

To: Dr. James Canton

From: David Blaiklock

Re: Therapeutic Enhancement and Augmentation

The concepts of therapeutic enhancement and augmentation as presented in The Extreme Future: The Top Trends That Will Reshape The World In The Next 20 Years have the potential to benefit society in many ways. From an educational perspective students will either no longer be born with cognitive/emotional disabilities or if they are, will be able to overcome them through gene therapy. Beyond the ability to overcome disabilities, students will have the potential to use gene therapy to enhance their intelligence and their memories through neurotech devices for total recall. While enhanced intelligence and memories will help American students learn complex material in a shorter period of time, these treatments may not be available to everyone. New technology tends to be expensive when it is first available for consumption creating a limited market for the implementation. While the affluent may have instant access to these technologies when they become available, people with low socioeconomic status (SES) may have to wait years before the technology becomes affordable. It is also possible these enhancements will never be affordable to people with low SES. Edweek (2004) reports that an achievement gap already exists between low and high income families (<http://www.edweek.org/rc/issues/achievement-gap/>). The implementation of enhancements would only widen this gap.

The United States Census Bureau (2002) reported that in 2001, 30 percent of African-American and 27 percent of Hispanic children were living in poverty as compared to 13 percent

of their Caucasian peers (<http://www.census.gov/prod/2002pubs/p60-219.pdf>). Edweek (2004) reported that the average cognitive pre-kindergarten scores were significantly higher for students from the highest socioeconomic brackets than their peers from the lowest socioeconomic bracket. While a gap exists between the cognitive abilities of students with high and low SES it has been further recognized that the teachers in the schools for low income students tend to be of poorer quality than those in the high income schools. Current policies are attempting to accommodate this issue by reducing the class sizes and improving the teacher quality for schools in low-income areas. No Child Left Behind has disaggregated achievement reports by race to ensure to hold school responsible if they are contributing to the achievement gap (<http://www.edweek.org/rc/issues/achievement-gap/>). The implementation of enhancements in intelligence and neurotech devices for memory would make the achievement gap substantially wider between low income and high income students.

From a cultural perspective, parents who are able to afford the enhancements may be ethically opposed to their use. Having students with enhancements attend the same school as those without gives the former group an advantage over the latter. Attending the same classes would mean reading the same material, participating in the same discussions, and taking the same tests. Either the students with enhancements would not be appropriately challenged or the students without enhancements would struggle to keep up. Separating the students would also create challenges in that each group would be receiving a separate but not necessarily equal education. Separate achievement tests would need to be developed in order to accurately assess the mastery of the enhanced student curriculum in a matter that was scaled to the test of the unenhanced curriculum. Another consideration in separate classes is the likelihood that teachers would have these enhancements and would be able to teach in a manner that truly challenged

these students. Beyond the daily classes the students with enhancements would dominate the class rank taking away college opportunities from students who did not have enhancements. The introduction of enhancements has the potential to create a second achievement gap between middle and high SES students with enhancements and those without. Additional policies would be necessary to close this second achievement gap.

Since these enhancements would become available in an educational system that is already running, students receiving these enhancements would be given an advantage over their peers. As the enhancements became more mainstream separate curriculum and standards of learning would need to be developed to accommodate the higher intelligence and total recall abilities. Teachers would require additional education to teach these gifted students and schools would need to accommodate for class rank. However, while these solutions may help to adapt the education system to students with enhancements, they will not solve for either the increase in the current achievement gap which will only grow as these enhancements become more affordable to the middle and lower-middle class, or the second achievement gap described above between students with enhancements and those without. Students with these enhancements will have the ability to contribute great things to society but those who do not will have few if any opportunities available to them in Canton's Extreme Future.

Edweek (2004). Achievement Gap. Retrieved on July 5, 2009 from

<http://www.edweek.org/rc/issues/achievement-gap/>

The U.S. Census Bureau (2002). Poverty in the United States: 2001. Retrieved on July 5, 2009

From <http://www.census.gov/prod/2002pubs/p60-219.pdf>.

