Moving the body improves mental, physical, and emotional domains. Seitz (1993, as cited in Chestnut, 2003) has proposed that “one of the most effective ways to relieve stress and irrational thoughts and feelings, is through so-called body therapies” (p. 86). Body-therapies such as chiropractics, physiotherapy, massage, and osteopathy have become mainstream interventions for the physical body. And others such as yoga, Somatic Psychotherapy, and Craniosacral are becoming popular tools for emotional and interpersonal change. In fact, all body-therapies and other forms of movement, especially sensory-motor and proprioceptive (movement of the joints) movement, affect the nervous system, thus reducing the stress response, increasing the immune system, and producing a homeostatic effect on cognition, emotions, and organ function (Schmahmann, 1996, as cited in Chestnut, 2003).

Movements such as running, walking, jumping, dancing, skipping, yoga, Tai Chi, and Brain Gym® (which will be mentioned in the next section), seem to play a part in the minor adjustments needed to enable the ‘stressed’ body to continue with the learning process (Hannaford, 2005). Dr. Coulter (1993, as cited in Hannaford, 2005), a neuroscientist, concurred with Hannaford and suggested that these minor adjustments are micro-interventions that bring about change because they enable the learner to integrate new information when previously it was stuck or blocked due to stressors.
Ratey (2008) has suggested that it is important to include both aerobic activity and complex coordinated movements into a daily regimen as each form of exercise has different advantageous effects on the brain. “While aerobic exercise elevates neurotransmitters, creates new blood vessels that pipe in growth factors, and spawns new cells, complex activities put all that material to use by strengthening and expanding networks. The more complex the movements, the more complex the synaptic connections” (p. 55). Activities such as tennis, which combine complex movements and aerobic exercise are the best; however, interspersing physical activities with something that requires more coordination, such as yoga, Karate, or golf into a weekly routine can be just as beneficial (Ratey, 2008).

**Brain Gym® and Educational Kinesiology**

Another activity that improves brain function is Brain Gym®. It is a movement-based program for people of all ages, within an area of study called Educational Kinesiology. The Random House Unabridged Dictionary (2006) defines Kinesiology as “the science dealing with the interrelationship of the physiological processes and anatomy of the human body with respect to movement”. Simply put, Educational Kinesiology (Edu-K) is the study of body movement and its impact on learning (socially, emotionally, and cognitively). This field of study delves into the self-exploration of one's own potential by eliminating physical, emotional, or cognitive 'blocks' through movement (Masgutova & Ahmatova, 2004). Dr. Paul Dennison (2007), the creator of the Educational Kinesiology Foundation, offered that “Edu-K, as
it is popularly know, demonstrates that, when the neuropathways for movement are fired, they activate and connect the whole brain in the synergistic way necessary for growth and change” (p. 1).

Dr. Dennison developed Edu-K and Brain Gym® through his research and experimentation working with children and adults in his Remedial Reading Clinics over a period of 19 years in California. During this time, Dr. Dennison was able to investigate specific movements that positively impact learning in a variety of academic skills (Brain Gym® International, 2003). As well, Edu-K was based on a synthesis of research from remarkable scientists and researchers of human and intellectual development such as Jean Piaget, Carl Rogers, Howard Gardner, Thomas Armstrong, and others (Masgutova & Ahmatova, 2004).

The Brain Gym® movements were derived from a wide range of disciplines including developmental optometrists, Traditional Chinese Medicine, and the principles of acupuncture related to the central nervous system.
athletic warm-up exercises, modern dance, and postural balancing (Brain Gym® International, 2003).

Brain Gym® is a learning-readiness program that develops the ‘physical skills’ needed to succeed in school. These exercises target the primary movement archetypes (see Figure 6) that babies and toddlers utilize as they explore the world with their bodies. For example, a toddler needs to side step before he or she can walk in a forward direction. This means that the toddler must be able to move homolaterally (same side) as well as cross-laterally (crossing the midline of the body). These movements incorporate developmental milestones and will establish reflex patterns that children normally complete on their own. The ‘Building Blocks of Learning’ (see Figure 7) adapted from Barbara Pheloung’s website, Move to Learn (2006), has suggested that it is important to address the neurological developmental building blocks such as balance, midline, touch, speech, hearing, vision, and memory. Each building block is necessary in order for learning to be successful. The Brain Gym® exercises target these ‘physical skills’ that are necessary and later “become the basis for complex movement (patterns)...specifically needed for reading,
writing, calculating, and other skills” (Masgutova & Ahmatova, 2004, p. 17) such as memory, attention, and concentration.

Various stressors, as mentioned previously, can introduce obstructions that hinder the learning process. These blocks can be emotional difficulties, physical ailments such as colds and sinus problems that progress to constant ear infections, and environmental factors such as poor nutrition – stressors that impact learning achievement. The stressed learner has difficulty integrating and assimilating new information, needed to be learned, remembered, and applied appropriately (Hannaford, 2005).

**Brain Gym® Research**

There has been limited research or articles written about the positive effects of Brain Gym® in academic publications; however, there are many parts of the world where Brain Gym® has been accepted and a number of experimental studies published. In the USA where Educational Kinesiology was first pioneered, Brain Gym® was chosen by the “National Learning Foundation as a ‘Successful Learning Innovation’ each year since 1990” (Hibbert & Moore, 2005, p. 251). There is also research from Australia (Hannaford, 1990, 2005), Russia (Masgutova, 1995, 1996, 2001; Kusnetsova & Kudryavtseva, 2002), Germany (Donczik, 1994, Drabben-Theimann et al., 2002), Bangladesh (Winkelman, 2001a) and Indonesia (Winkelmann, 2001b). All these published studies have concurred and have discussed the positive
outcomes of Brain Gym®; some of these studies will be discussed in more detail in the following section.

For example, an experimental research study on the static balance of 60 learning disabled students, Khalsa, Morris and Sifft (1988), demonstrated that the repatterned (the Dennison Laterality Repatterning will be discussed in the Brain Gym® Exercises section) group showed significantly better balance, as compared to the movement group (performing five basic Brain Gym® movements), which in turn was more improved than the control group. Both movement groups participated in Brain Gym® movements for five minutes, two times a day, five days a week, for six weeks.

Likewise, in another study, Khalsa and Sifft (1991) examined the response times and choice response times in 60 adults attending university. The adults were divided into three groups like the previously mentioned study: the control group (rested for five minutes), the movement group (performed seven Brain Gym® exercises for five minutes), and the repatterned group (received a Dennison Laterality Repatterning and performed the seven Brain Gym® exercises for five minutes). The results of the study concluded that the groups improved by 1%, 3½ %, and 6% respectively. This study suggested that after only one exposure to Brain Gym® movements, the processing capacity of the central nervous system can be increased. These two studies, that had subjects ranging from 7 to 40 years, indicated that Brain Gym® activities, especially the DLR (Dennison Laterality Repatterning), improved
certain perceptual-motor skills such as static balance and response times to a visual stimulus regardless of duration or gender.

In a quasi-experimental study (subjects were picked specifically because they had learning disabilities in reading), Donczik (2001) found that the Brain Gym® DLR had a profound impact on reading skills. Donczik’s (2001) pilot study in 1994 involved 81 students considered to be dyslexic. He divided the students into control groups and a group that was given a DLR. The results showed significant improvements in reading error rate, reading speed, reading comprehension, as well as short term and long term memory of the students that had a DLR, as compared to the control groups.

Two pre-experimental studies (containing no control group) had mixed results from Brain Gym® and there was no significant improvement in students’ academics, or attitudes toward classroom environment. A study by Jensen and Templeton (1996) focused on a grade four classroom with 28 students to see if performance and attitudes about learning environments could improve through the assistance of a daily Brain Gym® program for seven weeks. During the study, the majority of the students’ grades either declined or stayed the same in all subjects except spelling and English, and their attitudes about their classroom environment did not improve. However, one limitation with this research is that the teacher, who was responsible for performing the Brain Gym® exercises with the students, was reluctant to perform the activities and did not believe in movement in the classroom. The teacher’s beliefs and attitudes about learning affected and influenced the results.
In another study by Cammisa (1994, as cited by Witcher, 2001), learning disabled students in a private school were given instruction in educational kinesiology movements by an Educational Kinesiologist for a year. Students’ perceptual-motor skills significantly improved; however, their gains in academics were not significant. It should be noted here that there were some limitations with the experiment: it lacked a control group, and the test that was used for assessing academic skills was used on students that did not match the population on which it was normed.

Studies have also been published in the *Brain Gym Journal* that have not been academically peer-reviewed. One such experimental research (Irving, 1995) investigated 27 first-year nursing students’ self-reported anxiety and performance during weekly technical tests. This nine-week study divided the nurses into two control groups and one group that performed PACE (an acronym for four Brain Gym® activities: positive, active, clear, and energetic). The results show that over the nine weeks, the nurses in the PACE group decreased their anxiety by 69.5% and increased their performance by 18.7% as compared to a five-week baseline of their performance anxiety and skill level.

Another such non-peer reviewed experimental research by Koester and Sherwood (2001) divided 205 students in grades three, four and five into two groups: a control group and a Brain Gym® group. The Brain Gym® students performed the movements fifteen minutes a day, five days a week for a school year. Both of the groups’ reading abilities were post-tested, and the Brain Gym® groups in each grade level improved their test scores by twice as much as the control group. Anecdotal
comments by teachers and students that used Brain Gym® in the study mentioned how calm the classes had become, and students reported how much easier it was for them to read (Koester, 2006).

People from across the world have experienced a multitude of benefits from the use of Brain Gym® activities; however, there have been relatively few experimental research studies conducted in this area. Many of the studies have been conducted and published independently of the Brain Gym Journal (Khalsa et al., 1988; Hannaford, 1990; Khalsa & Sifft, 1991; Donczik, 1994; Wolfsont, 2002), although, it should be mentioned that research thus far is often self-referencing and generally has been excluded from scholarly fields.

Many of the studies conducted recommend further research to determine the usefulness of Brain Gym® (Khalsa & Sifft, 1991; Hibbert & Moore, 2005; Jensen & Templeton, 1996) and organizations such as The Brain Gym® Trust (McClelland, 2007) are actively looking for ways that more studies on the effects of Brain Gym® can be carried out and published. Hibbert and Moore (2005) have called for more research of the usefulness of Brain Gym® as an effective tool for learning; however, they also “contend that findings within existing research are significant enough to warrant further investigations” (p. 252).

Overall, Brain Gym® exercises assist the mind-body in making improvements in attention, concentration, reading, and academic skills. Brain Gym® exercises decrease anxiety as well. As mentioned earlier, these exercises help to eliminate blocks in the mind-body system and promote whole-brain learning. These simple
movements strengthen and integrate the connections, not only between the brain’s two hemispheres but also the frontal lobes, and help to activate the auditory, visual, and kinesthetic centres for ease of functioning (Dennison, 1980, 1989, all as cited in Hannaford, 1990).

From what has been stated previously, when someone is in a state of distress, his or her body gets ready for a ‘fight or flight’ response. The body is in ‘survival’ mode, ready to dash out the door or prepare to fight. Nowadays, stress is more to do with a danger that is only perceived rather than the actual need to run away from say, a Saber-tooth tiger. However, the body creates a strong physical response even though there may not be an immediate danger. Hannaford (1990) has suggested that Brain Gym® activities, which stimulate the motor activity in the frontal lobes, help to reduce the physical, mental, and emotional impacts of stress by “bringing attention away from the survival centres [which] may actually help to activate, develop and myelinate these areas of the brain allowing for controlled attention, self-regulating behaviour and ultimately formal reasoning” (p. 3).

This follows the research noted earlier on the benefits of aerobic exercise and the brain, as well as performing complex, coordinated series of movement patterns that incorporate balance. To reiterate, these movements increase neurotrophins (natural neural growth factors) and create new neuron growth, as well as many more neural connections, particularly in the frontal lobes and hippocampus (Brink, 1995, as cited in Hannaford, 2005) which are responsible for learning new information, memory, inhibiting stimuli, and initiating action, just to name a few (Ratey, 2008).
Edu-K terms, this process is moving from stressful learning, to ‘whole-brained’ or ‘dynamic’ learning, where there is easy access from the survival brain (brain stem, cerebellum) to the limbic brain and cerebral cortex, as well as good communication between the hemispheres and pre-frontal cortex. Simply put, good communication within the brain results in easy learning and living.

**Brain Gym® Activities**

The following will give a sampling of Brain Gym® activities. The four main exercises are a learning readiness sequence that I use whenever I work with a group of students or before any activity I want to be totally attentive for. It is a good way to begin a learning activity because it allows the learner time to reflect on how his or her body is feeling, what it may be needing, and also helps the learner become focused, calm, and attentive to the task at hand. The sequence involves drinking water and performing the Brain Buttons, Cross Crawl, and Hook-ups. These activities are referred to as PACE, an acronym for positive, active, clear, and energetic (see Figure 8).
Figure 8. PACE – The four main Brain Gym® learning readiness activities.

Find Your PACE

Everyone has a unique rhythm and timing—a self-initiated pace—for optimal learning. In Edu-K, the acronym PACE stands for the four learning-readiness qualities shown below.

Water, which is considered the energetic activity, is included in these activities for a variety of reasons. Water can restore the body’s hydration better when it is sipped rather than gulped (Dennison & Dennison, 2007). Water makes up 70% of our bodies, and it is thought to comprise approximately 90% of the brain (Hannaford, 2005). It is the electrical conductor in the body, carrying the electrical potential from electrolytes across cell membranes. Learning depends on this electrical exchange because it is critical when new neural networks are being created (Dennison & Dennison, 2007).

The next exercise in the sequence is the Brain Buttons, which stands for clear. The Brain Buttons are performed by placing one hand on the navel, while the other hand is positioned just below the clavicle. The thumb and first two fingers find a hollow between the ribs on either side of the sternum just below the collarbone. The hand on the navel provides gravitational information to the body, and as a result, the vestibular system activates the RAS which alerts the body for learning. As the other hand massages the points between the ribs, it is thought that this, in fact, stimulates the blood flow to the brain, bringing with it more nutrients and oxygenated blood (Hannaford, 2005). I find that I become more alert when I do my Brain Buttons, and by adding horizontal eye tracking exercises, my eyes feel more relaxed. I often yawn when I do this exercise, which means to me that I have had a slight energy change in my body, and often feel more relaxed, yet at the same time attentive.

The next active exercise is the Cross Crawl. The Cross Crawl consists of walking in place while touching the opposite knee to the opposite hand. It is best done slowly
to activate the frontal lobes and vestibular system; however, it may be challenging for some children to balance on one foot while touching the opposite knee (Hannaford, 2005). When I am working with children, I usually start off at a quick pace and then see how slow we can go. There are many cross-lateral actions that can be developed with some creativity. Dennison and Dennison (2007) have suggested that the Cross Crawl movement stimulates communication between the left and right cerebral hemispheres because body movements cross the midline. Walking-gait reflexes are also supported by this movement as it allows for shoulder and pelvis stabilization.

Hook-ups are the positive exercise, crossing one ankle over the other, and then crossing and clasping the hands together. This exercise can be done standing up or sitting down; hands can be hanging down or inverted on the sternum. The tongue is placed on the roof of the mouth. The vestibular system, motor coordination system, and both brain hemispheres are stimulated by this exercise, eliminating the survival reaction by unifying the body. The benefits are improved memory, focus, and supported learning (Hannaford, 2005). The second part of the Hook-ups is uncrossing the hands and feet, gently placing fingers together, as if the hands are grasping a large ball. A number of the students that I have worked with made comments about this exercise. It is often the very active boys that say, ‘I love this one’, or ‘I do this one all the time’. Personally, I feel very calm, yet alert, after the Hook-ups, especially if I have done the whole PACE sequence.

Hannaford (2005) also has recommended the Energy Yawn which exercises specific skills development. The Energy Yawn is done by yawning and then massaging
the temporal-mandibular joint (TMJ), which is right where the upper and lower jaw meet in front of the ear. Dennison and Dennison (1995) have explained that sensory information from the mouth, tongue, eye muscles, and all over the face are distributed by the cranial nerves that are gathered at the TMJ. Muscles for the face, eye muscles, vocalization, and speech expression are also activated here. Relaxing the entryway for these nerves improves skills such as communication, verbalization, tracking, hearing, and memory.

Personally, I love the Positive Points, because it is such an easy stress diffusing technique. The Positive Points are located about two finger widths above the middle of the eyebrow. Lightly place three fingers above the eyebrow and the Positive Points are where there is a slight indentation on the forehead. An easier way to find the Positive Points is by simply covering the forehead lightly with one hand. Promislow (2005), an Energy Kinesiologist, has suggested using this technique as it is beneficial when hurt, under stress, pressure, or shock. These points have been used in other Kinesiology modalities such as Touch For Health, and diffuse emotional stress by balancing the Stomach (emotional) and Central (mental) energy meridians. Promislow (2005) explained that the Positive Points counteract the stress response (blood flow moving from the front brain to back brain or survival areas) by keeping the pre-frontal lobes active, simply by touching these sites. I have seen a student so wound up in her emotional distress about a particular event that she could not stop talking about it for five minutes. When I asked her to put her hand to her forehead, approximately five seconds later she said, “Okay, what was it that you wanted me to
do?” and began quietly to get to her work. This little anecdote sums up the power of the Positive Points.

The Dennison Laterality Repatterning (DLR), as previously mentioned in a number of studies in this paper, also has powerful effects on learning and self-awareness. While PACE and other Brain Gym® exercises provide a ‘re-boot’ to the body system, the DLR can be thought of as a ‘re-programming’ offering longer lasting effects (Hibbert & Moore, 2005). The components of the DLR are as follows: doing the Cross Crawl while humming and with eyes looking up to the left; doing the homolateral crawl (one sided) while counting and with eyes looking down to the right; joining the left and right arms and hands together; doing the Cross Crawl while looking in all directions; doing the homolateral crawl while looking in all directions; and finishing with the Cross Crawl. Dennison and Dennison (2007) have explained that an individual can have a more efficient learning state if the body can move beyond one-sided movement and one-sided sensory processing (generally relying on the dominant hemisphere to process information). The DLR ‘re-programs’ the body system for multidimensional brain processing, thus creating more ‘whole-brained’ learning and whole-body coordination.

Another Edu-K technique is a ‘balance’, which incorporates establishing a goal that the individual identifies and wants to work towards. This is followed by a pre-activity that allows time to experience how the goal feels at this moment and establishes a base line for growth at the end of the ‘balance’. Then, one or more Brain Gym® activities are selected, depending on the specifics of the goal. Finally, in the
post-activity phase, the pre-activity is repeated and progress and change is noted and celebrated (Dennison & Dennison, 2007). Overall, Brain Gym® movements have many benefits for all ages, especially assisting the body to a homeostatic state for learning and emotional development.

*Using Educational Kinesiology in Counselling Sessions*

Educational Kinesiology has many implications for use in the counselling setting. Although, there has been limited research specific to Educational Kinesiology, there have been many clinical studies proving benefits in other Energy Psychology methods, such as the Emotional Freedom Technique (EFT), and body oriented psychology modalities like Somatic Psychology and Craniosacral Therapy. In Wolfsont’s (2002) study, a single goal oriented Brain Gym® balance session was integrated with Piaget’s conservation tasks. The study found that as a result there were increases in the adult participants’ abilities to conceptualize the behavioural skills (the plan) needed for attaining their goals.

During counselling sessions with adults, I can see the usefulness of suggesting some Brain Gym® activities that may assist in specific areas, such as the Hook-ups or Positive Points, to aid in diffusing emotionally charged events. As well, personal goals could be supported with a Brain Gym® ‘balance’ and DLR, if the individual was receptive. I have noticed tremendous growth in my mental and emotional processes since I began giving myself Kinesiology ‘balances’.
When counselling children, PACE and Brain Gym® exercises would be likely become a ritual, as children generally love the movement activities and are so receptive to these techniques. I can see children utilizing these exercises instinctively as tools for self-improvement. Hannaford (2005), in her role as a school counsellor, used Hook-ups for children that had been sent to her for fighting, or being disruptive in the classroom. Hannaford explained that after two minutes of Hook-ups, the children were able to see their own perspectives and others’ viewpoints more clearly. They were also able to talk calmly about the problem rather than escalating again to anger.

Brain Gym® ‘balances’ would also be easy to do with children in a counselling situation and would most likely be utilized when there was a specific goal the child had identified and chose to work towards. Since counselling and working with children can be quite a playful process, I see that Brain Gym® is a good fit. Moreover, because the ‘balance’ process of Brain Gym® accepts and unconditionally honours the individual, it fits with my view of my role as a counsellor. Hannaford (1990) found that using Brain Gym® in counselling helped the children she worked with gain a greater perspective of themselves, others around them, and their respective worlds. She succinctly summed up her experience of Brain Gym® in a counselling setting with children and stated: “Brain Gym® is one of the most elegant ways I have of supporting them experiencing happiness in their lives and reaching their full unlimited potential” (p. 4).
Exercise and its Implications in Counselling

The impact of daily exercise on children’s and youths’ learning and mental health is too significant to ignore. It is hoped that research will continue to delve into how exercise affects the brain-body, especially studies that indicate the ‘dose’ of weekly exercise needed to maintain a healthy body-mind. Perhaps when scientists can definitively educate us on the benefits and undeniable evidence of exercise, the education system will change the Physical Education curriculum to one of a fitness model, as discussed by Ratey (2008), which is currently taking place in a few school districts in the US. Teaching children about the importance of exercise for cognitive, physical, and emotional health and well-being when they enter elementary school, and continuing to emphasize this through fitness activities in P.E. all the way through to secondary school, can be viewed as a preventative health care measure saving both the government and taxpayers money.

I feel so strongly about the importance of exercise and its impact on learning and wellbeing that I have begun to give workshops in British Columbia S.D. #62. As a teacher in S.D.# 62, I use a lot of movement to ‘warm up’ children’s minds and help them become more attentive and ready to learn. I can see the value of using this approach for elementary school counsellors as well, utilizing movement to engage, activate, and establish a safe and fun atmosphere and client-counsellor relationship. With older children and youth, I see value in walking and talking or playing a sport during the counselling session. Not only is it a way to bond with youth, but also it
provides an outlet for stress, which could be an underlying reason for talking to a counsellor.

Looking at counselling from an exercise and stress reduction framework makes me conscious of how important it is for me to educate children and youth on its benefits. Teaching children and youth about stress and how the body responds, as well as the common side effects of chronic stress on health, is an important life skill for youth to be aware of, if not to fully comprehend. Social skills groups in the elementary grades, or health and wellness classes taught by a school counsellor in the junior high and high school grades, are perfect venues in which to discuss stress, as well as how to become more physically active. Providing positive, social outlets such as a drop-in basketball or soccer games at lunch would also be opportune times for working on social skills development with children and youth that require assistance.

As well, in my future capacity as a school counsellor, I will be talking to parents about concerns they may have for their children regarding their behaviours and emotional problems. This would be a perfect time to discuss preventative measures such as a healthy balanced diet and having enough rough and tumble play or regular physical exercise. Educating parents about the stress reducing, mood-enhancing effects of physical activity may not only be helpful for their child, but would likely be beneficial for them as well.

Regular exercise is not a cure-all for cognitive and emotional deficits in children and youth, but it is the natural way for their bodies to regulate the daily stresses they take in from their hectic environments. Movement improves one’s
mood, aids in decreasing anxiety and depression, and can even calm the cravings of some addictions. The benefits are clear: physical activity is nourishment for the brain; physical activity assists children and adolescents in thinking clearly, with more attention and motivation.