Unlocking School Bias

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Using Neuroscience to Improve Student Outcomes

Horacio Sanchez

Foreword by David Flink

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FOREWORD

In 2014, in my book *Thinking Differently,* I wrote about being a neurodiverse third grader long before the term *neurodiverse* became more commonplace. My primary problem, as a third-grade student, was that I couldn't read at anywhere near grade-level standards and I acted impulsively, according to my teacher, Mrs. K, and our school principal. When my mother came to school to speak with Mrs. K about my troubling behavior, Mrs. K directed me to sit outside her classroom on the cold linoleum floor, where another "bad" student had drawn a frown face in a small pile of dust. Sitting there, feeling ashamed without really understanding why, I heard Mrs. K say to my mother, "He must try harder. Just encourage David to try."

What made her think that I hadn't been trying? I'd been trying, with all my might, every day since starting school. How had she put me in this lousy box?

Fast-forward to fifth grade. I found out that I was in fact dyslexic and had attention deficit hyperactivity disorder (ADHD). However, knowing all this didn't change everything immediately. My neurodiverse identity gave me something—accommodations and more kindness and understanding from my teachers—but I was still living in a world in which everyone, including me, constantly made assumptions about how people with dyslexia and ADHD thought, felt, and performed in school. I couldn't simply dodge these assumptions the way you might dodge a shark while swimming off the beaches in Florida.

And why?

Because biases were—and remain—the water, not the shark. As my brilliant friend Horacio Sanchez writes in the book you now hold in your hands, each of us has "automated biases [that] are always present, acting as lenses through which we see the world." This means we respond to situations and people according to how our subconscious mind perceives them. The scary thing is that our perceptions are often, very terribly, wrong.

I'm living proof of this. Although from a young age certain adults perceived me as someone who didn't or wouldn't try, I had within me as much drive, determination, and grit as my highest-achieving peers. With appropriate support for dyslexia and ADHD, I changed my trajectory in school. After high school, I attended Brown University and then Columbia for my master's degree. I became an educator, nonprofit leader, and author. These days I also teach at the Ivy League schools I attended.

At every step of my journey, I've become better at intentionally pushing against pervasive societal biases, specifically those allowing even the most well-meaning adults to think kids with learning disabilities don't try, can't learn, or won't ever achieve their potential. I've devoted my career to "fighting the water," addressing the biases that stunt student achievement and well-being.

And yet, I'm still learning and reflecting on this work every day, because, like everyone else in the world, I can't stop swimming in biases. I swim in biases when I teach, when I write, when I lead my staff at The Neurodiversity Alliance, when I take care of and make decisions concerning my two young children, and even when I think about who I am as an individual as well as a husband, son, and friend.

In this book, with Horacio as your guide, you'll discover the neuroscience behind implicit biases; how biases are formed

and confirmed by the amygdala, the part of the brain triggering emotion and action, often within 200 milliseconds; how patterns in one's environment (home, classroom, workplace, and community) create biases and change how the brain develops; and, along with all this, simple actions you can take to counteract biases. Using the latest research, Horacio shows you why addressing implicit biases is a daily mindful practice. Human brains, he shows, are wired for automated actions. We must check ourselves, and check ourselves again, and again, every single day, to stop the subconscious mind from determining our thoughts and behavior.

Horacio and I became friends after meeting several times as speakers at conferences. Oddly enough, I was still surprised when he asked me to write the foreword to his book. I'm known for giving talks about neurodiversity—the word we now use for the idea that people experience and interact with the world in many different ways. I'd never heard Horacio use the word *neurodiversity* in his presentations. As soon as I began reading his book, however, I realized that his work fundamentally mirrors mine, and mine his. If you know and care about neurodiversity, you're no doubt aware that it's still a new concept, and that many people are just now learning about it, embracing the science behind it, and forming new perceptions about how kids—and adults—learn and achieve.

We have a long way to go, but together we can create a world in which the adverse outcomes associated with implicit bias are significantly reduced and even obliterated—a world that believes everyone can flourish, including neurodiverse learners who tend to think and solve problems differently. Whether you're an educator, a parent, a working professional, or another kind of leader, I hope this book will give you the research, tools, and inspiration you need to "swim" stronger and more intentionally in the rough waters we live in.

David Flink, Author, Founder, and
CEO of The Neurodiversity Alliance

ABOUT THE AUTHOR

Horacio Sanchez, a national speaker and author, is an educational consultant to many organizations focused on improving formal education. He is recognized as one of the nation's leading authorities on resiliency and applied neuroscience. His expertise helps schools overcome the impact of poverty, improve school climate, engage in brain-based instruction, and address issues related to implicit bias. He is the author of the best-selling books *The Education Revolution* and *The Poverty Problem*.

Faith guides me; my wife inspires me.

INTRODUCTION

We all live with bias. It is impossible not to be biased because the brain is hardwired with certain biases from birth—it is programmed to be biased when encountering others. Then, our world will bias us further because disproportionate patterns in our environment also bias the brain. We can be biased by people, experiences, and repeated messages pervasive in the world around us. It is time to accept it: We all live life on the bias.

Bias has become a popular topic. Certain sound bites become prevalent whenever a topic becomes popular, and a false sense of understanding inevitably arises. Many of these views are erroneous and predictably lead to false narratives that do more harm than good. For example, years back, resiliency theory had become a popular topic, and suddenly, resiliency experts were as common as the Toyota Camry. There were two frequently heard messages: Every student needs one adult to care for them unconditionally to become resilient, and students who survive traumatic experiences show remarkable resilience because they possess the fortitude to carry on. Although people found to be resilient seem to have at least one long-term relationship with a caring adult, that fact alone does not make them resilient. They still need to acquire enough protective factors to counteract the risk in their lives. Also, surviving trauma speaks to our survival drive, not to our level of resilience. Resilient people achieve life success in the face of trauma and do not merely survive to experience bad life outcomes.

Once sound bites become prevalent, people repeat them with the confidence of a PhD candidate defending their dissertation. Sound bites can become so pervasive that they seep into every aspect of our society, being reiterated in social media, print media, television, movies, and even songs. These repeated messages can unwittingly bias us further because they tend to be subconsciously accepted as truth even if they oppose our value system. How many times have you heard that Asians are good at science and math and never stopped to examine the statement?

The truth is that implicit bias occurs subconsciously and at a rate of speed so fast that the conscious brain is unaware that it happened. Therefore, implicit biases influence our thoughts and actions before they are formulated. As a result, most of us walk around acknowledging the outcomes of bias but completely unaware when we are complicit. Since we are unaware of our implicit biases, the lack of motivation to address them is logical. Who runs out to put out a fire that no one sees burning?

The road to addressing implicit bias has two divergent paths. One is blind faith, where we confess that we have committed biased acts but we don't know when or why. The other, the road less traveled, is based on neuroscience, which helps us understand how our brains produce bias, predict when it is probable, and engage in appropriate responses.

This book is written to end the confusion around bias and to provide educators with research and strategies that will enable them to address the issues of bias without guilt and accusations. Neuroscience allows us to understand that we all are biased. Implicit bias first occurred before we could formulate independent thought. We all possess a higher number of implicit biases than we could ever estimate, and not all of them are necessarily bad. Positive biases can provide a better disposition, help our social interactions, and even improve our physiology. To those who use the knowledge of implicit bias to assail others, I say, let him who is without bias cast the first stone.

CHAPTER 1

THE BIRTH OF BIAS

A Love Story

CHAPTER OVERVIEW

▶ In-group bias is an unintended outcome of infant–mother attachment. The bonding hormone **oxytocin** plays a role in in-group cooperation, resulting in diminished collaboration with out-group members. In-group bias begins before a child can formulate independent thought or exercise choice.

A BABY'S LIFE: THE FIRST 12 MONTHS

Imagine being in a comfy womb, taking as many naps as you want. Your loyal butler, Placenta, delivers your meals around the clock. Then, suddenly, your home is raided, and you are

unceremoniously dragged out of your pampered existence into the real world. No wonder Otto Rank described the birth experience as a traumatic, violent, physical, and psychic separation from your mother (Rank, 1929). The British psychoanalyst Wilfred Bion wrote that children are born into an inner state of chaos and confusion because whatever they feel is unknown and undistinguishable (Bion, 1977). Bion also posited that a baby is born before rational thinking comes into being, making the experience unfathomable. Thank God we no longer welcome a baby into the world by holding them upside down and slapping their backside. Birth is traumatic enough.

In truth, what a baby is feeling at birth are just conjectures. None of us can recall the birth experience or the first years of life. However, neuroscience does provide a few salient points of clarification that are reliable. Humans struggle with change. Change alerts the amygdala's fight-or-flight response, spiking cortisol and causing an increase in your heart rate and blood pressure. At the very least, change challenges our homeostasis—our equilibrium. Now imagine change from an infant's point of view. The brain achieves comprehension of new experiences by being able to associate them with prior life events. Babies have nothing to which to compare the initial changes they experience. That makes new information more chemically charged than things with which we are familiar. When we are unable to connect new information to something we already know, the brain undergoes a chemical upheaval, creating a sense of unease. The amygdala is always alerted to new experiences because it must make sure you are not in danger. As a result, a child's temperament is put to the test within the first minute of life. Infants with difficult or shy and anxious temperaments have a dramatic physiological response to the experiences of birth, which is why they are likely to perceive it as a traumatic event. Studies show that the early experiences and environmental influences of infants with more fragile temperaments can leave a lasting signature

on their genetic predispositions that can affect the emerging brain's architecture for their lifespan (Shonkoff et al., 2012).

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0–6 Months

An infant's earliest form of communication is, at its core, a display of emotion. If their needs are not understood and quickly met, they experience frustration, and an increased emotional outburst is manifested. The state of utter dependency for some infants is exhausting and can lead to a persistent state of anxiety. The human infant begins life more helplessly than any other living creature. Imagine being an infant with an unresponsive caretaker. Your needs are not met, your cries increase until you are physically spent, and your body shuts down from sheer exhaustion. It is easy to understand why the quality of care and environment in the early days of life can have lifelong ramifications.

Empathy

At the same time, infants are born with a superpower that helps them survive until they can communicate with words—the ability to understand and produce emotional expression. The capacity to understand the emotions of others is the foundation of **empathy**. Empathy is the process the brain utilizes to not only identify the emotions of others but also feel what the other person is experiencing. The brain goes through a three-step process in producing empathy. First, mirror neurons activate; this step triggers motor neurons in the brain to engage as if we are doing the emotion we are witnessing (Rizzolatti & Craighero, 2004). Next, the **amygdala**, the part of the brain intricately involved in producing emotions, assigns a chemical

signature to the experience, which enables us to feel what the other person is feeling at a biological level (Carr et al., 2003). Then, the **insula** interfaces between the mirror neuron system and the amygdala to bring social-emotional context to what is being observed (Dapretto et al., 2006). The importance of emotional comprehension cannot be understated; it is essential for effective human interaction.

Infants are born with an innate capacity to express basic emotions and have an intuitive knowledge of the meaning of the major emotional expressions displayed by others (Ekman, 2003). Many early researchers limited this ability to reading only facial expressions, but babies seem to intuit emotion in voice tone, hand gestures, and body posture. Parents are often surprised to see how alert a newborn is. Immediately after birth, a newborn's eyes are open, and they spend a lot of time studying faces. Babies react to the sound of others' voices and utilize all their senses, including smell and touch, to further identify and bond with their caregivers. The ability to quickly recognize, label, and display basic emotions draws adults to the infant and keeps them engaged. Think about the amount of time an adult is willing to spend with an infant who repeatedly smiles in response to a game of peekaboo. Now imagine how many adults are not willing or able to engage with the infant. The infant may begin to mimic the blank stare of the adult who lacks emotional expressions. It is essential that we comprehend just how important understanding emotional expression is to human experience. Empathy is right up there with feeding and social bonding as essential to survival. The ability to express and read emotions begins to be cultivated from the first day of life.

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The repeated labeling of emotions during social interactions leads to the aptitude to anticipate what emotion will happen next. A baby begins to learn that their smile can trigger a smile in another person. In this moment, the unpredictable world becomes more predictable. Most of these social interactions are transpiring with the primary caregivers, leading to the association of safety and nurturance being identified with parents. Babies gain a mental script of daily interactions that form the basic building blocks of attachment with their caregivers.

One of the functions of **mirror neurons** is to teach social behavior that happens at a predictable time and in a predictable setting (Jeon & Lee, 2018). Therefore, a baby becomes hyper-focused on the expressions of the caregiver and learns what responses make them happy or sad. The intensity of focus on emotional expressions causes an imprinting of the face or faces associated with safety and security. The result is that the emotions of the caregivers have a greater neurobiological impact. When the caregiver is sad, the infant is sad; when the caregiver is happy, the infant is happy. The foundations of positive social interactions are being laid. A look of approval by the caregiver triggers mirror neurons, activating motor neurons in the infant's brain that mimic their expressions, and the amygdala, assigning a positive chemical signature that the baby feels. Positive looks provide a wonderful feeling that is rewarding and sought by the infant. Looks of disapproval, on the other hand, provide a negative chemical experience that the baby seeks to avoid. Belsky and colleagues went as far as to suggest that insecure infants are biased toward the recollection of negative memories, while secure infants are biased toward the recollection of positive memories (Belsky et al., 1996). One of life's most profound lessons is taught very early in life: The attitude you project influences the responses you receive.

Insecure infants are biased toward the recollection of negative memories, while secure infants are biased toward the recollection of positive memories (Belsky et al., 1996).

The predictable positive exchange of expressions sets in motion healthy prosocial behaviors. Research has found that the foundation of attachment is predictive of age-appropriate emotional recognition later in childhood (Steele et al., 2008). It is not surprising that children who do not develop a positive attachment with caregivers often suffer from poor social behavior, which might be rooted in poor emotional cognition. Research indicates that by the sixth month of life, infants have already been exposed to 32,000 highly articulated contingent facial expressions of emotion (Malatesta, 1985). No wonder the infant and caregiver can reach such an elevated level of empathy that they can experience periods of brain-to-brain synchronization. **Brain-to-brain synchronization** occurs when the brain waves of two individuals synchronize in brain regions simultaneously, creating an emotional resonance, further strengthening the social bonds, and motivating prosocial behavior within the pair (Peng et al., 2021).

Children who do not develop a positive attachment with caregivers often suffer from poor social behavior, which might be rooted in poor emotional cognition.

It is persistent interactions with a significant other who is consistently available and supportive in times of distress and stress that facilitate the sense of attachment and give rise to a sense of self. Having a **secure attachment** sets a trajectory for future physiology. The theory is that a secure attachment lowers anxiety and avoidance, and the individual therefore reacts to stressful events with lower levels of distress and

physiological arousal (Feeney & Kirkpatrick, 1996; Mikulincer & Florian, 1998). Also, a secure attachment provides a child with a more positive expectation about people and relationships, improving the likelihood that people with similar outlooks will be drawn to the child (Collins, 1996; Collins & Read, 1990). It is important to recognize that an attraction toward positive people is established early in life. Although children with a secure attachment to a primary caretaker often demonstrate a more favorable reaction toward novel stimuli and interactions with strangers, resilience seems to have some limits (Arend et al., 1979; Moss et al., 1997).

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6–12 Months

In-Group Bias

The dark side of attachment is the activation of fear. Initially, infants with a secure attachment still demonstrate a fear of strangers (Bronson, 1968; Collard, 1967). Most individuals exposed to infants have witnessed that they are frightened by strangers, and unfamiliar objects and places can alert them to danger. In unfamiliar situations, the infant experiences feelings of anxiety and seeks out proximity to attachment figures to feel supported and safe. The infant begins to categorize people into familiar and unfamiliar groupings. The familiar is associated with a positive physiological response, and the unfamiliar is associated with a negative physiological response. Over time, the safe category is expanded to siblings, extended family, and close family friends. The safe group over time is defined as "us" (the in-group), and the unfamiliar as "them" (the out-group) (Allport, 1954). This is not merely a

cognitive process but an emotional one rooted in involuntary physiological responses.

The dark side of attachment is the activation of fear.

Every day, relying on primary caretakers for survival links survival with the caregivers and, eventually, people who look like the caregivers. Being drawn to gaze and noticing your primary caregiver's emotions and being impacted makes looking at and reading **in-group** members attractive. Aversion to strangers lowers the desire and the ease of noticing and reading the emotional cues of **out-group** members. The calming physiological response is felt when in the presence of your primary caregiver and eventually around extended family and friends. The feeling of safety with the in-group is not felt when in the presence of strangers and, eventually, people in the "other" category. Everything signals loudly that "I am safe with my parents, family, and friends—us." It is love and nurturance that have formed an in-group bias. Every day, an in-group presence exists without consistent positive exposure to out-group members, which further solidifies the reaction of the mind and body. Studies show that by 3 to 9 months of age, infants already are demonstrating an in-group bias and reacting favorably to the faces of members of their own group and less so toward those of other races (Sangrigoli & De Schonen, 2004; Xiao, Quinn et al., 2018; Xiao, Wu et al., 2018). **In-group preference** seems consistent across differing races, genders, and ages (Langlois et al., 1991).

By 3 to 9 months of age, infants already are demonstrating an in-group bias and reacting favorably to the faces of members of their own group and less so toward those of other races (Sangrigoli & De Schonen, 2004; Xiao, Quinn et al., 2018; Xiao, Wu et al., 2018).

It is important to note the subtle nature of **implicit bias**. An infant's in-group preference is formulated before choice or conscious awareness has been developed. Babies do not have conscious awareness that bias influences their thoughts and actions. Implicit bias occurs at 150 to 200 milliseconds (100% subconscious), while conscious thought does not occur until around 600 milliseconds. This allows infants' thoughts and actions to not only seem logical but, more importantly, feel normal. It is the breaking of the patterns of in-group preference that will cause adverse reactions in the mind and body.

An infant's in-group preference is formulated before choice or conscious awareness has been developed.

Consider the influences that in-group preference born of love will produce. It will influence attractions, initial friendships, and eventually partner selection, reinforcing the preference. The amygdala, the emotional brain, is already drawn to things that are familiar. As a result, an in-group exposure does not cause an adverse reaction, while an out-group presence will alert the amygdala. Furthermore, in-group preference promotes cooperation with the thoughts and actions of in-group members. The cooperation associated with in-group preference is connected to the oxytocin attachment between infant and primary caregiver (often the parent). Research shows that in-group cooperation is conditioned by oxytocin and is intuitive rather than deliberate (Ten Velden et al., 2017). The opposite of cooperation is disagreement. Oxytocin does not promote disagreement; rather, by increasing a natural desire to agree with in-group members, it creates a natural tendency to disagree with opposing viewpoints. Repeated agreements with in-group members over time create a point of view or a way of thinking. Once established, patterns are hard for the brain to change because they are reinforced with

dopamine (Wickens et al., 2007). It is the surge of dopamine in the **nucleus accumbens** that makes **habits**.

In-group cooperation is conditioned by oxytocin and is intuitive rather than deliberate (Ten Velden et al., 2017).

It is safe to say that by the end of the first year of life, two things have already been established. A bond between the infant and the primary caretaker is forged by oxytocin. Also, an in-group preference is established and reinforced by oxytocin and dopamine. The conductor of Implicit Bias Railways has just yelled, "All aboard," and the train is not only on the track; it has already hit such high speeds that applying the brakes will only slow its progress but not bring the train to a stop.

RECOMMENDATIONS FOR EDUCATORS

1. Encourage Variance and Exposure

What it is: It is a safe assumption that most parents are not intentionally attempting to program an in-group preference. On the contrary, most parents would be appalled at the notion that parental attachment gave birth to such a reaction toward certain people. However, studies have found that several conditions can mitigate in-group bias on the part of infants. Having interracial parents has been shown to influence in-group preference (Bar-Haim et al., 2006). Children being exposed to parents who look different from each other makes researchers wonder if other forms of early exposure could reduce in-group bias. Socially diverse environments that provide a greater range of exposure to people of different

races also seem to influence the preferences of infants. For example, infants with early and consistent exposure to different races do not show a preference for their own race at 3 months of age (Bar-Haim et al., 2006).

The research findings suggest that exposure to in-group versus out-group faces can lower in-group preference and improve the recognition of the physical characteristics of out-group members (K. Lee et al., 2017). Training at the preschool level to recognize out-group faces has reduced implicit racial bias. Teachers can implement this training through a variety of simple activities. For instance, students can be asked to look at pictures of out-group members and associate each picture with a child's name. Then, later, they can see how many students can remember the correct name corresponding to the picture. Another effective activity is to read stories with pictures of out-group characters and review the stories to see if students can recognize and name the characters (Heron-Delaney et al., 2011). These simple activities serve two purposes: to promote recognition of people with different features and to humanize them by encouraging students to remember their names.

What it looks like in practice:

- Imagined Play

Imagined play with out-group members consistently reduces intergroup bias among children (Cameron et al., 2006). Some visuals are useful to help students. Figurines representing different groups or faces of students from different groups glued to Popsicle sticks work well (actual faces of children work better than cartoon faces because the brain reacts differently to pictures of actual people than it does to a cartoon representation). Then, different scenarios are created for students to do during imagined play.

- Empathy Scenario

Students are instructed to help their new friend, who fell on the playground, by checking if he is okay. This scenario incorporates the key elements of empathy, identification of emotions, and response. Teachers can elevate the effectiveness of this exercise by having students imagine how the new student's face will look after he has fallen and how it will change after they have helped him.

- Social Skills Scenario

Students practice two elements of social skills identified by neuroscience to build rapport. They are instructed to imagine that the figurine representing them is meeting a new out-group student. The students are instructed to imagine smiling while approaching the new student, introducing themselves by saying hi and their name. Then, they are instructed to ask the new student what her name is. Students are instructed to ask the new student what she likes to do for fun, and find something they both like.

Neuroscience has identified two key elements of social skills: disarming the amygdala with a smile, which lowers the amygdala activation to differences, and triggering amygdala attraction by focusing on what two people have in common. Research shows that the amygdala becomes attracted when we identify a commonality (Adolphs, 2010).

- Cooperation Scenario

Cooperation is a natural outcome of empathy; when cooperation is emphasized, empathy is enhanced. In cooperation scenarios, the students imagine themselves working with an out-group member to achieve a goal that cannot be completed unless they work together. For example, both must get on the other side of a wall too high to get over on their own.

Why it works:

Three types of childhood experiences were found to reduce intergroup bias reliably (Skinner & Meltzoff, 2019):

- *Structured intergroup play on a consistent basis.* Intergroup playdates must be a conscious decision and may require effort. Making a conscious decision to ensure that a child has consistent social exposure to out-group members is an investment in the child developing a higher level of comfort with the people they will deal with in a diverse world.

The most effective way to achieve diverse groupings is to engage in activities in which students discover things they have in common with other students. The teacher can then group students by things they have in common, carefully creating diverse student groups. It is recommended that students engage in an activity that requires them to work together to achieve a required goal physically. Embodied cognition determines that the brain anchors abstract concepts to concrete things to improve our understanding. An activity in which you physically cooperate with others will quickly anchor the concept of cooperation with out-group members. Many team-building activities work well. One example is the life raft activity. Groups of four to six students must stand on a 2-foot-diameter circle for 60 seconds without any part of their bodies touching the ground outside the circle. Each student group will engage in problem-solving, planning, and figuring out how to physically support one other so that everyone can fit in the circle for 60 seconds. When they are ready, they call the teacher to check if everyone is in the circle and to count down the 60 seconds. Successfully achieving the task instantly bonds the group based on a sense of accomplishment and dependency on one another.

- *Imagined play with out-group members*. Imagined play with out-group members usually requires access to toys and books that reflect diversity. When children have consistent exposure to diversity in toys and books, it enables their imaginations to create diverse friends during imagined play.

Teachers should consider creating imaginary play scenarios and finding books emphasizing empathy and cooperation. Empathy will enable students to put themselves in the out-group member's place. It has also been found to promote cooperation. By emphasizing cooperation with an out-group member, empathy is increased.

- *Correction and redirection when exposed to prejudiced behaviors or ideas*. One of the ways the amygdala establishes values during childhood is based on correction by parents when the child engages in inappropriate behaviors. When caregivers redirect, the child observes something not in line with family values. Parents who share their values on how all people should be treated consistently produce children with similar values. Parents who voice their disapproval of the unfair treatment of people based on race, religion, gender, or disability establish early family values that are protected by the amygdala.

Teachers should always be sensitive to behaviors or comments that promote prejudice and gently correct and redirect behaviors. For example, a student might tell his friend that Juan talks funny. The teacher might hear the comment and, rather than ignoring it, take the time to help the student understand that Juan is from a different country and speaks two languages. If he were a student in Juan's country, he would speak differently from the students there. Would he like that the students might think he sounds strange because he is from another country that speaks a different language?

CONCLUSION

Our values begin in our emotional brain and are based on our experiences. The brain protects established values by allowing the amygdala to filter incoming information before it reaches the **cortex**, the part of the brain responsible for rational decision-making. When new information contradicts established values, the amygdala attempts to bias our opinion toward the information to increase the probability that it will be rejected.