

# **YOGA FOR CHILDREN WITH LEARNING DIFFICULTIES/ DYSLEXIA**

**An Experiential Study**

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**Yoga Therapy Project Report  
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## **Introduction:**

**“Every time we teach a child something, we prevent them from discovering it for themselves.” - Jean Piaget**

My final topic to study was working with children with learning difficulties/ dyslexia. However before I came to this topic, which I will present here, I explored two different topics and I would like to mention these first, as they were important and give an overview of how my whole journey with the research evolved. Also these experiences show a general trend of how Yoga is still perceived in our community today.

My initial topics were: “The Healing power of sound” and “ Managing hypertension with a focus on diaphragmatic breathing”.

Early on in the therapy course I investigated “The Healing power of sound”. My interest in this topic was kindled by a personal practice, which involved sound/chanting and was suggested for my personal well being. I maintained the practice on a daily basis over a period of approximately 9 to 10 months. I really enjoyed the practice and experienced a lot of inner change so that I was keen to share this experience with others. As I did the literature research, I was fascinated by the findings, which are so very interesting! However because I had not enough experience as well as understanding of using sound in a yoga practice and the topic of sound would only be presented in module 5, which was another 2 years down the track I was hesitant to proceed with this interest. Another aspect that stopped me continuing a study on this topic was that the concept is so unconventional and raised the question of where would I be able to find these volunteers who would like to use sound and chanting on a daily basis over a period of time?

A more conventional tool to explore would be breathing and breathing patterns and how they can affect or benefit our well-being. Exploring down this avenue I came about the idea of Hypertension through Dr. Buteyko’s main discovery and life’s work, which is a most fascinating story.

So I changed my topic to “Managing hypertension with a focus on diaphragmatic breathing”, which I thought with this focus I would have a much bigger chance to find volunteers. Especially if I would get the enthusiasm and support of allopathic GP’s from our local surgery behind me.

So I set to work and after some time I met with three different doctors on an individual basis where I explained the aim of the study and presented them with brochures to give and inspire their patients. The brochure had a brief outline on Yoga/ Yoga therapy/and a synopsis of the aim, the background and the method of the research. Along with the brochure I had also made a website where people would be able to find more in depth information about the content of the brochure as well as background on the Tradition and more. In this way people interested had a brochure with a link to the website as well as all my contact details.

The doctors of whom one of them was particularly enthusiastic were keen in helping me and gave me some very good suggestions; which blood pressure device to use, to maybe primarily aim for people with pre-hypertension.

I was also very pleased I had been able to obtain a non-commercial license agreement from Quality Metric (an internationally recognized company based in US) for the use of their SF-36v2 Health Survey, which measures functional health and well being from the patient's point of view and this over a period of 4 months.

I then checked in a few times with the surgery but when after 2 months time I still had not received a single response, I made an appointment with one of the doctors. She told me she had been unable to motivate any of her patients and commented: "I do not know why no one is interested. They do not want to try yoga, they seem to think you can solve everything with a pill, maybe you are in the wrong suburb!"

I then considered trying some different avenues and put up a poster in two local Yoga schools in the Krishnamacharya tradition. I contacted a nurse in a nearby hospital and finally got an apprentice journalist to write an article in the local Newspaper.

In total I only had two people respond to the newspaper article, probable the lack of response was also because the article appeared at an unfortunate time, during school holiday and a few weeks before I had to attend another 2 weeks of yoga-therapy module. The two people were enthusiastic at the time of the article but I could never reschedule a meeting with them once I came back from my 2 weeks study. By this point the license agreement for the Health Survey of Quality Metrics had expired and I felt things were not working out at all so I no longer could use time to pursue this research.

Then during my second internship at KYM this year (2011), I discovered that some teachers were working on developing a manual on how Yoga could be used to assist students with different abilities (ADHD, ADD, Autism, Dyslexia, Dysgraphia etc.) This rekindled my interest as it was in 1997 that I was awarded with the "Hornsby Diploma" in teaching of students with specific learning difficulties/ dyslexia and finding out about the project of a manual at KYM inspired me, because maybe I could contribute in some way with this ongoing research. My internship mentor also encouraged me to follow this idea through.

My interest in children with learning difficulties dates back twenty years ago while living and working in South India/Auroville where I began to work with children in pre-schools. I also trained for this in India at Mirambika a branch of the Sri Aurobindo Ashram situated in New Delhi, at this free progress school and Research Centre for Integral Education and Human Values I studied for 2 ½ years towards being a primary school teacher.

Once I became a primary teacher and was back in Auroville, while teaching, I observed some children having very specific difficulties, especially with writing, reading and spelling, one quite common example I observed was their reversal of letters such as b and d. This made me enroll in the Hornsby International Correspondence Course in teaching of students with specific learning difficulties/dyslexia.

After my second internship at KYM, I revisited Auroville and visited colleagues of my dyslexia study from way back and consulted some of their library books, forwarded excerpts of different text to one of the teachers at KYM with whom I thought to work together on exchanging information, however practically it did not work out to be that simple and probably too time consuming. So I just concentrated on how I could make my study happen over in Australia.

Once back in Australia I knew a friend whose daughter had been academically diagnosed as dyslexic. The girl (10yr) called Lucy had already been taking yoga classes for 2 years with a teacher in the Krishnamacharya tradition. These classes were not aimed to work on her dyslexic symptoms, but included improving Lucy's awareness of what enhances and/or hinders her focus/ concentration. Rather the practices addressed her overall well being and her interest in learning many different postures.

Her yoga teacher was happy for me to work with Lucy on a separate practice with a goal to remedy her dyslexic symptoms, but she was reluctant to work with me as a co-researcher because of the research involved. So I started working with Lucy on a specific practice and she also continued her ongoing weekly practice with her teacher, after one month of actually teaching Lucy, she no longer wanted to continue the classes.

My aim with Lucy was to do an in depth case study and to recruit two more dyslexic children for the same. I contacted several schools in our surrounding area, State schools as well as private schools. The initial State school I approached stated that I first needed to acquire approval from the department of education in Queensland, which would involve a lot of red tape and take several months to be processed. So I thought that maybe I would have more of a chance within the private schools.

However here I came across another obstacle as one of the private schools objected to yoga as it was not in line with their Steiner philosophy and I got a similar reply from a Christian school. I started to wonder if anything was going to materialize at all.

After more weeks and many phone calls, I finally did get the support of the Principal and Support/Inclusion teacher in the State Primary School where my daughter used to attend a couple of years ago. The Support teacher kindly liaised with the school's class teachers and found two teachers who were keen in having several of their students participate in my initial project proposal. At first the teachers identified 18 children they thought could benefit from participating.

## Literary Review:

In today's context we seem to specialize in distinct fields, break things into separate parts, treat symptoms, rather than work with the connectedness of life. More and more aspects in society are functioning in a disconnected way; if we look for example on how we grow our food and how monocultures have dramatically increased worldwide and with its devastating consequences on our environment and on a diminished nutritional value of our food.

Similarly in the field of education a heavy emphasis has been placed on literacy and numeracy skills and with this the value of other important aspects such as developing healthy physical, emotional, social and mental habits of wellbeing are often neglected. Likewise within the health care system there is this focus on specialization. However for a balanced life and for health all dimensions need to be considered.

Yoga is about balance and holistic health and was originated so many thousand of years ago before our modern times of technology and science. Yoga was developed then in order to remove suffering or dukkham as they called it. Dukkham also meant constriction and tightness and this could manifesting on any dimension it being physical, psychological, social, mental, as well as spiritual.

The framework and different models that were used to understand and represent the working of our human system are still very much valid in our modern day context and can actually keep us attentive and aware of the interconnectedness of so many aspects in life.

Yoga's truly holistic model is represented in one ancient Vedic text called the "Taittiri Upanishad" (Chapter II) here the concept of the human system is explained as being made up of different layers called the "Pancha Maya model" which translates as the five-layered model. The text says that within each individual these 5 layers consist of a physical body or layer, a layer of prana or breath, a layer of mind or intellect, a layer of behavioral and personal patterns, and a layer of feelings and emotions. It describes that all these layers together form our complex human dimension which functions as an individual unique system within each of us. It emphasizes that all of these layers are completely interconnected, interrelated and as the text says, they pervade each other. So when there is dukkham in any of these layers it will have repercussion on all of the other layers. This model is very interesting and makes us perceive the complexity of our being-ness and makes us conscious of how everything is linked.

An important example of this interconnectedness for children with learning difficulties is presented in Dr. Donald Nathanson M.D. findings when he explains the link between attention and emotion.

"Most of us were raised with the idea that emotion is only something that distracts us from solid, important thinking. But now we know that there's more than one kind of thinking, that the kind of thinking we see in reading involves certain parts of the neocortex that are our most, our highest level of cognitive ability. But what people haven't realized until fairly recently is that the processing equipment that we call the neocortex does not start to operate until the emotion system, or what we call the affect system, aims the cognitive mechanism." (1)

He explains that if a child discovers they suddenly can no longer understand something no matter how much interest they put into it, this interruption in learning triggers what he calls "the physiology of shame" and brings about a cognitive shock and with it a total inability to think clearly.

This brings me to another model, which is “the foundational model of Yoga therapy” and is explained in the Patanjali’s Yoga Sutra Chapter III Sutra 9:

“Vyutthana nirodha samskarayoh abhibhava nirodhaksana cittanvayo nirodha parinamaha.” In this Sutra, Patanjali points to two distinct tendencies of our mind. (Our mind, which is so often the cause of our suffering) On one hand he points to vyutthana samskara, which translates as the mind’s pattern and tendency of distraction, of agitation and stress and on the other hand he directs our attention to nirodha samskara, which is the mind’s pattern of stability, calmness and comfort.

Patanjali explains in the next yogasutra-s how the mind constantly swings between these two mind patterns and their specific characteristics and modifications, but that at any one time only one of these mind-patterns can prevail. He also points out that the prevailing pattern will extend and influence all the other layers of our being in a similar way, by pervading all with different characteristics of agitation or of tranquility.

In the next yogasutra-s III.13, 14 and in the previous chapter II.18, 19 Patanjali explains that everything we perceive is subject to change including our mind and senses. That a constant flux in nature’s three basic characteristics of heaviness, activity and clarity allows for any change to occur. Then in yogasutra III 15 he points us to the possibility of influencing change, because change always happens in a particular order and by changing the sequence of this order we can influence the characteristic of a particular pattern into another pattern. He emphasizes that it is only through a sequence of little steps and this over an extended period of time that a sustainable change can be established.

This clarifies the process of Yoga therapy, where change is facilitated by consciously replacing some of our habitual and inappropriate patterns with new and more appropriate ones and this in turn influencing the whole system similarly on a multi-dimensional level.

Both these yoga models above are important in our understanding of the dynamics involved in both aspects, the creation of imbalances and in seeing the potential of restoring balance within our human system. It also points our attention to many possible consequences coming from an origin of imbalance in any one of the layers.

Through my literature research I discovered Susan R. Johnson a MD, FAAP, a certified Waldorf teacher and a Behavioural and Developmental Paediatrician for more than 22 years who looks at learning challenges from a holistic perspective. Through her experiences of her brother, diagnosed autistic as a child and her own son who developed learning difficulties (she points out that he suffered from a persistent “stiff neck” after his C-section birth and that he also never crept on his belly as an infant) Susan discovered the importance of movement in the development and healing of neurological pathways. (2)

“Susan R. Johnson wrote that after completing four years of medical school, three years of paediatric residency, and three years of fellowship training in behaviour and developmental paediatrics, she had learned how to identify the various pathways of learning, whether auditory, visual, or kinaesthetic, but she didn’t learn anything about sensory integration”. (3)

Susan watched her son transform over a period of a year-and-a-half as a Waldorf kindergarten teacher worked with him after school twice a week, doing lots of

harmonious, non-competitive, rhythmic movements, which significantly improved his fine and gross motor skills. She writes "His balance, auditory processing, and speech articulation all dramatically improved. He became a social being who could relate and play imaginatively with his peers while his oversensitivity to touch seemed to disappear." (4) Susan completed the three-year Waldorf Teacher Training Program, and then spent another year studying sensory integration.

Sensory integration here does not just mean processing information of our surrounding environment by our external five senses (sight, touch, smell taste and hearing) but includes the two internal senses of proprioception and vestibular sense. The proprioceptive system gets information from the sensations in our muscles and joints and helps us in feeling how we are moving and where our body is in space this provides a calming effect and enables the child to sit still and "pay attention." The proprioceptive system works together with the vestibular system, which responds to accelerated and decelerated movement and influences functions such as muscle tone, postural control, balance, eye and neck movements.

Susan states: "During the first seven years of life, the child's mind needs to make a map of the location of pressure receptors within the muscles, tendons, and joints of the entire body." (5) When these children then look at the shapes of letters and numbers, they will be able to follow and track the lines and curves with their eyes and are able to imprint this picture in their mind. They then remember the correct orientation of numbers like 2 and 3 and no longer confuse a letter "b" for a letter "d" as they are reading and writing.

So according to Susan R. Johnson the proprioceptive system is a major key to learning and forms a prerequisite in order for children to develop their basic neural pathways for reading and learning.

"Labels like ADD, ADHD, speech and language disorders, learning disabilities, and the autistic spectrum disorders may actually represent an increasing severity of sensory integration dysfunction. A child labeled with ADD has a poorly integrated proprioceptive system and this may also create visual processing disorders. A child labeled with auditory processing problems, especially if they forget what they are supposed to do when moving their body, may have vestibular difficulties. (6)

Susan R. Johnson, who also trained in Anthroposophical Medicine, notes that a child labelled with autism will have severe impairment of their proprioceptive, vestibular, and tactile systems, as well as suffer from a weak metabolism with a potentially "leaky" intestinal tract. She explains that this unhealthy intestinal bacteria, which may have been caused by frequent antibiotic use early on in life, or a frequent exposure to stress as well as a diet rich in simple sugars, causes an overgrowth of yeast that brings about inflammation and weakens the intestinal wall. This in turn affects the process of absorption and elimination; as the partially digested proteins which should be eliminated get reabsorbed "are now broken down inside the body and their toxic by-products can cross the blood-brain barrier into the central nervous system, affecting speech centres and other sensitive areas of the brain." (7)

She also expresses that children with one or more sensory integration difficulties are always multi-tasking and their nervous system is constantly under stress. Under this 'fight and flight' mechanism all aspects of their being are affected: inability to pay attention, often hyperactive, tendency to behave hyper vigilant, easily distracted,

hypersensitive to sounds and likely with a compromised digestion as well as extremely sensitive to the effects of sugar and caffeine.

As Dr Donald L. Nathanson, mentioned above a mind that is stressed can't access higher centres of learning, and cannot easily form these new pathways and important neurological connections.

Susan R. Johnson learned that movement forms the neurological pathways in children from neuropsychologists Judith Bluestone of the Handle institute and Carla Hansford who works with Brain Gym.

It was mainly through the initial work of 19<sup>th</sup> century neurologists that we today understand more of how the brain functions. These findings formed the base for different therapies such as Primary movement and Brain Gym.

Research since 1960 showed that many children with learning difficulties had immature neurological responses, they still used their infant or primary reflexes, in particular, a persistence of the Asymmetrical Tonic Neck Reflex (ATNR) was observed. In many of these cases there was a history of problems during pregnancy or at birth. The developmental delay inhibited co-ordination and prevented the simultaneous use of right and left hemisphere, leading to difficulties with eye / hand co-ordination and with balance. (8)

**Pierre Paul Broca** was the first to prove localization of brain function. While studying autopsies of and vascular lesions in several patients' brains he discovered that in the left hemisphere the affected brain tissue in the middle of their frontal gyrus caused patients to lose their ability to produce speech, while they were still able to understand when spoken too.

**Carl Wernicke** discovered another functional asymmetry studying patients with brain lesions, although in his case the patients, after a lesion to their left upper posterior part of the temporal lobe were unable to understand speech but still able to produce spontaneous speech. These discoveries became important contributions in identifying the locations of language skills in the left hemisphere.

**In 1960-70 Roger Sperry** decided to test the functional specialization of the left and right hemispheres in patients with epilepsy. These patients had undergone surgical cutting of the nerve fibers in the corpus callosum connecting the two cerebral hemispheres, in order to prevent an epileptic seizure spreading from one hemisphere to the other.

**Kenneth Hugdahl** "Symmetry and asymmetry in the human brain"(9)

Through this test specifically and many others that followed they found that tactile sensations of the left hand such as touching and manipulating objects are projected to the right hemisphere and vice versa. The part of the brain called the visual cortex, which is located in each hemisphere, is responsible for processing visual information and the left hemisphere receives signals from the right eye and the right visual cortex receives signals from the left eye. Through tests like dichotic listening one can now determine which side of the brain is dominant in processing auditory information. Further research showed that although the left-brain is dominant in most people for language skills, the right hemisphere holds important skills in order to comprehend language.



**Brain Gym** was also included in my study by the Hornsby Course on learning difficulties and dyslexia.

Brain Gym was created by Paul Dennison, PhD, a remedial educational specialist and founder of this Educational Kinesiology, declares that the midline cross over movements are essential for whole-body coordination and ease of learning in the near visual area, like reading and writing. Because in this midline (corpus callosum: where both hemispheres are connected, communicate and coordinate) the left and right visual field overlap and function as one and these midline movements help the integration of gross and fine motor-skills, the integration of left and right hemisphere functioning as well as binocular vision and binaural hearing (explained below).

Children with learning difficulties tend to rely more on one particular hemisphere function. Brain Gym use "re-patterning" techniques to stimulate the neurological connections within the brain and to facilitate whole brain learning as opposed to using one hemisphere at the time. This re-patterning means basically to retrain the brain, and this process was first developed by neurologists/medical doctors Glen and Robert Doleman and Carl Delacato who discovered that we can use the body to retrain the brain into changing inefficient pathways into more efficient ones. By simple exercises and stretches along with the eyes looking in a particular a technique called "patterning" which consisted of exercises replicating the crawling movements of a baby to help students with head injuries and other severe neurological dysfunctions. These Brain Gym activities have been incorporated into many educational, sports, business, and seniors programs throughout the world. They are also widely used in British state schools. (10)

In the Hornsby Course we were introduced to Brain GYM to stimulate this integration of both brain hemispheres prior to learning. As each side operates in an entirely different way and helps to promote highly specific and different functions. While the right brain is more visual spatial oriented and perceives more intuitively by seeing the whole picture, the left brain is more equipped for verbal skills and phonetic awareness, it identifies parts, analyses data and acquires conclusions. So it is important for both brain hemispheres to work together in order for learning to occur with ease and become effortless.

Another characteristic of the hemisphere is that a few of its functions communicate in an asymmetrical manner, as we saw in the scientific test above. The motor cortex on the right hemisphere controls the skeletal movement of the left half of the body and the motor cortex on the left hemisphere is in charge of movement on the right side of the body.

Likewise information of the left eye and the left ear are processed in the right hemisphere and similarly for these senses on the right side of the body their information is processed in the left hemisphere.

This asymmetry of the brain in processing information is interesting and I can't help but link this with another aspect of the yoga therapy framework and more particularly the ancient yogi's **model of the subtle human anatomy**.

Complex concepts like these were introduced in a meditative form by a presentation of animated models, which included symbolism and metaphor. This was especially done in order to enhance interest and to encourage ongoing introspection as the student evolved and matured. "... all education was transmitted orally... ancient masters often used animated models and metaphors to explain difficult concepts... so

the students would be able to relate to these teachings with greater ease and also introspect on them when they were older and wiser.”(11)

“Prana” or “life force” or “conscious breath” was seen as what differentiated human beings from other living species. “The yogi-s of the past understood that human beings are different from other non-living entities, on account of what is termed prana” (12) Prana is closely associated with breath, as without breath or prana there is no life, but prana is not merely breath.

”Rather, the breath is only an external aspect, or a form of manifestation, of prana, which is the life force that interpenetrates and sustains life.” (13)

More important, prana was also seen as the expression of consciousness and because prana can travel to every part of body, the whole body becomes conscious. As an example we could bring our attention to particular tight area of the body and by consciously visualizing it to relax and let go we can actually influence the characteristics in that area and bring space aiding in the bodies natural healing process. The way in which the yogi’s described the movement of prana through the body was by means of subtle channels they called “nadi’s”. The number of nadi’s throughout the body varies considerably depending on different text, but ranges around 72.000 nadi’s for the whole or pertaining to either side of the body. (14)

All nadi’s were depicted as originating from one source; a point located at the base of the spine called the Muladhara. From this point the nadi’s would emerge to all parts of the body. There are however three nadi’s that were considered the most important ones and they were all represented running along what we in today’s context know as the spinal cord. The main nadi (the Susumna) is shown running vertically upward until the crown of the head, while the other two most important nadi’s are shown originating on either side of the Susumna in the Muladhara and crisscrossing the central Susumna at five more important points to end at the opposite nostril location.

Yoga and Ayurveda recognizes these important points along the spine such as the Muladhara as energy centers or chakra’s as they called them. Interestingly each of these energy center’s are associated with a vital function, a particular sense (hearing, touch, vision...) with an organ of action (throat, hands, feet...) and some more associated aspects such as their main function and natural tendencies.

The free flow of prana through the nadi’s can be hindered by blockages (mala), which literally means “impurity” and signify things that are unhealthy for our system and which should be eliminated. These blockages could originate from a physical level, such as postural imbalance or a result from unhealthy food and/or poor digestion; it may stem from a difficult and unprocessed emotional experiences; it may be a result of un-useful communication style, or a negative mental attitude. In other words impurities may originate in any dimensions of our human system.

A Yoga practice aims at eliminating the blockages so as to enhance the free flow of prana. (Could we conclude that the yogi’s discovered through direct experience what we understand through science today?)

Another movement-based approach that contributed to my literature review was via my neighbors and their experience with their son and their involvement with the DORE Programme. As a young child their son was diagnosed as autistic, his parents totally devoted to his wellbeing did not approve of labeling and continued to explore

all possibilities to help their son with his multiple learning problems, he was later diagnosed as suffering from Asperger Syndrome. (He did actually suffer from a weak metabolism with a "leaky" intestinal tract as Susan R. Johnson pointed out above)

The DORE program, which no longer functions today in Australia, but is still operating in other countries such as the UK is based on the understanding that conditions such as dyslexia, dyspraxia, ADD, Autism, Asperger syndrome and ADHD are caused by a cerebellar developmental delay (CDD).

**The DORE program** explains the cerebellum as the skill centre of the brain whose task is to stimulate and coordinate several body functions, such as fine and gross motor skill coordination, balance and equilibrium as well as muscle tone. The cerebellum is linked to the cerebrum, which is also known as the telencephalon and is the largest and most highly developed thinking part of the brain. The cerebellum speeds up the process of the cerebrum's new acquired skills and enables these skills to become automatic, such as tying shoelaces, riding a bicycle, typing as well as reading and writing. If the link between those two aspects of the brain is not efficient as with CDD, the thinking centre or cerebrum has to work continually to reprocess all the information each time. (15)

The DORE program is based on the belief that there are a number of overlapping symptoms in people with learning, attention and communication difficulties that can show itself in different ways affecting literacy, memory, attention, coordination, as well as social and emotional well being, which are often diagnosed as separate problems, but which all come from one single underlying neurological cause, the cerebellum. The cerebellum is the only area in the brain that is separately linked to all of these different conditions. So the DORE's approach is to address the underlying cause rather than the symptom and that by treating the cause the symptoms will usually recover.

What I discovered studying the DORE program is that they enhance the cerebellum's function with gentle repeated and organized stimulation of vestibular-, somatosensory- and visual exercises. A quantity of each of the exercises was given according to the need of the child and this was done over an extended period of time. Vestibular exercises involved lateral movements, twists, balancing on one leg; somato-sensory exercises focused on stretching receptors in joints and muscles, and visual exercises enhance general vision or eye tracking movements.

What is interesting is that Susan R. Johnson, Brain Gym and the DORE program method all address learning difficulties with a similar understanding and approach, although their terminology and perspective varies slightly. Or do they speak of the same aspects and is the cerebellum the main processing organ for proprioceptive and vestibular functions? It seems like that but I have not yet found this confirmed.

Another interesting perspective with very successful results is the Davis theory. Ronald D. Davis being a dyslexic himself experienced that in contrast to the scientific researcher of his time "Dyslexia is not the result of brain or nerve damage, nor is it caused by a malformation of the brain, inner ear or eyeballs" but rather that "Dyslexia is a product of thought and a special way of reacting to the feeling of confusion." (16)

**R.D. Davis** learned through experimentation that he could control his own dyslexia by shifting his mental perspective. The feeling of confusion he describes as “disorientation” and he affirms that all the symptoms of dyslexia are symptoms of disorientation, where a person’s perception has become distorted, mainly affecting and distorting their sense of vision, hearing, balance, movement and time. He describes disorientation as a natural occurrence that can take place in any person when overwhelmed by different impulses or thought but occurs more frequently in people with dyslexia. Sometimes disorientation might occur when the mind tries to relate contradicting data it receives from different senses for example while sitting in a stationary vehicle and having the impression of moving by looking at a moving vehicle through the window.

Another common tendency he discovered in most dyslexics is their reliance on nonverbal thinking strategy. While most adults use two different types of thinking for conceptualization: verbal and nonverbal, dyslexics think in mental pictures or have visual images of concepts or ideas. Picture thinking is considered more basic to human nature as it develops at birth. According to Davis dyslexics tend to highly develop this capacity of visualization and imagination and it becomes like their main focus and way of perception and maybe even their special gift.

**The Davis method** developed strategies for disorientation and for nonverbal thinking. He developed the Davis procedure where he taught the student to shift the location from where their mind eye looked at an image to a specific location, at a point six to ten inches above and behind the head at approximately a 45-degree angle precisely on the midline of the body. Making this shift with their mind eye stopped their dyslexic symptoms from occurring. This orientation skill was reinforced with balancing and coordinated movements crossing the midline of the body. The students then could turn their skill or gift of disorientation on or off at will. Once their perception was orientated they were gradually taught to master the symbols of letters and words as well as steps to easier reading.

While researching the origin of dyslexia I also discovered that there are still many different views and descriptions of the possible causes to dyslexia.

**Scientists Research by John Stein and Silvia Parachini** show that the nervous system’s “magnocellular nerve cells”, which are responsible for rapid cue exchanges between the visual and auditory senses are often not functioning properly in dyslexics. In many cases there is a history of early brain developmental impairment... faulty movement and development of these particular nerve cells... during development in the mother’s womb. The nerve cells become misplaced in the cerebral cortex... which is responsible for controlling the higher cognitive functions, such as to speak and read (17)... Genetic variants on chromosome... associated with protein drop... causing brain changes. (18)... Premature babies have... tendency to develop dyslexia... High incidence of autoimmune conditions in dyslexics such as allergies and asthma as compared to non-dyslexics.

According to John Stein this faulty development can affect the visual skills and more in particular with attention and eye movement; the auditory skill in distinguishing order and differentiation in the units of sound and it affects also motor skills in particular speaking, writing, balance and coordination. (19)

**Research by Sally Shaywitz** and other neuroscientist through brain imaging studies (at the Yale Center and elsewhere) identified that there is a “glitch within the language system-at the level of the phonologic module (in the posterior part of the brain)- impairing the child’s phonemic awareness and thus, their ability to segment the spoken word into underlying sounds (their phonemes are less sharply defined). As a result of this weakness, children have difficulty breaking the reading code.”(20)

Probably all these different views are because no one set of symptoms for two dyslexic people are ever going to be exactly the same.

However, the literature review above points to the interconnectedness, especially of the proprioceptive sense and sense of balance as well as movements across the midline of the body all contributing to the cognitive skills.

These aspects are often neglected in a remedial program and these could prove to make all the difference for children to break the reading code.

## **Objective of the Study:**

Today even in the most recent ground breaking scientific research of neuroplasticity, there is still the tendency to look at the learning difficulties/dyslexia as a difficulty within and relating to the mechanism of the brain only.

Most remedial programs for children with learning difficulties focus primarily on the cognitive aspects, by using computer generated programs that teach the children phonetic and linguistic rules to reading and writing as well as strategies to master other areas such as math.

Therefore my study objective is to investigate this interconnectedness and interdependence between the different layers of our being, thus proving that by bringing a positive change in one layer will affect the other layers.

As a main objective of the study I want to explore this inter-connection between the body's developmental motor coordination and sensory integration with the cognitive functions of the brain.

Other aspects that I want to consider are the influence of diet and digestive capacity as well as the effect of emotion, especially connected to attention and confidence.

## **Hypothesis:**

**By enhancing the children's ease of movement in space, muscle tone, postural alignment, sense of balance, and their eye and neck movements we indirectly influence the children's cognitive skills in a positive manner.**

**In the Samkhya principles of manifestation (Indian philosophy) the creation of the cognitive functions, the sensory faculties and the motor faculties are all connected.**

The underlying cause of the learning difficulties might be that both hemispheres are often processing information independently rather than using a whole-brain approach as we saw through Paul Dennison's work and Brain Gym. The origin of the problem might be a neurological impairment in the cerebellum, which is the only area in the brain that is separately linked to all of these different aspects (motor, sensory and cognitive) as the DORE program suggests.

Enhanced movement patterns are said to release physical, mental and emotional blocks in learning. (Dennison and Dennison: 1994)

Blocks that originated from tension in the body causing information to be inhibited from flowing freely among functional centers located throughout the brain and sensory motor system.

Edu-K emphasizes that the visual, auditory, motor and postural mechanics or physical elements are all linked to the mental aspects of learning. (Dennison and Dennison 1987)

Lastly, slow rhythmic movement patterns as Susan R. Johnson points out enhance an under-developed proprioceptive system, the vestibular system and aid with sensory integrations. However a significant and sustained transformation can only come about after a prolonged and regular practice (over a 3month period and for a minimum of 15 to 20min/daily). Even with less practice some initial changes should be noted.

## **Methodology (First Case Study):**

My first attempt and idea was to approach the study with an in-depth case study research, this was so that I would be able to observe and investigate more deeply all aspects that could possibly influence the child's ability to learn. If I would work with a group of children I would be limited to the aspects I could consider and more difficult to investigate the interconnected layers.

No two children with learning difficulties are ever going to present exactly the same problems, so within a group I would also be limited with the capacity of the intervention.

With a case study approach I would be able to adapt the practice to the person and have an ability to show an example of yoga's holistic approach to healing and /or restoring balance.

## **Choosing subjects**

I knew a friend whose daughter had been academically diagnosed as dyslexic. The girl (10yr) who I will name Lucy had already been taking yoga classes for 2 years with a teacher in the Krishnamacharya tradition. These classes were not aimed at alleviating her learning difficulties, but included improving Lucy's awareness of what enhances and/or hindered her focus and concentration. Rather the practices addressed her overall well being and kindled her interest in learning many different vinyasa's.

I contacted her yoga teacher who was happy for me to work with Lucy on a separate practice with as goal to remedy her dyslexic symptoms, I started working with Lucy, while she also continued her ongoing weekly practice with her teacher.

My aim was to do an in depth case study with Lucy and to recruit two more dyslexic children for the same.

## **Method**

My method of working was based on the Vyuha model, a Yogic term used for a specific four step arrangement of working; whereby as a first step one observes and identifies the multiple problems; by looking at all aspect of a person's life, considering their social and cultural background, their life style, diet, etc.

The symptoms guide us to the cause of the imbalance; but because any one symptom can have different origins Yoga works with a multitude of frameworks based on the working of the different aspects in our complex human system.

Nothing happens by accident it has a cause and only by discovering the actual source of the problem can whole healing be addressed, which might not be possible in the initial stages of therapy but might be revealed over time.

Once the source of a problem is understood, a goal (step 3) can be set to work towards. The initial short-term goal will always focus on pacifying the system to reduce symptoms of stress, agitation and anxiety; once the system is more balanced and stable the goal can shift towards purification.

Most often there are multiple problems, which then ask for goal prioritization to prepare and enhance a long-term goal to be brought about. Choosing the tools of therapy are only the fourth and final step once a goal has been discerned to work towards.

### **First step identifying the symptoms**

In order to observe and identify the symptoms my diagnostic method involved multiple means: an informal interview with parent, with the yoga teacher and with the child; a consultation with the child, which included a questionnaire and referring a professional Academic Assessment Portfolio.

After having sought permission from her yoga teacher I arranged an informal interview with Lucy's mother, where Lucy was present.

The interview was based on my past experience when teaching children with dyslexia, and I focused on how dyslexia affected her by looking at all the five layers (Pancha Maya model).

I also received a copy of her Academic Assessment Report for dyslexia.

Hereafter I observed a yoga class with Lucy and her teacher and I had an informal interview with her teacher prior to this lesson.

After the lesson I had the opportunity to talk with Lucy directly and without the presence of adults. Here I was able to do a good assessment of Lucy's physical features and postural alignment, as well as assess her sense of balance. Through dialogue we discovered together some more interesting aspects of how certain symptoms affected her.

I also took this opportunity to clarify some questions I had regarding the result of the Academic Assessment Report.

Lucy also filled in a questionnaire designed by myself, which inquired about possible difficulties in the different layers related to dyslexia. This questionnaire would be repeated at the end of the research and details would be compared. (See Appendix Panchamaya 1)

### **Second step Identifying the possible cause**

I am assuming that the possible causes are as outlined in the chapter on objectives.

#### **Primary goal**

As initial goal to work towards to, I choose to focus on Lucy's particular weak sense of balance, this to impact the workings of her vestibular system because in the literature review I found that children who forget what they are supposed to do when moving their body, may have vestibular difficulties. The vestibular system influences functions such as muscle tone, postural control, balance, eye and neck movements.

Lucy had a weakness with muscle tone, balance and eye movements.

I also addressed her breathing pattern, her visual and fine motor-skill.

#### **Tools: Asana**

The tools I used were asana's as a primary medium to enhance the proprioceptive system and sense of balance; for reasons explained above in the literature research.

To stimulate movements across the midline of the body that is said to engage the whole brain. Also, in order to bring about an enhanced alignment of the spine and the chakra center's along the spine and thus encourage balance and a more balanced functioning of their associated motor and sensory faculties. (Jnanendriya and Karmendriya)

(At a later stage I intend to use other tools as a secondary medium besides the breath to stimulate or reduce the dynamics within those energy centers and thus influence their energy according to students needs)



**Tadasana** with the heels raised was used to initiate balance as well as to stimulate the sole of her feet and help to correct her flat feet.

**Pascimatana** posture as well as **Purvataka** postures formed part of the practice to correct inappropriate habits of posture; the first because I noticed she pushed her abdominal area forwards; the later because while observing her from the side her ear was positioned more forward than her shoulders, demonstrating slight kyphosis.

**Purvataka** was also to open her chest area and improve her breathing capacity.

**Pascimatana** also stimulated her digestive region.

I choose **Surya Namaskar** sequence with variations because they are fun and engages the mind as they require concentration and memory in order to remember the different vinyasa's. The vinyasa sequences also lend themselves to bring more awareness to the different aspects of breath and thus stimulate breathing capacity.

**Twists or Parivrtti** classification of postures were included in each practice to stimulate the workings and integration of the right and left hemisphere functions as described in the research of Brain Gym with the ease of movements across the midline of the body, postures in yogic terms known as Parivrtti.

These postures also served to stimulate the apana region and aid digestion.

**Asymmetrical postures** were included as there was a difference noted in the postural alignment between both sides of the body; one shoulder was held higher than the other.

#### **Balancing postures (Bhagirathasana & Garudasana)**

These are particularly challenging, as they require both aspects of flexibility and strength on both sides of the body in order to achieve this balancing alignment of the body. They also encourage a sustained one pointed focus of the mind. But mostly these postures were chosen to strengthen the vestibular and cerebellum function.

**Breath:** Awareness of the movement of the breath was taught to enhance breath (she used her mouth to breath and when asked to try and breath through her nose she used a lot of force in face/neck and shoulders) and to direct the energy-flow as well as to stimulate focus.

**Mind:** During rest recite parts of the alphabet forwards and backwards to stimulate focus.

**Palming:** To relax her visual sense

#### **Secondary tools**

**Chant:** To bring focus and direct the flow of the breath (sound coming from apana region) as well as to increase length of the breath. (She had a past history of pneumonia and whooping cough)

**Directing the eyes:** To enhance the visual sense as a problem was noted of both eyes not moving simultaneously at times.

**Nyasa:** To enhance her fine motor-skill because she experiences difficulties holding a pencil.

## **Result (Case study):**

Although this case study did not go beyond a couple of initial practices, the information I gathered prior to these practices was very valuable and point in the direction of my hypothesis, but it also brought forward some interesting points/questions.

### **Feed back from interview with mother**

From the start and from my interview with Lucy's mother I found out that Lucy had low muscle tone diagnosis, which had been identified by a professional friend.

Her mother also affirmed Lucy's difficulties with balance, which delayed her ability to ride a bicycle until she was 9yrs old and this with a special instructor.

Because of this Lucy had a resistance to activities, which demanded lots of physical effort such as running at a cross-country race, which she would walk instead.

Her mother also informed me that Lucy became hyperactive and unable to focus after eating sweets with contained additives.

Her mother had also noticed that dairy products caused constipation and wheat products affected Lucy with a smelly breath. Both symptoms confirmed that there were problems with Lucy's digestive system.

Her mother said that mentally Lucy's attention would tend to drift and resulted in her inability to stay on task. Following through the daily routine of getting ready in the morning with shower and brushing of teeth caused many confrontations.

When given a task Lucy was only ever able to remember the first step of the instructions and having done that step she had forgotten the remaining steps, which contributed to frequent frustration which upset her to the extend that she stopped the Ballet classes.

### **Feed back from interview with Yoga teacher**

From my interview with her Yoga teacher I discovered that Lucy had started to come for classes on a weekly basis for 2 to 3 years.

Initially the main focus was to improve Lucy's focus and attention span. The main tool used were asana, which were taught within different vinyasa sequences.

At first the focus was on improving Lucy's flexibility and today she is developing strength. The teacher would make Lucy attentive to what caused her attention to drift and what was possible with an appropriate focus.

Chanting was sometimes used with the postures to ad another dimension of keeping her focus, to lengthen the breath (exhale mainly) as well as to pace the movements.

The choice of asana's was to improve flexibility and strength and to learn many different postures. She learned the names of the postures in Sankrit and was able to memorize a lot of sequences. Her favorite postures were shoulder-stand and twists.

Over these 3 years the teacher had seen a lot of improvement in Lucy's ability to stay focused, Lucy was now also aware of the actual moments when she to diverted her focus.

### **Feed back from interview with Lucy**

In my observation I noticed she held her right shoulder higher then the left, she tended to push her abdomen forward; her left eye looked bigger then her right. Her ears were positioned more forward then her shoulders (side view). She had flat feet and her feet (toes) were both turned outwards.

Talking to Lucy she explained how the dyslexia affected her; that initially as she looked at printed text letters would move across the page sometimes changing a word (at would become to fat). Her strategy to make the letters stop moving was to bring the book closer to her head which made the letters bigger and allowed her to focus on the word without losing her attention on the page. However her teacher did not approve and accused her of not paying attention.

When Lucy had the Academic assessment for Dyslexia done, they tested if by covering printed text with a colored film (yellow, blue and pink) would improve her ability to read. Interestingly when the text was covered with a yellow film, Lucy found that this stopped the letters from moving.

This is interesting and fascinating as learning about Yoga and Ayurveda's principles based on the Samkhya philosophy everything in the Universe is composed out of "the great five elements" or Panchamahabhuta's. These five elements- Space, Air, Fire, Water and Earth are everywhere and are mixed in an infinite variety of relative proportions manifesting in unique and distinct forms of matter. These elements or bhuta's also combine into three bodily energies (tri-dosa-s: vata, pitta, kapha) and three qualities of nature (gunas: activity, inertia and clarity). The dosa-s or bioenergetics force regulate and determine our health and physical condition while the guna-s are said to be forces that determine our mental and spiritual health.

Each Panchamahabhuta is related to a specific sense organ, with its properties and actions; and each element is also linked to a particular chakra, color, bija sound, shape and deity. Yoga and Ayurveda understand that all variations of patterns in human beings are just fluctuations of these three guna-s and dosha-s and that if there are any vitiations, that their energies can sometimes be returned to balanced by introducing qualities associated with an opposite element.

So coming back to Lucy and the yellow colored overlay that stops the letters from moving on the page; in Ayurveda the color yellow is associated with the element of earth and the nature of this element is solidity and structure, this could clarify from an Ayurvedic perception how the color yellow helped to stabilize this imbalance and excessive movement in Lucy's sense of vision.

Besides this visual imbalance, symptoms such as having a sensitive digestive system, her difficulty with balancing on her feet, could all relate back to the element of fire and an imbalance in the Manipuraka chakra. In her postural observation I noticed that she tends to protrude her abdomen forwards, which is the Manipuraka region.

I also observed that her right shoulder is up and her left shoulder is lower, this could also affect other areas of the spine such as a tilt and something I wanted to examine further. Also her feet are out-toeing which could be because of an external rotation of her hips and tightness in that area?

She told me she can balance very well on her left leg, here she feels as if she is locked, or stuck as she calls it; but she cannot hop forward on her left leg. While on her right leg she can hop forward but cannot balance on it without support.

Another distinctive characteristic I noticed needing further investigation from a professional are her eyes and how the left eye sometimes looks bigger than the right eye and sometimes the movement of her eyes seem to be unsynchronized.

She tells me she has a lot of difficulties copying from the blackboard, she keeps losing her space after each syllable she copies as the distance between her desk and the blackboard is too large, going close to the blackboard helps.

I asked Lucy's mother later if they had done an eye-examination, she responded that someone else had also advised her to get Lucy's tracking skills tested, but she had not yet done this. One month after our study together, Lucy went to get her eyes checked and was given reading glasses to remedy her eye movement or eye tracking problems, today she is reading novels!

Lucy also experienced problems hearing but this she told me only took place after she had been exposed to lots of noise, like after time spent in the playgrounds or after a period in class where all the children were allowed to share something in pairs and it became very noisy; in the silence following right after this noise, when they were asked to be still; Lucy found that everything became totally quiet and she found that if something was said in that time she was unable to even hear it, to the frustration of herself, her teacher and her friends.

In yoga this concept Lucy experienced is described with the terms of a-yoga or ati-yoga, which is explained as an imbalance that comes about through an abrupt exposure to two opposite environmental conditions as opposed to a gradual transition where the system has time to adjust.

Explaining this problem with hearing to me, Lucy discovered that she had intuitively found a way of adapting to this by covering her ears in the moment of transition between these two extremes, which ruled out her deafness. She was astounded that she had never told anyone about this before not even her mother.

### **Discussion:**

However after two lessons Lucy did not want to continue any further with the study, she just wanted to continue her weekly lessons with her teacher. There were several obstacles that caused her to discontinue. A couple of weeks before the yoga study her mother had taken her out of school, she felt Lucy was getting too upset; she was now being home-schooled by her mother. This decision put extra pressure on the mother's already overloaded schedule, with a father working away in the mines and an older daughter and granddaughter moving into their home.

Although the aim was for Lucy to become more independent and self motivated in her yoga practice, this commitment to bring her to a regular yoga practice was an extra burden on top of the home schoolwork, the extra remedial work in an irregular home routine and a home environment that lacked structure. Her mother was at the end of her tether.

Another contributing factor that made Lucy abandon the study was because she became confused noticing a difference in both yoga teachers instruction and focus. Unfortunately as working with Lucy showed the ability to explore some interesting links, but circumstances prevented further investigation.

### **Further developments**

Lucy went back to school but to a different and smaller school, she has now a lot of support from the teachers and feels happy.

Lucy was prescribed reading glasses and is now able to read novels.

She enrolled in a special music program for piano, the Suzuki approach and she still continues her weekly yoga classes with her teacher.

## **Methodology (Second study in a Primary School)**

### **Choosing subjects**

I contacted several schools in our surrounding via email, State schools as well as private schools in order to find interested student volunteers, which the school thought could benefit from participating in the research. (see Appendix: Info to Schools)

The initial State school I approached, stated that I first needed to acquire approval from the department of education in Queensland, which would involve a lot of red tape and take several months to be processed. So I considered that I would have more of a chance within the private schools sector.

However here I came across another obstacle as one of the private schools objected to Yoga as it was not in line with their Steiner philosophy and I did get a similar reply from a Christian school.

I started to wonder if anything was going materialize at all. After more weeks and many phone calls, I finally did get the support of the Principal and Support/Inclusion teacher in the State Primary School where my daughter used to attend a couple of years ago. The Support teacher kindly liaised with the schools class teachers and found two teachers who were keen in having several of their students participate in my project proposal.

### **Method**

After an initial email response of the Support/Inclusion teacher, I found out that the teachers (composite year 4/5 class) had identified 15 to 18 children (10 year olds) they thought could benefit from participating.

The teachers proposed 3 time slots of 40min for me to choose between to work with the children. Upon reflection this meant that I could no longer approach the study as a case study approach as there were too many children and only one 40 min timeslot per week. (Working with individual cases would be impractical and disruptive to both teacher's and student's schedules.)

So I reviewed my plans and proposed to work with an experimental group (a group of around 7 children who were keen to participate and practice at home) and a control group (the remaining children who did not want to take part) I wanted to do an assessment for both groups at the beginning and at the end of the research project and use the difference (or similarities) in measurements to evaluate the results.

A letter was sent home to these children's parents explaining my intentions and asking for their consent. (See Appendix: Letter to parents and caregivers.)

I decided to mainly evaluate:

- If by enhancing student's sense of balance and muscle tone (aspects of the vestibular system/ the inner ear) would benefit their auditory processing skills.
- If by strengthening the student's proprioception (their ability to know where their body is in space) would enhance their ability to sit still and pay attention as well as strengthen their visual skills.
- While still considering the influence of the intervention on the other aspects of their being.

There were only 8 weeks until the end of the school year, so I would use the first and last week to explain the study to the children and gather feedback from them via the questionnaire. I still used the same questionnaire (Pancha Maya) for the children as the one I had used with Lucy (case study) so that I could consider the influence of this intervention on the other aspects of their being and I repeated this questionnaire (with some adjustments) after the 6 weeks of practice. (See Appendix: Panchamaya 1 & Panchamaya 2 )

A questionnaire asking for the children's area of learning difficulties (auditory, visual memory etc.) was sent home for parents to complete and I was intending to do the same at the end of the research. (See Appendix: Students Assessment)

Over the remaining 6 weeks six practices were given and the children were encouraged on a weekly basis to practice these at home. (See Appendix: Group practices)

### **Primary Tools:**

I used asana's as a primary medium and each practice had two main or goal postures, one twist and one balancing posture, this in order to enhance the proprioceptive system and sense of balance for reasons explained above in the literature research. Asana as the primary tool was also in order to bring about an enhanced alignment of the spine and a more appropriate distance between the chakra center's along the spine thus aiming to achieve more balance within these subtle energy center's and their associated motor and sensory faculties. (Jnanedriya and Karmendriya)

I chose **Surya Namaskar** sequence because it fulfills a lot of purposes; it limbers the body especially useful at the beginning of the practice by working with both flexibility and strength, it is also fun and engages the mind, as it requires concentration and memory in order to remember the different vinyasa sequences. The Surya Namaskar sequence also allowed the body to direct and release any excessive rajasic energy, which was often helpful at the beginning of the class.

**Twists or Parivrtti classification of postures** were included in each practice to stimulate the workings and integration of the right and left hemisphere cognitive functions. (See the research of Brain Gym with the easy of movements across the midline of the body). These postures also improve eye and neck movements.

**Balancing postures (Tadasana, Bhagirathasana, Garudasana, and Ekapada uttanasana, Utthita Trikonasana (variation lift leg horizontal parallel to the floor) Virabhadrasana2.**

In the Dore program one of the activities that boost cerebellum functions is by improving ones sense of balance. Susan R. Johnson found that sense of balance improves sensory integration and skills required for literacy. So my purpose of including these balancing postures is to find out if an improved sense of balance and with it a sense of body awareness in space would influence the motor and sensory faculties (Jnana and Karma) in a positive way and if it has any effect on their cognitive skills. These postures also require a sustained one pointed focus of the mind and the children loved the challenge.

## **Secondary tools**

**Breath & Mind:** Bringing attention to different aspects of as well as the length of the breath to stimulate focus and attention and boost breathing capacity. Using the breath to let go of agitation/ hyperactivity, also with using sound on exhale.

## **Results and Discussions:**

I had a meeting with the teachers and the Support/ Inclusion teacher prior to commencing the classes. Here I was given a very brief outline of the children's problems as well as some guidelines on how to deal with unruly behavior. During this meeting I also found out that there were now only 8 children in total as opposed to 15 or 18, which negated the value of a study with an experimental group and a control group. For my evaluation I could now only use the experimental group and compare the details I gathered before and after the 6 weeks intervention.

The group of children presented me with a whole blend of learning difficulties from Dyslexic (1) and ADHD (1) symptoms, to problems with focus (7), spatial awareness, general low literacy & numeracy skills (8), behavioral problems (3), emotional problems, insecurity (4), incontinence (1), unsettling family situation (3).

On my first meeting with the children, all (6 boy's & 2 girls) filled in the Panchamaya questionnaire 1 (see Appendix) One boy expressed that he did not want to participate and I said to him that he had a choice to participate or not. However for the first class all the children were sent to attend, they were not given any choice.

The initial lesson with the children was quite challenging and it took a couple of lessons for some of these disruptive behavioral patterns to settle down. This made it also difficult to become aware of and adjust to certain children's individual needs. So I discovered only after the feedback on the children's final questionnaire that I had totally misinterpreted one boy named Asher's inability to balance for deliberate disruptive clumsy behavior that I assumed was to gain peer attention. Did he disguise that he had difficulties balancing because he felt embarrassed?

I was able to have the children's feedback on the Pancha Maya questionnaire in mind from the beginning as we completed this together in class. These answers were often helpful in revealing links that would have been missed otherwise. Two of the boys had dark circles under their eyes and one of them responded that he never slept well, had irregular meals and that he often felt tired. I was told two weeks later that he was taken out of school and moved elsewhere because of a troubled family situation. (This brought the final number to seven children participating in the study.)

However to get the Student assessment feedback-form on the "child's area of learning difficulty" (see Appendix) returned from the parents was a challenge and some forms were only returned to me in the final week. One form never reached me as the boy kept purposely losing it, feeling too embarrassed by his mother's comments. Another form was signed but left blank, here the parents had neither made any contact with their son's classroom teacher during the school year and left their contact details blank on the signed Consent form.

So to find out if the parents thought the study had been helpful and get their feedback on change: good or not so good, I decided to do a telephone review instead. This turned out to be a rewarding alternative instead of repeating the Assessment form and it also gave me also some additional insights.

An overview of the final results from the children and their parent's feedback can be observed in the Assessment table below.

Improved= YES

Not Improved= NO

Scale: 1-10 equals the rating the children have given themselves

Parents confirmed positive change: YES

Parents didn't see any change: NO

+ Student practiced at home.

\* These children had additional intervention at the same time as the yoga.

	Auditory Skills	Visual Skills	Sense of Balance	Improved Sense of Body	Memory	Focus	Confidence	Emotion Happier
Alissa+	YES YES	YES NO	YES YES Scale: 9	YES YES Scale: 9	YES YES Scale: 10	NO YES	YES YES Scale: 5	YES Scale: 9
Asher	NO NO	YES NO	WORSE	NO YES		YES Scale: 4	NO	NO YES
Henry	NO NO	NO YES*	YES Scale: 9	YES Scale: 7	YES Scale: 4	YES YES Scale: 8	YES YES Scale: 8	YES YES Scale: 10
India	YES		YES Scale: 8	YES Scale: 7	YES: Scale: 8	YES YES Scale: 9	YES YES Scale: 7	YES Scale: 9
Justin	NO	NO	YES Scale: 2	YES Scale: 5	NO	YES Scale: 10	YES Scale: 10	NO
Sol	NO NO	NO YES*	YES Scale: 7	YES Scale: 3	YES Scale: 3	YES Scale: 3	YES Scale: 3	YES Scale: 4
Zach	YES NO	YES NO	YES Scale: 6	YES Scale: 7	YES Scale: 4	YES YES Scale: 8	YES YES Scale: 9	YES YES Scale: 9

The table does not include when the parent/ mother was unsure, but shows only when she explicitly replied to that particular aspect.



### **More detailed background on each individual child:**

**Alissa's** difficulties were mainly visual and auditory related to memory. The teacher described her as being "in her own bubble".

She was the only student who regularly practiced at home, knew already many postures from the start and was very able to do them she already had a very good sense of balance.

Her mother's final feedback was: " She is definitely more confident and now able to express how she is really feeling rather than a pretense. Her ability to focus, listen and retain information has definitely improved!"

**Asher** I was told had behavior issues and ADHD symptoms, he was the same boy that did not want to participate in the yoga classes from the start and whose problems with balancing I had overlooked.

From his questionnaire responses I could infer that he was emotionally disturbed because of his difficulties, as he felt often sad and sometimes frustrated and angry. He also viewed his own behavior as terrible and in the final questionnaire he commented that he kept waking up in his sleep. However in class he often showed consideration for others and was proactive and helpful when there was a need.

His mother wanted to particularly mention his difficulties with concentration, focus and patience as well as his difficulties with emotional control/ management.

While observing him in class I noticed that he had no problem to focus and was able to concentrate amidst the noise of his classmates as he completed the questionnaire by himself long before the others. He was smart and very fast as well as impatient and maybe this combination could be a main cause for his problems of concentration and focus, as well as for his lack of emotional control and management at other times.

Looking at his difficulties in the visual, auditory, fine motor and memory skills these could all be connected to his processing speed. He actually used the word "same speed" as a comment in an evaluation question on his motivation/ stamina /energy.

Asher also confirmed that sugar and additives affected him and made him hyper.

If I could have worked on a one to one base I would not have been able to miss that he had trouble balancing and could have adapted the practice more to suit his needs.

His mother said Asher would have benefitted even if he did not realize it, because she values yoga. She did not see any particular change but neither any change for the worse. Asher himself only mentioned that his focus had improved.

**Henry**, I was told had low literacy and numeracy and he also had behavior issues. At times his thin ear canals affected his hearing. He also experienced problems with tracking while reading but he was introduced to reading glasses at the same time as the yoga, the glasses stopped his tracking difficulties.

His mother commented that she felt yoga had helped him more academically as he was definitely more focused. She noticed she didn't have to prompt him when he came home. She found him more confident. Emotionally she saw a huge difference, as he was happier during this last term.

**India** had some auditory problems, she also felt agitated and had problems focusing. The teacher informed me that India suffered from incontinence, one day at school I met her mother and I was able to give her and India some extra suggestions to focus on during the yoga practice that would benefit her.

In the final telephone review her mother said that the yoga practices had helped India to concentrate and become more confident. India commented that it relaxed her. She felt less agitated and happier (on scale 1-10 she scored both 9). She slept better, was

more focused and her ability to remember had improved. One day she quietly told to me that her toilet problem had improved a bit.

**Justin** always looked tired, and had dark rings under his eyes he was quiet and a bit withdrawn. Justin mentioned he had irregular meals and that he had an operation on his ears. I had no input from his parents and no comment from the teachers except that they had never seen his parents. Justin who was very stiff and thought that he had become more flexible, more confident and that the yoga had improved his focus.

**Sol's** difficulties I found out from his teacher and mother were mainly with reading, although he loved reading he struggled to focus. At times he was fidgety and lacked spatial awareness. Sol's reading difficulties improved over those six weeks, but he also received personal tuition for reading during those six weeks. His teacher thought both Yoga and the tutoring had helped him.

Sol's parents broke up during the study, which I discovered at the end during the telephone conversation with his mother, this clarified for me his changed behavior from a more passive child who was keen and enthusiastic at the beginning of the study, to a more rebellious and restless boy later.

**Zach** had dyslexic symptoms: visual, auditory, fine motor-skill (hand writing) and memory problems. He was always keen to attend and very focused. He felt that the yoga had helped him with his reading, focus, had improved his confidence and he also felt happier and more relaxed. His mother confirmed those last four aspects and remarked that he absolutely loved the yoga.

## **Discussion:**

Looking at the results we have to keep in mind that only one of the seven children applied themselves to a regular practice at home. This is also reflected in the result by a greater improvement in this student overall progress.

Another important aspect is the duration of the study, which only involved a six weeks period. For any real and sustained change to occur from a yoga intervention it should be applied very regularly and prolonged over a period of three months. I was aware of this but unfortunately I came to this research nearing the end of my own study and had a deadline to work towards. I also was only able to actually start with the study eight weeks before the end of the children's school year.

It also took me some lessons to find an appropriate manner in dealing with some unruly behavior as I did not want to negatively reinforce certain children's self image but at the same time I wanted them to be respectful towards each other and myself.

So considering the above I was actually amazed by the children's feedback and the parents affirmation to an overall improvement of their level of focus (7of 7), confidence (6 of 7) and memory (5 of 7) in such a short timeframe and with such a minimal amount of active participation.

These results are very promising because all these three aspects form a major basis for a successful remedial learning program. Self-confidence does play a vital role in improving the learning process, children who are positive and confident are more likely to enjoy new challenges and more able to deal with mistakes.

Also as we saw above in the literature review there is this important relationship between thinking in the highest level of our cognitive ability (activated in the neocortex) and our emotions. So how we feel about ourselves is directly linked to our ability to pay attention and focus our attention.

The key to a better memory performance is by focusing our attention on the task at hand. Focusing our attention is key to Yoga as well and one way of achieving it is by guiding the mind to the breath, and because the movements of body are synchronized with the different aspects of the breath like on inhale we can move into a posture and on the exhale we move out of the posture it becomes a very dynamic process, which children really enjoy especially because it involves their growing body, their mind and their boundless energy. This process is also expressed in one of the meanings of yoga as "to tie the strands of the mind together".

Yoga provides a myriad of ways to focus attention and many can be specifically tailored to the needs of children with learning difficulties.

The results showed no improvement in the children's visual or auditory skills except for those two children that had other interventions (glasses and tutoring).

Although the children sense of balance was enhanced slightly and some children saw it as a huge change, much more work needed to be done before they would have a flexible and stable body. This means that their proprioceptive sense, which plays a vital role in the nervous system control of posture, also needed much more stimulation to become really integrated. From my research above I found that difficulties in the visual field could sometimes be linked to a poor proprioceptive system.

I was amazed by how inflexible some of the children were for their age and think it shows a reflection of how most children are today physically under-stimulated, they

are driven by car instead of walked, exposed to an excess of television and computer entertainment and often nourished on an imbalanced sugar rich diet.

We adapted many postures and ekapadha uttanasana became ekapadha adhomukha svanasana, however I did not present them the variation while demonstrating nor in their written up practices as lowered expectation have shown to have a negative impact on how willing children are to attempt a task, they loved the challenge. All children except one, their sense of balance had improved and there seemed to be a link between their overall positive feedback and their level of improvement with balance however the group size is too small to really confirm this.

I was keen to explore a yoga tool called drsti, which involves a focused gaze of the eyes to particular point. This is said to aid in hemisphere integration and certain drsti work also on strengthening the eyes. I was going to introduce this to the children in Utthita Trikonasana once they were more at ease in the posture by the gazing towards their thumb (they looked upwards towards their hand).

In the Davis method mentioned in the literature review they use a focusing of the mind's eye from a particular point to actually stop the dyslexic symptoms from occurring. However due to the short time frame I was unable to explore this deeper in this study.

### **Summary of Conclusions:**

From the results we can conclude that although the time frame and group size were very limited it showed very clearly that the children generally responded in a very positive way to the yoga intervention. Also from this very limited study we can see that already in a very short timeframe an improved foundation for learning was established. With this enhanced confidence and focus other areas of their learning can evolve and improve upon.

A follow up program could be implemented over a longer period of time to evaluate progress in other areas such as visual- and auditory skill.

Looking at the change that occurred in such a short time, I would recommend some form of assessment taking place at regular intervals for a group-study that would be conducted over a longer time because within a group setting many details tend to be overlooked. Another consideration would be to work with a partner so one person can focus on observation.

Comparing the potential of the case study above with the group study, we can see a big difference to how much more effective we could work on an individual basis as opposed to a group. The one on one relationship in a case study provides for a more in depth and immediate feedback and allows for more delicate issues to be discussed. The existing yoga tools can be adapted to suit the needs of children with learning difficulties, and working on an individual basis the yoga tools could be used very efficiently to address multiple dimensions in one practice.

These children also need a multi sensory approach to learning that engages their auditory, visual and kinesthetic sense. Teaching phonetics combined with movement is most beneficial and chanting or sounding out letters and words could be combined with moving in and out of postures, vinyasa's or while balancing. Nyasam, which involves different variations of placing the thumb and pressing it or sliding it up and down the other fingers of the same hand in synchronicity with different aspects of the breath; is another yoga tool that could be used and this to improve the children's fine motor-skill.

In conclusion: an individual tailored yoga practice would form a very valuable complementary intervention for the children (with learning difficulties) along with phonetic/ linguistic/mathematical tutorial courses.

A personalized yoga practice has the capacity to assist the integration of learning into all layers of their being and assists them in their daily lives.

It does this in these ways:

- By enhancing the children's muscle tone, their posture, their sense of balance and focusing on movements across the midline of the body. These aspects aid in the integration of their vestibular and proprioceptive (sensory-motor) system, which is a prerequisite development for being able to sit still and listen, for being able to focus attention and to remember facts and tasks. Before the study the children circled the word "always" (5 children) and "sometimes" (2 children) to the statement: "When doing schoolwork or listening to the teacher my mind thinks of something else" After the study all children except one felt their sense of body and sense of balance had improved. The statement above was repeated with an additional question: Do you think you are more focused and a scale from 1-10 was added so they could mark the degree of improvement. Six children answered "yes" and four with a scale between 7&10, two children scale of 3, 4 and one child found no change. The parents confirmed the children's improved focus. Five children found their memory had improved as well.
- By boosting confidence and feeling of ease. All children except one felt more confident and parents confirmed with: "Is definitely more confident!" "Improved confidence, definitely! If he had practiced more it would have been even better!"

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## **Appendix:**

### **1/ Info sent to the schools via email (looking for volunteers)**

My name is Li Melville, I am a registered Yoga Teacher with Yoga Australia, I am trained with and a member of KHYF based in India (Chennai)

**<http://www.khyf.net/khyf/aboutus.aspx>**

At present I am nearing completion of a 5 years training program towards becoming a Yoga Therapist and as part of this training we are requested to do a research project. It is regarding this that I am contacting you.

I have chosen to research the effects of a regular, individually tailored Yoga Therapy practice to the overall needs of students with different learning abilities/ dyslexia.

It is regarding this research that I am contacting you as I am looking for student volunteers to participate in this research.

From Yoga's theoretical framework supporting my research I am focusing on a few different models and one in particular: "Yoga Therapy Holistic Perspective" of the human system, which is composed of five different layers: the physical, energetic, mental, characteristic and emotional dimensions. In this traditional Indian anatomical model these layers are seen as interrelated, all pervading and affecting each other, because of this when there is a change in any one layer whether negative or positive it will affect and influence all the other layers in the same way.

The aim of a Yoga therapy practice is to facilitate the change of existing inhibiting patterns (multi-dimensional) to new and more appropriate patterns; hereby affecting the whole system in a positive way. The ancient yogi's designed the many different yoga tools to work on multiple layers at the same time.

#### **Methodology & aims:**

Considering the above, the methodology I have chosen will be a case study approached research. This is in order to tailor the practice more efficiently to the needs and abilities of the student whereby a child's feedback and point a view will form a important part. No two people with Dyslexia will ever present exactly the same symptoms.

Information collected will involve multiple sources; informal interviews with parent and student volunteers and teachers, referral to specific Academic Assessment Reports conducted for their learning disabilities, pre-post questionnaire on Yoga's holistic perspective (5 different layers), weekly feedback.

The research will involve parent and teacher/school consent as well as a child's informed assent.

The research will be done over a period of 12 weeks, during which the student will be given an evolving yoga practice that will be reviewed and refined on a weekly basis.

The research wants to emphasize the integrative approach of learning that involves and is enhanced or hindered by all dimensions of our being from our physical, vital, mental as well as our personal and emotional traits.

More specific aims:

- On a physical level:  
To bring about appropriate alignment to the physical structure and a good sense of balance, both aspects will facilitate the proprioceptive system (our internal awareness of where our body is in space) it is said that when this system is strengthened it in turn enhances the neurological pathways for reading, writing and spelling.
- On an energetic level the focus could be to relax the system or to stimulate it depending on the need. Also to bring about an enhanced breathing capacity by influencing different parts of the breath.
- On a mental level to improve focus, concentration, memory and sequencing skills.
- On a personal level to increase awareness of their unique learning process: valuing their strengths and to discovering means to make use of these in order to overcome their weaknesses. To build confidence, develop self-empowerment and faith in their ability.
- On an emotional level to stabilize emotional challenges, to stimulate lightness, openness and joy.
- (The research will not be directly working with the specifics in our language code for reading and writing, but aims to indirectly influence the impairment of auditory, visual processing skills.)

To achieve these aims some of these different yoga tools can be used:

- Asana's and sequences of asana to develop alignment, strength and flexibility, to promote balance as well as to set a challenge.  
To stimulate certain energy centers in the body that in the yogic anatomy is related to particular senses (eg. visual or auditory senses)
- Breath regulation and sound to direct energy, enhance focus and vitality.
- Focusing of the mind, as well as visualization, set intention.
- Nyasa and mudra (hand placements)
- Dietary and lifestyle suggestions.

My background as a teacher goes back 25 years while living in India. I trained 2 ½ years towards a primary school teacher at a Research Centre for Integral Education and Human Values / Mirambika (a free progress school in New Delhi).

Later while teaching children in pre-and primary grades (India), I became intrigued when I observed some children having particular difficulties especially with writing, reading and spelling.

In 1997 I completed the "Hornsby Diploma" in teaching of students with specific learning difficulties/ dyslexia.

Looking forward to your reply,  
Warm Regards

Li Melville



## **2/Letter in order to acquire Consent from Parents or Caregivers.**

My name is Li Melville, I am a registered Yoga Teacher with Yoga Australia and I am training as a Yoga Therapist.

As part of my research I have chosen to study the following:

- If with enhancing student's sense of balance and muscle tone (which are aspects of the vestibular system/inner ear) will benefit their auditory processing skills (eg. understanding and following instructions).
- If by strengthening the student's proprioception (their ability to know where their body is in space) will enhance their ability to sit still and pay attention as well as strengthen their visual skills.

It is regarding this research that I am contacting you as I am looking for student volunteers to participate in this research.

I have spoken to the school, Mrs Kenna (Principle) and Vicky (learning support teacher) who in turn has spoken to two class room teachers who identified a number of children in their classroom, which they thought would benefit from taking part in the research.

This letter has been given to these particular students.

The teachers have also allocated me a timeslot, which would work best in their weekly schedule and that would not interfere with the curriculum/academics.

The research will be done over a period of 8 weeks of the last term, during which the students will be given an evolving yoga practice that will be reviewed and refined on a weekly basis and which the students are encouraged to practice at home.

An additional acquirement of the research will be to complete an information sheet and assessment questionnaire, which will help me in order to evaluate the benefits at the start and the end of the research.

The practice will involve regular even movements of the body in coordination with the breath, with a main focus on postures that enhance balance, muscle tone and promote an increased sense of spatial awareness.

Expected benefits:

- Enhancing balance and muscle tone, which are aspects of the vestibular system (inner ear) that are said to in turn benefit auditory processing skills (the ability to understand and follow verbal instructions)
- Strengthening a student's proprioception (their ability to know where his or her body is in space) which is said to enhance the ability to sit still and pay attention as well as to strengthen visual skills.

To proceed, I will first need your parental consent in conjunction with your child's informed assent\*

**(Article 12 : Respect for the views of the child:** When adults are making decisions that affect children, children have the right to say what they think should happen and have their opinions taken into account. [www.unicef.org/crc/files/Right-to-Participation.pdf](http://www.unicef.org/crc/files/Right-to-Participation.pdf))

Please feel free to contact me directly in case you have any further questions  
Li Melville  
Tel: 54711653

### **Consent Form**

#### **Consent Form for participants (student & parent) in a Yoga Therapy Research Project.**

“Evaluating the effects of particular Yoga tools to the needs of students with specific learning difficulties/ dyslexia.”

**By signing below, you are indicating that you:**

- **have read the information sheet about the study**
- **understand that you are free to withdraw your son/daughter from the study at any time, without any comment**
- **are aware that you are required to complete a student questionnaire and record form**
- **understand that all personal information given by you will remain confidential**
- **agree that your son/daughter can participate in this research**

**I (Full Name of student & parent)**

.....

**Wish to participate in this Yoga Therapy Research Project**

**Signature:**

**Date:**

**Telephone:**

### **3/The child's area of learning difficulty**

Students laterality:

Hand

Feet

Visual skills

Does the student

- have difficulties discriminating between letters that have similar appearance, or different orientation/rotation?
- have difficulty in keeping his place while reading /copying?
- Have a problem in remembering words?
- Experience letters moving on the page while reading?

Auditory skills

Does the student

- Often mishears or garble spoken words?
- Is not able to tell when sounds are same or different?
- Have problems in identifying rhyme?

Memory skills

Does the student

- Have difficulties in following directions?
- Behave restless in class lessons/stories?
- Constantly ask for repetitions?

Handwriting

Does the student

- Writing which is of poor quality and barely legible?
- Lack fine motor control?
- Experience poor eye-hand coordination?

Writing skills

Does the student

- Have problems in formulating and sequencing ideas?

Any other difficulties that you want to mention:

#### **4/ Panchamaya questions 1 (before intervention)**

Body:

How do you feel in your body, are you fit?

Excellent/good/medium/poor

Which parts of your body are strongest?

Which parts are not so strong?

How is your sense of balance?

Excellent/good/medium/poor

(R/L side?)

Do you sometimes have problems with hearing/listening?

Do you sometimes have problems with seeing/reading?

Do you have problems talking/speaking?

Do you eat well/have good appetite?

Do you have regular meals?

Regular/Irregular

Are there any foods that affect you in a bad way? (give you an upset stomach/ give you wind/ make you hyper)

Energy:

Do you have good stamina/motivation/energy to do what you want to do?

Mostly/sometimes/Rarely

Do you feel hyper or agitated?

Often/sometimes/rarely

Do you feel tired or lazy?

Often/sometimes/rarely

Do you normally breath through your nose or mouth?

Do you sleep well?

Excellent/Good/Troubled/Irregular

Mind:

Doing schoolwork/or when listening to teacher?

My mind tends to think of something else.

Always/often/sometimes/rarely

When someone is talking nearby while I'm working on a task, it breaks my concentration.

Always/often/sometimes /rarely

How is your sense of order/eg. can you find things you need in your room?

Always/sometimes/rarely

Do you find it difficult following several instructions given at the same time?

Usually /sometimes/rarely

Do you often have trouble finding the right words to say something?

Often/sometimes/never

Do you find it difficult to remember new things you learn/or list of things?

Often/sometimes/rarely

Personality/behavior:

“Everyone is unique”

Do you use mostly your right, left or both hand to cut/write?

Do you use the same side for your foot to kick a ball?

I find it easiest to learn something new by:

- Listening to someone explain how to do it.
- Watch someone do it in front of me.
- Try it myself

I remember my schoolwork best by:

- Seeing: see a picture in my mind/ or see it written down.
- Hearing: listening/repeat aloud/ talk to self
- Touching: doing, moving and acting

Are you mostly confident?

Always/mostly/sometimes/not-confident

Are you often worried or scared?

Often/Sometimes/Not-scared/worried

Emotions:

Do you feel happy?

Mostly/Sometimes/not so often

Do you feel angry or frustrated?

Often /sometimes/rarely

Do you feel sad?

Often /sometimes/rarely

**5/ Panchamaya questions 2 (after intervention)**

1. Did you like the yoga sessions?

Yes/ No; Explain why:

2. Did you practice at home?

Regularly/ sometimes/ did not practice

Comment:

Body:

3. How do you feel in your body now, has anything changed?

Yes/ No /Same

Scale: 0-1-2-3-4-5-6-7-8-9-10

Comment:

4. Have some parts of your body become stronger?

5. Have parts of your body become weaker?

6. How is your sense of balance, now?

Improved / Same / Worse

Scale: 0-1-2-3-4-5-6-7-8-9-10

7. If you had problems with hearing/listening, do you think this has improved?

8. If you had problems with seeing/reading do you think this has improved?

9. Do you have problems talking/speaking?

Yes/ No /Same

Scale: 0-1-2-3-4-5-6-7-8-9-10

Comment:

10. If some foods affected you (like made you hyper) has that changed? Yes/ No

/Same

Scale: 0-1-2-3-4-5-6-7-8-9-10

Comment:

Energy:

11. Do you have more stamina/motivation/energy to do what you want to do?

Yes/ No /Same

Scale: 0-1-2-3-4-5-6-7-8-9-10

Comment:

12. Have the times you feel hyper or agitated reduced?

Yes/ No /Same

Scale: 0-1-2-3-4-5-6-7-8-9-10

Comment:

13. Do you feel something has changed with your breathing?

Yes/ No /Same

Scale: 0-1-2-3-4-5-6-7-8-9-10

Comment:

14. Do you feel you sleep better?

Yes/ No /Same

Scale: 0-1-2-3-4-5-6-7-8-9-10

Comment:

Mind:

15. Doing schoolwork/or when listening to teacher?

My mind tends to think of something else.

Do you think you are more focused?

Yes/ No /Same

Scale: 0-1-2-3-4-5-6-7-8-9-10

Comment:

16. When someone is talking nearby while I'm working on a task, it breaks my concentration. Do you feel you get less distracted?

Yes/ No /Same

Scale: 0-1-2-3-4-5-6-7-8-9-10

Comment:

17. Did you find it difficult following several instructions given at the same time? Has this improved?

Yes/ No /Same

Scale: 0-1-2-3-4-5-6-7-8-9-10

Comment:

18. Do you often have trouble finding the right words to say something? Has this improved?

Yes/ No /Same

Scale: 0-1-2-3-4-5-6-7-8-9-10

Comment:

19. Do you find it easier to remember new things you learn/or list of things?

Yes/ No /Same

Scale: 0-1-2-3-4-5-6-7-8-9-10

Comment:

Personality/behavior:

20.Has something changed?

21.Do you feel more confident?

Yes/ No /Same

Scale: 0-1-2-3-4-5-6-7-8-9-10

Comment:

Emotions:

22.Do you feel happier?

Yes/ No /Same

Scale: 0-1-2-3-4-5-6-7-8-9-10

Comment:



## **6/ Review via the telephone from parents after 6 weeks practice**

### **Alissa Phillips**

1. Did ..... like to show you what we did in the lessons, and did he/she practice at home?  
Yes, she showed me the worksheets and did practice.
2. Do you think the yoga practices have been helpful towards his/her physical health? (spatial-awareness, balance, fitness and energy level)  
Yes, definitely!  
Yes, I would think so, it has enhanced her balance even more and her energy.
3. Do you think it has improved his/her attention level/ concentration/focus?  
YES!!
4. Have you noticed any good or not so good change with visual skill/ listening skill/memory/writing skill?  
Concentration, ability to listen, focus and retain information has definitely improved!
5. Has it changed his/her confidence level?  
Is definitely more confident. She is now able to express how she is really feeling rather than a pretense.
6. Has it changed his/ her emotional state?  
More confidence, more real with herself and that might sometimes seem not such a good thing but it is really great!

### **Asher Richards**

1. Did Asher like to show you what we did in the lessons, and did he practice at home?  
No, not really,.... typical boy!
2. Do you think the yoga practices have been helpful towards his physical health? (spatial-awareness, balance, fitness and energy level)  
Yes, he would have benefitted even if he doesn't realize.  
I love yoga and it does benefit. There has been no change for the worse.
3. Do you think it has improved his/her attention level/ concentration/focus?  
Not sure about that!
4. Have you noticed any good or not so good change with visual skill/ listening skill/memory/writing skill?  
No, not really!
5. Has it changed his confidence level?  
Possibly confidence improved.
6. Has it changed his emotional state?  
Yeh!

### **India Mc Donald**

1. Did ..... like to show you what we did in the lessons, and did he/she practice at home?  
No, she never really practiced at home.
2. Do you think the yoga practices have been helpful towards his/her physical health? (spatial-awareness, balance, fitness and energy level)  
Definitely helped her concentrating at school, her rapport card is very good.  
She always had a good sense of balance.
3. Do you think it has improved his/her attention level/ concentration/focus?  
Yes, rapport card is very good.

4. Have you noticed any good or not so good change with visual skill/ listening skill/memory/writing skill?  
She is a very good listener, she is a good kid. Other skills maybe if it was over a longer period of time I would have more feedback.
5. Has it changed his/her confidence level?  
Definitely is more confident, but she was already confident.
6. Has it changed his/ her emotional state?  
She sucks her thumb and I have been more tuff on her about this. She is very emotional around that. Otherwise she is a very balanced kid.

Mam wants India to do yoga next year.

### **Henry Herring**

Review via the telephone from parents after 6 weeks practice

1. Did ..... like to show you what we did in the lessons, and did he/she practice at home?  
He showed them some of the postures. He didn't practice as he is too involved with his tennis. I want to laminate the practices and help him practice in the holidays.
2. Do you think the yoga practices have been helpful towards his/her physical health? (spatial-awareness, balance, fitness and energy level)  
It helped him more academically as he is more focused. I did not have to prompt him when he came home.
3. Do you think it has improved his/her attention level/ concentration/focus?  
Definitely improved!
4. Have you noticed any good or not so good change with visual skill/ listening skill/memory/writing skill?  
Definitely more focused, reading glasses were also introduced at the same time as the yoga.
5. Has it changed his/her confidence level?  
Yes, more confident!
6. Has it changed his/ her emotional state?  
Emotionally there is a huge difference, more content and happier during this last term.

The mother was very enthusiastic!

### **Justin Cox**

Review via the telephone from parents after 6 weeks practice

Justin's parents did not come once during the whole school year to meet, see or speak to the class teacher.

They returned the signed consent form but did not provide any contact number.

The form inquiring about the area of learning difficulty was returned and signed but left blank.

The school remedial teacher left my contact on the parents answer phone so that they could share their feedback directly with me but they never phoned.

### **Solomon Presnell**

Review via the telephone from parents after 6 weeks practice

1. Did ..... like to show you what we did in the lessons, and did he/she practice at home?  
In the beginning he was very enthusiastic and would show a lot of things but he did not practice a lot.
2. Do you think the yoga practices have been helpful towards his/her physical health? (spatial-awareness, balance, fitness and energy level)  
He really enjoyed it, but I could not say if his spatial awareness or balance has improved.
3. Do you think it has improved his/her attention level/ concentration/focus?  
He has been very emotional lately as we have recently separated. He has been doing better in reading.
4. Have you noticed any good or not so good change with visual skill/ listening skill/memory/writing skill?  
No, only with reading. (Sol's teacher also confirmed he had been making a lot of progress with his reading-skill, as he also received special remedial lessons at the same time as the Yoga; teacher thinks both contributed)
5. Has it changed his/her confidence level?  
He is normally a very passive child, but has been getting more into trouble lately.
6. Has it changed his/ her emotional state?  
He has been crying a lot at home recently, the yoga coincided with his father's issue's and absence.

Thank you for doing that he really enjoyed it.

### **Zachary Anderson**

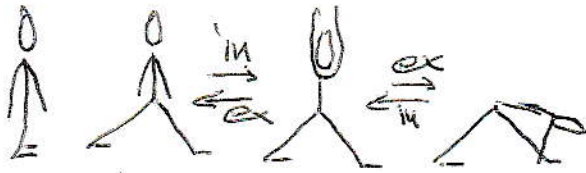
Review via the telephone from parents after 6 weeks practice

1. Did ..... like to show you what we did in the lessons, and did he/she practice at home?  
No, he did not really practice, but he often showed some things. But he loved it, absolutely loved it!
2. Do you think the yoga practices have been helpful towards his/her physical health? (spatial-awareness, balance, fitness and energy level)  
I think it has been helpful towards his mental health.  
Not sure about spatial awareness, probably his energy level.
3. Do you think it has improved his/her attention level/ concentration/focus?  
Possibly
4. Have you noticed any good or not so good change with visual skill/ listening skill/memory/writing skill?  
Not noticed, no.
5. Has it changed his/her confidence level?  
Improved confidence, definitely! If he had practiced more it would have been even better.
6. Has it changed his/ her emotional state?

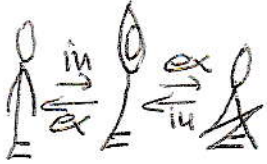
Lucy



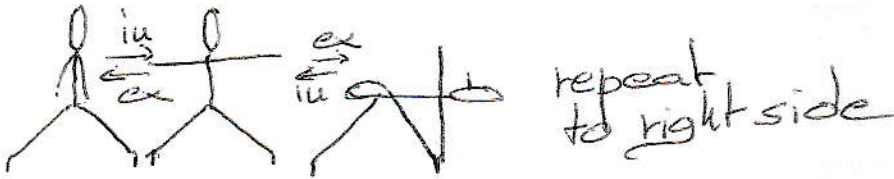
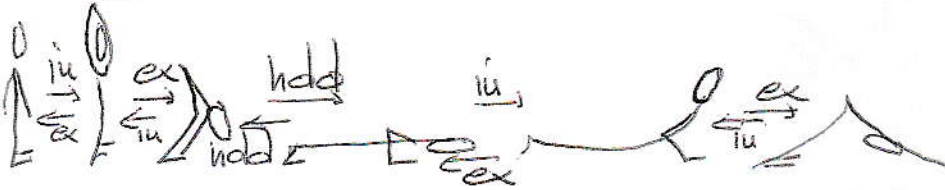
(do all 2 to 4 times)



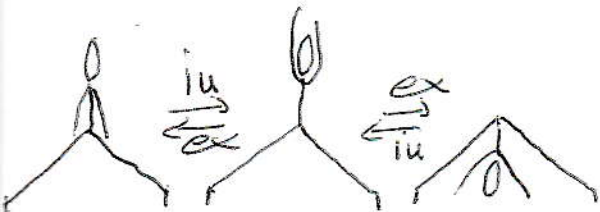
repeat  
on both sides



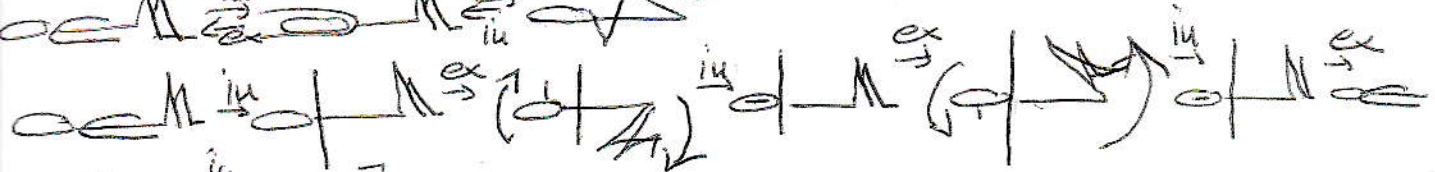
repeat  
on right side



repeat  
to right side

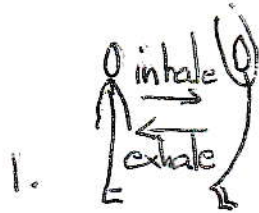


rest / <sup>hyasaw</sup>  
in: slide thumb upwards  
ex: " " downwards

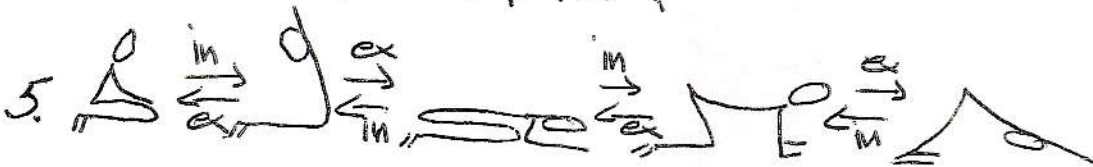
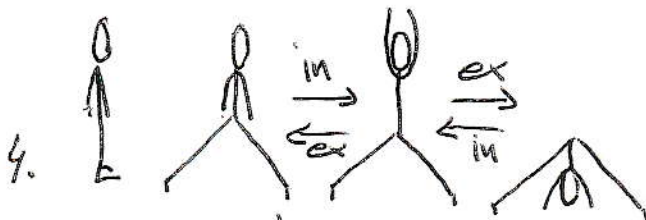
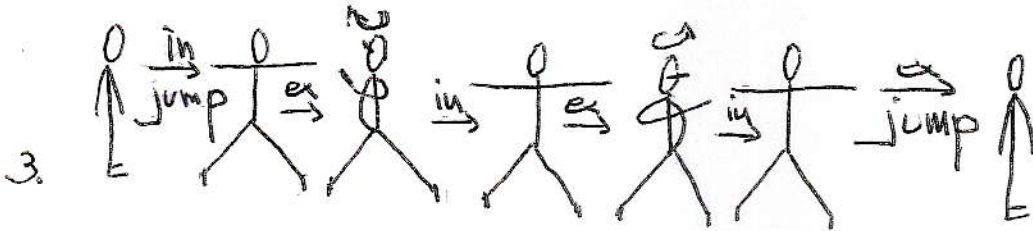



- A. rest eyes closed
- B. eyes open slowly move the eyes to each corner of the room and hdd 2" clock wise x anti clock wise (3 rounds each)
- C. palming

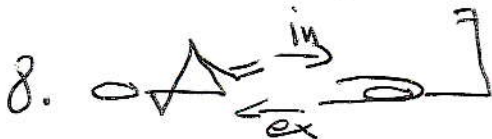
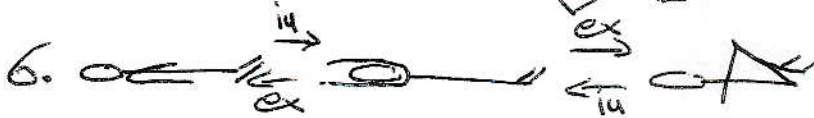
Week 1



\* On inhale count 1,2,3,4  
\* On exhale count 4,3,2,1

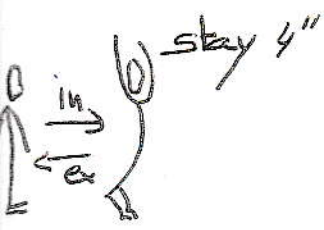


REST  Observe breath in/ex when

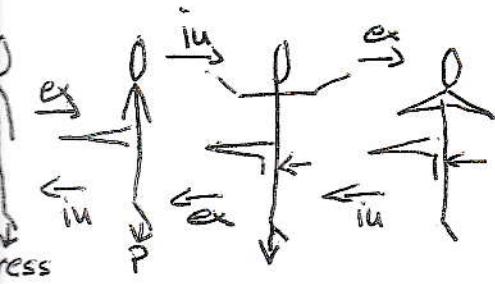
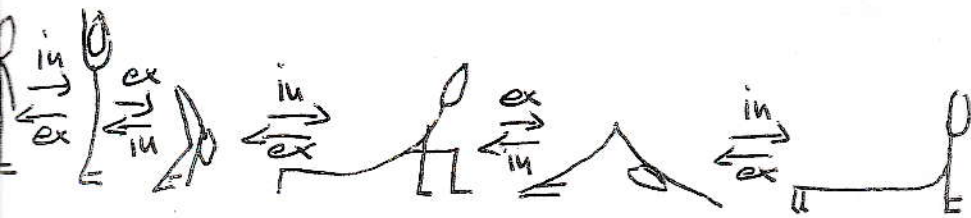


(Do all sequences  
2 to 4 times)

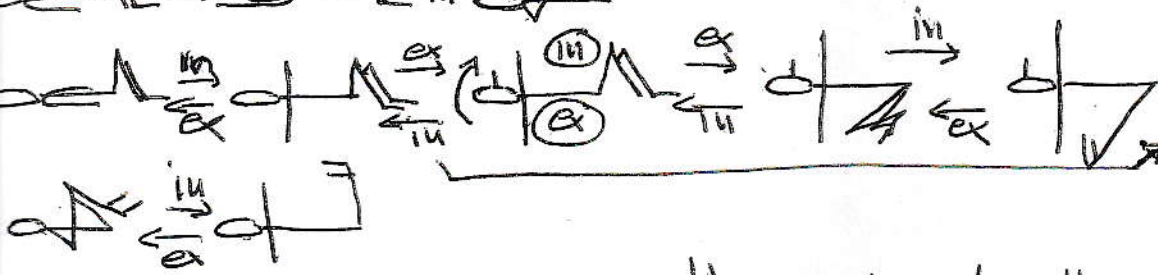
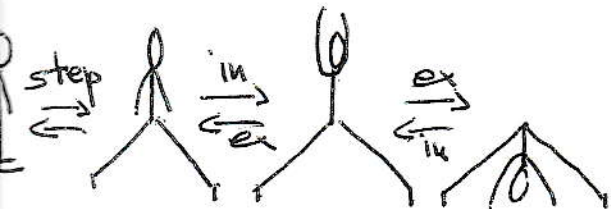
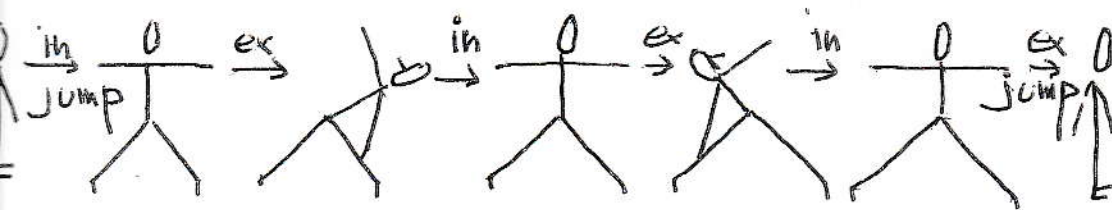
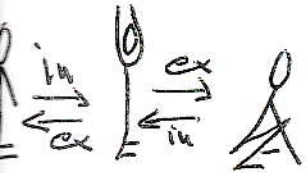
# Week 2



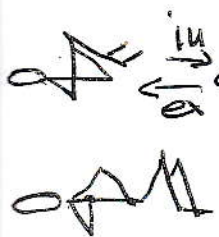
(do all 2 to 4 times)



stay 3 Brth  
= 4 5''

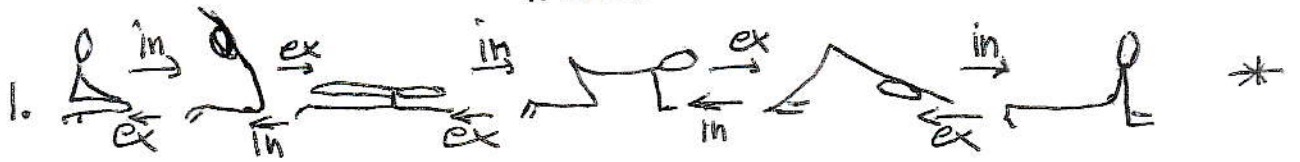


Repeat same movements to Right side

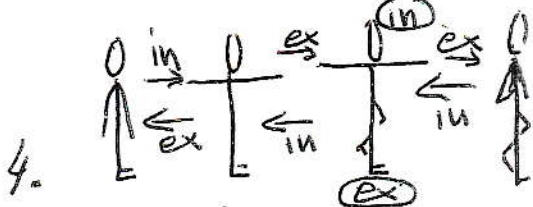
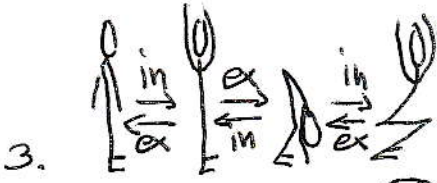


Observe Breath in/ex length?

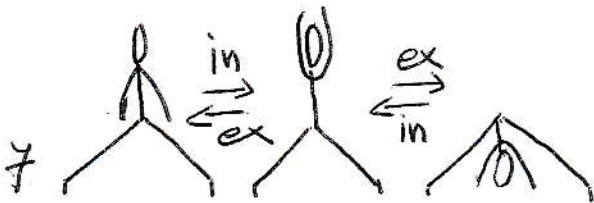
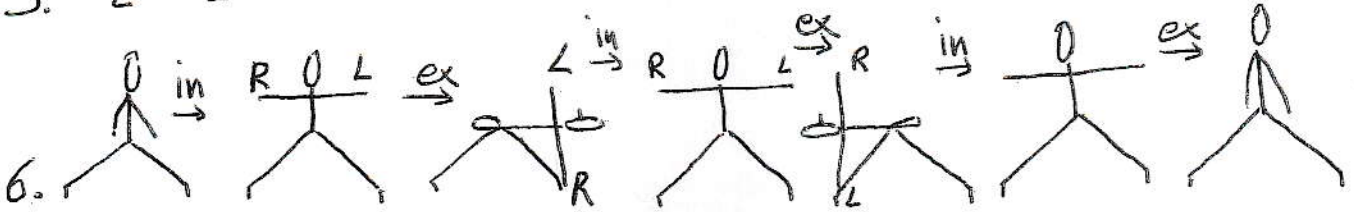
Week 3



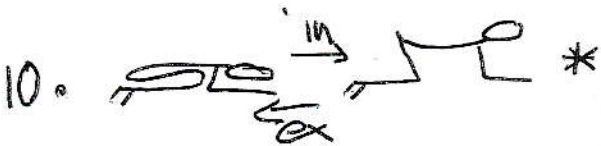
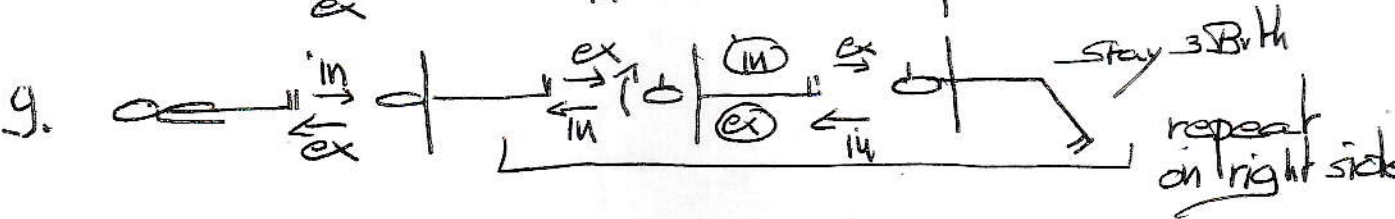
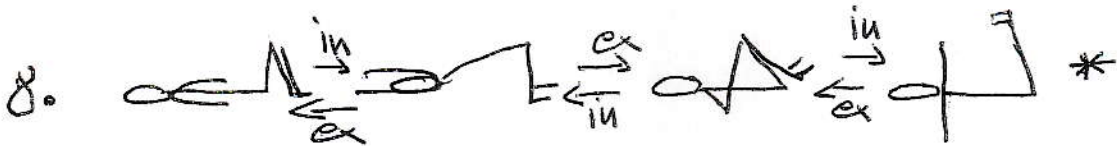
\* in = 3"  
ex = 6"



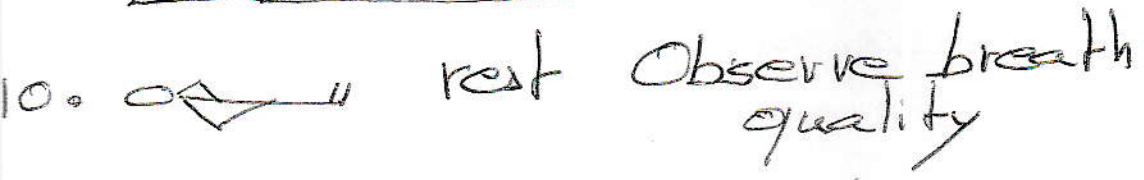
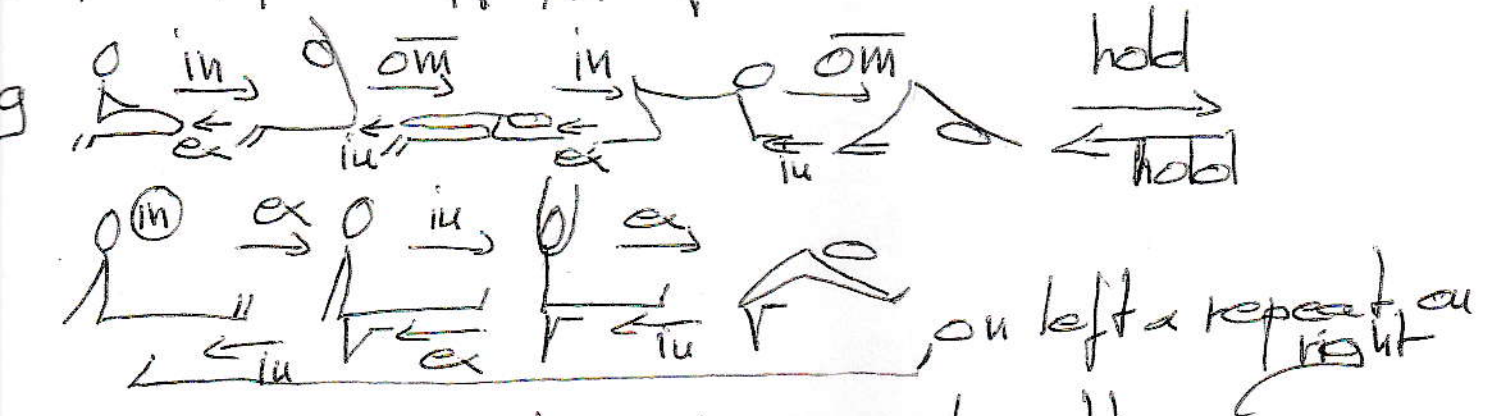
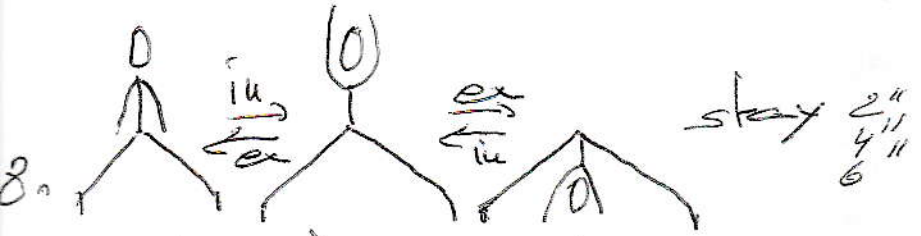
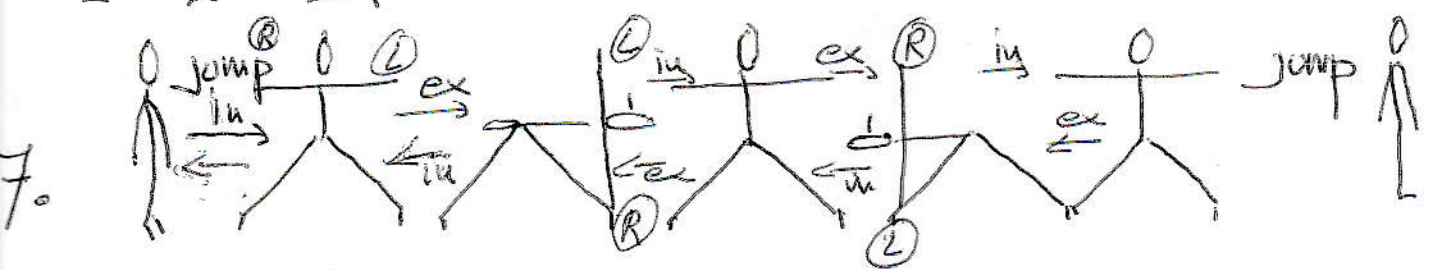
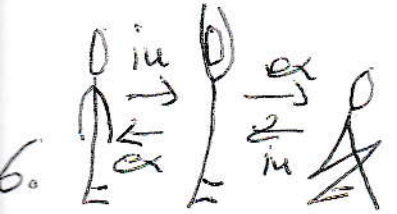
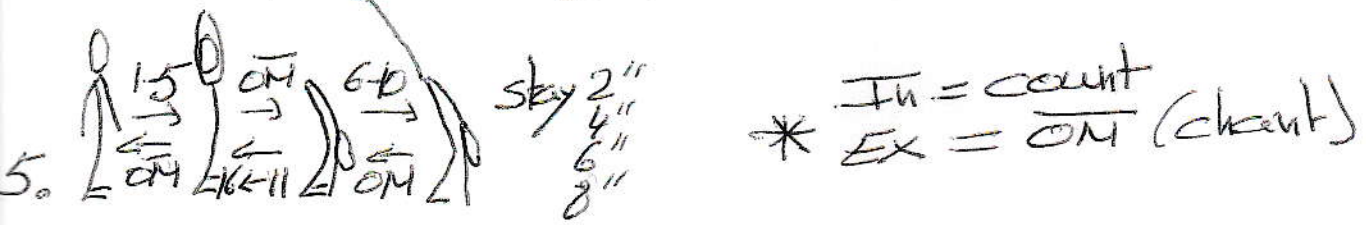
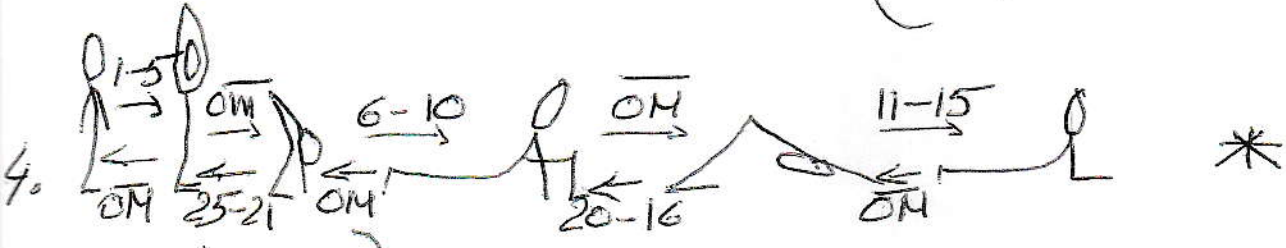
Garudhasana  
Cross legs  
Cross elbows



rest



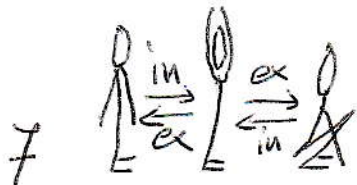
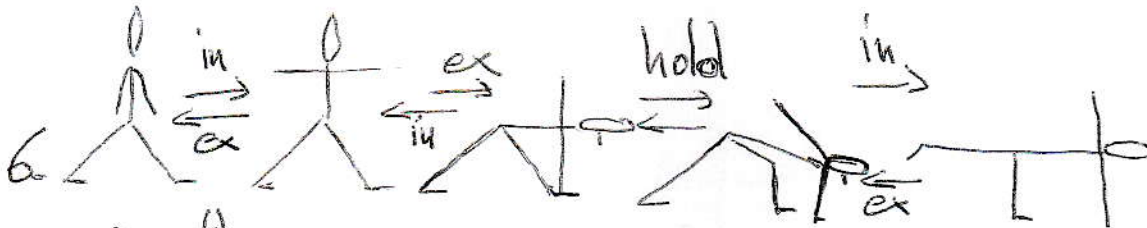
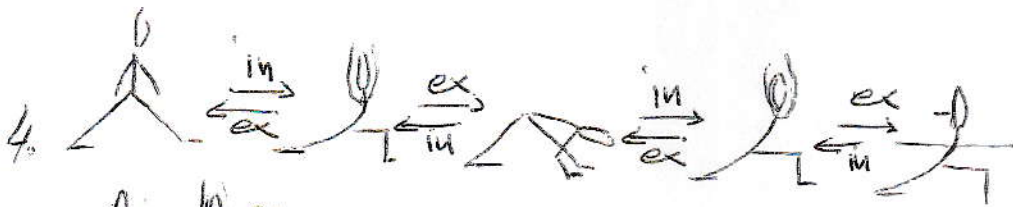
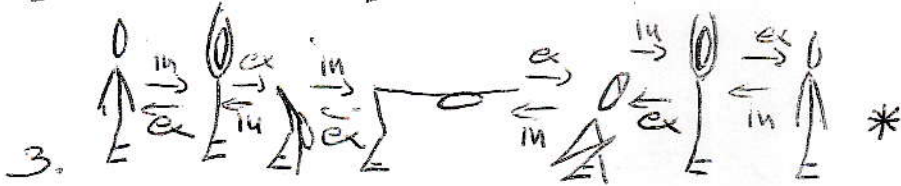
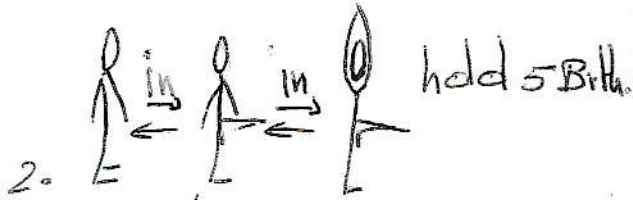
# Week 4



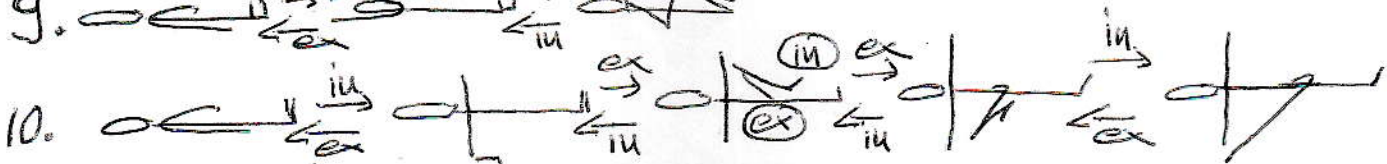
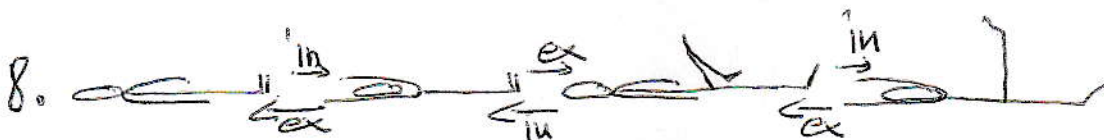




\* in = 1, 2, 3, 4, 5  
 \* ex = 5, 4, 3, 2, 1



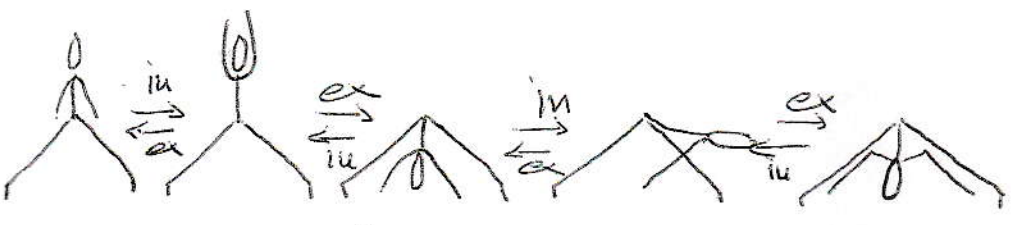
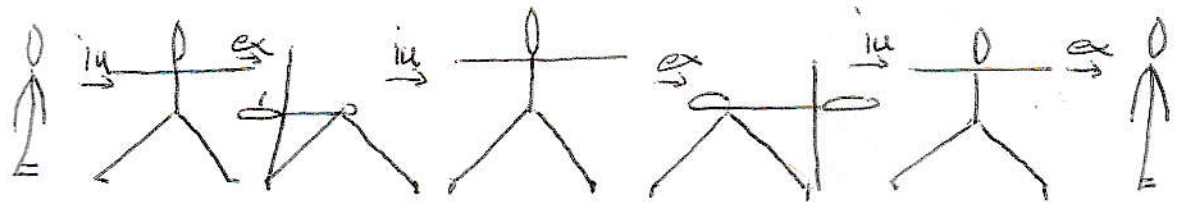
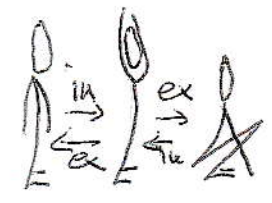
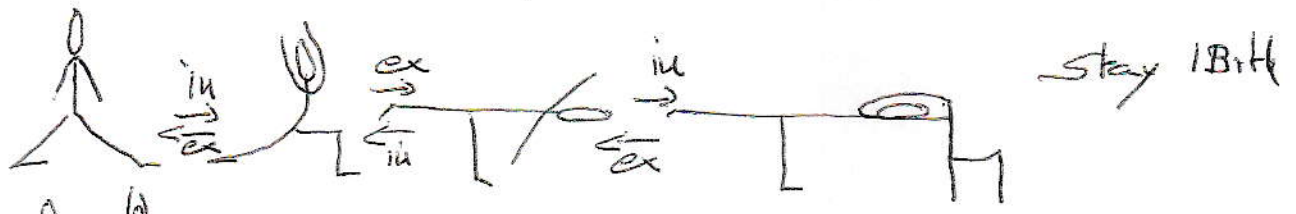
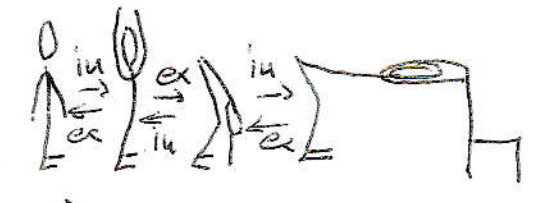
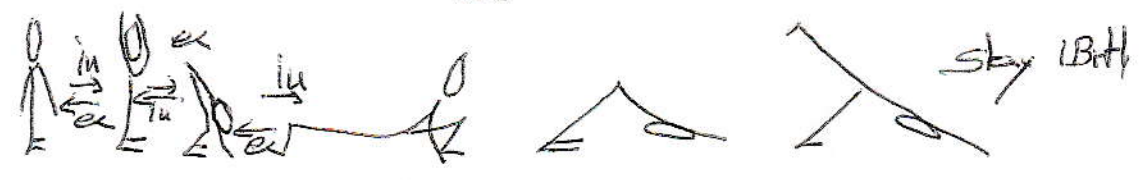
rest



rest

Week 6

(do all 2 to 4 times)



ocean rest

