

**Waldorf Early Childhood Education with the Brain in Mind**

**Submitted as partial requirement for the degree of**

**Master of Arts in Education:**

**Concentration in Waldorf Early Childhood**

**Rudolf Steiner College**

**Fair Oaks, California**

**By**

**Claudia Pfiffner**

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BRAIN DEVELOPMENT AND WALDORF EDUCATION

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BRAIN DEVELOPMENT AND WALDORF EDUCATION

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## BRAIN DEVELOPMENT AND WALDORF EDUCATION

### ABSTRACT

The problem under investigation was whether a toddler-specific curriculum is needed for public and Waldorf preschools. The growing need for preschools leads to the issue of what should these toddlers be taught. The current tendency is to use a simpler version of the kindergarten curriculum rather than to recognize the specific needs of a toddler and to offer activities that support this development. The literature reviewed included research on the brain in general and the developmentally sensitive areas which are emotional, sensory-motor, auditory, and visual functioning. A list of recommended educational activities from brain researchers was put together. An exploration of Waldorf early childhood pedagogy and its recommended educational activities followed. Activities from both fields were compared and contrasted and a new, toddler-specific curriculum was developed based on the findings from brain researchers and Waldorf principles.

The action-based research was conducted in the preschool classroom at Taos Waldorf School, New Mexico. The new toddler-specific curriculum was implemented there from August 2011 to January 2012. Data from four tools of measure showed consistent evidence of “developing” or “developed” functioning in the four developmentally sensitive areas for each participant. This was taken as evidence that the new curriculum was a major factor in meeting the needs of the preschool child and therefore was indicated for curriculum enhancement.

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## CHAPTER 1: INTRODUCTION

### **Background**

I have worked in the field of education for thirty years in several different countries, observing different teaching methods and curricula. During this time, I noticed significant changes in children and families on the one hand and educational programs on the other. Young children used to stay at home with their mothers or other family members. At the age of five or six, they were sent to Kindergarten to learn to socialize with other children and develop fine-motor skills doing crafts. Reading, writing, and mathematics were not taught until grade one. With changes in society, in particular the entrance of many mothers into the work force, young children needed a place other than the home environment to spend their days. Furthermore, Head-Start programs were created offering programs to young children of low-income families to improve their cognitive and socio-emotional development (United States Department of Health and Human Services, 2003). Play groups, preschools, and daycare centers were created in response to this need.

The curriculum for these preschoolers tended to be copied from the kindergarten. This resulted in children “learning social skills and doing crafts” two years earlier than the generation before them. Head-Start programs included cognitive activities and soon, affluent parents were demanding early cognitive activities for their children as well.

Since a preschooler now already had two years experience socializing and doing crafts, kindergarten programs seemed in need of a new and different curriculum. Instead of creating a developmentally appropriate curriculum for the three- to five-year-old child

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and leaving kindergarten to the five- to seven-year-old, it went the other way. Letters and numbers were beginning to be taught in kindergarten. This seems to speed up the process for children to finish school and enter the work force. Public school expectations today for children graduating kindergarten include several beginning reading and writing skills (Franklin Public Schools, 2003; Ministry of Education, 2006; Scholastic, n.d.).

One might argue that this cannot hurt children especially since some children want to learn of their own accord. This is certainly so. It would be interesting to study whether those children imitate what they see in their environment or whether there is an innate interest in the abstract. However, to achieve the goal, many hours are spent sitting at desks, listening to teacher-directed lessons, doing homework memorizing letters, trying to hold the pencil correctly, and trying to write small letters on straight lines. These are activities not necessarily appropriate for an under six- or seven-year-old child as indicated from recent brain research. It emphasizes emotional and sensory-motor development for this age group (Ginsberg, 2007; Schiller, 2010).

### **Steiner and Waldorf**

Dr. Rudolf Steiner (1861-1925), born in Austria, was a philosopher, scientist, artist, visionary and truth-seeker. He practised meditative, spiritual research through which he gained far-reaching wisdom on every aspect of human life. As an exceptional spiritual teacher who traveled all over Europe, he was able to translate into modern consciousness humanity's most ancient desire of knowing itself. He freely shared his research on cosmology, evolution, history, astronomy, physics, mathematics, biology, and psychology and made innovative contributions to fields as diverse as education (Waldorf

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schools), agriculture (biodynamic farming), medicine (anthroposophical medicine), and social theory (threefold social order). He was the founder of anthroposophy (Bamford, 2004).

At the center of his work, Steiner always placed the conception of the spiritual dimension of the human being. He perceived the reasons for the failure of schools early in the twentieth century to be their basis on materialistic facts like science and the absence of life. He did not recommend to abandon science but to include the realities of the soul and spirit. He also envisioned education free of influences of church and state. It should be entrusted to the educators themselves (Steiner, 1996).

In 1919, Emil Molt, director of the Waldorf-Astoria cigarette factory in Stuttgart, Germany asked Steiner to create a school for the children of his workers as he was concerned about their spiritual health. Steiner designed a curriculum based on the holistic human being or the integration of body, soul, and spirit. Steiner's keen observations of the different stages of development of the child were complemented with the appropriate curriculum which did not contradict science but completed and expanded it (Steiner, 1996).

Waldorf kindergartens, founded by Steiner almost one hundred years ago, do not introduce letters and numbers. Instead, they emphasize activities that help develop imagination, the senses, a rich vocabulary, and large- and fine-motor skills. This is facilitated by offering extended play time in- and outdoors, language- and movement-based circle times, domestic activities and crafts, songs, poems, and stories. When kindergarten children move on to grade one, they are usually physically, emotionally, and

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mentally ready to do seat work, hold a pencil and copy letters, and are eager to follow teacher-directed, cognitive activities.

Steiner thought the healthiest place for a young child before kindergarten in a loving, non-intellectual environment, filled with purposeful activities that can be imitated, and where the child can develop body, soul, and spirit in a holistic way (Steiner, 1998). In the olden days, this was usually the home. However, demand for programs for very young children outside the home is increasing even in the Waldorf movement. Many Waldorf schools now offer parent-child and preschool classes from infants on. The educational activities offered to these youngsters are often strikingly similar to the ones in the kindergarten. This is concerning to the researcher as the developmental stages of these age groups vary greatly.

In the Waldorf grade school, curriculum content is carefully assigned to each grade to match the developmental stage of the children. Considering that, should not preschoolers also have their own developmentally appropriate program? What are educational activities that best support healthy development in two- to four-year-old children? Author and director of the Institute for Neuro-Physiological Psychology Goddard Blythe maintains that activities that do not support children in their developmental stages potentially threaten their healthy foundation which will negatively influence their education for many years to come (2005).

### **Personal Bias**

I completed a kindergarten teacher training in Switzerland, a grades' teacher training in Canada, and worked in public and private schools teaching children from

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kindergarten to grade eight. Over the course of the years, I noticed an increasing discrepancy between the curriculum I had to teach and the developmental needs of my students. As I became more conscious of this and unsuccessfully tried to alter it, my dissatisfaction with the educational system grew. In addition, I experienced the frustration of many families trying to deal with schools and teachers that did not take into consideration the developmental needs of their children.

I decided to stop teaching or find a method that was more child centered. The answer to my quest came through the study of anthroposophy and Waldorf early childhood teacher training at Rudolf Steiner College in Fair Oaks, California. I studied the works of Steiner in my training and found that he designed a curriculum that addressed head (thinking), hand (doing), and heart (feeling) at every stage of a child's development. I liked the way he described children as individual spiritual beings with a mission. A curriculum goal included training teachers to help with the child's developmental journey. My past experience with regular education makes me biased in favor of Waldorf education. However, I am of the opinion that toddlers should have their own developmentally appropriate curriculum, different from the kindergarten. This applies to public as well as Waldorf preschools. The question explored in this thesis is “Should there be a toddler-specific curriculum? If yes, what should it look like?”

### **Overview**

The field of neuroscience seems a good place to start this study. This is where scientists look at the brain, how it works, what it does and does not do, and how it can be influenced and trained. A child's brain is imprinted early on by factors in the surrounding

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environment. It is important to pay attention to these influencing factors as they form the basis for further development of body, soul, and spirit. This is recognized by pediatricians, early educators, parents, and others.

Chapter two will explore what researchers found regarding the brain in general, early brain development in particular, and what educational activities they recommend to support the latter. The second part will explain Waldorf pedagogy, Waldorf early childhood education in particular, and Waldorf recommended educational activities. The recommended activities of both fields will be compared and contrasted. The results expected will show brain research as fully compatible, partially compatible, or not compatible with Waldorf education. The researcher's expectation is that preschoolers should have their own age-specific curriculum and that brain-based and Waldorf activities will be compatible.

Chapter three will describe a toddler-specific curriculum and its implementation during the action-based part of this research. Chapter four will explain how data was collected and scored. Chapter five will interpret the findings and summarize the study.

Parents of young children would likely be interested in this study due to its ability to inform their search for the best school and educational methods available for their young ones. The study could also be of use to early childhood educators and teachers, who are searching for best practices to serve children in their care. To ensure a bright future, all of society should have an interest in the healthy development of children's brains and the pedagogy that best supports it.

## **CHAPTER 2: LITERATURE REVIEW**

### **Overview**

In this chapter, the researcher will explore research on early brain development by specialists in neuroscience, pediatrics, psychiatry, psychology, and education. The first part will explore about the brain in general and the “windows of opportunity” in particular, followed by recommended educational activities. The second part will focus on Waldorf pedagogy, in particular Waldorf early childhood education, and its relation to early brain development, followed by its recommended educational activities.

Balanced nutrition is the basis for healthy brain development as researchers continuously emphasize, however, due to the vast amount of information on this topic, this thesis will focus on a developmentally appropriate curriculum for toddlers.

### **Brain Development**

In the last twenty years, new technologies have helped develop the field of neuroscience. Instead of guessing how the brain works and how learning happens, researchers are now able to provide scientific evidence. Fischer, Goswami, Geake, and the Task Force on the Future of Educational Neuroscience (2010) are talking about an emerging field of educational neuroscience. Researchers employed in this field are transforming scientific theory into educational practice to help improve learning. In order to harvest the fruits of such a highly scientific field, it is important to “translate” its vocabulary into the more arts-based language of education. Early childhood educators need to be particularly interested in this knowledge because early brain development is crucial for the long-term as stated by Mustard and Rowcliffe (2009).

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The brain starts developing shortly after conception and continues after birth. Environmental factors influence the wiring of the brain so that it becomes highly attuned to the surroundings into which an infant is born. If the environment is abusive and loud the brain will be wired to lookout for danger. If the surroundings are loving and relaxed, the brain is wired in a positive way (Mustard & Rowcliffe, 2009). Babies are very limited in their verbal capacities. This led to the belief that they are quite incapable. New science, however, looks at what babies and young children do instead of what they say. Gopnik (2010) found some amazing facts. Babies can imagine another person's experiences, conduct experiments, analyse statistics, and form theories just like scientists do.

Gopnik (2010) explains experiments conducted with babies as young as fourteen-months-old. The best learning happened when children were able to experience objects by themselves without adult intervention. If an adult showed them first how to handle the object, the young child would tend to imitate the adult rather than explore. How often do we adults feel we need to show children how to do something before we let them do it? We may tend to overlook a child's need to explore and experiment in order to develop in a healthy way, rather than imitate and memorize.

The brain consists of neurons and glial cells. A newborn has almost all cells it will need for the rest of life (Goddard Blythe, 2005). Cells alone, however, are as helpless as one human being living in the world by itself. We need others to become the best we can be. Cells need to be connected to each other by dendrites and axons through which they receive stimulation and send communication. Connections between cells are

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established through life experiences and interactions with the environment. Schiller (2010) holds that the more an activity is repeated the stronger the connection becomes. In the first year of life, we have the highest number and density of connections. High (2010) points out that a newborn child has 50 trillion connections, a one-year-old 1000 trillion, and a twenty-year-old 500 trillion. This points to the fact that we lose brain cells every day through disuse, decay, and attrition, a process which is also called pruning. Factors such as stress can inhibit growth, whereas exercise can encourage it as stated by Jensen (2005).

Our brain is subject to constant change not only in terms of cell growth and cell death, but also regarding connectivity, changing chemicals, and electrical activity (Jensen, 2005). Some researchers argue that thanks to this great adaptability, we will always be able to learn or relearn even if we did have negative experiences in early life. High (2010), however, argues that it “takes less time, intensity, and repetition to organize developing neural systems than to reorganize the developed neural systems” (slide 29).

Scientists divide the brain into different areas or lobes. There are four main areas each of which is responsible for a particular function. The occipital lobe is in the middle-back area of the head and primarily responsible for vision. The temporal lobes are located on either side of the head around the ears and are primarily responsible for hearing, memory, and language. The parietal lobe is at the top of the head and mainly responsible for processing higher sensory and language function. Finally, the frontal lobe is in the area around the forehead and is involved with purposeful activities like creativity, judgment, problem solving, and planning (Jensen, 2005). The wiring of the

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frontal lobes may not be complete until the mid-twenties, however, it depends on the long experimental learning from childhood (Gopnik, 2010). High (2010) explains that the brain is organized from bottom to top. The brain stem is responsible for the simplest functions like body temperature and heart rate whereas the neocortex involves the complexities of concrete and abstract thought.

This helps explain why brain development is also called hierarchical. Neural pathways that formed earlier become the basis for the next stages of development. For example, learning to cope builds neural pathways that later will help develop higher level language and cognitive skills. Sensory neural connections are crucial for a later ability to interpret signals for intellectual, emotional, physical, and psychological responses to stimuli. Early visual and auditory pathways are the basis for receptive language development (Mustard & Rowcliffe, 2009).

Early childhood educators who are aware that neural pathways develop early will hopefully be more conscious in offering supporting activities to children in their care. What are these neural pathways that need to be established before higher development can take place and what kinds of experiences will nurture them?

### **Developmentally Sensitive Areas**

Some researchers of early brain development talk about “windows of opportunity” (Jensen, 2005; Schiller, 2010). These are fertile times when specific areas of the brain are being wired. They last from a few-months-old to four years of age. Positive experiences during this sensitive time will wire the brain in a positive way, negative experiences in a

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negative way. The critical areas are emotional, sensory-motor, visual, and auditory development (Schiller, 2010).

Interestingly, these sensitive areas do not include cognitive development. Not long ago, cognitive activities and flashcards hung at every crib were advertised as the most important factors for success in the lives of children. To find out why this might not be the case, an exploration of each of these sensitive areas will follow.

**Emotional development.** What do researchers have to say about the importance of emotional experiences? At the age of only four months, the brain wires for social and emotional development (Schiller, 2010). This seems surprisingly early. However, recalling researchers' findings that the brain of a newborn child is biologically wired to speak, feel, and think, one may realize that without human interactions this potential ability will not properly develop. Schore (2005) claims that the right brain is shaped by emotional communications. He goes on to say that the right brain undergoes a growth spurt in the first two years of life and matures earlier than the verbal left. Lally (2010) states that early relationships are the primary environmental ingredient for healthy brain development. The most important emotional relationship of a young child is with the parents. Unfortunately, as many children today are watching television for hours every day this comes at the expense of parental interactions, play, physical exercise, and reading books (Boston University School of Medicine [BUSM], Erikson Institute, & Zerotothree, 2006).

Stress can have a major impact on someone's emotional life. Healy (2009) distinguishes between “good” stress which can enhance motivation and chronic stress

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which may cause erosion of brain circuits. Sousa (2009) confirms that positive emotions release endorphins and dopamine in the brain which create euphoria and continued interest and engagement. Negative emotions release cortisol which puts the brain in survival mode. Schore (2010) elaborates that following are reactions of dissociation within the child disengaging from stimuli and the outer world. In order to avoid or limit these stress factors in children, we need to understand what they are.

High (2010) offers a list of childhood stresses: physical, sexual, and emotional abuse, physical and emotional neglect, household mental illness, substance abuse, divorce, domestic violence, and/or incarceration. Brazelton and Greenspan (2000) have extensive experience dealing with children suffering from stress. In *The Irreducible Needs of Children*, they found that a society with a prevalent materialistic view of human nature tends to put many young children dealing with complicated family patterns and stress on three to four medications rather than offering psychological help or therapy to learn to modify behavior.

All of these researchers hold positive emotional experiences in early life as crucial. Unfortunately, our Western life style with its high degree of substance abuse, physical and sexual abuse, divorce, both parents working, and television- and other screen-watching does not seem to support consistency of positive early life emotional experience. In early childhood classrooms, it is paramount that teachers compensate for this by providing calm and safe environments, emotional interactions with constant caregivers, qualified personnel, and a knowledge of counseling and therapeutic resources

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to which families in need can be referred. Being prepared and taking action will help provide positive emotional experiences and therefore positive wiring of the brain.

**Sensory-motor development.** Sensory-motor development is next in importance regarding early positive experiences. In the brain, sensory and motor experiences are closely intertwined. This is why scientists commonly use the term sensory-motor development to describe how the brain processes these activities (Jensen, 2005). Both, sensory and motor regions begin myelination before birth and complete before the first birthday (High, 2010). Myelination is a process in the brain that makes connections between cells working more smoothly by “oiling” them with a dense, fatty substance. This helps neurons send and receive messages faster and more clearly (Jensen, 2005). The sense of touch, one of the most important senses at this young age, helps children base abstract ideas into concrete experiences (Schiller, 2010). When children put their hands into warm water, the feeling of warmth is far more comprehensible than the abstract word. Touch therefore helps build trust as the child learns about the environment and its qualities (BUSM at al., 2006). Memory results from sensory stimulation. A lack of stimulation raises concerns about impaired intellectual development (Goddard Blythe, 2005). These findings are consistently emphasizing the great importance of sensory stimulation for the young child. It reminds one of the hierarchical quality of brain development. First, children experience warmth as a sensory input. Once repeated enough, they will have memorized the meaning of it and will therefore be able to recall the abstract concept in the future. By the time they are ready to read and write, ideally,

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children will have memorized images and concepts and will therefore understand what it is they are reading about.

Myelination helps motor circuits gain better control and coordination over fine- and gross-motor movements (Jensen, 2005). Goddard Blythe (2005) explains that the earliest movements of the embryo are reflexes which are intrinsic and spontaneous. As development takes place and the higher brain centers gain control over the lower ones, reflexes transition to controlled fine- and gross-motor movement. Practice moves this process along. The best wiring for motor development happens before birth until up to one year of age. This is the time when a healthy child develops its movement ability from lying to crawling, to sitting, and walking. She sees the sense of balance as being the primary sense which gives the body the ability to function in space. Lots of movement during this “window of opportunity” is required. Isbell and Temple-Isbell (2007) report that babies who spend too much time in swings, high chairs, and car seats will not develop adequately. Children gain their first experiences of the environment through movement, and the more they move the better their motor control becomes.

Adults generally are not good role models in this area as exercise has become an additional task rather than a normal part of everyday life (Goddard Blythe, 2005). This is concerning in terms of inadequate physical but also intellectual development. Jensen (2001) states that during physical activity most of the brain is activated. When we observe young children we cannot help but notice that they move constantly. Or, as Goddard Blythe (2005) puts it “physical experience is the very expression of life” (p. 3).

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Early childhood educators have to support this need by providing safe and large enough environments in- and outdoors for physical activities. In addition, materials to practise various gross- and fine-motor movements are needed. These should include objects to climb up and down on, to swing, slide, spin, and hide under. Most movements should be free and child-directed. This will allow children to follow their own inner clock of development. Teacher-directed movements can be included, for example in a therapeutic way. Today's children often lack a variety of movements. One example is the cross-lateral, where the right hand crosses the mid-line to the left side and the left hand crosses over to the right side. This could be consciously and playfully remedied by the teacher.

**Auditory development.** This section will conclude with the exploration of the last two time-sensitive areas: auditory and visual development. The sense of hearing develops from the organs of balance (Goddard Blythe, 2005). During the first two years of life, neurons in the auditory cortex are very plastic and adaptive. This helps infants distinguish voices and melodies (Jensen, 2001). This is so much so that when they cry, they echo the inherent melody of their native language (Schiller, 2010). The sense of hearing is very much connected to memory and learning. The way a young child learns is by repetitive sensory input for example of hearing the parent's voice. This allows the brain to make internal representations. Memory improves if emotional arousal is added (as long as it is not stress-induced). In her research, High (2010) found that the IQ of a three-year-old correlates highly with non-business talk at one and two years of age. Non-business talk relates to chit-chat, active listening, praise, and restatements. Business talk

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relates to instructional language like “no”, “don't”, “stop”, and “come here” which is heard in every family. In addition, Pretorius, E., Naude, and Pretorius (2005) stated that sleep after training plays an important role in memory. It is essential for the brain to consolidate, sort, and catalog information which happens during periods of rest. A regular night's sleep of nine to ten hours is essential for a preschooler (Schiller, 2010).

**Visual development.** High (2010) points out that neural connections in visual areas peak at four months and decline until preschool age. Each eye needs to be able to see and send input to the brain for stereoscopic vision to develop. As young children handle objects they learn about the relationships between these objects as well as between the objects and the sounds they make. The more they can experience the better they will understand the underlying concepts. Furthermore, the brain needs visual depths to develop properly (Jensen, 2005).

The process of developing vision does not only happen by looking around. Through “active” vision the child develops eye-hand coordination as well as an understanding of concepts. This kind of learning goes back to ancient cultures when no written word existed. Concepts were learned by doing, not by reading instructions. Lots of in- and outdoor play provide for these experiences in a three-dimensional way. Unfortunately, screens and flash cards provide only two-dimensional experiences. In addition, a child cannot directly manipulate them (Jensen, 2005).

How can early childhood environments support healthy auditory and visual development? Lots of time and space should be provided for play, exploration, and experiments. Computer screens should not be part of materials provided. A variety of

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gross- and fine-motor movement is crucial. Songs, finger plays, and stories combining language with an emotional component is highly recommended. Repeat them often and provide a daily rest to help develop memory (Jensen, 2005; Pretorius, E., Naude, & Pretorius, 2005; Schiller, 2010).

This concludes a preliminary understanding of how the brain works in general, what is meant by “windows of opportunity”, and what the developmentally sensitive areas are for early brain development. Based on these findings, many professionals have come forward with practical suggestions for positive experiences during the critical early windows. If these suggestions were implemented in all preschools, one could potentially see results like children arriving at school with attentive, cooperative, trauma-free, drug-free, healthy brains brimming with positive life experiences and a love for learning (Jensen, 2005).

### **Practical Suggestions**

To best exercise a toddler's brain, to help it grow and develop movement skills, BUSM et al. (2006) advise for nurturing relationships and daily interactions around care giving in addition to ample space and opportunity to practise gross- and fine-motor movements. Hirsh-Pasek, Golinkoff, Berk, and Singer (2008) report that playful learning engages and motivates children in ways that enhance development and lifelong learning. This is in stark contrast to the drill-and-practice needed to learn letters and numbers. Lipari (2010) writes that early cognitive stimulation could potentially be harmful as it forces children to use lower-level thinking processes rather than develop their learning

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ability (Gopnik, 2010). Other recommended educational activities for preschoolers coming out of the above research:

1. “Floor time” (Goddard Blythe, 2005; Brown, 2010)
2. Nursery rhymes with actions, singing about things one is doing (Goddard Blythe, 2005)
3. Modeling activities (Goddard Blythe, 2005)
4. Playing with swings, slides, see-saws, and roundabouts (Goddard Blythe, 2005)
5. Simple fairy stories to help understand the difference between right and wrong (Goddard Blythe, 2008)
6. Social and emotional skill-building (Jensen, 2005)
7. Manipulating puzzle pieces, using spoons and fork, pouring one's milk, buttoning or zipping, putting on shoes and coats, washing hands, jumping, skipping, hopping, and climbing (BUSM et al., 2006)
8. Self-directed activities (Elkind, 2007)
9. Play (Ginsberg, Committee on Communications, & Committee on Psychosocial Aspects of Child and Family Health, 2007)
10. Self-regulating activities (Sigman, 2008)
11. Repetition (Mustard & Rowcliffe, 2009)
12. Creative exploration and flexible learning (Gopnik, 2010)
13. Singing and providing hands-on learning activities (Schiller, 2010)
14. Intentional and purposeful interactions and experiences (Schiller, 2010)

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### 15. Reducing clutter and decorations (Schiller, 2010).

Some of the above recommendations are in stark contrast to the reality in many preschools. The researcher has observed teachers reading up to twenty books per week to children without repetition. When asked by a teacher trainer of the school board to reduce this amount to three per week, one teacher stated, she would definitely read more than three. Teachers have been observed occasionally playing a musical compact disc for the children as they declare themselves “non-singers”, teacher-directed activities normally lasting most of the morning leaving about twenty minutes for self-directed play, daily drill-and-practice with flashcards and homework books memorizing letters and numbers to achieve reading by the end of kindergarten, frustrated teachers getting upset with crying, young children because they still have not memorized names of letters, and teachers feeling pressured to teach the whole curriculum leaving little time for practising self-care skills like zipping, buttoning, putting on and taking off shoes and coats. Furthermore, many schools do not provide outdoor equipment for use by children for fear of vandalism.

### **Need for New Teaching**

How will brain-based learning be implemented by teachers who have been trained to teach cognitive activities? These teachers, though well-meaning, do not put much weight on self-directed activities nor do they have the skill to guide them. It is much easier to control a group of children when they all focus on the teacher, than when

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everyone plays and explores in a separate corner of the room. To implement a curriculum suitable for the future, we need teachers willing and able to learn and change.

Another area to be explored: Will children with healthy brains and brimming with positive life experiences be different? Will they emerge as stronger and freer human beings? Teachers might need additional training in how to deal with new kinds of behavior.

Koetzsch (1997) has researched the history of education. He states that the task of education used to be “the cultivation of virtue” (p. 57). Teachers were asked to teach students truthfulness, honesty, self-discipline, self-control, loyalty, courage, perseverance, compassion, and consideration. These are some of the characteristics that make good citizens. However, in the twenty-first century the task of education seems to be a different one. Ayers (2004) envisions education not to service the state but for students to become more themselves, engaged, and free. He is looking for teaching that is alive and dynamic, asking teachers to: “Love your neighbors; question everything; defend the downtrodden; challenge and nourish yourself and others; seek balance” (p. 18). Palmer (2007) calls it transformative teaching:

I call it cruel and maybe the root of all cruelty  
to know what occurs but not recognize the fact.  
And so I appeal to a voice, to something shadowy,  
a remote important region in all who talk:  
Though we could fool each other, we should consider-  
lest the parade of our mutual life get lost in the dark.  
For it is important that awake people be awake,  
or a breaking line may discourage them back to sleep;  
the signals we give-yes or no, or maybe-  
should be clear; the darkness around us is deep (p. 213).

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The call for a renewal of education and teaching, even a renewal of culture, has been put out there early in the twentieth century by philosopher Dr. Rudolf Steiner in Germany. Steiner and a group of far-sighted individuals realized that the materialistic world view prevalent in the nineteenth century had arrived at a dead end. Instead of turning back, they saw the solution in raising the consciousness of human beings to attain knowledge of spiritual as well as material realities (Piening & Lyons, 1979).

Kohler (2001) used the following poem by Steiner to describe the strong love necessary to teach children in this new way:

Victorious spirit  
Flame through the impotence  
of irresolute souls,  
Burn out the egoism,  
Ignite the compassion,  
That selflessness  
The life stream of humankind  
Well up as the source of spirit rebirth (p. xi).

### **Rudolf Steiner and Anthroposophy**

Now the researcher will explore writings by Steiner and professionals in education, pediatrics, and medicine well founded in anthroposophy. Even though one hundred years ago not much scientific evidence existed regarding brain development, the researcher intends to demonstrate that Waldorf pedagogy is brain compatible. Steiner, as a very advanced spiritual scientist, would have received inspirations on the importance of early childhood that took into consideration the “windows of opportunity” and sensitive

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areas of brain development. A list of Waldorf early childhood educational activities will conclude this chapter.

Steiner (1923) explains his understanding of education as an art which “must develop from a deeper knowledge of man's whole being” (p. 105). He saw educators as helpers presenting a subject to students and at the same time respecting the will and freedom of each individual. He looked at children in relation to their whole lives, not only in a given moment. The presentation of subjects was to be alive, relate to the developmental experiences of the children, and address hands and heart as well as the head (Piening & Lyons, 1979).

### **Waldorf Education**

The founder of the very first Waldorf kindergarten in Stuttgart was Elizabeth Grunelius. Her advice to teachers and parents was to be a role model, to let children experience the world, not to talk too much, and not to be a hindrance to learning (Grunelius, 1966). Jaffke (1993) re-enforces the idea of not hindering but fostering a child's development through awareness of the developmental stages.

Based on his spiritual scientific research, Steiner developed Waldorf education and the first Waldorf school in Stuttgart, Germany. The schools based on his philosophy are known as Steiner schools in most of Europe. In North America, the name Waldorf school is much more common originating from the name of the building the first school was housed in, the Waldorf-Astoria cigarette factory (Steiner, 2000).

Waldorf education in general needs to be understood as a multi-leveled method able to address a child's multi-dimensions. The curriculum emphasizes head-oriented

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teaching evolved to include the heart and hands. Is it brain compatible? To answer this question, the researcher will first focus on the importance of early brain development and the “windows of opportunity”.

Steiner (1994) repeatedly remarked on the great importance of the earliest years of childhood for healthy development in later years. He and those he trained, stressed the importance of the teacher to know the developmental stages of their students in order to teach to the children's experiences. Brain researchers do not elaborate deeply on the stages identified by Steiner. They do mention the “windows of opportunity” and the hierarchical development of the brain indicating the importance of the age and when children are more or less likely to learn certain things.

**Three areas of development in early childhood.** Jaffke (1993) explains Steiner's keen observations on the three areas of development of the human organism. From zero to three years of age the formative forces are at work in the head. During this time, the sense impressions of a child are conducted through the nerve system to the brain or the nerve-sense system. The child explores and is open to everything in the environment. During the early exploratory stage of development, Jaffke recommends a gesture of protection regarding what impressions meet the child. For example, have the baby face mother instead of busy traffic when in a stroller or car. Jaffke also says, one needs to use imitation, the innate capability of the child to learn.

The second area identified by Steiner which is pertinent to this study is called the heart or rhythmic system. It is located in the center of the chest. In the time between the third and fifth year, the formative forces are active in this middle part of the body which

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deals with the connection between the rhythm of breathing and the heartbeat. The feeling life is strongly connected to subtle variations of this rhythm. This is why Steiner's emphasis on teaching to the "heart" includes socio-emotional learning. During this time, two qualities appear in the child: fantasy and memory. Children are interested in manipulating their environment and objects with fantasy. This imagination must be supported by choosing the right playthings (Jaffke, 1993). Steiner (1994) stated that the memory of the child should not "be troubled by memory exercises and such like" (p. 3) as it is still an imitative being. Konig (2004) compares fantasy to a child's joyful connection with the world and memory to his painful collision with it. Kohler (2001) also supports this observation and reminds readers that conversations with very young children should consist of image-making, of representing the environment with pictures rather than terminology.

The third area is the limb-metabolic system which Steiner referred to teaching to the "hand", or introducing practical activities that engaged the child's will. Steiner's (1994) view of child development combined the lower region of the ever active movement of the limbs with the metabolism. The formative forces are active from five to seven years of age. The child experiences belief in adults and guidance by authority. Having imitated up until now, children are starting to obey observations they have grasped. Children get more and more dexterous and capable in their fine-motor skills. The stimulus for play is now coming from inside rather than external objects or actions (Jaffke, 1993). Play is determined from within, from the inner being of the child which wants to unfold (Steiner, 1994).

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These three major, very distinctive developmental stages in early childhood show very clearly that early educators need to complement each of these stages with specific educational activities that meet the child's needs. This will help support the child's development, provide positive early experiences, and therefore help the child build trust in the world. The three stages can also be seen as representing the three soul qualities of man: head, heart, and hand.

The answer to one of this thesis' questions regarding the need for a toddler-specific curriculum reveals itself here. Yes, there is definitely a need for a toddler-specific curriculum distinguished from the kindergarten. What will this curriculum look like? The next chapter will focus on this second question.

Furthermore, Steiner's (1994) explanation of the sequential nature of development from head to chest to limbs, suggests development to be hierarchical. This is a parallel to brain development. First things need to be developed first, in order to provide a basis or scaffold for future development. This scaffolding effect shows Waldorf education is at least partially compatible with brain research.

**The *Twelve Senses*.** The next areas to be examined are the developmentally sensitive ones discussed earlier: emotional, sensory-motor, auditory, and visual functioning. Steiner's model of human development emphasizes twelve senses rather than the standard five senses that are more commonly known. To help one understand them in terms of Steiner's research on the human sense organization, the concept of the *Twelve Senses* will be used (Kohler, 2001). Kohler (2001) writes that for Steiner a sense was a perceptive ability to gain information on what was going on in and around the body

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without having to rely on thinking. The four lower senses, or physical senses, relate to the first seven years of life. These are the senses of touch, life, balance, and self-movement. Waldorf early childhood programs are based on the understanding of these four senses which relate very well to the sensitive areas of early neural development.

**Sense of life.** Soesman (1990) states that the life sense teaches us about joy and pain, and provides “an experience of how you feel” (p. 20). Children as they grow begin to listen to their bodies. Their bodies tell them of comfort, security and shelter, or of discomfort, danger, and vulnerability (Kohler, 2001). Some people are more in touch with how they feel than others (Soesman, 1990). Not just their own bodies tell children how they feel, relationships may do so as well. Steiner (1994) emphasized the most important matter in kindergarten was the harmonious relationship a child had with those in charge. This would not only reassure the children and help them feel safe, but to make them feel reassured about the world as well since the teacher represents the outer world to the child.

In terms of bringing the outer world to the child, based on Steiner's view of the developing child as a spiritual being, this includes material as well as spiritual realities. Waldorf teachers are trained to develop a specific inner mood in relation to each student. Long-Breipohl (2009) states “The devotion of the teacher requires that [she feels herself] as working in the presence of spiritual powers and toward the highest possibilities of the human being” (p. 45). The sense of life relates to the feeling or emotional life of a child. In neuroscientific words one could say that a balanced sense of life results from positive

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experiences and implies the brain being wired in a positive way. Both fields are consistent in emphasizing the importance of an early, positive emotional life.

**Sense of touch.** The lower senses of touch, balance, and movement correlate to the sensory-motor development. Steiner (1923) declared the child as one great sense-organ in the first three years of life. Taste, for example, he saw not just working in the mouth but throughout the whole organism right down to the limbs. Everything around children that enters their being as sense impression is being reproduced in their inner being, and through imitation comes back out. The child lives in the environment in the manner in which, later in life, we live with our eyes (Steiner, 1994). Kohler (2001) confirms this connectedness of the child with his environment by stating that the sense of touch involves the whole surface of the body not just the hands. The sense of touch not only connects but separates from surroundings. The senses are also connected to each other as one never works alone but always with the help of others (Soesman, 1990). This description of the sense of touch reminds the researcher of earlier descriptions of the brain of a newborn with all its cells present, yet no connections. To be able to survive, cells need neural connections to send and receive information to and from the environment. This is what the sense of touch does for the young child, it provides information and connectedness to the child's surroundings.

**Sense of balance.** The sense of balance includes the understanding of physical as well as soul/emotional balance. Man's sense of balance proceeds from the head. It has to be stabilized before one can walk or use the hands (Steiner, 1994). Balance helps to fill physical space and allows a standpoint of one's own (Soesman, 1990). When one's

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feelings change, an opposite complementary impulse appears in order to set them in balance again (Kohler, 2001). Balance is also called the vestibular sense (Blanning, 2011).

**Sense of movement.** The sense of self-movement is less about moving than about the feeling that one is moving. One can *see* another person move, but one becomes aware of one's own movement by feeling it. Children are not masters of their entire bodies, only parts of it are at their service (Soesman, 1990; Kohler, 2001). It is also interesting to observe that the whole body is involved in movement: The moving parts depend on the others being still (Konig, 2004). Steiner (1994) described the child before the change of teeth as interested in everything related to movement. From the movement of the legs, he saw the outer and rhythmical element of speech arise, from the movement of arms and hands the inner and thematic element of it. The sense of movement is also known as proprioception (Blanning, 2011).

The indications given through neuroscientific research for sensory-motor experiences early on are answered in Waldorf early childhood programs. Waldorf educational programs emphasize a varied, daily range of sensory and motor experiences to stimulate the lower physical senses, providing plenty of opportunity for positive neural wiring.

**Auditory functioning.** The developmentally sensitive areas of early brain research include auditory and visual functioning. Similar to the sense of taste involving the whole organism of the child, processes related to auditory functioning extend over the whole organism of the child. Later in life, these processes are localized to the ear

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(Steiner, 1923). When children hear a sound, the true voice of things is revealed. This allows them to penetrate deeply into the inner nature of matter. In this sense, sound means giving one's self up (Soesman, 1990; Kohler, 2001). The child distinguishes between sound and the spoken word which is felt as speech (Konig, 2004). Kohler (2001) mentions that hearing is the foundation for all other senses whereas vision is a connecting sense between outer and inner. Again, this confirms brain research indicating that the senses teach about the environment one lives in. Waldorf programs put much emphasis on oral storytelling, puppetry, rhymes, finger games, and singing. These help provide positive auditory experiences for the young child.

**Visual functioning.** Regarding visual development, Steiner (1994) stated that the young child may be seen as completely an eye. The eye forms an inverted picture of an external object and the blood circulation in the choroid is affected by this picture. This is caused in part by the relation of vision to thinking: Most people associate yellow with light and black with darkness. Soesman (1990) also observed that with the eyes one stays at the surface of things whereas with the hearing one penetrates more deeply into matter.

Steiner's view that the young child's organism can be seen as wholly an eye or ear, the importance of consciousness in regards to sensory stimulation and sensory over-stimulation have far-reaching implications for curriculum development. Educators often forget what a major impact everything has on young children.

However, there is conflict in this issue as well: On the one hand, sensory experiences are crucial for healthy brain development. On the other, too much stimulation is overwhelming to the child's developing neurological system. How can an

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educator find a healthy balance? The researcher has observed children covering their ears or eyes and screaming when over stimulated, others who could not rest because of too much stimulation. Knowing the individuals in each group and imagining them as completely an eye or an ear, could help educators find a middle ground.

This brings to an end the investigation into the relationship between Waldorf early childhood pedagogy and the developmentally sensitive areas of brain research. Waldorf pedagogy appears to be very compatible with early brain development. Both fields agree that the crucial areas in early development are emotional, sensory-motor, auditory, and visual. Interestingly, neither emphasizes cognitive activities for young children.

Steiner (1923) pointed to an additional area of significance in early development. He talked about the inter-connectedness of walking, speaking, and thinking “Just as speech arises from walking and grasping, in short movement, so thought develops from speech.” (p. 112). This connection would be a very interesting topic to pursue. However, it is not directly related to the “windows of opportunity” and therefore will not be covered at this time.

The above offers a greater understanding of how Steiner saw the development of the child up to seven years of age. This understanding gave birth to the Waldorf early childhood curriculum in support of that development. Following are some suggestions, from Steiner's indications and from experienced Waldorf educators, for teachers' behaviors, classroom environment, and educational activities.

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### **Practical Suggestions**

Steiner wanted the teacher to be worthy of imitation, considering that the child is a perfect mimic. He also wanted educators to trust in children and their development: For example, they will raise themselves to the upright when the right time comes. Steiner (1994) asked to provide the child with objects taken from actual life that have simple indications leaving room for creativity. Foster (2010) recommends nourishing surroundings and activities that help experience rather than learn about phenomena. Weber (2008) advises soft, melodic, and musical speech when interacting with the young child. Aimless chatter and premature conversations distract children from their own self-directed play. Almon (2006) notes that play is very powerful for a child's healthy development. Children may use play to work through difficulties, socially, physically, and emotionally. Involvement in “real work” like baking, woodworking, and cleaning can help a child find play ideas. Aldinger and O'Connell (2010) see merit in children being able to follow processes from beginning to end. Because of the myelination in the brain, they see repetition as the major tool to teach a child. Other recommendations include:

1. Surroundings that can be assimilated by the senses (Steiner, 1994)
2. Simple needlework in imitation of what adults do (Steiner, 1994)
3. Love not only the whole child, but the teaching method you are using (Steiner, 1994)
4. Quality of touch: Use natural materials (wood, wool, silk, clay, and porcelain) instead of plastic (Soesman, 1990)

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5. Playing with pots and spoons, putting hands in water, and carrying things around from one spot to the next (Jaffke, 1993)
6. Free play of arms and hands, sensing of balance, symmetry, and space (Kohler, 2001)
7. Formed speech, recitation, and music to enhance the child's ability for balance of soul and body (Kohler, 2001)
8. An environment that provides for imitation, rhythm, and warmth (Kohler, 2001)
9. Apply to the child's guardian angel for help (Kohler, 2001)
10. Independence in self-care, learn to cook and make bread, keep the house clean, play, and do craft activities (Murphy-Lang, 2010).

### **Comparison: Neuroscience and Waldorf**

How do these Waldorf educational activities compare to the ones listed above by brain researchers? Most of them support the other. BUSM et al. (2006) and Jaffke (1993) recommend every-day activities like using spoons and fork and buttoning or zipping. Schiller (2010) and Kohler (2001) recommend singing and music. Goddard Blythe (2005) and Kohler (2001) are asking for movements on swings and slides to sense balance, symmetry, and space. Mustard and Rowcliffe (2009) and Aldinger and O'Connell (2010) are calling for repetition in teaching. Experts from both fields stress the all-importance of child-directed, free play.

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In terms of language development, the researcher found that in general all researchers see great benefits in singing, telling stories, and reading books. Schiller (2010) seems to support constant chatter to help little ones develop early language skills. Weber (2008), however, warns against aimless chatter and premature conversations to not pull the child out of his own doing. This issue raises a similar question like the one on sensory stimulation above. How much is needed and what content? For the researcher, the answer lies in balance or quality versus quantity.

There are other inconsistencies between neuroscience and Waldorf curriculum and child development methods. These include areas not mentioned by brain researchers, yet, integral to Waldorf education. One of them is play materials and their quality of touch. Does it matter whether a child touches plastic toys or woolen ones, climbs on plastic outdoor equipment or wooden stumps? Besides the sensory experience of touch with its inherent information about the environment, everyone enjoys touching natural materials like wool, porcelain, and bread dough (compared to play dough). It also appears as another issue of quality versus quantity. Plastic is much cheaper than natural materials therefore more can be bought. In the researcher's opinion, quantity has proven itself superfluous with many people complaining of owning too much stuff. Perhaps a way can be found to provide affordable quality.

Another inconsistency is the involvement of the child's angel. Not much information on the invisible was found in the neuroscientific field. However, for Steiner this is an integral part of Waldorf education. It was learned earlier that Steiner's conception of the human being includes its spiritual dimension. He said that we needed

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to recognize the living spirit in each of us and our connection with the entities of the spiritual world, namely angels, archangels, and archai. This recognition does not so much happen on a “head-thinking” level as a “heart-thinking” one. If we cultivate it, spiritual beings can help us in our work with the children and parents (Kugelgen, 1991).

Many educational activities from newest brain research almost completely support Waldorf pedagogy. However, as Incao (Kohler, 2001) observes, neuroscience is merely descriptive and looks at the child in a one-dimensional way. He does not think brain research helps understand deeper issues of a child's problems and how to help. He sees Steiner's model of child development as leading us to a broader understanding of what might be going on with a child as it is looking at the child in a four-dimensional way.

The researcher recognizes that science in general and neuroscience in particular very much reflect the confidence of Western society today. The researcher is hopeful that recommended educational activities coming from that field will soon be implemented in schools for the benefit of all young children. A change of curriculum will emphasize the importance of emotional relationships and sensory-motor development over early cognitive training.

### **Pikler**

This literature review will conclude by taking a brief look at Dr. Emmi Pikler's work. Pikler, a pediatrician, lived in Hungary in the early part of the twentieth century. She was asked by the Hungarian government to preside over an orphanage in Budapest. This is where she designed and implemented a specific approach to child rearing based on the following three pillars of care:

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1. Conscious presence and attention to the child's signals during care giving activities encouraging active participation
2. Lots of free movement
3. Careful observation of the child (Ris, 2008).

This approach was so successful that in 1972, a study of the World Health Organization validated it. It said that an adult who had grown up in that specific orphanage showed no different physical, emotional, and social behavior from one grown up in a healthy family (Ris, 2008).

Pikler's pillars of care confirm and bridge the findings of brain research and Waldorf pedagogy. The first pillar of the presence and attention of the caregiver towards the child connects with the emotional development and sense of well-being in the child. The second pillar of free movement relates to the development of sensory-motor skills. The third pillar of astute observation of the children leads to information on their developmental stages. Whereas pillar one and two support both neuroscience and Waldorf I see the bridging within the third pillar. Careful observation is in line with Pikler's very scientific approach compatible to brain research. Yet, an educator's careful observation of a child includes for the researcher an openness to what comes from or through the child which would include imaginations from the child's angel. This is where the researcher sees the meeting of the visible with the invisible to bridge the gap between neuroscience and Waldorf education, two already very compatible fields.

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Magda Gerber, an associate of Pikler, brought her theories to the United States where she co-founded and directed a training program “Resources for Infant Educators” (RIE) in Los Angeles. Many professionals from the field of infant development and care get additional training there and implement her approach in their programs. This includes many Waldorf early childhood educators (Gerber, 2002). Pikler's developmental approach is another way to ensure early positive neural wiring.

### **Conclusion**

This concludes a basic overview of how the brain develops, some of Steiner's child development theory, and how educators can best provide for healthy brain development opportunities for children. Each stage of human development is like a step up a ladder, having a scaffolding effect. Steiner posited that each step presents the child with a different set of physical, emotional, and intellectual qualities which need to be met by a particular educational response (Goddard Blythe, 2005). This is furthermore supported by Long-Breipohl (2008) who pointed out the need for a toddler-specific curriculum.

Based on the literature review, there is a clear need for a developmentally appropriate toddler-based curriculum. In the next chapter, there will be a focus on curriculum content which will merge recommended educational activities from early brain research and Waldorf early childhood education. The researcher would expect a rich and comprehensive toddler program that would provide age-appropriate, positive experiences which helps wire the brain in a positive way. The curriculum developed by the researcher will be implemented with a group of toddlers at the preschool of Taos

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Waldorf School and evaluated for its effectiveness. Chapter three begins with an explanation of this action-based research, its method and design.

### **CHAPTER 3: ACTION-BASED RESEARCH**

#### **Overview**

This chapter defines action-based research, its process, design, and method. The new toddler-specific curriculum is described under the title “teacher portfolio” in the process section.

#### **Definition**

Action-based research is about the intention to change a system. A scientific model is applied to a practical problem that requires action solutions. The researcher becomes a participant within the system who helps people to empower themselves and act on common needs through shared information. The assumption is that a system is more likely to change if it gathers its own information about its problems. This approach is also called “learning by doing” (O'Brien, 1998).

In this case, the scientific model applied is the combined list of recommended educational activities from brain research and Waldorf education supported by Steiner's observations of the developmental stages of two- to four-year-old children. This list is summarized in the teacher portfolio. The practical problem is the lack of a toddler-specific Waldorf curriculum. In the roles of both, researcher and teacher of the program, I am a participant empowered to design and implement this new curriculum. Information gathered from four tools of measure will help determine the effectiveness of this specific curriculum: attendance checklist, journal notes, observations of individual children, and the parent questionnaire. Any adjustments necessary will find their way back into a revised teacher portfolio.

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The action research process has a cyclical nature. Each cycle contains the following main steps: identifying a problem, planning the action, taking action, evaluating the consequences of the action, and identifying general findings (O'Brien, 1998). For this study this looks as follows:

### **Identifying a Problem**

Is there a need for a toddler curriculum that is different from the kindergarten? This curriculum would take into consideration the toddler's specific stage of development and complement it with appropriate experiences. This would more accurately support positive development of the sensitive areas during the “windows of opportunity”. If needed, what should it include?

### **Planning the Action**

**Who.** Participants in the research are the students in the researcher's preschool class called “Blossoms class” at the Taos Waldorf School in Taos, New Mexico. Thirteen children between the ages of two-and-a-half to four years are attending the program for two, three, or four days a week. Six are boys, seven girls. No selection process needs to take place as all of the children in the class participate. All of the children are white Caucasians, most originate from a low to middle socioeconomic background, and ten out of thirteen live with both mother and father in one dwelling. The group is only representative of the cross-culture in Northern New Mexico in terms of their socioeconomic profile. Ethnically, they are not representative with nearly half the local population being Hispanic. Also, only about one third of the children in this area live with both parents in the same house. This could potentially lower the validity of the

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study and make it less valid for children of Hispanic or other minority origin, especially if they live with their parents in separate dwellings.

**What.** What the researcher is attempting to observe is behavior, attitudes, and states of being that indicate positive or negative development of participants in relation to the emotional, sensory-motor, auditory, and visual areas. The experimental group will experience the curriculum which is also called treatment every time they come to school. The attendance list will be checked every time a child attends school and experiences the treatment. Observations of children's behavior when experiencing the curriculum are recorded by the researcher on a daily basis (see *Appendix A*). Descriptions for the necessary environment and teacher-student relationships for this process are detailed in the teacher portfolio. The researcher fills out a form for each of the children regarding their development in the four areas over the course of the treatment (see *Appendix B*). The parents fill in a questionnaire with their observations of their children's development (see *Appendix C*).

**Where.** Where is this being done? The location for the action research is the researcher's classroom at Taos Waldorf School in Taos, New Mexico. It consists of a cloakroom situated in one of the main rooms by the entrance to the class. Two average-sized rooms with an adjacent large kitchen and dining area form the core of the indoor space. Three tables pushed together in the middle of the kitchen seat everyone for meals. This is also the place where the class prepares meals, kneads bread, and does craft and circle activities. All rooms are connected with open archways. At the back off a small third room, there are two restrooms each equipped with a sink and toilet.

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The “Blossoms class” forms part of the early childhood department at the Taos Waldorf School. As a whole, the early childhood program consists of three classrooms situated in a separate building from the grade school. Three buildings make up Taos Waldorf School. They are surrounded by fenced yards, one each for the early childhood and the grades. The play yard includes equipment like a slide, climbing structure, sand box, small play house, tree house, swings, tree trunks to climb on, small toys, a tricycle, shovels and rakes. Behind the play yards, there are fenced areas for the school animals which include chickens, a goose, ducks, and several goats. The land is set away from the main road, borders Native American reservation land, and features unobstructed views of the majestic Taos mountain.

**When.** When will this action take place? Research of the literature started in May 2011. Mid August 2011, with the start of the school year, the researcher began implementing the curriculum. The researcher continuously observed participants and kept notes regarding their reactions to the program and their individual development. The questionnaire went out to parents by mid January 2012. Analyzing the data and summarizing the whole project took place in January. The first draft of the thesis was ready for review in February 2012.

### **Planning the Action**

**Design.** The basic nature of the researcher's approach is exploratory. This means, the researcher explored the best-fitting organization of variables and analyzed the data with a between-participants approach (Cone & Foster, 2006). There are two kinds of variables, independent and dependent. In this case, the newly designed curriculum is the

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independent variable or treatment. The dependent variable is the behavior observed in each participant after having been subjected to the independent variable. The researcher analysed the behavior of subjects in terms of their own development as well as differences between them. The general class of this design is called correlational as the researcher is examining the relationship of participants' scores.

What instruments of measure is the researcher using? The quantitative method is about facts that are measurable and phenomena that are experienced through abstraction and analysis. This method represents the core of scientific endeavor. The qualitative method includes feelings and argues that measuring always happens in context and that therefore subjectivity is at the heart of scientific inquiry. The method the researcher is using is a blend between the two called emancipatory or mixed method strategy (Creswell, 2009).

**Internal validity.** This leads to the question of how variables influence the validity of a study. Internal validity refers to changes in the dependent variable due to the independent one not to some other unintended or extraneous variable. Many extraneous variables may influence the effect of the independent variables. Using a control group may help control or enhance some variables but not others.

The researcher will look at some of these extraneous variables and examine whether they might have an effect on the internal validity of the study. History refers to events that happen during the course of the research that influence the results. For example, a gymnastics club could open nearby with free classes for preschoolers. Many of the subjects could be participating in those classes which would enhance their motor

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skills. Since the researcher does not have a control group it would be very difficult to control this variable. What the researcher can do is being aware of what is happening in the community and how these events might influence the study. If the researcher is not able to control a large extraneous variable the researcher might have to discontinue.

Maturation refers to biological or psychological changes in the participants during the course of the study. For example, as the children get older, they will naturally get more coordinated and physically stronger. This will show in the results of the study. Without a control group it is difficult to determine whether the same physical development would have taken place without the treatment. Being conscious of this point will help to not overemphasize the data.

Testing and instrumentation does not cause a threat to the validity of the study as there are no pre- or posttests involved. Participants will not be aware of observations the experimenter makes. All note-taking will take place when subjects are not present. The questionnaire will be handled only by the parents who are not subject to the treatment. They solely record their observations of participants' behavior.

Statistical regression, another potential threat, does not affect the validity of the study. The researcher is not using pretests to select subjects but involves everyone that is part of the core group of the Blossoms class.

Experimental mortality is a variable for this study. It refers to participants who drop out during the course of the treatment. This can potentially threaten the validity of a study. It can be controlled by testing the dropouts for systematic differences from the ones who complete the treatment. In our case, three children left the Blossoms program

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after the first four weeks. All of them were asked by the teacher to switch to a kindergarten class to make additional spaces available in the preschool class. One of the three children returned to the Blossoms after a few weeks as he was not able to cope with the behavior of the older group of children. In addition, three new children joined the group.

Furthermore, two children dropped out completely after three and four weeks, respectively, of school. Both of them had major separation anxiety and would not stay at school without their mothers present. Interestingly, they were the two children in the class with life-threatening food allergies and prescribed Epipens. This correlation could provide an area for more research regarding the relationship between controlling parents and severe allergies. A potential research question could be “Have the parents become so controlling to protect their child from a life-threatening condition or has the condition been helped to occur because of the controlling nature of the parents?” This would be a very valuable project to research considering the increasing number of children with allergies.

After these few changes early in the school year, what the researcher calls the core group of thirteen participants remained and consistently received the treatment.

Another threat to validity is the variable selection-maturation interaction. This combination of the differential selection and the maturation threats, with maturation being the differential characteristic does not affect the validity of the study due to the lack of a control group.

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There are other known extraneous variables that have to do with behavior of participants in the control group. As the study does not involve a control group, its validity is not affected by these threats.

**External validity.** Besides internal, there is also external validity or generalizability of a study to be taken into consideration. Both refer to the extent to which results can be applied to another situation. If the same result can be observed in another situation then it is referred to as generalizable. External validity depends on several ecological factors. These include explicit description of the experimental treatment, multiple treatment interference, the Hawthorne, novelty, and experimenter effects, pretest sensitization, historical interaction, choice of measurement, and interaction of time of measurement and treatment effects (Creswell, 2009).

In the study, careful attention has been given to the teacher portfolio which in detail outlines the experimental treatment. It explains not only educational activities but also the environment and desired behaviors of the teachers. It seems possible that anyone could copy the treatment. This should therefore not be perceived as a threat to external validity.

One might argue that the study suffers from multiple treatment interference. However, all components of the treatment, educational activities, the design of the environment, and the researcher's behavior towards the child, are under the control of the researcher. In addition, the assistant who is present in the classroom gets her instructions directly from the researcher. Involvement of colleagues, principal, or parents is not part of the treatment. The control of the environment is possible in such a measure because

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the study takes place in a Waldorf school. If it were conducted in a public school with a different understanding of quality and quantity of materials and sensory stimulation it would be more difficult to control. However, in this case, multiple treatments are not being applied to the group being studied.

The Hawthorne effect is not a factor either as there is no change in environment nor treatment from the beginning to the end of the study. The novelty effect does not apply as the independent variable is the only way participants have experienced their program at the preschool. Lastly, pre- and posttest sensitizations do not apply as there are no tests involved.

The researcher effect, on the other hand, may have an influence on the external validity of the study. Participants are likely to react with more positive behavior to treatment applied by a positive researcher who displays a warm, friendly, welcoming, calm, flexible, patient, and humorous character and in addition has lots of experience with preschoolers. Participants' emotional relationship to a researcher who is controlling, reserved, anxious, serious, and with little experience may be less positive, result in more stress, less interest and engagement in activities, and therefore reduced development in the sensitive areas. This would mean the same results may not materialize with another researcher and therefore not be generalizable.

Historical interactions could have a similar effect. Since the start of this school year, Taos Waldorf School has been suffering from great financial strain. Teachers' wages have been cut substantially, involvement in fund raisers is a common demand put on teachers besides the responsibilities of teaching, and there is no money to buy materials

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or equipment for the classroom. If the teacher who is at the same time the researcher is emotionally affected by this it may have a negative effect on students' emotional relationship and external validity may not apply.

One way this situation can be avoided is by selecting a researcher who is not the teacher of the program. Some people might argue that to ensure objectivity an outside researcher is a better choice. However, considering the young age of the subjects and their timidity towards strangers, this could result in less positive behavior than with a familiar person administering the treatment.

One compromise to the above could be that the teacher applies the treatment and an outsider observes the subjects' behavior in relation to it. Again, results could vary as children may change their regular behavior with an additional, unfamiliar person in the room. This might be avoidable if a film camera would be set up that the children cannot see. A well-hidden camera, though, might not be able to film some of the behavior that occurs which needs to be reported on.

Possibly the assistant could be the observer as her presence is very familiar with the group. Her objectivity could be questioned though, being in a similar employment situation as the teacher. And, although not part of designing the curriculum, she is involved in implementing it through her emotional relationships with the children and helping to care for the environment.

In our case, the researcher can quite confidently assure readers that the financial situation of the school did not affect her objectivity in terms of this research, her relationship to the subjects, nor her applying the treatment.

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The instruments of measure are designed to display information in a mixed approach. The attendance records reveal the fact of whether children attended school or not in a quantitative or factual manner. Teacher observations of the child in relation to the treatment and individual development will be difficult to separate from feelings. The same is true for the parent questionnaire. Both of them happen in context. This is why they are called qualitative.

External validity is good in relation to interaction of time of measurement and treatment. The researcher observes the dependent variable at the time and place it occurs and when the independent variable is in effect. However, the timing of the parent questionnaire five months into the treatment may be a factor in external validity. The researcher might get a different picture if it were filled out at the beginning or the end of the school year. Another picture might emerge once parents compare the abilities of their child to other children who have not had the treatment when in preschool for example when entering grade one. This would indicate that the results of the questionnaire are relative and need to be considered as taken in a moment of time.

Another factor to consider regarding the parent questionnaire is subjectivity. Consciously or not, parents want to see their child in the best light and may not accurately report a behavior they observe but find not acceptable in their child. This means not to put too much weight on this qualitative instrument of measure. It can be used for comparisons with the experimenters' evaluations of subjects' development and future parent-teacher conferences.

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Here follows one final word on the use of a control group. The researcher did consider this because in many ways it seemed beneficial for claiming higher validity in terms of history, maturation, and experimental mortality variables. The researcher's expectation would have been that the experimental group consistently displayed more positive behavior in the four areas of development compared to the control group. However, several factors make using a control group more complex and less valid such as testing, instrumentation, and selection-maturation variables. Considering the above, in addition to the researcher being new in town and therefore not knowing other preschool programs nor early childhood educators, the researcher decided to use only an experimental and no control group.

The researcher is hoping that the results of the study will apply to the population of preschoolers as a whole. The independent variable is based on current early brain research which arguably applies to most brains of young children. However, with a small subject number of thirteen and the potentially large threat of the experimenter variable external validity is questionable. One could argue that the results are based on chance alone. Therefore, readers may make their own judgments regarding transferability of the results as applied to their own situation.

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### **Taking Action**

**Teacher portfolio.** The teacher portfolio explains the educational activities, design of the environment, and the behavior of the teachers developed from indications of early brain research and Waldorf early childhood education.

The researcher will begin with an explanation of the type of emotional relationship needed between the primary caregivers and the participants, the most important ingredient for healthy brain development. This is followed by a description of the environment, and finally an overview of specific educational activities.

The activities for the portfolio have been chosen to provide positive experiences in support of the sensitive areas: emotional, sensory-motor, auditory, and visual development. Furthermore, the first two stages of Steiner's observations of the developmental stages have been taken into consideration as the children in the class overlap both. They are the nerve/sense system of the brain and the rhythmic system of the chest.

**Emotional interactions with caregivers.** The main teacher and an assistant are the two constant caregivers in the class. They interact with the children in a loving yet firm way. The teachers lead by example rather than instruction to accommodate the young child's extraordinary ability to imitate. In addition, they do not entertain the children but rather let them direct their own play as much as possible. This allows the children to deeply enter into play, explore situations and experience relationships between humans, objects, and objects in relation to themselves. The teachers interact in an emotional or “non-business” way during one-on-one self-care activities like toileting,

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getting dressed, brushing hair, washing hands, preparing the snack table, and when children seem to need individual attention.

In the evening, the teacher holds each child and his/her family in her thoughts. She looks back at the day to take notice of any concerns, needs, and oversights to remedy them the next day. This deepens the relationship between the teacher and students. It also allows the children's angels to do their work through the teacher.

**Environment.** For the child to explore freely the environment needs to be safe, warm, calm, rhythmical, and home-like. The “Blossoms” classroom has wooden stools, tables, shelves, and a play kitchen at the child's level. Shelves are placed along walls so they do not tip. Toys are large enough not to be swallowed. Household equipment that is handed to the children like knives for cutting vegetables are dull and special attention to safety is given when the oven is used for baking or the iron for ironing. In the restrooms, there are wooden steps to help children safely climb up to reach toilets and sinks. Mats and pillows for sleeping are stored at the child's level to encourage independence in putting them away. The rooms are painted with a soft peach-rose color, has lots of natural sun light, lots of wood and some imaginative pictures on the walls.

A rhythmical day helps the child develop healthy breathing and a sense of control. The daily rhythm is: outdoor play, self-care activities, snack, indoor play, clean-up and self-care activities, circle time with songs and games, lunch, story with puppets, nap, and a final snack. The weekly rhythm is: ironing and folding laundry on Mondays, cutting vegetables for soup on Tuesdays, making bread dough and kneading it on Wednesdays, and watering plants and drawing on Thursdays.

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**Sensory-motor development.** The children are involved in daily household activities to stimulate their senses. These activities include washing hands, rinsing bowl and spoon in water, spraying water on items to be ironed, folding napkins and place mats, setting the table, kneading bread dough, watering plants, coloring with beeswax crayons, getting a foot massage, and listening to singing and soft music.

During outdoor play, children may freely use the swings, seesaw, slide, climbing structure, sand, tree trunks of different sizes to climb on, push wheel barrows, rake, and use sand tools. The daily walks on school grounds, lead us to feed and watch animals, observe the vegetables in the garden, climb along the dry water channels called "acequias", or climb on and hide around an old tree known as "The Magic Grove". This allows children to practise their postural control, balance, sensory integration, and motor skills.

To practice fine-motor skills, the teachers offer purposeful activities like pouring water, serving oneself with the serving spoon, cutting vegetables, setting the table, zipping, buttoning, getting dressed, coloring, and an occasional seasonal craft.

**Auditory development.** The teacher sings songs and recites poems while doing daily activities like taking off shoes and coats or tidying up the toys. A seasonal circle is held around the lunch table singing songs, playing circle games, and doing finger plays. Before nap time, the teacher tells a puppet story. These songs and stories are repeated for about three weeks or until the children start to integrate them in their own play.

How much chatter is necessary for healthy development? An adult chattering constantly, pulling children out of their own doing should probably slow down.

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However, each child has different preferences, needs, and capabilities which have to be taken into consideration in this respect.

After lunch, there is a daily rest period. Children sleep in “their” spot, on their own mat, with a blanket from home. The length of rest time is about one hour and a half. Non-sleepers are asked to stay on their mats quietly for about forty-five minutes and may be given a small toy to play with. After that they may go to look at books in the book corner.

**Visual development.** Indoor and outdoor self-directed play takes up a large part of the program. This allows the child to play, explore, and investigate relationships between objects, objects and their sounds, and objects and themselves. Teachers encourage imitation by being involved in purposeful activities while children play. These include raking, putting sand on icy spots, sanding, making and mending toys, sweeping the floor, comforting a child, or helping with a dispute. Through imitation, the child can penetrate the world, visually taking in phenomena and imitatively bringing them back “out”. Furthermore, cleaning-up and putting the toys back to where they were is another daily activity that helps visual development. The classroom does not provide any technological screens for children. Indoor toys include a wooden kitchen corner with dishes and “food”, dolls of various sizes and colors, a clothesline with clothespins, a stroller, a rocking boat, a train set, wooden blocks of all shapes and sizes, some small, wooden vehicles, a broomstick horse, two play stands, lots of silks and fabrics of different colors and sizes, books, a nature table for children to play with, and lots of soft, knitted animals and puppets.

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**Developmental stage one: nerve-sense system.** Children between zero and three years of age learn through imitation. For teachers this means modeling behavior and reducing verbal instruction. Protection of the child is needed to prevent an overstimulation of the senses. The teacher may create an invisible, etheric sheath around those who are very young. Young children need emotionally positive one-to-one relationships, lots of nurturing hugs and understanding, and patience with toileting accidents.

**Developmental stage two: rhythmic system.** Children between three and five years of age live in fantasy and memory. They are best talked to in images and with imagination. They remember things that happen to them, but may display difficulty putting them into context. They love finger poems and stories and with enough repetition may recite them joyfully. Rhythm and routine help them establish healthy breathing. They begin to enjoy other children's company as they move fluently from one subject of play to another.

This social development is wonderful to observe but brings with it an increase in conflict. As these toddlers become aware of feelings they are not yet in control of, they cry at an instant. They feel for the sick cat or the insured spider. Teachers may acknowledge their feelings by stating "I see you are upset" or "Johnny looks happy." This is a good time for children to learn that they may feel angry but that this is not a reason to hurt others.

The teacher uses direct statements and imagination to help with conflict resolution "I saw Maria playing with the pony. I am sure, she will let you have a turn when she is

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done.” “Let's build a shed for the pony.” At this age, most children do not understand the concept of sharing but will learn it in time. Teachers do not offer adult-centered solutions too quickly to give children time for their own expression.

One aspect not yet mentioned that is paramount in terms of teaching young children is the very limited attention span of the young child. To accommodate this, the teacher cuts transitions to a minimum. Rather than having a separate circle time, it is combined with snack. With everyone seated around the table to eat, poems, games, and songs can easily be done before blessing the meal. Story time is similarly combined with rest time. This ensures a less teacher-structured day to accommodate a rhythmical but flowing movement of activities around play, self-care, self- and teacher-directed activities.

This concludes the explanation of the teacher portfolio. The combination of recommended activities by brain researchers' and Waldorf education enhanced by Steiner's observations of the developmental stages provide us with a rich and comprehensive toddler-specific curriculum.

### **Evaluating the Consequences of the Action**

The researcher is using four different vehicles for data collection. First is the quantitative instrument of measure, the attendance record. It shows the consistency of participants' attendance of the treatment. Consistent attendance would imply interest which would confirm positive emotional development.

The qualitative instruments of measure include the researcher's daily notes. Observations of subjects are written down in terms of interest and willingness to

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participate in activities offered, stress-level while doing it, and learning/changes in behavior due to treatment. The researcher observes each individual subject regarding development in the sensitive areas and fills in a form for each. This will help determine if the independent variable is affecting the dependent one and in what way. Lastly, a parent questionnaire will be handed out. Most parents know little about early brain development and Waldorf education. It will be interesting to the researcher to receive their feedback on how well they think their child is developing while receiving the treatment.

### **Identifying General Findings**

Hopefully, the findings include strong evidence for the effectiveness of the independent variable. Due to exposure to the independent variable, the participants would experience positive neural wiring in their emotional, sensory-motor, auditory, and visual development. In addition, the researcher may find results not anticipated, discuss problems encountered with the research, or identify questions for further study.

### **Ethics**

The action research is carried out in the real world, involving real people with their own desires, reservations, and ideas. Communication with them may be happening in an open or closed manner. The researcher has to be conscious and respectful of that by displaying ethical behavior.

From the beginning, the researcher has disclosed her personal bias and interests in favor of Waldorf education and spiritual science.

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As a new teacher at the Taos Waldorf School, the researcher has consulted with her early childhood director regarding the treatment. Permission was given in advance to design and implement the treatment based on the researcher's previous education, experience and current research.

As collaborative research reminds one, subjects are also co-researchers. The researcher is maintaining respect and dignity for all subjects in the treatment at all times. All participants have equal opportunity for involvement in the treatment. Parents are aware that children who do not attend the program on a full-time basis or are absent will have less exposure to it.

From the beginning, the researcher has informed the parents of the subjects about the research topic. The researcher has kept them informed of the progress as well as of new findings through parent information meetings, hand-outs, and emails. All people involved have been excited about the project. The researcher has had three parent volunteers who tried out the questionnaire. They offered valuable feedback especially on how to make the layout clearer, simpler, and therefore more comprehensible. The researcher included their suggestions in the final version. The questionnaire was handed out to all parents accompanied by the Letter of Consent. This letter informed parents of their rights to refuse to participate and guaranteed the confidentiality of themselves as well as their children (see *Appendix D*).

The researcher has received permission from Kim John Payne to use his training documents to help analyze some of the data.

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Chapter four will take a look at tools of measure and what they will measure.

Scores will be assigned to each variable and numbers analyzed.

## **CHAPTER 4: ANALYSIS OF FINDINGS**

### **Overview**

Scientists and other professionals explained why certain experiences in early childhood wire the brain in a positive or negative way. Different educational activities recommended for healthy early brain development were described. The researcher compared this to Waldorf education which turned out to be a very good example of how to put this theory into practice. The researcher refined the practice by developing a new toddler-specific curriculum different from the Waldorf kindergarten. Chapter three explained the design and implementation of this new curriculum which became the independent variable for the action research. A number of variables that could affect the validity of the study were considered. The researcher also explained what instruments of measure were used to record observations of the dependent variable while receiving the treatment.

Chapter four focuses on data, beginning with a definition of what was to be analysed. An instrument of measure was assigned to each area; it was then decided how to score each measure to evaluate data in a reliable and valid way.

### **What Was Analysed?**

What the researcher wanted to analyse was whether the independent variable provided the experiences needed for the dependent variable to support positive neural wiring and therefore positive development in the four time-sensitive areas. The researcher acquired data by observing, measuring, and assessing behavior of participants at the time and place it occurred naturally. The amount of interest, stress, and learning

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while receiving the treatment was to be understood as indicators of effectiveness.

Observing behavior, states of being, and attitudes in regards to the four areas of development were to help indicate how well these were developing. If the results showed high scores, the researcher would argue that the independent variable was appropriate.

### **Guidelines for Evaluating Data**

**CLASS.** To assist with the task of assessing behavior, the researcher considered well-known tools from the early childhood realm. One of them was the *Classroom Assessment Scoring System (CLASS)*, an observation instrument to assess classroom quality in preschools (Pianta, La Paro, & Hamre, 2008)

CLASS was based on the understanding that interactions between teachers and students are the most important element for student development and learning. The aspects of quality assessed were positive/negative climate, teacher sensitivity, regard for student perspectives, behavior management, productivity, instructional learning formats, concept development, quality of feedback, and language modeling (Pianta et al., 2008). This assessment tool highly valued the emotional relationship between teacher and students which was consistent with brain research and Waldorf education.

However, it scored and evaluated mainly the behavior of the teachers themselves not the behavior or development of the children. It could have been used to evaluate the emotional relationship between teacher and participants. An independent person familiar with using CLASS could have been invited to do the assessment in the classroom. This would have been a very interesting and worthwhile action for professional development.

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A look at the list of references made the researcher reluctant to use this tool at this time. It was noticed that there was no mention of names like High, Jensen, Schiller, Schore, or others connected to neuroscience and education. This was surprising to the researcher and led to a further search for something that included this research.

**ECERS-R.** Other internationally recognized measures of quality assessment in education and care are the *Early Childhood Environment Rating Scale (ECERS-R)* and its *Four Curricular Subscales Extension (ECERS-E)*. The ECERS-R was written by Harms, Clifford, and Cryer (2005). Besides instructions for use, it included the following areas to be assessed: space and furnishings, personal care routines, language-reasoning, activities, interaction, program structure, and parents and staff.

These scales more or less emphasized the same areas declared important for the young child by brain research and Waldorf education. There were small but distinct differences like the emphasis of meal time being a time for conversation. In the Waldorf world, with its strong emphasis on a calm, non-stressful environment, teachers foremost want children to eat rather than talk. Also, early exposure to cognitive stimuli like reasoning, thinking, introduction of concepts, plus the use of television and computers were factors of disagreement. The Waldorf emphasis is on a sensory-stimulating environment where the toddler can fully immerse in imagination and fantasy. And again, the ECERS-R evaluated teachers' actions not children's.

**ECERS-E.** The ECERS-E was written by Sylva, Siraj-Blatchford, and Taggart (2011). The ECERS-E as an extension to the ECERS-R assesses curriculum and environment for children from three to five years of age in the following four areas:

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literacy, mathematics, science/environment, and diversity. Subscales assessed include activities like discussions about print and letters, providing pencils, paper, and a theme to encourage children to “write”, working on specific number activities, and recognizing numbers in media. This tool supports the trend in the United States of “...increasing emphasis on fostering sound emerging literacy and numeracy in young children” (Sylva, Siraj-Blatchford, & Taggart, 2011, p. 1). The question arose of why this brand-new tool still emphasized cognitive activities not recommended by current brain research? A look at the reference lists revealed no resources from brain research in either the ECERS-R nor the ECERS-E.

The researcher was surprised to find that educational psychologists and other highly qualified early childhood professionals apparently did not consult brain research when releasing recommendations for curriculum and its assessment. The references that were consulted came from the field of education and included previous materials by the same authors. To the researcher it had become clear that new brain research emphasizes emotional and sensory-motor development for preschoolers which includes lots of self-directed play over cognitive activities which unfortunately result in lots of teacher-directed activities. Hopefully, a “bridging” field like educational neuroscience can assist in communicating new findings across disciplines.

An interesting question emerged from this: If assessment tools were to examine foremost children's behavior instead of teachers', would this result in change? Observations of kindergarten children crying and unhappy because of having to copy letters and memorize sight words instead of playing might indicate the need for a

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different curriculum. This is not to say that children at this age never have a natural interest in letters and print. Some of them in fact do. It is the researcher's opinion that they should be free to explore and experiment with print as they might with any object or medium.

*Observations Based on the Lower Senses.* The above methods failed to assess the behavior of children as indicators of quality. The researcher was therefore considering a tool designed by Payne (2006)<sup>1</sup> who has been involved in public and Waldorf school education. In *Observations Based on the Lower Senses*, teacher training materials, he listed the qualities of each sense, how to strengthen them, and factors that might hinder their development. In chapter two, a correlation between the sensitive areas of brain research and the four lower senses of Waldorf education was established. Based on that, it seemed reasonable to use Payne's tables to evaluate the measurements.

The researcher also consulted Murphy-Lang's (2010) guidelines for evaluating the development of young children. The study also considered Goddard Blythe's (2005) indications of behaviors and attitudes for determining healthy development in young children.

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<sup>1</sup> From *Observations of the Lower Senses* by K. Payne, 2006, tables used as training documents at Antioch University, Keene, NH. Adapted with permission.

#### **Four Instruments of Measure**

After the researcher had chosen the guidelines to help evaluate data, she decided on four instruments of measure, what they intended to measure, and how to score and evaluate findings. As the dependent variable was observed at the time and place it occurred, the measurements were likely to produce reliable and valid scores. The exception was the parent questionnaire which was filled out five months into the treatment. As discussed in chapter three, this timing could potentially have affected the results of the questionnaires.

**Attendance record.** The researcher's quantitative instrument of measure was the attendance record. It simply showed if participants were present for the treatment. It counted the days that subjects were supposed to be present (100%) versus days actually present. This resulted in the percentage of attendance. The researcher did not take into consideration the reasons for absence which were foremost family vacation and illness. This tool did not directly indicate positive or negative behavior considering that toddlers have little responsibility for their own attendance. However, at this age and early in the school year, children are known to fall sick, often missing many days of school. Therefore, it seemed reasonable to interpret a high percentage of attendance as an indicator of positive emotional development, using the indicators of health and interest to demonstrate a balanced sense of well-being (Payne, 2006).

The data scored showed the percentage of attendance from 77% to 100%. The average attendance was 91% which resulted in an average of 3.8 days missed per participant during the five months of treatment (see *Appendix E*). In *A National Portrait*

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*of Chronic Absenteeism in the Early Grades*, Romero and Lee (2007) reported on the problems of chronic absenteeism and truancy in the early grades. It found that on average kindergarten children missed 5 days of school, first graders 4.5, and third and fifth graders missed 3.7 days. The study's numbers confirm these averages.

**Journal.** The next instrument of measure was the journal. These observations related the behavior of the dependent to the independent variable. Each sector of the teacher portfolio was assessed and scored in relation to the following three variables: interest and willingness to participate, stress-level while participating, and learning/changes in behavior.

Interest and willingness to participate was considered as the underlying condition for learning and growth. A high amount of interest was likely to indicate that the environment was safe, the relationship to the teachers warm and emotional, and the activities offered appropriate. All of these were in support of positive wiring. Very high interest received a score of 10, moderate interest a score of 5, and no interest a score of 0.

The researcher wanted stress levels to be low to allow for safe and free exploration and examination of the environment. Low stress in relation to the variable got a score of 10, a medium amount of stress got a score of 5, and a high amount of stress got a score of 0.

Learning and changes in behavior are normally expected of children. The study's independent variable, however, was specifically designed to support the sensitive areas during the critical “window of opportunity”. Therefore, the researcher expected high scores here. Consistent learning received a score of 10, some learning a score of 5, and

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Table 4.1

### *Journal*

Behavior	Highest range	Lowest range	Average
Interest and willingness to participate	95.00%	70.00%	80.00%
Stress-level while participating	90.00% (low stress)	55.00% (high stress)	78.00%
Learning/changes	95.00%	45.00%	67.00%

no learning a score of 0. See Table 4.1 for a summary of the data, *Appendix F* for detailed results.

**Individual development.** The third tool of measure was the Individual Development which measured the dependent variable in terms of development in the four sensitive areas: emotional, sensory-motor, auditory, and visual. Some qualities evident for emotional development were a sense of well-being, an ability to face contradictions, a secure base out of which self-belief can arise, patience in solving problems, acceptance of differences, inner flexibility, health, interest, engagement, and a sense of control. Each variable was measured in terms of “developed”, “beginning to develop”, or “not yet developed” and got one score. High scores were taken as indicators of much welcome development during the “windows of opportunity”. Low scores would have been possible indicators of a delay in development. This could have meant the participant was not ready to develop this area, the experience of trauma was affecting development, or the failure of the independent variable in affecting the behavior of the dependent variable.

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A child well nourished by sensory-motor stimulation was expected to display the following behaviors: trust in the physical world, trust in one's own judgments, acceptance of boundaries, surety, industry and purpose, imitation of healthy, purpose-filled movements, individual strength, knowing where one's own and others' space begins and ends, relationship to gravity, levity, front-back, left-right, feeling of inner equilibrium, ability to move between tension and release, ability to quiet one's self, altruism, and a healthy rhythmic system. Scoring and evaluation were the same as explained above.

Behaviors in a child with positive early auditory development included: auditory accuracy and sensitivity, stimulated yet not overwhelmed by sounds, security, interest in social interactions, easily soothed, and superior development in motor skills. Scoring and evaluation were the same as explained above.

Finally, behaviors in a child with positive early visual development included: visual accuracy and sensitivity, stimulated yet not overwhelmed by visual impressions, security in the physical reality, acceptance of boundaries, and trust in one's own judgments. Scoring and evaluation were the same as explained above. See Table 4.2 for a summary of the data and *Appendix G* for detailed results.

**Parent Questionnaire.** The last tool was the Parent Questionnaire which assessed their impressions on the subjects' development. It consisted of the same format as measurement three in relation to the four areas of development and the variables it intended to score. Ten out of thirteen questionnaires were returned. Two participants left the program at the time of handing out the questionnaires due to financial difficulties with tuition payments. The third family returned the questionnaire late.

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Table 4.2

### *Individual Development*

Developmentally sensitive area	Developed	Beginning to develop	Not yet developed
Emotional	70.00%	28.00%	2.00%
Sensory-motor	68.00%	30.00%	2.00%
Auditory	83.00%	17.00%	0.00%
Visual	85.00%	15.00%	0.00%

In addition to receiving feedback on how the parents saw the development of their children, it was interesting to compare data between the teacher's and the parents' forms. The researcher expected differences in a positive or negative direction. A subject could have experienced a sense of control at school yet not at home or vice versa. Table 4.3 shows a summary of the results and *Appendix H* displays its details.

For confidentiality reasons, names of participants were stored in a separate file. Only the researcher and thesis advisers had access to the file. For representation in the study, subjects were randomly assigned a letter. For example, Anna was represented by the letter "T" and Johnny by the letter "F".

### **Summary**

Chapter four aimed to analyse whether the independent variable was able to affect the dependent variable in a positive way to support positive neural wiring and therefore positive development in the four time-sensitive areas. Scoring was designed so that high scores would indicate a positive answer to the above and low scores would indicate a negative answer. One could safely state that our data tended to show higher to medium

## BRAIN DEVELOPMENT AND WALDORF EDUCATION

Table 4.3

*Parent Questionnaire*

Developmentally sensitive area	Developed	Beginning to develop	Not yet developed
Emotional	54.00%	43.00%	3.00%
Sensory-motor	66.00%	32.00%	2.00%
Auditory	82.00%	18.00%	0.00%
Visual	76.00%	24.00%	0.00%

scores rather than low scores. This would imply that the independent variable was successful in influencing the dependent one. Chapter five will look at interpreting the data.

## CHAPTER 5: SUMMARY

### Overview

This study addressed the developmental needs of young children and how to best meet them in an educational setting. In particular, the researcher wanted to find out if there ought to be a toddler-specific curriculum and what it should look like. The researcher searched through current literature on early brain development and learned about the importance of the “windows of opportunity” and the sensitive areas of development. Recommended educational activities to support healthy wiring of the brain were gathered. This was followed by an exploration of Waldorf early childhood pedagogy and its compatibility with early brain research. The findings confirmed first of all, the need for a toddler-specific curriculum, and secondly, high compatibility of Waldorf education with brain development. This was further supported by J. W. Wilson (personal communication, January 3, 2012) the author of the soon to be published book *Cracking the Learning Code*, a summary of his brain research of thirty years. Incidentally, Wilson's sons attended a Waldorf school.

For the action part of this study, the researcher merged recommended educational activities from both neuroscience and Waldorf curricula into a new, developmentally appropriate program. This was laid out in detail in the teacher portfolio. The program was implemented with a group of two-and-a-half to four-year-old preschoolers at the Taos Waldorf School in New Mexico. The researcher chose four tools of measure to record the behavior of children in the program. The researcher scored and analysed the data in chapter four. The findings are discussed below.

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The findings focused on data gathered from the four tools of measure, the summary of these findings, and the transferability of the results. The researcher then looked at a different view of understanding the data and a vision of the teacher. The study concluded with feedback on learning processes and future ideas for study.

### **Discussion of Findings**

**Attendance record.** The data from the attendance record showed when children were absent. The researcher knew the reasons for absence were mostly family vacations with the occasional illness and therefore interpreted it as a high percentage of attendance and an indication of the students' interest in the program. However, after researching absenteeism at schools it was found that the researcher's rate of absence was considered high. In addition, it was learned that truancy or unexcused absences were real problems for some schools. Had the researcher been aware of this issue earlier she would have designed a more detailed attendance check list allowing for excused and unexcused absences. These two would have had to be listed separately in order to include the excused absences in the percentage of attendance. This would have allowed the researcher to argue for a higher percentage of attendance. Also, it would have allowed one to monitor any truancy occurring in the classroom.

**Journal.** The results from journal observations indicated very high interest and willingness to participate. The researcher was pleased with this result as it seemed to indicate the appropriateness of the age-specific curriculum. Curious about the lowest score, the researcher noticed that it was obtained by a student who displays difficulty following directions. He likes to do things his way and when he wants to. Were the

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activities not appropriate or was his willingness to participate not there because his personality works differently? The question could be debated.

The results for stress while in the program showed very low levels. The researcher was pleased to see low stress as this helps students be enthusiastic and interested to explore and experiment. It again confirmed the importance of the age-specific curriculum. A closer look at the two students with the highest stress scores revealed some interesting facts. The stress factors while at school did not directly originate from the program itself but were caused by social interactions like sharing, taking turns, or unwillingness to follow routines. During their attendance in the program, both children improved conflict resolution skills and stress levels diminished.

Finally, the learning scores were looked at. Some children displayed high levels which the researcher was tempted to attribute to the effectiveness of the educational activities offered in the curriculum. However, the relatively low score overall was surprising. After some reflection, the researcher realized that the timing variable had had an impact here. The amount of learning and changes in behavior that took place in the first weeks of attending the program was incredibly high. Several parents had commented “My child has become so polite and is often using words like 'please' and 'may I'”. “His table manners have improved so much we can now safely take him out to a restaurant.” “My child takes off shoes and coat and puts them away without having to be reminded.” At school, the researcher observed how the group of young children were able to play with each other for forty-five to sixty minutes with little assistance from the teachers after only three months. Had the researcher filled in the form earlier, it would

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have resulted in higher scores. However, several months into the program, the researcher got so accustomed to seeing the children happy, comfortable, polite, sharing, helping, and constantly exploring and learning that it was taken for granted.

**Individual development.** Data for individual development showed a positive to very positive picture. Displaying at least “developing” behavior in all four areas was taken as a good indicator for positive neural wiring. This again was interpreted as the result of the curriculum which offered activities in support of this.

**Parent Questionnaire.** Data from the parent questionnaire showed a similarly positive picture. Parents tended to score “developing” more often than “developed”, whereas the teacher scored “developed” more often than “developing”. However, there was much agreement between the teacher's and the parents' view of a child's development. Their scores for sensory-motor and auditory development were almost the same as the researcher's. Their scores for visual development were similar to the researcher, with the highest degree of disagreement in the perception of the child's emotional development. This could have been due to the nature of the area. It was noticed that parents had most questions about what emotional development was and how it showed in the child. This could possibly be the topic for a future parent meeting: What is emotional development, how does it come about, and how can it be supported?

Interacting with parents about this topic and in particular about the questionnaire was very rewarding. Several people were eager to help and learn more. One parent stated that the questionnaire was about herself upon realizing how closely related strengths and weaknesses of her child were to her own. Another parent whose child just

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had a concussion told me she turned on the television for her daughter as she needed to keep her still. She was happy to have acquired a more conscious approach to using the television. A lot of parents attended the parent meetings on brain development and early childhood education. This made the researcher realize how children will benefit from an increase in consciousness of the parent body. Overall, parents seemed more receptive to scientific information compared to Steiner's image-rich, often lofty language when learning about child development.

In addition to the four measurements, there was another positive fact that needs mention: The continued interest of parents in this program. Even though two children left the program in the second semester due to a lack of finances, three new children were welcomed and another three applications to join the program were received.

### **Transferability**

The researcher was pleased to see that the above positive results indicate the effectiveness of the new curriculum. The recommended activities from brain research and Waldorf education seemed to have had a positive effect on children's development. Could the results of the study be transferred to other situations? The researcher would say potentially yes, considering the objectivity of the source of the new curriculum. However, the group of children used in the study was only a small representation of the general population. In addition, the personality of the teacher and the maturation effect may have had an impact on the results. Although very happy and confident with the findings, the researcher recommends for readers to decide for themselves whether the research results can be transferred to their particular situation.

### **Evaluating the Whole Child**

The researcher found the scoring system to be a frustratingly inadequate representation of the students' individuality. Knowing the students on a personal level, the researcher had the option of evaluating their behavior in relation to the whole child. For example, it was interesting to find that a student who scored low in emotional development, scored highest in low stress and learning. The calm environment and age appropriate activities of the preschool perhaps helped this child distance herself from abuse in the home. Another student who scored low in emotional development scored high for stress. This may partly have been due to the life style of her single parent. Several children reached the highest score for emotional and sensory-motor development. They also scored high for interest, low stress, and learning. The home environments of these children were very supportive, protective, and stable. The child with the lowest score for learning was timid and not a risk-taker, perhaps due to an overprotective parent. These observations helped the researcher understand the large impact the home environment has on students' behavior and the difficulty in determining which influence has which effect on a child.

The researcher would love for the program to have had a large and positive impact on the group of students so that they may thrive to their fullest with healthy, brimming brains ready to learn. Yet, the researcher felt all she could do was receive the children in a warm, home-like environment providing a few hours of comfort, calm, space, and time to nourish their bodies, souls, and spirit. Humbly, she realized that perhaps this was all one could do especially considering the individual freedom of each human being.

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As a teacher, the researcher was profoundly impacted by Gopnik's report, resulting in a change in style of teaching. The researcher is now much more conscious about providing objects, space and time without instructions as she wants children to immerse into the process of exploration and experimentation.

The researcher is on the one hand fascinated by brain research and on the other dissatisfied by its simplicity, focusing solely on visual aspects. For example, brain research emphasizes the visual physical aspects of balance, neglecting to comment on the invisible emotional aspect. Also, the concept of each child having a guardian angel would most certainly raise eyebrows in disbelief. Steiner's explanations feel more holistic and satisfying to the researcher shedding light on the invisible as well as the visible parts of human beings emphasizing their wholeness.

### **Other Findings**

Conducting this research has been a very interesting and valuable process for the researcher. She learned a lot about the care and education of young children. It also opened her eyes to several issues that accompany research. Some of them are listed here:

1. A teacher who is involved in research benefits children, parents, and her program. The reflection that is used during the research process and the knowledge that is gained may result in new ideas being tried out and a better program being offered. It definitely results in more consciousness towards issues studied.
2. The researcher realized that it is important to her to research literature from various fields of study. She suspects that recommendations for

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program assessments that examined brain research might have come to a different conclusion than those who do not. The researcher is aware that the writers quoted in this study are not extreme. They want to ensure that teaching approaches used with young children to promote cognitive activities resist the tendency to become too rigid and academic. They might say that Waldorf education itself is too extreme in the opposite direction, seeing themselves on middle ground.

3. The researcher has learned that she can undertake a large project like this by herself. It was difficult being far away from the training college and its library, professors, and colleagues. To figure out what to do next or how to solve issues she had to consult books, notes, or email professors. Also, working almost full-time left the research to weekends. It took time to re-engage every Friday morning and disengage every Sunday evening. What pulled the process along was the interesting topic the researcher had chosen, including the fact that the action part could be conducted in her classroom.

4. The researcher conducted several parent meetings on the topic and realized that she was able to spark interest and enthusiasm with adult learners. The researcher discovered that she would like to teach at college level at some time in the future.

## BRAIN DEVELOPMENT AND WALDORF EDUCATION

### **Future Topics for Research**

This project felt as if it contained everything and nothing. The reading, writing, and thinking that went into it contained everything the researcher could do. However, compared to what else should be studied, it appeared to be nothing but a drop in the ocean. The researcher wanted to restart and include all the information left out or explore a new topic. Ideas for further research were: What are the best nutritional plans for schools to support healthy brain development? What is the nature of relationship between children with life-threatening illnesses and their parents? What are the effects of a sensory-rich yet calm environment, compared to an over-stimulating one? How much chatter is necessary for healthy auditory development in young children? If assessment tools examined children's behavior instead of their teachers', would this result in a change of curriculum?

### **The Treasure**

Lastly, the researcher wants to acknowledge her angel who assisted with this work. When the researcher was looking for the right word or next idea and concentrated on top of the head, she received helpful suggestions quite promptly. This is consistent with Steiner's view mentioned earlier that recognizing our connection with the spiritual entities is more “heart-thinking” than “head-thinking” and if cultivated may help with our work.

### **Conclusion**

The researcher can positively answer the question posed at the beginning of this study. A toddler-specific curriculum is needed. Brain researchers and Waldorf education

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provided hands-on activities to support toddlers in their stage of development. These suggestions were incorporated in a new program. As data showed, preschoolers who experienced this new curriculum developed very well in their developmentally sensitive areas: emotional, sensory-motor, auditory, and visual functioning. The group of children who tried out the curriculum was small which diminishes transferability of the results. However, no harmful effects were observed. Therefore, it seems safe to say that anyone working with toddlers may give this curriculum a try.

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*Appendix A*

**Journal Observations**

by

Claudia Pfiffner

January 2012

Scores for interest are: 10 for very interested, 5 for beginning to be interested, and 0 for no interest.

Scores for stress-level are: 10 for no stress, 5 for some stress, and 0 for high stress

Scores for learning are: 10 for lots of learning, 5 for some learning, and 0 for no learning.

Name of child: \_\_\_\_\_

Age: \_\_\_\_\_

<b>Educational Activities:</b>	Interest and willingness to participate	Stress-level while participating	Learning or changes in behavior
<b>Outdoor play:</b> (Playing with swings, seesaw, slide, climbing structure, sand, tree trunks, wheel barrow, rakes, and sand tools)			
<b>Outdoor guided walk:</b> Feeding and watching animals, picking and observing vegetables in the garden, climbing along the water channels and at the “Magic Grove”			
<b>Cleaning-up toys</b>			

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<b>Emotional interactions with teachers</b>			
<b>Self-care activities:</b> Toileting, washing hands, getting dressed, zipping and buttoning, brushing hair			
<b>Household activities:</b> Setting the table for snack, pouring water, serving oneself with the serving spoon, eating meals (snack and lunch), rinsing bowl and spoon in water, sweeping the floor, spraying water on items to be ironed, folding napkins and place mats, cutting vegetables for soup, making bread dough and kneading, watering plants, putting away sleeping mats and pillows			
<b>Napping:</b> Getting a foot or back rub, listening to singing and soft music			
<b>Circle time:</b> Singing songs, participating in games and finger plays, reciting poems, listening to puppet stories, “reading” books			
<b>Creativity:</b> Coloring and making a craft (process-oriented)			
Total score:			
Average score/participant:			

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*Appendix B*

**Individual Development**

By Claudia Pfiffner: January 2012

Name of Child: \_\_\_\_\_

1. Please check one option for each behavior you most often observe: “Developed”, “Beginning to develop”, or “Not yet developed”.
2. Please relate the option to the title of the subsection. For example, #1 Interest in relationships/the world relates to Emotional Development.

**Emotional Development:**

Behavior observed:	Column 1: Developed...	Column 2: Beginning to develop...	Column 3: Not yet developed...
1. Interest in relationships/the world			
2. Sense of well-being			
3. Ability to face contradictions			
4. Secure base			
5. Patience in solving problems			

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6. Accepting differences			
7. Inner flexibility with issues			
8. Engagement with others			
9. Sense of control			
10. Imitation of healthy, purpose-filled movement			
Total score:			

### Sensory-Motor Development:

Behavior observed:	Developed...	Beginning to develop...	Not yet developed...
11. Trust in physical world			
12. Trust in one's own judgment			
13. Acceptance of boundaries			
14. Surety			
15. Industry and purpose			
16. Individual strength			
17. Knowing where one's own and others' space begins and ends			

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18. Relationship to gravity/levity, front/back, and left/right			
19. Feeling of inner equilibrium			
20. Ability to quiet one's self			
21. Altruism			
22. Ability to move between tension and release			
Total score:			

**Auditory Development:**

Behavior observed:	Developed...	Beginning to develop...	Not yet developed...
23. Auditory accuracy and sensitivity			
24. Stimulated by sounds/tone			
25. Security			
26. Interest in social interactions			
27. Easily soothed by sound/tone			
28. Superior development of motor skills			
Total score:			

**Visual Development:**

29. Visual accuracy and sensitivity			
30. Stimulated yet not overwhelmed by			

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visual impressions			
31. Security in physical reality			
32. Acceptance of boundaries			
Total score:			

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*Appendix C*

**Questionnaire for Parents**

Developed by Claudia Pfiffner: January 2012

Name of Child: \_\_\_\_\_

1. Please check one option for each behavior you most often observe:  
“Developed”, “Beginning to develop”, or “Not yet developed”.
2. Please relate the option to the title of the subsection. For example, #1 Interest in relationships/the world relates to Emotional Development.

**Emotional Development:**

Behavior observed:	Column 1: Developed...	Column 2: Beginning to develop...	Column 3: Not yet developed...
1. Interest in relationships/the world			
2. Sense of well-being			
3. Ability to face contradictions			
4. Secure base			
5. Patience in solving problems			
6. Accepting differences			

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7. Inner flexibility with issues			
8. Engagement with others			
9. Sense of control			
10. Imitation of healthy, purpose-filled movement			
Total score:			

### Sensory-Motor Development:

Behavior observed:	Developed...	Beginning to develop...	Not yet developed...
11. Trust in physical world			
12. Trust in one's own judgment			
13. Acceptance of boundaries			
14. Surety			
15. Industry and purpose			
16. Individual strength			
17. Knowing where one's own and others' space begins and ends			
18. Relationship to gravity/levity, front/back, and left/right			
19. Feeling of inner equilibrium			

## BRAIN DEVELOPMENT AND WALDORF EDUCATION

20. Ability to quiet one's self			
21. Altruism			
22. Ability to move between tension and release			
Total score:			

### **Auditory Development:**

(It might be confusing to find a question on motor-development in the Auditory section. This is because balance and hearing relate to each other stemming from the same basis in the inner ear.)

Behavior observed:	Developed...	Beginning to develop...	Not yet developed...
23. Auditory accuracy and sensitivity			
24. Stimulated by sounds/tone			
25. Security			
26. Interest in social interactions			
27. Easily soothed by sound/tone			
28. Superior development of motor skills			
Total score:			

### **Visual Development:**

29. Visual accuracy and sensitivity			
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30. Stimulated yet not overwhelmed by visual impressions			
31. Security in physical reality			
32. Acceptance of boundaries			
33. Trust in one's own judgment			
Total score:			

### **Resources**

Goddard Blythe, S. (2005). *The well balanced child: Movement and early learning*. Gloucestershire, United Kingdom: Hawthorn Press.

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### **Feedback**

Anything else you would like to share:

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Thank you very much for your help with this!

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*Appendix D*

**Consent Letter**

Dear Parents,

I am a graduate student at Rudolf Steiner College, Fair Oaks, CA pursuing a Master of Arts in Education degree with a concentration in Waldorf Pedagogy. One of the requirements for graduation is to conduct a research project within a Waldorf school setting and write the results up in a thesis to be submitted for potential publication. My research topic is regarding early brain development and Waldorf early childhood education. I looked at the first four years of life and what activities provide experiences for positive wiring of the brain. As a result of my research, I have designed and implemented a toddler- specific curriculum in the “Blossoms” classroom at Taos Waldorf School based on current neuroscientific recommendations and Waldorf principles. This curriculum will be available to any survey participant who requests it from me.

The potential benefits and concerns of this research are the following: It will add to the body of knowledge about developmentally appropriate activities for toddlers in out-of-home care. This may lead to better program offerings for young children. With so many children under four years of age in care outside the home this is much needed information.

I am seeking participants who will be willing and capable of filling out the attached questionnaire. Participation is voluntary and there is no penalty for refusing or withdrawing from the study at any time. This study has been given approval by the Ethics Review Board of Rudolf Steiner College.

All information gathered in this study is strictly confidential. Only the researcher and the thesis committee will have access to it. Numbers or letters will replace all names involved in the study before collecting the data for analysis. You may request to see any or all of the surveys, and/or instruments employed to gather data. You also have the right to the results of the study. Please, request to see research materials and/or results of the study from my address listed below.

If you have any questions, please feel free to call my advisors Lauren Hickman, M.A., (916) 961-8727 ext. 117 or William Bento, Ph.D., (916) 961-8727 ext. 145,

Thank you for your consideration.

Sincerely,

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Claudia Pfiffner

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Date

156A Blueberry Hill Road  
El Prado, NM 87529  
Tel: (916) 965-2541

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*Appendix E*

**Attendance: Final Scores**

January 2012

Participants	<b>Days scheduled to attend</b>	<b>Days missed</b>	<b>Days attended</b>
A.	34	6	28
B.	49	0	49
C.	29	4	25
D.	21	6	15
E.	39	1	38
F.	64	4	60
G.	24	6	18
H.	33	2	31
I.	39	8	31
J.	67	2	65
K.	55	1	54
L.	57	7	50
M.	30	3	27
<b>Total</b>	<b>541</b>	<b>50</b>	<b>491</b>
<b>Average days/child</b>	<b>41.6</b>	<b>3.8</b>	<b>37.8</b>
<b>Percentage</b>	<b>100.00%</b>	<b>9.25%</b>	<b>90.75%</b>

BRAIN DEVELOPMENT AND WALDORF EDUCATION

*Appendix F*

**Journal: Final Scores**

January 2012

Participants	Interest and willingness to participate	Stress-level	Learning/changes in behavior
A.	60	65	55
B.	75	80	55
C.	75	80	45
D.	80	55	60
E.	80	85	55
F.	70	80	80
G.	75	75	60
H.	95	85	75
I.	85	85	70
J.	90	90	95
K.	85	85	70
L.	85	75	75
M.	85	70	75
Total score	1040/100	1010/100	870/100
<b>Average score</b>	<b>80.00%</b>	<b>78.00%</b>	<b>67.00%</b>

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*Appendix G*

**Individual Development: Final scores**

January 2012

Participants	Emotional Development			Sensory-motor Development			Auditory Development			Visual Development		
A.	5	4	1	5	6	2	3	3	0	2	3	0
B.	6	4	0	9	4	0	4	2	0	3	2	0
C.	8	2	0	7	6	0	4	2	0	3	2	0
D.	4	6	0	5	8	0	6	0	0	4	1	0
E.	10	0	0	12	1	0	6	0	0	5	0	0
F.	9	1	0	9	4	0	6	0	0	5	0	0
G.	8	2	0	9	4	0	6	0	0	5	0	0
H.	10	0	0	12	1	0	6	0	0	5	0	0
I.	8	2	0	11	2	0	6	0	0	5	0	0
J.	5	5	0	10	3	0	6	0	0	5	0	0
K.	7	3	0	12	1	0	4	2	0	5	0	0
L.	4	6	0	5	8	0	2	4	0	3	2	0
M.	8	2	0	10	3	0	6	0	0	5	0	0
<b>Total scores</b>	<b>92</b>	<b>37</b>	<b>1</b>	<b>116</b>	<b>51</b>	<b>2</b>	<b>65</b>	<b>13</b>	<b>0</b>	<b>55</b>	<b>10</b>	<b>0</b>
<b>Percentage</b>	<b>70.00</b> %	<b>28.00</b> %	<b>2.00</b> %	<b>68.00</b> %	<b>30.00</b> %	<b>2.00</b> %	<b>83.00</b> %	<b>17.00</b> %	<b>0.00</b> %	<b>85.00</b> %	<b>15.00</b> %	<b>0.00</b> %

BRAIN DEVELOPMENT AND WALDORF EDUCATION

*Appendix H*

**Parent Questionnaire: Final Scores**

January 2012

Participants	Emotional Development			Sensory-motor Development			Auditory Development			Visual Development		
A.												
B.	9	2	0	12	0	0	6	0	0	5	0	0
C.	6	4	0	5	7	0	4	2	0	2	3	0
D.	6	3	0	8	3	0	6	0	0	4	0	0
E.	7	3	0	7	5	0	6	1	0	5	0	0
F.	4	5	0	6	6	0	5	2	0	1	4	0
G.												
H.	6	3	0	7	5	0	4	2	0	3	2	0
I.	5	5	0	11	1	0	5	1	0	5	0	0
J.												
K.	5	5	0	8	4	0	5	1	0	4	1	0
L.	2	7	1	6	5	1	4	2	0	3	2	0
M.	3	6	1	9	3	0	6	0	0	5	0	0
<b>Total score</b>	<b>53</b>	<b>43</b>	<b>2</b>	<b>79</b>	<b>39</b>	<b>1</b>	<b>51</b>	<b>11</b>	<b>0</b>	<b>37</b>	<b>12</b>	<b>0</b>
<b>Percentage</b>	<b>54.00%</b>	<b>43.00%</b>	<b>3.00%</b>	<b>66.00%</b>	<b>32.00%</b>	<b>2.00%</b>	<b>82.00%</b>	<b>18.00%</b>	<b>0.00%</b>	<b>76.00%</b>	<b>24.00%</b>	<b>0.00%</b>

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