On Being Human(e)

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A frequent and ironic sentiment we encounter is that violence cannot be prevented because “after all, it’s human nature to be violent.” While yes, on face value one can accept that we are “just” animals. Taking a philosophical and scientific approach to this, one can ask “what makes us unique?” We are, after all, just one of approximately 5000 living members of the mammal class of animal. Mammals are subject to their evolutionarily-honed genetic drives for survival, as are all living organisms. These drives can be perceived as violent and callous and are manifest through the use of available physical tools (e.g. tooth and claw) to survive and reproduce in a challenging environment. Unique to humans, however, is the extent to which we can use the brain as our survival tool, affording the opportunity to adapt our environment to suit us rather than our adaptation to suit our environment. We use this brain tool to introspect, to understand our individual role in a larger community of thinkers, in order to mutually benefit and perpetuate our species. We can in essence, override our base instincts and drives, making conscious decisions to “do the right thing.” Therefore the irony is that, to be human is to be humane.

Key to this concept is the tenet that biology is not destiny. There are many risk factors contributing to violence, both genetic and environmental. There has been significant discussion in sensationalized media regarding the weight of one versus the other, the “nature versus nurture” debate. However, in scientific circles there is really no doubt or debate with respect to the fact that the influence of genetics and the environment on behavior cannot be separated. Genetics influence how one perceives and behaves in the environment and the environment influences what genes are expressed (not to mention when, where, for how long, and at what level these genes are expressed). This interplay has been a growing field of research in the past twenty years and termed epigenetics or “on-top-of” genetics. This cements the concept that we are not resigned to, or privileged by, the environmental context we grow up in. It is the combination of the two that ultimately constructs our individual character, personality, and behavior. While we have no control (as yet) over our genetic make-up, we do have a fair degree of control over our environment.

The genes we are born with influence everything from sex, stature, and obesity, to eye color, skin complexion, and disease susceptibility. The particular genes we are born with is referred to as the genotype and the physical manifestation of these genes is called the phenotype. The idea that our genes influence our behavior, perceptions, and how we experience the world is one we are familiar with. Men and women clearly experience their environment in a multitude of ways different from each other. A tall person perceives the world in a different way than a short person. A person born with a higher mass of fast-twitch muscle fiber will be more adept at sprinting, while those born with a greater slow-twitch muscle fiber mass will be more natural marathon runners. However with a fair amount of work, a sprinter can become a marathon runner and vice-versa, actually changing the relative proportion of fast or slow-twitch muscle fiber. No doubt the starting genotype will influence how much work is required to achieve the end goals.

On the other side of this equation is the influence of one’s environment on gene expression. This idea may not be as commonly discussed; however, there are many examples to illustrate our environmentally derived ability to influence gene expression and biochemical makeup, many of which are familiar to us. Engaging in exercise, for example, changes the expression of many genes, in terms of levels, timing, duration, and location, ultimately leading to muscle development and improvements in health and cardiovascular fitness. A number of epigenetic changes that
The point is that, yes, we can be dealt a bad hand of genetic risks. We can be born with genetic risk factors for chronic illness and obesity are impacted by dietary epigenetics which prompted McKay and Mathers to develop the concept of the four “Rs” which refer to the process by which diet drives these epigenetic changes. In their conceptual model of the four “Rs”, “nutritional and other exposures are Received and Recorded by the genome, evidence of these exposures is Remembered across successive cell generations and the consequences of these exposures are Revealed as altered gene expression, cell function and, ultimately, health.”

The concept of the four “Rs” refers to the process by which diet drives these epigenetic changes. In this conceptual model, nutritional and other exposures are received and recorded by the genome, evidence of these exposures is remembered across successive cell generations, and the consequences of these exposures are revealed as altered gene expression, cell function, and ultimately, health. This conceptual model highlights the importance of diet in shaping health outcomes. The “Rs” can be understood as follows:

1. **Received**: Nutritional and other exposures are received by the body and recorded by the genome.
2. **Recorded**: Evidence of these exposures is recorded across successive cell generations.
3. **Remembered**: The consequences of these exposures are remembered across successive cell generations.
4. **Revealed**: The consequences are revealed as altered gene expression, cell function, and ultimately, health.

People say that you can’t stop violence because that is just human nature. However, as thinking, planning, scenario contemplating people, we can decide to take specific actions that are contrary to the typical evolutionary pressures that drive other species. We can imagine doing things differently. We can imagine a healthier future for ourselves and then take action by modifying our diet, initiating an exercise program, or refraining from unhealthy or risky activities such as smoking or thrill seeking. We can do these things because: a) We are aware that these actions can improve our future health; and b) we have conscious free-will to make the choice to take a different path. When it comes to illnesses, such as hypercholesterolemia, diabetes, and cancer, we understand many of the mechanistic drivers of these diseases to a sufficient extent to enable the development of therapies to treat afflicted patients. We can be compassionate towards those that have been unlucky in the genetic lottery and be supportive as they do the extra work necessary to achieve the same life goals as genetically fortunate individuals. We can, and have changed our environment to reduce the risks associated with the spread of communicable illnesses (for instance, installing hand sanitizing stations in public buildings, and development of annual flu vaccines). In fact, as a species, we have a track-record of using the scientific method to understand societal problems which are then followed by the implementation of widespread policy solutions. These solutions are effectively changes to our environment, which reduce risk-factors for undesired life outcomes for all of society.

Our current understanding of the specific pathologies leading to violent behaviors does not provide us with a list of “to-dos” or “not-to-dos” which could reduce the risk of becoming violent. As a society we need to support those doing the science to further our understanding and uncover the key drivers of violent behaviors. However, our current understanding of many of the risk-factors that pre-dispose us to violent and aggressive behavior highlights many environmentally derived conditions. Conditions like exposure to adverse childhood experiences, traumatic brain injury, environmental toxins, violent media, and poor nutrition are within our realm of control. We are empowered to not only reduce exposure to these risk-factors, but how we respond following exposure of ourselves, our loved ones, and those in our communities to these environmental risk-factors. We can change the environment for those with identified risk-factors by building community support. In essence, knowledge is not just power, but empowering. The pinnacle of humanity is the ability to understand ourselves and our environment beyond our immediate needs, and to use this understanding to advance science, build ever-improved environments, to tackle the toughest problems of our society for everyone. This is what it is to be humane.

References


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