“Once More With Feeling”

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ABSTRACT: Donald Norman, a psychologist and computer scientist, himself, points out that “we scientists now understand how important emotion is to everyday life, how valuable.” He is commenting on recent scientific findings about emotion and cognition by cognitive scientists, psychologists, and doctors. The evidence reveals an intertwined relationship between emotion and cognition. Some of these findings include: mood as a stimulant to effective reasoning, mood as affecting the creativity of the designer, and psychological effect by aesthetically pleasing design. Scientists tell us about emotions and cognition. Then these scientific finding are being tapped by design professionals, who are already leading the way in integrating emotion and feeling in designs from automobiles to cereal commercials

This paper provides an overview of these recent scientific findings about emotion and cognition and suggests that teaching about emotion and cognition should be part of modern design education. Sensory appeals are all around us. As educators, we must be concerned with how and what our design students learn about the power of emotion in design. Students need to understand not only effective uses, but ethical uses, as well. Design education must be expanded to include what science and industry has discovered about cognition and emotion.

Key words: emotions, cognition, design

When I was little, my great aunt had a Chevrolet coupé. It was the 1960s, and the car was easily twenty years past its prime (I think she bought it just after the Second World War). I remember the car being very big. Of course, this might have something to do with me being very small. On its outside were so many curves I couldn’t count them, and on the inside there was cloth almost everywhere you looked. I just loved getting lost in its cavernous interior. The car was the color of mold, and that is what my aunt called it: “Old Moldy.” She had emotionally bonded with a car, a big hunk of green metal and cloth whose only function was to get her where she had to go. And I must have bonded with the car, too, because today I still recall virtually every inch of that automobile. I also recall some of the trips I took in that car: riding to my uncle’s wedding, Sunday excursions on the Skyline Drive, and countless trips to and from the supermarket with the big back seat filled up with bags of groceries for the trip home

As I write this I am tapping into my emotional reservoir, getting a little misty about my great aunt, happy times, and a big hulk of a Chevrolet named “Old Moldy.”

Forty years ago, I had no notions of becoming a designer, and little boys are not in the habit of intimately mapping out designed objects in their minds. Today, now that I am a designer, I recognize my auto memories as the kind that happens when emotions and cognition get together. They do this a lot. In fact, according to science, they do this most of the time. This was something we only started becoming aware of a decade or so ago. Before this scientific enlightenment, emotions did not mix well with the thinking designer. Allow emotion into the design equation and it was apt to overturn the rational citadel of the mind, and foul the pristine aesthetic and its governing philosophy. Shutter! (Postrel, p. 11).

Why do we develop relationships with inanimate objects? Why do we talk with them as if they could answer back? Why do we buy things we either don't really need or might not even like? (I often buy books based entirely on their covers). Why is it that a six-dollar wine tastes so much better in a beautiful crystal goblet? Why does an everyday, simple supper seem so special on the best china? Why do we run our fingers over the sleek lines of a sporty automobile? Why do clothes make the man (or woman)?

Well, the short answer is emotions, and science is revealing that we are better off for them. One of the reasons is the interaction of emotions and cognition. In the past, we may have viewed emotions and cognition as accidental partners, but now we know that they are necessary ones. Instead of making us irrational, emotions and cognition work to make us more alert, centered, and focused. This partnership also aids our decision-making (Damasio in Root-Bernstein, 1999, p. 6, and LeDoux, p. 157, and Pinker, pp. 371-372).

In order to function effectively, designers have had to be well acquainted with the cognitive. In light of the connection of emotion and thinking, it seems a natural next step to undertake a study of emotions and cognition. Such a study becomes even more important in an age of user-centered and experience-based design, two concerns that are so intimately tied to an understanding of how and why emotions happen and what happens when they do.

This paper is a very brief case for the necessity of including the study of emotion and cognition as a vital part of the design curriculum Some schools—mainly those with product design—already consider the nature and affects of emotion in the design process and the user's engagement with an object. Nevertheless, a thorough consideration of affects of emotion should extend into all phases of design learning. In order to make this short case for emotion, a brief mention of some of the recent findings in cognitive science and emotions is necessary.

As much as we would like to believe otherwise, we are not rational, logical beings. We might admire a Mr. Spock or Data type, but that's not who we are. If you want rational behavior, buy a computer. Oh, wait, that might not work: even some computers are being given emotions. The use of emotional speech capability and recognition (Douglas-Cowie, Campbell, Cowie, and Roach, p. 33) is moving toward implementation, and research is being done on equipping computers with life-like characters. Both developments are based on the theory that simulated human-to-human contact is preferable to humans than human-to-computer contact. (van Vugt, Hoorn, and Konijn, and Prendinger, H., Ishizuka, M).

If we are cut off from expressing our emotions in one form, we find other ways to express it. Hand gesture, facial expression, foot tapping, and pacing are all examples of non-verbal emotion communication. Sometimes, we must invent the expression of emotion. For example, email, an environment where there is no inflection to what we write. Or rather there wasn't. Enter the Emoticons. We've all seen them, the little quasi-facial expression expressed in two or three strokes of the keyboard that were born of a need to give emotional inflection to our writing: angry as >:I or happiness as :) or winking as ;) or grimacing as >: { and so on. A Carnegie Mellon computer scientist named Scott Fahlman developed them. Today a number of email systems come with a palette of full-color icons that can stand in for their keystroked forebears. (Chang and Press, pp. 4-5)

What are emotions? There are a number of definitions. Some are clinical, such as Craig's (2004) description of emotions as a subjective motivational state characterized by sensory images, feelings, or awareness of self. Some are more pejorative, such as Gratch and Marsella's (2004) definition that has emotions resulting from motivated action determined by a mental state that distorted our perceptions and influenced effective decision-making. Some researchers, such as Palkovich (2005), say the emotions are common to all of us, they are complex cognitive processes (though they differ from other cognitive processes), and they result from a stimulus. In fact, just thinking about a past

stimulus can cause the subjective experience of emotion. There are even unconscious emotional cognitive processes working to affect our feelings and we aren't even aware these processes are occurring.

So where did emotions get such a bad reputation? 2,500 years ago, Socrates advised that our minds and emotions should go their separate ways. "Know thyself," he said, in a direct appeal to the intellect, while dismissing the body with its emotional distractions. Then three hundred years ago, Descartes completely severed the mind from the body. (Oh, that pineal gland!) No wonder we have come to regard thinking and emotions as natural enemies. But Socrates and Descartes didn't have the science we have, and so they didn't know that—far from being antagonists, the brain (cognition) and our emotions are quite close, and necessarily so. Like them or not, we appear, for the moment, anyway, to be stuck with our emotions (unless Philip K. Dick proves to be correct, once again, and one day, we ingest mood pills each morning).

Emotions really are quite important to us in our everyday lives (Norman, p.8). And there is growing scientific evidence to support this. For instance, we now know that emotions release chemicals that stimulate specific areas of our brains, and aid in such things as our perceptions, our behavior, and our decision-making.

Briefly, here is what happens and what is involved. The amygdala (Latin for almond, and so named for its shape) is buried in each of our temporal lobes. It is the amygdala that contains the main circuits that supply the emotions for our experiences and signals almost every other part of the brain, including our decision-making centers, the frontal lobes. (LeDoux, p. 157, and Pinker, pp. 371-372). Upon each new or significant stimuli the axon terminals release various groups of neurotransmitters to stir the cortical cells to action, and making them receptive to signals (LeDoux, p. 289). Rather than make us irrational, emotions work with the cognitive to help us think better and function well. (Damasio in Root-Bernstein, 1999, p. 6).

Socrates and Descartes, notwithstanding, there is a rich history in the study of emotions. Aristotle considered the kinds of emotions and how words, images, and sounds affect humans. Studies in France, China, and India catalog how emotions are expressed through facial and hand gestures. Recently, a typology of emotions was compiled, citing four types of emotions: biological, social, cognitive, and moral (Buck in Marcus, pp. 30-31).

Today, in light of science, emotions and their affects of the cognitive cannot be ignored. This is true not only in design, but in other fields, as well. Here is Dr. John Burnside, Chief of Internal Medicine at the Hershey Medical Center in Pennsylvania:

> "One of our educational failures is a lack of serious recognition and attention towards the 'gut feeling' or inclination of common sense. Perhaps because this inclination is non-numerical it is glossed over as the 'art of medicine', implying passion or the primeval. But I believe it can be defined and should be taught."
> (Burnside in Root-Bernstein, 1999, p. 13).

Here is some more science speaking to the positive nature of emotions. They suggest why a consideration of emotion becomes necessary in a design education.

1. Emotions guide, enrich, and ennoble our lives and give meaning to our everyday existence. (Cacioppo, Berntson, Larsen, Poehlmann, & Ito, 2000, p. 173).

2. Emotion aids our decision making (Schwarz, p. 433). - there are studies of how firefighters rely on emotion, intuition, to make split second decisions in the midst of a danger (LeDoux, p XXX). Antonio Damasio, the renowned neurologist, has seen how closely intertwined are emotions and thinking by observing the behavior of patients who have lost their ability for emotional involvement in

decision making. Damasio noted that deprived of their emotions, the patients repeatedly failed to make good decisions. (Damasio in Root-Bernstein, 1999, p. 6).

3. Positive emotions, such as those things that give us pleasure and delight, make us function better. - In his book, “Emotional Design,” Donald A. Norman illustrates this by asking if a washed and polished car doesn’t drive better, or we feel better after a bathe and dressing in our best clothes, or if well-balanced and beautiful work tools or sports equipment make us perform better. (Norman, p. 10). Norman also asked for testimonials from individuals about products and websites they loved, hated, or were indifferent to. The responses ran the gamut between love, indifference, and hate, but

4. Emotions help us assign intangible value to things. - Susan Boztepe places Emotional value, along with Utilitarian, Social, and Altruistic, as one of the four values that design evokes. (Boztepe, 2002, and Cacioppo, Berntson, Larsen, Poehlmann, & Ito, 2000, p. 173). Kitsch items such as trinkets, mementoes, and souvenir items can accrue personal value from feelings of sentimentality (Norman, p. 46). Meaningless objects to anyone else, they are nevertheless, charged with meaning and value for us. Any executor of an estate is well aware of these items.

5. Emotion may be more vital to the success of a product than the more practical concerns (Hirschman & Holbrook in Desmet, 1982). - In many markets, products are virtually indistinguishable based on functional quality and pricing. So, if businesses want their product to stand out, and not just be a commodity based on low prices, they need to look at other ways to add value. Today, that value often comes in the way of aesthetic values (Postrel on NPR). Donald A. Norman, a psychologist, says simply that “the emotional side of design may be more critical to a product’s success than its practical elements.” (Norman, p. 5). Karim Rashid’s well-known Garbino trash cans, well manufactured and designed, is nevertheless, purchased for its pleasing curves and variety of colors (Postrel 2005 p. 57).

6. Emotions can influence the beliefs of individuals (Marsella and Gratch, p. 1). - Studies conducted by Marsella and Gratch at the University of Southern California indicate that strongly felt emotions can be employed to help discharge negative emotions and reinforce positive ones in individuals. (Marsella and Gratch, p. 2)

A consideration of emotions in a design curricula has been made necessary by the less palatable implications of the scientific findings about cognition and emotions. - As we become more aware of why we work the way we do, we are confronted with both a light and dark side of the research. This is true of the growing evidence linking emotions and cognition. Some of the positive aspects have been discussed. But what of the negative shadings? Certainly, there is always an element of coercion in a design. When does relatively benign suggestion cross over into malevolent manipulation? What are the finer ethical distinctions found in the grey between the light and the dark? Consider, for instance, the following.

The power of emotions is palpable. While we, as designers, conduct testing and compile data about the effects of emotions in the user experience in both the real and virtual worlds, industry is already employing emotions to sell their products. High-powered and high-paid consultants are making a name for themselves by advising industry on how to use emotions to add to the market share. One of the most outspoken and well-known of these consultants is Clotaire Rapaille. Chrysler was certain it had figured out the American car-buying public until they talked with Rapaille. He told them their research was mistaken because they were listening to what people said, instead of what they really felt. Some time later, the PT Cruiser, a car, was born and became an instant bestseller.

Why? According to Rapaille, it’s the ‘reptilian’ in us. This former child psychologist says we are all born with three types of brains functioning within our single brain. One is the Cortex, that which, (says Rapaille) we imagine to be the intelligent brain. The second is the Limbic brain, which is connected to our emotions. The third, but first to develop, is what Rapaille calls the ‘reptilian’, and it is about survival.

> "...terms of the way we approach people's behavior, I think you need to go beyond words, and my training with autistic children is that I had to understand what these kids were trying to tell me with no words. So, that's part of my training. How can I decode this kind of behavior which is not a word? My theory is very simple: The reptilian always wins. I don't care what you're going to tell me intellectually. I don't care. Give me the reptilian. Why? Because the reptilian always wins. (Rapaille, 2004)

Another way emotions are being used is in politics. Here's corporate consultant, pollster, and political consultant to Republicans, Frank Luntz:

> 80 percent of our life is emotion, and only 20 percent is intellect. I am much more interested in how you feel than how you think. I can change how you think, but how you feel is something deeper and stronger, and it's something that's inside you. How you think is on the outside, how you feel is on the inside, so that's what I need to understand. ... It's all emotion. But there's nothing wrong with emotion. When we are in love, we are not rational; we are emotional. When we are on vacation, we are not rational; we are emotional. When we are happy, we are not [rational]. In fact, in more cases than not, when we are rational, we're actually unhappy. Emotion is good; passion is good. Being into what we're into, provided that it's a healthy pursuit, it's a good thing. ... my job is to look for the words that trigger the emotion... We know that words and emotion together are the most powerful force known to mankind. (Luntz, 2004)

Words are not designs? Or are they? We design speech. We choose words and arrange them in a structure that makes visible our thoughts. Even so, as designers, we rely on words to aid us in choosing colors, shapes, compositions, and images. What then is the visual equivalent of "global climate change,' or 'death tax'?

Rapaille and Luntz are just two individual who have markedly demonstrated the power of emotions within the marketplace, both commercial and political. They also suggest how emotions might be used unethically. They suggest some questions we must consider. Some that come to mind include: Are there any emotions that are off-limits to a designer? If there are, then who decides, and how is enforcement overseen? Should electronic tracking be used to gauge the emotions of users and compile data on same? If this is done for whatever reason, should this data be shared? Are there age restrictions? This might be an important question in light of the amount of interactive and on-line material marketed to youth.

In the 1960s when it was suspected that subliminal images were used in advertising, there was a huge cry against advertisers. Today, we are much more sophisticated in our means of message delivery and are capable of exceeding the limits of photography and the airbrush. But do we need an 'Emotions Police,' or should something else be done?

Education is an answer. If not for everyone, then most certainly for those of us who have the power to pull on the strings of others' emotions. This is particularly true of the young learners, the future practitioners of design, and the ones who have already received a practical schooling in the pervasiveness of visual persuasion.

Studies in emotion and its uses in design already exist. They are at the top design schools, and they certainly exist in industry, where any edge in the market is sought. The focus is on knowing the user, but largely from a product and human-to-computer interface point of view. Since print is not

extinct, it is unwise to exclude them from the discussion. Design educators are, even now, continuing the debate over what should be included in a 21st-century design education. I believe that whatever shape it takes, it must include a vital and on-going study of the power and uses of emotion in design. An extended discussion of emotions and ethics must become part of this curriculum. This topic would be introduced early in the education of the young designer, with a class on emotion to be taken by design students early in their third-year. An ideal class might be team-taught by faculty drawn from cognitive psychology, ethics, as well as design. Workshops could be offered by the design think-tank schools (Carnegie Mellon comes readily to mind) where design faculty, professionals, and students. Online and offsite offerings could bring the workshops to many others, and I would expect more affordably.

"I think that the breadth of practical skills that institutions perceive their students need means that often not enough attention is given to the core thinking skills of empathy, analysis and synthesis around more complex problems." (Tim Brown, "Innovation by Design" 2003 p 4, next 4.2)

Here are some of the topics that might be addressed in a curriculum that emphasizes emotion and intuition, and why it is valuable to understand.

1. Emphasize user over author - This is design to please the user ahead of the designer. This is not to say the designer cannot take pleasure in a well-designed and user-centered object, but it does mean that the design was undertaken for the benefit of the user and not the designer.

2. Emphasize how the user assigns meaning and value to an object. - This is also design as experience, wherein meanings are linked to the objects and its use(s) and emotions are summoned (Jordan, 2000). But design for experience doesn't mean just usability; it means seeing the user as a complete individual, with thoughts and feelings (Sanders and Dandavate, 1999). Here too the designer must resist the temptation to see only the masses, but instead design for individual with real contexts in mind (Norman, 2004). People choose objects that make a visual statement about themselves. By empathizing with the user and his/her many existing relationships with an object, the designer can design objects that satisfy on a number of levels (Csikszentmihalyi and Rochberg-Halton, 1998.)

3. Emphasize how the user eventually will engage with the object and design that into the aesthetics - This is closely tied to the first item. Designers ought to design with the eventual use/activity in mind and the intuitive understanding of the user to understand the object's use. The use of the object can be explain by its design. Norman illustrates this point with a set of car seat controls. The controls are understood because they are shaped like the part of the seat to which they correspond. To design this way, the designer must have a good conceptual model, which he uses to make the object or the system images. Ideally, this system image will match the Users' conceptual image thereby making it immediately apparent to the user how the object is to be used (Norman pp 75 - 77). Consider strongly the use of participatory design. In other words, when possible, design with the user; the user often has information not available to the designer (Buchanan and Margolin, 2001.)

4. Storytelling as conduit of emotion - Story can capture the emotion of what the designer is attempting to create. The richness of the words and the structure of the narrative can aid the design. We, as human beings, understand storytelling and narrative; our life episodes and experiences comprise our life's story. We have objects onto which we've overlaid a story or turned into a character in our life's story. "Old Moldy" was a character in my great aunt's life. She probably never thought about it, but she an emotional bond with her old green Chevy.

Storytelling also helps us order, communicate, and remember experiences (Schank). We weave the pattern of our individual selves into the stories we tell about ourselves, defining ourselves but the stories we tell. Without stories, we lack a history, and so, we don't exist (Maley, p. 1). Telling stories is

as old as we are, and is the way a collective preserves its identity (Wajnryb 2003). Stories give us perspective on our current situation by allowing us to step back from ourselves (Maley, p. 3). They permit us to revisit what was so that we may better understand today.

4. Talking with clients and designers - There are times in the designer - client relationship when the language of design is necessary. It is certainly a language we have used and reused since the very early days of our design education. Much good use can be made of this specialized language. Still, it is an exclusionary language, and it can sometimes put us at odds with a client who might interpret it as one-upmanship. In this case, emotion might be used to find common ground. For instance, let's say the designer's analysis of the user suggested that a romantic association with color was important. Then instead of arguing that yellow was necessary because it is aesthetically pleasing with violet, cast the discussion in terms of color based on romantic emotion: a moon floating in a violet sky of a summer's early evening. This language is also helpful when designer talk with other designers, especially when using storytelling to understand the user and the user's relationship to the object.

5. Aiding in the selection and reading of images - We live in an age where catalogs change cover in order to speak more specifically to a particular segment of the audience. Images have power to appeal, as well as, inform. Analyzing images for emotional content is at least as important as analyzing them for information. No image is completely devoid of an emotional story (Bonnici, p. 25). Designers must understand how to read an image and anticipate how others might read it. This an education in ethics, as well as practical use. What is the story that is told, and why is it being told? Why were these actors chosen? What does their body posture and facial expressions communicate? What do the plastic items tell us? What symbolic meanings are being used? What do all of these things add up to? An emotional tone of voice is being employed in a well-chosen image(s); the designer must be able to hear it.

6. Understanding what happens when there are no words. - very often, an object communicates non-verbally—there are no words to help guide our intellect. When this occurs, emotion and intuition can be relied upon to give the user insight into an object's meaning. Body language, sound, space, touch, and smell are all evocative. They appeal to our experiences, especially our emotions of those experience, for it is emotion that helps imprint an experience vividly on our memories (Bonnici,pp. 24-37). As with the images, a designer must hear the emotional tone of voice coming from these non-verbal elements.

7. Understanding Synesthesia - Synesthesia is a translation of one sense into another. Feeling a color, smelling a texture, or hearing a flavor can be employed in designing. Designers can learn to use this faculty of translation to add complexity to the designed object. Can a sweeping, open, high-ceilinged interior space make us feel we are in the countryside? Can a bright orange digital music player tastes like a big scoop of tangerine gelato? This faculty of translation offered a two-out-of-one appeal to our senses and our emotions.

In their paper, "E-motion: Exploring the Emotional Design of Computer Mediated Visual Communication," Chang and Press write:

> "What drives technology and determines the forms into which it will be designed and used? To paraphrase Bill Clinton's election mantra: 'It's the emotional, stoopid'. It is when technologies engage with the emotional richness and depth of life experience and the inherent desire of people to communicate and be communicated with meaningfully, that they become transformed into useful, usable and desirable products and systems."

Human emotion and cognition are ancient, so it might be wrong to label the current concern for emotion in design as a brave new world. Yet it is. We know more than every before about the partnership of emotion and cognition. It is a world we should welcome for all the positive potential it offers a designer in making an object and for the delight it can bring to a beholder of that object. There is concern about the misuse of emotion, where ethical use slips into naked manipulation. For this reason alone, design educators must teach the power of emotion and cognition in design with an eye toward character and integrity.

Focus on the promise of emotion, but be aware of its power.

Forty years ago, there was a big green car that still exercises a powerful emotional hold on me. I dare say you have your own version of a big green car, too, whether it is in the past or the present.

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