



Kids & Teens: Protecting the Young Brain

Did you know that the amygdala (risk seeking) part of the human brain matures many years before the prefrontal cortex (which governs self-control)? This neural pattern of development may place children and teenagers at greater risk than adults of emotional stress, cognitive damage caused by stress, addiction and even radicalisation. Recent research indicates that these threats might be even more pronounced for very bright kids given their potential for hyper stimulation. Read on to see how we can protect not only the IQ, but the happiness and the health of our bright young people.

Hypersensitivity

Recent research published in the journal *Intelligence* identified a relationship between high IQ and hypersensitivity for individuals with an IQ in the top 2% of the population.

The article reported findings of a study that included the responses of 3,715 American Mensa members, with the authors concluding that highly intelligent individuals (highly intelligent defined as top 2% of the population) were at a far more significant risk of presenting mood and anxiety disorders, ADHD, and conditions involving inflammation and dysregulation of the immune system such as allergies, asthma, autoimmune disease, and ASD. The authors referred to this relationship as a 'hyper brain/hyper body', where high IQ individuals demonstrate hyper sensitivity to external stimuli.

The Young Brain

When we think of our junior Mensa members, this recent study becomes even more interesting. And this is why: neurological studies paint a fascinating picture of brain development in childhood and the teenage years. Interestingly, whilst the amygdala (the emotional, thrill-seeking) part of our brains develops relatively quickly, our prefrontal cortex (that is, the area of our brain that governs self-control) can take until the age of 25 to become fully mature.



As a result of this prefrontal cortex immaturity, youngsters remain at risk (until the prefrontal cortex catches up) of being highly vulnerable to their emotions, to risk-seeking behaviours and addictions (such as taking drugs or becoming hooked on computer games) or to anxiety and depression caused by social media use. Symptoms of PTSD have been found in social media users and patterns of radicalization amongst young people, particularly in the US in recent years (e.g. in the context of school shootings) underscore the powerful relationship between this neural immaturity and the hormonal changes also at play during the teenage years.

High IQ & High Sensitivity?

Many readers might identify as an individual with a dual exceptionality (e.g. high IQ plus ADHD), or as possessing a heightened level of hyper-sensitivity. If a high IQ really does predispose us to a heightened physiological and psychological hypersensitive response, this carries specific implications for the way that we live, manage, expose ourselves to, and mediate, daily stressors.

Artificial environmental stressors such as social media, for example, are designed to stimulate a dopamine response, and raise cortisol (stress hormones) to elicit a particular response (e.g. a political campaign broadcast on Facebook that aims to anger voters, and make them fearful, as those emotions are statistically most likely to mobilise voters). The mental health implications are clear, and for bright young people, that hypersensitivity could be even more pronounced given the immaturity of the prefrontal cortex, the overwhelmingly high social media and tech utilisation within this age demographic and the confusing hormonal changes occurring within a teen or pre-teen's body as a result of puberty. One can see how grooming, trolling and radicalising influences can pose a particular danger; teens can become more receptive to emotional, flattering, inclusive appeals as these appeals strongly fire up their primal, emotional brain – a brain that is not yet as neurally powerful as an adult's in terms of its ability to self-regulate and moderate feelings, emotions and ensuing actions.

Currently students are exhibiting the highest levels of stress and anxiety in recorded history – partly as a result of factors identified here and also as a result of what many head teachers and teachers identify as systemic over-testing. An oppressive teach-to-test culture can expose young people to ongoing high cortisol (stress hormone) levels. One of the long term effects of this over-exposure is, ironically, death of grey matter in the brain that can compromise cognitive ability.

Powering Young Brains

Whilst stress raises the hormone cortisol and adrenaline in adults, the damage caused by chronic cortisol over-exposure in youngsters can be particularly damaging, effectively 'wearing out' stress pathways, and making them far less resilient to future stress. Worse it can cause the death of grey matter in the brain, literally risking the cognitive development and IQ levels of those youngsters. In some studies an acute stress event has even been seen to permanently disrupt neural development.



The effects of cortisol carry particular resonance for the young and gifted if we consider the potential for a greater hypersensitivity within this group, in the context of the 'hyper brain/ hyper-body/ hypersensitivity' thesis postulated by researchers in the earlier-mentioned 2018 American Mensa-focused study. Hypersensitivity would suggest a greater stress response which would mean a potentially greater risk of damage, both physical and neural, to the young gifted brain as a result of over-production of the stress hormone cortisol.

Giving our Brains a Workout?



So what can we do to help gifted youth?

Well, firstly, it seems that spending time in nature restores a great deal of stress-related neural damage. A wealth of psycho-evolutionary research, for example, identifies

the necessity for the human brain and body to become exposed regularly to nature. This honours the design of our Paleolithic genome that assumed a constant relationship with, and exposure to, our natural environment. It might be hard to prise iPads, laptops and kindles from the hands of many kids and teens but the benefits are really worth it. For the young and gifted, objectively explaining the pathology of stress and tech overexposure in the context of their heightened vulnerability to addictions, and so forth, might be more effective than simply removing or banning tech.

Secondly, exercise remains an incredible tool for the restoration of neural damage. Exercise lowers cortisol, up-regulates all of the chemicals and steroids that promote wellbeing and reduce stress (dopamine, serotonin, DHEA, GABA, BDNF, endorphins, testosterone). It can also completely reverse brain atrophy caused by stress, facilitates the replacement of the brain's 'stress buffers' that may have been eaten away by cortisol over-production, and provides a solid route to neurogenesis (creation of new brain tissue). This exercise can take the form of a gym visit, walking the dog, martial arts, skiing, swimming or anything else that the individual enjoys. An easy way to engage with nature could be to invest in a light alarm that wakes us up with light, simulating a sunrise, rather than the noise of an alarm.

Find out More...

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Referring to it as 'exercise' might well carry negative connotations – time in nature, restorative recreation, or other labels, might work better with some young people. Sometimes understanding the science can be particularly empowering.

Testosterone & IQ

Testosterone surges in teens, particularly in boys, can lead to a need to hyper-focus on something; it is at this time that encouraging interest in social issues (e.g. climate change projects), sport, extra-curricular activities and so on would be extremely beneficial. This can lead to a healthy outlet for anger, frustration, interest, the pursuit of pleasure and risk, aggression and a safe space to bond with peers. As testosterone levels in teenage boys unconsciously spike when they know their friends are watching them, the need for a safe space to take risks and mediate hormonal changes and manage their stress response is critical.



Listen to your Gut!

The gut houses 70-80% of the body's entire immune cells, so a low sugar diet with decent vitamins and minerals, lots of water and a decent probiotic would make a great impact on cognitive, mental and emotional (as well as physical) health of anyone – including young people. A multivitamin in the mornings and a multi-mineral at night can also make a huge difference, particularly in times of stress, or if the young person lives in an area of heightened pollution.