

EVOKED POTENTIALS

Seeing Morality Through the Lens of Creativity

If a person suffers from a fatal illness for which there is inadequate treatment, what degree of risk would be considered ethically acceptable in a clinical trial? This is a question faced by physicians, scientists, institutional review boards, courts, and of course our patients every day as we seek to advance our therapeutic armamentaria for glioblastoma, amyotrophic lateral sclerosis, and many other illnesses. In the absence of an objective anchor on which to base our decisions, we are driven by our moral sense. Morality is critical for the practice of medicine and for guiding research. Perhaps surprisingly, we can begin to understand the origins of morality within the construct of human creativity that I have discussed in each edition of this column this year.

Motivation

Fairness and the punishment of unfairness activate reward centers in the brain (Science 2004;305:1254-8). Evolutionary psychologists believe this behavior is an instinct that supports the survival of social groupings ("Evolutionary Psychology: A Primer" 1997 [www.psych.ucsb.edu/research/cep/primer.html]). The uniquely large size of human social groupings (cities, states, countries, and even a global community) requires social cooperation for which these motivational anchors of fairness and its enforcement exist.

Perception

In any social grouping, we occasionally perceive situations involving inequality or unfairness, especially within our social niche. If I am at a restaurant with my neighbor, and we both order the same chocolate ice cream dessert, I will feel unfairly treated if he gets twice as much as I do, or if his comes with sprinkles and a cherry and mine does not. I perceive this inequality, but I envisioned (expected) equality. The difference between what I envisioned and what I perceive provides the motivational voltage that leads me to act.

Action

I now formulate a plan. I will call the waiter over, point out this obvious difference, and ask that I receive a serving equal to my neighbor's. Enactment of this plan requires me to account for and conform to the context. Though internally my motivation is clear, externally, I am among polite company in a public place and the injustice is of rather small import, even if it is unfair in principle. So, in acting out the formulated plan, I do not yell obscenities or threaten the waiter's life, but rather tactfully wave him over when I catch

his eye and then politely point out the difference.

Temperament

Although this is not a long-term issue, the restaurant is busy, and it is more than a few minutes before I am able to signal my waiter, so I am waiting. In waiting, my impatience palpably grows, fueled by the indignation of the unfairness in front of me and the gradual melting of my ice cream, which I'd rather be enjoying instead of waiting to replace. But I must be patient for my plan to be effective. I miss the waiter once or twice, so I must persevere. It would be a mistake to lose my temper and yell or jump up impatiently, as it would only make me look bad.



RICHARD J. CASELLI, M.D.

Social Context

Infused throughout this situation is the social context that governs what is right and wrong on both sides. No one in the restaurant would likely say that two patrons ordering the same bowl of ice cream should receive such different servings. Similarly, in this restaurant it is expected that we behave in a well-mannered fashion, and to do otherwise would be a violation of the social mores that itself would exceed the injustice of the unequal ice cream. This may be too trivial of an example to merit the term "morality," but it does at least merit the term "social conduct." Note how different our social mores are in a car accident or a tsunami. How we behave depends on the situation, and that in turn is reflected in how we are expected to behave.

At any given point in history, there are social mores associated with various situations (Biol. Philos. 2010;25:361-78). Some of these situations are today considered wrong, yet in their time were part of the social landscape and had to be navigated just as I had to navigate our hypothetical restaurant scenario. There was a right and wrong way to treat slaves and a right and wrong way to mete out medieval torture, and it was the social context that determined this "cultural morality." Applying the cultural expectations of social behavior in 21st-century urban America across time to the Middle Ages or across space to an isolated tribe in a tropical rain forest is a mistake that missionaries have made, sometimes resulting in death.

Philosophers may debate whether there are some universal moral truths about right and wrong and whether or not science may inform us about them, but like aesthetics, eventually any moral conclusion is applied within a social context and it is society's behavior that operationally defines if the moral creation is acceptable or not. As we judge the moral failing of our predecessors and

those of other cultures, so too will we be judged by our descendants and those of future dominant cultures. Our acceptance of that may help us to avoid the atrocities that may arise from any unidirectional belief in the absolute correctness of an existing position. Morality and its misapplication underscore the importance of understanding the model of human creative thought and the creative origin of morality so that we avoid tyranny by a would-be dictator, regardless of whether he or she is a king, clergyman, or scientist. Note that it is not politics, religion, or science, per se, that necessitates tyranny. It is the individual person using the mantle of politics, religion, or science to justify what may be his own inner turmoil, or, as others have explained (Psychol. Rev. 2001;108:814-34; Neuron 2004;44:389-400), to rationalize his emotional impulse toward a self-serving goal.

Society has created an extensive system of judgment that defines the limits for what can be tolerated within whatever bounds it may consider moral behavior. This is our legal system. Our legal system sets out the rules of social behavior and the punishments for violations. But even our legal system evolves with the times and differs across countries, each with its own national culture (and set of subcultures). If society perceives what exists (ban on gay marriage) and envisions what it believes to be something better (legalizing gay marriage), then an action plan will be formulated and enacted in an attempt to overturn the law.

Temperament is crucial. If Martin Luther King Jr. and the civil rights movement had retreated after their first encounter with police resistance and illegal violence against them, they might not have succeeded. But once the prevailing paradigm starts coughing up blood, minds start to change, society's mores evolve, and the paradigm eventually shifts. Perhaps one day in the future when our personal genomes become as standard a part of our medical record as our date of birth, we will not look upon genetic disclosure to research participants as such a great risk, but rather take the opposite approach of ensuring full genetic disclosure regardless of uncertainties or implications. What is moral today in America differs from 200 years ago even though our biology has not changed in that time, nor have the philosophical anchors of western civilization. What changes is the attitude of the people who live here and now, and that is what defines morality here and now. ■

DR. CASELLI is the medical editor of CLINICAL NEUROLOGY NEWS and is a professor of neurology at the Mayo Clinic in Scottsdale, Ariz. The views expressed in this column are those of the author and do not necessarily reflect the views of the publisher IMNG or Elsevier.

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plus PTAS (N. Engl. J. Med. 2011 Sept. 7 [doi:10.1056/NEJMoa1105335]).

The medical management comprised daily aspirin (325 mg), daily clopidogrel (75 mg) for 90 days after enrollment, management of primary risk factors such as hypertension and hypercholesterolemia, and management of secondary risk factors such as diabetes, smoking, excess body weight, and insufficient exercise using a lifestyle modification program.

The probability of the combined primary end point at the end of 1 year of follow-up also differed significantly between the two groups (20% with PTAS and 12% with medical management).

There were five stroke-related deaths

in the PTAS group (2.2%), compared with one death unrelated to stroke in the medical management group (0.4%).

Among the 33 strokes that occurred in the PTAS group within 1 month of enrollment, 25 happened within a day of the procedure and the remaining 8 took place within a week. PTAS also led to a significantly higher rate of the secondary end point of any stroke and any major hemorrhage (23.2%), compared with medical management (16.3%).

"Contrary to what we hypothesized, the results of this trial showed that aggressive medical therapy was superior to PTAS with the use of the Wingspan system in high-risk patients with intracranial stenosis, because the rate of periprocedural stroke after PTAS was higher

than expected and the rate of stroke in the medical management group was lower than estimated," Dr. Chimowitz and his colleagues wrote.

With regard to the success of medical therapy, "we were surprised at the extent and rapidity of the reduction" in recurrent stroke, they noted.

"One possible explanation for the higher rate of periprocedural stroke in this trial as compared with the [device] registries is that all the patients in this study had stenosis of 70% to 99% and recent symptoms, whereas the registries included patients with stenosis of 50% to 90% and symptoms that had occurred more than 30 days before enrollment. Recent symptoms may be a marker for unstable plaque, which could increase

the risk of distal embolism during stenting," the researchers wrote.

Continued follow-up of the study subjects will be crucial to revealing long-term outcomes, particularly the rates of restenosis, with each of these treatment approaches, they added.

Stryker Neurovascular (formerly Boston Scientific Neurovascular) provided stents and supplemental funding. AstraZeneca provided rosuvastatin, and Walgreens Pharmacies provided other study medications at a discount. Nationwide Better Health-INTERVENT provided a lifestyle modification program at a discount. Dr. Chimowitz's colleagues disclosed potential conflicts of interest with numerous companies that manufacture neurovascular devices. ■