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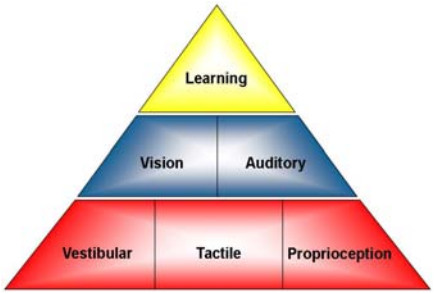
Technology and the Decline of the Educational Empire

The foundation for children's learning is movement. Whether children are using their hands to print, eyes to read, or bodies to play a sport, children can attend and learn best when they move. Technology such as television and videogames (TVVG) act as a *restraint* to a child's movement, resulting in motor and sensory system deprivation and delayed development, which impacts on learning. Recent years have seen such an explosion in the electronic media market, targeting children as young as 9 months old, that accompanying research on the benefits or harmful effects of TVVG cannot possibly keep up. What we do know is that an infant strapped into a car seat in front of a TV cannot move, and a young body that doesn't move, doesn't receive adequate stimulation for proper neurological development. Escalation of TVVG use in the pediatric population, has caused alarm in the pediatric school therapy and special education sector, where professionals are reportedly seeing an increase in the prevalence of developmental delays and a decline in school performance. As diagnoses of ADHD, Autism Spectrum Disorder, Sensory Processing Disorder and Developmental Coordination Disorder escalate, therapists and schools everywhere struggle to find effective treatment and teaching strategies for "Today's Child". Society is only beginning to see a *glimmer* of technology's detrimental impact on the health and well being of children, and subsequent imminent decline of the educational empire.



Sensory Development Hierarchy

Cris Rowan, a Pediatric Occupational Therapist and Sensory Specialist states that poor school performance seen in children who use excessive TVVG is due to lack of movement resulting in the underdevelopment of the children's sensory systems. Rowan performs workshops and develops programs available to review at www.zonein.ca for parents, teachers and therapists addressing the detrimental effects of TVVG on children's developing central nervous systems. Rowan lectures workshop participants on how impaired neurological development can affect a child's ability to print, read, pay attention in class, and even play sports. Rowan reports that sensory and motor system development is "hierarchal", with the vestibular (balance), proprioceptive (muscles/joints) and tactile (touch) sensory systems developing first. Higher level visual (eyes) and auditory (ears) sensory systems develop later and integrate to become a fully functioning sensory system. When children do not get enough sensory stimulation to their vestibular, tactile and proprioceptive systems, they have difficulty learning through their visual and auditory sensory channels, which are the sensory channels children need to use most for learning in school. As child neurological development is rapid in the pre-school years, early intervention regarding decreasing TVVG exposure is crucial.

While the causes of developmental delays are multi-factorial, increased home TVVG use is the largest, statistically proven, contributing factor. In 2007 the Kaiser Foundation reported North American children use an average 6.5 hour per day TVVG, and over 50% of North American homes have this technology in their bedrooms. While North American TVVG addiction escalates unchecked, many countries such as Britain and the Netherlands are advanced in their recognition of this problem through establishment of camps and clinics to "de-program" their children from TVVG. While parents would never think to tie their

children up, blindfold and gag them, they do allow the much more insidious form of restraint...TVVG. Ironically, studies show that well meaning parents of children with high TVVG use perceive the world to be more "unsafe" than parents of children with low TVVG use, and therefore doubly encourage their children to stay "safely restrained" at home.

In the past 100 years, while the world has changed dramatically, the biology of the human species has not. Transportation, communication and technological advances have made lives physically easier, yet mental stress is at a peak. The human body needs to *move* to survive, but in the new millennium, human movement is at an all time low. Use of TVVG with accompanying lack of body movement is not only linked to poor school performance, hyperactivity and attention problems, but also linked to obesity, addictions, accelerated sexuality, aggression, and sleep disorders. In 2001, the American Academy of Pediatrics issued a warning that children under the age of two years should not use TVVG, and children with learning difficulties should not use more than one hour of TVVG per day. In classrooms across North America, children are either too *sleepy* or too *hyper* to attend to academic tasks due to poor development of their sensory systems. Gross and fine motor development is also impaired, resulting in children who are unable to sit up straight, hold a pencil or produce adequate printing. Why is this?

Consider for a moment the impact of sedentary movement and lack of touch stimulation from TVVG use on the human child's developing body. Rowan reports that beginning in infancy and continuing through childhood, humans need to *move* and *touch* for proper neurological system development. Through movement and touch stimulation, a child gains the ability to maintain an upright posture, coordinate both sides of the body and muscles of the eyes, and attain optimal energy states for sleeping, play and school work. Infants, toddlers and children who are deprived of movement and touch, show delays in printing, reading, speech, sports and their ability to pay attention. The ability to express language, as well as eventual printing and reading skills, are all *motor* tasks, using the fine motor muscles of the mouth, eyes and hand, and Rowan reports are skills that should be taught like one would teach a sport...motorically and interactively. Long hours of TVVG therefore act as a *restraint* to movement and touch, and directly impact children's ability to perform academically. A good example would be a child who watches a soccer game on TV, but is not able to go out and replicate the motor components necessary to demonstrate good soccer performance. Playing outside and viewing three-dimensional nature is very different from viewing a nature program on TV! Children need to *practice* task motor components over and over again before a "motor plan" is formed. Once a child achieves a motor plan for a specific task, whether the task be printing, reading or a sport, the task then becomes subconscious, requiring very little cognitive attention for completion.

Children also have small *ocular* muscles that control their eyes. To develop properly, the ocular muscles require adequate stimulation to the brain's vestibular system, through movement patterns in a variety of different *planes.* Because TV, videogames, and computers have small screens and are two-dimensional, children only have to move their eyes short distances. These children are not receiving adequate ocular muscle movement necessary for eventual printing and reading. A two-dimensional screen image is considerably different from three-dimensional "real" life. A common belief represented by teachers in Rowan's workshops is that children don't need to learn to print, as technology will replace this function. Rowan explains how printing is a foundation for literacy, as when children practice letter formation, they are creating letter visual memory, important for letter recognition and eventual reading. Rowan observed during her decade working in British Columbia's school system, that classroom black boards are gone, and teaching is predominantly verbal. For a child with auditory comprehension problems, learning in a classroom setting is impossible. Rowan's review of Canadian curriculum indicate that while there is an "expectation" for teachers to teach printing, there are no guidelines. This essentially means each teacher decides what, how and IF they will teach printing. With no guidelines, there is no way to measure effectiveness of teaching techniques, or duration of printing instruction. With no curriculum guidelines, how could anyone determine whether a child who is failing in math, socials or science, was failing because

of cognitive skill, or failing because they are spending all their precious mental energy remembering how to make their letters?

Attention and hyperactivity...every teacher and parent's nightmare. Rowan's study found that 30% of elementary children have attention problems impacting their ability to learn. A study by Dr. Dimitri Christakis and Frederick Zimmerman followed children's TVVG habits from ages 0 to 7 and found that every one hour per day watching TVVG increased a child's chance of attention difficulties by age 7. Christakis and Zimmerman go on to report that this is due to the fact that a child's developing brain becomes "hard wired" for high paced visual and auditory stimulation. Rowan states that when "hard wired" children also receive inadequate movement and touch stimulation, that child becomes *sensory deprived.* Combine childhood sensory deprivation with sleep deprivation from being up half the night unsupervised playing videogames, and the result is a child who is immensely frustrated and truly a challenge to parents and teachers alike. Rowan reports that use of vestibular and proprioceptive movement techniques can work remarkably well to help a child reduce hyperactivity and improve attention for initiating and maintaining focus on task. These techniques simulate the type of high resistive "heavy work" that children performed in earlier generations. Rowan instructs workshop participants that every hour of TVVG use should be offset with one hour of intense exercise e.g. biking, running, climbing, jumping, and playing. Children need to learn how to be children, and children need to be taught the value of play.

While the lure of technology is irresistible and virtually unstoppable, society would be wise to open its eyes and its heart to the irreversible damage technology is inflicting on child development. Through the promotion of *balance* between exercise and use of technology, parents, teachers and therapists can optimize child sensory and motor system development, and ensure academic success for every child. Children are the future of this planet, but no child will be saving the planet while they are "lost" in the virtual reality of TVVG.

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Biography

Cris Rowan, is a well-known speaker and author to teachers, parents and therapists throughout North America, and recently created the new Zone'in and Move'in Programs www.zonein.ca to address sensory and motor delays in elementary school children. Cris has a BSc's both in Occupational Therapy and in Biology and is a Paediatric Sensory Specialist. Cris has written numerous articles for international journals, and is in the process of completing her first book.