THE ROLES OF TOUCHING AND MASSAGE AMONG

OCCUPATIONAL THERAPISTS AND TEACHERS IN

EARLY INTERVENTION PROGRAMS

Except where reference is made to the work of others, the work described in this dissertation is my own or was done in collaboration with my advisory committee. This dissertation does not include proprietary or classified information.

_____

Gwendolyn Gray

Certificate of Approval:

Phillip Browning Professor Rehabilitation and Special Education	AmySue Reilly, Chair Associate Professor Rehabilitation and Special Education
Karen Rabren Associate Professor Rehabilitation and Special Education	Rebecca Curtis Assistant Professor Rehabilitation and Special Education
Margaret Shippen Assistant Professor Rehabilitation and Special Education	George T. Flowers Dean Graduate

THE ROLES OF TOUCHING AND MASSAGE AMONG OCCUPATIONAL THERAPISTS AND TEACHERS IN EARLY INTERVENTION PROGRAMS

Gwendolyn Gray

A Dissertation

Submitted to

the Graduate Faculty of

Auburn University

In Partial Fulfillment of the

Requirements for the

Degree of

Doctor of Education

Auburn, Alabama
December 19, 2008

THE ROLES OF TOUCHING AND MASSAGE AMONG

OCCUPATIONAL THERAPISTS AND TEACHERS IN

EARLY INTERVENTION PROGRAMS

Gwendolyn Gray

_____

Signature of Author

_____

Date of Graduation

VITA

Gwendolyn Gray was born to Lincoln and Elizabeth Gray in Birmingham Alabama. After completing elementary and secondary school in Birmingham, Alabama, she attended the University of Alabama at Birmingham and completed a Bachelor of Science degree in occupational therapy and a Master of Arts degree in education with a major in Special Education. After completing her bachelor's degree, she worked as a staff therapist for eight years at United Cerebral Palsy of Greater Birmingham (UCP). During this time she returned to school to complete a Master's degree. After leaving UCP of Greater Birmingham, she worked at Hill Crest Hospital, a private emotional and behavioral health facility in Birmingham for four years as the Head of Occupational Therapy. In August of 1984 she joined the faculty at Tuskegee University in the undergraduate occupational therapy program as an instructor. For the next fifteen years, she continued a faculty practice in public and private school systems in Eufaula, Macon, Montgomery, Lee, and Auburn City school districts and Project AIM. Today she is an assistant professor and since 1999 has served as the Director of the Occupational Therapy program at Tuskegee University. After the profession of occupational therapy moved to an entry level master's degree, she returned to school to earn a doctor of philosophy degree at Auburn University in Rehabilitation and Special Education, specializing in early intervention.

DISSERTATION ABSTRACT

THE ROLES OF TOUCHING AND MASSAGE AMONG

OCCUPATIONAL THERAPISTS AND TEACHERS IN

EARLY INTERVENTION PROGRAMS

Gwendolyn Gray

Doctor of Philosophy, December 19, 2008
(M.A., University of AL in Birmingham, 1977)
(B.S., University of AL in Birmingham, 1972)

168 Typed Pages

Directed by AmySue Reilly

The purpose of this study was to determine what occupational therapists and teachers in early intervention programs know about touching and massage; their personal attitudes about touching and being touched; and their practices regarding the use of touch/massage with infants and children with special needs from 0 to 3 years of age.

The survey instrument was pilot tested for psychometric properties (test-retest reliability, and factor analysis) with student volunteers from Auburn and Tuskegee Universities. The survey was then mailed to a sample of occupational therapists nationally and teachers in early intervention programs in Alabama. With a follow up postcard, the return rate was 31% (n = 336).

Based on statistical analyses, the survey instrument was determined to be a valid and reliable device for measuring the population under study. Using probability statistics, two of the three null hypotheses were retained and one was rejected. The following conditions were statistically significant: (a) number correct (knowledge) by work experience; (b) number correct by professional position; (c) avoid touch factor (attitude) by work experience; (d) avoid touch factor by highest degree; (e) will practice factor (practice) by license to massage; and (f) will practice factor by complementary and alternative medicines (CAM). Being an occupational therapist or teacher in early intervention was only statistically significant as it related to knowledge.

The multiple regressions predicted that the more knowledge a participant has about touch, massage and CAMs, the more willing they were to use these interventions in practice. And the reverse was also predicted: where there is an attitude of more touch avoidance a participant would practice touch/massage less often in intervention.
The respondents who commented on the study stated that they were supportive of CAMs, massage and touch-related intervention. Two hundred and thirty seven of the respondents were trained in other CAMs. The most frequent CAM training was myofascial release and massage training.

The results were predictable. The analyses presented evidence that work experience and any CAM training (including massage) were statistically significant rather than professional position (teacher or therapist) as it related to attitudes about touching and a willingness to practice massage or other CAMs.

ACKNOWLEDGMENTS

The author would like to thank Dr. Jim Gundlach for assistance with statistical analyses and my dissertation committee for their guidance and help. Special thanks are also due to the Chair of my committee, Dr. AmySue Reilly, and other students, staff members and professors at Auburn University and Tuskegee University who encouraged, cajoled, and believed that the author could get this investigation done. Thanks are especially due to family and friends who prayed and supported the author during this investigation.

Style manual or journal used: Publication Manual of the American Psychological Association (5th ed.)

Computer software used: Microsoft Word 2007, JMP (version 7) of Statistical Analysis Systems (SAS)

TABLE OF CONTENTS

LIST OF TABLES xii

I. INTRODUCTION 1

Overview of Early Intervention 2

IDEA Legislation 3
History of Early Intervention and Early Childhood Special Education 4

Overview of Occupational Therapy in Early Intervention 6

Federal Legislative Influence on Occupational Therapy 7

Purpose of Study and Hypotheses 10
Therapeutic Principles of Touch and Massage 10

Complementary and Alternative Medicines 11
Theoretical Frame of Reference 12

Significance of Study 13

II. REVIEW OF LITERATURE 17

Understanding Sensory Systems 17

The Brain and Touch 18
Structure and Function of Human Skin 19
Massage and Pain Reduction 23
Nature of Human Touch: Types and Patterns 25

History of Massage and Touching for Therapy 28

Ancient Civilization 28
The Middle Ages 31
The Nineteenth Century 31

Massage in the United States 32

Touch Deprivation Studies 34

Summary of Mary Carlson's Work in Romanian Orphanages 40
Tronick and Morelli Cross-Cultural Studies in Zaire and Mother-Infant Interactions 47

Touch Among the Efe 48
Touch During Face-to-Face Interactions 50

Aversion to Touch 53

Massage Theory and Techniques 55

Theory and Indications for Use 55
Overview of Manual Techniques 57
Contraindications for Massage/Touch 59
Infant Massage Techniques 60

Touch During Pregnancy, Labor and Delivery 62
TRI Research on Infant Massage 64
Some Multidisciplinary Uses of Touch/Massage for Therapeutic Intervention 70

Nursing and Therapeutic Touch 70
Occupational Therapy and Sensory Integration 72
Other Touch Therapies 74

Best Practices Among Practitioners in Early Intervention 78
Summary and Conclusions 80

III. RESEARCH METHODOLOGY 82

Measures 83
Participants 86
Data Analysis 88
Summary 91

IV. RESULTS 94

Demographic Information 95

Primary Study 95
Pilot Study 98

Data Analysis 99

Psychometric Properties of Survey Instrument 99
Primary Study 103
Summary 115

V. DISCUSSION 117

Summary of Present Study 117

Pilot Study 122

Previous Research 123
Limitations of Study 125
Implications for Further Study 127

REFERENCES 129

APPENDICES 140

Appendix A: Information Letter 141
Appendix B: Survey Instrument 144
Appendix C: Information Letter Pilot Study 151
Appendix D: Script for the Pilot Study 154

LIST OF TABLES

Table 1	Cross Tabulation of Professional Position by License to Massage	96
Table 2	Gender and Education	97
Table 3	Work Experience	98
Table 4	Pilot Study Demographics	99
Table 5	Cross Tabulation on True/False Questions for Both Pre and Post Tests	101
Table 6	Factor Loadings for Analysis of Q12-31	105
Table 7	Factor Loadings for Analysis of Q32-43	106
Table 8	Knowledge about Touching and Massage	107
Table 9	First Eleven Knowledge Questions: Distribution Number Correct	109
Table 10	*ANOVA F* Statistic Summary	111
Table 11	Multiple Regressions	112
Table 12	Summaries of Comments from Respondents in Primary Study	113
Table 13	Other CAM Training (Question #50)	114

I. INTRODUCTION

Early intervention has been used as a label in many different contexts depending on one's frame of reference. *Early* refers the critical developmental period in young children between the age of birth and 3 years of age. *Intervention* has been defined as the implementation of a program to enhance or maintain a child's development (Blackman, 2002, p. 11). According to the Individuals with Disabilities Education Act (IDEA), *early intervention* is a collection of 16 primary services including special instruction, occupational therapy, physical therapy, speech and language therapy and other support services that provide children who have a disability, or are at risk for developing a disability between birth and two years of age, the help they need to be successful later in life [IDEA, 20 U.S.C. § 1400 (d)].

Part C of the IDEA (IDEA—20 U.S.C. § 1400 et seq.) defines early intervention as developmental services for infants and toddlers which are provided at public expense and under public supervision, that are designed to provide physical, social, emotional, cognitive, communication and adaptive needs of a child. These services when provided must be in a natural environment similar to the environment of children without disabilities. Examples of a natural environment would be a daycare or home setting. When a child who receives early intervention services turns 2 years of age, he/she should transition to a lead educational agency that serves children with disabilities between the

ages of 3 and 21. Described in Part B of IDEA, school programs for children between the ages of 3 and 21 are a legally mandated service, whereas Part C is an entitlement. An entitlement acknowledges a right to receive a service; a mandate creates programs and services that are required by law (IDEA Regulations, 34 C.F.R. § 303.16).

For the purpose of this study, only two professional disciplines in early intervention that are mandated services under the IDEA—early childhood special education and occupational therapy were studied. According to IDEA, special education is defined as "specially designed instruction, at no charge to the parents or guardians, to meet the unique needs of a child with a disability" [IDEA, 20 U.S.C. §1404 (a) (16)]. Related services, which includes occupational therapy are developmental, corrective, or supportive services that students need to benefit from special education [IDEA, 20 U.S.C. §1402 (26) (A)].

Overview of Early Intervention

The field of Early Intervention/Early Childhood Special Education (EI/ECSE) has grown rapidly in the past 30 years as a separate and distinct discipline from Special Education and Early Childhood Education. Although these disciplines are similar, EI/ECSE is especially concerned with the population of infants, toddlers and preschoolers with special needs between the ages of 0-5. The term "young children with special needs" is used to refer to a population of children with an identified disability, with a developmental delay or children who are at risk for developing a disability or delay. A part of the history of special instruction for young children with disabilities can be traced along with the development of the IDEA.

IDEA Legislation

Prior to the 1960s, states and local governments had the sole responsibility for educating students with disabilities. Also, during this time very few teachers were being trained as special educators and very few funds were available to universities to support educational research. In 1965, Congress passed the Elementary and Secondary Education Act (ESEA). The Act was designed to help states provide funding for the education of children with disabilities through various grant programs. The ESEA was amended in 1966 and 1968 (Martin, 2001).

Education of the Handicapped Act (EHA) was signed into law in 1970. EHA did several things. One, it consolidated all the earlier grant programs under one law. Second, it provided additional federal money to fund pilot projects in several states. Third, EHA funded colleges and universities to develop and train teachers in special education. Fourth, EHA funded regional resource centers to provide technical assistance to state and local school districts (Martin, 2001; Yell, 2006).

As a result of two court cases in 1972, basic procedural rights for children with disabilities were established and this influenced the government to amend EHA in 1974. *Pennsylvania Association for Retarded Citizens v. Pennsylvania* and *Mills v. District of Columbia Board of Education* were the two court cases that resulted in requirements that Pennsylvania and D.C. public schools provide access to education for students with disabilities. The amendments to EHA in 1974 required each state that received federal funding to provide (a) full educational opportunities; (b) procedural safeguards; and (c) education in the least restrictive environment for students with disabilities (Martin, 2001; Yell, 2006).

Advocacy groups for students with disabilities believed that the new laws were not enforceable and no one was able to ensure that children with disabilities were being educated appropriately. Meanwhile, in the early 1970s states had begun to develop their own statues and regulations for the education of students with disabilities. Most of these programs were uneven across states and many advocates felt that an enforceable federal standard was needed. Research reported by Congress in late 1975, indicated that approximately 1.75 million students with disabilities were excluded from public schools and another 2.2 million were educated in programs that were not meeting their needs (Yell, 2006).

History of Early Intervention and Early Childhood Special Education

On August 23, 1977, President Gerald Ford signed into law the Education of All Handicapped Children Act (EAHCA). The EAHCA provided federal funding to states to assist them in educating students with disabilities. States wanting to receive federal funding had to submit a plan to the Bureau of Education for the Handicapped. This state plan was required to describe the policies and procedures the state would use to educate children with disabilities according to the EAHCA. If approved, the state was obligated to guarantee a free and appropriate education to students with disabilities in return for the federal funding. States were funded based on the number of children they served on an annual basis (Yell, 2006).

According to Yell (2006), and Murdick, Gartin and Crabtree (2002), as the years passed, the original EAHCA was amended seven times between 1975 and 2004. An important amendment occurred in October of 1986, when P.L. 99-457 (Infants and Toddlers with Disabilities Act) was enacted to provide an expansion of the original

legislation. Part B was expanded to include services to children with disabilities aged three to five. A new chapter was established –Part H. This chapter provided funding for the planning and implementation of early intervention programs for young children with special needs. In 1990, EAHCA (P.L. 101-476) was reauthorized and re-titled Individuals with Disabilities Education Act. This change reflected the use of “people first” language which is now the accepted language when referring to persons with disabilities.

P.L. 102-119 amendments to IDEA were passed in October of 1991 by Congress. The purpose of these amendments was to reauthorize the Part H program. The name of the Part H program was changed to The Early Intervention Program for Infants and Toddlers with Disabilities. Significant changes were made to assist in the transition of children from the Part H programs to preschool services. Federal funds were authorized to assist states in the education of infants, toddlers, preschoolers, children and youth with disabilities.

Instead of requiring an IEP for children aged birth to three, the amendments required an Individualized Family Service Plan (IFSP). In states that receive Part C funds, all infants and or toddlers with disabilities must have an IFSP that is developed by a multidisciplinary team which include the parents, other family members, the case manager, the professionals conducting the evaluation and other persons who will be involved in providing services. An IFSP is required to include the following information: (a) the child’s status; (b) family information; (c) outcomes; (d) early intervention services; (e) other services; (f) dates; (g) duration of services; (h) service coordinator; and (I) transition from Part H services (IDEA Regulations, 34 C.F.R.§ 303.344).

The purpose of EI/ECSE programs is to enhance the competence and confidence of the children and families who participate in early intervention programs. Intervention within EI programs are family-centered and focused on teaching functional skills. According to the DEC Task Force (1993), recommended practices for infants and young children with special needs and their families, teachers in early intervention are encouraged to provide intervention strategies that promote autonomy, active engagement, initiation and age-appropriate abilities in many natural contexts and situations.

In summary, the field of EI/ECSE has evolved and grown as the community advocated for services for children with disabilities and Congress passed laws that mandated the education of infants and young children with special needs. Part H of the IDEA (amendments in 1991) defined what services should be provided to families of infants and young children with special needs, who qualified for these services, and who could provide these specialized services. The Division of Early Childhood (DEC) of the Council for Exceptional Children (CEC) beginning in 1993 provided recommended practices for quality programming and instruction among infants and young children with special needs and their families. The next section will introduce the field of occupational therapy.

Overview of Occupational Therapy in Early Intervention

According to current practice information provided by the American Occupational Therapy Association, more than a third of practicing occupational therapists have identified early intervention as their primary practice setting (AOTA, 2005). This translates into over a 1,000 therapists across the continental United States.

Occupational therapy practice settings and roles are varied. The Individuals with Disabilities Education Act (2004) (IDEA) is the primary federal law that supports occupational therapists and occupational therapy assistants in early intervention and school-based programs [IDEA, 1997, 20 U.S.C. 1401ξ 602(22)].

Occupational therapy is one of the related services that may be provided to students receiving special education in schools, homes, center-based programs, hospitals, juvenile justice centers, and alternative educational settings. Occupational therapists and occupational therapy assistants work with children, families, teachers, caregivers, and other team members to facilitate the child's ability to engage in meaningful occupations or purposeful activities. These services support the child's participation in activities of daily living, education, work, play, leisure and social interaction (AOTA, 2004). Most of these activities involve some form of touching, holding, handling, positioning, cuddling, rubbing, or massaging the infant or child.

Federal Legislative Influence on Occupational Therapy

There are several federal laws that influence the practice of occupational therapy in early intervention and school based programs. In addition to the IDEA–Parts B and C occupational therapy services for children are also allowed under Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act of 1990 (ADA). Services for these children are based on their disability status and their ineligibility for special education.

The Individuals with Disabilities Education Act (IDEA), Part B, mandates occupational therapy as a related service for those children with disabilities, age 3–21 years who need it to benefit from special education. The Individual Education Planning

team (IEP) determines the need for services. IDEA, Part C, allows for occupational therapy as a primary early intervention service for children up to 3 years of age who are experiencing developmental delays, or who are at risk for developing delays [Individuals with Disabilities Education Improvement Act of 2004, 20 U. S. C. §1400, H. R. 1350 (2004)].

Section 504 of the Rehabilitation Act of 1973, as amended, prohibits discrimination on the basis of disability by programs receiving federal aid [Section 504, 29 U.S.C. §794 (a)] . Children, who are not IDEA eligible, may be eligible for 504 services. Examples include children with AIDS, asthma, arthritis, attention deficit disorder, traumatic brain disorder, conduct disorder or depression. Occupational therapy services may be provided directly to the child eligible under Section 504 or as a necessary accommodation (AOTA, 2004).

The Americans with Disabilities Act of 1990 (ADA)(ADA, 42 U.S.C. § 12101-12213) extends the anti-discrimination protection under 504 to all services and activities of state and local governments whether they receive federal funds or not. These activities include education and early intervention programs. Like Section 504, children who are not eligible for IDEA may be eligible for services under reasonable accommodation to help them access the learning environment (AOTA, 2004).

As a pediatric occupational therapist for more than twenty years, touching a client was an important part of the intervention process (G. Gray, personal communication, December, 28, 2005). The “laying on of hands” was an important technique whether it was for a physical examination, positioning, handling, or providing a sensory-motor treatment. The child was always touched. However, soothing a child when he or she

experienced separation anxiety from a parent was different. The touch in this situation was designed to soothe the child in a tender, caring way. Certainly, other occupational therapists are also touching the infants and young children in their case load as well. However, the pattern of caring touch and massage among occupational therapists in early intervention programs is not well documented in the literature (G. Gray, personal communication, December 28, 2005). For the purpose of this paper, touch/massage will be used to describe a broad range of tactile stimulation from touching, massage, deep pressure touch and manipulation of the skin and underlying soft tissues and muscles.

Occupational therapy educators teach students treatment approaches and techniques in both physical and psychosocial intervention classes. Students are able to document effective treatment programs and discuss the basic principles underlying treatment but when they are required to "touch the client" to carry out an intervention program they become very uncomfortable, step back and wait for me or someone else to touch the client first. I have also observed students and therapists who are not afraid to "lay on hands", but it is done in such a routine, mechanical or perfunctory way that the client does not view the touch as caring. These therapists do not actively use their tactile sense to perceive the change or lack of change in the patient's physical status. No doubt, teachers in early intervention are also touching, handling and physically caring for infants and young children in their programs on a routine basis. How do occupational therapists and teachers in early intervention programs attitudes, practices and knowledge about touch and massage affect their intervention? What is the nature of the touching in both disciplines? Are teachers touching to teach? Are therapists using a caring or procedural

touch? Therefore, the primary research question is: What role does touching and massage play among occupational therapists and teachers in early intervention programs?

Purpose of Study and Hypotheses

In this study, the investigator will attempt to determine the role of touching and massage among occupational therapists and teachers in early intervention programs. These practitioners will be surveyed about their knowledge, use of and attitudes about *caring touch* and massage in their intervention programs for infants and children between the ages of 0–3. The null hypothesis states there is no significant difference between occupational therapists and teachers in early intervention programs regarding their knowledge, attitudes and practices about touching and massage. The next section explores why it is important to understand caring touch and massage in occupational therapy and early intervention programs.

Therapeutic Principles of Touch and Massage

The study of caring touch/massage among occupational therapists and teachers in early intervention is important for several reasons. Humans need food, water and sleep for physical survival; they also have a constant need for comfort, reassurance, and security. Touch comfort is a conditioned response learned very early in life based on early mother infant interactions. These needs are particularly active when there is increased physiological stress inside a person and external stress from the environment (Huss, 1997). When a person is ill, angry, anxious or depressed, the need for body contact, which signifies being loved, comforted, accepted and protected, can be greater

than at other times (Huss, 1997). The public's widespread use of non-conventional forms of treatment like touching therapies and infant massage to promote wellness may indicate "skin hunger" or the need for more tactual stimulation. And finally, there is a paucity of literature in occupational therapy on the role of caring touch in intervention (Huss, 1976).

Complementary and Alternative Therapies

Massage and other forms of non-conventional treatment—herbal medicines, specialized diets, exercise, aromatherapy, acupuncture, acupressure, and reflexology—as well as other forms of manual therapy, are considered 'alternative or complementary therapies'. As the cost of health care increases and more and more Americans are uninsured or unable to access health care, they are increasingly using treatment approaches that are considered non-traditional by the American Medical Association (Sultz & Young, 2006).

A survey was conducted in 2001 through the National Institutes of Health (NIH), the National Center for Complementary and Alternative Medicine (NCCAM), in conjunction with the National Center for Health Statistics (NCHS) to investigate the use of complementary and alternative therapies among Americans. The study revealed that approximately 36 % of adults in the United States are using some form of complementary and alternative medicine (CAM). Surveys conducted in 1997 by NCCAM revealed that the public spent about $36 billion on CAM therapies. Most of this amount ($12–20 billion) was paid-out-of-pocket to CAM health care providers. These amounts represent more than what the public paid-out-of- pocket for all hospitalizations in 1997.

In 1995, the Office of NCCAM defined alternative medicine as modalities used instead of conventional medicine. This type of health care is not generally taught in

United States medical schools and is not available as standard treatments in hospitals. Complementary medicine is the use of multiple modalities together to complement offerings of conventional medicine (Kuhn, 1999; NCCAM, 2004). The newer terms integrative medicine and blended medicine are also references to complementary medicine (AOTA, 2005).

There are five domains of complementary and alternative medicine (CAM) practices: 1) alternative medical systems, 2) mind-body interventions, 3) biologically-based treatments, 4) manipulative and body-based methods, and 5) energy therapies. In recent years, many of these therapies have regained their popularity among the public (AOTA, 2005). According to AOTA (2005), CAMs may be used within the scope of practice of occupational therapy when CAMS are used as preparatory methods, or purposeful activities to facilitate the ability of clients of any age to engage in their daily life occupations. CAM techniques currently being used in occupational therapy include guided imagery, massage, myofascial release, meditation, yoga, and behavioral relaxation training.

Theoretical Frame of Reference

Health professionals in the Western world have primarily followed the allopathic model of health. This model of health is largely based on the "contagion" theory of disease and the suppression of symptoms through the promotion of medicines, surgery, and other organic measures that fight harmful agents and their effects on the body (Brown, 2005). Allopathy, based on the principle of dualism, was introduced by a French philosopher, Rene' Descartes in the 17th century (McCormack, 1991). Dualism considers the mind and body, as separate distinct entities. Body became the more important of the

two because it could be studied objectively. The mind or “psyche” could not be studied in this way and thus was often ignored (Reed, 1984).

In most occupational therapy schools, students are taught a holistic model of health (also called mind-body model of health). Holism is based on the assumption that the human organism as a whole is more than the sum of its parts. The human has characteristics that are not a part of the physical body. An example would be the mental and spiritual dimensions of health. Taking the broadest possible view of health and illness, the holistic model includes both internal and external factors. Physical, spiritual, as well as social-emotional well-being constitutes health.

Today in occupational therapy, there are many specialties including physical dysfunction (body disorders) and psychosocial dysfunction (mind disorders). In psychosocial dysfunction, occupational therapy students are taught about *the therapeutic use of self* (Punwar & Peloquin, 2000). The therapeutic use of self meant that successful therapy was more than the skills and techniques offered, but also included an attitude of caring and concern that enabled the client to heal. Establishing a cooperative working relationship through mutual goal setting with the client and family is a part of motivating the client to want to change or meet their goals. Being able to listen and communicate effectively is an important part of the therapeutic relationship as well (Erhardt, 2005; Huss, 1997; McCormack, 1991).

Significance of the Study

Communication through touch is a powerful method. It is used especially when words cannot be expressed. Punwar and Peloquin (2000) believe “that being able to read

and send meaningful non-verbal communication is valuable in this *special* relationship" (p. 96). The therapeutic relationship is an occupational therapist's most important tool. If touch is used, it is important to realize the effects of touching on clients and others with whom we interact and love. As humans we all need to touch and be touched in return (Erhardt, 2005; Huss, 1997; McCormack, 1991).

In physical dysfunction clinical treatment programs, some occupational therapists have used deep pressure touch (DPT) to calm children who are hyperactive, learning-disabled, or aroused children with autistic behaviors and persons with schizophrenia (Krauss, 1987). Deep pressure touch is one of several somatosensory sensations arising from hugging, cuddling, squeezing, stroking, or holding. Touch sensations are coupled with the stimulation of the underlying fascia (tissues) (Krauss, 1987). Methods using DPT have included rolling up a patient in a snug blanket, or playing body contact games or games like the 'mat sandwich' (the child lays between the fold of a therapy floor mat) described by Williams and Schellenberger (1994). Ayres (1964) and Knickerbocker (1980) have advocated the use of DPT with children who are hyperactive, distractible, and demonstrate sensory defensiveness. Ayres (1979) reported that this procedure promotes a calmer, more organized, interaction with the environment in these children.

Huss (1997) urged occupational therapists to embrace tactile communication. She believed that the education of occupational therapists, which included the biological, and behavioral sciences, was adequate for understanding the implications of caring touch. However, an awareness of one's feelings as a human being is needed before caring touch can be used effectively. Western medicine has historically neglected the value of touch and today many health care practitioners are reluctant to touch their clients in a caring

way. McCormack (1991) encourages a type of intentional touching for health care practitioners after skills have been developed to use the hands therapeutically. Intentional touching as described by McCormack (1991) and Krieger (1979) is the use of the hands with the intent to help or heal.

What about teachers in early intervention and touching? The field of early intervention offers a rich environment for providing massage to infants. Whether it is done to enhance child and family social interaction, child development and growth, or just to soothe a child who is crying, it can be an excellent tool to improve outcomes for infants and young children with special needs. Many educators in ECSE have studied and followed the work of Schneider (1996) who describes the power of touch and massage for infants who are at risk for developmental delays. Schneider describes five areas of skill development in early intervention that is enhanced or improved through massage—communication, motor, socialization, self-help and cognition. Schneider proposes that infant-caregiver bonding through massage helps the infant's pre-speech skills (i.e. listening, eye gazing, and turn taking), social reciprocity in playful or quiet states, oral motor awareness and reduced muscle tension during feeding, an overall increase in body awareness, and cognitive awareness of self, and body boundaries.

Farlow (1998) a speech and language pathologist, and certified special education teacher in Athens Alabama has used her skilled training as a certified infant massage therapist to enhance basic language and social skills in abused and neglected children and children with disabilities. Farlow's program, "Touch to T.E.A.C.H.", is a program of mother intervention. The program is described as a mind/body integration system in which massage can support language, and cognitive development. Throughout Alabama,

she has trained parents of children with disabilities and day care providers. She believes that massage is a special gift for parent and child. A daily routine of massage can assist a working parent in connecting with his/her child in a special, nurturing way.

II. REVIEW OF THE LITERATURE

Understanding Sensory Systems

Touch is our first language. The first system to function in utero, touch mediates our experiences in this world. We are nourished, we are calmed, and we first become attached to others through touch (Montagu, 1986). The sensation of touch is, in fact, the "oldest and most primitive expressive channel" (Collier, 1985, p. 29), and a primary system for "making contact" with the external world. We are extremely dependent on touch until language, motor skills, and cognitive processes develop and can guide us in experiencing and interacting with the environment (Collier, 1985). According to Huss (1997):

> Touching involves risk. It is a form of nonverbal communication and therefore may be misunderstood by one or both parties involved. It invades intimate space and may be a threat. If we are not in tune with ourselves and the one we touch, it may be inappropriate. However, non-touch may be just as devastating at a time when words are insufficient or cannot be processed appropriately.... (p. 305)

Despite the identified importance of touch as a communication system and as an important factor in the survival of living organisms, the effects of touch are hard to isolate. Yet the complexity of this sensory modality makes touch a fascinating focus for research (Brazelton, 1984). Dr. Tiffany Field (2000), the director of the Touch Research

Institute (TRI) at the University of Miami School of Medicine and Nova Southeastern University in Florida, expresses disappointment that regardless of the long history and popularity of massage and touching, there is a paucity of research based on clinical trials and appropriate research methods. Only two meta-analyses appear in the literature. This is due to so few studies with comparable designs and standards and too few replications of existing studies. Follow up studies are also needed to see if the results are sustained over time.

The Brain and Touch

The word *touch* and its common synonyms *feel and contact*, refer to a complex set of sensations that can be narrowly or broadly defined. Touch often refers to cutaneous sensations aroused by stimulation of receptors on the skin. Sensations of the muscles and joints (proprioceptive sense) and sensations of movement (vestibular sense) are closely linked to touch (Costanzo, 1998; Rose, 1984). The sensation of touch is multifaceted, encompassing separate sensations of temperature, pressure, pain, and muscle movements. Touch also includes stereognosis, the ability to sense the location, size, texture and shape of objects placed in our hands. Touch at its most basic level tells us about our emotional needs and the external world around us (Rose, 1984).

Any stimulation that touches the skin is carried to the spinal cord on nerve fibers that may be no longer than several feet. The fibers are small if they carry pain or temperature information. They are large if they carry mechanical information like touch pressure, up the spinal cord to the brain. The information traveling to the brain crosses the sensory cortex to the opposite side of the brain where it is processed (Costanzo, 1998).

Scientists have done experiments by placing electrodes on the surface of a person's cortex to note exactly where the brain receives and processes skin stimulation. A homunculus is a diagram of where the stimulation from different parts of the body is received by the brain (Field 2001; Montagu, 1986). Used as an anatomical device, this diagram shows that in determining how much space is needed on the cortex, the size of the body part is less important than the density of its nerves. Areas with more nerve endings, such as fingertips, require more space in the cortex than the back, which has fewer nerve endings. In addition, some specialized nerve cells in the cortex are so sensitive to specific types of stimulation (i.e. stroking the surface of a certain body part in one single direction, or at a specific frequency) that their representation in the cortex is larger as well (Field, 2001; Montagu, 1986).

Structure and Function of the Human Skin

According to Taber's Cyclopedic Medical Dictionary (Thomas & Venes, 2001), the skin is the organ that forms the outer surface of the body. In addition to holding in our organs, the skin shields the body against infection, physical injury, dehydration, and temperature changes. The skin provides sensory information about the environment, thus perceiving danger and signaling the person to move away. It manufactures vitamin D, and excretes salts and small amounts of urea. This process helps to regulate our body temperature, as well as our water and salt metabolism by perspiration. The skin helps prevent disease by releasing immune hormones. Its sebaceous glands help lubricate the skin, particularly the lips, breasts and genitalia. As a sense organ, our skin is critical for perceiving and processing the meaning of different touch stimuli. The ridges in our finger

tips are sensitive and important for the perception of texture (Field, 2001; Thomas & Venes, 2001).

Montagu (1986) describes the skin as the largest organ in the body. The skin weighs from 8 to 10 pounds in an adult and covers nearly 20 square feet if it was laid end to end. A piece of skin the size of a quarter contains more than 3 million cells, 100-340 sweat glands, 50 nerve endings, and 3 feet of blood vessels. Because of its size and the multiplicity of its function, the skin has an expansive representation in the brain. The tactile areas of the brain cover a large area both in the sensory and motor regions. The sensory feedback the brain receives from the skin is continuous even in one's sleep (Davis, 1999; Field, 2001; Montagu, 1986). At this point a brief review of the human nervous system is required.

The human nervous system is divided into three parts: the central nervous system (CNS), which includes the brain and the spinal cord; the peripheral nervous system (PNS), which includes sensory receptors, sensory nerves; and ganglia outside the CNS; and the autonomic nervous system (ANS) that acts involuntarily and controls and modulates the functions primarily of visceral organs. It includes the sympathetic and parasympathetic systems.

Costanzo (1998) states "the somatosensory system (PNS) processes information about touch, position, pain and temperature" (p. 67). The receptors that transduce these sensations are called mechanoreceptors (for touch and proprioception), thermoreceptors (for temperature), and nociceptors (for pain or noxious stimuli). There are two pathways for transmission of somatosensory information to the CNS: the dorsal column system and the anterolateral system of the spinal cord. The dorsal column system processes the

sensations of fine touch, pressure, two-point discrimination, vibration, and proprioception (limb position). The anterolateral system processes the sensations of pain, temperature, and light (Costanzo, 1998).

The mechanoreceptors are divided into different types of receptors depending on which kind of pressure or proprioceptive quality they encode. Some are found in hairy skin and some types are found in non-hairy skin. Depending on their function, a receptor will react or adapt very quickly, quickly, or slowly to stimuli. Very quick or quick adapting receptors detect changes in the stimulus and its velocity. Slow adapting receptors respond to intensity and duration of the stimulus. The very quick adapting receptors are called Pacinian corpuscles; the quick adapting receptors are called Meissner's corpuscles and hair follicle receptors; the slow adapting receptors are called Ruffini's corpuscles, Merkel's receptors and tactile discs (Costanzo, 1998).

The thermoreceptors are slowly adapting receptors that detect skin temperature. The two classes of thermoreceptors are cold receptors and warm receptors. If the skin is warmed above 36 degrees centigrade, the warm receptors are active. If the skin is cooled below 36 degrees centigrade, the cold receptors are activated. If the skin temperature rises to damaging levels above 45 degrees centigrade, warm receptors become inactivated and polymodal nociceptors are activated to register pain (Costanzo, 1998).

Nociceptors respond to noxious stimuli that can produce tissue damage. There are two major classes of nociceptors: thermal or mechanical nociceptors and polymodal nociceptors. Thermal or mechanical nociceptive are supplied by finely myelinated afferent nerve fibers and respond to mechanical stimuli like sharp or pricking pain. The polymodal nociceptors are supplied by unmyelinated C fibers and respond to high-

intensity mechanical or chemical stimuli and hot and cold stimuli. When nociceptors are activated, Substance 'P' is released from their terminals into the skin. This action has several effects including inflammation. It is important to note that opiates or opioid-like substances can inhibit the release of Substance 'P' (Costanzo, 1998). Now that each of these receptors has been described, where are they located in the skin?

Taber's Medical Dictionary (Thomas & Venes, 2001) states that the skin may be classified as hairy and thin or thick and hairless. Thin hairy skin covers most of the body. The thick hairless skin covers the surface of the palm of the hands, soles of the feet and the flexor surfaces of the fingers. The skin consists of two major divisions: the epidermis and the dermis. The epidermis is that superficial part of the skin exposed to the environment. The dermis is that layer of skin lying immediately under the epidermis.

The epidermis houses the tactile system. The free nerve endings in the epidermis are almost entirely concerned with touch. The two nerve plexuses in the epidermis—the Meissner's corpuscles and the Pacinian corpuscles are both encapsulated sensory nerve endings sensitive to touch. The Meissner's corpuscles, the end organ of touch, respond to the lightest forms of stimulation. They are most numerous in the hairless portions of the skin, especially the volar surface of the hands, fingers, feet and toes. They are also present in the lips, eyelids, nipples and the tip of the tongue.

The larger of the two plexuses, the Pacinian corpuscles, are the specific end organs that are sensitive to deep or heavy pressure, vibrations, and high frequency sounds. They respond to mechanical stimulation of pressure and tension. These Pacinian corpuscles are very numerous under the pad of the fingers. They are also located near joints and deep tissues. This plexus of free nerve endings is distributed among the

epidermal cells of each hair follicle. When the hair in these follicles is mechanically displaced, tactile sensations are produced. Merkel's disks, located just beneath the skin, respond to constant pressure as well (Costanzo, 1998; Field, 2001; Thomas & Venes, 2001).

The dermis, or the true skin, consists of two layers—papillary and reticular. The dermis is composed of fibrous connective tissue made of collagen and elastin, and contains numerous capillaries, lymphatics, and nerve endings. This layer of skin also contains hair follicles and their smooth muscle fibers, sebaceous glands, sweat glands, and their ducts. Ruffini endings, located deep in the skin, can also register pressure and temperature (Costanzo, 1998; Field, 2001; Thomas & Venes, 2001).

Massage and Pain Reduction

There are three theories that explain the benefits of massage and its impact on pain reduction: the *endorphin-serotonin*, the *gate* and the *sleep deficit* theories. The endorphin-serotonin (Field, 2001) states that massage stimulate the release of endorphins, or the body's natural pain suppressors. According to Taber's (Thomas & Venes, 2001), endorphin (also called beta endorphins) is a polypeptide produced by the brain that acts as an opiate and produces analgesia by binding to opiate receptor sites involved in pain perception. The threshold for pain is increased by this action. Serotonin, synthesized in the brain from tryptophan, is another pain- relieving chemical and neurotransmitter found in the CNS (Field, 2001).

Tryptophan is an essential amino acid found in animal and fish proteins. It is necessary for normal growth and development. Studies on infant and adult massage by Field and colleagues (Field, 2000) have shown that subjects with chronic pain when

massaged had increased levels of serotonin in their urine and milder pain in comparison to control subjects who did not receive massage. Control subjects had decreased levels of serotonin in the urine and fewer pain free days. Several medications prescribed for pain increase serotonin levels in the body. Examples are sumatriptan and selective serotonin re-uptake inhibitors like Prozac.

Newer research (Isaacson, 1982) has shown that lesions to, or stimulation of the septal area of the limbic system, have resulted in a short-term increase of emotionality in humans and rats. This increased emotionality can be reduced with handling (i.e., touch) in animals and the increased emotionality is less severe when it is experienced during youth. According to Isaacson (1982), the hippocampus, the hypothalamus and certain neurotransmitters are interrelated in the central nervous systems' ability to modulate sensory inputs and emotional responses related to sensory inputs including the sense of touch.

The gate theory (Ayres, 1979; Field, 2000) is based on the idea that pain travels on the nerves to the brain and that one can overwhelm the nerves with other stimulation such as pressure or cold temperature and block the pain message. This is because pain fibers are shorter and less myelinated than pressure and cold temperature receptors. The brain receives the pressure or cold stimuli before the pain stimulus, the gate is closed, and the pain stimulus is not processed (Field, 2000). Ayres (1979) described it this way; if you are bitten by a mosquito you scratch the bite because the deep pressure sensation prevents the tactile system from conducting itch or pain sensations. So the itch disappears as long as we scratch, but reappears when we stop.

The other potential theory relates to quiet or restorative sleep (Field, 2000). During deep sleep, somatostatin is normally released. Without this substance, pain is experienced. Another substance called 'P' is released when an individual is deprived of deep sleep, and this substance is notable for causing pain. Thus, if a person is deprived of deep sleep, they may have less somatostatin and increased levels of Substance P. Substance P is an amino acid peptide that is believed to be important as a neurotransmitter in the pain fiber system. Massage therapy has been shown to improve sleep in several studies conducted by the Touch Research Institute (Bundy, Lane, & Murray, 2002; Field, 2000)

The Nature of Human Touch: Types and Patterns

Humans assign various roles to touch. McCormack (1991) refers to six roles of touch: active, passive, social, comforting, affectional, and touch with intention. *Active* touch includes patterns of exploration in which the skin, muscles and joints together enable the individual to discriminate and explore in order to obtain information about the object being touched. *Passive* touch involves excitation of receptors in the skin and underlying tissues. An external agent makes contact with the subject's skin. An example would be moving a rough texture across the back of the hand. *Social* touch involves the role of touch in promoting social bonds, attachment, and emotional integrity. Research on *social* touch generally concerns the effects of social deprivation and social stimulation. Failure to thrive infants can have all the food they need, but continue to deteriorate without intervention that includes emotional nurturing, care and contact comfort. Mother-infant attachment is the infant's first real social experience and is the beginning of social and emotional development (McClure, 1989).

Health professionals use *comforting* touch to assist a client coping with an illness or related stressors. As a way to express empathy, “tender loving care” (as it is often called) is encouraged but has been practiced infrequently by health care practitioners. Comforting, gentle touch can be therapeutic when it is used to communicate compassion. Compassion implies deep concern not pity or sympathy.

Affectional touch, similar to *comforting* touch has been defined by McCormack (1991) as touching provided by health care practitioners during routine care. *Comforting* touch can be applied by anyone, but *affectional* touch is confined to touch provided by health care professionals. This type of touch should not be confused with *procedural touch*ing that is done to apply a treatment, monitor or diagnose an illness. Procedural touching is very stressful to patients because they fear pain, discomfort or a loss of dignity. More research has been done on *affectional* touching among health care practitioners. McCormack (1991) reporting on studies done by other investigators, states that sustained stationary touch is used most often and stroking touch is used the least by health care practitioners. The wrist and hand were the locations most frequently touched. The face and trunk were touched the least. Because of social, sexual and cultural taboos, the trunk and head are usually avoided during *affectional* touch.

Intentional touch is currently practiced by proponents of “therapeutic touch” (TT). TT is defined by Krieger (Krieger, Peper & Ancoli, 1979) as the intentional use of the caregiver’s hands to help or heal a patient. The patient is not actually touched, but the caregiver’s hands are used to scan the body, by moving the hands over the body from a distance of about 2–3 inches, while noting changes in the patient’s energy field (Krieger,

Peper & Ancoli, 1979). More on therapeutic touch will be discussed later under the topic: Nursing and Therapeutic Touch.

Massage is a manipulation of the body that combines tactile or touch and kinesthetic (perception of movement) stimulation and is performed in a purposeful and sequential application for its therapeutic effect (DePaoli, 1995). Massage techniques utilize active or passive touch or both in combination. How much skin-to-skin contact, deep pressure or friction is applied depends on the desired outcome. Light touch or passive touch is called effleurage. It is used to promote relaxation, alleviate pain and encourage sleep. Petrissage and percussion techniques utilizes active touch and are designed to stimulate underlying tissues by applying pressure and friction to promote circulation, revitalize tissues, and help to eliminate waste (DePaoli, 1995).

The research on touch and communication mostly describes how touch varies by gender, age, class and culture. Hicks (1998) reported that even casual touch has benefits. In one famous experiment, a librarian used the same words and voice inflection with every patron that passed through the checkout line. But during the encounters she brushed the hands of every other patron as they checked out their books. When these patrons were surveyed later outside the library, almost every patron reported having a pleasant experience inside if they were touched. Those who were not touched had either neutral or negative things to say about the experience. Women patrons responded favorably to the touch, but the men patrons were ambivalent. The men were the most negatively affected if a male librarian touched them.

Jourard (1966) describes his visits to café's around the world and his observations of how often people touched while sharing coffee at these cafes. In London the tally was

zero; in Gainesville, Florida, 2; in Paris, 110; and in San Juan, Puerto Rico, more than 180. According to Field (2001), societies like those in the Mediterranean countries (Spain, France, Italy, Greece, Turkey and Egypt) are touching societies, whereas, northern countries such as Holland, Great Britain, and the United States are less touching societies.

History of Massage and Touching for Therapy

Touch is as old as humankind and the art of massage is as ancient as touch itself. Massage is the most natural and instinctive means of relieving pain and discomfort. Massage is used instinctively by animals to relieve pain or respond to injuries through licking, pressure and rubbing. Rat pups cannot survive without their rat mother's tongue licking touch. In humans, massage may have begun when ancient man rubbed his bruises for comfort and pain relief. Anytime we have abdominal pain, aching muscles or wounds, our natural inclination is to rub that body part (Field, 2001; Fritz, 2000).

Ancient Civilizations

Touch as a method of healing has numerous cultural origins. The word massage comes from several sources. The Latin root massa and the Greek root word messein or masso means to touch, handle, squeeze or knead (Fritz, 2000). Most ancient cultures practiced some form of healing touch. Usually a shaman or priest performed healing rites by using herbs, oils, water and massage to the skin (Fritz, 2000). Archeologists have found many pre-historic artifacts depicting the use of massage for healing and cosmetic purposes. Often the skin was burned, scraped, or cut as part of the process. Massage may

have been used along with fasting and bathing as a preparatory part of tribal rituals (Fritz, 2000).

Chinese folk medicine has strong roots in therapeutic massage. Historical records (DePaoli, 1995; Fritz, 2000; Schneider, 1996) have revealed the therapeutic use of massage in China about 3,000 years before the birth of Christ. Chinese massage was administered by using the hands to knead or rub the entire body using gentle pressure and traction on the joints. Described in ancient Greek, Egyptian, and Chinese writings, massage was used as a traditional medical technique along with herbs, exercise and acupuncture to heal the body.

Acupuncture involves the stimulation of specific points on the body by inserting tiny, solid, needles and applying pressure (Sadock & Sadock, 2003). Massage and other forms of skin pressure were used along with acupuncture for treatment. Traditional Eskimo and African healing arts used acupuncture- like treatments by using sharp stones to scratch the skin's surface. The Chinese introduced massage to India by way of their trading opportunities and the Japanese learned about massage through early Chinese writings (DePaoli, 1995; Fritz, 2000; Schneider, 1996).

In the Far East and India, and throughout history, massage played an important role in healing. Ancient Egyptians left artwork depicting foot massage (Fritz, 2000). In ancient Greece, the god of healing was Asclepius. According to myth, he healed people by simply touching them. This practice of "laying-on of hands" has a long history, extending back before written records were kept. Field (2001) reports that around 1553 B.C. papyrus was found that depicted the practice of healing by touch. Greek athletes underwent friction treatment, anointing, and rubbing sand on their skin before an

Olympic game. In the time of Hippocrates around 500 B.C. there were hand healers who were called “kheirourgos”. This is the origin of the modern word surgeon (Field, 2001; Fritz, 2000).

Massage came to the Romans through the Greeks. The ancient Romans used massage as a form of relaxation and as a beauty treatment for facial skin. Extensive use of massage for the treatment and prevention of disease was made by Hippocrates (460–377 B.C.). Julius Caesar (100–144 B.C.) had himself “pinched all over” (massage) daily to relieve his neuralgia and prevent his epileptic seizures (Fritz, 2000). One of the most famous Roman healers was Galen (A.D. 130). As a hand healer, he used massage as a medical treatment (Field, 2001; Fritz, 2000).

A way of healing the sick as written in the Bible was the “laying on of hands”. In all four gospels of the New Testament, the practice of using the hands in healing was commonplace for those with some type of disease or illness. Jesus healed children, lepers, the lame and others with disease by using his hands. In Hebrew and Christian traditions the use of touch is still used as a method for healing. Today, charismatic churches and ministers of the gospel televise a church ritual in which healing is done through touch. Full body massage with oils for anointing goes back in Jewish history before the 1st century. The ancient Jews practiced anointing for its ritual, hygienic and therapeutic benefits (DePaoli, 1995; Fritz, 2000; Schneider, 1996). Field (2001) reports that this practice was dropped from the church during the seventeenth century, but the monarchs of France and England continued this practice of touch by using what was called the “royal touch”. Kings and Queens would touch common people to treat many diseases. This continued into modern times. In France as late as 1825, King Charles X touched

between 120 and 130 people for healing. Queen Anne of England was the last royal to perform this healing gesture for her subjects.

The Middle Ages

The Islamic Empire in the East continued the Greco-Roman traditions of using massage as a part of their healing arts. However in the West, the Greco-Roman traditions of using massage disappeared. Common people continued to practice massage and it became a part of folk medicine among the Slavs, Swedes, and Finns. Associated with the practice of massage were supernatural experiences and observances. This association with supernatural events alienated the practitioners of massage from the scientific community that was beginning to take root during this era. The church persecuted practitioners of folk medicine and taught that their healing powers came from the 'devil'. Western culture adopted a puritanical view of life and any extensive touching or pampering of the body was viewed as sinful. As a result, massage both as a form of medicine and relaxation was ostracized (DePaoli, 1995; Fritz, 2000; Schneider, 1996).

The Nineteenth Century

Massage has fallen in and out of favor with the medical community over the past centuries as a legitimate healing art. This situation remained until in the 1780's when a Swede named Per Henrik Ling (1776–1839) returned from China and developed a scientific system of massage based on the principles of anatomy and physiology. He is credited with developing Swedish massage. Ling developed an integrated program of massage and exercise. In his system, Ling divided movements into active, duplicated, and passive forms. Active movements are performed by the person's own efforts. Today this is called exercise. Duplicated movements are performed by the person with the

cooperation of the therapist and involve active movement on the part of both therapist and person. Today this is resistive exercise. Passive movements are performed for the person by the active movements of the therapist alone. These passive movements of the extremities are called stretching and range of motion today. This movement therapy was not separated from massage and both were considered important components for healing. Ling taught many physicians in Russia, England, Germany and Austria his Swedish massage techniques. By the time of his death in 1839, his system had achieved worldwide recognition (Fritz, 2000).

Massage in the United States

Charles Taylor and his brother George Taylor introduced Swedish massage to the United States in 1856. An English physician named Dr. Mathias Roth trained them. Roth was a student of Per Henrik Ling. Dr. John Harvey Kellogg, who established a Sanitarium in Battle Creek Michigan, wrote extensively about massage and hydrotherapy as aids to good health. Massage was held in high esteem as a therapeutic technique among people until the massage scandals of the 1800s (Fritz, 2000).

Because massage was so popular, many massage schools opened overnight, and recruited students wherever they could be found. Since there were no educational standards for training practitioners of massage, many of these schools flooded the market with poorly trained therapists. Desperate to find a job to pay off school loans, many of these graduates opened businesses and made unethical claims about massage in their advertisements and charged high fees for their services. The worst of these clinics came to be known as “massage parlors” or houses of prostitution. In 1886, Dr. Charles Mills of Philadelphia, a prominent neurologist and advocate of massage, complained about the

uneven training of massage professionals and their unethical claims about the benefits of massage. The massage scandals, eroded the public's and medical profession's confidence in massage as a legitimate healing art (Fritz, 2000).

In spite of the scandals, massage continued to flourish and by 1918, the practice of massage had developed from a little known, unskilled trade into a medical discipline from which the profession of physical therapy emerged. During 1900 to 1960, much research and writing about massage techniques were done. One of the writers Dr. James Mennell, wrote on the effects of massage. In 1916, he divided the effects of massage into two categories: mechanical actions and reflex actions. Mechanical actions included: (a) aiding venous return of blood to the heart, (b) promoting lymph movement out of the tissues, (c) stretching the connective tissue (e.g., tendons and scar tissue), and (d) mechanical stimulation of the stomach and intestines (Fritz, 2000, p. 20). Mennell also theorized that tactile stimulation such as stroking and light touch stimulates the reflex arc causing muscles to relax or contract depending on the type of stroke. Ling and Mennell's theories have since been supported by research (Fritz, 2000).

Other innovators like Elizabeth Dickie, a German physiotherapist, developed connective tissue massage. Emil Vodder, a Danish physiologist, and his wife Estrid introduced a technique of light massage for lymph drainage. This technique is still used today to treat chronic lymphedema. James Cyriax, an orthopedic surgeon from London wrote about massage and later developed transverse friction massage for soft tissue manipulation in the treatment of chronic pain syndromes (Fritz, 2000).

Consequently, massage emerged in the first half of the 20th century as a complementary or alternative treatment method for many conditions including chronic

diseases (Fritz, 2000). Many of these diseases are resistant to surgical or drug treatment. Research continues to validate massage therapy. Massage as a professional discipline has evolved into a credible and distinct course of study with a standardized educational program. Although the fields of nursing and physical therapy trained their students in the art of massage, massage therapy is recognized as a separate and distinct field of study from other professional disciplines. Since the opening of the Touch Research Institute (TRI) in 1991 in Miami Florida at the University of Miami, much of the research on massage and touch therapy continues to evolve. Under the direction of Dr. Tiffany Field, over 90 research studies on the healthy benefits of touch and massage therapy has been published.

Touch Deprivation Studies

Given all that is known about touch/massage, why are Americans not touching? The 2003 Time Almanac (Brunner, 2002) indicates the number of sexually abused children in the United States in 1998 was 11.5%. Other studies (Field, 2001) indicate that 30% of girls and 10% of boys are sexually abused before they are 18 years of age. Although this percentage has declined from 17.5% in 1990, the potential for sex abuse has unfortunately created an environment supportive of not touching in American society. Parents and teachers are afraid to touch young children because physical affection might be misinterpreted as inappropriate behavior. Huss (1997) indicates that touching starts to decrease at 5–6 years of age in American culture. This decreased touching is directed more strongly toward boys. Therefore, children are deprived of touch at an early age. Field (2001) indicates that this fear of touching has resulted in policies that prohibit many

daycare centers from hiring male teachers. Not only are children deprived of male role models, these policies add to the stigma of touching and result in touch deprivation (Field). Montagu (1995) argues that such alarm is understandable in a society that has so confounded love, sex, affection, and touch. Genuinely loving parents have nothing to fear from demonstrative acts of affection for their children or anyone else. The problem with the confusion over affection toward children is that it has made parents and teachers paranoid about hugging and touching children.

Field, Harding, Soliday, Lasko, Gonzalez, and Valdeon, (1994) conducted a study at the TRI nursery school to observe three aspects of touch: the different types of touching the children received from their teachers and from the other children; where on the body touch occurred; and whether the touch seemed to be for communication purposes or for affection. They found that in spite of being a model nursery school, the teachers touched the children very little, particularly as they got older. Teachers were touching the one-year olds less than 12 percent of the time. When the teachers were shown the data, they stated that they touched little because of a concern that their touching might be mistaken for sexual abuse. After a discussion of acceptable types and places for touch, the teachers increased their touching.

What happens when we do not touch? There are several studies on touch deprivation and its effects on animals and humans. Among the human studies, various side effects of touch deprivation have been described. These side effects have included physical violence; sleep disturbances, suppressed immune responses, growth deprivation, dermatitis, asthma and cardiovascular disease (Field, 2000).

Several investigators, including James H. Prescott (1971), have suggested that touch deprivation in childhood leads to physical violence. Prescott, a developmental neuropsychologist believes that a principal cause of human violence stems from a lack of bodily pleasure during the formative periods of life. Most studies report that juvenile delinquents and criminals come from broken homes, or neglectful and abusive parents. Prescott (1971) believes that " the deprivation of body touch, contact and movement are the basic causes of a number of emotional disturbances including depressive and autistic behaviors, hyperactivity, sexual aberrations, drug abuse, violence and aggression" (p. 1). Therefore, according to Prescott, the deprivation of sensory pleasure is the principal cause of violence. A raging, violent animal will calm down when electrodes stimulate the pleasure centers of its brain. Rage cannot co-exist with pleasure. Prescott goes on to suggest that during development certain sensory experiences will create a neuropsychological disposition for either violence-seeking or pleasure-seeking behavior later in life. His theory is that the lack of sensory stimulation in childhood leads to an addiction to sensory stimulation in adulthood, resulting in delinquency, drug abuse, and crime. Montagu (1986) warns that exceptions often occur because some children raised in homes with a lack of love grow up to do quite well (Field, 2001; Montagu, 1986).

Prescott's (1971) theory comes from a study of 49 non-industrial, non-literate cultures, from the Ainu in Japan to the Zuni in New Mexico. All of these cultures were notably similar, except that high rates of adult violence were observed in those cultures where children received very little physical affection, and no adult violence occurred in those cultures with high levels of physical affection toward children. Although these

findings could be related to other things, such as parental sexual abuse, he found no cultural differences on this or any other variables (Field, 2001).

Touch deprivation is harmful to children because it disturbs their sleep (Heinicke & Westheimer, 1965). Sleep reduces stress and enables one to conserve energy. When very young children are separated from their parents, research has shown that they continue to have sleep disturbances even after being reunited with their parents. Heinicke and Westheimer (1965) studied two-year-old children who were separated from their parents for 2–20 weeks and lived in an institution where they received less touch. Even when these children were reunited with their parents, most of them continued to have sleep disturbances. This included difficulty falling to sleep or remaining asleep. At the Touch Research Institute, Field and colleagues (1991) discovered that in all of their studies where very young children were separated from their mothers, the children's sleep was always affected. This occurred whether the mothers were hospitalized for the birth of another child or whether they were out-of -town at a conference. Although the children continued their usual classroom behavior, their sleep (both naptime and nighttime) was the most affected of all the behaviors observed. The children took longer to fall asleep and they awoke more frequently during the night.

Touch deprivation also affects the immune system. The mounting evidence that the skin has immunologic function has been confirmed by a number of independent investigators. The epidermis of the skin secretes an immune hormone similar to thymopoietin, the hormone secreted by the thymus gland. Thymopoietin is active in producing T-cell differentiation. T-cells are responsible for cellular immunity. They are called T-cells because, following their origin in the embryo from lymphocytic stem cells

in the bone marrow, half of them migrate to the thymus gland, where they are processed to become T-cells. T-cells are capable of performing specific immune functions, which enables them to react to a certain antigen and destroy it (Field, 2001; Montagu, 1986).

Steve Suomi (1991, 1995) at the National Institute of Child Health and Human Development and others (Coe, Lubach, Ershler, & Klopp, 1989) have conducted a number of immune studies with monkeys testing the relationship between physical contact and the body's ability to respond to an immunologic challenge (i.e. a tetanus shot). Their results indicate that contact deprivation in newborns and early weaning resulted in a chronic stress condition and a suppressed immune system.

Touch may influence the immune system by counteracting the stress response by lowering arousal levels and their accompanying stress hormones. For example, social grooming among pigtail monkeys is associated with a decrease in heart rate and stress hormones and their immune system's function improves (Suomi, 1995). Field (2001) reports that the immune system also improves in humans who receive deep-pressure touch.

A compromised immune system can also result from sleep disturbances. As discussed earlier, sleep disturbances can be caused by touch deprivation. Reite and Capitanio (1985) and his colleagues at the University of Colorado Medical Center found that after a two-week separation from their mothers, infant bonnet monkeys experienced both sleep disturbance and a suppressed immune system. But after they were returned to their mothers their immune system returned to normal. The separated monkeys also showed depressed behavior, huddling in corners along with changes in body temperature,

heart rate, brain waves and sleep patterns. Some of these symptoms continued even after they were returned to their mothers (Reite & Capitanio, 1985).

Field (2001) reports that in her studies of touch deprivation among preschool children who were separated from their mothers, she and her colleagues noted a higher incidence of illnesses like upper respiratory infections, constipation, and diarrhea. In another research study on 10-week old infants, when mothers were instructed to massage their infant's backs, and give them extra tactile stimulation, Field (2001) and her investigators found that the infants experienced fewer upper respiratory infections and diarrhea. The effect lasted for approximately 4 months later.

Touch deprivation also delays growth. The effects of the emotional environment on growth in childhood have been recognized for many years. In the absence of malnutrition, children reared in emotionally unsatisfactory home environments may show growth retardation, which can be corrected by transferring them to a different environment. Early descriptions focused on the effects of separation from parents following the admission to hospitals or institutions (Rayner & Rudd, 1973).

Powell, Brasel, Rati, and Blizzard (1967b) at John Hopkins University Medical School initially labeled growth deprivation as "psychosocial dwarfism". In their report, they noted growth deprivation, endocrine effects, speech and behavioral problems. Today this condition is called "failure to thrive syndrome." Children with failure-to-thrive syndrome have decreased growth hormone, but after only one day recuperating in the hospital, their growth hormone response is able to recover. Given what is known today about children who fail-to-thrive, and that depleted growth hormone may be a factor in

delayed bone growth, this data is still not as clear as it is in animal models, where touch deprivation in rat pups is directly related to growth deprivation.

In 1951 Dr. Widdowson of Cambridge University first reported the differences between good and bad orphanages (Older, 1982). Children raised in orphanages run by caring caregivers thrived, but in those environments where caring and nurturing was not emphasized, the children did not do very well. Although some reforms were made during and after WWII, throughout the 19th and 20th centuries, children raised in orphanages had less than a 50-50 chance of reaching puberty. In the early 1900s, a German foundling home had a mortality rate of over 70% for infants. During the same time, American orphanages had infant death rates around 32–75%. In Baltimore, institutions were estimated to have at least a 90% mortality rate. Even worse was New York's Randall Island Hospital were the mortality rate among infants in the early 1900s was close to 100% (Older, 1982).

Summary of Mary Carlson's Work in Romanian Orphanages

Numerous investigators have described the serious nature of developmental problems of children raised in orphanages, hospitals and other institutions. Most of the research among non-human primates illustrates the deleterious effects of touch deprivation. According to Carlson and Earls (1997), research in the early 1990's indicated the importance of sensory stimulation in the early development of the brain's sensory, motor and memory processing areas, as well as the neural and hormonal systems that regulate an individual's stress. Infant monkeys deprived of their mother's touch develop autistic like behaviors. When infant rat pups groomed by mothers are compared to their non-handled peers, they secrete less stress hormone when restrained and show

less loss of cells in the hippocampal cortex that is associated with memory (Carlson & Earls, 1997; Carlson, 1998).

Cortisol, a glucocorticoid, secreted by the adrenal glands, which sits above each kidney, is elevated in the blood stream during stress. When a person is exposed to a stressful situation, the sympathetic nervous system is activated with a response known as "fight or flight". During this response, there are increases in cortisol, arterial blood pressure, blood flow to muscles, the metabolic rate, blood glucose concentration, mental activity and alertness. Cortisol also acts by inhibiting the body's inflammatory response to irritants or trauma; suppressing the immune response; vasoconstricting or vasodilating blood vessels; inhibiting bone formation; and producing alertness, with its effects on the limbic system in the CNS (Costanzo, 1998; Thomas & Venes, 2001).

Carlson (1998) measured the blood levels of cortisol (a stress hormone) by sampling saliva in the Romania children they investigated. Cortisol has a diurnal (happening in the day time) pattern. Normally blood levels of cortisol peak during the time just before we awake in the morning, levels off to an un-measurable level during the day and night time but rises again in the early morning before we awake. When blood levels of cortisol rise during conditions of extreme stress, the system is inhibited and further production of cortisol is reduced or stopped. Touch is critical in establishing this system and maintaining the body's equilibrium.

In Carlson's studies (Carlson, 1998; Carlson & Earls, 1997), the Romanian children were divided into 3 groups: the control group of 30 children was raised in standard conditions of the orphanage; another 28 children were assigned to the enriched institutional group; and the third group was children raised by their families. The control

group of children, raised with the standard institutional conditions, had one caregiver for every 20 children. They were frequently changed from one room to another, from one caregiver to another, and from one group to another group. This group received adequate custodial care, and medical care, but they were not referred to by name. The children in the intervention or enriched group were called by name and remained in stable groupings with the same caregiver. These caregivers had only 4 children to care for and they received training in child education techniques.

Carlson and Earls (1997) found that by the average age of 6–9 months of age, the intervention group grew more physically and progressed more in motor and mental skills than the control group. When the cortisol levels of the two institutional groups were compared to the family-reared children, it was discovered that the two institutional groups had abnormally suppressed cortisol levels in the morning.

When the children's cortisol levels at each time of day were correlated with their behavioral development, it was found that those with the highest morning levels showed the best performance on motor and mental tests. Later in the day, when the cortisol levels should be very low or not detectable, the most deprived children (the control group) showed significantly more elevated cortisol levels at noon compared to the intervention group. High cortisol levels at noon and in the evening in both the institutional groups were associated with poor mental and motor performance. Cortisol levels among the family-reared children (as measured by their parents at home on weekends) were similar to those of typical American children (Carlson & Earls, 1997).

The investigator's most surprising finding came from measuring the cortisol levels of family-reared children while they were in the bleak, highly structured

environment of the state run daycare. They again found abnormally high cortisol levels similar to the levels found in the orphanages. The high daytime levels also correlated with low behavioral scores. Studies of children who experience natural disasters and adults with post-traumatic stress disorder also offer compelling evidence that there is a relationship between abnormal cortisol secretion, hippocampal shrinkage, and related memory deficits (Carlson, 1998).

According to Field (2001), in 1945 an investigator named Spitz compared two children's orphanages—a prison nursery for convicted women and infants in a foundling home. Both provided adequate nutrition, clothing and good medical services. Although the foundling home was cleaner and better staffed, the children there fared worse. They had a higher mortality rate and experienced motor and mental retardation at rates higher than the children at the prison nursery. The children at the prison nursery had the women convicts as substitute mothers and their motor and cognitive development surpassed those of the foundling home children.

Several investigators have attributed allergies such as asthma and dermatitis to touch deprivation. Both chronic illnesses are considered psychosomatic (psychological factors affecting physical conditions) or autoimmune disorders. In auto- immune disorders the body attacks and destroys normal cells in the body. The severity of these disorders has been correlated with depression, stress, and anxiety, which in turn cause negative effects on the immune system (Schachner, Field, Hernandez-Reif, Duarte, & Krasnegor, 1998).

Montagu (1986) has anecdotal evidence that traces asthma to touch deprivation. He describes a case of twin sisters who had frequent asthmatic attacks. They lost their

mother at birth and as a result had experienced very minimal touch stimulation. Dr. Montagu prescribed massage therapy for one of the twins he happened to visit. This twin's asthma attacks stopped after receiving massage therapy. The other twin's asthma attacks improved after her marriage, but when she divorced, she eventually died of an asthmatic attack.

In an earlier study, Rosenthal (1952) reported that the majority of a group of children with eczema had mothers who failed to touch them sufficiently. Although the reason is unclear, this immune problem may be related to the fact that the thymus and skin needs stimulation in order to produce immune cells. Parents are often advised to apply medication (as in a massage) to provide additional tactile stimulation. Jules Older (1982) indicated in his book "Touching is Healing" that "he believes that a study comparing self-applied medications for skin conditions like psoriasis would show that having someone else apply the medication would be far more effective" (p.176).

Massage has been shown to reduce cortisol levels in the bloodstream (Field, 2000). The Touch Research Institute (TRI) has conducted several studies using massage therapy with children who have asthma (Field, et al., 1998) and atopic dermatitis (Schachner, Field, Hernandez-Reif, Duarte, & Krasnegor, 1998). After receiving massage therapy from their parents for a month, the children with asthma had fewer asthma attacks and showed improved pulmonary function and the children with atopic dermatitis had less eczema.

In the Field et al. study (1998) on asthma, 32 children with asthma (16 4–8 year olds and 16 9–14 year olds) were randomly assigned to receive either massage therapy or relaxation therapy. The children's parents were taught to provide one therapy or the other

for 20 minutes before bedtime each night for 30 days. In the progressive relaxation therapy comparison group the parent instructed the child to tense and relax major muscle groups. In the massage therapy group, the massage involved stroking and kneading motions to three regions: (a) face/head/neck/shoulders, (b) arms/hands, and (c) legs/feet/back.

Younger children who received massage therapy showed an immediate decrease in behavioral anxiety and cortisol levels after massage. Also, their attitude toward asthma and their peak airflow and other pulmonary functions improved over the course of the study. The older children who received massage therapy reported lower anxiety after the massage. Their attitude toward asthma also improved over the course of the study, but only one measure of pulmonary function (forced expiratory flow 25% to 75%) improved. The reason for the smaller therapeutic benefit in the older children is unknown. However, it appears that daily massage improves airway caliber and control of asthma. Massage therapy was evaluated in this study because it has effectively lowered anxiety and cortisol levels in children with other problems. Also, massage requires less involvement from the children and more activity from the parents who provided the therapy. Parents of children with asthma versus parents of children who do not have asthma experience higher anxiety levels, which are detrimental to the child's health. By giving the parents an active, coping-promoting role in their child's care, it helps to reduce their own anxiety (Field, 2000, 2001; Field et al., 1998).

Cardiovascular disease is often made worse by a lack of contact with other people, whereas those who have more contact with others seem to be protected from the disease. Older (1982) suggests that heart disease prevention focuses on smoking,

exercise, and cholesterol, but little has been made concerning human contact, even though several studies suggest the value of touch/massage for treating the disease. The famous Framington study and another study by Carter and Glick (1970) showed that married couples live longer lives, whereas single and widowed people have shortened lives. Older claims that for every major cause of death— heart disease, homicide, stroke, cirrhosis of the liver, automobile accidents—divorced men stand a 2–6 time greater chance of dying than married men. Of course single, divorced or widowed men may differ in their diet, exercise, and amount of verbal interaction, but the regular physical contact with another human is just as critical. Research like the following study (Lewis et al., 1997) is important because touch/massage reduces stress hormones, increase circulation and stimulates the immune system.

Lewis et al. (1997) examined the effect of turning and backrub on mixed venous oxygen saturation in critically ill, surgical, ICU patients. A repeated measures design was used to study the effect of a change in body position (left or right side) and timing of a backrub (immediate or delayed) in 57 critically ill men. Mixed venous oxygen saturation was recorded at 1-minute intervals for 5 minutes in each of three periods: baseline, after turning, and after backrub. Subjects were randomly assigned to body position and timing of backrub. Subjects in the immediate backrub group were turned and given a 1-minute backrub. Mixed venous oxygen saturation was measured at 1- minute intervals for 5 minutes at two points: after the backrub and when the patient was lying on his side. For the subjects in the delayed backrub group, saturation was measured at 1-minute intervals for 5 minutes at two different points: after the subject was turned on his side and after the backrub.

The results indicated that both position and timing of backrub had significant effects on mixed venous oxygen saturation across conditions over time. Subjects positioned on their left side had a significantly greater decrease in oxygen saturation when the backrub was started. At the end of the backrub, oxygen saturation was significantly lower in subjects lying on their left side than in subjects lying on their right side. The pattern of change differed according to the timing of the backrub. The return to baseline levels of oxygen saturation after intervention differed according to body position.

Therefore, Lewis et al. (1997) concluded that two consecutive interventions (change in body position and a backrub) cause a greater increase in venous oxygen saturation than the two interventions separated by a 5-minute equilibration period. Also, turning to the left side decreases oxygen saturation more than turning to the right side. Oxygen saturation returns to clinically acceptable ranges within 5 minutes of an intervention. It is recommended that the standard practice of turning the acutely stressed, cardiovascular patient and immediately giving a backrub is best practice. Here again, the timing of the backrub is just as important as turning the patient.

Tronick and Morelli Cross-Cultural Studies in Zaire and Mother-Infant Interactions

How do other cultures experience touch/massage in handling their young? This paper has explored the American experience and our reticence to touch. Descriptive studies of other cultures, informs us about alternative ways of touching, massaging and relating to the young.

Dr. Edward Tronick (1995) and his colleague Gilda Morelli, at Harvard Medical School have focused on the role of touch in the interactions of infants and young children

and their caretakers. In Zaire, they did cross-cultural studies on touch among the Efe, a community of people who live as foragers in the Ituri Forest. In other studies among American families in Boston, he and his colleagues used touch to reduce the stress infants' feel in strange situations. One of their hypotheses is that touch regulates both infant state and infant stress. The other area of focus in his research is the "idea that touch communicates specific messages." For example, gently holding and cuddling an infant might communicate safety, whereas pinching or poking may communicate, "You are being physically threatened" (p. 53).

Touch among the Efe. Tronick and his colleagues studied the development and caretaking practices of the Efe community for 10 years in the Ituri Forest of Zaire. Why study other cultures? Tronick believed that comparative studies are critical to our understanding of the role of touch. For example, the Kung infants in a tribe of foragers in the Kalahari Desert were in bodily contact with someone approximately 75% of the time during the first 3–6 months of life and this level of contact did not start to drop off until about 9 months of age. In the U.S. sample, the rate of bodily contact with infants at this age was 30% and quickly dropped off to below 25% by 9 months of age. Without knowledge of the Kung's level of bodily contact, our knowledge of the range and variety of touch among other people would be limited (Tronick, 1995).

The Efe are a people of short stature who forage the forest in which they live to survive. They also hunt with a bow and metal tipped arrow. They live in transient camps formed by clearing a section of the forest and building leaf huts. Camp membership ranges from 7–21 people composed of one or several extended families. The huts are used for sleeping, storing food and protection from inclement weather. Most of the day-

to-day activities take place outside the huts in communal space where other people are physically present, visible and available to young children and infants for social and physical contact. A young child will spend 80–95% of their day time hours in this community space where there are men, women, and other children who are not members of their nuclear family (Tronick, 1995).

Tronick (1995) and his colleagues used a behavioral coding scale to describe the patterns of social contact and touch in this community. The percentage of time the Efe infant was in physical contact or face-to-face contact with another individual was 97% of the time between infancy and 3 years of age. This percentage also holds true for evenings and nighttime care taking as well, because infants sleep with their parents. Mothers spent about 50% of the infant's time in social contact the first year of life. This rate drops off to less than 3% by the time the infant is 3 years of age. Fathers have a low level of contact during daytime hours because they are out of camp most of the day. "Others" (a category that includes both adults and children) interact with the Efe infants 50% of the time in social contact. Others maintained their level of physical contact over the first, second and third year of the infant's life, whereas the mother's rate declined over the three years. This social contact can be in the form of affectionate physical touch, grooming or just talking face to face with the infant.

In summary, Tronick (1995) found that among the Efe tribe high levels of physical as well as social contact was present. This touch was multifaceted with different people touching across the infant's early childhood development. The infant's experience of touch from different people becomes one of the ways children identify different individuals. For example, mother may touch in a different way than father. According to

Tronick (1995) there is a tendency to label studies that involve simple, non-technical societies as just a part of human evolutionary past emphasizing the behavior as the force of natural selection. Tronick disagrees, stating that "...the Efe lifestyle is no more or less genetically based than the lifestyles of other peoples. The Efe behaviors are environmentally determined and influenced by the same amount of human evolutionary history as other communities and cultures" (Tronick, 1995, p. 59).

The touching among the Efe fits their particular set of physical and social opportunities and disadvantages. The touch facilitates the infant's achievement of thermal regulation and growth promotion in a socio-cultural context that emphasizes the infant's interdependent role in that community. However, their touching behavior is not necessarily a model for other societies. Other societies face different social and physical environmental demands and constraints. If there were extended family living together or relatives living in close geographic areas in any society, the children would benefit from more handling and touching, especially when the primary care givers are unavailable to provide this nurturing touch.

Touch during face-to-face interactions. This portion of Tronick's research speaks volumes about what depressed mothers can do to enhance the social-emotion development of their babies by just touching them in a soothing and playful way. In contrast to Tronick's (1995) study of the Efe tribe in Zaire, he and other colleagues have done laboratory studies of face-to-face interactions between mothers and infants in Boston. His focus has been to determine how much and what kind of touching is taking place in the context of playful but structured interactions. Other investigators have studied similar interactions (Field, 1984; Kaye & Fogel, 1980) and reported that mothers

touch their infants during brief social interchanges about 61% of the time. Tronick and his colleague Katherine Weinberg generated data in a study that showed the total amount of time mothers touched their 6-month-old infants in face-to-face interactions. He also measured the amount of time spent touching in a particular way. The types of touch measured were: stroking, rhythmic touching, holding, tickling, kissing, and poking/pinching. What he found was that the largest percentage of time was spent in stoking, rhythmic touching and holding their infants. Tickling and kissing were behaviors that took up a smaller percentage of time. All of these behaviors were emotionally positive for the infants. Poking and pinching are negative behaviors and they occurred rarely in these interactions.

In a follow up study, Tronick (1995) wanted to understand the independent roles of touch, vision and voice in mother-infant interactions. Tronick' study had 5 conditions: (a) a normal play condition (the mother talks, touches and vocalizes to her infant); three experimental conditions: (b) the infant only sees the mother; (c) the infant only hears the mother; and (d) the infant can only feel the mother's touch; and (e) an '*alone condition*' in which the infant is by him or herself. The results of this study indicated that in the touch only condition, the infants reacted in an affectively and behaviorally subdued manner. Subdued means there was a low level of fussing and crying, a low level of scanning (these behaviors indicate stress), a high level of attention to objects, and fewer smiles than in the normal and face-to-face interactions.

These findings are supported by other studies that used Tronick's Face-to-Face Still Face Paradigm (Tronick, 1995). Stack and Muir (1992) investigating the role of touch in modulating infant stress, used three episodes in the Face-to-Face Still Face

Paradigm: (a) a normal face-to-face play episode during which the mother is instructed to talk, touch, smile or play with her infant;(b) a still face episode during which the mother was instructed to hold a poker face and to be non-responsive to the infant (i.e. not to touch, talk or smile at the infant); and (c) a reunion episode during which the mother resumed a normal face-to- face play situation. Each episode lasted 2 minutes and was separated by a 15 second interval in which the mother was instructed to turn her back to the infant. Numerous investigators including Stack and Muir have found the Still Face episode to be very stressful for the infants. Infants express more anger and sadness in the Still Face episode than during the first, normal play episode. It was also found that the infants expressed a high level of negative emotion during the reunion episode (Tronick, 1995).

Stack and Muir (1992) also found that allowing the mother to touch her infant could reduce the stress of the Still Face. When mothers were instructed to touch their infants during the Still-Face, infants maintained levels of smiling and attention to the environment similar to the levels seen during the normal play episodes. Infants did less grimacing, fussing and crying during the Still Face with touch than the Still Face without touch.

Consequently, Tronick (1995) and his colleagues have hypothesized that positive touching (not poking or jabbing) has a calming effect on the infant and touch appears to serve as an external regulator of the affective and behavioral organization of the infant. In other studies where depressed mothers have poked and jabbed their infants, this behavior was associated with the infant's negative affect and gaze aversion. Later in development, touch may continue to facilitate the infant coping with stressful events and times of high

arousal levels. Touch along with other forms of affective expressions and communications are critical components of the mutual regulation that takes place within the mother - child dyad. This relationship is an important part of how the child comes to know and experience others. The over all message is that depressed mothers who are not very stimulating to their infants (Still-Face similarities) or very busy mothers like the Efe, can compensate for their infant's stress by providing extra touch themselves or through other caregivers. Given all we know about the importance of touch, are there ever situations in which people do not like touching? The following section explores this phenomenon.

Aversion to Touch

Some children seem to be born with an aversion to touch that can result in touch deprivation by their own doing. Some of these aversions could result from a genetic predisposition. Others appear to be learned, conditioned responses. Schneider (1996) reports that skin-to-skin contact from parents or caregivers may not be the "massage touch" of first choice for medically fragile, premature infants. Direct touch may be disruptive and unbearable to the sensitivity of that infant. When very premature babies (less than 37 weeks gestation or 5.5 pounds or less) get excited and respond to any sensory or tactile stimulation, it can overtax their autonomic nervous system, cause fatigue and eventually bradycardia or apnea (Gorski et al., 1984). Field (1990) also reports that light touching or stroking has been found to be aversive to babies and in studies where it has been used the babies did not have a significant weight gain. Also many pre-term babies who receive invasive procedures, primarily in the chest and abdomen region, develop extremely averse reactions to being touched in that region.

When studies were conducted on them, they would not let anyone massage those areas (Field, 2001).

Tactile defensiveness is one form of a sensory modulation disorder (Bundy, Lane & Murray, 2002). Treated as sensory integrative dysfunction, Ayres (1979) defines it as the tendency to react negatively and emotionally to touch sensations that most people find non-threatening. Symptoms may vary but usually involve a defensive reaction of avoidance-withdrawal (e.g. rubbing and scratching, and avoidance of a certain texture). These behaviors have been documented in children with developmental problems (Ayres, 1985; Larson, 1982). However, more tactile stimulation is needed in order to inhibit the child's hypersensitivity to touch. Ayres also reports that a lack of adequate tactile stimulation increases tactile defensiveness and when a person is not able to integrate the sensations they have received a defensive reaction also develops.

Children with autism are thought to be innately averse to touch. Even though most people described these children as being resistant to hugs and cuddling, research by Field, Lasko, Mundy, Henteleff, Talpins, and Dowling (1996) found that children with autism respond to touch with pressure and enjoy being massaged. In a study of 22 preschool children with autism, each child was randomly assigned to either a touch therapy group or a touch control group. The touch therapy group received massage therapy 15 minutes per day, 2 days a week for a period of 4 weeks (8 sessions). A student volunteer rubbed the children's head, neck, arms, hands, legs and feet with smooth stroking movements using moderate pressure. The touch control group had a volunteer student who sat with a child on her lap with her arms around the child while she engaged the child in a table game, which involved selecting different color/shape/form toys. The control group

session was also held for 15 minutes per day, 2 days per week, for 4 weeks. Both groups received pre and posttest developmental assessments including observations of classroom behavior (touch aversion, off task behavior, orienting to irrelevant sounds, and stereotypic behaviors). Results indicated that touch aversion decreased in both groups, but on the other measures (off task behavior, orienting to irrelevant sounds, and stereotypic behaviors), the behaviors decreased significantly more in the touch therapy group (Field et al., 1997). The following section will explain massage theory, techniques and benefits with a focus on infant massage.

Massage Theory and Techniques

Theory and Indications for Use

Kuhn (1999) defines massage as a systematic and scientific manipulation of the soft tissues of the body. Techniques include gliding, stroking, percussion, shaking, compressing, friction, kneading and vibration. Every language has a word for massage. Although the origin of the word “massage” is unclear, in Arabic, mash means to press softly. In Greek, ‘massein’ means to knead and in French, ‘masser’ means to shampoo (Kuhn, 1999).

Fritz (2000) describes massage as unique because it can serve many functions. Fundamentally, massage is as basic as shared touch between those in an intimate or family environment. Basic massage skills can be used to enhance nonverbal communication in order to convey caring through a safe and appropriate touch structure. When a trained professional applies massage in a deliberate manner it is used to

accomplish a desired outcome as previously agreed upon by the client and therapist. Professional massage has many therapeutic goals.

Professional massage affects the body in different ways. It adds value and comfort to a person's life. Massage can provide a one-hour vacation from daily life by surrounding the body with pleasurable sensory input and shifting the receiver's focus from everyday concerns. In a professional relationship, massage can provide the benefits of human touch in a therapeutic environment that respects the boundaries of the client. Massage can be the key part of a stress management program in a wellness setting or in a mental health setting for those with anxiety or depression (Fritz, 2000).

After the appropriate training, massage can be used in a specific rehabilitative program as part of a treatment that supports the skills of a medical or osteopathic doctor or other rehabilitative professional (i.e. physical therapy, chiropractor, nurse or occupational therapist). Massage can ease pain and discomfort, and help in the management of chronic physical conditions. Often added to athletic training programs or exercise protocols, massage can support anyone including the factory or office worker or musician with repetitive motion strain and injuries (Fritz, 2000).

Infant massage can be used as a teaching tool to enhance bonding between parent and child. Massage and appropriate touching provides the infant with an organized system of sensory stimulation that not only soothes the infant but also facilitates the development of the infant's nervous system. Massage feels good. Massage has many benefits. It improves blood flow to muscles, removes waste products from cells, provides deep cell cleansing, enhances the flow of lymph for drainage (especially after a

mastectomy), reduces stress and enhances body/mind connection, among many other benefits (Fritz, 2000; Kuhn, 1999).

Massage touches lonely and isolated individuals and gives them a human connection. Excessive stress or disease causes disorder in natural body rhythms (i.e. heart rate, breathing patterns, and sleep-wake cycle). Research has shown that massage reduces the level of stress hormones, which allows for homeostasis in the body. This balanced physical state encourages effective sleep and restorative processes. Massage and touch is beneficial in almost all life circumstances, whether it is between therapist and client, parent and child, friend and friend, owners and pets or couples. It is shared touch because no one can touch without being touched in return (Fritz, 2000). Referrals for therapeutic massage may include several general conditions across diagnostic categories. This list includes: pain that can be local, sharp, dull, achy, deep surface; unexplained or long-lasting fatigue; inflammation; lumps and tissue changes; rashes and changes in the skin; edema; mood alterations (i.e. depression, anxiety); infection (local or general); changes in habits, such as in appetite, elimination, or sleep; bleeding and bruising; nausea, vomiting, or diarrhea; and temperature that is either hot or cold (Fritz, 2000).

Overview of Manual Techniques

Kuhn (1999) states there are more than 80 different types of massage therapy and bodywork. Bodywork is a general term that includes massage and any other type of musculoskeletal manipulation, such as stretching, postural alignment, and breathing exercises. Most of the techniques are variations of five broad categories of *Traditional European Massage*. Based on the knowledge of anatomy and physiology these techniques are designed to manipulate soft tissues. They are as follows: e*ffleurage*:

gliding strokes toward the heart; p*etrissage*: strokes that lift, roll, or knead tissue; *friction:* circular strokes; *vibration*: a machine is used instead of human touch; and *tapotement*: percussion or tapping, slapping and pounding (Kuhn, 1999).

Swedish Massage, a variation of *Traditional European Massage*, uses all of the above strokes to enhance circulation of blood through the soft tissues. Oil or talcum powder may be used to facilitate these movements. *Contemporary Western Massage* therapy uses a variety of techniques to enhance personal growth, emotional release, and to balance the mind-body spirit. Most of these techniques have developed since 1960. There are five types of *Contemporary Western Massage.* They are *Esalen*, *Neuromuscular Therapy, Deep Tissue Massage, Sports Massage* and *Manual Lymphatic Drainage.*

Esalen creates a deep state of relaxation and well being by using slow, rhythmic, hypnotic techniques. It focuses on mind/body relationship. *Neuromuscular Therapy* involves soft tissue manipulation to reduce pain and dysfunction by balancing the nervous and musculoskeletal systems. *Deep Tissue Massage* releases chronic patterns of muscular tension by using the fingers, thumbs, and elbows and producing movement across the grain of muscles with deeper pressure than in Swedish massage. *Sports Massage* uses both massage and stretching to enhance athletic performance by releasing lactic acid and increasing range of motion. It also promotes healing from injury. Three major strokes are utilized: compression, trigger point or direct pressure, and cross fiber friction. *Manual Lymphatic Drainage* involves light, slow, repetitive strokes to boost circulation of lymphatic system. It also facilitates removal of excess water, wastes, and toxins (Field, 2001; Fritz, 2000; Kuhn, 1999).

Contraindications for Massage/Touch

Is there any time or circumstance when touch is not therapeutic or its therapeutic value is questioned? In the research of the literature, very few articles or research studies were found in which massage therapy failed. Kuhn (1986) and Field (2000) reports that there is a media bias in publishing studies with a negative result from a touch/ massage intervention. However, among the studies that are published, investigators have discovered certain touch/massage methods that work and others that do not benefit the recipient. The health status of the recipient, the techniques of the person massaging, the age of the infant, and the nature of the touching (or lack of) can be important variables for successful intervention.

Fritz (2000) suggests that in general, vigorous massage should be avoided if the subject is ill in any way. Gentle massage may be soothing and beneficial. Massage should be avoided over a recent injury that is in the active healing process. Massage around this area however, may promote healing. Endangerment sites are areas where nerves and blood vessels are close to the skin and are not well protected by soft tissue (i.e. front of neck/throat, armpits, front of elbow, groin, back of knee, and area around the umbilicus). Deep sustained pressure to these areas may cause damage to nerves and vessels. Because the kidneys are located in the mid-back, in loosely suspended fat and connective tissue, they are considered an endangerment site as well. Light pressure should be used in these areas or they should be avoided all together.

Kuhn (1999) also reports that massage may also increase pain and discomfort in persons with arthritis so care should be taken. Field (2001) suggests that the only contraindications are for bursitis (inflammation of the joint), cellulitis (inflammation of

the legs) and severe varicose veins. A person to be massaged should inform the therapist about their physical or medical conditions before the massage care plan is developed. Also, a professionally trained massage therapist should have a list of medicines and herbs that a person is taking. Drugs like coumadin (blood thinners associated with slow clotting) may change the type of massage technique used. Tissue injuries may occur and cause internal bleeding.

Infant Massage Techniques

According to Field (2001), infant massage techniques used in the United States is based on the work of two massage therapists who trained in India. As mentioned earlier, they are Vimala Schneider McClure and Amelia Auckett. Both women have published books on infant massage (Auckett, 1982; McClure, 1989). Leboyer (1976) and Heinl (1983) have also published books on infant massage based on their experiences in India. Heinl's teaching and work has been mostly in England and West Germany. Leboyer's seminal work as a physician challenged western society's notions about birthing and he authored several books, among them *Birthing Without Violence* and *Loving Hands: The Traditional Art of Baby Massage.* In *Birthing Without Violence,* Leboyer (1975) tried to describe birth through the eyes of the infant. As a result of what he learned, he changed the way he delivered babies. Leboyer dimmed the lights, lowered the noise levels, and massaged and bathed the newborn in warm water. Infant massage pictures and techniques from these authors are included in the appendices. For the purposes of this writing, the basic techniques as used in India will be described. This discussion will be followed by the infant massage techniques used in the research protocols of Field (2000; 2001) and her colleagues at the Touch Research Institute.

Field (2001) describes the Indian infant massage as beginning within the first days of life and is practiced as a daily routine. The mother sits on the floor and the infant is laid on his or her stomach on the mother's outstretched legs, and each body part is individually stretched. Warm water and soap is applied to the arms, legs, and back and then as the infant is turned over, the abdomen, neck and face. After the infants receive this massage, they are swaddled and sleep for prolonged periods of time. Leboyer (1976) reports that Indian mothers use a coconut, olive, or almond oil that is rubbed and warmed in the palm of their hands before applying it to the infant's skin during the massage. The children are never massaged on a full stomach and after the massage the infant is bathed. In the first month of life the infant is massaged very gently and some pressure is applied only after the first month of life. Infants are massaged for 10–20 minutes once or twice daily until they are 3–6 months of age.

When giving massage therapy in research studies on premature infants, Field and colleagues (2001) massaged the infants for ten days at 45 minutes a day broken into 3-fifteen minute periods. The infants were given Swedish type massage, which involves deep pressure in order to stimulate both tactile and deep pressure receptors. The massage sessions were divided into 3 phases. For the first and last phases, the newborns were placed on their stomachs and gently stroked for 5 one-minute periods (12 strokes for approximately 5 seconds per stroking motion) over each of the following regions and in the following sequence: (1) from the top of the head to the neck; (2) from the neck across the shoulders; (3) from the upper back to the waist; (4) from the thigh to the foot to the thigh on both legs, and (5) from the shoulder to the hand to the shoulder on both arms. During the middle phase, the infants were placed on their backs and their arms and legs

were moved back and forth in bicycling motions (Field, 2001). The massage procedure for infants 3–24 months of age is more complex. Older infants like more variety, so a varied amount of techniques are used.

Touch During Pregnancy, Labor and Delivery

The most developed of our senses, the tactile and vestibular senses, are used in the womb as the fetus moves about. The tactile sense is the first to function, with the somatosensory cortex being the most developed at birth. At as early as 3 months gestation, the fetus will move its face towards a tactile stimulus (such as a hair). Shortly after birth, the newborn can discriminate the touch of brush hairs of various diameters, and respond to electrical stimuli and puffs of hair that are barely discernible by an adult (Field, 1990).

Touch in early development starts during pregnancy, labor, and delivery. Pregnant women will often massage their abdomens with oil to prevent stretch marks after birth. Midwives also encourage women to massage the areas around the opening of the vagina since this area is often torn during delivery because of stretching at birth. Natural childbirth classes teach a woman's partner to massage her during labor to help circulation, contraction of the uterus, and removal of the placenta. It is also important to remember that a fetus gets continuous massaging in utero for the nine months of pregnancy from the mother's body movements inside and outside, and especially from the amniotic fluid. Most mothers naturally massage their babies when they playfully push back in response to a poking movement from the fetus. This playful give and take begins

the formation of a mother infant relationship. The infant feels this movement and becomes accustomed to their mother's hands and caressing motions.

Touch alters oxytocin (an estrogen dependent hormone produced by the pituitary gland) levels in the mother's bloodstream. According to Field (2001) and Taber's Cyclopedic Medical Dictionary (Thomas & Venes, 1997), oxytocin relaxes the individual, promotes touching, encourages bonding, triggers milk production during breast feeding, and sets off uterine contractions that accompany childbirth.

Touch is critical for the infant's bonding. During the newborn period, most of an infant's affections are tactile. The infant affectionately pats the mother's breast while nursing and months later pats the mother's face and shares kisses. This period around birth is considered the most important for bonding between parent and child. Bonding may actually occur before birth now that parents can view their unborn child on ultrasound pictures and listen to their heartbeat. This encourages some parents to read to their babies on a regular basis and stimulate them with vibrators before birth (Field, 2001).

Infant massage, a wellness program for infants is a common child-care practice in many parts of the world, especially in Africa and Asia (e.g. Nigeria, Uganda, India, Bali, Fiji, New Guinea, New Zealand, Venezuela, and the Soviet Union). In most of these countries, the infant is given a massage with oil following the daily bath and prior to sleep time, for the first several months of life (Auckett, 1982; Field, 1995). Infant massage has only recently been discovered and researched in the western world and in the United States. The techniques used today are based on the teachings of Amelia Auckett and Vimala Schneider McClure, both who trained in India and published books

on infant massage in 1981 and 1989, respectively. Massage therapy schools are beginning to teach infant massage and infant massage therapists have founded a national organization of therapists who teach parents how to massage their infants (Field, 1995).

Although infant massage groups are located in most parts of the United States, more research is needed to validate its potential to offer real, substantial, therapeutic benefit to people of all ages in states of ill health and as an intervention for disease prevention and wellness. Nonetheless, the infant massage training groups around the United States have anecdotal reports that indicates that massage: (a) facilitates communication and the parent-infant attachment process, (b) reduces stress responses to painful procedures, (c) reduces the pain associated with teething and constipation, (d) reduces gas and colic discomfort, (e) helps induce sleep, (f) facilitates body awareness, and (g) makes parents "feel good " while massaging their infants (Field, 1995; Schneider, 1996).

TRI Research on Infant Massage

Dr. Tiffany Field and her colleagues at the Touch Research Institute (TRI) have engaged in over 50 experiments related to touch and human health. To date, Institute studies have shown that touch, especially massage, have beneficial effects on chronic fatigue syndrome, bulimia, cancer, diabetes, job stress and depression. Massage can help asthmatics to breathe easier, boost the immune system of HIV- positive patients, reduce anxiety, and depression in children and adults, and reduce apprehension in burn victims undergoing painful treatments. Field is cited as saying, "We're finding that it is something that is critical to life. It is something that we need like diet and exercise to

keep us healthy, alert, and productive. It is healing therapy that more people should be using" (Hicks, 1998, p.3).

Most of the data on the positive effects of infant massage come from studies on premature infants. Since the 1970's, a number of investigators have researched the effects of infant massage. These results have generally been positive. Some of these studies have been summarized in other sections of this chapter. (See maternal depression studies, touch deprivation and touch in early development). In a meta-analysis of 19 of these stimulation studies, Ottenbacher, Muller, Brandt, Heintzelman, Hojem, and Sharpe, (1987) estimated that 72% of infants receiving some form of tactile stimulation were positively affected. Most investigators reported greater weight gain and better performance on developmental tasks for premature infants receiving massage therapy.

In one of the studies used in this meta-analysis, Field, Schanberg, Scafidi, Bower, Vega-Lahr, Garcia, Nystrom, and Kuhn (1986). investigated 20 premature infants. These infants were given 45 minutes of massage every day. The massage was given in three 15-minute periods during the day for 10 consecutive days. The infants averaged 31 weeks of gestational age and 20 days of intensive care in the neonatal intensive care unit (NICU). When they had "graduated" from this unit they were enrolled in the study.

The 15-minute massage was divided into 3 five-minute phases. During the first and third phases, tactile stimulation was given. The infant was placed in a prone position (face down) and given moderate pressure stroking of the head and face region, neck and shoulders, back and legs, and arms for 1 minute each. The middle phase was kinesthetic. It involved flexing and extending of the infant's arms and legs while the infant was lying supine (or on his or her back). The study found that the massaged infants gained 47%

more weight than the control group (Both groups received the same amount of calories). The massaged infants were awake and active a greater percentage of the observation time than the control group, and showed better performance on the *Brazelton Neonatal Behavior Assessment Scale* (Brazelton, 1973) in habituation, orientation, motor activity, and regulation of state behavior. The massaged infants also averaged six days less in the hospital than the control group of infants (Field et al., 1986).

Given all we know about the benefits of massage with infants at risk for developmental problems, the next logical question would be: Does massage help normal infants? Anecdotal information from infant massage therapists (Auckett, 1982) has suggested that massage: reduces stress responses to painful procedures; reduces pain associated with teething, constipation and colic; helps induce sleep; makes parents (who are the massage therapists) feel good while they are massaging their infants; as well as facilitates bonding between parent and infant and the development of a positive relationship. Although research on infant massage is limited, it would be important to study full term infants born to depressed mothers. Several studies have documented less than positive affects in infants of depressed mothers and related growth delays. Would massaging these infants improve their affect and growth as it did with pre-term infants? Field and her colleagues (Field, 2000) at TRI took on this challenge and hypothesized that based on previous research, massaging full term infants with depressed mothers would help the infants by gaining more weight, having more organized sleep/wake behaviors; being less fussy and having a more positive affect; which in turn would cause a lowering of cortisol and higher norepinephrine levels.

The sample for this study comprised of 40 full term 1-3 month old infants born to depressed, adolescent mothers. The subjects were recruited at birth from the day care program at the TRI center. The infants were born full term (mean gestational age was 39.4 weeks), had normal birth weight (mean was 3483 grams) and a normal Apgar score (mean was 9.1). Their mothers were categorized as low socioeconomic status (SES) (mean score on the Hollingshead Index was 4.2.), single parents, adolescents (mean age 17.3 years); and primary caregivers on public assistance. African-Americans comprised 65% of the population and Hispanics comprised 35% of the population. The infants were randomly assigned to a massage therapy group or a control-rocking group (Field, 2000).

The mothers were classified as depressed because they were diagnosed as dysthymic on the Diagnostic Interview Schedule (DIS) (Costello, Edelbrock & Costello, 1985) and had Beck Depression Inventory (Beck, Ward, Mendelson, Mach, & Erbaugh, 1961) scores greater than 16 (mean for subjects 28.1). The initial diagnosis was made following the infant's delivery. When the mothers were retested at the beginning of the study and found not to be depressed, they were not recruited for the study (Field, 2000).

During the study the infants were cared for during the day by teachers at the TRI daycare. All the infants were bottle fed by the nursery workers except when their mothers were present. The teachers serving as observers recorded the presence or absence of the following behaviors while the mothers interacted with their infants: number of visits, and patterns of touching, holding and feeding the infant. The mothers and teachers were unaware of which therapy a child was receiving (massage or rocking), or the intent of the study (Field, 2000).

As part of the procedures the 20 massage therapy infants were provided a 15-minute massage midway between morning feedings 2 days a week for a 6-week period. A investigator trained in the procedure gave the massage therapy. Placing the infant supine on a mat in a quiet area of the nursery and using a small amount of mineral oil on the palm of her warm hands the following procedures were used with each infant.

The 20 infants in the rocking control group were scheduled to receive rocking sessions at the same time of day as the massage group (15 minutes a day on 2 days a week over 6 weeks). During this control condition the infant was held in a cradled position by the investigator and rocked in a rocking chair. This control condition was implemented to ensure that any changes noted in behavior/physiology were not related to changes in activity or to the presence/attention provided by the investigator. Parents to reduce fussiness and induce sleep often use rocking. Massage therapy has similar benefits (Field, 2000).

Immediate effects were measured as well as longer-term measures for each infant in the study. Immediate measures included sleep/wake behaviors and salivary cortisol on the first and last days of the study period (day 1 and day 12). To take sleep/wake measures, the investigators observed the infants' predominant state and various other behaviors during, and for 15 minutes after, the massage or rocking sessions on day 1 and day 12. Salivary samples (used to measure cortisol levels which is a stress indicator) were taken from the infants immediately before and 20 minutes after the massage or rocking sessions on days 1 and 12 of the study (Field, 2000).

Longer term measures included daily weight and formula intake data; temperament ratings (Colorado Child Temperament Inventory), and urine analyses taken

on the first and last day of the study. The nursery workers measured the infant's weight daily before their morning feeding. The nursery workers measured the amount of daytime formula intake and the mothers measured the nighttime formula intake on a daily basis during the study. On the first and last days of the study, the nursery teachers were trained to complete the Colorado Child Temperament Inventory on each infant. Urine samples were collected in the morning on the first and last day of the study (Field, 2000).

The results of this study revealed that the massage therapy infants were recorded as spending more inactive alert and active awake states (including more movements) and less time in drowsy, quiet sleep states. In addition, crying and cortisol levels decreased among the massage therapy infants. Among the rocking group infants the crying and cortisol levels remained the same throughout the study. The rocked infants also spent less time in an active, awake state during rocking but were awake after the rocking sessions. These results suggest that massage may be more effective in inducing sleep than rocking. Other long-term outcomes for the massage therapy group for the duration of the study included: "weight gain with no increase in formula intake; an improvement on temperament dimensions including emotionality, sociability, and soothability; as well as decreases in both urinary catecholamine and cortisol levels and increased serotonin levels" (Field, 2000, p. 30). The rocking group infants did not change on any of these measures.

Some Multidisciplinary Uses of Massage and Touch for Therapeutic Intervention

*Nursing and Therapeutic Touc*h

According to Kuhn (1999), therapeutic touch or TT is a nursing intervention developed by Dora Kunz and Delores Krieger, in the 1970s, as an act of healing or helping in which patients are reported to receive many therapeutic benefits including relaxation. The technique is based on the ancient practice of laying-on of hands, or "energy transfer". Krieger (R.N., PhD), a faculty member at New York University Division of Nursing initiated the teaching of therapeutic touch as a part of the graduate program in nursing. Krieger describes TT "as a transfer of energy from the healer that helps the patient to re-pattern his or her energy level to a state comparable to that of the healer" (Krieger, Peper, & Ancoli, 1979, p. 660). The practitioner of TT acts as a human energy support system until the recipient's own immunologic support system is robust enough to take over. The TT practitioner is completely focused in a meditative state on the intention to help or heal. Nurses, health professionals and lay people who are committed to helping or healing people can practice TT effectively. Heidt (1991), a nursing practitioner of TT, described her treatment session this way:

> ... I do not physically touch the patient ... I start out the session with both patient and me sitting across from one another as we talked about reasons for their treatment. Then I used my hands to make an assessment of the flow of energy. I find this best done by keeping the hands about 2–3 inches above the surface of the body. I usually share this evaluation with the patients, and this allows them to add more information if they wish. During this time, I evaluate the cues I am receiving

> and make an initial plan of treatment. The assessment process continues throughout the session as my relationship opens and deepens with the patient.
>
> The therapeutic touch treatment is a reciprocal communication process. First, there is a period of unblocking, a letting go of the impediments to a free flow of energy within the system and between the patient and me. It is always interesting to see how this will happen—what parts of the energy system will respond first; which blocks to the energy flow clear out quickly, and which hang on and need further and deeper healing. This part of the treatment is followed by a period of engagement, in which the nurse allows and encourages the healing energies to move through her to the patient. (p. 65)

Rosa, Rosa, Sarner, and Barnett (1996) refuted the practice of Therapeutic Touch (TT) as "mystical" and not based on scientific principles. In a well-publicized experiment by Rosa, TT was challenged on the grounds that it could not be proven as a health benefit for patients. This assertion was based on the skill level of TT practitioners and a literature review of studies involving the efficacy of TT that were not designed well enough to prove its benefits. Rosa et al. study (1996) found that when 21 experienced TT practitioners were blinded, and the experimenter moved her hand over the TT practitioner's hands, the TT practitioners were unable to tell which of their hands was in the experimenter's energy field. The mean correct score for the 28 sets of 10 tests was 4.4, which was close to what was expected for random guessing. Proponents of Therapeutic Touch indicated that they have seen it work to heal or improve many medical problems from colicky infants to the healing of wounds and infections (Rosa et al. 1996;

Kuhn, 1999). More objective, quantitative studies need to be done to demonstrate TT's therapeutic benefits**.**

Occupational Therapy and Sensory Integration

Occupational therapists often provide needed services to children with developmental disabilities who demonstrate numerous sensory, motor and perceptual limitations and related behavioral difficulties (Baranek, Foster & Berkson, 1997). Several theories underlie treatments in occupational therapy for children. Sensory integration is one of them. A. Jean Ayres' theory of sensory integration has sparked more research, and generated more controversy than any other theory in occupational therapy. Ayres, an occupational therapist with advanced training in neuroscience and educational psychology, developed this theory to explain the relationship between deficits in interpreting sensation from the body and the environment and difficulties with academic or motor learning (Bundy & Murray, 2002).

Ayres (1979) defined sensory integration as the "neurological process that organizes sensation from one's own body and from the environment and makes it possible to use the body effectively within the environment" (p. 11). Ayres focused her theory on the vestibular (sensation derived from stimulation of the vestibular mechanism in the inner ear through movement and position of the head), proprioceptive (sensations derived from movement and joint position, especially from resistance to movement), and tactile systems. Sensory integrative dysfunction manifests itself in two major ways, poor sensory modulation and poor praxis. Dyspraxia is the developmental inability to plan new movements in the absence of brain damage, peripheral sensory loss and other neurological damage (Bundy & Murray, 2002). Sensory modulation refers to one's

ability to regulate and organize reactions to sensory inputs in a graded and adaptive fashion. The expression of sensory modulation disorder includes sensory or tactile defensiveness, gravitational insecurity, aversive response to movement, and sensory under responsiveness. Because sensory modulation is a dynamic, central nervous system (CNS) process that is subjected to the constant ebb and flow of continuous nerve cell activity over multiple channels, poor modulation may be manifested in distractibility, impulsiveness, increased activity level, disorganization, anxiety, and poor self-regulation (Lane, 2002).

Individuals can have evidence of one or both types of dysfunction. Poor processing of vestibular and proprioceptive information have been related to deficits in practic dysfunction and two sensory modulation disorders (gravitational insecurity and aversive responses to movement). The tactile system has been related to dyspraxia and sensory defensiveness (Bundy & Murray, 2002). Of particular concern in this paper is the *use of touch* in the treatment of tactile or sensory defensiveness.

In developing intervention to increase sensory responsiveness and decrease tactile or sensory defensiveness, Ayres (1979) found clients responded best to deep pressure touch as well as proprioception. There are many activities used by therapists to enhance sensation in these areas. Some of the activities include the following: textured coverings (i.e. sheepskin, carpeting) on equipment like barrels, bolsters and balls; wide paintbrushes or textured mitts used for brushing or scrubbing large areas of the body-- legs, arms or back; ace bandages wrapped around extremities; large containers of plastic bubble balls in which clients can submerge themselves; boxes filled with dried lentils, beans or rice in which younger clients can sit and older clients can submerge their extremities; large

pillows and mats for burrowing; large therapy balls that a therapist can roll firmly over a child's back and legs or that the client can push against while the therapist provides resistance; clients wearing weighted vests, backpacks, or hats; clients using heavy objects for pushing or pulling; resistive substances are used for sucking from a straw (Sour, thick textured substances work best); Using toys, objects, food, or gum appropriate for clients to chew; using various equipment that enables the client to jump, bounce, or pull while swinging; and vibrators applied to arms or legs (Koomar & Bundy, 2002, p. 263–270).

All of these activities involve a form of touch. Does this treatment work with clients? Anecdotal evidence from clinicians suggests that it does. However two meta-analyses, one by Ottenbacher (1991) and another by Vargas and Camilli (1999) found sufficient evidence to suggest that intervention based on the principles of sensory integration theory was effective. In spite of their findings, there is not empirical consensus among investigators regarding the validity of sensory integration theory. Other investigators who have evaluated sensory integration research studies have reported conflicting or contradictory recommendations (Arendt, Maclean, & Baumeister, 1988).

Other Touch Therapies

There are many types of manual or touch therapies, from Rolfing (myofascial release), acupuncture, reflexology, to massage therapy, chiropractic care, and others. Touch therapies can be classified into three groups: (a) energy methods, (b) manipulative therapies, and (c) amalgams (a combination of both). Among the public in general, the most popular forms of CAM are chiropractic care, massage therapy, and relaxation therapy (Field, 2001).

Energy methods include acupuncture, acupressure, reflexology, tai chi chuan and yoga. All involve stimulating body points to move energy throughout the body. In most Eastern societies, health is seen as the movement of energy freely through the body via meridians or channels. The Chinese call this energy “chi”. They believe that universal energy comes from the food we eat and the air we breathe. That is why Yoga emphasizes deep breathing. And why energy therapists claim they can treat stress-related problems, addictions and many kinds of pain. Yoga teaches basic principles of mind and body unity. If the mind is chronically restless and agitated the health of the body is comprised. Acupuncture or acupressure can manipulate chi points along the meridians in order to help chi energy flow freely. Tai chi is a combination of meditation and exercise that when practiced keep one’s chi energy balanced and flowing freely. Reflexology could be called massage therapy because it involves the same manual techniques (i.e. kneading, stroking or rubbing) but it is centered on particular points of the body like the ear, feet or hands. According to reflexologists, energy from the point that is touched is transmitted across a network of nerves to other parts of the body, such as the back or the stomach (Field, 2001; Kuhn, 1999).

Yoga and tai chi have many features in common with massage therapy because both involve a form of self-massage. The various positions in yoga require the limbs to be pressed against each other and against a floor surface. Like massage these positions stimulate pressure receptors in the skin, which in turn stimulates the vagus nerve. The vagus nerve slows the body down and enhances attentiveness. The stimulation of the long more insulated nerve fibers for pressure can reduce pain as well (Field, 2001).

The CAM (complementary and alternative medicine) Institute at NIH recognizes acupressure and acupuncture as an effective alternative treatment for pain disorders. The channels or meridians through which energy passes have corresponding points on the surface of the skin, which can be pressed or punctured to affect the workings of internal organs or to enhance pain tolerance. For example, pressing a point on the forearm is said to reduce lower back pain. Each meridian has an entry point at the skin's surface where the energy enters and an exit point where the energy leaves. These meridians look like a road map on the diagram (Field, 2001; Kuhn, 1999).

The Japanese version of acupressure is called shiatsu ("shi" means finger and "atsu" means pressure). Shiatsu therapists use heavy, prolonged pressure usually using the balls of their thumbs, and sometimes the palms or elbows. They follow a diagram of the key pressure points called "tsubos". Some people consider this therapy painful. It is theorized that the effects are caused by an increase in vagal activity, which slows the heart rate and relaxes the patient (Field, 2001).

In ancient times tradition says that Eastern therapists used only their fingers to manipulate chi (acupressure) and that needles were eventually added to enhance the effect. Acupuncture requires training and experience to place the needles accurately. A trained therapist uses 100–150 body points for needle insertion. Part of the skill is knowing where to place the needle based on the patient's condition. Acupuncture has been used successfully to treat many conditions from various types of addiction (eating, alcohol, drug abuse) to chronic diseases like arthritis and hypertension. The National Institutes of Health recently explored the effects of acupuncture with a task force that concluded acupuncture was an effective treatment for pain disorders. It is often favored

over Western anesthesia because it does not lower blood pressure or depresses breathing. The evidence on why it works is unknown (Field, 2001).

Although very little is known about the origin of reflexology. It is considered another energy method and it is also similar to massage because it involves kneading, stroking, rubbing and other massage techniques. Centered on certain points on the ear, hand or foot, it should not be confused with foot or hand massage. It is specific pressure therapy based on the premise that there are reflex points on the feet and hands that correspond to every muscle, bone, nerve, organ, and gland in the body. Pressing on these points breaks up congestion and helps to relax the nerves. This in turn reduces vascular constriction so that the blood and nerves flow more freely. As circulation improves, toxins are released. Reflexology also promotes endorphin release enhancing one's sense of well being. In Oriental medicine, acupressure, and acupuncture is based on the premise that life's vital energy or Chi flows through the meridians (energy pathways) (Field, 2001; Kuhn, 1999).

Reflexology is performed most frequently on the foot. It should be noted that six of the twelve meridians are found in the foot. The foot contains about 7,200 nerves, 26 small bones 114 ligaments, and 20 muscles. The hand can also be used in reflexology. The hand contains 27 bones. Both feet and hands are finely tuned; intricately structured parts of the human body that when combined makes up half the bones in the human body (Kuhn, 1999).

Unfortunately there is a paucity of research studies on reflexology. Those studies that exist are based on anecdotal evidence, poorly designed without controls or inadequate in describing the details of the methodology (Kuhn, 1999). However, Kuhn

reports on four of these studies done between 1985 and 1996 using reflexology to either reduce pain, or care for the terminally ill. All of these studies had positive results, but were criticized for poor methodology. More research is needed on this treatment approach.

Best Practice Among Practitioners in Early Intervention

If touch is as therapeutic as the literature suggests, then what are the implications for occupational therapists and early interventionists? Unfortunately, American culture discourages touching. However, certain professions have been given the permission to touch. Included among them are physicians, hairdressers, massage therapists, tailors, dentists and other health care professionals. Among occupational therapists this touching is mostly procedural. Therapists provide passive range of motion, muscle testing, splinting of the upper limbs, blood pressure, sensory-based treatments and other techniques requiring procedural touch. In the NICU, Hunter (2005) recommends infant massage as a part of a sensory stimulation program for stable pre-term or low birth weight infants preparing for discharge. It can be used or taught to parents. Early interventionists, knowledgeable and sensitive to the roles of touching and massage, will encourage parents and care givers to massage their infants and toddlers with special needs as well.

McCormack (1991) reported studies that indicate most of this touching is perceived by the patient as routine, directive, or controlling. Sterile techniques to prevent the transmission of infectious diseases, fear of malpractice suits, cost containment and a host of other legitimate concerns have moved 21st century medicine away from caring,

affectional, intentional, or any other kind of touching without gloves. Huss (1997) reports that when therapy students are given the opportunity to “lay on of hands” they will sit back and wait for someone else to do it.

Is there a role for affectional touching in early intervention? Yes, there is a place for affectional and caring touch. Most people, familiar with and comfortable around children, enjoy picking up babies and cuddling. But students will need to be taught when, how and where to touch when it is used to communicate warmth, understanding, empathy, affection, and acceptance. The areas most often touched by health care professionals are the patient’s forehead, shoulder and hand. A student must first get in touch with his or her own use of and feelings about non-verbal communication before touching can be used effectively with others. Most Americans tend to use verbal interaction instead of touching to communicate affection (McCormack, 1991; Huss, 1976).

The American Occupational Therapy Association (AOTA, 2005) recommends that occupational therapy practitioners use CAMs “within the scope of occupational therapy practice as a preparatory method or purposeful activity to facilitate the ability of clients to engage in their daily life occupations” (AOTA, 2005, p. 654). As a part of the evaluation and intervention process, the occupational therapist and occupational therapy assistant must determine whether the use of CAMs is (a) consistent with the client’s cultural practices, (b) priorities and needs, (c) is safe to use, and (d) is an appropriate approach to intervention. Some CAMs may require additional training, competency examinations, certification and regulatory knowledge. Some CAMs currently used among

occupational therapists include guided imagery, massage, myofascial release, meditation, yoga, and behavioral relaxation training.

Early intervention teachers are encouraged to touch and hold infants and young children in a caring, nurturing way and to teach parents the importance of touch and massage to their child's growth and cognitive development. Occupational therapists are taught that an appropriate motor response or output in a given situation was dependent on the right amount of sensory input. Effective sensory input includes some degree of touching and handling of the patient or client. Given the overwhelming body of knowledge concerning the effectiveness of touching, what implications do caring or affectional *touch* has in the framework of occupational therapy and education in early intervention? How knowledgeable and comfortable are these practitioners with caring touch and massage? When do they touch a child in a caring way? If practitioners are not touching or encouraging massage for a child in a caring way, why? This will be the focus of my research.

Summary and Conclusions

Touch and massage has a long history across many cultures. As this discussion concludes we have attempted to examine the varied roles of touching and massage in early intervention, school based programs and the general population at large. Issues related to touching and massage in the pre-service education of ECSE teachers and occupational therapists were also explored. As we delved into the twin topics of touch and massage we explored their varied and similar manifestations. This included (a) a history of humankind's use of touching/massage, (b) the broad area of complementary

and alternative medicine versus allopathic medicine; (c) the roles of touch/massage, (d) the anatomical, physiological, social-emotional and healing properties of touch/massage, and (e) the communicative value of touch/massage in relationship to human growth and development across various cultures. Massage techniques as a therapy was also covered including a myriad of therapeutic approaches across professional disciplines that use touch, no touch, massage or deep pressure touch.

With a review of over 31 studies, research on touch/massage was covered extensively from its benefits and contraindications, to the deleterious effects of touch deprivation. All of the studies showed positive effects for the one who touches or massages and the one who receives the touch or massage. Although I could find no published studies on the negative effects of massage and touching, there is certain skin, circulatory, orthopedic or other medical conditions that would contraindicate the use of massage. The health status of the recipient is very important to consider before a program of massage is implemented. There is also a certain type of vigorous touching that is not recommended for relaxation. Some parts of the body are off limits to certain types of touching and massage because superficial nerves, blood vessels and internal organs can be damaged. People taking certain drugs or herbs (i.e. blood thinners) would make them ineligible for some types of massage.

In conclusion, practicing therapists can generally find justification for using touch therapy but again there are a few barriers to using it, including the requirement that a practitioner must be licensed or certified to practice massage therapy. Again, all of the published studies show positive effects, but the studies tend to be of relatively low quality, small in scope and inexpensive.

III. RESEARCH METHODOLOGY

This section describes the procedures that were used to investigate the roles of touching and massage among occupational therapists and teachers in early intervention programs. This section also contains a discussion of the data collection instrument, the research population, the research variables, the null hypotheses and data analysis.

An overwhelming body of knowledge exists giving evidence of the numerous therapeutic benefits of giving and receiving touch and massage. The purpose of this study was to determine what occupational therapists (OT) and teachers in early intervention programs (a) know about touching and massage; (b) report as their personal attitudes about touching and being touched, and (c) report as their practices regarding the use of touch and massage with infants and toddlers with special needs from birth to three years of age.

The primary research question was, “What are the roles of touching and massage among occupational therapists and teachers in early intervention programs?” The following steps were used to answer the research question.

1. The investigator developed a measurement instrument to assess knowledge, attitudes and practices regarding the use of touch and massage.

2. Once the measurement instrument was developed the investigator piloted the instrument to provide an empirical basis for refining it using both reliability and validity measures.
3. The final instrument was administered to a sample of the population of occupational therapists from a national data base and a sample of teachers in early intervention programs in Alabama.
4. The resulting data were coded and entered into a statistical software package in a way that ensured the anonymity of the respondents.
5. The data were statistically analyzed in relationship to the research hypotheses.

The following null hypotheses were developed:

HØ1. There is no significant difference between occupational therapists and teachers in early intervention programs regarding their *knowledge* about touching and massage.

HØ2. There is no significant difference between occupational therapists and teachers in early intervention programs regarding their *attitudes* about touching and massage.

HØ3. There is no significant difference between occupational therapists and teachers in early intervention programs regarding their *practices* with touching and massage.

Measures

The data in this study were collected using a survey instrument developed by the investigator. The survey instrument, which included 32, four point Likert-type scale statements (i.e. strongly agree, agree, disagree, and strongly disagree) 11, true /false statements, and one free response question, was developed based on information about survey research and instructions about how to develop a survey as reviewed from Kielhofner (2006), Patten (2005) and Orcher (2007). The four-point Likert-type scale and true/false statements were formulated based on information from the review of the literature, three occupational therapy assessments on tactile processing (Dunn, 1999; Parham, 1997; Royeen & Fortune, 1990), and feedback from a panel of six experts in the fields of occupational therapy and education in early intervention. A statistician was consulted to refine the questions and to assist in categorizing the statements according to the areas of knowledge, attitudes and practices regarding the use of touch and massage in early intervention (J. Gundlach, personal communication, June and July 2007).

The decision about what kind of demographic data to collect from the research sample was decided based on the review of the literature, references on survey research by Orcher (2007) and Patten (2005) and feedback from the dissertation committee. The demographic data on the survey included a) gender, b) professional discipline and level (i.e. occupational therapist or occupational therapy assistant), c) education, d) highest degree earned in any field, e) years of work experience in early intervention, and f) training (or credentialing) in massage or other manual therapies.

Section I of the survey, "*Knowledge about Touching and Massage*", is comprised of eleven true and false statements about the therapeutic benefits of touching and

massage in early intervention. The respondents were asked to indicate whether each statement was true or false by circling "1" for true and "2" for false. These statements were developed based on relevant studies from the literature review and feedback from a panel of experts in occupational therapy and early intervention. The statements were designed to determine how familiar the participants were with the research underlying the positive benefits of touching and massage (AOTA, 2005; Carlson & Earls, 1997; Field, 1995; Lane, 2002; Powell, Brasel, & Blizzard, 1967a).

Section II of the survey, "*Personal Attitudes about Touching and Being Touched*", used a Likert-type scale and participants were asked to indicate their level of agreement with twenty statements about their personal tactile preferences (H1) with the following options: strongly agree, agree, disagree, or strongly disagree. The statements on tactile preferences in this attitude scale were randomly selected from three occupational therapy assessments on tactile processing: *The Infant-Toddler Sensory Profile* (Dunn, 1999), *Evaluation of Sensory Processing* (Parham, 1997) and the *Touch Inventory for Elementary-School-Aged Children* (*T.I.E.*) (Royeen & Fortune, 1990).

Section III of the survey, "*Practices in Early Intervention with Very Young Children with Disabilities",* used a Likert-type scale in which participants indicated their level of agreement with twelve statements about the use of complementary or alternative therapies in early intervention and their practices regarding touching their clients (H2) with the same options indicated above (strongly agree, agree, disagree, or strongly disagree). Again, the statements were developed by the investigator using relevant research on the use of complementary and alternative medicines (CAMs), touching in early intervention (DEC Task Force, 1993; Hardee, 1998, Kuhn, 1999; McCormack,

1991; NCCAM, 2004; Schneider, 1996) and feedback from a panel of experts in occupational therapy and educators in early intervention.

One open ended question was used at the end of the survey asking participants if they had additional comments to share with the investigator. This open-ended question was added to support participants by allowing them to give additional feedback as desired.

Participants

In order to investigate the primary research question (*What are the roles of touching and massage among occupational therapists and teachers in early intervention programs*?), the investigator acquired a sample of 1,002 occupational therapists and 90 teachers or coordinators in early intervention programs based on current membership information from the American Occupational Therapy Association (AOTA) and the Office of Early Intervention for the Alabama Department of Rehabilitation Services (ADRS). Utilizing a priori coding of this group of participants, the following categories were assigned: (a) occupational therapists (b) occupational therapy assistants (c) early intervention teachers with an education degree (i.e., early childhood education and early childhood special education) and (d) early intervention teachers without a degree in education.

Each group was then subdivided and analyzed based on the respondents' answer to the demographic questions: gender, professional position, education for professional credentials, highest degree earned in any field, years of work experience in early intervention, licensing to practice massage therapy and whether or not they had training

in any other manual or touch related therapy. All 1,092 participants were included in this investigation and mailed a survey.

In order to refine the survey, pilot testing for psychometric properties of the instrument was done before the surveys were mailed. Student volunteers, who were not a part of the primary study, were recruited from Auburn University's early childhood special education program and Tuskegee University's occupational therapy program. After institutional permission was granted by Auburn and Tuskegee University's Institutional Review Boards, faculty was contacted in each academic program. With a goal of recruiting 25 students from each major, the resultant pool of student volunteers averaged about 48 participants between the pre and post testing of the survey instrument.

At an informational meeting, the investigator and a research assistant described the study using a pre-printed script and answered any questions about the study. Student volunteers were informed that they would have to take the survey twice within a two week period of time and that they would have to code both surveys and place them in a sealed envelope so no identifying information about them would be available to the investigator. The date for session two was announced at this session. Students who decided not to participate were excused from the session and the volunteers were allowed to complete the survey after receiving an information letter, a blank survey and an envelope. After students read the information letter and calculated their identification code, they filled out the survey.

Their identification code was calculated by multiplying 3 numbers together—their mother's birthday, father's birthday and their birthday. The number calculated was entered on the top sheet of their survey form. After the students completed the survey,

they placed it in a sealed envelope and returned the envelope to the investigator. The same procedures were followed during session two.

Data Analysis

Since this study is descriptive in design and uses a survey developed by the investigator, the data analysis was divided into two parts. One part involved an analysis of the data collected from the respondents and the other part involved validity and reliability assessment of the survey instrument through pilot testing. Descriptive statistics were used to describe and categorize the respondents. All of these analyses were conducted using SAS (JMP version 7) statistical software.

One part of data analysis was related to the research question: *What are the roles of touching and massage among occupational therapists and teachers in early intervention programs?* The null hypothesis states that there is no significant difference between occupational therapists and teachers in early intervention programs regarding their knowledge, attitudes and practices about touching and massage. A factor analysis, a statistical test of significance (i.e. ANOVA) was used. The statistical test of significance was used to test whether the group means on each section of the survey (knowledge, attitudes and practices) between the groups of occupational therapists and early intervention teachers were different from each other. The level of significance was set at $p < .05$ (Kielhofner, 2006; Munro, 2001). The multiple regression analysis was done to predict the relationship between the dependent variables (knowledge, attitude and practices) and the independent variables found in the demographic data (Hair, Anderson, Tatham & Black, 1984; J. Gundlach, personal communication, July 2008).

The pilot study of the survey instrument was used to assess its content validity, construct validity, test-retest reliability, and the reliability of the scale's internal consistency. As previously described, the data collection instrument is comprised of two sections of four point Likert-type scales, one section of true/false statements, a section on demographics and a free response question at the end of the survey.

Content and face validity were established by using a panel of six experts. Three of the panelists were occupational therapists practicing in early intervention and three of the panelists were teachers in early intervention programs. Two of the panelists were also college professors in occupational therapy and special education. The panelists were asked to take the survey and note on another sheet of paper any questions that were confusing, inappropriate or questions they could not answer. They were also asked the following questions: Was the use of language appropriate? Was the survey too long or too short? What questions would you eliminate? What were you thinking as you were answering the questions? Do the statements match the established categories in each section of the survey? Other comments and feedback were also accepted (Orcher, 2007). The initial survey was revised several times based on feedback from this panel, the dissertation committee and personal communication from a statistician (J. Gundlach, personal communication, July 25, 2007).

Pilot testing for the instrument included test-retest reliability statistics, a contingency analysis on the knowledge section (the first 11 items) and a factor analysis on the other test items. Test-retest reliability is an estimation of reliability based on the correlation between two or more administrations of the instrument for different times, locations or populations (usually the *Spearman-Brown coefficient*). The contingency

analysis or cross tabulation is used when the test items lack variability (i.e. true/ false questions in the knowledge section of the scale). Internal consistency of the instrument is an estimation of reliability based on the correlation among the variables comprising the set of items. This measure is usually *Cronbach's alpha* (Garson, 2007). Factor analysis is a method for organizing the items on a new instrument into groups of items that fit together. Factor analysis provides validity evidence concerning the structure of the data collection instrument (Munro, 2001).

To determine test-retest reliability of the survey instrument, (based on consultation from a statistician, J. Gundlach, August, 2007), students from the disciplines of occupational therapy and early intervention who were a part of the pilot study were asked to answer the survey. After two weeks these students were asked to retake the survey. An analysis was done on the two sets of scores to compute a correlation coefficient which indicated the test-retest reliability. The majority of researchers according to Orcher (2007) prefer tests and scales with reliability coefficients above (.70). Patten (2005) suggests that if one is interpreting group averages based on twenty-five or more participants the instrument is serviceable even if its reliability coefficient is as low as (.50). If the coefficient is below (.70) the results of the research should be interpreted with caution (Orcher, 2007).

A factor analysis was also performed on the survey instrument with the data collected from the students. A *factor* is an underlying structure that detects items that belong together. Factor analysis is also used to test the validity of ideas about items on an instrument by helping the researcher decide how items should be grouped together in subscales. Some items might be eliminated from the original instrument, and other

separated items on the scale might be grouped together. Usual practice in social science research uses a minimal cut off of (.3 – .35). Some rules indicate that loadings of (.4) or less are *weak*, and *strong* if the loadings are more than (.6) Most rules are arbitrary depending on the context of the research. For Likert-type scales a factor loading of (.6) might be required to be considered *high* (Garson, 2007). The final survey instrument was considered to be reliable and the survey items conformed to what was being measured. More details about the instrument are discussed in the results section.

For those respondents to the survey who chose to add comments, the investigator analyzed the free response question at the end of the survey which asks, *Are there comments you would like to share?* Each comment was recorded and then coded based on categories of comments that fit together (i.e., comments about their answers on the survey, comments about the structure of the survey, comments about getting results from the survey, etc.). Comments relevant to the research question are discussed in the results section.

Summary

In summary, the data in this study were collected using a survey which contained thirty-two Likert-type questions, eleven true/false questions and one free response question at the end of the survey. The survey had statements of knowledge about touching and massage and required the participants to answer true or false. Participants were asked to respond to their level of agreement with statements regarding their personal attitudes about touching and being touched and their practices in early

intervention. One open ended question was used at the end of the survey asking participants if they had additional comments to share with the investigator.

Participants were occupational therapists, occupational therapy assistants, and teachers in early intervention with or without a degree in education. Pilot testing was done on the survey instrument with student volunteers from Auburn University and Tuskegee University. The survey after being statistically analyzed (reliability and validity assessments) was mailed to a population of occupational therapists and teachers working in early intervention programs.

In the primary study, the occupational therapists in the sample were selected from a national data base of therapists working in early intervention (AOTA) and teachers in the sample were selected from a population of teachers working in early intervention programs in Alabama (ADRS). All of the participants received follow up post cards one week after the surveys were mailed.

Several statistical analyses were performed on data collected during this investigation. Descriptive statistics, test-retest reliability, a factor analysis, a test of significance (ANOVA) and a multiple regression analysis were performed on the data collected from the primary and pilot study as appropriate. A confidence level was set at $p < .05$ level to reject the null hypothesis (There is no significant difference between occupational therapists and early intervention teachers in their knowledge, practices and attitudes regarding touching and massage).

Any comments written by the respondents on the last page of the survey were recorded, summarized and coded. Comments relevant to the investigation are discussed in the results section of the dissertation report. The pilot study provided testing for the

psychometric properties of the instrument and included test-retest reliability, a contingency analysis and a factor analysis. All statistical analyses were obtained using JMP (Version 7) statistical software.

IV. RESULTS

This study examined the roles of touching and massage among two professional disciplines in early intervention that are mandated services under the IDEA—occupational therapy and teachers. The purpose of this study was to determine what occupational therapists (OT) and teachers in early intervention programs (a) know about touching and massage; (b) their personal attitudes about touching and being touched, and (c) their practices regarding the use of touch and massage with infants and toddlers with special needs from birth to three years of age. The results are presented in four main sections.

Chapter IV begins with demographic information including a description of the populations in the primary and pilot studies. The next section describes reliability and validity assessments on the survey instrument from the pilot study. The third section describes the analyses of the data and the results of hypothesis testing for the primary study. The chapter ends with the results of the free response question (Are there other comments you would like to share?) and participant responses to other manual or touch therapies being utilized in their practice. All analyses were computed using JMP (Version 7) software.

Demographic Information

Primary Study

The professionals that were the focus of this investigation were contacted through organizations that had a database of occupational therapists and special instructors in early intervention programs. The Alabama Department of Rehabilitation Services (ADRS) and the American Occupational Therapy Association (AOTA) were contacted to obtain a list of early intervention professionals in education and occupational therapy. The staff in the office of early intervention at ADRS provided the investigator with a list of agencies that provided early intervention services in the State of Alabama. From this list of 89 agencies, 90 mailing labels were generated for special instructors or coordinators in early intervention programs. AOTA provided a non-randomized, national mailing list of 1,002 occupational therapists and occupational therapy assistants who were members of their organization and who identified early intervention as their primary practice setting. Surveys were then mailed to 1,092 occupational therapists and special instructors or teachers. From this population of 1,092 potential participants, 348 surveys were returned and 336 were completed and used for data analysis. Twelve surveys were not used, either because they were returned late (n = 7) or were not completed (n = 5). This was a return rate of 31.8%. These responses were coded and placed in an Excel file and later imported into a JMP data file.

Of the 336 respondents the majority were female (94%) with a mean of 16.9 years of work experience in early intervention, were employed as occupational therapists (78.2%) and did not have a license to massage. Although only 3.57% of the respondents had a license to massage, 43% of them indicated they were trained in a manual or touch

related therapy. As a group, 263 (78.2%) were occupational therapists, 8 (2.83%) were occupational therapy assistants, 15 (4.46%) had early childhood special education (ECSE) or early childhood (EC) education degrees, 24 (7.14%) were special instructors without a degree in ECSE or EC, one (.29%) was a special instructor without a degree, and 15 (4.46%) respondents had a combination of two of the previous categories (see Table 1, 2 and 3 below).

Table 1

Cross Tabulation of Professional Position by License to Massage

	No Response	License	Not Licensed	Totals
No Response	10	0	0	10
1–OT	0	9	254	263
2–OTA	0	0	8	8
3–EC or ECSE	0	2	13	15
4–EI other degree	0	0	24	24
5–EI without degree	0	0	1	1
6–Combination of two above	0	1	14	15
	10	12	314	336

Note: *OT = occupational therapy, OTA = occupational therapy assistant, EC = early childhood education degree, ECSE = early childhood special education degree, EI = early intervention teacher, and Combination of two above = a professional with two types of degrees or positions*.

Table 2

Gender and Education

	N	%
Gender		
1–Male	10	2.97
2–Female	316	94.04
3–No response	10	2.97
Professional Education		
1–Certificate	4	1.19
2–Associate	8	2.38
3–BS/MS	60	17.85
4–Bachelors	139	41.36
5–Masters	107	31.84
6–OTD	4	1.19
7–Other degree	2	0.59
8–Combination of degrees	2	0.59
9–No response	10	2.97
Highest Degree Earned		
1–Associate	5	1.48
2–Bachelor's	161	47.91
3–Master's	150	44.64
4–Ph.D.	4	1.19
5–Other Doctorate	6	1.78
6–No response	10	2.97

Note: 10 respondents did not answer the demographic questions.

Table 3

Distribution of Work Experience

Maximum Years	48
Minimum Years	0*
Median Years	15
Mean Years	16.9
Standard Deviation	10.21
N	336

Note: New graduates with less than a year experience and missing data were assigned a zero.

Pilot Study

Pilot testing for the psychometric properties of the survey instrument was performed with student volunteers from Auburn University's early childhood special education program and Tuskegee University's occupational therapy program.

After institutional permission was granted, faculty in both academic programs were contacted and asked to recruit 25 volunteers for the pilot study. For the pretest there were 51 participants (26 occupational therapy and 25 early childhood special education students) and for the post test there were 44 participants (23 occupational therapy and 21 early childhood special education students). Seven participants failed to complete both tests (3 occupational therapy and 4 early childhood special education students). The

student responses were coded and placed in an Excel file and later imported into JMP software (see Table 4).

Table 4

Pilot Study Demographics

	Pre Test		Post Test	
Gender	N	%	N	%
Male	9	17.6	8	18.1
Female	41	80.3	34	77.2
Unknown	1	1.9	2	3.9
Total	51		44	
School Major				
Occupational Therapy	26	50.9	23	52.2
Early Childhood Special Education	25	49.0	21	47.7
Total	51		44	

Data Analysis

Psychometric Properties of the Survey Instrument

Data analysis of the survey instrument was based primarily on pilot testing of college student volunteers with majors in occupational therapy or early childhood special education. Test-retest reliability was completed over a period of two months, on two

separate college campuses—Tuskegee University and Auburn University. The survey instrument was divided into three sections for analysis. The first eleven questions on the knowledge section were analyzed separately for reliability using a contingency analysis of each pretest item by its corresponding post test item. This cross tabulation statistic was used because of low variability among the True/False items. The sections on attitude (questions 12–31) and practices (32–43) were analyzed separately using a factor analysis. These sections were separated because a factor analysis is most efficient when there is a clear conceptual basis for the variables being analyzed. Labeling factors is a subjective process, so knowing the factorial structure in advance helps to select the variables to be included which then yields the best analysis of factors. Here the investigator's goal was to summarize the set of attitude items into an underlying variable and then the practice items into an underlying variable. Once the factor analysis calculates these underlying factors, it becomes easier to look at the relationship between attitudes and practices and summarize the findings. Once the statistical software computes the factor matrix it will automatically compute factor scores (standardized scores) as variables to be used in other subsequent analyzes (i.e. multiple regression) (Hair, Anderson, Tatham & Black, 1984; Garson, 2007).

The results of the first eleven T/F statements indicated that the respondents on both the pre and post testing primarily answered the same way on all items. The similarity of their answers across both tests was clustered in the upper 70 to 100 percentile for all items except for item 7 (statement on failure to thrive). The mean of the similarities was 82% (see Table 5 below).

Table 5

Pilot Study Cross Tabulation on True/False Questions for Both Pre and Post Tests

Survey Item in Knowledge Section	N Who Answered Both Items in Pre and Post Tests	n Respondents Who Answered the Same Way	%
1–Research has shown that it is healthier to hold, cuddle and soothe a child in your arms when he/she is crying or distressed.	32	29	90.6
2– Touch research indicates that touching and massaging infants and children are important for their physical growth and social development.	32	26	81.25
3– Studies show that mother-infant bonding is enhanced through skin to skin contact, touching and massage.	32	32	100
4– Studies on massage have been shown to relieve pain, improve the immune system and reduce stress and discomfort.	32	32	100
5– Some studies have indicated that deep pressure touch used in early intervention programs can increase sensory responsiveness and decrease sensory defensiveness.	32	23	71.88
6– To reduce infections it is recommended that gloves always be used during the day when picking up, touching or handling a child. (This does not include diapering or feeding.)	32	24	75

(table continues)

Table 5 (continued)

Survey Item in Knowledge Section	N Who Answered Both Items in Pre and Post Tests	n Respondents Who Answered the Same Way	%
7– Studies have shown that infants diagnosed with a failure to thrive syndrome are known to improve with only medical care and improved nutrition.	32	19	59.38*
8– Research has shown that infant massage should be a part of a sensory stimulation program for stable, pre-term or low birth weight infants ready for discharge.	32	24	75
9–"Laying on of hands" or intentional touching during intervention has been proven to be ineffective as a treatment approach.	32	26	81.25
10– Experts agree that communicating with a crying baby should be done by "cooing" or making baby sounds instead of always picking up a baby.	31	23	74.19
11– Based on practice standards, complimentary and alternative treatments are utilized by occupational therapists as preparatory methods to facilitate the ability of their clients to engage in their daily occupations.	32	30	93.75

Note: The mean of the group is 82 and the median is 81.2. Statement number 7's performance was less reliable across tests.

A factor analysis was performed on the remaining survey statements. The section on personal attitudes about touch (questions 12–31) revealed that across pre and post testing the following correlation was discovered between these items. A factor or hypothetical construct (touch *attitude*) was found with a total variance of 20.2%. With an *M* of zero and a *SD* of one, a high score (above 0) indicates touch avoidance and a low

score (below 0) indicates a preference for touch. The section on practices in early intervention (questions 32–43) found a factor that will be called: *will practice* with a total variance of 28.9% A high score(above 0) indicates an unwillingness to practice complementary and alternative medicine (CAM) in intervention and a low score (below 0) indicates a willingness to practice CAM in intervention. These results generally indicate an instrument that detects an underlying dimension that conforms to what is being measured (except item 7 in the pilot study).

Primary Study

The primary research study was designed to answer the following question: What are the roles of touching and massage among occupational therapists and teachers in early intervention programs? Specifically, what do occupational therapists and teachers in early intervention programs (a) know about touching and massage; (b) their personal attitudes about touching and being touched, and (c) their practices regarding the use of touch and massage with infants and toddlers with special needs?

In order to answer these questions 3 null hypotheses were developed:

HØ1. There is no significant difference between occupational therapists and teachers in early intervention programs regarding their *knowledge* about touching and massage.

HØ2. There is no significant difference between occupational therapists and teachers in early intervention programs regarding their *attitudes* about touching and massage.

HØ3. There is no significant difference between occupational therapists and teachers in early intervention programs regarding their *practices* with touching and massage.

In order to test these three null hypotheses, a one way analysis of variance (ANOVA) was performed on the data. A multiple regression analysis was conducted to predict the relationship between the dependent variables (knowledge, attitude and practices) and the independent variables found in the demographic data. A factor analysis was performed again to summarize what items belong together. Similar to the pilot study data, two factors were discovered: the touch factor (questions 12–31) and the will practice factor (32–43). For questions 12–31, the *M* was zero; *SD* was one, with a variance of 16.8%. A high score (above 0) indicates touch avoidance and a low score (below 0) indicates a preference for touch. For questions 32–43, again the *M* was zero; *SD* was one with a variance of 24%. A high score (above 0) indicates a willingness to practice complimentary and alternative medical approaches (CAM) in intervention and a low score (below 0) indicates an unwillingness to practice CAM in intervention (see Tables 6 and 7).

Table 6

Factor Loadings for Analysis of Q12–31(attitudes toward touch)

	FACTOR LOADING
Factor 1 (Variance)	16.8%
The Touch Factor	
20–I rarely go barefoot on grass, sand or carpet because I do not care for the "feel" of various textures on my feet.	0.56
23–I do not like wearing hats, sunglasses or other accessories because of the way they feel on my body.	0.53
28–I enjoy a facial, manicure or pedicure because I feel relaxed afterwards.	-0.71
29–I dislike having a facial, manicure, or pedicure because someone is rubbing, massaging or touching my skin.	0.77
30–I enjoy having someone cut, wash or style my hair because I feel relaxed afterwards.	-0.73
31–I do not like the feel of someone cutting, washing or styling my hair.	0.82

Note: Low scores (less than 0) indicate *like* touching. High score (higher than 0) indicates touch *avoidance.* The *SD* is 1 and the *M* is zero.

Table 7

Factor Loadings for Analysis of Q32–43(practices in EI)

	FACTOR LOADING
Factor 1 (variance)	24.0%
Will Practice Factor	
33–I would *not* use alternative or complementary approaches in providing intervention(s) with very young children with disabilities because it is not part of my traditional training.	-0.71
34–If training was provided; I would use treatments like acupuncture, massage, or therapeutic touch because they are known to be effective.	0.40
35–I stay away from treatments like acupuncture, massage, or therapeutic touch because they are unscientific	-0.79
37–The only hand or touch procedures I use during an intervention with young children with disabilities is for positioning, handling or applying a treatment.	-0.67
42–I would use alternative or complementary approaches to treatment like chiropractic care, massage, or tai chi when I am ill, stressed, or need relaxation.	0.56
43–I would *not* use alternative or complementary treatments like chiropractic care, massage, or tai chi when I am ill, stressed, or need relaxation because they are unscientific.	-0.73

Note: Low score (less than 0) indicates unwilling to practice touch/CAM) and high score (above 0) indicates a willingness to practice touch/CAM. The *SD* is 1 and the *M* is zero.

Because the knowledge section of the survey instrument lacked sufficient variability to conduct correlation statistics, descriptive statistics (frequencies, mean, median, and standard deviation) were used to analyze the data. The majority of the respondents (70.6–73.5%) answered all eleven T/F statements correctly. With a *SD* (.72)

and with a *M* (10.6) for statements answered correctly, the majority of the respondents had some knowledge about touching and massage in early intervention (see Table 8 below).

Table 8

Knowledge about Touching and Massage

Survey Item in Knowledge Section	n Who Answered Item Correctly	n Who Answered Item Incorrectly	**N** Total Respondents	% Who Answered Correctly
1- Research has shown that it is healthier to hold, cuddle and soothe a child in your arms when he/she is crying or distressed.	319	10	329	96
2– Touch research indicates that touching and massaging infants and children are important for their physical growth and social development.	327	4	331	98
3– Studies show that mother-infant bonding is enhanced through skin to skin contact, touching and massage.	330	1	331	99
4– Studies on massage have been shown to relieve pain, improve the immune system and reduce stress and discomfort.	328	2	330	99
5– Some studies have indicated that deep pressure touch used in early intervention programs can increase sensory responsiveness and decrease sensory defensiveness.	320	10	330	96

(table continues)

Table 8 (continued)

Survey Item in Knowledge Section	n Who Answered Correctly	n Who Answered Incorrectly	**N** Total Respondents	% Who Answered Correctly
6– To reduce infections it is recommended that gloves always be used during the day when picking up, touching or handling a child. (This does not include diapering or feeding.)	321	9	330	97
7– Studies have shown that infants diagnosed with a failure to thrive syndrome are known to improve with only medical care and improved nutrition.	320	8	328	97
8– Research has shown that infant massage should be a part of a sensory stimulation program for stable, pre-term or low birth weight infants ready for discharge.	299	28	327	91
9–"Laying on of hands" or intentional touching during intervention has been proven to be ineffective as a treatment approach.	281	42	323	86
10– Experts agree that communicating with a crying baby should be done by "cooing" or making baby sounds instead of always picking up a baby.	311	16	327	95
11– Based on practice standards, complimentary and alternative treatments are utilized by occupational therapists as preparatory methods to facilitate the ability of their clients to engage in their daily occupations.	294	24	318	92

Note: With a *SD* (.72) and *M* (10.6), a majority of respondents answered each question correctly.

To further investigate hypothesis one, the researcher used the number correct distribution above as the dependent variable, and conducted a one way ANOVA by the independent variables of *license in massage* (Q 49), *professional education* (Q 46), *highest degree* (Q 47), *years work experience* (Q 48), *training in CAM* (Q 50), *gender* (Q 44) *and professional position* (Q 45). The results indicated a significant difference (F = 4.02, df = 1, $p < .04$) between the means of *number correct* predicted from *work experience* and the *number correct* predicted *from professional position* (F = 2.54, df = 5, $p < .02$).

Table 9

ANOVA F Statistic Summary

Dependent Variables	Independent Variables	*df*	*F*	*p*
Number Correct	Work Experience	1	4.02	.0459*
Number Correct	Professional Position	5	2.54	.0285*
Avoid Touch Factor	Work Experience	1	5.61	.0184*
Will Practice Factor	Massage License	1	6.70	.0100*
Will Practice Factor	CAM Training	1	42.6	.0001*

*Statistically significant; $p < .05$

For number correct predicted from work experience p is barely less than .05 at .0459, r = .115, *r squared* = .013. The regression coefficient of .008 shows that each year of experience yielded .008 additional points on the T/F knowledge scale. For number

correct predicted from professional position, the *M* on the one way ANOVA for every category is close to 10.7 on knowledge except for category 4 (EI teacher with a degree in an area other than EC or ECSE) which had a *M* slightly lower (*M* = 10.1). In other words if null hypothesis one is rejected, it should be done with caution, because only one professional group had a lower mean. But the participants who had more work experience (across professional positions) did especially well on the knowledge section (see Table 9).

For null hypothesis 2 , a one way (ANOVA) analysis was conducted to predict the *avoid touch factor* from *license to massage, work experience, education, highest degree, gender, and number correct distribution.* Null hypothesis 2 will be retained. A significant *F* value was only shown on the avoid touch factor predicted from work experience (*F* = 5.611, *df* = 1, *p* < .018) (see Table 9).

When the avoid touch factor was predicted from highest degree the value of *p* was *p* < .264. But when all small categories are eliminated except category 2 (Bachelor's degree) and 3 (Master's degree), the investigator found an interesting relationship (*F* = 3.72, *df* = 1, *p* < 0.054). Although not significant, this variable showed an interesting trend that was close to significance. Respondents with a Master's degree (*M* = - 0.11) had an increased affinity for touch and those with a Bachelor's degree (*M* = 0.10) had a decreased affinity for touch.

Gender was also an interesting demographic variable as it was correlated to the avoid touch factor. Because there were only 10 males in the study compared to 316 females, this variable was not statistically significant. However, the males' *M* score was higher on touch avoidance than females. The males were a quarter of a *SD* above females

and it conforms to our observations about males in our culture. Boys in our culture receive less touching as they age and generally shy away from excessive touching as men (Huss, 1997) (see Table 10).

Table 10

ANOVA F Statistic Summary for Gender

Dependent Variable	Independent Variable	*Df*	*F*	*P*	*M*	*SE*
Avoid Touch Factor	Gender	1	0.6114	0.4348+		
Males (n = 10)					0.243	0.3164
Females (n = 316)					-0.007	0.0562

Note: Low score indicates like touch and a high score indicates an avoid touch attitude.

(+) means that this score is not statistically significant. $p < .05$

For null hypothesis 3, a one way (ANOVA) analysis was conducted to predict the *will practice* factor from *license to massage*, *work experience, professional position, education, highest degree, gender, and training in CAM.* A significant *F* value was shown on the *will practice factor* by license to massage ($F = 6.70$, $df = 1$, $p < .010$), and in *will practice factor* by training in CAMs ($F = 42.6$, $df = 1$, $p < .0001$). The strongest significance in this investigation was found with *will practice factor* as predicted from training in CAMs. Therefore, we can retain null hypothesis 3. The most powerful

relationship (across professional positions) was for those participants with a license in massage and training in CAMs (see Table 9).

Finally a multiple regression was conducted to predict *knowledge on practice* (controlling for attitude) *and attitude on practice* (controlling for knowledge). Both results were significant in a predicted direction. Will practice factor by knowledge (number correct) yielded p = .0025 and r = .17361.Will practice factor by avoid touch factor (attitude) yielded p = .0019 and r = -.17. Thus these analyses can be interpreted as more knowledge in touch/ massage predicts more use in practice and where there is an attitude of more avoidance of touch/ massage it predicts less practice with touch/massage (see Table 11).

Table 11

Multiple Regressions

Variable	*p*	r^2	*β*
Step 1			
Knowledge (Number correct)	.0025	.030	0.17361
Will Practice Factor			
Step 2			
Will Practice Factor			
Avoid Touch Factor (Attitude)	.0019	.029	-.17167

The survey ended with a free response question: Are there comments you would like to share? There were 21 comments from the respondents. The comments were inclusive of 4 main categories: (a) supportive statements about CAMs and touching or massage in intervention; (b) personal expressions about their attitude concerning touching and being touched; (c) negative feedback related to the survey questions or format; and (d) insurance reimbursement for massage therapy. The majority of the comments (n = 14) were supportive of CAMs and touch-related intervention (see Table 12).

Table 12

Summaries of Comments from Respondents in Primary Study

Categories	N
1–Supportive of CAM and Touch-Related Intervention (i.e. We use a therapeutic coaching model to teach parents effective touch protocols; I have found massage to be extremely valuable in EI).	14
2–Expression of personal attitudes about touching and being touched (i.e. I know I am tactile defensive…it runs in my birth family)	3
3–Feedback related to the survey format (i.e. You need to flag part B. I almost missed it; Question 1 is very ambiguous.)	3
4-Insurance reimbursement for massage therapy (i.e. In our state CAMs are not currently supported or billable in EI)	1
Total	21

The last question on the survey asked respondents: “Are you trained in any other manual or touch-related therapy? If you answered yes above, please specify which therapy.” Although only 12 of the participants were licensed to massage, 237 were trained in CAMs. Ninety-nine of respondents answered “no” to other training (see Table 13).

Table 13

Other CAM Training (Question #50)

Type of CAM Training	N	%
Myofascial Release	82	33.5
Massage Course or Training	59	24.8
Craniosacral Therapy	23	9.7
Therapeutic Touch	19	8.0
Certified Infant Massage Instructor	13	5.48
Reiki	8	3.3
Neurodevelopmental Therapy (NDT)	8	3.3
Wilbarger Approach	6	2.5
Sensory Integration	5	2.1
Acupressure	4	1.6
Reflexology	4	1.6
Healing or Loving Touch	3	1.2
Others (one each)*	13	5.4
Total	237	

**Note:* The other category included tai chi, yoga, lymphedema, Trager, Feldenkrais, zero balancing, sensory processing, mobilization techniques, TAMO, polarity therapy, NIDCAP training, developmental therapist or specialist, and Reddy approach. Ninety-nine participants answered "no" to training in CAMs.

Summary

Results presented in this chapter addressed the reliability and validity of the survey instrument for the pilot study and the three null hypotheses for the primary study. Based on statistical analyses, the instrument was determined to be a valid and reliable device for measuring the population under study. Two of the three null hypotheses were retained. Null hypothesis one was rejected with caution because only one category of professional had a *M* slightly lower than all the other categories. This fact made number correct predicted from professional position statistically significant. The following conditions were statistically significant: (a) number correct (knowledge) by work experience; (b) number correct by professional position; (c) avoid touch factor (attitude) by work experience; (d) will practice factor (practice) by license to massage; and (e) will practice factor by CAM training. Professional position (occupational therapist or teacher in early intervention) was only statistically significant as it related to knowledge. Work experience and CAM training (including massage license) were significant and not professional position as it related to attitudes about touching and willingness to practice CAMs.

The multiple regressions predicted that the more knowledge a participant has about touch, massage and CAMs, the more willing they were to use these interventions in

practice. And the reverse was also predicted: where there is an attitude of more touch avoidance a participant would practice touch/massage less often in intervention.

There were only four categories of comments in answering the free response question. The most frequent comments were supportive of CAMs, massage and touch-related intervention. Question 50 asked respondents if they were trained in any manual or touch related therapy. Two hundred and thirty seven of them were trained in other CAMs. Ninety-nine participants answered “no” to training in CAMs (see Table 13).

V. DISCUSSION

This chapter reviews the investigator's conclusions about the present study. These conclusions will include a summary of the present study, a comparison of the present study with previous research, the limitations of the present study and finally implications for further research.

A large body of knowledge exists giving evidence of the numerous therapeutic benefits of giving and receiving touch and massage. The purpose of this study was to determine the roles of touching and massage among occupational therapists and teachers in early intervention programs. The guiding research questions were: (a) what do occupational therapists and teachers in early intervention programs *know* about touching and massage? (b) What are their personal *attitudes* about touching and being touched? And (c) what are their *practices* regarding the use of touch and massage with infants and toddlers with special needs in early intervention programs?

Summary of the Present Study

The relevant research leading to this investigation are over 30 studies indicating positive effects for touching or massaging infants and children. Infant massage has been used across the country as a wellness program for infants. Touch deprivation studies on infants and children have shown sleep disturbances, suppressed immune responses,

growth deprivation, dermatitis, asthma, and other conditions including a failure to thrive syndrome. In studies on touch deprivation in orphanages, when one caregiver provided touch comfort with consistent nurturing to children in this environment, an improvement in physical, social-emotional and brain development occurred (Carlson & Earls, 1997; Older, 1982).

Massaged infants in pre-term and well baby nurseries showed greater gains in weight, better performance on developmental tests, easier soothability and sociability with less fussiness and crying. Other studies have shown that massage reduces pain and distress which improves sleep, breathing, digestion and the immune system of infants and children (Field, 2001; Schneider, 1996). Deep touch pressure used by therapists produces a sedative effect on the nervous system (Ayres, 1964; Knickerbocker, 1980; Krauss, 1987).

Parent-child bonding and communication is enhanced through infant massage. When depressed mothers massaged their new-born babies, a study showed improvement in the mother's emotional state and the infant's sociability, growth and development (Stack & Muir, 1992; Tronick, 1995).Consequently, the investigator thought it was important to discover and describe what these two professions in early intervention (occupational therapy and teachers) know, think and practice in regard to touching and massage. It was hypothesized that there was not a significant difference between occupational therapists and teachers in early intervention programs regarding these topics.

Null Hypothesis One stated that there is no significant difference between occupational therapists and teachers in early intervention programs regarding their

knowledge about touching and massage. Both groups of professionals know about the benefits of touching and massage as evidenced by their scores on Section I of the survey. Although the T/F statements were relatively easy to answer correctly (M = 10.6 for number of questions answered correctly), there were 10 respondents who did not answer this section of the survey. Why? The investigator is not sure. Some of the respondents might have thought the statements were ambiguous or felt less confident in answering them. Statement 7 on failure to thrive was problematic for students in the pilot study, but performed well during the primary study. Primary study participants answered all of the statements correctly at an 86–99% range.

Through further investigation, it was discovered when a factor analysis of the number correct by work experience was correlated using *ANOVA,* it was statistically significant ($p < .05$). In fact, the regression coefficient indicated that for every increase in years of work experience the number of correct answers increased by .008 points on the T/F knowledge scale. So what about a respondent's professional discipline? Which profession has the most knowledge—occupational therapists or special instructors in early intervention? When the factor: number correct by professional position was analyzed, it too was statistically significant ($p < .05$). All categories of professionals (OT, OTA, EC/ECSE, special instructor without EC/ECSE degree, special instructor without a degree, and a combination of degrees) had an M close to 10.7 except special instructors without a degree in EC/ECSE (M = 10.1). Null hypothesis one is rejected with caution because the difference in means was less than one.

Null Hypothesis Two stated that there was no significant difference between occupational therapists and teachers in early intervention programs regarding their *attitudes* about touching and being touched. Focusing on Likert-type statements on section II of the survey (questions 12–31) the investigator measured the avoid touch factor by several demographic variables. Remembering that high scores on the factor represent touch avoidance and low scores represent touch preference, the only variable that was statistically significant ($p < .05$) was work experience. The null hypothesis can be retained. Work experience but not professional position (OT versus teacher) affects attitudes toward touching.

Although work experience was predictable and the only significant factor, the investigator discovered an interesting relationship with the highest degree variable. It had a p value close to $p < .05$ ($p = 0.054$) when the investigator eliminated the smaller degree categories (associate–n = 5; PhD–n = 4; and other doctorate–n = 6). Most of the respondents had either a Bachelors (n = 161) or Master's degree (n = 150). The respondents with a master's degree (M –0.119) had a greater affinity for touch and the respondents with a bachelor's degree (M –0.101) were touch avoidant. A higher degree indicates these respondents were more likely to have a positive attitude toward touching.

Null Hypothesis Three stated that there was no significant difference between occupational therapists and teachers in early intervention programs regarding their *practices* with the use of touching and massage. Section III on the survey instrument (questions 32–43) focused on practice and the willingness to use touching, massage and other CAMs in practice. The factor, willing to practice was correlated with high scores and a reluctance to use these modalities in practice was correlated to low scores. When

the willing to practice factor was correlated to a massage license (p = .01) and other CAM training (p = .0001) they were both statistically significant. In fact the relationship was predictable and inversely related for both variables. When looking at the license to massage variable, the *M* for "yes I am licensed" was 0.72 and the *M* for variable "no I am not licensed" was -0.02. The will practice factor correlated to CAM training was the most significant correlation in the entire study. "Yes I am trained in any other manual or touch related therapy" *M* was 0.38 and the opposite "No I am not" *M* was -0.30. If the respondents were trained in massage or use another CAM they were more likely to use massage or another CAM in practice. And of course, the reverse is true as well. Therefore, we can retain null hypothesis 3, because there is no significant difference across professions except for professionals who are licensed to massage or have been trained in massage or another CAM.

The results of the present study were predictable given what is known about education and training. For example, the analyses presented a preponderance of evidence that work experience and any CAM training (including massage) were statistically significant rather than professional position (teacher or therapist) as it related to attitudes about touching and a willingness to practice CAMs. Using caution, professional position was significant only as it related to knowledge. Furthermore, the multiple regression analysis predicted that the more knowledge a participant had about touch and massage, the more they used these approaches in practice. Also it was predicted that where a participant had more of a touch avoidance attitude, the less likely they would use these techniques in practice.

There were some interesting findings with gender and other CAM training variables. As stated earlier, gender was an interesting demographic variable as it was correlated to the touch avoidance factor. The males in the study (n=10) when compared to females (n=316), scored higher on touch avoidance. The males' *M* was a quarter of a *SD* above females on the touch avoid factor. Although this variable was not statistically significant, it conforms to observations about males in our culture. Boys in our culture receive less touching as they age and generally shy away from excessive touching as men (Huss, 1997 & Field, 2001) (see Table 10).

Licensing to practice massage was perceived as a critical variable to study when the survey instrument was developed. However the EI practitioners who responded to the survey were less likely to be licensed. But if they were licensed, they were more likely to accept the use of CAMs in their practice. Only 3.57% (n = 12) of the respondents were licensed (9 occupational therapists, 2 EC/ECSE educators, and 1 combination degree) but 70.5% (n = 237) were trained in CAMs including massage. The most frequent CAM utilized by the respondents was myofascial release (n = 82) at 33.1% and second was a massage course or training in massage (n = 59) at 23.8%.

Pilot Study

The pilot study was informative and gave the investigator information about some possible outcomes with the primary study. The test- retest reliability and construct validity measures used to determine test item consistency and if the test was measuring what the researcher wanted it to measure told the investigator two things: (a) the questions were clustered around two factors—touch attitude and a willingness to practice; and (b) some questions did not perform well across the pre and post tests (i.e. question

#7). However, the pilot study results indicated that the instrument's overall structure was measuring what the researcher hoped it would measure and this knowledge provided confidence in the instrument's psychometric properties.

Previous Research

Previous research is mostly mixed about early intervention practitioners and their knowledge, attitude and willingness to use manual therapies to improve their client outcomes. What we do know is that non-traditional therapies or CAMs are increasing in popularity and more therapists are trained in CAMs and not just massage. Professionals trained in both fields—occupational therapy and EC/ECSE know the benefits of touching and massaging infants in early intervention and both disciplines have advocated for the use of more tactile communication and the use of caring touch in intervention. Training parents to massage and touch their children is also a part of their advocacy.

Many special educators have followed the work of Schneider (1996) who describes the power of touch and massage for infants and young children at risk for developmental delays. Schneider describes five areas of skill development in early intervention that is enhanced or improved through massage—communication, motor, socialization, self-help, and cognition. Schneider proposes that infant-caregiver bonding through massage helps the infant's pre-speech skills (i.e. listening, eye gazing, and turn taking), social reciprocity in playful or quiet states, oral motor awareness and reduced muscle tension during feeding, an overall increase in body awareness, and cognitive awareness of self, and body boundaries.

Farlow (1998) believes that massage is a special gift for parent and child. A daily routine of massage can assist a working parent in connecting with his/her child in a special, nurturing way. Field (1994) and colleagues conducted a study at the Touch Research Institute's (TRI) nursery school to observe the types of touching the children received from the staff and other children. They found that in spite of being a model nursery school, the TRI teachers only touched the one-year-olds 12% of the time and that this lack of touching increased as the children got older. When questioned, many of the teachers stated that they touched very little because of the concern that their touching might be mistaken for sexual abuse.

Huss (1997) an occupational therapist, states that touching starts to decrease at 5–6 years of age in American culture. This decrease touching is directed more strongly toward boys. Huss and McCormack (1991) urge occupational therapists to use a type of intentional touch to help or heal during intervention. According to the American Occupational Therapy Association, CAMs can be used within the scope of practice in occupational therapy as preparatory methods or purposeful activities to facilitate the ability of clients of any age to engage in their daily life occupations. CAM techniques currently being used by occupational therapists include guided imagery, massage, myofascial release, meditation, yoga and behavioral relaxation training (AOTA, 2005).

Hence, it is important to note that myofascial release and massage were confirmed in the present research as the top two touch-related therapies used among practitioners in EI. When a one way ANOVA was conducted with the will practice factor as predicted from professional position, the results were not statistically significant. These results

suggest that a practitioner's willingness to practice a CAM is not based on their professional position but their previous training in non-traditional intervention methods.

Early intervention practitioners as a group in this study ((70.5%) were more likely to have been trained in a complimentary or alternative medical technique and a few of these practitioners were actually licensed to massage (3.5%). When asked to comment about the survey some respondents (n = 21) took time to give the researcher feedback about the survey. The majority of these respondents (n = 14; 66.6%) stated positive comments about touching, and using massage with their clients in early intervention.

Limitations of the Study

In the primary study, there were several sampling errors that could limit the generalizability of this investigation. There were (a) few cases per category; (b) many variables with limited variation; (c) issues of representativeness of the EC and ECSE sample; (d) errors in the format of the survey instrument and (e) researcher effects. Finding participants for the EC/ECSE, OTA, and EI special instructors without a degree category was problematic. Due to time constraints, and mailing lists that were not representative of the population needed, the investigator proceeded with the study with a very small sample in these categories. There was one special instructor without a degree, and only 8 occupational therapy assistants. There were also seven questions related to demographic variables with a range of 2–7 subcategories per question (i.e. professional position had 5 categories) which also limited the numbers in each category. Ten respondents refused to answer or overlooked the demographic questions on the back of the last page of the survey.

Obviously, the section on True/False questions had limited variation in answers. The answers were either true or false. The demographic variables were also limited in variation. Most of the answers were clustered in a few categories. This lack of variation limited the correlation analyses and had an effect on the internal validity of the project.

The third concern was the representativeness of the sample. The occupational therapy group was larger in number (n = 271) and more representative of the population of EI professionals. The sample was taken from a nationwide data base. The teacher group was small in number (n = 40) and represented a state wide sample. However, the analyses in which there was a larger group across professional disciplines (i.e. highest degree versus males and females), the results tended to be significant. We must therefore interpret with caution all measures related to professional position.

Instrumentation errors may have affected respondents and the internal validity of the results. Several errors were made with the printing of the survey instrument and its construction. To save on costs, the survey was printed on the front and back of the paper. One of the respondents commented that the last page (printed on the back of page three) was almost overlooked and another respondent stated that some of the questions or statements were ambiguous. The demographic questions were printed on the last page and some of the categories were confusing or not exhaustive in the groupings (i.e. combination category for degrees for EI and OT).

Researcher effects may have had an effect on external validity. The EI community in Alabama and the OT community across the country are relatively small in comparison to other professional disciplines. I suspect that many of the respondents or potential participants knew the investigator and/or her advisor and based on those relationships

reacted to the survey negatively or positively. Many of the respondents' comments were supportive of the study but some were negative (see Table 12).

The pilot study had several limitations that could have affected the results. Internal validity and reliability problems included subject mortality, subject selection, and subject learning. All of the subjects were volunteers and were selected because of their majors in occupational therapy or ECSE. Participants who are volunteers are likely to be different from participants who are selected to participate in a study. Seven students were lost between the pre and post testing and based on data analyses; some participants learned the material between pre and post testing (see Table 5). Again researcher effects might have an effect on external validity. The students might have been influenced positively or negatively by the fact that their teacher was also the researcher (Patten, 2007).

Implications for Further Research

This investigation was important to undertake because, in spite of its limitations, it added to the body of knowledge in early intervention and touch-related therapies for infants and toddlers with special needs. This investigation is the first study to explore early intervention practitioners and the roles touch and massage play in their interventions. The results predicted what is suggested by the literature—work experience, knowledge and experience with touch-related therapies and CAMs increases the probability of using these methodologies in practice. Hence these empirical results appear to support these precepts. Caution should be exercised on generalizability on all measures

related to discipline specific results due to the small numbers in many categories (see Table 1).

Replication of this study and further research should focus on representative sampling among early intervention teachers using a national population. Occupational therapy assistants and special instructors without a degree were also under represented in the sample. It would be important to add other EI professionals to the population of participants (i.e. physical therapists, speech and language pathologists) and increase the population of males proportional to the females in another study.

Further refinement of the survey instrument would also be appropriate in a replicated study. Some questions or statements did not perform as well as others on the survey. The primary study participants 'comments should be used along with comments and evaluations from a panel of experts to review and revise the instrument and improve its content validity.

This research design explored and described what EI professionals in the field of occupational therapy and EC/ECSE know, feel and do to improve the lives of their clients. The next level would be an experimental design measuring the benefits of touching and massage with infants, toddlers and their caregivers in an early intervention program. More research is needed in the fields of EC/ECSE and occupational therapy. This report contributes to that body of knowledge.

REFERENCES

American Occupational Therapy Association. (2004). Occupational therapy services in early intervention and school-based programs. *American Journal of Occupational Therapy*, *58*, 681–685

American Occupational Therapy Association, Practice Division, Bethesda, MD. (2005). American Occupational Therapy Association (2005) Complementary and alternative Medicine: A position paper. *American Journal of Occupational Therapy*, *59*, 653–655.

Americans with Disabilities Act of 1990, 42 U.S.C. § 12101 *et seq*.

Arendt, R., Maclean,W., & Baumeister, A.(1988). Critique of sensory integration therapy and its application in mental retardation. *American Journal on Mental Retardation, 92*, 401–411.

Auckett, A. (1982). *Baby massage*. New York: Newmarket Press.

Ayres, A. J. (1964). Tactile functions: Their relation to hyperactive and perceptual motor behavior. *American Journal of Occupational Therapy, 18*, 6–11.

Ayres, A. J. (1979). *Sensory integration and the child*. Los Angeles: Western Psychological Services.

Baranek, G., Foster L., & Berkson, G. (1997). Tactile defensiveness and stereotyped behaviors. *American Journal of Occupational Therapy, 51*, 91–95.

Beck, A., Ward, C., Mendelson, M., Mock J., & Erbaugh, J. (1961). An inventory for measuring depression. *Archives of General Psychiatry, 4*, 561–571.

Blackman, J. A. (2002). Early intervention: A global perspective. *Infants and Young Children, 15*(2), 11–19.

Brazelton, T. (1973). *Neonatal behavioral assessment scale*. London: Spastic International Medical Publications.

Brazelton, T. (1984). Introduction. In C. Brown (Ed.), *The many facets of touch* (p. xv). Skillman, NJ: Johnson and Johnson.

Brown, L. J. (2005). *What is holistic health?* Retrieved October 3, 2005 from http://www.holistic.com/holistic/learning.nsf/

Brunner, B. (Ed.). (2002). *Time almanac 2003*. Boston: Family Education Network, Inc.

Bundy, A., & Murray, E. (2002). Sensory integration: A. Jean Ayres' theory revisited. In A. Bundy, S. Lane & E. Murray (Eds), *Sensory integration: Theory and practice* (2nd ed.; pp. 3–10). Philadelphia: F. A. Davis.

Bundy, A., Lane, S., & Murray, E. (Eds.). (2002) *Sensory integration: Theory and practice* (2nd ed.). Philadelphia: F. A. Davis.

Carlson, M. (1998). *Developing self and emotion in extreme social deprivation*. Retrieved August 29, 2000, from http://www.loc.gov/loc/brain/emotion/Carlson.html

Carlson, M., & Earls, F. (1997). Psychological and neuroendocrinological consequences of early social deprivation in institutionalized children in Romania. *Integrative Neurobiology of Affiliation, Annals NY Academy of Science, 807*, 419–428.

Carter, H., & Glick, P. (1970). *Marriage and divorce: A social and economic study.* Cambridge: Harvard University Press.

Coe, C., Lubach, Ershler, W., & Klopp, R. (1989). Influence of early rearing on lymphocyte proliferation responses in juvenile rhesus monkeys. *Brain, Behavior and Immunity 3,* 47–60.

Collier, G. (1985). *Emotional expression.* Hillsdale, NJ: Lawrence Erlbaum Associates.

Costanzo, L. (1998). *Physiology*. Philadelphia: W.B. Saunders.

Costello, E., Edelbrock, C., & Costello, A. (1985). Validity of the NIMH Diagnostic Interview Schedule for children: a comparison between psychiatric and pediatric referrals. *Journal of Abnormal Child Psychology, 13*, 579–595.

Davis, P. (1999). *The power of touch*. Carlsbad, CA: Hay House, Inc.

DEC Task Force on Recommended Practices. (1993). *DEC recommended practices: Indicators of quality in programs for infants and young children with special needs and their families*. Reston, VA: Council for Exceptional Children.

DePaoli, C. (1995). *The healing touch of massage*. New York: Sterling Publishing.

Dunn, W. (1999). *Sensory profile user's manual*. San Antonio: Psychological Corporation.

Erhardt, R. (2005). The role of touch in occupational therapy. *Advance Online Editions for Occupational Therapists.* Retrieved October 10, 2005 from http://occupational-therapy.advanceweb.com

Farlow, P. J. (1998, November). *Touch to T.E.A.C.H*. Paper presented at the meeting of the Alabama Early Intervention Conference, Huntsville, AL.

Field, T. (1984). Early interactions between infants and their postpartum depressed mothers. *Infant Behavior and Development, 7*, 517–522.

Field, T. (1990*). Infancy.* Cambridge: Harvard University Press.

Field, T. M. (1991). Young children's adaptations to repeated separations from their mothers. *Child Development, 62*, 539–547.

Field, T. (1995). Infant massage therapy. In T. Field (Ed.), *Touch in early development* (pp. 105–114). Mahwah, NJ: Lawrence Erlbaum Associates.

Field, T. (1998). Depressed mothers and their newborns. In C. Rovee-Collier (Ed.), *Infant behavior and development.* Special ICIS Issue 21 (p. 84). Greenwich, CN: Ablex Publishing.

Field, T. (2000). *Touch therapy.* New York: Churchill Livingstone.

Field, T. (2001*). Touch.* Cambridge: The MIT Press.

Field, T., Gonzalez, N., Harding, J., Lasko, D., Soliday, B. & Valdeon, C. (1994). Touching in infant, toddler, and preschool nurseries. *Early Child Development and Care,* 98,113–120.

Field, T., Henteleff, T., Hernandez-Reif, M., Martinez, E., Mavunda, K., Kuhn, C., & Schanberg, S. (1998). Children with asthma have improved pulmonary functions after massage therapy. *Journal of Pediatrics, 132*, 854–858.

Field, T., Herandez-Reif, M., Taylor, S., Quintino, O., & Burman, I. (1997). Labor pain is reduced by massage therapy. *Journal of Psychosomatic Obstetrics and Gynecology, 18*, 286–291.

Field, T., Lasko, D., Mundy, P., Henteleff, T., Talpins, S., & Dowling, M. (1997). Children with autism have improved attentiveness and responsivity after massage therapy. *Journal of Autism and Developmental Disorders, 27*, 333–338.

Field, T., Schanberg, S., Scafidi, F., Bower, C., Vega-Lahr, N., Garcia, R., Nystrom, J., & Kuhn, C. (1986). Tactile/kinesthetic stimulation effects on preterm neonates. *Pediatrics, 77*(5), 654–658.

Fritz, S. (2000). *Mosby's fundamentals of therapeutic massage*. St. Louis: Mosby.

Garson, D. (2007). *Factor analysis*. Retrieved September 11, 2007 from http://www2.chass.ncsu.edu/garson/pa765/factor.htm

Garson, D. (2007). *Reliability analysis.* Retrieved November 15, 2007 from http://www2.chass.ncsu.edu/garson/pa765/reliab.htm

Gorski, P., Leonard, C., Sweet, D., Martin, J., Sehring, S., O'Hara, K., High. P., Lang, M., Piecuch, R., & Green, J. (1984). Caring for immature infants a touchy subject. In C. Brown (Ed). *The many facets of touch* (pp. 100–106). Skillman, NJ: Johnson & Johnson.

Hair, J. F., Anderson, R. E., Tatham, R. L., & Black, W. C. (1984). *Multivariate analysis* (5^{th} ed.; pp. 148–149). Upper Saddle River, NJ: Prentice Hall.

Hardee, C. (1998, August 11). Children can benefit from healing touch. *The Huntsville Times*, pp. B1, B6.

Heidt, P. (1991). Helping patients to rest: Clinical studies in therapeutic touch. *Holistic Nurse Practice, 5*(4), 57–66.

Heinl, T. (1983). *The baby massage book*. Englewood Cliffs, NJ: Prentice Hall.

Heinicke, C., & Westheimer, I. (1965). *Brief separations* (p. 12). New York: International Universities Press.

Hicks, J. (1998). The magic of touch. *The News and Observer.* [On line]. Retrieved on January 29, 1998, from http://www.news-observer.com/daily/1998/01/29/day00.html

Hunter, J. H. (2005). Neonatal intensive care unit. In J. Case-Smith (Ed.), *Occupational therapy for children* (p. 715). St. Louis: Elsevier Mosby.

Huss, A. J. (1997). Touch with care or a caring touch. *American Journal of Occupational Therapy, 31*, 295–309.

Individuals with Disabilities Education Improvement Act of 2004, 20 U. S. C. §1400, H. R. 1350 (2004).

Individuals with Disabilities Education Act Amendments (IDEA), 20 U. S. C. §1400 *et seq*. (1997).

Isaacson, R. (1982). *The limbic system* (2nd ed.). New York: W. B. Saunders.

Jourard, S. (1966). An exploratory study of body accessibility. *British Journal of Social and Clinical Psychology, 5*, 221–231

Kaye, K., & Fogel, A. (1980). The temporal structure of face to face communication between mothers and infants. *Developmental Psychology*, *16*, 454–464.

Kielhofner, G. (2006). *Research in occupational therapy: Methods of inquiry for enhancing practice*. Philadelphia: F. A. Davis.

Knickerbocker, B. (1980). *A holistic approach to the treatment of learning disorders*. Thorofare, NJ: Slack.

Koomer, J., & Bundy, A. (2002) Creating direct intervention from theory. In A. Bundy, S. Lane, & E. Murray (Eds.), *Sensory integration: Theory and practice* (2nd ed.; pp. 263–270). Philadelphia: F. A. Davis.

Korner, A. (1984). The many faces of touch. In C. Brown (Ed.), *The many facets of touch* (pp. 107–113). Skillman, NJ: Johnson & Johnson.

Krauss, K. (1987). The effects of deep pressure touch on anxiety. *American Journal of Occupational Therapy,* 41, 366–372.

Krieger, D., Peper, E., & Ancoli, S. (1979). The physiological indices of therapeutic touch. *American Journal of Nursing*, *4*, 660–665.

Kuhn, C. (1986). Tactile/Kinesthetic stimulation effects on preterm neonates. *Pediatrics, 77*, 654–658.

Kuhn, M. (1999). *Complementary therapies for health care providers* (pp. 306–319). Philadelphia: Lippincott, Williams and Wilkins.

Lane, S. (2002) Sensory modulation. In A. Bundy, S. Lane, & E. Murray (Eds.), *Sensory integration: Theory and practice* (2nd ed.; pp. 102–107). Philadelphia: F. A. Davis.

Larson, K. (1982). The sensory history of developmentally delayed children with and without tactile defensiveness. *American Journal of Occupational Therapy*, *36*, 590–596.

Leboyer, F. (1976). *Loving hands: The traditional art of baby massage*. New York: Newmarket Press.

Leboyer, F. (1975). *Birthing without violence*. New York: Basic Books.

Lewis, P., Nicholas, E., Mackey, G., Fadol, A., Sloane, L., Villagomez, E., & Liehr, P. (1997). The effect of turning and backrub on mixed venous oxygen saturation in critically ill patients. *American Journal of Critical Care, 6*(2), 132–140.

Martin, Jr., E. D. (2001). *Significant disability: Issues affecting people with disabilities from a historical, policy, leadership and systems perspective*. Springfield, IL: Charles C. Thomas.

McClure, V. (1989). *Infant message: A handbook for loving parents (*2nd ed.). New York: Bantam Books.

McCormack, G. L. (1991). *Therapeutic use of touch: A treatment guide for the health-care professional.* Tucson, AZ: Therapy Skill Builders.

Montagu, A. (1986). *Touching: The significance of the skin*. NY: Harper Row.

Montagu, A. (1995). Animadversions on the development of a theory of touch. In T. Field (Ed.), *Touch in early development* (pp. 1–10). Mahwah, NJ: Lawrence Erlbaum Associates.

Munro, B. H. (2001). *Statistical methods for health care research* (4th ed.). Philadelphia: Lippincott.

Murdick, N. L., Gartin, B. C., & Crabtree, T. (2002). *Special education law.* Upper Saddle River, NJ: Merrill Prentice Hall.

NCCAM. (2004). *The use of complementary and alternative medicine in the United States.* Retrieved August 18, 2004, from http://nccam.nih.gov/news/camsurvey_fsl.htm

Orcher, L. T. (2007). *Conducting a survey: Techniques for a term project.* Glendale, CA: Pyrczak Publishing.

Ottenbacher, K. (1991). Research in sensory integration: Empirical perceptions and progress. In A. Fisher, E. Murray A. Bundy (Eds.) *Sensory integration: Theory and practice* (pp. 387–399). Philadelphia: F. A. Davis.

Ottenbacher, K., Muller, L., Brandt, D., Heintzelman, A., Hojem, P., & Sharpe, P. (1987). The effectiveness of tactile stimulation as a form of early intervention: A quantitative evaluation. *Journal of Developmental and Behavioral Pediatrics, 8*, 68–76.

Older, J. (1982). *Touching is healing* (p. 49). New York: Stein and Day.

Parham, L. D. (1997, April). *Sensory questionnaire validity for children with autism*. Paper presented at the annual conference of the American Occupational Therapy Association. Orlando FL.

Patten, M. L. (2005).*Understanding research methods: An overview of the essentials* (5th ed.). Glendale, CA: Pyrczak Publishing.

Powell, G., Brasel, J., & Blizzard, R. (1967a). Emotional deprivation and growth retardation simulating idiopathic hypopituitarism: I. Clinical evaluation of the syndrome. *The New England Journal of Medicine, 276*, 1271–1278.

Powell, G., Brasel, J., Raiti, S., & Blizzard, R. (1967b). Emotional deprivation and growth retardation simulating idiopathic hypopituitarism: II. Endocrinologic evaluation of the syndrome. *The New England Journal of Medicine*, *276*, 1279–1283.

Prescott, J. (1971). Early somatosensory deprivation as an ontogenetic process in the abnormal development of the brain and behavior. In E. Goldsmith & J. Moor-Jankowski (Eds.), *Medical primatology* (pp. 1–20). New York: S. Karger.

Punwar, A. J., & Peloquin, S. M. (2000). Occupational therapy: Principles and practices (3rd ed.). Philadelphia: Lippincott Williams & Wilkins

Rayner, P., & Rudd, B. (1973). Emotional deprivation in three siblings associated with functional pituitary growth hormone deficiency. *Australian Pediatric Journal*, *9*, 79–84.

Reed, K. (1984) Models of practice in occupational therapy. Baltimore: Williams & Wilkins.

Reite, M., & Capitanio, J. (1985). On the nature of social separation and social attachment. In M. Reite & T. M. Field, (Eds.), *The psychobiology of attachment and separation* (pp. 232–249). Orlando, FL.: Academic Press.

Rosa, L., Rosa, E., Sarner, L., & Barrett, S. (1996). A closer look at therapeutic touch. *Journal of American Medical Association, 279*(13), 1005–1010.

Rose, S. (1984). Preterm responses to passive, active, and social touch. In C. Brown (Ed.), *The many facets of touch* (pp. 91–100). Skillman, NJ: Johnson & Johnson.

Rosenthal, M. (1952). Psychosomatic study of infantile eczema. *Pediatrics ,10*, 581–593.

Royeen, C. B., & Fortune, J. C. (1990). TIE: Touch inventory for school aged children. *American Journal of Occupational Therapy, 44,* 155–159.

Sadock, B. & Sadock, V. (2003). *Kaplan and Sadock's synopsis of psychiatry: Behavioral sciences/clinical psychiatry* (9th ed.; pp. 159–161). Philadelphia: Lippincott Williams Wilkins.

Schachner, L., Field, T., Hernandez-Reif, M., Duarte, A., & Krasnegor, J. (1998). Atopic dermatitis symptoms decreased in children following massage therapy. *Pediatric Dermatology*, *15*, 390–395.

Schneider, E. (1996). The power of touch: Massage for infants. *Infants and Young Children*, *8*, 40–55.

Section 504 of the Rehabilitation Act of 1973, 29 U.S.C.§ 794 *et seq.*

Stack, D., & Muir, D. (1992). Adult tactile stimulation during face-to-face interactions modulates five-months-olds' affect and attention. *Child Development*, *63*, 1509–1525.

Sultz, H., & Young, K. (2006). *Health care USA: Understanding its organization and delivery* (5th ed). Sudbury, MA: Jones and Bartlett Publishers.

Suomi, S. (1991). Early stress and adult emotional reactivity in rhesus monkeys. In CIBA Foundation (Ed.), *The childhood environment and adult disease* (pp 171–188). Chichester: Wiley.

Suomi, S. (1995). Touch and the immune system in rhesus monkeys. In T. Field (Ed.) *Touch in early development* (pp. 67–79). Mahwah, NJ: Lawrence Erlbaum Associates.

Tronick, E. (1995). Touch in mother-infant interaction. In T. Field (Ed.), *Touch in early development* (p. 53-64). Mahwah, NJ: Lawrence Erlbaum Associates.

Thomas, C., & Venes, D. (Ed.) (2001). *Taber's cyclopedic medical dictionary* (19th ed.). Philadelphia: F. A. Davis.

Vargis, S., & Camilli, G. (1999). A meta-analysis of research on sensory integration treatment. *American Journal of Occupational Therapy, 53*, 189–198.

Williams, M. S., & Shellenberger, S. (1994). *"How does your engine run?" A leader's guide to the alert program for self-regulation.* Albuquerque, NM: Therapy Works.

Yell, M. L. (2006). *The law and special education* (2nd ed.). Upper Saddle River, NJ: Person Merrill Prentice Hall.

APPENDICES

APPENDIX A

INFORMATION LETTER

AUBURN
UNIVERSITY

COLLEGE OF EDUCATION
REHABILITATION AND SPECIAL EDUCATION

INFORMATION SHEET
For Research Study Entitled
---THE ROLES OF TOUCHING AND MASSAGE AMONG OCCUPATIONAL THERAPISTS AND TEACHERS IN EARLY INTERVENTION PROGRAMS---

You are invited to participate in a research study to investigate the knowledge, attitudes and practices of practitioners in occupational therapy and education in early intervention programs. This study is being conducted by Gwendolyn Gray, an assistant professor in the occupational therapy program at Tuskegee University under the supervision of Dr. AmySue Reilly, an associate professor in the Department of Rehabilitation and Special Education. I hope to learn what occupational therapists and teachers working in early intervention understand and believe about the use of touching and massage in their intervention programs. You were selected as a possible participant because you are either an occupational therapist or teacher who works with children between the ages of 0 and 3.

If you decide to participate, you will be requested to fill out a survey with 43 true/false and Likert-type statements and your demographics. The survey can be completed in 15 minutes or less. You will have 14 days to complete and return the survey. When you have completed the survey, please place it in the stamped, return envelope and mail the survey back to me. There is no benefit or compensation associated with this research project. However, if you wish to receive a summary of the results of this study, you can e-mail me at gravg@tuskegee.edu or contact me at the information provided below.

There is a small risk for breaching your confidentiality when the surveys are being mailed and returned. In order to protect your confidentiality, all return envelopes will be shredded and your name will not appear anywhere on the survey. Any information obtained in connection with this study will remain anonymous and confidential. Information collected through your participation will be used to fulfill the educational requirement for a doctoral degree at Auburn University. Composite information may also be used to publish an article in a professional journal or present a paper at a professional meeting. If so, no identifying information will be presented.

You have the right to withdraw from participation at any time, without penalty. However, after you have provided anonymous information and participated in the study, you will not be able to withdraw your data since there is no way to identify your individual information. Your decision whether or not to participate will not jeopardize your future relations with Auburn University, the Department of Rehabilitation and Special Education, or the occupational therapy program at Tuskegee University.

For more information regarding your rights as a research participant you may contact the Auburn University Office of Human Subjects Research or the Institutional Review Board by phone (334) 844-5966 or e-mail at hsubjec@auburn.edu or IRBChair@auburn.edu.

1228 HALEY CENTER
AUBURN, AL 36849-5226

TELEPHONE:
334-844-5943

FAX:
334-844-2080

www.auburn.edu

If you have any questions now or later, my advisor or I will be happy to answer them.

Gwendolyn Gray, M.A., OTR/L
Assistant Professor, SNAH
71-266 Bioethics Center
Tuskegee University
Tuskegee, AL 36088
(334) 727-8695

gravg@tuskegee.edu

AmySue Reilly, Ph.D.
Associate Professor
1228 Haley Center
Department of Rehabilitation and
Special Education
Auburn University, AL 36849
(334) 844-5943 Main office
reillam@auburn.edu

HAVING READ THE INFORMATION PROVIDED, YOU MUST DECIDE WHETHER TO PARTICIPATE IN THIS RESEARCH PROJECT. IF YOU DECIDE TO PARTICIPATE, THE DATA YOU PROVIDE WILL SERVE AS YOUR AGREEMENT TO DO SO. THIS LETTER IS YOURS TO KEEP.

Investigator's Signature _____ Date 1/9/08

Gwendolyn Gray
Print Name

APPENDIX B

SURVEY INSTRUMENT

A SURVEY
OF
EARLY INTERVENTION PRACTITIONERS

Part A

Section I: Knowledge about touching and massage.

Directions: Thinking about your professional intervention as a therapist or early interventionist, respond to the following statements by circling options TRUE or FALSE. **Remember to circle only one number for each statement.**

		TRUE	FALSE
1.	Research has shown that it is healthier to hold, cuddle and soothe a child in your arms when he/she is crying or distressed.	**1**	**2**
2.	Touch research indicates that touching and massaging infants and children are important for their physical growth and social development.	**1**	**2**
3.	Studies show that mother-infant bonding is enhanced through skin to skin contact, touching and massage.	**1**	**2**
4.	Studies on massage have been shown to relieve pain, improve the immune system and reduce stress and discomfort.	**1**	**2**
5.	Some studies have indicated that deep pressure touch used in early intervention programs can increase sensory responsiveness and decrease sensory defensiveness.	**1**	**2**
6.	To reduce infections it is recommended that gloves be used during the day when picking up, touching or handling a child. (This does not include diapering or feeding.)	**1**	**2**
7.	Studies have shown that infants diagnosed with a failure to thrive syndrome are known to improve with only medical care and improved nutrition.	**1**	**2**
8.	Research has shown that infant massage should be a part of a sensory stimulation program for stable, pre-term or low birth weight infants ready for discharge.	**1**	**2**
9.	"Laying on of hands" or intentional touching during intervention has been proven to be ineffective as a treatment approach.	**1**	**2**
10.	Experts agree that communicating with a crying baby should be done by "cooing" or making baby sounds instead of picking up the baby.	**1**	**2**
11.	Based on practice standards, complimentary and alternative treatments are utilized by occupational therapists as preparatory methods to facilitate the ability of their clients to engage in their daily occupations.	**1**	**2**

Section II: Personal attitudes about touching and being touched.

Directions: Thinking about growing up or your usual reaction on typical days regarding touching and being touched, indicate your personal preference or comfort level about touching, being touched, in close contact with others or certain textured objects**. Remember to circle only one number for each statement. SA stands for** *strongly agree***, A stands for** *agree***, D stands for** *disagree* **and SD stands for** *strongly disagree***.**

		SA	A	D	SD
1.	I enjoy being hugged or touched by people who are a part of my family.	**4**	**3**	**2**	**1**
2.	I enjoy being hugged or touched by people who are not a part Of my family.	**4**	**3**	**2**	**1**
3.	While growing up, we rarely touched or hugged each other in my family.	**4**	**3**	**2**	**1**
4.	While growing up, I frequently touched or hugged my family members and friends**.**	**4**	**3**	**2**	**1**
5.	I would rather touch someone else than for them to touch me.	**4**	**3**	**2**	**1**
6.	I like being kissed or having my face touched.	**4**	**3**	**2**	**1**
7.	I dislike being kissed or having my face touched.	**4**	**3**	**2**	**1**
8.	It bothers me to be touched when standing by unfamiliar people when in crowded lines or walking in crowds**.**	**4**	**3**	**2**	**1**
9.	I rarely go barefoot on grass, sand or carpet because I do not care for the “feel” of various textures on my feet.	**4**	**3**	**2**	**1**
10.	I enjoy touching and playing with “messy textures” such as pudding, mud, finger-paints or shaving cream when working with young children with disabilities.	**4**	**3**	**2**	**1**
11.	It bothers me when my hands, clothes and/or face are dirty or messy.	**4**	**3**	**2**	**1**
12.	I do not like wearing hats, sunglasses or other accessories because of the way they feel on my body.	**4**	**3**	**2**	**1**
13.	I cut the tags out of my blouses, shirts, shorts, and/or pants because it feels uncomfortable.	**4**	**3**	**2**	**1**
14.	I enjoy feeling certain textures or fabrics against my skin.	**4**	**3**	**2**	**1**
15.	I have an unusually high tolerance to pain and I may not feel certain kinds of touch stimulation.	**4**	**3**	**2**	**1**
16.	I do not tolerate pain or discomfort well.	**4**	**3**	**2**	**1**
17.	I enjoy a facial, manicure or pedicure because I feel relaxed afterwards.	**4**	**3**	**2**	**1**
18.	I dislike having a facial, manicure, or pedicure because someone is rubbing, massaging or touching my skin.	**4**	**3**	**2**	**1**

		SA	A	D	SD
19.	I enjoy having someone cut, wash or style my hair because I feel relaxed afterwards.	**4**	**3**	**2**	**1**
20.	I do not like the feel of someone cutting, washing or styling my hair.	**4**	**3**	**2**	**1**

Section III: Practices in early intervention with very young children with disabilities.

- *Touch and massage are considered complementary and alternative interventions*.
- *Alternative intervention* approaches are considered non-traditional by the American Medical Association and are not generally available as standard treatments procedures.
- *Complementary approaches* are the use of multiple modalities along with traditional medical approaches.
- *These two approaches can be used with or without traditional medicine.*

Directions: For each of the statements below indicate the extent of your agreement or disagreement about using complimentary and alternative medicine by placing a circle around options 1, 2, 3, or 4. **Remember to circle only one number for each statement**. **SA stands for** *strongly agree*, **A stands for** *agree,* **D stands for** *disagree* and **SD stands for** *strongly disagree.*

		SA	A	D	SD
1.	If training was provided, I would use alternative or complementary approaches in providing intervention(s) with very young children with disabilities if the approach was appropriate.	**4**	**3**	**2**	**1**
2.	I would *not* use alternative or complementary approaches in providing intervention(s) with very young children with disabilities because it is not part of my traditional training.	**4**	**3**	**2**	**1**
3.	If training was provided, I would use treatments like acupuncture, massage, or therapeutic touch because they are known to be effective.	**4**	**3**	**2**	**1**
4.	I stay away from treatments like acupuncture, massage, or therapeutic touch because they are unscientific.	**4**	**3**	**2**	**1**
5.	I have used hand or touch therapy interventions like infant massage, myofascial release, tactile stimulation, or deep pressure touch in intervention for young children with disabilities for its therapeutic benefits.	**4**	**3**	**2**	**1**
6.	The only hand or touch procedures I use during an intervention with young children with disabilities is for positioning, handling or applying a treatment.	**4**	**3**	**2**	**1**

		SA	A	D	SD
7.	I use touch such as cuddling, holding, stroking, or patting young children to soothe them or to communicate that I care or have empathy for them.	**4**	**3**	**2**	**1**
8.	I communicate empathy and caring to young children during intervention by verbally expressing my feelings.	**4**	**3**	**2**	**1**
9.	I am concerned about touching young children with disabilities because my touch might be interpreted incorrectly.	**4**	**3**	**2**	**1**
10.	Touch is an integral part of our every day lives and it is natural to touch during my intervention procedures with young children with disabilities.	**4**	**3**	**2**	**1**
11.	I would use alternative or complementary approaches to treatment like chiropractic care, massage, or tai chi when I am ill, stressed, or need relation.	**4**	**3**	**2**	**1**
12.	I would *not* use alternative or complementary treatments like chiropractic care, massage, or tai chi when I am ill, stressed, or need relaxation because they are unscientific.	**4**	**3**	**2**	**1**

Part B: Demographics: Thank you for completing this attitude scale. Now please tell me something about your background. This information is needed for the statistical analysis and categorization of your answers. **Circle the number next to the response that best describes you.**

Gender

Male	**1**
Female	**2**

Professional Position

OT	**1**
OT Assistant	**2**
Early Interventionist with a degree in Early Childhood (EC)or Early Childhood Sp Ed (ECSE)	**3**
Early Interventionist with a degree in an area other than EC or ECSE	**4**
Early Interventionist without a degree	**5**

Education (credentials earned to be a therapist, educator or early interventionist)

Certificate	**1**
Associate	**2**
BS/MS	**3**
Bachelors	**4**
Masters	**5**
OTD	**6**
Other degree (specify): _____	**7**

Indicate the highest degree earned in any field

Associate	**1**
Bachelors	**2**
Master's	**3**
Ph.D.	**4**
Other Doctorate: _____	**5**

How many years of work experience have you had in early intervention or occupational therapy? _____

Are you licensed to practice as a massage therapist (as governed by a state agency)?

Yes	**1**
No	**2**

Are you trained in any other manual or touch related therapy (e.g. myofascial release, acupressure, reflexology, massage or therapeutic touch)?

Yes	**1**
No	**2**

If you answered **YES above**, please specify which therapy_____

Are there comments you would like to share? If so, please respond on back.

THANK YOU FOR TAKING TIME TO COMPLETE THIS SURVEY!

APPENDIX C

INFORMATION LETTER PILOT STUDY

AUBURN
UNIVERSITY

COLLEGE OF EDUCATION
REHABILITATION AND SPECIAL EDUCATION

INFORMATION SHEET
For Research Study Entitled
---A SURVEY OF EARLY INTERVENTION PRACTITIONERS---

You are invited to participate in a research study to investigate the knowledge, attitudes and practices of practitioners in occupational therapy and education in early intervention programs. This study is being conducted by Gwendolyn Gray, an assistant professor in the occupational therapy program at Tuskegee University under the supervision of Dr. AmySue Reilly, an associate professor in the Department of Rehabilitation and Special Education. I hope to learn what occupational therapists and teachers working in early intervention understand and believe about the use of touching and massage in their intervention programs. You were selected as a possible participant for the pilot study because you are a student in either the field of early childhood education or occupational therapy and both disciplines work in early intervention. You must be 19 years of age or older to participate.

If you agree to volunteer you will be requested to answer a 43 question survey twice which can be completed in 15 minutes or less. This will be done to assess this survey instrument for reliability and validity. We will be administering this survey to you twice within a two week time period. If you decide to participate, you will be notified when you take survey one when survey two will be administered. There is a risk for breach of confidentiality. In order to protect your confidentiality, you will devise an identification code to match your first response with your second response. Each survey will be similarly coded by you and placed in a sealed envelope. Your code will not be known to me. This pilot data will be analyzed as a group based on gender and academic major. The results will be used to refine the survey prior to mailing it to the survey population of occupational therapists and teachers in early intervention.

There is no benefit or compensation associated with this research project. However, you can request information about the results of the study. Your participation is not connected to any class requirements in your academic program. Your participation in the study will be scheduled at a time when you are not in class. Any information collected through your participation will be used to fulfill the educational requirement for a doctoral degree at Auburn University and may be used in future presentations and/or publications. If so, no personally identifying information will be presented.

You have a right to withdraw from participation at any time, without penalty. Your decision whether or not to participate will not jeopardize your future relations with Auburn University's Department of Rehabilitation and Special Education or Tuskegee University's Department of Allied Health or the occupational therapy program. If you would like a summary of the results of this study, please e-mail me at gravg@tuskegee.edu .

1228 HALEY CENTER
AUBURN, AL 36849-5226

TELEPHONE:
334-844-5943

FAX:
334-844-2080

www.auburn.edu

If you have any questions now or later, my advisor or I will be happy to answer them.

Gwendolyn Gray, M.A., OTR/L
Assistant Professor, SNAH
71-266 Bioethics Center
Tuskegee University
Tuskegee, AL 36088
(334) 727-8695

grayg@tuskegee.edu

AmySue Reilly, Ph.D.
Associate Professor
1228 Haley Center
Department of Rehabilitation and Special Education
Auburn University, AL 36849
(334) 844-5943 Main office
reillam@auburn.edu

For more information regarding your rights as a research participant you may contact the Auburn University Office of Human Subjects Research or the Institutional Review Board by phone (334) 844-5966 or e-mail at hsubjec@auburn.edu or IRBChair@auburn.edu and Dr. Stephen Sodeke, Chair, Tuskegee University Human Subjects Review Committee by phone (334)727-8210, or e-mail at sodeke@tuskegee.edu.

HAVING READ THE INFORMATION PROVIDED, YOU MUST DECIDE WHETHER TO PARTICIPATE IN THIS RESEARCH PROJECT. IF YOU DECIDE TO PARTICIPATE, THE DATA YOU PROVIDE WILL SERVE AS YOUR AGREEMENT TO DO SO. THIS LETTER IS YOURS TO KEEP.

Gwendolyn Gray — 1/9/08

Investigator's Signature — Date

Gwendolyn Gray
Print Name

The Auburn University
Institutional Review Board
has approved this document for use
from 1/14/08 to 1/13/09
Protocol # 07-262 EP 0801

APPENDIX D

SCRIPT FOR PILOT STUDY

Script for the Pilot Study with Students

"I am recruiting students to participate in a pilot study entitled 'a survey of early intervention practitioners.' I hope to learn what occupational therapists and teachers working in early intervention understand and believe about the use of touching and massage in their intervention programs. You were selected as a possible participant for the pilot study because you are a student in either the field of early childhood education or occupational therapy and both disciplines work in early intervention. If you agree to volunteer you will be requested to answer a 43 question survey twice which can be completed in 15 minutes or less. This will be done to assess this survey instrument for reliability and validity. We will be administering this survey to you twice within a two week time period. If you decide to participate, you will complete survey one today within the next 10 minutes. Survey two will be administered 2 weeks from today on (date) at (time). If you need a reminder for the administration of survey two, please give your contact information to our secretary. She will contact you the day before survey two will be administered. There is a risk for breach of confidentiality. Therefore you will not write your name on the survey. In order to protect your confidentiality, you will devise an identification code to match your first survey response with your second response. To calculate your identification code, take the day of the month that you, your mother and father were born and multiply them. For example, I was born on October 12, my mother on October 4, and my father was born on April 17. I then multiply 12 times 4 and get 48. I then multiply 48 times 17 and get 816. So I would enter 816 as my identification number on the front cover of the survey. If you do not know your parents' birthdays,

substitute your own birth day for any unknown days. If you need a calculator, raise your hand and I will provide you one. Each survey will be similarly coded by you and placed in an envelope you will seal. Your code will not be known to me. This pilot data will be analyzed as a group based on gender and academic major. The results will be used to refine the survey prior to mailing it to the survey population of occupational therapists and teachers in early intervention. There is no benefit or compensation associated with this research project. However, you can request information about the results of the study. Your participation is not connected to any class requirements in your academic program. Your participation in the study will be scheduled at a time when you are not in class. Any information collected through your participation will be used to fulfill the educational requirement for a doctoral degree at Auburn University and may be used in future presentations and/or publications. If so, no personally identifying information will be presented.

You have a right to withdraw from participation at any time, without penalty. Your decision whether or not to participate will not jeopardize your future relations with Auburn University's Department of Rehabilitation and Special Education or Tuskegee University's Department of Allied Health or the occupational therapy program. If you have any questions now or later, I will be happy to answer them".