

CHILDHOOD PLAYING IS ONE PRECURSOR FOR SUSTAINED HIGHER COGNITIVE SKILLS AND FOR EMOTIONAL WELL BEING



Mats Niklasson B.A., NDT
 Vestibularis™ Parkgatan 11 S-383 31 Mönsterås, Sweden
 E-mail: mats.irene@vestibularis.se



Introduction

In different ways growing up has always been a difficult task but the society of today put greater pressure than ever on the developing child. For a child to develop a strong nervous system has never been more important than it is today. It will take the growing child up to fifteen years to learn to move and to orient the body against the gravitational force.¹ This force is a precondition for proper brain function² via the vestibular system which "...is an organ the function of which is directed against the isolation of the diverse functions of the body".³ Neurologically, we are essentially still 'stone age' people but forced to dress in 'IT suits'. To be as able as possible to cope in a world where impressions constantly flow the child must be given the opportunity to mature and progress in a certain way.^{4,5,6} At Vestibularis™, a centre for sensory motor training in Mönsterås, Sweden the number of younger children with difficulties in socialising with their peers have increased over the years. Almost regardless of age these children have been verbal and intellectual, interested in computer- and TV-games but not fully capable to play and to interact with others. More interested in letters and numbers than in playing. Adults often find these children cute as they appear to be clever. In my opinion we have to be aware that their 'cleverness' might turn into learning disabilities and emotional problems as they grow older. But why do they not play, as research show that there seems to be a basic urge for all mammals to play at certain ages?^{7,8,9,10,11} Panksepp writes "It is now certain that the brain does contain distinct neural systems devoted to the generation of roughhousing or rough-and-tumble (RAT) play". "Obviously, play recruits many brain abilities concurrently, and it is to be expected that many neural circuits are called into action during RAT play.

There are bound to be powerful influences from vestibular, cerebellar, and basal ganglia systems that control movement".⁷ According to Brown play is not only fun but also "...necessary for the development of empathy, social altruism and the possession of a repertoire of social behaviours enabling the player to handle stress, particularly humiliation and powerlessness".⁸ The children mentioned seem to be more 'cortical and left brain driven' than 'brain stem / limbic and right brain driven'. Could it be an 'escape' into the left hemisphere and the cortical area? A search for security in the 'ordered and intellectual world' instead of taking part in the more insecure playing? Rourke concludes "The basis for their problems appears to be that they have very deficient right-hemisphere systems or limited access to them, thus rendering the processing and integration of novel stimuli and ideas very difficult, and sometimes impossible".⁹ It has been suggested that the right hemisphere can be regarded as a representation of the brain stem / limbic system and the left hemisphere being closer connected to the cortical area.^{11,12,13} Playing can be considered as a right-hemisphere activity while reading and writing are mostly left-hemisphere activities. Therefore uninterest in playing is one strong indicator for a right-cerebral-hemisphere dysfunction. The research of Bakker¹⁴ "suggest that the 'switch in hemisphere' takes place at 7 to 8 years of age". "For many children, reading before the age of seven 'splits the brain' in half, and the child can never again function as an integral whole".¹⁵ There is also an obvious risk for the child not being properly embodied which might result in an abnormal psychic development. If the child lacks its own body references it will be difficult to relate to other people's body language and facial expressions.¹⁶ Adults have to realize that play is vital as active playing "...is thought to be a precondition for the

evolution of social morality in humans".¹⁷ For the child to be able to mature into a social individual we have to find ways to help it 're-connect' with the right hemisphere.

Method and a Case Study

Clients at Vestibularis are mostly children and youngsters with concentration problems and / or learning difficulties. Presently the average age for starting the program is 8.6 years and for completing the program 11.9 years. Approximately 20% are girls and 80% are boys. Training at Vestibularis follows the method Education in Balance™⁴ (Figure 2) with the special aim of giving the nervous system a second chance to 're-connect' and to mature. The child is training at home fifteen minutes a day according to a specially devised program and is re-assessed every eighth week during a period of about two years. The hypothesis behind the training is uninhibited primitive reflexes (Fundamental Movement Patterns) being a hindrance for further physiological and a psychological development.^{18,19} Vestibular stimulation is of great importance when it comes to inhibition of the reflexes¹⁵ and also when it comes to our psychological well being.³ Both Vestibular organization and stereotypical movements are brain stem functions.^{4,20}

A Case Study; The Process and Results

D was only 4.5 years old when he came to Vestibularis for his first assessment. He had a history of clumsiness and balance problems and anything involving eye-hand coordination was done with a lot of strain. As an infant he disliked to swing too roughly and he did not want to use his

hands when eating.

He had always been very sensitive to sound. At the time of our first meeting he was able to read simple words. He knew a lot of figures, was very verbal and had a very good vocabulary. Although he was so young he made an intellectual impression. Besides balance problems the main reasons for his visit were sudden anger and relation difficulties with peers. He had difficulties in understanding body language and facial expressions. Mutual playing was an obvious problem. In my view D was a typical example of a 'cortical and left brain driven' little boy (Figure 1).

The Process

The initial sensory motor assessment was difficult for D. Although done in a playful way, testing is demanding and being told what to do is hard. Under such circumstances reliable scoring⁴ is hard to obtain. The main impression from what could be done gave support to the story his parents had told me. D started the training (Figure 2) and as it progressed and D became more stable I was able to test him more in depth and also engage him in the re-testing. His balance problems were confirmed by the high scores on all tests where the vestibular and proprioceptive systems were involved. During the time of training Fundamental Movement Patterns have been inhibited and corresponding Postural Reactions have appeared.^{4,21} The scoring, in figures, of this physiological progression is one valuable tool. Equally important but more difficult to score is the parents' impression of how behaviour mature. In the case of D it is obvious that physiological improvement was followed by more stable behaviour.

Results

D is eight years old now and he is still in training. After seventeen re-assessments he is about to gain good balance in erect position. He is not clumsy anymore. His anger turned into tears and lately he has become more able to take criticism and describe his feelings. He is doing much better among peers. According to his parents he has less need to intellectualise but more need for playing. In my opinion D is now more 'brain stem-limbic and right brain driven' (Figure 3).

Discussion

Movement is not only a key to brain growth but also our first language and "a prerequisite for normal psychic development".¹⁶ Through movement we learn to respond to speech.²² "In primates, the amount the brain grows between birth and maturity reflects the amount a species play".¹⁰ Suggested circuits for play are likely to be found in the brain stem. 'Maturation of the brain stem and limbic levels are obviously fundamental for social ability. According to the neuropsychologist James Prescott "The lack of movement, by depriving the vestibular-cerebellar system of stimulation, may be the critical factor in social withdrawal"..."the brain's vestibular-cerebellar pathway, which regulates balance by sensing gravity, plays a major role in the development of normal social behaviour".²³

It seems to be necessary for the newborn to be able to activate the vestibular system right after birth.²⁴ An early gaining of head control is a prerequisite for all further development.²⁵ My hypothesis is that a lack of ability to move, due to vestibular problems, is one cause for the 'escape' into the left hemisphere. When children under the age of five lose themselves in books and too prematurely become interested in intellectual matters instead of playing, adults ought to be aware. In order to develop and retain higher cognitive levels the neurological foundation must be solid. Our work at Vestibularis shows that the vestibular system is of importance when it comes to physiological and psychological maturation.^{21,26} There are strong reasons to suspect that childhood depression and overactivity are partly caused by right-cerebral-hemisphere dysfunction.²⁷ After all, playing is what children should love to do. Bergström writes "We can see that play is needed in the society and that 'a playing society' is our only future salvation".²⁸

Acknowledgements

I thank Dr. Bo Ahrenfelt, Johannes Ahrenfelt, Prof. Matti Bergström, D's parents, Prof. Giuseppe Vitiello and Dr. Nina Yderberg for valuable help.

References

- Hubbard DG, Wright CG. The Emotion of Motion. Functions of the Vestibular Apparatus. In: Shaskan DA, Roller WL, eds Paul Schilder. Mind Explorer. New York: Human Sciences Press, INC, year unknown.
- Bergström M. Meaning and the Living Brain. In: Pylkkänen P, ed The Search For Meaning. Wellingborough, Northamptonshire, England: Crucible, 1989: 124-154.
- Schilder P. The Vestibular Apparatus in Neurosis and Psychosis. *Journal of Nervous and Mental Diseases* July 1933; **78**: 1-23, 137-164.
- Niklasson M. Poster presentation. Toward a Science of Consciousness. Skövde, Sweden 2001.
- Schilder P. The Psychological Implications of Motor Development in Children. *Proceedings of the fourth Institute on the Exceptional Child* 1937; **October**: 38-59.
- Rourke BP. Central Processing Deficiencies in Children: Toward a Developmental Neuropsychological Model. *Journal of Clinical Neuropsychology* 1982; **1**: 1-18
- Panksepp J. Affective Neuroscience. New York: Oxford University Press, 1998.
- Brown S. Play as an organizing principle: clinical evidence and personal observations. In: Bekoff M and Byers JA, eds *Animal Play: Evolutionary, Comparative, and Ecological Perspectives*. Cambridge, England: Cambridge University Press, 1998: 243-259.
- MacLean P. Brain Evolution Relating to Family, Play, and the Separation Call. *Archives of General Psychiatry* April 1985; **42**: 405-417.
- Furlow B. Play's the Thing. *New Scientist* 9 June 2001: 29-31.
- Pearce JC. Magical Child. Rediscovering Nature's Plan For Our Children. New York: Bantam Books, 1986.
- Bergström M. *Neurodidagogy. A School for the Whole Brain*. Stockholm: Wahlström and Widstrand, 1995. (in Swedish)
- Gazzaniga MS. The Split Brain Revisited. *Scientific American* July 1998: 35-39.
- Bakker DJ. *Neuropsychological Treatment of Dyslexia*. New York: Oxford University Press, 1990.
- Robbins J. Vestibular Integration Man's Connection to the Earth. *Somatix* 1977; **Autumn**: 27-36.
- Dr Bo Ahrenfelt. Personal communication 2002.
- Bekoff M. Social Play, Cooperation, Fairness, Trust, and the Evolution of Morality. *Journal of Consciousness Studies* 2001; **8**, No 2: 81-90.
- Goddard S. A Teachers Window into the Child's Mind. Eugene, Oregon, U.S.A: Fern Ridge Press, 1996.
- Goddard S. Early learning in the balance: Priming the first ABC. *Support for Learning* 2000; **15**, 4: 154-158.
- Guyton AC. *Basic Neuroscience: Anatomy and Physiology*. Philadelphia: W.B. Saunders Company, 1991.
- Niklasson M, Niklasson I. Evaluation of the method Education in Balance. In work.
- Condon W, Sander L. Neonate Movement is Synchronized with adult Speech: Intentional Participation and Language Acquisition. *Science* 11 January 1974; 99-101.
- Hutchinson M. *Mega Brain: New Tools and Techniques For Brain Growth And Mind Expansion*. New York: Ballantine Books, 1993.
- Ornitz EM. *Normal and Pathological Maturation of Vestibular Function in the Human Child*. In: Romand R, ed *Development of auditory and vestibular system*. New York: Academic Press, 1983: 479-535.
- Shepard R. *Physiotherapy In Pediatrics*. Oxford: Butterworth-Heinemann Ltd, 1990.
- Dryden G, Vos J. *The Learning Revolution: To change the way the world learns*. Torrance, CA, USA: The Learning Web, 1999: 236, 239, 375.
- Brumback RA. *Childhood Depression and Medically Treatable Learning Disability*. In: Molfese D.L., Segalowitz S.J. *Brain Lateralization in Children: Developmental Implications*. New York: Guilford Press, 1988.
- Bergström M. *Black Games and White Games: Chaos and Order in the Brain - About the Playing Child*. Stockholm: Wahlström and Widstrand, 1997. (in Swedish)

