1	The research study that I'm presenting today concerns how people perceive typefaces. Amy's presentation about the personality of type was great—Kanye West's quote "I just get emotional over fonts!" –that was great! My research is a decidedly academic take on that subject. Typography is both an art and a craft, that, according to Wheildon (1996), has little or no empirical evidence to support its largely intuitive practice. But typography is not just about words on the page. Designers communicate both WITH words and withOUT words. Its tricky to communicate without words because you run the risk of not being understood in the way that you intended—but we do it all of the time. Design students learn that type somehow communicates a message through its very design. So HOW DO we communicate without words? That question is at the crux of this study.
2	Emotion touches and colors nearly all of human experience. It is well established that aesthetic visual art produces an emotional response, but the connection of emotion and graphic design had not been empirically established. In 1974, around the time when new forms of medical imaging were being developed, Rudolph Arnheim theorized that "Every aspect of a visual experience has its physiological counterpart in the nervous system." Today, it is nearly a requirement for researchers to work in interdisciplinary groups. Neurologists like Ramachandran are connecting the study of art aesthetics to vision and emotion.
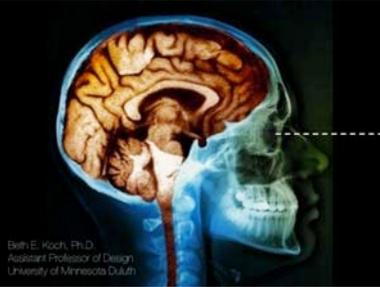
Brain 3	The brain is programmed to notice change—*anything that is different* from everything else in the visual field. The brain contains four distinct and parallel systems to detect different attributes of vision: motion, color, form, and positioning attributes. Physiologist Semir Zeki proposed that it may not be a coincidence that the ability of the artist to abstract the essential features of an image and discard redundant information is essentially identical to what the visual areas themselves have evolved to do.
"Ultimately the key to understanding all visual communication lies in the neurological workings of the brain" (Barry, 2005). 4	At Boston College, Ann Marie Barry developed a theory she called Perceptual Aesthetics, a human-centered visual communication theory that framed my study. She wrote that… <READ SLIDE> Barry's theory considered more than just the psychology of vision, it moved us from vision, to emotion and the brain, and on through to behavior.
Not much is empirically known about how people comprehend visual systems such as graphic design and typography. 5	<READ SLIDE> Today's advances in medical imaging technology have shown precisely how emotion mediates vision, and how the structures of the brain coordinate and ultimately affect our behavior.

People seem to intuitively decipher the meaning of typefaces (Van Leeuwen, 2005) 6	As infants, most human beings learn about the world through visual means. Even though people develop their own sense of beauty, we also develop a socially-shared sense of aesthetics. It is common for university students in typography classes to express difficulty in knowing how to select typefaces to communicate specific meaning, most people… <READ SLIDE>
Designing Emotions Pieter Desmet, Industrial Design Professor Delft University of Technology 8	In 1999, product and industrial designers initiated research in design and emotion in their quest to understand what attracts people to certain product designs and not others. Pieter Desmet, an Industrial Design Professor at the Delft University of Technology, was the first to develop a study of product emotions using an interactive survey technique. My study adopted his validated survey tool as a starting point – as one component in a new method for approaching the perception of typography.
"I wonder if we need to temporarily put aside our talk of brand, strategy and execution, and consider our power to influence emotion." Eric Karjaluoto smashLAB 9	Of all of the distinct design disciplines, (industrial, fashion, typography, graphic, web,) every area of specialty has ONE COMMON DENOMINATOR: human beings.
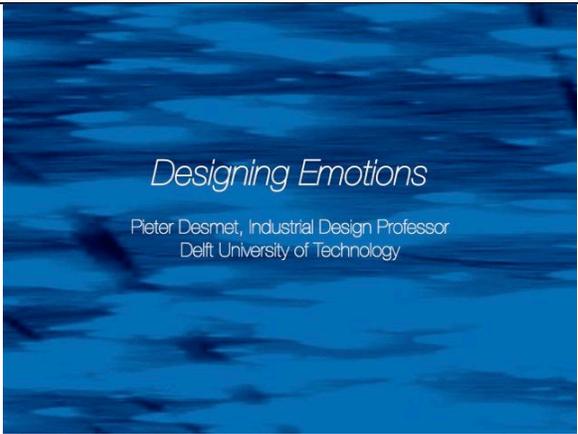
Slide	Notes
People respond emotionally … to art (Wittgenstein, 2005), to design (Norman, 2004), and to products (Desmet, 2002). To begin to understand how people respond emotionally to individual design features, this study investigated how people interpreted different typestyles (alphabet designs). 10	<READ SLIDE> Recent research with art and photographic images indicates that vision stirs emotion pre-consciously (O–Miranda et al, 2003). That means humans respond to things in the environment even WITHOUT paying attention. For instance, we can decide whether we like or dislike web pages after seeing the page for less than 50 MILLIseconds.
11	Marketing and consumer behavior studies have also shown that those milliseconds determine whether we will consequently buy or try a brand or a product! What I wanted to know about is WHAT are we responding to? Can design elements themselves stir emotion?
Q1: Does viewing specific typefaces produce emotional responses? Q2: When viewing typestyle designs, do all people feel the same emotions? Q3: Are certain emotions predominantly associated with the formative design features of typefaces—differences in classification (serif or sans serif), terminal construction (angular or rounded), character width (condensed or extended), and weight (light or bold)? 12	My study asked these three research questions: <READ SLIDE>
15	The categories of Classification, Weight, Character Width, and Terminals are terms we commonly use to describe type features that can be used and varied to help convey meaning.

STUDIES ABOUT THE MEANING OF TYPEFACES 16	The earliest study about the meaning of typefaces was conducted by Poffenberger & Franken in 1923. Since then, 13 studies about type design have been conducted by researchers from a wide variety of disciplines, nearly all of them outside the field of graphic design. For example Linguistics and Journalism have several studies each.
Breadth of terminology: Congeniality (adjectives) Personality characteristics Emotional connotation Connotative messages Emotional meaning Dress Descriptions 17	There are several difficulties with the current scientific literature about typography – including What are we studying? <READ SLIDE>
Product emotion research University of Delft, Desmet (2002) VALENCE OF EMOTIONS 	ID	Positive Valence	ID	Negative Valence
D1	Desire	D2	Disgust ✔
S1	Satisfaction	D3	Dissatisfaction
P	Pride	S2	Shame ✔
H	Hope	F2	Fear ✔
J	Joy ✔	S3	Sadness ✔
F1	Fascination	B	Boredom | 18	Psychologists have determined that the primary emotion states are anger, fear, joy, disgust, sadness, shame, and guilt. The chart shows emotions that were validated for use in Desmet's product design research. Are these the "right" consuming emotions for Americans? We may have to adjust those. But we measure emotion in two ways: Valence — whether there is a positive or negative value direction to the emotion, and Arousal — how strong the temperature of the effect is.

Breadth of presentation formats:

Introduction to the Declaration of Independence
— Poffenberger &Franken (1923)

"Now is the time for all good men… " — Davis & Smith (1933)

Artificial languages "ere sasesuth wid oteren bo" — Weaver (1949)

Format to approximate English — Wendt (1968)

Alphabets (ABC… abc… ?+!@…) — Kastl &Child (1968),
Tannenbaum et al. (1964), Benton (1979)

"Lorem ipsum" greek —Morrison (1986)

Typeface sampler — Koch (2011)

19

Next, there is no common presentation format for stimuli, but almost all these studies presented samples in some form of writing.

Many key philosophers and scientists had thought that the primary way humans acquire knowledge about the world is through language (they call it epistemological primacy).

But, as fMRI brain studies have shown, the visual system is faster at gathering knowledge about the world than language (epistemological primacy belongs to vision!!).

So just as Morrison suggested, researchers should use visual methods to study visual subjects.

In terms of research design, the reason that this is important – when humans take in visual or auditory information, in order to formulate a response, our brains must switch back and forth between right- and left-brained functioning in order to perceive something, recognize it, understand and remember it, and finally to be able to report what was seen.

The distinction between visual and verbal methods was also important to resolve in order to eliminate interactions that could occur between what we see when we read and the semantic meaning of a passage of text (this could include things like seeing design features of individual letter forms, visual patterns of headlines and paragraphs versus reading and understanding the words).

	TYPOGRAPHIC ATTRIBUTES						
	Classification		Weight		Character Width		Terminals	
TYPEFACE	Serif	Sans serif	Light	Bold	Condensed	Extended	Square	Round
1 Glypha Medium	•			•			•	
2 Helvetica Bold		•		•			•	
3 Helvetica Condensed Bold		•		•	•		•	
4 Helvetica Bold Extended		•		•		•	•	
5 Helvetica Light		•	•				•	
6 Helvetica Rounded Medium		•		•				•

Previous studies of typography lacked an orderly criterion for selecting the typefaces that would allow for generalizations (Morrison, 1986).

As a starting point, I developed a rubric of typographic attributes (or design features) to analyze the typefaces. I selected these attributes because they represent features similar to what the brain is known to respond to visually.

20	In order to help eliminate confounding variables in the designs themselves, Five of the six typefaces were selected from the same type family, (so the stimui shared the same typographic structure and many similar features) — This built-in homogeneity helped to control and isolate the variables.

THE TYPEFACES I selected were: Helvetica Ultra Light, Helvetica Bold, Helvetica Condensed Bold, Helvetica Bold Extended, Helvetica Rounded, and Glypha Medium. |
|

25 | The interactive survey method that I adopted from product design is called PrEmo. It has cartoon characters. When a user clicks on the cartoon, it animates, acting out the facial and vocal expressions and body movements of that emotion. At the same time, a graduated intensity scale appeared. Participants selected a number from 0 to 4 to indicate the intensity of the emotion response. There are no labels to indicate what emotion is being demonstrated.

Participants were told:
"To express your responses you can use a set of animated characters (see picture below)."

"Please look at this alphabet for a few seconds. Click on 'next' to continue."

"How much do your feelings about the alphabet design pictured here correspond with the feelings expressed by each cartoon? Click on the cartoons one at a time and rate your feelings for each one. Once you have clicked on each cartoon and made your choice, you will be able to move on to the next page." |
|

21 | Then I paired responses for comparison. Each pairing contained responses to typestyles that had all features alike except for one. Here are the paired typestyles:

Weight
Ultralight vs Bold |

 22	Character width: Narrow vs wide
 23	Terminals: Rounded vs squared
 24	Classification Serif vs sans serif The data were analyzed to compare responses using descriptive statistics, then paired t-Tests were conducted to establish whether emotions could be linked to typographic design features.
 26	Participants were invited from international typographic and graphic design associations. Students from the University of Minnesota were also invited via email. A convenience sample of 100 participants started the study and 42 actually completed the study. (Online surveys may have similar dropout rates)

Analysis and Findings Paired t-Tests α = .05 People respond to type designs with emotion. Certain emotions are associated with the formative design features of typefaces. 27	The study compared respondent's scores in a paired t-test and adopted an alpha level of α=.05 with a corresponding confidence level of 95%. Even though people have individual aesthetic preferences, they agreed about the emotion effects of the design examples.
1. People responded to type designs with emotion rather than indifference. 28	Overall, these were major findings from the study…
1. People responded to type designs with emotion rather than indifference. 2. People agreed about the emotions associated with specific typefaces. 29	

	And
1. People responded to type designs with emotion rather than indifference. 2. People agreed about the emotions associated with specific typefaces. 3. Certain emotions were associated with the formative features of typefaces. 30	

	This method was visual, interactive, online, and it measured both emotions and the strength of responses. The responses were then paired to compare the emotional response to individual design features. <READ SLIDE> The study also contributed evidence of the connection of emotion and graphic design, which had not been empirically established.
IMPORTANCE OF THE METHOD Avoids problems of self-report Allows report of multiple feelings and co-occuring feelings Avoids problems with cognition of language and reading Forms keystone with emotion research 31	

	This study suggests that designers should be able to use design features to shape human response behaviors and perhaps even improve the speed of visual understanding. Since sophisticated technological advances in word processing programs have provided tools effectively democratizing typography…
IMPLICATIONS For individuals For practitioners For society 32	

It is increasingly important for all people to have some degree of design understanding, not only to decipher messages, but to reciprocate with visually appropriate messages. 33	<READ SLIDE>
IMPLICATIONS For design researchers 34	There is a need for graphic design and visual communication research to: Develop new visual methodologies that utilize interactive, non-verbal response mechanisms Develop and use consistent language to describe this research area. Decide upon the best type classification system, then develop a way to quantify typographic measurements (bold-ness, etc.) Select stimuli to limit confounding features Test a wider range of type features Test a wider range of typeface designs Adopt emotion terms that have been validated by psychologists And build a robust taxonomy of the emotion effects from viewing typestyle design features

CONCLUSION

35

Since the time of the early philosophers, authors have speculated about the existence of some invisible underlying visual language that informed humans and helped us make meaning of our natural surroundings and the objects in our environment—including our artistic creations and written language.

This study hypothesized that this connection could be found from understanding how the brain processed visual features and it tested this hypothesis by examining emotion responses to typefaces.

The results of the study clearly must be viewed in context—a similar study may produce different results based on fashion trends, or culture, age of the respondents, or even circadian rhythms.

But because the results showed that people reported similar emotion responses to typographic design features, the study strongly suggests that design's underlying features represent a common visual language.

The full results of this study will be published in a forthcoming issue of the journal "Visible Language" I hope you enjoy it and I'd love to get your feedback on the article and convince a few of you to consider a career in human-centered design and typographic research! Thank You!