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Unconscious Emotions, Conscious Feelings

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Understanding the importance of emotions and feelings is crucial to effective teaching and learning.

Why do we have to do this? The question may irritate the teacher, but it is one of the most intelligent questions that a student can ask. Students—and the rest of us, for that matter—are loathe to expend cognitive energy unnecessarily, so assessing the importance of a task is a key initial step in cognition.

But how do we know what is important? Our brain's ability to unconsciously or consciously identify and assess the relevance and meaning of what we confront is just a small part of a very complex cognitive system. Recent developments in our understanding of the neurobiology of consciousness (Damasio, 1999; Edelman & Tononi, 2000) are providing educators with new understandings of how we recognize dangers and opportunities, and these insights pose important challenges to educators.

Unconscious Emotions

Because our immediate environment is rich in dangers and opportunities that range widely in importance, our brain needs something akin to a thermostat to determine when a specific challenge is sufficiently important to activate the several systems that focus attention and develop appropriate responses. Emotion, centered principally in a small set of subcortical brain systems, is our biological thermostat and central to cognition and educational practice. Although *emotion* is a somewhat vague word, recent scientific developments are clarifying the term and changing some previously held beliefs about the biology and function of emotion.

Emotion is an innate, powerful, and principally unconscious process. It alerts us to problems but doesn't bother us with processes that don't require conscious attention. For example, emotion alerts us to an opportunity for food, but it doesn't continually report on the digestive process that follows eating unless the food turns out to be indigestible. Further, we don't consciously choose to be emotionally aroused, and such arousal often interferes with what we are currently doing. In effect, our emotions tell us to stop doing what we are currently doing and to attend to a more important challenge.

That dominance is possible because far more neural fibers project from our brain's emotional centers up into the logical/rational areas than the reverse. A sudden emotional stimulus can thus easily and immediately stop classroom activity—and it's then difficult to get students to shut off their emotional arousal and resume what they were doing. Effective teachers, realizing that the disruptive emotional arousal will continue until the problem is resolved, simply take the time to resolve the problem before resuming their previous activities.

Emotion is perceptible in body language. A click of the thermostat announces a furnace's imminent response to a drop in room temperature. Our mostly unconscious body language similarly reports our current emotional state. It is obviously useful for a social species to have a way to anticipate an imminent emotion-driven behavior—and so it makes a lot of sense for teachers to become adept at reading and adapting to their students' body language.

Emotion responds most vigorously to high-contrast information. This tendency is biologically sensible. Emotion will merely monitor or ignore steady states and subtle change, staying the course rather than expending cognitive energy on what isn't problematic or fluctuating. Emotion can thus trick us into not recognizing the subtle body language that indicates a gradually encroaching problem until the problem suddenly becomes menacing.

For example, the recent spate of school killings came as a surprise to many educators and classmates who had worked daily with the perpetrators and hadn't suspected a thing. We are also surprised when an unnoticed former student turns out to be very successful.

Schools need a monitoring system that can recognize both the manifest and masked dangers and opportunities that crowd the corridors. In a reckless search for economy at any cost, many schools dismiss counselors and others whose training and principal assignment focus on recognizing potential problems. We have discovered that the schools that ignore currently minor but emerging problems do so at their peril.

Emotional arousal doesn't define or solve the challenge. Instead, emotion activates the problem-solving processes that develop the response, just as our immune system separates the tasks of recognizing and responding to our body's microscopic invaders. Rather than solve the challenge, our emotions alert us to the challenge's existence—a subtle but important distinction—and then may continue to arouse us to maintain interest in the problem.

Consider an emotionally arousing classroom game (such as a spelling relay) that has no relationship to the skill being taught. The game artificially hypes student emotion in an activity that probably would not of itself arouse enough interest to enhance learning. Even artificial emotion can activate attention, which activates the cognitive systems that memorize the spelling of words. Ideally, though, an emotional connection to an activity should be related to the nature of the activity—such as in role playing, simulations, or class projects—thus providing a more easily remembered emotional context for the future use of the learned material.

Although emotions don't solve our problems, they can bias the direction of the response. Temperament is a seemingly innate element of our emotional system that unconsciously predisposes emotional arousal toward danger or opportunity. A person's temperament typically centers somewhere along a continuum between uninhibited and inhibited (Kagan, 1994), with boldness being processed principally in the left hemisphere and anxiety in the right hemisphere (Siegel, 1999). When emotionally aroused, the bold tend to be initially curious about a potential opportunity, and the anxious wary about a potential danger. Temperament enhances a quick and confident move toward a response. Because we frequently follow our temperamental bias, we tend to become quite competent with it over time. Think of handedness, which similarly develops exceptional competence with the favored hand.

Either temperamental bias can be useful, so students should be encouraged to develop whatever nature has given them. But students should have opportunities to experience situations that would move them away from their temperamental predisposition and allow them to practice their back-up system. Projects that effectively team bold students with shy students can create a cooperative forum in which the best elements of both approaches can be synthesized into an effective solution.

Emotions (like temperament) are neither positive nor negative in themselves. Emotions evolved to alert us to specific kinds of problems, so all kinds of emotions are developmentally important. Just as theorists have proposed several different ways of categorizing intelligence, so scientists differ somewhat in their classification of emotions.

Damasio (1999) lists fear, anger, disgust, surprise, happiness, and sadness as our primary emotions and includes embarrassment, jealousy, and guilt among our secondary, or social,

emotions. Note that most of these emotions alert us to negative situations. We have tended to consider emotional responses in the classroom as misbehavior—but because all brain systems, including emotions, must be developed, educators should design appropriate developmental environments for the emotions that alert us to negative situations.

But how do we become conscious of the signals from our unconscious emotions?

Conscious Feelings

Damasio (1999) suggests that when an unconscious emotional arousal escalates, it can activate conscious *feelings* within our brain. Emotions can often be publicly observed, but our feelings remain a private mental experience of the emotion. Feelings, which lead us to conscious exploration of the current challenge, are useful because they allow us to go beyond programmed behaviors to rationally design solutions for a variety of contemporary challenges that evolutionary development didn't cover.

Feelings thus allow us to step into the arcane world of consciousness, the mysterious, subjective process that abandons us when we go to sleep and magically reappears when we awaken. Consciousness identifies the first-person-singular *self* that philosophers, psychologists, and theologians have long tried to define. Not only do I know something, but I know that I know it. So who is the "I" who is doing all this knowing—and feeling?

Drawing on decades of neuroscience research and the recent advances in brain-imaging technology, Damasio (1999) hypothesizes that the unconscious processes that regulate emotion could have created the conscious processes that are central to the educational process. Damasio's theory has important implications for education. Here are three concepts central to the biological system he postulates.

Protoself. The body and brain constantly communicate about what is happening throughout an organism. *Protoself* is the word Damasio assigns to the "collection of brain devices whose main job is the automated management of the organism's life" (1999, p. 23). We are not conscious of the protoself; like all animals, we have automated brain systems that manage the innate processes of the body, such as circulation and respiration.

Core consciousness—the present. The protoself manages an organism's internal mechanisms, but an organism also explores its constantly shifting external environment. Sensory/motor and related brain systems provide a mechanism for mapping and connecting to the external world. Damasio (1999) believes that consciousness emerges when the brain notices the body's reaction to external stimuli. The mapped relationship produces a nonverbal *feeling* of what is currently happening. Feelings, then, activate consciousness.

Core consciousness, which we share with many animals, is the consciousness of the here and now. It is an imaged and nonverbal account of the objects an organism confronts in a series of successive instants. We are both actor and spectator in a movie within our brains—a movie that is a sequence of still pictures giving the illusion of movement as they quickly pulsate through our brains.

Extended consciousness—the past and future. Extended consciousness requires both memory of the past and anticipation of the future. Damasio (1999) suggests that organisms must have a large cortex to move consciously beyond the here and now—to profit from past experiences and to avoid future problems. The large cortex of the human brain—and, to a lesser extent, that of the great apes—can develop a vast and powerful autobiographical memory that can quickly identify the largest possible range of information relevant to a novel challenge.

Emerging from this ability to extend consciousness is intelligence, which allows our brains to manipulate recalled information in the design and analysis of potential responses. The practical

applications of conscious intelligence include imagination, creativity, and conscience—which lead to language, art, science, technology, and a variety of cultural and political systems, such as the shared governance of a democratic society.

Curricular Challenges

What do these biological insights—especially the understanding of critically important recognition and arousal systems—mean to those who seek practical educational applications from such theory and research? Three related issues seem promising, especially for imaginative educators seeking appropriate applications in this area.

The arts. The arts play an important role in the development and maintenance of our motor system, which processes the concluding stage of most cognitive sequences (Sylwester, 1998). What role might the arts play in the initial stages of cognition—recognition and arousal?

Unconscious emotions and conscious feelings alert us to *biologically* important dangers and opportunities. We're a social species, so it would be advantageous for a society to have similar alerting systems for *culturally* important dangers and opportunities. Mass media and cultural organizations play such a role in social arousal. For example, think of the mail you get from organizations that want your support for a social issue that might otherwise not concern you. The arts similarly can sometimes serve as the social equivalent of our very important emotion and attention system—think, for instance, of the horrors of war depicted in Picasso's *Guernica*. It is folly to reduce school programs that help students to understand the often critical role of social arousal systems, such as the arts.

If the arts are important to the development and maintenance of the systems that initiate and conclude cognitive activity, they're probably also important to the robustness of the systems that process the several intervening stages of cognitive activity. The arts, like consciousness, have always been an enigmatic element of human life. We may soon be able to research their purposes and effects in ways not possible previously.

Play. Extended consciousness requires a large cortex. Humans are born with a very immature brain, one-third of its adult size, which develops over a long and sheltered childhood. In contrast, most animals are born with a substantially developed brain and are on their own shortly after birth. Their survival depends on a large number of innate, rather than learned, brain systems that respond automatically to the dangers and opportunities their species typically confront.

Sheltered from the need to protect and support themselves, juvenile humans are free to use play to consciously explore the dynamics of and alternate solutions to *pretend problems* that they devise—typically childhood versions of various adult problems they will later confront. But how does a brain unconsciously generate the requisite emotional arousal without the presence of real danger or opportunity? Good games simulate problems and arouse emotions; consequently, much informal childhood motor, language, and social learning develops easily and without much adult instruction through play, games, and contests that can spark emotional arousal, which in turn activates our behavioral-response and problem-solving systems.

We continue to use play and games throughout life to maintain the robustness of our emotional arousal system. Cognitive systems that aren't used weaken through a use-it-or-lose-it principle, and our primary emotions (surprise, happiness, fear, anger, disgust, and sadness) typically aren't frequently activated in real life. But a game, such as basketball, will frequently and unpredictably (and perhaps artificially) activate all the emotions of players and spectators over its course—and it's the emotional arousal that accounts for much of the appeal of the game.

Play and games are thus important *emotion/attention machines* that can enhance the quality of a sheltered child's extended learning. Only in school do we refer to learning as *work*. In an era obsessed with assessment and standards, educators must rediscover the power that play has to activate and enhance learning.

Classroom management. The ability to recognize inappropriate social behavior is a key developmental skill. Misbehavior is to a classroom what pain is to a body—a useful status report that something isn't working as it should. Damasio (1999) suggests that pain isn't an emotion, but rather a local tissue dysfunction that may or may not activate an emotion. Teachers and students similarly respond to or ignore a variety of behaviors during a school day.

We've tended to view classroom management as an institutionally directed means for inducing compliance in children and creating an efficient teaching and learning environment. The assumption is that the students are the problem, and yet there is often as much institutional as student misbehavior in a classroom. So why do the educators get to make all the decisions about misbehavior and management? Is it possible to think of classroom management as a key collaborative element of the social curriculum? It would certainly be a revolutionary challenge, but I believe that our emerging understanding of cognition and consciousness suggests that imaginative teachers can and should attempt to develop more collaborative behavior (Sylwester, 2000).

Most curricular information comes from beyond the classroom. Conversely, classroom management must recognize and respond to internal social dynamics and tensions. The classroom provides students with marvelous opportunities to consciously confront and solve real social problems in an institutional environment that differs from the informality of the students' homes and neighborhoods.

We're a conscious, social species, and in the United States we are more than 200 years into the creation of a democratic society that depends on the mastery of social skills and collaborative behavior. And yet, by defining classroom management as something teachers do to students, we've ignored the best available laboratory for helping students develop social and democratic skills consciously and collaboratively. Many adult social problems have classroom parallels. When the perspective shifts from behavior management to curricular laboratory, misbehavior shifts from being only a negative danger to also being a positive opportunity for teachers and students to solve classroom problems. How much current misbehavior emerges from student anger at having no voice in what occurs in a classroom?

One obvious problem is that the social behavior of immature students isn't exemplary. But neither is any behavior when an individual begins the learning process. We realize that crawling leads to toddling leads to walking leads to running, and so we allow the process to develop naturally—not by posting rules and giving lectures on how to do it. Conversely, schools unrealistically expect exemplary institutional behavior from day one. Outside of school, children learn social skills through the emotionally stimulating *pretend problems* that play engenders, and they gradually and informally resolve the problems that emerge. The classroom-as-laboratory would enhance that informal process by explicitly and experientially developing social skills.

A social-skills curriculum grounded in collaborative classroom management would develop skills in behavior recognition, data gathering, analysis, and negotiation. Conceptually, the social management of a classroom involves the same elements as those involved in the biological management of one's body: decisions on *energy* expenditure, *space*, *time*, *movement*, and the biologically possible and culturally appropriate *range* of behavior. These decisions are not complicated, but it will be a challenge to rid ourselves of an irrational belief that if we tightly

control the behavior of K–12 students for 12,000 hours, the result will be the sudden magical mastery at age 18 of the social skills a democratic society requires of its adult citizens.

John Dewey (1916) began the 20th century with a philosophic plea that schools get serious about becoming laboratories for the development of the democratic skills our society requires. A century has passed, and we know much more about development, cognition, and consciousness than Dewey could have imagined. We can revolutionize educational policy and practice, but only if we inform ourselves of the explosive and educationally important developments in cognitive neuroscience that are occurring now, on our watch.

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