and Ginger 1993), whereas AvantGarde is modern (Kostelnick and Roberts 1998; Shushan and Wright 1994) without being formal.

Despite the extensiveness of the claims regarding typeface persona and its rhetorical impact, little empirical evidence is mentioned in the handbooks and how-to books, and there are few references to theory. Instead, the literature relies heavily on intuition and anecdotal evidence, on terms such as "aesthetic judgment" and "good taste."

Typeface persona in research

Although not often cited by theorists or practitioners, a limited body of empirical studies on typeface persona does exist. These studies date back to the 1920s; the most recent were conducted in the 1980s.

Atmosphere values The earliest studies attempted to identify "atmosphere" values for typefaces. For example, Poffenberger and Franken (1923) identified five atmosphere qualities for the 29 typefaces they used: cheapness, dignity, economy, luxury, and strength. Ovink conducted a similar study at the University of Utrecht in 1938, concluding that typefaces can be grouped under three headings of atmosphere value: luxury/refinement, economy/precision, and strength (Spencer 1969; Wendt 1968).

Professionals and laypersons Subsequent studies examined whether typography experts and laypersons share similar perceptions of typeface persona. These studies be-

gan with the assumption that, in order for a document to be completely effective, the typeface, much like the verbal language used, must hold the same connotations for both the writer and the reader.

Brinton (1961) and Tannenbaum, Jacobson, and Norris (1964) used semantic differential scales (see Osgood, Suci, and Tannenbaum 1957) to assess experts' and amateurs' perceptions of typefaces. Brinton found that there generally was consensus between experts and amateurs, although professionals typically attributed more qualities to a given typeface. Brinton stopped short of establishing personality profiles for the thirteen typefaces in his study; instead he simply compared the mean ratings of the typefaces on each semantic scale.

Tannenbaum, Jacobson, and Norris (1964) similarly used semantic differential scales to examine whether individuals with varying degrees of expertise in typography agree in their assessment of a selection of typefaces. All three groups in the study—"pros," "semi-pros," and "amateurs"—showed relatively high agreement in their judgments of the typeface connotations; that is, the three groups were similar in their ratings of the typefaces. In keeping with Brinton's data, the professionals were the most extreme in their judgments; the "semi-pros"—journalism students who had taken a one-semester typography course—were the least extreme, possibly because the little knowledge they had gained made them more conservative.

Semantic quality More recently, Bartram (1982) and Rowe (1982) conducted studies on the semantic quality (what Rowe terms the "connotative dimensions") of typefaces. Both studies began with the assumption that the semantic properties of a typeface "modify the explicit message of the text (the actual words) and provide an implicit context within which the message is understood" (Bartram p. 39); Bartram likens this process to speech, in which we can modify the impact of the verbal language we use by adding inflections, stresses, and nonverbal cues. Using similar methodology, each researcher instructed participants to rank a set of typefaces on several semantic differential scales.

Rowe identified five factors that appear to represent categories of the semantic qualities of typefaces: potency (strong/weak), evaluation (clean/dirty), elegance, novelty, and antiquity. She then used these dimensions to provide a "connotative characterization"—a persona profile—of each typeface used in the study. Bartram followed a similar approach, but identified only four semantic factors: potency, evaluation, mood, and activity. Only the first two of these correspond to the factors identified by Rowe.

Need for additional studies

Each of these studies concluded that typefaces have distinct personas; however, there is little consistency in the

personality profiles identified. The discrepancies could be due to a variety of factors, but it seems likely that methodological differences and problems, as well as differences in the demographics of participants, played an important role. Additionally, and perhaps even more importantly, typeface preferences and usage change markedly over time, and would be likely to have a substantial impact on experimental results. Finally, no attempt has been made to establish similar personality profiles for both typefaces and texts, which would allow subsequent investigation of interactions between the two.

RESEARCH METHODOLOGY

The research project I conducted consisted of two empirical studies: the first investigated whether readers/viewers consistently assign particular personality attributes to particular typefaces; the second used comparable methodology to investigate whether they similarly attribute personality characteristics to passages of text.

The purpose of the first study was to provide current empirical support for the notion that typefaces have personas, corroborating both practitioners' lore and the handful of previous studies conducted on the rhetoric of typography.

The purpose of the second study was to determine whether a similar approach could be used to identify text persona. If persona profiles can be established for both typefaces and text passages, then subsequent studies can pair typefaces and texts in more typical reading situations to investigate the impact of mismatches in persona.

Thus, the two studies that comprise the project are intended to work together, providing foundational data for further research.

Participants

Participants in both studies were undergraduate introductory psychology students, all of whom were required to participate in four hours of research studies. Participants from one study did not participate in the other study.

A substantial body of research supports the notion that there are significant differences in the ways males and females use and interpret language (Crawford and Chaffin 1986; Edelsky 1977), suggesting that gender could be a potentially important variable in the studies that comprise this project. Thus, for each study, half of the participants were male, and half were female, a division that allowed me to perform statistical analyses for each group and to make comparisons.

I collected other demographic information from participants as well, specifically their ethnicity and first language, World Wide Web usage, age, and academic major.

It seems reasonable to expect differences due to ethnicity and first language, as there are substantial cultural

differences in language usage (Beamer 1992; Thrush 1997). Additionally, it is possible that World Wide Web usage may affect individuals' perceptions of visual rhetoric because the Web is a particularly visual medium and one that is used extensively by many college students. Finally, age and academic major could conceivably also impact participants' interactions with both typefaces and text passages because these factors certainly shape people's experiences, which in turn shape their perceptions.

While it was not feasible to treat each of these demographic factors as an independent variable (the resulting groups would have been too small to allow for any meaningful statistical analyses), I did conduct secondary analyses using the demographic data to get a sense for whether any of these factors affected participant responses.

Data collection method

The data collection method for both studies was a modification of the attribute scaling methodology known as the semantic differential, developed by Osgood, Suci, and Tannenbaum (1957). The semantic differential approach entails presenting participants with a series of paired opposite terms (*masculine/feminine*, *strong/weak*, *quick/slow*), referred to as semantic differential scales.

For each concept being judged, participants indicate the point on a seven-point semantic scale that best fits the concept ("very masculine," "somewhat weak," and so on). Other researchers have demonstrated the appropriateness of this methodology for examining typefaces (Tannenbaum, Jacobson, and Norris 1964; Wendt 1968; Bartram 1982; Rowe 1982).

However, presenting participants with paired attributes is potentially problematic. Although terms may appear to represent opposite extremes of a particular attribute, it is difficult to ascertain whether they are universally viewed as opposites. Additionally, it may be inappropriate to consider certain attributes as having a neutral point and polar extremes along a single dimension. The more complex the attribute, the more potentially problematic a bipolar approach.

For example, "hot" and "cold" clearly represent the opposite ends of a uni-dimensional temperature scale on which the center point is neither hot nor cold, but rather is neutral. However, "masculine" and "feminine" may be neither opposite extremes nor points along a uni-dimensional scale. An object or person may be viewed as having both masculine and feminine characteristics, but the absence of masculine characteristics does not necessarily mean the presence of feminine characteristics, and it is not always clear what the center point between masculine and feminine represents.

To avoid this complication, I used rating scales with non-paired attributes. I selected attributes based on Osgood, Suci, and Tannenbaum's work, on terms frequently

	Not at all		Somewhat				Very
Cheap	1	2	3	4	5	6	7
Cold	1	2	3	4	5	6	7
Confident	1	2	3	4	5	6	7
Dignified	1	2	3	4	5	6	7
Elegant	1	2	3	4	5	6	7
Feminine	1	2	3	4	5	6	7
Formal	1	2	3	4	5	6	7
Friendly	1	2	3	4	5	6	7
Inviting	1	2	3	4	5	6	7
Loud	1	2	3	4	5	6	7
Masculine	1	2	3	4	5	6	7
Playful	1	2	3	4	5	6	7
Pretentious	1	2	3	4	5	6	7
Professional	1	2	3	4	5	6	7
Relaxed	1	2	3	4	5	6	7
Scholarly	1	2	3	4	5	6	7
Serious	1	2	3	4	5	6	7
Sloppy	1	2	3	4	5	6	7
Straightforward	1	2	3	4	5	6	7
Warm	1	2	3	4	5	6	7

Figure 1. Attribute scales for Study 1 and Study 2.

used to describe typefaces in the literature, and on previous studies on typeface tone. The attribute lists identified by Osgood, Suci, and Tannenbaum are particularly useful because they are not specific to typefaces, but instead have been used as rating scales for a wide range of concepts, ensuring their appropriateness for assessing text passage personas.

I omitted purely denotative terms that describe physical characteristics, such as rounded, angular, dark, and heavy. Instead, the focus was on connotative attributes (see Figure 1). Identical attribute lists and scales were used for both studies.

Participants were given no explanation or description of the intended meaning of each term prior to the study because such explanations or descriptions could conceivably bias them to respond in particular ways.

STUDY 1: ESTABLISHING TYPEFACE PERSONAS

Study 1 established a persona for each of 15 typefaces. I selected the typefaces to represent a range of physical characteristics (see Table 1 for a complete listing). Several of the typefaces are commonly used in professional documents, including Times New Roman, Garamond, and Arial, whereas others are novelty typefaces. For each typeface, the complete alphabet (upper and lower case) was displayed, as well as numerals and the sentence "A quick brown fox jumped over the lazy dog," which uses all the letters in the alphabet (see Figure 2).

The variations among and within typefaces in character height and width made controlling precisely for physi-

TABLE 1: FEATURES OF TYPEFACES USED IN STUDY 1

Typeface	Feature							
	Orientation (Roman or Oblique)		Relative x-height (Short/Med/Tall)			Serifs (Y/N)		Shape, ornamentation, or other notable features
	R	O	S	M	T	Y	N	
Adler	X				X	X		Slab serifs; "grunge" typeface
Arial	X			X			X	Relatively narrow; tall
Bauhaus Md BT	X			X			X	Rounded
BlackChancery	X			X		X		Calligraphic; oblique (left) stress; large descending capitals
CasablancaAntiqueItalic		X	X			X		Bracketed serif; shaky edges
Comic Sans MS	X				X		X	Uneven baseline
CounselorScript		X	X			X		Ornamented
Courier New	X			X		X		Slab serifs, mono-spaced; wide
Garamond	X		X			X		Bracketed serifs; round counter
Harrington	X			X		X		Ornamented
Lucida Sans Italic		X			X		X	Oblong counter; narrow capitals
Lydian BT	X			X			X	Narrow
Square721 BT	X				X		X	Square
Times New Roman	X			X		X		Bracketed serifs; narrow counter
VanDijk		X		X			X	Uneven baseline

cal size impractical; therefore, all typefaces in Study 1 were displayed in the same size. I chose 14 point to increase the visual contrast between each typeface sample and the attribute list displayed on the page with that sample. It is important to note that this study is in no way intended to simulate a typical reading situation.

Materials and procedure

A packet including a demographic data form and instructions, followed by 15 pages of typefaces with attribute lists, was given to 80 participants (40 male, 40 female). Each page of the packet included a typeface sample and the list of 20 attributes; the same attribute list was provided for each typeface so that direct comparisons could be made. The sequence of pages was randomly determined among the packets to avoid any order effects. Participants ranked each typeface on all 20 attributes. They were asked to work quickly, basing their responses on their first impressions.

Study 1 took approximately 40 minutes for each subject to complete and was administered to groups of up to eight people. Participants were seated around a conference table, which enabled me to observe them during the study.

Methods of analysis

I analyzed the data from Study 1 in several ways, using SPSS (version 9.0).

1. I analyzed the rating scores for each attribute and typeface to determine whether there were correlations between any of the typefaces.

2. I conducted exploratory factor analysis to identify common underlying factors in the pattern of ratings that would account for any such covariation (see Kim and Mueller 1978).

3. I subjected the data to Multidimensional Scaling (MDS)—a set of mathematical techniques that also attempt to uncover the underlying structure of data (see Kruskal and Wish 1978).

4. I also analyzed the data to identify any effects linked to age, academic major, usage of or familiarity with the World Wide Web, ethnicity, and gender.

Correlation Mean rating scores for each attribute for all the typefaces; I then used these means to determine the correlations between typefaces. A high positive correlation

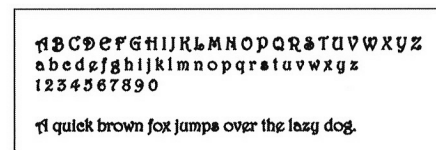


Figure 2. Typeface sample from Study 1 using Harrington.

TABLE 2: STUDY 1 CORRELATION MATRIX ($P \leq 0.001$ SHADED)

Typeface	Adler	Arial	Bauhaus Md BT	BlackChancery	CasablancaAntiqueItalic	Comic Sans MS	CounselorScript
Adler		0.065	0.004	-0.844	-0.829	-0.003	-0.887
Arial			0.193	0.192	0.307	-0.101	0.006
Bauhaus Md BT				0.082	0.365	0.939	0.057
BlackChancery					0.924	-0.024	0.967
CasablancaAntiqueItalic						0.239	0.900
Comic Sans MS							0.000
CounselorScript							
Courier New							
Garamond							
Harrington							
Lucida Sans Italic							
Lydian BT							
Square721 BT							
Times New Roman							
VanDijk							

between two typefaces indicates that participants perceived the typefaces to have very similar personas; a high negative correlation between two typefaces indicates that participants saw the typefaces as very dissimilar in persona. (The highest possible correlation is a correlation of "1," meaning that the two items have a perfect correlation with one another.)

Additionally, the statistical significance of each correlation was computed to evaluate the probability (p) of the correlations occurring by chance. Traditionally, a value of $p \leq 0.05$ is considered significant (the results would occur only five times or fewer in 100 trials—5% of the time), while a value of $p \leq 0.01$ is considered highly or very significant.

The correlation data was subsequently used for both factor analysis and multidimensional scaling.

Factor analysis I performed factor analysis through what is known as Principle Components Analysis with Varimax Rotation (Kaiser Normalization), a method that

was used in earlier studies of typeface persona conducted by Bartram (1982) and Rowe (1982). Bartram (1982) describes principle components analysis as follows:

This is a technique for "summarising" the inter-correlations between a large number of scales in terms of a smaller number of independent factors. If four scales . . . all measure the same semantic property, principle components analysis should produce one main factor which accounts for most of the variation in the correlations (i.e. the inter-relationships) between the four scales. This factor can be taken to represent the semantic dimension which each of these scales is measuring. (p. 42)

Principle Components Analysis allows determination of the strength of the relationships between items through what is known as "factor loading." In this study, factor loading indicates how well a particular typeface fits a par-

TABLE 2: CONTINUED

Courier New	Garamond	Harrington	Lucida Sans Italic	Lydian BT	Square721 BT	Times New Roman	VanDijk
0.423	-0.263	-0.772	-0.349	-0.472	0.417	-0.283	-0.209
0.835	0.931	-0.154	0.534	0.804	0.898	0.918	-0.099
-0.021	0.158	0.455	0.792	0.262	0.080	0.158	0.861
-0.266	0.449	0.823	0.542	0.707	-0.125	0.439	0.304
-0.157	0.558	0.856	0.738	0.784	-0.072	0.559	0.462
-0.271	-0.110	0.458	0.638	0.013	-0.183	-0.096	0.875
-0.407	0.286	0.869	0.432	0.567	-0.328	0.289	0.313
	0.652	-0.585	0.103	0.399	0.900	0.657	-0.439
		0.086	0.617	0.929	0.718	0.990	-0.044
			0.615	0.406	-0.456	0.087	0.704
				0.752	0.287	0.611	0.725
					0.525	0.916	0.188
						0.690	-0.234
							-0.069

ticular factor; it is the correlation between a particular typeface and a particular factor.

Finally, Varimax Rotation with Kaiser Normalization simply refers to a method of sorting the data until the clearest groups are identified, much like rotating the cylinders in the drum of a combination lock until they line up properly to open the lock.

Principle Components Analysis allowed me to compare the ratings for each typeface and determine whether the typefaces could be grouped together based on their persona (as determined by the ratings). Thus, analysis of the data began by looking at the interrelationships among the typefaces and then determining whether those relationships could be explained by the existence of a smaller number of hypothetical variables.

Multidimensional scaling Like factor analysis, Multidimensional Scaling (MDS) examines the inter-relationships among variables (in this case typefaces). MDS techniques use proximities—measures of the similarity/difference between items—to generate a spatial map of the data. The correlations between typefaces were used as measures of similarity and difference for the MDS analyses. The MDS allowed grouping of the typefaces according to their personas, as well as generating dimension-based (like factor-based) personality descriptions for each typeface.

Results

Analysis of the Study 1 data revealed that participants did, in fact, consistently ascribe particular personality attributes to a given typeface. Additionally, the typefaces used for the

TABLE 3: STUDY 1 TYPEFACE GROUPINGS (FACTORS) AND CORRELATIONS (FACTOR LOADINGS)

Group 1 ("Elegance")		Group 2 ("Directness")		Group 3 ("Friendliness")	
Typeface	Corr.	Typeface	Corr.	Typeface	Corr.
<i>CounselorScript</i>	.985	Arial	.994	Bauhaus Md BT	.978
<i>BlackChancery</i>	.962	Garamond	.937	Comic Sans MS	.972
<i>CasablancaAntiqueItalic</i>	.900	Times New Roman	.928	<i>VanDijk</i>	.922
Harrington	.848	Square721 BT	.903	<i>Lucida Sans Italic</i>	.742
Adler	-.943	Courier New	.856		
		Lydian BT	.795		

TABLE 4: STUDY 1 TYPEFACE USED FOR SECONDARY ANALYSES

"Elegance" Group		"Directness" Group		"Friendliness" Group	
<i>CounselorScript</i>	.985	Arial	.994	Bauhaus Md BT	.978

study divided cleanly into categories determined by their personas.

Typeface persona A number of strong correlations between typefaces were highly significant, as Table 2 illustrates. The table shows the correlation between each pair of typefaces (the bottom left portion of the table is left blank because it would simply duplicate the information already shown); correlations that are highly significant ($p \leq 0.001$) have been shaded.

Again, a high positive correlation between two typefaces indicates that participants perceived them to have very similar personas, whereas a high negative correlation suggests that participants perceived the typefaces to be very dissimilar in persona. For example, *BlackChancery* correlated very highly with *CounselorScript*, suggesting that these two typefaces were perceived by participants to have a similar persona profile. *Adler*, meanwhile, had a very high negative correlation with *CounselorScript*, indicating that the two were perceived as having very dissimilar personas. I subsequently used the correlation data for both factor analysis and multidimensional scaling.

Factor analysis revealed that three independent factors accounted for 96.3% of the total variance. In other words, the typefaces sorted very cleanly into three categories (see Table 3): typefaces within a group correlated highly with the other typefaces in that group, they did not correlate highly with typefaces in either of the other two factor groupings, and there was no overlap between groups.

Closer examination of the attribute ratings for each typeface allowed identification of common semantic properties among typefaces within a group. For example, all typefaces that correlated positively in the first group rated

much higher than those in the other two groups on "elegant"; thus, elegance was a common property of the typefaces in group one and was a characteristic that distinguished those typefaces from the typefaces in the other groups. Although the first group also rated fairly high on "feminine," the differences between the groups were not as great, so femininity was not considered to be as distinguishing a characteristic.

I systematically compared the mean ratings for each attribute across the three groups and ranked them within each group. Based on these comparisons and rankings, I derived a label for each group that reflected its overall persona and distinguished it from the other groups: "elegance" (group 1), "directness" (group 2), and "friendliness" (group 3).

Once the factor analysis was complete, I applied multidimensional scaling techniques to the data. The multidimensional scaling revealed groupings comparable to those from the factor analysis.

Demographic differences None of the demographic factors appear to have significantly affected perceptions of typeface persona. It was not feasible to identify effects linked to age, as only seven of the participants were outside the 18–23 age range. Additionally, I was not able to identify effects that might be due to academic major because participants reported a very wide range of majors (from Art History to Sports Medicine). While there were some majors with several participants, the groups were not sufficiently large to allow for a statistically reliable or valid analysis. English was the first language for most of the participants in Study 1; only nine participants were nonnative speakers. Removing the data of these nonnative speakers did

TABLE 5: FEATURES OF TEXT PASSAGES USED IN STUDY 2

Text No.	Source	Grade Level	Reading Ease	Coherence (sentence)	Purpose and Topic
1	<i>Rainbow six</i>	8.0	69.3	0.2387	Entertain: action novel w/terrorism focus
2	<i>Palomino</i>	7.9	68.1	0.2776	Entertain: romance novel
3	<i>Unknown worlds</i>	7.9	70.0	0.3129	Entertain: science fiction short story
4	<i>Newsweek</i>	7.6	66.7	0.2681	Instruct: snowboarding
5	<i>Bowhunter magazine</i>	8.6	60.0	0.2162	Instruct: bowhunting
6	<i>Women's sports and fitness</i>	8.6	62.1	0.2669	Instruct: t'ai chi
7	<i>The economist</i>	7.9	61.9	0.3749	Inform: fire forecasting
8	<i>Smithsonian</i>	8.1	61.6	0.2758	Inform: robotics
9	<i>Popular mechanics</i>	8.1	60.5	0.2978	Inform: geothermal heating
10	<i>Shape magazine</i>	8.4	60.4	0.2995	Persuade: food/eating
11	<i>Business week</i>	7.5	62.5	0.2788	Persuade: luxury tariffs
12	<i>TV guide</i>	7.5	64.6	0.2634	Persuade: TV violence
13	<i>Cognitive psychology and its implications</i>	8.1	60.5	0.2725	Teach: (textbook) history of cognitive psychology
14	<i>The shape of reason</i>	7.7	60.7	0.3667	Teach: (textbook) discourse communities
15	<i>Macroeconomics</i>	8.6	61.9	0.3553	Teach: (textbook) gross domestic product

not alter the factors or the pattern of correlations within each factor.

For the remaining demographic data (World Wide Web use, ethnicity, and gender), I performed Univariate Analyses of Variance (ANOVAs), which are used to determine whether there are statistically significant differences between the data of distinct groups.

Because the correlations within each typeface group were very high, I used one typeface from each group for these secondary analyses, treating that typeface as representative of the group (see Table 4). I performed ANOVAs for all 20 attributes. Because these analyses relied on smaller data sets (statistically, a smaller sample due to the grouping of participants by gender, ethnicity, or World Wide Web use), I used a stringent probability level ($p < 0.01$) to determine statistical significance.

World Wide Web use among participants was surprisingly low, given their ages and their position as college

students: the largest group of participants (37) used the World Wide Web less than 5 hours per week; 22 participants used the Web 6–10 hours per week. Because the remaining categories had only a few participants each, the groups were collapsed to determine whether there were any effects linked to World Wide Web use. Thus, I compared three groups: those who used the Web 5 hours or fewer per week; those who used it 6–10 hours per week; and those who used it 11+ hours per week. The ANOVA revealed no significant differences between these groups. Participants' reported use of the World Wide Web did not seem to affect their perceptions of typeface persona.

Analysis of the ethnicity and gender data began with additional factor analyses to determine whether different typeface groupings would emerge for participants of different ethnicity and gender. I analyzed the data for each of the groups separately. Following the factor analysis, ANOVAs were performed as described previously.

TABLE 6: STUDY 2 CORRELATION MATRIX (P < 0.001 SHADED)

Text	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1		-0.590	0.961	0.125	0.863	-0.203	0.240	0.200	0.244	-0.293	0.375	0.754	0.133	-0.125	0.249
2			-0.600	0.247	-0.453	0.527	-0.209	-0.144	-0.131	0.591	-0.400	-0.406	-0.250	0.183	-0.360
3				0.019	0.780	-0.340	0.084	0.079	0.096	-0.396	0.265	0.640	0.004	-0.242	0.131
4					0.461	0.802	0.386	0.727	0.519	0.374	0.109	0.408	0.241	0.464	0.182
5						0.201	0.550	0.601	0.584	0.016	0.553	0.849	0.423	0.264	0.495
6							0.560	0.675	0.665	0.763	0.263	0.292	0.474	0.774	0.353
7								0.851	0.969	0.599	0.921	0.732	0.963	0.881	0.955
8									0.887	0.472	0.682	0.634	0.780	0.788	0.759
9										0.642	0.861	0.731	0.913	0.902	0.900
10											0.446	0.251	0.563	0.842	0.490
11												0.733	0.922	0.731	0.980
12													0.641	0.479	0.682
13														0.863	0.970
14															0.801
15															

The participants came from four ethnic groups: 46 were White, 32 were Hispanic, one was Black, and one was Asian. I omitted the data for the latter two participants from the comparison of ethnic groups, and then performed two factor analyses: one on the data for White participants, one on the data for Hispanic participants. The typeface groupings that emerged for both groups were identical to those that emerged from the analysis of all the Study 1 data: "elegance," "directness," and "friendliness." There were, however, some slight differences in the factor loadings.

For both White and Hispanic participants, the first two groups were reversed; that is, the "directness" factor, not the "elegance" factor, accounted for the largest part of the variance. Additionally, for White participants, *Lucida Sans Italic* did not fall cleanly into the "friendliness" group of typefaces; instead, it loaded equally on "directness" and "friendliness." For Hispanic participants, *Lydian BT* was grouped with the "elegance" cluster rather than with the "directness" cluster. These were the only differences revealed by the factor analyses.

The subsequent ANOVA revealed no statistically significant differences between the responses of White and Hispanic participants. Participant ethnicity, therefore,

did not significantly affect perception of typeface persona.

Analysis of the gender data revealed a similar pattern. The results for female participants were comparable to those for all participants in terms of both the factors and the typeface groupings within each factor. Interestingly, the results for male participants aligned more closely with those for White participants. That is, the first two factors were reversed ("directness" accounted for the largest part of the variance), *Lucida Sans Italic* could be grouped with either "directness" or "friendliness." These were the only differences revealed by the factor analyses; the results of the subsequent ANOVA suggest that these differences again were not significant.

Two ANOVAs did reveal effects that approached significance: on average, females rated *Counselor Script* ("elegance" grouping) as less "scholarly" than did males (a mean rating of 3.75 as compared with 4.63, $p = 0.02$) and rated *Arial* ("directness" grouping) as more "serious" (a rating of 5.3 compared with 4.5; $p = .01$). However, because these were the only differences approaching significance out of 60 comparisons, we can conclude that participants' gender did not substantially affect their perception of typeface persona in this study.

Discussion

Study 1 provides strong evidence that people do consistently ascribe particular personality attributes to a particular typeface. To a great extent, these findings confirm both practitioners' lore and the results of earlier studies on typeface persona. It is interesting to note that the typeface categories identified in Study 1 did not match those identified in previous studies of typeface persona (see Bartram 1982; Rowe 1982). There are several possible explanations for the dissimilarity.

First, I employed a different methodology, using unidirectional scales rather than the semantic differential used by previous researchers. Additionally, I used different typefaces and attribute lists. Finally, and perhaps most significantly, both previous studies were conducted two decades ago; it is reasonable to expect that perceptions of typeface persona would change with time and usage if they are shaped by experiences. The latter theory is supported by the finding that the typefaces separated into categories based on semantic qualities; they did not separate according to physical characteristics.

Although the study revealed no statistically significant differences resulting from demographic factors, certain patterns that emerged deserve further attention. The differences, however slight, between male and female participants may point to gender differences in the interpretation of visual rhetoric. Likewise, the small differences observed between White and Hispanic participants' responses may point to cultural differences in the interpretation of visual rhetoric. Certainly, each of these areas merits further investigation.

STUDY 2: ESTABLISHING TEXT PERSONAS

The objective of Study 2 was to establish a persona for 15 brief passages of text, using methodology comparable to that of Study 1. The Study 2 persona profiles are based on characteristics of the verbal text, not on visual characteristics. This difference may on the surface make the studies seem incongruously paired. However, the two studies work toward a common purpose: they provide the groundwork for future investigation of the ways in which verbal and visual characteristics interact when we read a document.

The text passages for Study 2 came from a variety of sources, including novels, anthologies, magazines, and textbooks. The passages were intended to reflect a range of purpose, content, style, tone, and audience (see Table 5). Unfortunately, locating passages comparable in length and reading level was not feasible; thus, some modification of the passages was necessary. I began by editing the text passages to make them four to five paragraphs and 375 words long. I then modified them to ensure comparability in reading difficulty. I determined reading difficulty by using the Flesch Reading Ease and Flesch-Kincaid Grade

Level measures provided by Microsoft® Word 2000.

The Flesch Reading Ease score is based on a 100-point scale, on which a higher score indicates greater readability; the reading ease score for each passage was between 60 and 70. The Flesch-Kincaid Grade Level score indicates the U.S. school grade-level at which the text is written; the grade level for each passage was between 7.5 and 8.6.

Like other instruments designed to measure reading difficulty, the Flesch Reading Ease and Flesch-Kincaid Grade Level scores provide only rough measurements because they rely solely on surface features of the text, such as average sentence length and average number of syllables per word.

To further control for variation between texts, I also evaluated text passage coherence, using a program developed by Peter Foltz of the New Mexico State University Department of Psychology. Using Latent Semantic Analysis (LSA), a method related to neural net models, the program offers a quantitative evaluation of the coherence between words, sentences, and blocks of text in a document. The coherence estimates produced by LSA are derived through complex mathematical analysis that looks beyond surface features used by instruments such as the Flesch measures described previously (Landauer, Foltz, and Laham 1998). Foltz, Kintsch, and Landauer (1998) describe LSA as follows:

LSA provides a fully automatic method for comparing units of textual information to each other . . . to determine their semantic relatedness. These units of text are compared with each other using a derived measure of their similarity of meaning. (p. 287)

Coherence for the Study 2 text passages was measured at the sentence level. Because each passage contained only four or five paragraphs, between-paragraph coherence would most likely be quite variable. I revised the passages so that each produced similar coherence estimates. However, because the coherence measure does take into account surface features in addition to other measures of semantic relatedness, the text passages that contained more repetition produced higher coherence ratings.

For example, in a passage on fire forecasting from *The economist*, the term *forecast* appeared several times, elevating the coherence rating. In the passage from *The shape of reason*, the term *community* was repeated throughout, and, similarly, in the *Macroeconomics* passage, the term *GDP* was repeated. All three of these texts produced higher coherence ratings than the remaining texts, which had less repetition (see Table 5). However, revising the texts further to reduce repetition was not feasible, as the repeated terms were field-specific and integral to the text passage.

Once I had revised the passages to control for length, reading difficulty, and coherence, I printed all the text passages in 12-point Times New Roman. Because the pur-

TABLE 7: STUDY 2 TEXT GROUPINGS (Factors) AND CORRELATIONS (Factor Loadings)

GROUP 1 "Professionalism"		GROUP 2 "Violence"		GROUP 3 "Friendliness"	
Text Source	Corr.	Text Source	Corr.	Text Source	Corr.
<i>Cognitive psychology and its implications</i>	0.979	<i>Rainbow six</i>	0.969	<i>Newsweek</i>	0.910
<i>Macroeconomics</i>	0.977	<i>Unknown worlds</i>	0.951	<i>Women's sports and fitness</i>	0.874
<i>The economist</i>	0.944	<i>Bowhunter magazine</i>	0.875		
<i>Business week</i>	0.940	<i>TV guide</i>	0.716		
<i>Popular mechanics</i>	0.884				
<i>The shape of reason</i>	0.859				
<i>Smithsonian</i>	0.712				
<i>Shape magazine</i>	0.587			<i>Shape magazine</i>	0.553
		<i>Palomino</i>	-0.637	<i>Palomino</i>	0.599

TABLE 8: STUDY 2 TEXT PASSAGES USED FOR SECONDARY ANALYSES

"Professionalism" Group		"Violence" Group		"Friendliness" Group	
<i>Cognitive psychology and its implications</i>	0.979	<i>Rainbow six</i>	0.969	<i>Newsweek</i>	0.910

pose of Study 2 was to examine the persona of the text passage itself—that is, the persona of its verbal tone, style, and content—all the passages of text were printed in the same typeface.

Assessing reading comprehension and rate

The initial step in Study 2 was measuring participants' reading comprehension and reading rate because there may be a correlation between reading ability and perception of the text's persona. I assessed reading comprehension and rate by administering part 2 of the Nelson-Denny Reading Test (1993 version, Form H).

The Nelson-Denny is a nationally standardized and normed measure of reading designed to evaluate vocabulary development (part 1), and comprehension and reading rate (part 2) for high school students, college students, and adults. Part two, Reading Comprehension and Rate, is a 20-minute test, the first minute of which is used to determine reading rate. This section of the Nelson-Denny contains seven reading passages and a total of 38 questions multiple-choice questions, each with five answer choices. The text passages are selected from current, widely used, high school and college texts.

Materials and procedure

Once Study 2 participants completed the Nelson-Denny, they were presented with the packet of 15 text passages. The data collection method for Study 2 was similar to that used in Study 1 to identify typeface persona. A total of 80 participants (40 male, 40 female) were each given a packet with two parts: part I was the Nelson-Denny test; part II was a booklet including a demographic data form, instructions, and 15 text passages and attribute lists.

Participants were presented each passage of text on a separate page; because of the length of the text passages, the attribute list for each passage was presented on the facing page. The text passages were distributed randomly in each packet to avoid any order effects. Participants ranked each text passage on all 20 attributes.

The tasks in Study 2 took approximately 60 minutes for each subject to complete and were administered to groups of up to eight people at a time. Participants were seated around a conference table so that I could observe them.

Methods of analysis

I analyzed the data from Study 2 with methods similar to those used in Study 1. First, I determined correlations

TABLE 9: STUDY 2 GENDER DIFFERENCES

Text Group	Attribute	Mean— Females	Mean— Males	Significance
Professionalism	Elegant	2.58	3.40	$p < 0.01$
	Pretentious	2.13	2.85	$p < 0.01$
	Serious	5.05	5.63	$p < 0.01$
	Sloppy	1.48	2.25	$p < 0.01$
Friendliness	Cheap	1.85	2.73	$p < 0.01$
	Playful	5.35	4.53	$p = 0.02$

between attributes; then, I conducted factor analysis; finally, I applied MDS techniques. In addition, I performed secondary analyses of the data to identify any effects linked to age, academic major, usage of or familiarity with the World Wide Web, ethnicity, and gender.

Results

Analysis of the Study 2 data revealed that participants did consistently ascribe particular personality attributes to a given text passage. Like the typefaces in Study 1, the text passages used in Study 2 could be categorized by their personas.

Text passage persona The correlations between certain texts were highly significant ($p \leq 0.001$). I calculated mean rating scores for each attribute for all the text passages and used these means to determine whether there were correlations between any of the texts. A high positive correlation between two text passages indicates that participants perceived the texts to be very similar in persona; a high negative correlation indicates that participants saw the texts as very dissimilar in persona (see Table 6). I subsequently used the correlation data for both factor analysis and multidimensional scaling.

Factor analysis revealed that three independent factors accounted for 92.9% of the total variance. For the most part, the texts sorted cleanly into the three categories (see Table 7). Two of the texts fit equally well in two of the groups: the romance novel passage (*Palomino*) and the *Shape* magazine passage. Multidimensional scaling revealed comparable groupings.

I derived labels for the Study 2 groups using the same procedure as for Study 1, with one addition. I conducted an informal analysis of the texts within each grouping to identify common semantic features. I subsequently labeled the Study 2 groups “professionalism” (group 1), “violence” (group 2), and “friendliness” (group 3).

Demographic differences The data reveals that perceptions of text passage persona may be affected by gen-

der and reading comprehension level. It was not feasible to identify effects linked to age because only four of the Study 2 participants were outside the 18–23 age range. Additionally, it was not possible to identify effects that might be due to academic major because participants reported a wide range of majors. There were eight participants in Study 2 who were nonnative speakers of English. Removing the data of these nonnative speakers did not alter the factors or the pattern of correlations within each factor.

For the remaining demographic data, I performed Univariate ANOVAs to determine whether there were significant differences in text attribute ratings between demographic groups. For each factor, the text with the highest factor loading was chosen as representative and used for these secondary analyses (see Table 8). A probability level of $p < 0.01$ was used to determine statistical significance.

Over half (45) of the Study 2 participants used the Web fewer than 5 hours per week, while 21 participants used the Web 6–10 hours per week. The remaining categories had only a few participants each, so they were combined. Thus, a comparison was made between three groups, just as for Study 1: participants who used the Web 5 or fewer hours per week; participants who used it 6–10 hours per week; and participants who used it 11+ hours per week. The ANOVAs revealed no significant differences between these groups. Participants' use of the World Wide Web did not seem to affect their perceptions of text passage persona.

Analysis of the ethnicity and gender data began with additional factor analyses to determine whether different text groupings would emerge for participants of different ethnicity and gender. Following the factor analyses, I performed ANOVAs as described previously.

A total of 43 of the participants were White, 36 were Hispanic, and 1 described himself as “Other.” I omitted the data for the last participant from the comparison of ethnic groups. I performed two factor analyses: one on the data for White participants, one on the data for Hispanic participants. The text groups that emerged for both groups were

TABLE 10: STUDY 2 DIFFERENCES DUE TO READING COMPREHENSION

Text Group	Attribute	Mean— Low Comp.	Mean—High Comp.	Significance
Friendliness	Playful	5.60	4.15	$p < 0.01$
	Sloppy	1.60	2.50	$p < 0.01$
Professionalism	Loud	3.10	1.75	$p = 0.01$

identical to those that emerged from the analysis of all the Study 2 data: “professionalism,” “violence,” and “friendliness.”

For the most part, the factor loadings were also comparable. However, for White participants, the text passage from *TV guide* divided almost equally between “professionalism” and “violence,” rather than belonging clearly in the “violence” grouping. In addition, the passage from *Shape magazine* correlated positively with “professionalism” and negatively on “violence” instead of positively on “professionalism” and “friendliness.”

The results of the factor analysis for Hispanic participants more closely matched the results for all participants. The only difference was that the *Smithsonian* text passage correlated equally with both the “professionalism” and “friendliness” factors, rather than fitting clearly in the “professionalism” group.

The subsequent ANOVAs using the representative text for each factor revealed only one statistically significant difference between the responses of White and Hispanic participants. On average, White participants rated the *Cognitive psychology* text passage (“professionalism” group) as less “confident” than did Hispanic participants (a mean rating of 4.21 compared with 5.06, $p < 0.01$).

A second difference approached significance: White participants also viewed the *Cognitive psychology* text passage (“professionalism” group) as “cheaper” (a rating of 2.21 vs. 1.61, $p = 0.02$). No other statistically significant differences were observed between White and Hispanic participants. It is unlikely, therefore, that participants’ ethnicity had a substantial effect on their perception of text passage persona.

Analysis of the gender data revealed a different pattern. While the text groupings that emerged matched those for all participants, the loadings differed slightly. For female participants, both the *Smithsonian* text and the *TV guide* text correlated with two factors: the *Smithsonian* passage fit in both the “professionalism” and the “friendliness” groups, while the *TV guide* passage fit with “professionalism” and “violence.” For male participants, each of the text passages had a high correlation with only one group.

Even the two texts that straddled groups in the analysis for all participants loaded on only one factor for males: the *Palomino* text had a high negative correlation with “violence,” but was not perceived by males as high on “friendliness”; the *Shape magazine* text loaded high on “profes-

sionalism” but was not as high on “friendliness.”

The subsequent ANOVAs revealed some significant differences between female and male participants. Most of the significant differences were observed for the “professional” text (the *Cognitive psychology* passage); none were obtained for the “violent” text (*Rainbow six*). On average, females rated the *Cognitive psychology* passage as less “elegant,” but also less “sloppy”; less “pretentious,” but also less “serious.” They rated the “friendly” text passage (*Newsweek*) as less “cheap” and (approaching significance) more “playful” (see Table 9 for mean ratings and significance levels).

Thus, gender does appear to play a role in readers’ perceptions of text passage persona, supporting the contention that males and females may approach the same text differently (Crawford and Chaffin 1986; Edelsky 1977). However, the gender differences in the data are not extensive enough to establish a pattern that allows speculation about their causes.

I performed additional ANOVAs to determine whether there were any effects due to reading rate or reading comprehension. I grouped the data by quartile and compared the top and bottom quartiles for both reading rate and reading comprehension. For reading rate, only one attribute rating approached significance for the *Rainbow six* text passage (“violence” group). On average, participants who read faster rated the *Rainbow six* passage as “cheaper” than those who read more slowly (a mean rating 3.80 vs. 2.45, $p = 0.02$).

Two ANOVAs revealed significant differences between groups with differing reading comprehension scores: on average, participants with better comprehension scores rated the *Newsweek* passage (“friendliness” group) as less “playful” and more “sloppy.” The difference between the high and low comprehension groups also approached significance for the *Cognitive psychology* text passage (“professionalism” group): on average, the participants with better comprehension scores rated the *Cognitive psychology* text as less “loud” (see Table 10 for mean ratings and significance levels).

While reading comprehension level may play a role in the perception of text persona, the differences revealed by the Study 2 analyses are few in relation to the overall number of comparisons made.

Discussion

Study 2 provides strong evidence that people do consistently ascribe particular personality attributes to particular passages of text. Additionally, and not surprisingly, the data suggests that perceptions of text persona may be shaped in significant ways by demographic factors.

The text passages used for the study sorted into three distinct categories: "professionalism," "violence," and "friendliness." It seems likely that the categories will vary with the texts chosen; a different set of texts may result in an entirely different set of factors. Additionally, the complexity of text persona further complicates sorting text passages into neat, mutually exclusive categories. That is, the persona readers ascribe to texts most probably is determined by the language of the text, the style in which it is written, the topic on which it focuses, and the purpose and audience for which it is intended. Given such a complex set of interacting factors, it seems reasonable to expect overlap between text persona categories. Some overlap notwithstanding, clear categories emerged for the texts in Study 2.

While text passage persona was not significantly affected by World Wide Web use and reading rate, ethnicity, gender, and reading comprehension did play a role. The differences between White and Hispanic participants were limited, but they are sufficient, particularly when taken with the patterns that emerged in Study 1, to merit additional investigation. The gender differences were more substantial, supporting the notion that males and females use and interpret language in different ways. Finally, the differences between reading comprehension groups are intriguing; they do not establish a pattern that would allow us to speculate about their causes, but they clearly suggest that readers of different abilities may interact with texts differently.

CONCLUSIONS

The objective of this project was to begin to address the lack of experimental studies examining the rhetorical impact of typography. More specifically, my goal was to explore empirically the practitioners' lore that suggests that typefaces have personas. Additionally, I investigated whether this hypothesis also held true for passages of text.

The data from Studies 1 and 2 provided strong evidence that readers do consistently ascribe particular personality attributes to particular typefaces and text passages. The typefaces and texts used in the project separated into clear categories according to their personas, and the differences between the categories were substantial. The Study 1 results thus provide strong support for the speculative body of literature that argues that typefaces have personas. Additionally, the data supports theoretical perspectives that suggest that visual language is analogous to verbal language in carrying connotations.

IMPLICATIONS AND DIRECTIONS FOR FUTURE INQUIRY

This project was designed to offer a starting point for future inquiry, to provide a foundation for experimental investigation of visual rhetoric—specifically, the rhetoric of typography. It accomplishes this goal by providing empirical evidence for theoretical perspectives on visual rhetoric as well as corroboration of centuries of practitioners' lore.

At the very least, then, these results ask us to approach the document design process as a problem-solving task in which decisions regarding visual language are made as carefully as are decisions about verbal language. At a more global level, the results of this project suggest the potential importance of visual rhetoric. If readers perceive a document to carry distinct verbal and visual messages, then how may conflicts between those messages shape readers' interactions with a document?

Perhaps the most significant implication of this project for the field of technical communication, however, lies in the wealth of questions it raises regarding typography, one relatively narrow aspect of visual rhetoric. The project was intended not to produce a set of formulas or prescriptive rules for typeface usage, but rather to gather a large base of information to serve as a foundation for future inquiry. The methodology served this purpose well, but in doing so precluded gathering information about the "why" of the results.

Knowing the reasoning behind readers' persona judgments of typefaces and text passages would certainly enrich our understanding of visual and verbal rhetoric and thereby allow for more effective decision-making as we design and write.

The participants themselves also serve as a limitation to the project. Like many studies in the social sciences, this project relied on students from an introductory psychology course. Although these students represent a broad cross-section of the undergraduate population, they are not a random sample of that population, nor are they truly representative of a population outside the university community. Would conducting a similar project with a different sample yield different results? Would it reveal more significant ethnic and gender differences?

New Mexico State University is situated in a border community in which White and Hispanic cultures interact and blend; these two ethnic groups may thus exhibit more commonalities than one would expect elsewhere. It may be that conducting a similar study in a nonborder region may lead to very different results regarding ethnicity. Identifying such cultural differences would be very beneficial given recent and continuing growth in international technical communication.

Another useful direction of inquiry would be to conduct this project with both laypersons and design experts to compare the responses. If such testing revealed signifi-

cant differences, the results may provide insight into how we can better assist technical communicators in making the transition from novice to expert.

Yet one more direction for future research lies in the interaction between technology and typography. Given a growing emphasis on electronic communication, a similar study using online typefaces and texts would be particularly timely. Additionally, it would be interesting and useful to investigate whether extensive computer use changes individuals' sensitivity to visual rhetoric.

While I have touched on several directions for additional research here, there are countless others. I have focused on a social-scientific approach to studying the rhetoric of typography, but typography is only one relatively narrow area of visual rhetoric, and the social-scientific approach is only one means of inquiry. My hope is that this project—and those that may grow from it—will serve as a starting point for developing a broader understanding of visual rhetoric and of the ways in which visual and verbal rhetoric intersect and interact. **TC**

ACKNOWLEDGMENTS

I would like to thank the Society for Technical Communication for supporting this project through a research grant. I am also indebted to Dr. Douglas Gillan, of the New Mexico State University Department of Psychology, for assisting me with statistics and for making the resources of his laboratory available to me. Finally, I am grateful to Dr. Stephen A. Bernhardt for his support and encouragement.

REFERENCES

- Arnheim, Rudolph. 1969. *Visual thinking*. Berkeley and Los Angeles, CA: University of California Press.
- Bartram, David. 1982. "Perception of semantic quality in type: Difference between designers and nondesigners." *Information design journal* 3, no. 1:38–50.
- Baylis, Clarence H. 1955. "Trends in typefaces." *Printer's ink* 252, no. 5:44–46.
- Beamer, Linda. 1992. "Learning intercultural communication competence." *Journal of business communication* 29, no. 3:285–303.
- Benson, Philippa. 1985. "Writing visually: Design considerations in technical publications." *Technical communication* 32, no. 4:35–39.
- Bringhurst, Robert. 1996. *The elements of typographic style*. 2nd ed. Point Roberts, WA: Hartley and Marks, Publishers.
- Brinton, James E. 1961. "The 'feeling' of type faces." *CA magazine* 3:43–45.
- Burt, Cyril L. 1959. *A psychological study of typography*. Cambridge, UK: Cambridge University Press.
- Crawford, Mary, and Roger Chaffin. 1986. "The reader's construction of meaning: cognitive research on gender and comprehension." In *Gender and reading: Essays on readers, texts, and contexts*, eds. Elizabeth A. Flynn and Patrocínio P. Schweickart. Baltimore, MD: Johns Hopkins University Press, pp. 3–30.
- Edelsky, Carole. 1977. "Acquisition of an aspect of communicative competence: learning what it means to talk like a lady." In *Child discourse*, ed. Susan Ervin-Tripp and Claudia Mitchell-Kernan. New York, NY: Academic Press, pp. 225–243.
- Foltz, Peter W., Walter Kintsch, and Thomas K. Landauer. 1998. "The measurement of textual coherence with latent semantic analysis." *Discourse processes* 25: 285–307.
- Johnson-Sheehan, Richard, and C. Baehr. 2001. "Visual thinking in hypertexts." *Technical communication* 48, no. 1:22–30.
- Kim, Jae-On, and Charles W. Mueller. 1978. *Introduction to factor analysis: What it is and how to do it*. Beverly Hills, CA: Sage Publications.
- Kinross, Robin. 1992. *Modern typography: An essay in critical history*. London, UK: Hyphen Press.
- Kostelnick, Charles. 1990. "The rhetoric of text design in professional communication." *The technical writing teacher* 17, no. 3:189–202.
- Kostelnick, Charles, and David D. Roberts. 1998. *Designing visual language: Strategies for professional communicators*. Needham Heights, MA: Allyn and Bacon.
- Kruskal, Joseph B., and Myron Wish. 1978. *Multidimensional scaling*. Beverly Hills, CA: Sage Publications.
- Laliberte, Jadette. 1987. "La typographie moderne: Conséquence de la révolution industrielle?" *Communication et Langues* 72, no. 2:60–76.
- Landauer, Thomas K., Peter W. Foltz, and Darrell Laham. 1998. "Introduction to latent semantic analysis." *Discourse processes* 25:259–284.
- Lanham, Richard A. 1983. *Analyzing prose*. New York: Charles Scribner's Sons.

- Lanham, Richard A. 1993. *The electronic word: Democracy, technology, and the arts*. Chicago, IL: University of Chicago Press.
- Osgood, C. E., G. J. Suci, and P. H. Tannenbaum. 1957. *The measurement of meaning*. Champaign-Urbana, IL: University of Illinois Press.
- Parker, Roger C. 1997. *Looking good in print*. Research Triangle Park, NC: Ventana Communications Group, Inc.
- Poffenberger, A. T., and R. B. Franken. 1923. "A study of the appropriateness of type faces." *Journal of applied psychology* 7:312-329.
- Rainey, Kenneth T. 1997. "Visual communication: The expanding role of technical communicators." In *Foundations for teaching technical communication: Theory, practice, and program design*, ed. Katherine Staples and Cezar Ornatowski. Greenwich, CT: Ablex Publishing, pp. 231-242.
- Rowe, Camille L. 1982. "The connotative dimensions of selected display typefaces." *Information design journal* 3, no. 1:30-37.
- Sassoon, Rosemary. 1993. "Through the eyes of a child—Perception and type design." In *Computers and typography*, ed. Rosemary Sassoon. Oxford, UK: Intellect Books, pp. 178-201.
- Secrest, James M. 1947. "Personalities in type designs." *Printer's ink* 218, no. 7:52-53.
- Shushan, Ronnie, and Don Wright. 1994. *Desktop publishing by design*. Redmond, WA: Microsoft Press.
- Spencer, Herbert. 1969. *The visible word*. 2nd ed. New York: Hastings.
- Spiekermann, Erik, and E. M. Ginger. 1993. *Stop stealing sheep and find out how type works*. Mountain View, CA: Adobe Press.
- Sullivan, Patricia. 1991. "Taking control of the page: Electronic writing and word publishing." In *Evolving perspectives on computers and composition studies*, eds. Gail E. Hawisher and Cynthia L. Selfe. Urbana, IL: NCTE, pp. 43-64.
- Tannenbaum, Percy H., Harvey K. Jacobson, and Eleanor L. Norris. 1964. "An experimental investigation of typeface connotations." *Journalism quarterly* 41:65-73.
- Thrush, Emily A. 1997. "Multicultural issues in technical communication." In *Foundations for teaching technical communication: Theory, practice, and program design*, ed. Katherine Staples and Cezar Ornatowski. Greenwich, CT: Ablex Publishing Corporation, pp. 161-178.
- Tschichold, Jan. 1991. "Graphic arts and book design" 1958. In *The form of the book: Essays on the morality of good design*, tran. Hajo Hader, ed. Robert Bringhurst. Point Roberts, WA: Hartley and Marks, pp. 8-11.
- Warde, Beatrice. 1956a. "The crystal goblet, or printing should be invisible." In *The crystal goblet: Sixteen essays on typography*, comp. and ed. Henry Jacob. Cleveland and New York: World Publishing Company, pp. 11-17.
- Warde, Beatrice. 1956b. "On the choice of typefaces." In *The crystal goblet: Sixteen essays on typography*, comp. and ed. Henry Jacob. Cleveland and New York: World Publishing Company, pp. 137-149.
- Wendt, Dirk. 1968. "Semantic differentials of typefaces as a method of congeniality research." *The journal of typographic research* 2:3-25.
- Wheildon, Colin. 1996. *Type and layout: How typography and design can get your message across—or get in the way*. Berkeley, CA: Strathmoor Press.
- White, Jan V. 1988. *Graphic design for the electronic age: The manual for traditional and desktop publishing*. New York, NY: Watson-Guipill Publications and Xerox Press.

EVA BRUMBERGER is an assistant professor at Virginia Tech, where she teaches in the professional writing program. She completed the studies discussed in this article as part of her dissertation research in the Rhetoric and Professional Communication program at New Mexico State University. Before pursuing her doctorate, she taught at the University of Wyoming. Her prior experience also includes adjunct teaching at three other institutions and working as a technical writer and editor on a full-time and freelance basis. Her research interests include visual rhetoric, document design, visual communication pedagogy, and technical communication pedagogy. Contact information: ebrumber@vt.edu