Reality: What’s that?

I paint my own reality ~ Frida Kahlo

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Professor, Psychology
Suggested Reading list:


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Faculty Lecturer of the Year
2011–2012

April 17, 2012


“Does it EVER occur to you that you can’t do something?” asked Vera’s friend, Krista Jarrard once, in a moment of frustration. “No, it never really does…” answered Vera after some thought.

Vera’s view of reality was molded by strong women in her early life, including her mother, Donna Jean, her grandmother, Vera Pauline and her aunts, Carla and Tona. They instilled in her the notion that anything was possible through learning, hard work, dedication, and determination (and being blonde didn’t hurt the cause either!)

Qualities of astute analysis developed early for Vera – she was asking “Why?” at every turn. She noticed that girls were not allowed to help in her elementary school’s lunch line. Of course, she challenged this set-up. When her third/fourth grade teacher, Mrs. Reeder, told her she could do the boys’ job of working in the lunch line serving food, she was off and running, until she passed out in the green beans from heat stroke!

When her Del Vallejo Junior High Home Economics teacher, Mrs. Hall, encouraged her to “sew anything she wanted.” Vera didn’t just sew an apron, but created a flaming red pair of cuffed shorts with suspenders, and the fashion designer was born!

When girls were not allowed to take wood and metal shop in junior high, Vera rounded up a group of girls and petitioned to enroll in “shop class” – although they all had to agree to wear hairnets! She has been in love with power tools ever since!

Lessons learned? That there are always bumps in the road, that the possibilities combined with creativity are endless, and that K-12 rules were really just “suggestions.”

When Vera wanted to go out for sports in high school, and when cheerleading and field hockey were the only sports open to girls in those pre-Title IX days, Vera took the bait and earned the position of Head Faculty Lecture of the Year 2012

References


Cheerleader for two years…but also played on the men’s water polo team! And when representatives from the psychology department at CSUSB came to Pacific High her senior year, Vera made the decision to attend CSUSB rather than UCLA and began professional friendships that impacted her professional career.

Lessons learned? That learning, hard work and dedication were very important, but it was also important to explore the possibilities!

In 1974, at the age of 17, Vera enrolled at CSUSB as a psychology major, and became the first person in her family to attend college. She enrolled in a statistics and research class offered by a new CSUSB faculty member, Dr. Kathy Pezdek, and her academic course was set. Dr. Pezdek gave Vera the encouragement to further develop her analytical skills. Her first research publication came as an undergraduate under the guidance of Dr. Pezdek as second author. Since Dr. Pezdek’s specialty was in Cognitive Psychology and Vera’s major interest was Social Psychology, she was encouraged to seek mentorship under Dr. Gloria Cowan. Through Dr. Cowan’s guidance, Vera was able to start her career research path in Social Psychology with an emphasis in gender studies. Vera received her BA in Psychology in 1978 and her Masters degree in Experimental Psychology in 1979 from CSUSB graduating with honors.

With the encouragement of these two strong women, Dr. Pezdek and Dr. Cowan, Vera applied to Chaffey College in 1980 as a one-year sabbatical replacement (yes, we used to have those positions...) for Professors Ken Koenigshofer and Stanley Waldrop. In those days, Vera had plans to work for the Rand Corporation or the US government as a researcher, but she fell in love with the classroom. Teaching was amazing! This experience was so incredible that she applied for a fulltime position at Chaffey and has been teaching here continuously since 1981 as it became her true calling. As she likes to say, it is really the only adult job she has ever had! During her time at Chaffey, she attended Claremont Graduate University, Ph.D. program in Psychology (working with Dr. Barbara Gutek). And harkening back those early days of Home Ec with Mrs. Hall, Vera followed her interests in fashion design and earned a degree in Fashion Design from FIDM in Los Angeles…and yes, it’s true…she danced on Soul Train from 1987 –1992.

Lessons learned? Do what you love, follow your passions, do the unexpected, be a lifelong learner, and life never gets boring or old!

She has been on too many committees to count, held many positions that no longer exist, given/attended countless seminars, taught over 25 different Social processing and learning happen in part by internalizing our subjective interpretations of other people’s beliefs, goals, feelings and actions, and vicariously experiencing these in some ways as if they were our own. In short, our personal experiences through development provide a platform on which to understand and relate to the thoughts and actions of other people. Our realities must include thoughts, emotions and abilities from all facets of our minds.

I am sure, given some deep thinking time (after all the deadlines are met!) all of us can figure out ways to more fully engage the anterior insulas of our students and help them (and possibly ourselves) to find some balance. If the focus is always outward, they do not have time to daydream or have idle time to mull things over and integrate them together. For instance, we can start to tie together the strategies of visual and performing arts with those in math and English. It’s not as difficult as it sounds to work fashion and art examples into a statistics curriculum. Try asking the students for examples of empathy in regard to whatever it is they are learning. If they can’t come up with any examples and are staring back at you after you’ve waited more than three seconds then just maybe we need to send them on journeys to find some pertinent examples and keep doing so until they can find them! Emotion and cognition are intertwined and involve interplay between the body and various facets of our minds.

I don’t want students of the world to continue to, “… draw conceptual boundaries around entities that we easily perceive, and in so doing we carve out what seems to us to be reality,” Hofstadter wrote. “The ’I’ we create for each of us is a quintessential example of such a perceived or invented reality, and it does such a good job of explaining our behavior that it becomes the hub around which the rest of the world seems to rotate.” Douglas Hofstadter in his 2007 book I Am a Strange Loop.

Truly “educated” adults can move between these various neural networks easily, have an optimistic outlook and a very strong sense of self and have a clear vision of their own realities. I hope we all have individuals in our lives that serve to “educate” us.

At Chaffey a few come to mind, Don Wargin, Michael Alexander, Christine Flores, Eva Rose and Kelly Ford. I’m personally striving for that “education” on a daily basis…any help you’d like to offer will be greatly appreciated!
those skills by integrating them into our curriculum at all levels of education. Emotions involve the self and the body, and so should schools (Immordino–Yang, 2009). You may be thinking that teaching these skills is more of a “family” or parental duty. The students born in the early nineties are now becoming parents who were also “raised” in this skewed educational system. How can they teach what they were not taught?

We cannot solely place this on the backs of the K-12 teachers. “Great,” you’re thinking, “one more thing I have to be responsible for!” Fortunately, most of us already do many things to activate both neural networks in our students and our co-workers. We just need to consciously do more of it. I also believe there is one important place we can start. We can allow for more questioning, as well as deep-thinking time to formulate questions and answers. This is especially true for higher cognitive questions, the so-called open-ended, interpretive, evaluative, inquiry, inferential, and synthesis questions. This impassioned modeling must apply at all levels of an institution. We need to allow students to question seemingly unfair policies and procedures and we should have very clear, well thought out answers to those questions prepared or have them answered within a reasonable time frame. This should occur both inside and outside the classroom. **We need to model this behavior by allowing employees to question policies and procedures of the administrators and administrators of the Governing Board. We need to clearly demonstrate that questioning when we feel something (even when that may be dissent) is not disloyalty.** For a great, impassioned treatise on this topic see the 1993-1994 Faculty Lecturer, Maura O’Neill’s presentation *On Being a Person of Passion in Academia.* http://www.chaffey.edu/fac-handbook/b/pdf/1994MauraO%27Neill.pdf. It will cause some action in your anterior insula!

Along with how to do well on a multiple-choice test, we also need to train students to engage in deep, critical thinking time (albeit any thinking time would be a good thing to develop and practice). The average time an instructor allows for a student to think about an answer after asking his/her class a question is one second or less. Just increasing wait-time beyond three seconds is positively related to increases in the amount and quality of evidence students offer to support their inferences (Honea, 1982). How much “thinking time” do we allow in our classes? How many times when we do allow “time for thinking” do students immediately start taking out their smart phones? How soon are those deadlines set? Yes, we have a problem here…

Vera’s passions outside Chaffey include anything Italian, especially the Grand Canal in Venice. She revels in great vintage finds, although has had more than one rude awakening from the realization that the things she wore in high school are now great “vintage” finds! Vera loves reading Brazilian lyricist and novelist, Paulo Coelho, a great cup of espresso and the artwork of Frida Kahlo.

So many people have served as her mentors and friends in life and at Chaffey. While there are certainly too many to name here, she would like to send special thanks and acknowledgments to all those persons aforementioned, as well as Bea Rose, Carol Sayles, Chris Flores, Eva Rose, Marie Boyd, Joy Haerens, Ardon Alger, Orville Clarke, Kelly Ford, Mamta Agarwal, past and present colleagues in the CSUSB & Chaffey psychology departments, her creative colleagues in VPA, Martin Fung, Erik Pipins, Krista Jarrard and, of course, her always supportive and creative three sisters, Donarae, Shireen and LeeAnne. You have all served to make me a better instructor, a better person and profoundly shaped my view of reality.

“We don’t see things as they are, we see them as we are.” - Anais Nin
Faculty Lecture of the Year

Reality: What’s that?

“Thoughts Happen. A lot. A few slip into an eddy in the stream of consciousness where they swirl around for a bit, allowing us to observe them with a kind and curious eye, and with luck a bit of humor, before they make their way downstream again. A very few we fish out and choose to act upon, and those are the ones that create our reality.” Louise Julig, (2008, italics mine)

First of all, I’d like to send a heartfelt thanks to all of my colleagues for this high honor. I sit in awe of those who have preceded me as Faculty Lecturer of the Year, and I’m sure there will be many more great presentations in the future. While it is a daunting task, it is truly a labor of love. There are many people at our college who have helped me navigate this journey and they are too numerous to mention here. I trust that most of you know who you are. However, two women that I would like to thank very publicly are Dr. Kathy Pezdek and Dr. Gloria Cowan. It is because of the guidance and mentoring of these two professors very early in my academic career, and later as I began my professional career here at Chaffey, that I am here before you today.

I’d also like to say a special thank you to my supportive, loving family as well as my closest loved ones Erik, Martin and Krista for their support and being here to share this day. To all my former and present students in the audience today, thank you for always being so supportive and creative. All of you have contributed to my growth as an instructor and as a person. I’d also like to thank the Chaffey College Governing Board for continuing to support this wonderful tradition that began in 1969.

Choosing just one topic for a “Faculty Lecturer of the Year” one-hour presentation was, well, impossible. Several came to mind immediately, such as what had I learned in 31 years of teaching, how positive mindsets can help us learn, teaching statistics in new and interesting ways, why it is important to strengthen visual and performing arts programs and/or ten things I learned from my cat about teaching psychology. However, none of these topics really lend itself to an hour presentation. So after reading my colleague, Ken Koenigshofer’s new book, Mind Design, I thought I’d go investigate how we see reality and the self, why students seem different nowadays,

When “who are you wearing?” becomes a more important, newsworthy question than “what charitable organization do you feel passionately about” we are in trouble! I surmise this same process may also be giving rise to the increase in “bullying” and the ability to severely physically and mentally hurt others around us without much reasoning other than “s/he made me mad” or “I didn’t like her/him.” There has to be a balance here or we will all have to pay a very steep price.

We do not directly perceive another person’s reality (we are not video camcorders nor mind readers). Each of us perceives what we, alone, think and believe exists. We interpret reality all the time via mechanisms that allow us to experience social networks via other peoples’ situations in relation to ourselves. This is how we learn from the environment around us; this is how we learn social context.

The educational environment is one of the most powerful influential environments we find ourselves in during our lifetimes. A teacher is an extremely strong influence, both by personal example and through teaching of social context. We internalize our culture’s ways of understanding by learning from other people’s actions and reactions (especially those people we admire) with both neural networks. The skeletonmuscular network allows us to admire sports figures, movie stars, “reality” TV stars and to sympathize/relate with their situation. The other, more visceral network that is an internal self allows us to empathize with a guttural reaction when we view homelessness in our city and starving in Darfur. We need to be exposed to moral or social dilemmas and then strive to find ways to feel and understand them. For the most part in the last 10 to 15 years, students have not been taught to effectively recognize, feel and deal with complex social situations due to the over emphasis of the external, more automatized (less emotion laden) tasks. I truly believe this is the “change” in my students I have noticed but could not readily put my finger on. They are more distant from me, they have a more difficult time when asked about a vision for their futures, and rarely (if ever) challenge or question what I say in class. For the most part, they are reluctant to express an opinion (especially an emotional one) and would rather know what I want as an answer. While many of us complain about this “disengagement,” we need look no further than the mirrors in our offices for the perpetrators.

What Do We Do Now?
We need to teach our students to recognize the complexities of others’ situations in the social arena (physical pain and immediate situations and social, moral and internal dimensions of other’s situations) and then develop
identities with those people they would emulate. Engaging the neural network of the self is a trade-off endeavor. When the other, more external skeletomuscular system is engaged we are able to focus on external more automatized tasks. I think we all know the tasks within our current school curriculum tend to be more and more automatized. They include rote rehearsal of information and superficial memorization for standardized test taking (such as multiple choice questions timed on the computer) that require prolonged attention on certain tasks. No one is saying these methods need to totally be tossed out of school. They are useful aspects of learning. However, researchers are saying that the educational curriculum in this country has overemphasized these abilities more and more in education over the last 10-15 years. This has been done at the expense of suppressing the sense of self (the internal sense of self and personal identity) along with the ethical decision making, complex emotions, moral emotions, sense of a future, and, basically, being inspired. Could this be a factor in more students dropping out of high school and college than ever before?

Implications of our “sit up, shut up, pay attention, focus on this, focus on that, be hypervigilant in your environment” education comes at a very high cost: the neurological substrate for visceral reaction, one’s sense of self and what grounds a person in the self is diminished. The long term ethical response to the social environment that rides on that visceral reaction is switched off regularly...in essence, traded for the emotionally blunted, single minded, hypervigilant reaction that will become the more predominant skill.

We need to teach our students about recruiting a strong sense of self and reality in relation to what they are learning. They need to learn when it is appropriate to use the more external system and when to use the internal, visceral system. For example, Immordino–Yang points out that conflict resolution programs have had only mixed success in schools over the last few decades. Many school and intervention programs have tried to teach students (young and old) using this method. To those students that fight with each other, we would say, “Do you get how the other person feels? What would it feel like it this was done to you?” On the surface this should work (and had worked better in the past say in the fifties to the early seventies) but it usually doesn’t now. Why not? These students, by living in such a media rich, externally focused environment must vigilantly focus on the external. They admire those people (especially in the media) that have very good skeletomuscular skills, voices and bodies, etc. rather than focusing on developing a strong of the internal sense of self. I often hear, “I want to be just like Kobe and make lots of money!” What I don’t hear are students saying they want to be like the Dalai Lama or a Peace Corp volunteer.

brain physiology, cognitive neuroscience and its implications for education. Sure I could cover that in an hour! So I decided to leave out the ten things I learned from my cat and mixed the rest of the topics together into, what I hope, is the beginning of a conversation about rethinking how we teach and learn in our educational system based on evidence from cognitive neuroscience.

This written form of my presentation is much more detailed and lengthy than the one hour “in person” presentation. In the hopes of starting many conversations, I have decided to present the written version as if I am talking directly with you. The first person narrative works well and, hopefully, will incite you to talk with me and other people about the information herein. Understanding, even challenging, the views of others, questioning and discussion are the very basis of building one’s own view of reality.

Background
First, let me tell you a little about how the idea for this presentation was formed. I was looking for a common thread to the aforementioned interests as well as wondering what had changed over the last 30 or so years since I had been a college student. In my years of teaching I have noticed changes among the student populace, but have not really been able to put my finger on what exactly those changes have been. At first, I figured it was just me, after all when I started teaching I was the same age (or even younger) than most of the students. At that time, most of the students in my classes (~90%) were within five years of my age. Now, it has flipped with 90% being about 20 years or more younger than me! I have no idea how this happened...so, maybe the changes I noticed were just my imagination. After all, I was getting older and more removed from the students of today. But, hey, I keep up on social media, music, popular trends and I do constantly ask the students (of all ages) to tell me what is of current interest to them. Still something just seemed different about the students now as opposed to when I started teaching in 1981. I started on a journey to discover what changes, if any, I might find in our students.

As a scientist/researcher, I was well trained in the method of naturalistic observation. I still remember the class where I was first exposed to this methodology. It was Psych 300, at CSUSB with Dr. Kathy Pezdek. Here we observed a short film of a single person “behaving.” Each of us was to write down everything “viewed” during the short film (yes, film, not video). She had started us on the research road of honing the skills of objective observation. I realized how difficult that was to do! It was very clear, after this one assignment, that each of us saw different behaviors of this one person and, naively, made various (completely different) attributions for his behaviors.

Faculty Lecture of the Year

Reality: What’s that?
This was a real eye-opener for me at 18 years old. Something my mother had said to me only a few years earlier was actually true. We had been arguing about something and she stated, “Look, Verajean, the whole world does not think like you!” Needless to say I was stunned, not by the statement, but that not everyone thought like me – a revelation! Obviously, parts of my thinking (cognitive development) had not yet moved from the concrete operational stage to the formal operational stage (Piaget, 1972).

During this time in my early college education, modern cognitive psychology was still in its early stages. The Journal of Cognitive Psychology came on the scene in 1970 and was followed by the Journal Cognitive Science in 1976 (Andersen, 1995). I worked as a research assistant with Dr. Pezdek on her early basic research on picture memory. While this was certainly interesting research, Dr. Gloria Cowan was doing research in social psychology on sex role differences and perceptions. How men and women perceive the world differently just by virtue of being a man or a woman has always been an interest of mine. With a strong research and statistical background provided by Dr. Pezdek, I started also assisting Dr. Cowan and enrolling in all of her social psychology classes. With cognitive and social psychology training and interests, after graduating in 1979 with my Masters degree in experimental social psychology, I focused my career on teaching in 1980.

Over the years, I have created, adapted and applied to the classroom many of the concepts that have been published in a variety of psychological journals and books. Throughout this time I have continued to wonder: how are they thinking different from me? What is going on in their minds? How do the students process information into useful ways in their careers and life in general? Does what and how we teach make differences in their views of the world, in their realities? The key question: what changes in the cognitive landscape and social learning of the students over the last 20 years may have changed their view of reality (if it has indeed changed)?

Reality: What’s that?
Okay, so what is reality? I hope you were not expecting an answer to this question here! This age old question has been asked (and answered) by all “schools” of human thought, from philosophy to economics to religion and, most certainly, by psychology. While I’d love to delve into this concept within the realm of quantum physics (especially with the double-slit experiment) and discuss research from one of my favorite scientists, Michio Kaku, that might be a bit “out there.” However, I’m willing to go a little “out there” to discuss how psychology has viewed the “self” in our formation of our personal reality and, with the help of new brain-imaging devices, where the “self” (or reality) may “happen” in the human brain. Then I would like to what it is like to suffer. But before you can empathize with the feelings of another, you have to figure out what they are feeling (Lehrer, 2009). We generate theories about what is going on in the minds of others through engaging with them in a social context. Most of us are born with the brain capacity for empathy and “standing in the shoes” of another person, however, it is a skill that needs to be developed.

There are several interesting situations in which researchers can accurately predict when this empathic neural network can be easily switched off: The first one is when we cannot readily see a “person” either because they are invisible to us: physically distant as in being in another room or, dare I say, on the other end of a computer conversation. Another situation is when we are just shown statistics about a situation that should cause empathic feelings such as the number of children that are starving in Darfur, how many children die by age two, etc., that is not accompanied by any pictures of the children. However, my favorite situation has been found by University of California, Berkeley psychologist Dacher Keltner. He found that people with power act just like patients with damage to the emotional neural network. He found that people in positions of power and authority within their organizations (oh say, administrators in colleges and professors in classrooms…) become very impulsive and insensitive which is not exactly inspiring for others to follow (Keltner, 2008). As Mother Teresa put it, “If I look at the mass, I will never act. If I look at the one, I will” (as cited in Lehrer, 2009).

More recent research by neuroscientist, Dr. Tali Sharot outlined in her book, The Optimism Bias (2011), has also highlighted how the brain may generate the tendency to engage in the projection of positive future events, suggesting that the insula area modulates activity in that it is involved in emotional processing and autobiographical retrieval to create positive images of the future (optimism).

While evolution has primed us to deeply care, the activation of these neural networks at appropriate times comes from learning in our environment as we develop, as we are emotionally engaged in that learning, and as we are personally interacting with other people.

Implications for Our Educational System
It appears that we have functionally subdivided brain areas within the insula for particular types of learning. When a person engages the visceral internal network, there is activation of the brain areas that give rise to consciousness and awareness of the self and deep emotions. We need each student to identify his/her “sense of self” with what s/he is learning, and build

Reality: What’s that?
You are standing on a footbridge over the trolley track. You see a trolley racing out of control, speeding toward five workmen who are fixing the track. All five men will die unless the trolley can be stopped. Standing next to you on the footbridge is a very large man. He is leaning over the railing, watching the trolley hurtle toward the men. If you sneak up on the man and give him a little push, he will fall over the railing and into the path of the trolley. Because he is so big, he will stop the trolley from killing the maintenance workers. Do you push the man off the footbridge? Or do you allow five men to die?

The real facts remain the same here: it is better to kill fewer people… right? Well, if it is a “rational” external decision then a person would answer the same way in both scenarios…s/he would push the man off the bridge. Yet, almost no one is willing to actively throw another person onto the train trolley tracks. While the decisions lead to the same outcome (one dead, five survivors) one decision is moral…the other is murder. Dr. Greene explains that in the first scenario participants take a more distanced, higher moral ground. The more rational choice is to kill one man rather than five men. The more external, skeletonmuscular systems in the posterior insula related to immediate behavior and skills is activated. In the scenario where a person has to push the man from the bridge is a more direct, personal moral decision thus engaging the more visceral, anterior insula neural network. It is responsible for incorporating the feeling of other people with our own. The participants automatically imagined and related to how the poor man would feel as he plummeted to his death. In fact, participants have a hard time explaining why this scenario was different yet they often said, “it just felt wrong” (Lehrer, 2009).

Our deep senses of admiration, compassion, empathy, etc., in a moral sense, are activated in the brain areas of this “self” neural network. The basic life functions in the top of the brainstem are also activated. There is a very visceral reaction to activation of this network. Lateral parietal regions of the brain that control our bodies (not interconnected to the visera) are activated when there is sympathy for a hurt knee (nothing moral here!). A lot of the triggering is done unconsciously…you don’t stop and think about it literally, it is more of a convergence of thoughts and memory. For an excellent explanation of the types of empathy and how they are integrated into the “self” see Hodges and Wenger, in William Ickes (ed.) book entitled, Empathic Accuracy (1997).

At its core, moral decision-making is often about feelings of empathy and the self. We don’t hurt other people because we know what it is like to be hurt. We are upset at signs of suffering of other people because we know take you on a short journey into a new realm called “cognitive neuroscience” and how it is beginning to reveal many interesting details about our sense of reality. New research in this exciting area may have some answers to how students’ views of reality have changed and the implications for education.

**The Self**

It becomes very clear, early on, in the readings on what researchers regard as the “self” that there is not much agreement on a definition. I am not talking about self-concept or self esteem but rather what/who is the “you” in you? As early as 1890, William James, in his Principles of Psychology, includes a chapter on “The Consciousness of Self.” In 1915, Mary Whiton Calkins (the first woman president of the American Psychological Association, APA) published a review paper entitled, “The Self in Scientific Psychology” in the American Journal of Psychology. Introspection was the hot topic of the day and plenty of psychologists have weighed in on “the self” and what that constitutes since that time. Here are just a few of these offerings from the world of psychology:

“He does not allow for the fact (the unique thing in psychology) that psychological happenings and processes are nothing apart from an active, unifying, synthetic self. ‘Self’ is doubtless a ‘mystery’ – an ‘ultimate’ – but there are psychological manifestations of its reality.” William Caldwell (1898, In response to a paper given at APA in 1897 by Edward Titchener)

“People often say that this or that person has not yet found himself. But the self is not something one finds, it is something one creates.” Thomas Szasz (1974)

“The first question about consciousness is whether there is such a thing.” Joseph E. Bogen (1999)

“Disembodied thought is not a physiological option. Neither is a purely rational mind free from bodily and mental sensations and perceptions. And yet, we must have some sensory system that tells us where “we” are located, or we wouldn’t feel that we are present at all.” Robert Burton (2010)

“The answers are unequivocal. There is indeed a self, but it is a process, not a thing, and the process is present at all times when we are presumed to be conscious.” Antonio Damasio (2010)
And here is my favorite and the definition I’ll use in this presentation:

“Things get a lot more puzzling, however, once we try to get a better grip of what being a person and having a self actually amount to. There seem to be four main factors involved. First of all, our self is inside our body, yet is distinct from it. It owns the body that supports its existence. Second, we regard ourselves as unchanging and continuous. This is not to say that we remain forever the same, and never change our desires, inclinations, or fundamental outlook on the world. Yet among all this change, there is something that remains constant and that makes me now the same ‘me’ as me five years ago and five years in the future. Third, the self is the unifier that brings it all together. The world presents itself to us as a disconcertingly diverse cacophony of sights, sounds, smells, mental images, recollections, deliberations, and so forth. In the self, these are all integrated and an image of a single, unified world emerges. Finally, the self is an agent. It is the thinker of our thoughts and the doer of our deeds. It is where the representation of the world unified into one coherent whole is used in order to act on this very world.” Jan Westerhoff (2011)

Even if we do not have a a unifying definition of the “self,” we do know we have at least one self within our human brain. Psychologists know the self resides in the human brain because of several situations in which the self “disengages” from the brain. One of these situations is what happens in the brain when a person goes under general anesthesia. Anesthesia works by suppressing or blocking neural signals in key areas of the brain (Carini, 2000). Therefore, the person is no longer aware (“unconscious”) of his/her external surrounding (the surgical suite) or, in most cases, his/her internal world (feeling of pain). We do not believe that the self “goes away,” but consciousness is temporally disengaged from other brain areas under anesthesia. Researchers studied signs of interrupted information flow (conscious/self) by conducting brain scans as propofol (yes, the powerful anesthetic that killed Michael Jackson in 2009) takes effect. In a study published in *NeuroImage*, healthy volunteers were administered the propofol anesthetic while in a functional magnetic resonance imaging (fMRI) brain scanner. fMRI approximates a brain region’s activity by measuring blood flow (more on this machine will be discussed information (such as compassion) and relates to the visceral systems of our bodies.

A behavioral example of the posterior insula activation may be when a person is very focused on an immediate external task s/he may forget to eat (not responding to viscera) and the passage of time goes more quickly. When the anterior insula is activated by strong emotion a person does feel like eating or wants to eat too much (we know different individuals react to the extreme in both ways to the emotion…but they do react). When one neural insular system is working and the other insular system is the “off” position. Thus engaging the networks of the self and emotion (anterior insular region and subsequent areas of the brain) is a separate endeavor than engaging the other network (posterior insular region) that responds to things viewed as more external to the self.

From this research, as well as several other aforementioned studies, it would appear that much of what we think of as the self resides in the anterior insular cortex or insula. Parts of the self are localized and then interact with other brain areas to give rise to our strong emotional responses (such as compassion and empathy) from our “subjective” viewpoint.

The anterior insula, a high level association area that brings together emotion felt in the viscera with episodic (more personal) memory to give rise to a sense of self…especially giving rise to the subjective experience of self and reality.

In one clear example from Jonah Lehrer’s book, *How We Decide* (2009), I can demonstrate these brain areas to you. He relates an experiment done by neuroscientist Joshua Greene at Harvard. Greene asks participants questions about a runaway trolley, an oversized man and five maintenance workers. The first scenario goes like this:

You are the driver of a runaway trolley. The brakes have failed. The trolley is approaching a fork in the track at top speed. If you do nothing, the train will stay left, where it will run over five maintenance workers who are fixing the track. All five workers will die. However, if you steer the train right— this involves flicking a switch and turning the wheel— you will swerve onto a track where there is one maintenance worker. What do you do? Are you willing to intervene and change the path of the trolley?

Given this scenario about 95% of the participants agree that it is okay to turn the trolley…it is better to kill fewer people. But now give the participants this scenario:

*Reality: What’s that?*
The scans indicated that: the busier the brain region, the more blood flows there. While deeply anesthetized, some brain regions that normally operate in tandem fell out of sync. Conversations within particular brain areas as well as between far-flung brain areas, fell apart (Schrouff, et.al, 2011).

Another situation that exemplifies the disengagement of self from the brain occurs in the later stages of Alzheimer’s disease in what is commonly referred to as Stage 6 (moderately severe/midstage). During this stage a person may not remember his/her own name, has difficulty with his/her own personal history, may not remember names of close family members/caregivers and, overall, just does not seem to be his/her “self” any longer.

During sleep we also see a disengaging of the self and consciousness during slow wave (non-dreaming/NREM) sleep. Casali and Massimini of the University of Milan in Italy and colleagues decided to manipulate the brain directly. The team figured out how to use a technique called Transcranial Magnetic Stimulation, or TMS, to jolt a small part of the brain and monitor the resulting signals with electrodes. The reverberation from the TMS in a healthy, alert person created a complex, widely spreading brain activation pattern. Brain activation patterns from the reverberation from the TMS became much simpler, sat where it started and faded away faster when the brain was deeply asleep (Casali, et.al, 2010). Dr. Massimini believes that conscious thought works through an integration process of different areas of the brain talking to each other. When we are asleep the thought patterns stay in one locale and communication channels shut down.

An even more mind altering example of one’s sense of self occurs in an experiment that separates the “self” from the body while a person is conscious. Research by Dr. Henrik Ehrsson reveals our sense of a separate “I” is illusion created by the brain processing data from one’s senses. If we change the “incoming information,” we can change the illusion.

(see YouTube Video: BBC Horizon The Secret You clip: Transporting the self: start at 29:29 to 34:16)
http://www.youtube.com/watch?v=9_ZG_ewoOI0&list=PLE9237A7FE0F70D13&index=3&feature=plpp_video)

For further research by Henrik Ehrsson on the mind/body illusion go to http://www.ehrssonlab.se/
The research from neuroscience has clearly shown that the seat of the self is in the brain. The brain is organized in a hierarchical structure. It is this precise arrangement that allows our expectations to influence both our perception of reality and our actions—thereby altering reality itself (Sharot, 2011). Can we figure out, with our new neuroimaging technologies, where the “I” resides? And, given the research, especially by Ehrsson, what changes in the self and, thus our reality, are we susceptible to? How do we know what is “real?” How does the outside world influence the self and, in turn, one’s consciousness and one’s view of reality?

The Crossing of Social Cognitive Psychology with Neuroscience

This collaboration was bound to happen. I am actually surprised it has taken as long as it has to converge. Give scientists a new machine to look at the brain and brain function and everybody wants a piece of the action. The technology embraced by neuroscience was the fMRI, as mentioned previously, it is a machine that can not only help diagnose diseases of the brain - it also enables scientists to get inside our mental processes to determine what and where we’re thinking and feeling. fMRI is a noninvasive test that uses a strong magnetic field and radio waves to create detailed images of the body. But instead of creating images of organs and tissues like MRI, fMRI looks at blood flow in the brain to detect areas of activity. These changes in blood flow, which are captured on a computer, can give 3D views of the brain and help researchers to understand more about how the brain works. You are now probably thinking it is something like this:

It is actually a large machine that looks like this:

There is more and more evidence for the role of anterior insula in all subjective emotional feelings. The fundamental role of anterior insula may be described most simply as subjective awareness. Damasio (2003) contends that this region plays a role in mapping visceral states that are associated with emotional experience, giving rise to conscious feelings.

Beginning in 2008, extending the work done by Bush, Luu and Posner (2000) and Craig (2003) on the brain area known as the anterior cingulated cortex, Immordino-Yang began with an fMRI experiment to see how emotions may be related to particular brain areas. Participants were shown video clips with audio and still pictures of narratives based on true stories (real people were used not actors or recreations) designed to evoke the emotions of admiration and compassion. She used four distinct categories:

1. Admiration for virtue (AV), which involved people performing highly virtuous, morally admirable acts. The narratives emphasized the virtuous and morally admirable nature of the protagonist, such as dedication to an important cause despite difficult obstacles, and did not include displays of notable skill.
2. Admiration for skill (AS), which involved people adeptly performing rare and difficult feats, e.g., an athletic or musical performance, with both physical and cognitive components. No physically or socially painful acts were shown, and the skillful feats, although amazing, did not imply a virtuous protagonist or reveal a virtuous act.
3. Compassion for social pain (CSP), which involved people in states of grief, despair, social rejection, or other difficult psychological circumstances. No physical pain was evident in these narratives, and the troubling circumstances were discerned from the descriptions, rather than being apparent in the images shown.
4. Compassion for physical pain (CPP), which involved people sustaining a physical injury. The injuries were caused by sports and other mishaps and had no moral or social implications. The injuries were not the result of malevolence, and the participants were reassured that the injuries had no long-term implications. To preclude eliciting disgust, no open wounds were shown.

She also used “control narratives”, which involved comparable living, mentally competent people engaged in or discussing how they felt about typical activities under commonplace social circumstances. These circumstances were engaging but not emotion provoking.
As fate would have it (or good graduate advisement), Mary Helen Immordino-Yang having just worked with Fischer at Harvard to obtain her Ed.D., landed a post-doc at USC with Damasio who, by then, had his own fMRI lab. Immordino-Yang began her work on emotion, learning and development using the fMRI to ascertain what happens in the brain when these concepts are tied together. In her current work, she surmises that emotions are not add-ons that interfere with cognition. They involve the self and the body; they are the foundational element of why thinking and learning happen. The brain is a dynamic, plastic, experience-dependent, social, and affective organ. She really was not sure what she would find but the results were groundbreaking. Her 2008-09 study and results are detailed below.

Immordino-Yang hypothesized very specific brain areas would be stimulated by the different narratives thus possibly for different emotions. The major brain area she was looking into is commonly known as the **insula cortex** (often called **insula**, insulary cortex or insular lobe). The **insula** is a long-neglected brain region that has emerged as crucial to understanding what it feels like to be human. It is the wellspring of social emotions, things like lust and disgust, pride and humiliation, guilt and atonement. It helps give rise to moral intuition, empathy and the capacity to respond emotionally to music. The insula, located within the cerebral cortex, is unique in that it is situated at the interface of the cognitive, homeostatic, and affective (emotional) systems of the human brain, providing a link between stimulus-driven processing and brain regions involved in monitoring the internal status of the body.

It yields fantastic pictures of the brain:

(Limb & Braun, 2008)

Now that researchers were able to look into the brain for where actual thoughts were occurring, they were off and running. As neuroscientist Christof Koch of Caltech and the Allen Institute for Brain Science states: “You’re not condemned to walk around in this epistemological fog where it’s all just sort of philosophy and speculation. It used to be the case, but now we can attack this question experimentally, using the tools of good old science to try to come to grips with it.” (Sander, 2012, p.22)

We are able to see perception and action converge in the brain: representations of patterns of actions mix together with patterns of perception including social cognition/perception. Social cognition has its roots in social psychology, which attempts "to understand and explain how the thoughts, feelings, and behavior of individuals are influenced by the actual, imagined, or implied presence of others" (Allport, 1985, p. 3). It studies the individual within a social-cultural context and focuses on how people perceive and interpret information they generate themselves (intrapersonal) and from others (interpersonal) (Sternberg, 1994, as cited in Huitt, 2006).
We are starting to see the fusion of these schools of psychology and neuroscience in many programs and universities. Just down the road in Pasadena, California there is the Caltech Emotion and Social Cognition Laboratory. They are using the fMRI technology to look at how fear is processed in the brain as well as how people with autism process social perception. We also have at the University of Southern California (USC), the Brain and Creativity Institute that was founded by Antonio and Hanna Damasio in 2006.

On the Institute’s website they explain, “recent technological advances in brain imaging and fresh insights into the functioning of the human brain at the level of systems, cells and molecules, provide extraordinary new opportunities for uncovering the neurological underpinnings for a large array of mental functions – from emotion and decision-making to innovation and creativity…” It is also apparent that emotion, decision-making, memory and communication, are central to our most fundamental socio-cultural endeavors. Understanding the neurological workings of these functions within their socio-cultural niche is likely to lead to novel practices in a variety of fields: education, business management, international relations and social communication, and technical and artistic innovation.” I could not have explained it more clearly or thoroughly.

We can now see actual brain changes, as they happen, and pinpoint where they happen. Can we find aspects of the conscious self as when we attempt to read our own emotions and read the emotions of another human being, make compassionate decisions and communicate? Can we see social cognition happen? Can we see “learning” happen? If so, what implications might this have on education?

**The Research of Antonio Damasio, Kurt Fischer and Mary Helen Immordino-Yang**

Antonio Damasio is currently the David Dornsife Professor of Neuroscience and Director of the Brain and Creativity Institute at USC. He received his MD in 1969 and Ph.D. in 1974 and has been a leader in the field of consciousness since I was in college.

He now studies the neurobiology of mind and behavior, with an emphasis on emotion, decision-making, memory, communication, and creativity. If you have not read his book, *Descartes’ Error: Emotion, Reason, and the Human Brain* (2005), I highly recommend it. His latest book, *Self Comes to Mind: Constructing the Conscious Brain* (2010) is equally engaging and looks at how the brain constructs a “mind” and how the brain makes the “mind” conscious. He posits that what the brain needs to become conscious is to acquire a new property: subjectivity…we make images “ours.” He makes a great argument for an integrated approach to how we study the “mind.” He argues that we need to combine three current approaches: 1. the direct-witness perspective on the individual consciousness (personal, private and very unique to each one of us); 2. the behavioral perspective, which allows us to observe the actions of others (who, hopefully, also have a conscious mind); and 3. the brain perspective, which allows us to see brain function in conscious and unconscious minds. Images/concepts within the mind can now become known.

Dr. Kurt Fischer is the Charles Bigelow Professor of Education and current director of the Mind, Brain, and Education Program at Harvard. Dr. Kurt Fischer’s work at Harvard has centered around cognitive and emotional development and learning from birth through adulthood, looking at the commonalities across people with the diversity of pathways of learning and development. His research includes students’ learning and problem solving, brain development, concepts of self in relationships, and cultural contributions to social-cognitive development. He was the graduate advisor to Mary Helen Immordino-Yang.

In *Why Mind, Brain, and Education? Why Now?* Fischer and Immordino-Yang make the statement that “Education plays a key role in cultural transformations: It allows members of a society, the young in particular, to efficiently acquire an ever-evolving body of knowledge and skills that took thousands of years to invent. It is time for education, biology, and cognitive science to join together to create a new science and practice of learning and development. Thanks to this kind of research, policy makers and practitioners can begin to base their decisions about educational practices and institutions on empirical evidence rather than opinions, fashions, and ideologies” (Fischer & Immordino-Yang, 2007, p.1).