INFORMATION TO USERS

This manuscript has been reproduced from the microfilm master. UMI films the text directly from the original or copy submitted. Thus, some thesis and dissertation copies are in typewriter face, while others may be from any type of computer printer.

The quality of this reproduction is dependent upon the quality of the copy submitted. Broken or indistinct print, colored or poor quality illustrations and photographs, print bleedthrough, substandard margins, and improper alignment can adversely affect reproduction.

In the unlikely event that the author did not send UMI a complete manuscript and there are missing pages, these will be noted. Also, if unauthorized copyright material had to be removed, a note will indicate the deletion.

Oversize materials (e.g., maps, drawings, charts) are reproduced by sectioning the original, beginning at the upper left-hand corner and continuing from left to right in equal sections with small overlaps.

Photographs included in the original manuscript have been reproduced xerographically in this copy. Higher quality 6" x 9" black and white photographic prints are available for any photographs or illustrations appearing in this copy for an additional charge. Contact UMI directly to order.
SURVEY OF BEST PHYSICAL EDUCATION PRACTICES FOR CHILDREN WITH AUTISTIC BEHAVIORS

DISSERTATION

Presented in Partial Fulfillment of the Requirements for the Degree Doctor of Philosophy in the Graduate School of The Ohio State University

By

Fabio Luis Fernandes Lisboa, B.S., M.S.

The Ohio State University

2000

Dissertation Committee:

Professor Paul Jansma, Co-Adviser
Professor David Porretta, Co-Adviser
Professor Samuel Hodge

Approved by

Paul Jansma
Co-Advisers
School of PAES
ABSTRACT

The development and implementation of "best practices" when designing, planning, evaluating, and delivering instruction is a key to achieving success when educating children with autistic behaviors in physical education settings. In this regard, certified adapted physical educators (CAPEs) are in a unique position to identify these practices because of their training and professional attainment by passing a national certificate examination. The purpose of this survey research was to obtain information relative to best physical education practices for children with autistic behaviors from certified adapted physical educators (CAPEs). Three areas of the teaching/learning process were investigated in this study (assessment and evaluation; program development and teaching; and, behavior management). A survey instrument (Survey of Best Physical Education Practices for Children with Autistic Behaviors - SBPEPCAB) was developed, and underwent successful checks to establish appropriate face and content validity, and reliability. A total design method was employed as the basic format for the study (Dillman, 1978) and the questionnaire was mailed to the entire CAPE population. Respondents were 216 of 268 CAPES, representing
a 80.6% return rate. Based on the descriptive data gathered, Section Three (behavior management) had the highest grand mean (4.20/5.0), followed by Section Two (program development and teaching) with a grand mean of 3.98, and then by Section One (assessment and evaluation) with a grand mean of 3.67. Frequencies for all items across the three sections revealed that the highest total mean for a single item was 4.80 for "adapt activity" in Section Two. The highest individual mean across independent variables was 4.90 also for "adapt activity" in segregated settings. The lowest individual mean for a single item was 3.04 for "structured assessment" by females in Section One. A 3 X 2 X 2 (setting X years of experience X gender) ANOVA was performed. Significant differences were found for behavior management, relative to physical education settings, $F(2, 171) = 7.60, p < .05$. A post hoc Tukey HSD showed significant differences between segregated (4.19) and inclusive (3.92) ($p < .05$), and between inclusive (4.19) and both settings (4.25) ($p < .05$). Overall results show that the best physical education practices suggested by researchers and related textbook authors are used by CAPEs, always or most of the time, for improving effective teaching and strengthening physical education programs for children with autistic behaviors.
To:

Magda
(My wife and confidant)

Larissa and Deborah
(My daughters, the shiniest stars in my universe)

Déa Fernandes
(My mother and number 1 fan)

Roberto, Flávio, and Dennis
(My brothers, whom I wish were in this journey with me)

and

Dr. José Pinto
(My father in law, partner in great conversations)

This is dedicated to you
ACKNOWLEDGMENTS

It was a great honor to have had two of the greatest scholars in the field of adapted physical education as my co-advisers. I would like to express my sincere appreciation and gratitude to Dr. Paul Jansma and Dr. David Porretta for their valuable advice, support, and for always making me believe in the success of this project. The completion of this journey would not be possible without their comments, encouragement, and guidance. Thank you very much Drs. Jansma and Porretta. May God bless you!

I was very fortunate to have Dr. Samuel (Sam) Hodge as a member of my dissertation committee. He was in fact my "third" adviser. He gave me strength when I was down, and dedicated hours of his busy time to discuss my work. Dr. Hodge offered important suggestions during the course of my research, and I am very thankful for that.

I would like to thank Professor Daniel (Dan) Webb, my first mentor and "friend of the heart", for his welcome and assistance in my first years at OSU. Also, special thanks to Dr. Julienne (Julie) Maeda, Professor Jennifer Hodge, A. C. Sullivan, and Lynn Schincariol for their friendship and for the good time we spent together. "Hey guys, I still believe we are going to write that book...".
My appreciation for the certified adapted physical educators (CAPEs) from all over the United States for their prompt willingness to respond to my request. I would like to give a special thanks to Dr. Luke Kelly (APENS Director), who gave me his consent to use the CAPEs population in this study.

A particular gratitude for two special ladies: Mary Porretta for her unforgettable support to my family and me, and Dr. Sandra Stroot for her eternal smile.

Last but not least, my exclusive appreciation and forever gratefulness to my spouse Magda and my two daughters Issa and Debbie. I am very sure I could have not made it without you by my side. You really made a difference during these last three years far away from our homeland. I am not “The king of the world”, but I certainly am the most fortunate person in this world for having you in my everyday life. Thank you from the bottom of my heart.
VITA

January 26, 1957........................................... Born – Natal, RN – Brazil

1979......................................................... B.Ed. in Physical Education – Federal
University of Rio Grande do Norte.
Natal, RN – Brazil

1982.......................................................... B. S. in Physical Therapy – Federal
University of Rio Grande do Norte.
Natal, RN - Brazil

1994.......................................................... M.S. in Education – University of Maine
Orono, ME - USA

1995 – 1996................................................. Physical Education Teacher
ETFRN, RN – Brazil

1996 – 1999................................................. Graduate Teaching Associate, School of
PAES, The Ohio State University.
Columbus, OH – USA

PUBLICATIONS

domain training and serious disabilities (5th ed., pp. 261-268). Lanham, MD:
University Press of America.


FIELDS OF STUDY

Major Field: Health, Physical Education, and Recreation

Studies in Adapted Physical Education:

Professors Paul Jansma, David Porretta, and Samuel Hodge

Studies in Physical Education Teacher Education (Pedagogy)

Professors Daryl Siedentop, Sandra Stroot, and Deborah Tannehill

Studies in Research:

Professors Larry Miller, Joe Gliem, J. Robert Warmbroad, Jan Henderson, and William Loadman.
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abstract</td>
<td>ii</td>
</tr>
<tr>
<td>Dedication</td>
<td>iv</td>
</tr>
<tr>
<td>Acknowledgments</td>
<td>v</td>
</tr>
<tr>
<td>Vita</td>
<td>vii</td>
</tr>
<tr>
<td>List of Tables</td>
<td>xv</td>
</tr>
<tr>
<td>List of Appendices</td>
<td>xvi</td>
</tr>
<tr>
<td>Chapters:</td>
<td></td>
</tr>
<tr>
<td>1. Introduction</td>
<td>1</td>
</tr>
<tr>
<td>1.1 Importance of studying autism in physical education settings</td>
<td>3</td>
</tr>
<tr>
<td>1.2 Best practices in general and special education</td>
<td>4</td>
</tr>
<tr>
<td>1.3 Best practices in adapted physical education</td>
<td>7</td>
</tr>
<tr>
<td>1.4 Inclusion as a meaningful best practice strategy in physical education</td>
<td>9</td>
</tr>
<tr>
<td>1.5 Theoretical framework for the study</td>
<td>11</td>
</tr>
</tbody>
</table>
1.6 Importance of the study ............................................................. 14  
1.7 Purpose of the study .................................................................. 15  
1.8 Research questions .................................................................. 16  
1.9 Limitations .................................................................................. 17  
1.10 Definition of terms ..................................................................... 17  
2. Review of literature ......................................................................... 19  
   2.1 Overview of autism and autistic behaviors ................................. 20  
      2.1.1 Definitions and theories ..................................................... 20  
      2.1.2 Etiology and diagnosis ...................................................... 24  
      2.1.3 Prognosis and treatment ................................................... 26  
      2.1.4 Tactile defensiveness and maladaptive behaviors ......... 28  
      2.1.5 Communication, socialization, and integration processes 30  
      2.1.6 Behavior modification techniques and interventions for children with autistic behaviors ........................... 35  
      2.1.7 Cognitive ability ............................................................. 45  
   2.2 Views of inclusion for children with autistic behaviors and other disabilities ................................................................. 47  
      2.2.1 The roles of physical educators in inclusion .................... 51  
      2.2.2 Including students with disabilities with autistic
behaviors using play strategies............................................... 55

2.3 Best practices for children with autistic behaviors in physical education................................................................. 58

2.3.1 Best practice, malpractice, and wise practice in physical education............................................................... 59

2.3.2 The teaching/learning environment in physical education settings.............................................................. 61

2.3.3 Adaptation as the key for success in inclusive physical education............................................................. 64

2.4 Research on physical activity for children with autistic behaviors...................................................................................... 66

2.5 Best physical education practices for children with autistic behaviors: Textbook reviews................................................................. 74

2.5.1 Inclusion and integration......................................................... 76

2.5.2 Assessment and evaluation...................................................... 78

2.5.3 Program development.......................................................... 81

2.5.4 Behavior management........................................................ 84

2.5.5 Teaching strategies............................................................ 88

2.6 Summary...................................................................................... 91

3. Methodology.................................................................................. 94

3.1 Participants................................................................................... 94

3.2 Instrument development............................................................ 96

3.2.1 Questionnaire content.......................................................... 97
<table>
<thead>
<tr>
<th>Section</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.3.1.1</td>
<td>Descriptive data</td>
<td>120</td>
</tr>
<tr>
<td>4.3.1.2</td>
<td>ANOVA for ASSESS data</td>
<td>123</td>
</tr>
<tr>
<td>4.3.2</td>
<td>Section Two results - Program development and teaching</td>
<td>125</td>
</tr>
<tr>
<td>4.3.2.1</td>
<td>Descriptive data</td>
<td>125</td>
</tr>
<tr>
<td>4.3.2.2</td>
<td>ANOVA for PROGDEV data</td>
<td>127</td>
</tr>
<tr>
<td>4.3.3</td>
<td>Section Three results - Behavior management</td>
<td>130</td>
</tr>
<tr>
<td>4.3.3.1</td>
<td>Descriptive data</td>
<td>130</td>
</tr>
<tr>
<td>4.3.3.2</td>
<td>ANOVA for BEHAMA data</td>
<td>132</td>
</tr>
<tr>
<td>4.6</td>
<td>Discussion</td>
<td>137</td>
</tr>
<tr>
<td>4.6.1</td>
<td>Research question 1</td>
<td>137</td>
</tr>
<tr>
<td>4.6.2</td>
<td>Research question 2</td>
<td>141</td>
</tr>
<tr>
<td>4.6.3</td>
<td>Research question 3</td>
<td>144</td>
</tr>
<tr>
<td>4.6.4</td>
<td>Research question 4</td>
<td>145</td>
</tr>
<tr>
<td>4.6.5</td>
<td>Research question 5</td>
<td>146</td>
</tr>
<tr>
<td>4.6.6</td>
<td>Research question 6</td>
<td>151</td>
</tr>
<tr>
<td>5.0</td>
<td>Summary, conclusions, and recommendations</td>
<td>154</td>
</tr>
<tr>
<td>5.1</td>
<td>Summary</td>
<td>154</td>
</tr>
<tr>
<td>5.2</td>
<td>Conclusions</td>
<td>162</td>
</tr>
<tr>
<td>5.3</td>
<td>Recommendations</td>
<td>164</td>
</tr>
<tr>
<td>References</td>
<td></td>
<td>166</td>
</tr>
</tbody>
</table>
# LIST OF TABLES

<table>
<thead>
<tr>
<th>Table</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1 List of reviewed adapted and general physical education texts</td>
<td>75</td>
</tr>
<tr>
<td>2.2 A systematic approach to inclusion in physical education</td>
<td>77</td>
</tr>
<tr>
<td>2.3 Summary of best practices in inclusion and integration</td>
<td>79</td>
</tr>
<tr>
<td>2.4 Summary of best practices in assessment and evaluation</td>
<td>82</td>
</tr>
<tr>
<td>2.5 Summary of best practices in program development</td>
<td>85</td>
</tr>
<tr>
<td>2.6 Summary of best practices in behavior management</td>
<td>87</td>
</tr>
<tr>
<td>2.7 Summary of best practices in teaching strategies</td>
<td>90</td>
</tr>
<tr>
<td>3.1 CAPEs distribution by state</td>
<td>95</td>
</tr>
<tr>
<td>4.1 Summary of response rate data</td>
<td>114</td>
</tr>
<tr>
<td>4.2 Group statistics for early and late respondents</td>
<td>114</td>
</tr>
<tr>
<td>4.3 Independent samples test for early and late respondents</td>
<td>116</td>
</tr>
<tr>
<td>4.4 Frequency and percentages for years of teaching adapted physical education (APE) and general physical education (GPE)</td>
<td>117</td>
</tr>
<tr>
<td>4.5 Descriptive statistics for Section One (assessment and evaluation)</td>
<td>121</td>
</tr>
<tr>
<td>4.6 Frequency and percentages for assessment and evaluation</td>
<td>122</td>
</tr>
<tr>
<td>4.7 Three-way ANOVA for Section One (assessment and evaluation) data</td>
<td>123</td>
</tr>
<tr>
<td>Section</td>
<td>Title</td>
</tr>
<tr>
<td>---------</td>
<td>-------</td>
</tr>
<tr>
<td>4.8</td>
<td>Descriptive statistics for Section Two (program development and teaching)</td>
</tr>
<tr>
<td>4.9</td>
<td>Frequency and percentages for program development and teaching</td>
</tr>
<tr>
<td>4.10</td>
<td>Three-way ANOVA for Section Two (program development and teaching) data</td>
</tr>
<tr>
<td>4.11</td>
<td>Descriptive statistics for Section Three (behavior management)</td>
</tr>
<tr>
<td>4.12</td>
<td>Frequency and percentages for behavior management</td>
</tr>
<tr>
<td>4.13</td>
<td>Three-way ANOVA for Section Three (behavior management) data</td>
</tr>
<tr>
<td>4.14</td>
<td>Three-way ANOVA for Section Three (behavior management) data across gender and years of experience</td>
</tr>
<tr>
<td>Appendices</td>
<td>Page</td>
</tr>
<tr>
<td>---------------------------------------------------------------------------</td>
<td>------</td>
</tr>
<tr>
<td>A. Human Subjects Institutional Review Board Approval</td>
<td>182</td>
</tr>
<tr>
<td>B. Survey of Best Physical Education Practices for Children with</td>
<td>184</td>
</tr>
<tr>
<td>Autistic Behaviors (SBPEPCAB)</td>
<td></td>
</tr>
<tr>
<td>C. Content validity evaluation checklist</td>
<td>191</td>
</tr>
<tr>
<td>D. Cover letter for face validity participants</td>
<td>194</td>
</tr>
<tr>
<td>E. Face validity evaluation checklist</td>
<td>196</td>
</tr>
<tr>
<td>F. Cover letter for CAPEs (first package)</td>
<td>199</td>
</tr>
<tr>
<td>G. Postcard reminder for CAPEs</td>
<td>201</td>
</tr>
<tr>
<td>H. Cover letter for CAPEs (second package)</td>
<td>203</td>
</tr>
<tr>
<td>I. Item-by-item descriptive data for independent variables</td>
<td>205</td>
</tr>
</tbody>
</table>
In 1990, with the enactment of Public Law 101-476, The Individuals with Disabilities Education Act (IDEA) (U.S. Department of Education, 1991), autism was for the first time identified as a distinctive disability, even though writings identifying the characteristics of autism date back as far as the 1940s. According to IDEA, autism is defined as a developmental disability, which significantly affects verbal and nonverbal communication and social interaction, generally evident before age three, which adversely affects a child's educational performance (Kanner, 1943; Ritvo & Freeman, 1978). Other characteristics often associated with autism are engagement in repetitive activities and stereotypical movements, and emphasized in IDEA are: resistance to environmental change or change in daily routines, and unusual responses to sensory experiences (U.S. Department of Education, 1991).

Odd movements, such as rocking backward and forward, waving fingers in front of the face, bending the head forward, flapping arms and hands, and making facial grimaces are described as "stereotypical behaviors" or
"stereotypes". Stereotypes, including self-stimulation are behaviors observed among individuals with emotional problems, particularly individuals with autism or presenting autistic behaviors (Koegel & Covert, 1972; Matson, 1994; Watters & Watters, 1980; Wing, 1985). Although stereotypical behaviors are considered as basic characteristics of children with autism, some of those behaviors are also present in other psychiatric or psychological conditions (Matson, 1994).

Disruptive behaviors such as aggression, self-injuries, excessive crying, and unusual body movements among others, are known as "autistic-like behaviors". Autistic-like behaviors may affect communication skills (interfering with socialization) as well as performance in physical and recreational activities, and general development (Elliott, Dobbin, Rose, & Soper, 1994; Kern, Koegel, & Dunlap, 1984). The repeated presentation of stereotypical behaviors causes the individual to perform unskilled movement patterns, characterizing the development of immature movements, which interfere with responses for on-task or other appropriate behaviors (Kern et al., 1982).

Clumsiness or awkwardness is defined as a lack of grace in skilled movements, but is also a reflection of immature movement patterns that could be present in typically developing children. Problems in coordination associated with extreme deficits in emotional control, cause children with autism to present unusual behaviors in movement control (Kern et al., 1982; Wing, 1985). Other characteristics of children with autism are the inability to play, and difficulty in storing, and accessing knowledge in the memory (Jarrold, Boucher & Smith, 1993; Kanner, 1943; Lewis & Boucher, 1995; Wing, 1985). Due to their lack of
imagination and language, most children with autism are unable to fully participate in physical activities in which several components of social integration and appropriate behaviors are required (Kern et al., 1982; Koegel & Rincover, 1976; Lisboa, 1997).

Importance of Studying Autism in Physical Education Settings

Although almost 60 years have passed since the first studies about autism (Kanner, 1943), the prognosis for the syndrome is still unfavorable and, as reported in more current research, it is still very difficult to find any clear relationships among different models and techniques or interventions related to this syndrome (Locke, Banken, & Mahone, 1994). However, the development of a variety of interventions, treatments, and teaching/learning strategies potentially could ameliorate the adverse life conditions of children with autistic behavior. In this connection, physical activity could play a significant role. Several researchers (Connor, 1990; Kern et al., 1982; Killian, Joyce-Petrovich, Menna, & Arena, 1984; Lisboa, 1997; Reid & Morin, 1981; Schmidt, McLaughlin, & Dalyrymple, 1986; Watters & Watters, 1980) have reported that physical activity can reduce autistic behaviors, and as a result can improve socialization, motor development, communication patterns, and general proficiency.

Because the number of children with autistic behaviors in public schools has increased rapidly, school personnel (including physical educators), now have to adapt or modify their instruction (Block, 1996; Schopler & Bristol, 1980). To that end, the collective goal of physical education is to provide appropriate instruction for all students, meeting their individual needs, respecting individual
differences, refining teaching practices, and providing the necessary adaptations so that students can achieve instructional objectives. One way to accomplish this overall goal is to incorporate "best practices" when designing, planning and delivering instruction.

It is a challenge to develop best practice instruction in inclusive settings, because physical education teachers many times lack the competency to provide appropriate instruction, based on best practices, for students with special needs (Melograno & Loovis, 1991). To date, few research studies have examined the teaching performance of physical educators (adapted or general) with children presenting autistic behaviors who are included into their classes, specifically as it relates to best practice perceptions, adaptations, and general practices.

Best Practices in General and Special Education

Best is defined as: "of the most excellent sort; surpassing all others, most suitable, most desirable, most favorable, most profitable, being almost the whole; in the most excellent manner; in the most suitable way, in the highest degree; under the most favorable conditions or interpretation" (Compton’s Interactive Encyclopedia, 1995). Practice is defined as "to do or engage in frequently or usually; to do repeatedly in order to learn or become proficient; exercise or drill oneself in; to put into practice; to teach or train through practice; implies repeated performance for the purpose of learning or acquiring proficiency" (Compton’s Interactive Encyclopedia, 1995). Best practices for students therefore can be defined as the most excellent conditions and the highest degree to teach or train for the purpose of learning or acquiring proficiency. Best practice can also be
viewed as the implementation of strategies and guidelines based on a theoretical base of support, empirical methodology, consensus with literature, and social validity, with the purpose of enhancing the teaching/learning process (Peters & Heron, 1993).

Peters and Heron (1993) proposed a series of criteria for best practices, suggesting that researchers and practitioners should implement such information in current professional practices. First, the authors focused on the need for a theoretical base to support any practice, in order to qualify the practice as "best". Second, they stressed the need for an empirical methodology and design to be provided for any practice. Third, the authors suggested that best practices need to be consistent with existing literature, and that they should produce desirable outcomes. Finally, they stress the need for social validity (i.e., acceptability or viability of an intervention) as a means to evaluate the usefulness and importance of a program, teaching strategy, or intervention.

In order to promote better achievement of goals and objectives in the teaching/learning process, research on effective teaching describes a series of variables with a direct influence on teacher or student behavior (Doyle, 1983; Rosenshine, 1979; Wesson, Wilson, & Higbee-Mandlebaum, 1988). Four variables were compiled in a classroom observation checklist (Sikorski, Niemiec, & Walberg, 1996), with the purpose of providing a tool for teachers' use in examining best practice in special education. The checklist is user-friendly and can be utilized for evaluative feedback among school personnel, as a reminder of practices to be included into lessons, and for systematic peer feedback between
teachers. The four variables presented in the checklist are: a) lesson introduction of concepts of learning, benefits of lesson, students' and teachers' expectations, and behavioral norms; b) lesson presentation incorporating pacing, behavior modeling, eye contact, concrete examples, learning strategies, and challenging questions; c) student participation stressing standards, schedule of activities, comprehension checks, behavior management strategies, and peer interactions; and, d) corrective feedback like content revision, appropriate homework, accurate feedback, and evaluation strategies.

The 1995 Ohio BEST Practices Conference in Columbus, Ohio, addressed several programs developed in the Ohio School System with the purpose of bringing excellence in education. The Development of Physical Activity as a Motivation Tool (Westgate Alternative School, Columbus, Ohio) is a program to improve the participation of students in school activities, based on their learning experiences during physical education sessions in the gymnasium. Another best practice program cited at the conference was developed at The Decker Family Development Center (Barbeton City Schools, Ohio). This program provides comprehensive social, medical, education, and mental health services to low income and special-needs preschool children and their parents (Ohio Education Association, 1995).

In order to develop an adequate "best practice" program in any area of application, it is necessary to observe several variables required in the promotion of an individual's success. O'Neil, Foy, Bailey, and Cuozzo (1995) proposed a "best practices" model combining the strengths of five existing organizational
models (i.e., AT&T, IBM, The U.S. Navy, NYNEX and General Electric) and addressing new features. The model contains eight steps: (a) determining requirements, (b) conducting a performance analysis, (c) determining training requirements, (d) planning and designing the program, (e) developing the training program, (f) creating evaluation strategies, (g) designing and implementing the program delivery strategies, and (h) measuring results. According to O’Neil et al. (1995), the model can be adapted for use in other environments, providing the users a variety of sources for continuous evaluation and feedback. The development of teaching strategies in the education setting suggests that educators should use principles and other tools related to these best practices models.

Best Practices in Adapted Physical Education

Kelly and Gansneder (1998) conducted a nationwide study to examine the preparation, roles, and job demographics of adapted physical educators (APEs) across the United States. According to the authors, serious problems existed in the United States because of a lack in defining whether or not APEs were qualified to provide services for children with disabilities in physical education settings. Results revealed a substantial need from APEs for training (e.g., teaching strategies and motor development), as well as a stated need for continuing education (Kelly & Gansneder, 1998).

As a result of a survey study with adapted physical education professors in institutions of higher education (IHE), Jansma and Surburg (1995) developed several “competency guidelines” concerning the professional preparation of
doctoral students in the area of adapted physical education. The survey resulted in a list of 79 competencies across six specific professional roles: adapted physical educator, researcher, administrator, movement scientist, advocate, and pedagogue. Relative to the physical educator competencies, Jansma and Surburg (1995) emphasized the need to understand a variety of behavior management and motivational techniques and demonstrate the ability to serve as an adapted physical education consultant. They also stated that adapted physical education professors should be able to identify normal and delayed gross motor development, posture, play, and fitness development across high and low incidence disabling conditions, as well as demonstrate the ability to develop criteria for teacher evaluation, including professional growth (Jansma & Surburg, 1995). This study is of fundamental importance for physical educators because it recognizes that what professors teach will eventually affect child learning in schools.

Other best practice intervention and effective teaching strategies in adapted physical education have been provided by Webster (1993). First, individualized instruction was reported as an important key to enhance academic learning time (ALT), especially for students with disabilities placed in general physical education. Second, the use of peer tutors was emphasized, in order to improve levels of motor performance, as well as to develop socialization and integration. Third, the learning environment must have a positive climate, with explicit social relationships among all members of the class (teachers, aides, and students with and without disabilities). Fourth, use of appropriate feedback was
especially noted when used to keep students with behavior problems on-task. In this context, the use of reinforcement was highlighted for students with disabilities. Also, for students with severe mental retardation, the application of primary and sensory feedback was recommended, while for all other types of disabilities, a token economy system seemed to be an efficient reinforcement strategy. However, the most efficient reinforcement strategy advocated, especially for students with profound mental retardation, was the use of music during physical education. Webster (1993) also reported findings from existing research in the area of best practice conditions (i.e., practice opportunities, use of specific feedback, and reinforcement). Research in this area (Del Rey & Stewart, 1989; Porretta, 1988; Vogler, Martinek, & DePaepe, 1989; Weber & Thorpe, 1992) also has revealed that students with autistic behaviors are more successful when a varied maintenance task format is used; that students with mild mental retardation (MMR) learn better when random or sequenced acquisition trials are employed; and, that the use of movement variation enhances skill performance.

Inclusion as a Meaningful Best Practice Strategy in Physical Education

The literature relative to the inclusion of students with disabilities into physical education classes has increased significantly over the past decade. Inclusion is operationally defined as educating children with disabilities (mild to severe) in regular classes, with the support (if needed) of special resources, personnel and curricula (Block & Vogler, 1994). According to Block and Vogler (1994), the development of inclusion has involved social, legislative, and political
processes. Inclusion involves a social process because it involves parents, children, and most of the community (school administrators, teachers, etc.). Inclusion involves a legislative process since the passage of laws is necessary to provide direction. Finally, inclusion involves a political process due to the fact that political influence is needed in order for laws to be passed and enacted.

Block and Vogler (1994) emphasized that there has been little systematic effort to compare integrated and segregated physical education settings as related to the placement and skill development of students with disabilities. Miller (1994) identified challenges that physical educators will meet as the inclusion process progresses. The service delivery of physical education content, which represents the basis for all challenges, should have at least five areas of focus: (a) learning which produces observable outcomes, (b) developmentally appropriate activities, (c) meaningful, functionally based activities, (d) appropriate in-class support, and (e) a student-centered learning environment.

The placement of children of varying special needs, into physical education with no support system, may provide some limited degree of socialization, however, motor skills may not be achieved. On the other hand, an inclusionary support system includes classroom teachers, aides, peer tutors, physical therapists, and occupational therapists, working together during physical education sessions (Miller, 1994). As a supportive statement for the inclusionary process, Heikinaro-Johansson and Vogler (1996) reported that the process of learning for children with disabilities is not, and should not be, adversely affected by inclusion.
Lisboa, Butterfield, Reif, and McIntire (1995) suggested that some children with autism could participate effectively in inclusive physical education classes, when appropriate programs, and support services are provided. More specifically, highly individualized, skill-based programs taught by teachers, using teacher assistants working directly with children, were attributed as the elements with which to actualize effective participation by students.

Lastly, Lisboa (1997) suggested that interaction patterns of children with autism placed in general, adapted, or reversed mainstreaming physical education classes may be improved with the presence and assistance of a classroom aide. Also, positive expectations by instructors and aides is an important key for an easier adjustment of children with autism participating in inclusive physical education activities, which may also result in an improvement of skill performance (Lisboa, 1997). However, best practices in physical education that provide higher degrees of success relative to working with children with autistic behaviors have yet to be addressed in the research literature.

Theoretical Framework for the Study

The framework for this study is based on two theoretical orientations: Adaptation Theory (Kiphard, 1983) and the Conceptual Model of Teaching (Reiser & Dick, 1996). Adaptation Theory expanded by Sherrill (1995), postulates that any professional field must be supported by four themes. Sherrill (1995) applies this to adapted physical education:

Ecosystems with a psychomotor problem – Refers to the construction of a body of knowledge in adapted physical education around human-environment. This
requires changing beliefs, attitudes, intentions, and practices of individuals with and without disabilities within the same environment (inclusive setting);

Physical activity – The main purpose of this theme is to teach and empower lifespan physical activity, providing adaptations of the activities and instruction. Also, teach individuals how to develop physical education programs to meet the needs of children with disabilities;

Service delivery – Emphasis on seven aspects of service delivery: planning (goal setting), assessment (ecosystem relationships), prescription/placement (Least Restrictive Environment philosophy), teaching/counseling/coaching, evaluation (overall system of service delivery), coordination of resources (consultation and administration), and advocacy (emphasis on social changes), and;

Empowerment/advocacy – Individuals' control over their life and events, with emphasis on social change and equity.

The critical challenge of the teaching/learning process is to provide behavioral change in both students and teachers. Adaptations must be viewed as dynamic, continuous, and bi-directional processes (Sherrill, 1998); a reciprocal exchange of information between individuals and the environment. Sherrill (1995) suggested that, in order to be recognized as a profession or as a scholarly discipline, adapted physical education must be based on beliefs and perceptions supporting not only a strong knowledge base, but also stressing interactions between the individual and the environment (adaptations).

Making the right decision about what, how, and where to teach a specific task or content area requires the understanding and perception of all the
variables involved in that particular context. Adaptation theory involves motivation, decision-making, and knowledge of variables, cooperation, and social interaction. In summary, the essence of the adaptation theory is to provide success for the learner, and making use of strategies and procedures from the teaching/learning process. Those strategies are known as best practices (the most excellent conditions and the highest degree to teach or train performances for the purpose of learning or acquiring proficiency). The development and application of best practices in physical education settings is a way to improve the quality of the teaching/learning process. Consequently, using best practices is a key to addressing the tenets of the adaptation theory.

In the Conceptual Model of Teachings, Reiser and Dick (1996), suggested seven steps, which serve as a basis of support for strong and effective planning. These are central to the Conceptual Model of Teaching:

Identifying instructional goals – general statements that will support and preview the desired outcomes of the teaching/learning process;

Identifying objectives – a description of what students will be doing as a result of the instruction they are receiving;

Planning instructional activities – steps and events that take place when instruction is presented to the students;

Choosing instructional media – the types of equipment that will help the application of the instructional plan;

Developing assessment tools – use of strategies to evaluate students’ progress and learning outcomes;
Implementing instruction – use of a mastery learning approach (varying instructional time among students so most students can master the skill to be accomplished), and;

Revising instruction – providing the necessary modifications in the instruction, according to students' progress as reported through the assessment process.

The basic idea of developing systematic instructional planning through the Conceptual Model of Teaching is to enable teachers and students to clearly understand the goals and objectives of the teaching/learning process, as well as to acquire proficiency in basic skills, knowledge and attitude change (Reiser & Dick, 1996). Effective instruction is the final expected outcome of this complex process.

The process of development and application of best practices in teaching physical education is intrinsically related to the principles of the systematic approach to instructional planning. In order to achieve students' success in physical education programs, one must use best practices based on systematically developed instructional planning. The Adaptation Theory and the Conceptual Model of Teaching, associated with the need for explaining the development and application of best practices in inclusionary settings for children with autistic behaviors, establish the basis for and intent of this study.

Importance of the Study

Of major importance in this study is the determination of whether or not physical educators are using appropriate and successful best practices to meet the needs of children with autistic behaviors in physical education settings. Also,
there is an important social context involved in this study, which is related to the importance of providing equal opportunities for the participation of children with autistic behaviors in physical and recreational activities at school. Due to the fact that there is such a paucity of data based research relative to the inclusion of children with autistic behaviors in school settings, the results of this study will begin the validation of related "best practice" for these children. In addition, the results will provide an important source of information to support future physical education research and professional preparation efforts.

Purpose of the Study

Although there is a fair amount of published information relative to best practice in educational settings, no data are available to determine whether or not, to what extent, and how effectively best practices are being implemented in school physical education programs for children with autistic behaviors. However, certified adapted physical educators (CAPEs) are in a unique position to offer suggestions for best practice because of their specific training and practice. Also, teachers should be aware of their goals and responsibilities based on those related competencies derived from 15 established adapted physical education national standards (APENS areas): a) human development; b) motor behavior; c) exercise science; d) measurement and evaluation; e) history and philosophy; f) unique attributes of learner; g) curriculum theory and development; h) assessment; i) instructional design planning; j) teaching; k) consultation and staff development; l) program evaluation; m) continuing education; n) ethics; and, o) communication (Kelly, 1994).
In this context, the purpose of this study is to collect data relative to best physical education practices for children with autistic behaviors from certified adapted physical educators (CAPEs). This research study will explore and validate the key methods and strategies (i.e., best practices) that physical educators use, and authors recommend, to best address the achievement of successful levels of performance and integration in the least restrictive environment (LRE) for children with autistic behaviors.

Research Questions

Six research questions are addressed in this study:

1. Do CAPEs support the same best physical education practices across physical education settings (segregated, inclusive, and both)?

2. Do CAPEs with fewer (less than 4 years) as opposed to more (more than 4 years) years of teaching experience support the same best practices for teaching physical education to children with autistic behaviors?

3. Do male and female CAPEs support the same best practices for teaching physical education to children with autistic behaviors?

4. Do CAPEs who teach or have taught children with autistic behavior support the same best physical education practices identified from those CAPEs who have not taught children with autistic behaviors?

5. What are the best physical education practices for children with autistic behaviors as identified by CAPEs?
6. What best practices presented in the refereed literature on teaching physical education to children with autistic behaviors are practiced by CAPEs in the field?

Limitations

The only limitation to this study was that data were collected from CAPEs certified in 1997 and 1998. No other data were available because national certification began in 1997.

Definition of Terms

Autism – is defined as "a developmental disability significantly affecting verbal and nonverbal communication and social interaction, generally evident before age three, which adversely affects a child's educational performance" (Ritvo & Freeman, 1978, p. 565).

Best Practices - is defined as the most excellent conditions and the highest degree to teach or train performances for the purpose of learning or acquiring proficiency. Best practices includes the implementation of strategies and guidelines based on a theoretical base of support, empirical methodology, consensus with literature, and social validity, with the purpose of enhancing the teaching/learning process (Peters & Heron, 1993, p. 371).

CAPE – "Certified Adapted Physical Educator" is the title given to all physical education professionals who have passed the national certification exam based on the Adapted Physical Education National Standards (APENS) (Kelly, 1997).
Inclusion - is operationally defined as “educating children with disabilities (mild to severe) in regular classes, with the support (if needed) of special resources, personnel and curricula” (Block & Vogler, 1994, p. 16).

Least Restrictive Environment (LRE) - To the maximum extent appropriate, children with disabilities, including children in public or private institutions or other care facilities, are educated with children who do not have a disability, and that special classes, separate schooling or other removal of children with disabilities from the regular educational environment occurs only when the nature and severity of the disability is such that education in regular classes with the use of supplementary aids and services cannot be achieved satisfactorily (Department of Health, Education, and Welfare, 1977, p. 42497).

Stereotypical Behaviors - are defined as “odd movements, such as: rocking backward and forward, waving fingers in front of the face, bending the head forward, flapping arms and hands and making facial grimaces, very typical in individuals with the syndrome of autism” (Harris, Belchic, Blum, & Celiberti, 1994, p. 133).
CHAPTER 2

REVIEW OF LITERATURE

In this chapter, literature related to autism and children with autistic behaviors is presented and discussed. Current literature is reviewed in order to substantiate and contextualize the two theoretical orientations (Adaptation Theory and Conceptual Model of Teaching), which constitute the framework for this study. The issues relative to teaching children with autistic behaviors in physical education, as well as in special education, are divided into six sections. The first section provides a general overview of the syndrome of autism and specific features and characteristics of autistic behaviors. The second section review issues relative to the inclusion of children with autistic behaviors and other disabilities. Section three describes and analyzes best physical education practices. Research on physical education for children with autistic behaviors is reviewed in section four. Section five provides a summary of best physical education practices for children with autistic behaviors from text books in the field. Finally, Section six contains a summary of Sections one through five.
Overview of Autism and Autistic Behaviors

In 1938, a study developed by Dr. Leo Kanner at the Johns Hopkins Hospital revealed the appearance of a psychological condition, in a group of 11 children, different from anything ever reported in the literature and results were eventually published under the title: “Autistic Disturbances of Affective Contact” (Kanner, 1943). As reported by Kanner (1943), the 11 children (eight male and three female, ages two to eight years) presented a series of behavioral disturbances characterized by problems with communication patterns, extreme difficulty with socialization, unusual reaction to environment changes and stimuli, and manifestation of repetitive and stereotypic behaviors. Since then, autistic tendencies have been studied, and researchers all over the world continue to struggle to discover the causes of these psychological phenomena, as well as the most effective strategies and interventions to reduce its symptoms. Autistic symptoms occur in approximately 10 to 15 cases in a population of 10,000 newborns, with an average of four males to one female (Schneider & Mannion, 1996). The onset of autism is prior to age 3 years (APA, 1994). A recent (1998) report from the Ohio Developmental Disabilities Planning Council estimates the occurrence of 400,000 cases of the syndrome in the United States, and classifies autism as the "third most common developmental disability" (AXIS Newsletter, 1998).

Definitions and Theories

As a disturbance of social development, autism is manifested after the second year of life (Kanner, 1943). More specific characteristics of autism
include: delayed echolalia, insistence on sameness, lack of imagination, pronominal reverse, and in many cases, good memory and a normal physical appearance.

Ritvo and Freeman (1978) offer a definition of autism in which it is a behaviorally defined syndrome produced by many types of brain pathology, which, in turn, can have one or more causes. As reported by Stumey and Sevin (1994), autism is a behaviorally defined syndrome, emphasizing among other features, sensory processing abnormalities, developmental delays, and onset prior to 30 months of age.

The *Diagnostic and Statistical Manual of Mental Disorders* - DSM-IV (1994) defines autism as a disorder with the “presence of markedly abnormal or impaired development in social interaction and communication, and a markedly restricted repertoire of activity and interests” (American Psychiatric Association [APA], 1994, p. 66). According to this resource, other conditions associated with autistic disorders include: moderate mental retardation (IQ 35-50), abnormalities in the development of cognitive skills, hyperactivity, impulsivity, aggressiveness, self-injuries behaviors, and tantrums. Terms used to describe autism, according to the DSM-IV (1994), include: Early infantile autism, childhood autism, and/or Kanner's autism. Differential diagnosis may be used to differentiate autism from other pervasive disorders such as Rett's disorder, Childhood disintegrative disorder, and Asperger's disorder.
In an attempt to better understand and clarify the psychological and behavioral intricacies of autism, various theories have been proposed to explain the relation between behavioral patterns and the development of the disorder. The behavioral hypothesis of Ferster (1961) suggests that autistic behaviors are developed in children in whom parents are unable to provide sufficient positive reinforcement, and at the same time have negative reactions to their children's unusual and excessive behaviors. As a result, interdependent reinforcement contingencies between the parents and the child are enough to promote the appearance of autistic behaviors (Ferster, 1961). Ferster (1961) explains that a lack of parental positive reinforcement for a child's acceptable behaviors may be a strong cause for the appearance of autistic tendencies.

In 1989, Lovaas and Smith described four tenets of their behavioral theory. First, the laws of learning account for the behaviors of children with autism, and provide the basis for treatment. Second, there is not a central deficit associated with children with autism; rather, there are many separate behavioral deficits. Third, if special environments are provided, children with autism can learn. Finally, a mismatch between the nervous system and environmental conditions is the major cause of problems associated in children with autism. According to Lovaas and Smith (1989), breaking down a larger problem into smaller units, focusing on environment instead of etiology and history, and placing emphasis on inductive research, are the behavioral methodological decisions needed to support a behavioral treatment.
The social communication theory developed by Koegel, Valdez-Menchaca, and Koegel (1994) attributes autistic like behaviors (self-stimulation, short attention span, tantrums, and language development problems) to a defective neurological or psychological process. Some of the basic features of the theory emerged from their earlier studies in verbal language acquisition, and the development of the Natural Language Teaching Paradigm (Koegel, O'Dell, & Koegel, 1987). The Natural Language Teaching Paradigm attends to the improvement of verbal communication in nonverbal children with autistic behavior, with the manipulation of traditional teaching techniques, incorporating parameters of natural language interactions and motivational techniques.

The most recent theory in this area is the behavioral interference theory, developed by Bijou and Ghezzi (1996). The theory presumes that the tendency of children with autism to avoid and escape tactile and auditory stimuli interferes in the initial development of positive social behaviors. The results of this social disengagement will severely affect the growth of social-emotional and verbal behaviors. Other features associated with the behavioral interference theory are: a) the analysis of stereotypic behavior as a compensatory function of the children's' lack of social and verbal repertoire; and b) social-emotional and verbal behavior deficits are interrelated characteristics of children with autism (Bijou & Ghezzi, 1996).

Almost 60 years after Kanner's (1943) publication describing autism, definitions and theories are still controversial and little is known about the genuine causes of the syndrome. A review of many etiological models and
diagnostic instruments reveals the existence of polemical remarks, and unsettled arguments among researchers.

**Etiology and Diagnosis**

Some of the acceptable and possible etiologies of autism are based on four factors: family history, prenatal, perinatal, and postnatal factors. Family history was described as an acceptable cause for autism by Folstein and Piven (1991), as a result of extensive research in this area. According to their studies, the second child would have higher chances of developing autistic behaviors, if parents have a language, personality, or psychiatric abnormality (Folstein & Piven, 1991).

Nelson (1991) developed another study involving family history as an etiological base for autism. Results from this study showed that there are higher chances for children presenting autistic behaviors in a family where parents are alcoholics, have a psychiatric problem, epilepsy, or other varieties of psychological illnesses, such as schizophrenia. Nelson (1991) also connected the causes of autism, to: a) prenatal factors (mother taking medication during pregnancy, which would cause the accumulation of meconium staining in the amniotic fluid); b) perinatal factors (post maturity of the mother and labor complications); and c) postnatal factors (low birth weight, low Apgar, respiratory problems, hemolytic diseases, delayed cry, and apnea).

A review study with very controversial views was conducted by Rapin (1991) in which the etiology of autism was largely discussed relative to perinatal and postnatal factors. Although Rapin (1991) reports that the etiology of autism is
“unknown in the vast majority of cases”, she states that the syndrome is “rarely if ever” due to perinatal factors or any type of postnatal trauma to the brain. In conclusion, Rapin (1991) emphasizes the need for inquiries about potential encephalopathic events as a possible cause for autistic disturbances.

Stone, Hoffman, Lewis, and Ousley (1994) discuss issues relative to the early recognition of autism based on parental reports and clinical observation. The authors report the importance of early recognition of the syndrome of autism and the extent to which clinical observations and parental reports help in the identification of the disorder. Twenty-six children were used in this study, where social interaction, communication, and activities and interests were evaluated. A standard diagnostic criterion for autism was used to measure the variables. Although recognizing the different perspectives of parents and clinicians for the recognition of the syndrome, both offer information that will help in the early identification of autism. The authors recommend further studies in the areas of play and parental report in order to help in the identification of the disorder in an efficient and timely manner.

A very useful resource for diagnostic criteria and differential diagnosis for autism is the Diagnostic and Statistical Manual of Mental Disorders - DSM-IV (1994). The manual provides a series of suggestions to assist professionals with the clarification and interpretation of issues relative to diagnostic confusions for the syndrome. Some of the main features presented in the DSM-IV are: association with other mental disorders such as abnormalities in eating or sleeping, abnormalities of mood or affect; lack of fear to danger conditions or
harmless objects; and, the presence of a variety of self-injuries behaviors. According to the DSM-IV (APA, 1994), the diagnosis of autism should also be associated with laboratory findings (e.g., abnormal imaging studies; abnormalities in ECG), physical examination findings, and general medical conditions (presence of primitive reflexes, encephalitis, seizures, tuberous sclerosis, fragile X syndrome, and maternal rubella).

As for the course of the syndrome, the DSM-IV (1994) refers to onset prior to three years of age, following an uninterrupted course, with deteriorated behaviors in some individuals during the adolescence period. Although certain individuals with autism may acquire some independence during adult life (about one-third of cases), they may continue to exhibit poor interactions, communications, and other social problems throughout their lives (DSM-IV, 1994).

The differential diagnosis for autism as reported on the DSM-IV (1994) must consider distinguishing autism from other pervasive developmental disorders such as: a) Rett's disorder [sex ratio (only in females), head growth deceleration, poor gait coordination and trunk movements, and transient difficulties in social interactions]; b) childhood disintegrative disorder (developmental regression after two years of normal development); and, c) Asperger's disorder (lack or delay in language development).

**Prognosis and Treatment**

Although still unclear, the prognosis for autism is now based on the use of early discovery and intervention, the development of quantitative assessment
instruments, and the use of social and behavioral intervention techniques. Mcllvane (1996) proposed a series of recommendations for researchers and therapists working with individuals with autism. Among others, Mcllvane (1996) advocates for: 1) research studies related to treatment outcomes with individuals' characteristics; 2) observation of the effects of environmental changes, behavior modeling and other strategies to promote successful outcomes; 3) collaborative projects (interactions between samples and intervention programs); 4) generalization of research outcomes into practice; 5) multidisciplinary effort during intervention programs; and, 6) development of early intervention and follow-up studies.

A highly used intervention, in the area of autistic behavior management, is the technique developed by Ivar Lovaas at the University of California in Los Angeles. The Lovaas behavioral-intervention project for children with autism began in 1970, and had as its major purpose the treatment of very young children (below age 4) with autism in a variety of environments. The results showed a great improvement across all observed behaviors, with 47% of the children in the experimental group achieving normal intellectual and educational functioning. Grounded on his research, Lovaas (1987) suggested that autism is based on different etiologies, and that there are no permanent intellectual or behavioral deficits in recovered children. In an analytical study about behavioral therapy, Lovaas and Smith (1989) provided an overview of research on autism, focusing on developing paradigms for research and treatment. The theory proposed by Lovaas and Smith (1989) is based on a group of four tenets. The
first tenet is that the bases for the treatment of children with autism rest on adequate learning. The second is that instead of having a central deficit behavior characteristic, children with autism have many separate behavior deficits described as developmental delays. The third tenet accounts for the fact that, when placed in special environments, children with autism are able to learn as any other people. The last tenet proposed by Lovaas and Smith (1989) is that the manipulation of the environment in which the child lives may provide adjustments for his/her nervous system, leading to success.

Lovaas (1993) reported a summary of findings on behavioral therapy research for children with autism in the last three decades. Lovaas described three dimensions of the treatment research: 1) The role of serendipity, also known as accidental discoveries; 2) the importance of performing inductive research in the treatment of children with autism; and, 3) the improvement of treatment adequacy by the use of cumulative information gathered over the years. In a follow-up study done with a group of 38 children with autism, using the Early Intensive Behavioral Treatment (The Lovaas Intervention Technique), McEaching, Smith, and Lovaas (1993) reported that the children in the experimental group achieved the best outcomes in contrast to children in the control group, and that this type of treatment may produce significant gains that will last longer.

Tactile Defensiveness and Maladaptive Behaviors

Stereotypical mannerisms, tactile defensiveness, and maladaptive behaviors are some of the barriers that affect academic achievement, social
interaction and the integration of children with autism with their non-disabled peers. Children with autism have difficulty when placed in environments with multiple cues, and their immediate responses are to exhibit behaviors that are generally not accepted by normal developing children (Auxter, Pyfer & Huettig, 1997). Researchers have used various methods or strategies to interrupt or at least to decrease such behaviors, in order to promote better levels of social interaction and social acceptance (Baranek & Berkson, 1994; Elliot, Dobbin, Rose & Soper, 1994; Kamps, Barbeta, Leonard, & Delquadri, 1994).

The act of rubbing, scratching, response withdrawal or avoidance to tactile stimulation is defined as tactile defensiveness. Individuals with autism tend to show a negative reaction to touch. Baranek and Berkson (1994) conducted a study on tactile defensiveness in children with developmental disabilities, as it related to an inhibition deficit. They hypothesized that tactile defensiveness would be associated with higher responsiveness to a tactile stimulus, and that children with varying levels of tactile defensiveness would demonstrate differential levels of habituation. It was concluded that a gradual and increasing tendency to inhibit defensive responses may occur with maturation, and that insufficient evidence was found to support a statement that there is a habituation deficit in tactile defensiveness (Baranek & Berkson, 1994). Stereotyped behavior (rocking, twirling objects, finger flapping) and maladaptive behaviors such as aggression, self-injury, and property destruction clearly interfere with learning and consequently may preclude the inclusion of children with autism in general education settings (Elliot et al., 1994).
Communication is a very important feature in the educational development of individuals with autism. The intent of including children with autism in regular physical education classes is to improve their levels of fitness and general motor skills, to increase interaction with children engaged in common activities, and to develop the achievement of social acceptance (Lisboa, 1997). An improvement in their levels of interaction may develop some communication behavior skills.

Researchers have focused their attention on the study of the behaviors of children with autism relative to their language development and communicative skills. Zanolli, Daggett, and Adams (1996) studied the effects of a priming (technique that employs low demand and high reinforcements) intervention on spontaneous initiation of children with autism to their typical developing peers, relative to five issues involved in teaching children with autism to initiate communication. The five issues were: spontaneity, success of initiation, appropriate rates of initiation compared with peers without disabilities in the same setting, variety of appropriate behaviors to initiate social interactions, and teacher time. The subjects for this study were 18 children (ages 2.5 to 5 years) in a preschool setting. From the selected sample, there were 12 normally developing children and 6 children with developmental delays. Only 2 children with autism were involved in this study (ages 4 year / 10 months, and 4 years / 2 months). Both children were males. The authors used a multiple baseline design across four activities: coloring, water table, cars, and blocks. Data were collected through observations and behaviors of participants (teachers and peers) were
recorded on a data sheet. Results from the study showed that priming successfully addresses all five issues involved in teaching children with autism to initiate interactions with peers. Another study (McArthur & Adamson, 1996) examined attention processes of preschool children who experienced severe delays in the onset of language. The authors used two groups of subjects in this study: Group 1 (treatment) with 15 children with autism (13 boys, 2 girls) with an average age of 47.1 months; and group 2 (comparison) with 15 children with developmental language disorder (DLD) (7 boys and 8 girls) with an average age of 45.6 months. Subjects were selected from a pool of 556 children from a preschool setting. McArtur and Adamson (1996) concluded that children with autistic disorders developed communication patterns with adult partners 37% less than children with DLD, and adults showed more variability in the number of bids for shared attention of children with autism.

Several studies about social interactions of children with autism have been developed in the last decade. Goldstein, Kaczmarek, Pennington and Shafer, (1992) investigated the effects of an intervention (peer-mediated) relative to the social interaction between children with autism and typical developing peers. The participants were 15 children (5 with disabilities and 10 normal developing) enrolled in two integrated preschool classrooms. Four instruments were used to assess the children involved in this study: a) the McCarthy Scales of Children's Ability (McCarthy, 1972); b) the Learning Accomplishment Profile (Lernay, Griffin, & Sanford, 1977); c) the Sequenced Inventory of Communication Development (Hedrick, Prather, & Tobyn, 1975); and, d) the Childhood Autism Rating Scale
(Schopler, Reicher, DeVellis, & Daly (1980). Results showed that the use of comments in conjunction with requests for attention and acknowledgments are strategies that improve social communicative interaction between children with autism and normal developing peers.

In 1992, Odom, Chandler, Ostrosky, McConnell, and Reaney examined a strategy for fading teachers' prompts of normal developing peers relative to their initiations (act of originating interactions) to children with disabilities. Six children with autistic behaviors enrolled in two special education classrooms were the participants for this study. Trained observers collected data in five categories: Initiations, responses, teacher prompts, teacher praise, and social interactions. According to the results, peer initiation of interaction patterns increased at the beginning of the intervention and resulted in increased levels of social interaction for the children with disabilities. The authors recommended additional research in the analysis of variables that extend these skills.

Another study investigated the effects of self-evaluation procedures on preschool children related to their use of social interaction strategies among their classmates with autism (Sainato, Goldstein & Strain, 1992). For the purpose of this study, the researchers used three triads of subjects (one with autism, one peer trained in facilitative strategies, and another peer not trained). Children were in a classroom setting, rotating through three activities during 20-30 minutes of a free play period each day. Results showed improvement in social behavior of children with autism when associated with trained peers. On the other hand, the untrained peers demonstrated little change in their social behavior.
With the purpose of documenting changes in both adults and children behaviors in the reorganization of two classrooms for children with autism, Nordquist, Twardosz, and McEvoy (1991) conducted a study on the influence of the environment on the behaviors of individuals with disabilities. The participants for this study were six children with autism who were residents at a state psychiatric institute, and the classrooms observations were performed during instructional time and free play time. Data were collected two or three times a week, for one and a half-hours. The coded behaviors were smiling, affectionate words, and physical affection. Results showed that adult smiling and affectionate words increased markedly in the free play area, as a result of class reorganization.

Kamps et al. (1994) investigated a strategy to promote peer interactions among individuals with autism and normally developing peers. With some individual variation in performance, the total duration of free-time interactions for individuals with autism and children without disabilities was increased. This study enforces the importance of programs that emphasize academics and the social needs of students as keys to successful inclusion. Kamps et al. (1994) pointed out that “peer strategies” played an important role in the improvement of social skills. The success of children with autism included into the general classroom is directly related to their lack of social competence. On the other hand, social acceptance by their peers, teachers, and classroom aides is also a factor that could facilitate social functioning (Kamps et al., 1994).
Dunn (1989) reviewed the literature in related services and educational models relative to the development of effective therapeutic interventions for children with neurological impairments. This review provided directions for future practices, research, and policy development in the area of physical and occupational therapy for children with special needs. The author first provided an overview of two different models of integrated related services - the dichotomous model (isolated and integrated therapy with students, out of and within the classroom environment) and the continuum of services model (direct treatment, monitoring, and consultation). The models were then compared and Dunn (1989) concluded that positive children outcomes might be achieved by the use of integrated strategies.

Secondly, Dunn (1989) described strategies used to enhance successful integration of related services. Some of the strategies were: a) sensory stimulation technique – development of accurate maps of self and environment; b) posture and movement strategies – use of play experiences to increase interactions with the environment (upper extremity weight bearings, and proper position of the child during an intervention); c) activities of daily living strategies – different types of therapy applied to produce better quality of daily life tasks such as eating, personal hygiene, and dressing; and, d) environmental strategies – identifying a balance between interventions that increase functional skills and assistive and adaptive devices, to produce new learning opportunities.

Finally, Dunn (1989) commented on the need for physical and occupational therapists to support practice, research, and policy development.
The author recommended formal research in several areas, policy changes to support the use of integrated services, and the integration of therapeutic techniques to produce more generalized outcomes. This was a very important literature review for physical and occupational therapy, as well as other related areas of rehabilitation, and education. The review provided a broad amount of knowledge relative to the study of different intervening variables in therapeutic programs.

An important contribution of this article for professionals in other specialization areas working with individuals with disabilities is the amount of information provided about the relationships between rehabilitation and education. The importance of associating and integrating related services as mandated by P.L. 101-476, the Individuals with Disabilities Education Act (IDEA) (U.S. Department of Education, 1991) was stressed during the review, as an important tool for providing successful interventions for children with neurological impairments. This article also provided classroom adaptations for common referral complaints.

**Behavior Modification Techniques and Interventions for Children with Autistic Behaviors**

Integration and inclusion (all students, independent of their level of disabilities, are educated in regular classes) represents an important means of treatment of individuals with autistic behaviors. The use of varied behavior modification techniques and integration with children without disabilities has resulted in reduced aggressiveness for children with autistic behaviors (Wolfberg
Schuler, 1993). Related research shows that autistic behavior decreases when a child with autism is in the presence of children without disabilities (McGee, Paradis & Feldman, 1993). McGee et al. used 28 children with autism, whose chronological ages ranged between two and five years. The research was conducted in a regular classroom environment during a period of six years, and at each year, seven children with autism were integrated with eight children without disabilities.

Special programs of behavior management have been an important development in the treatment of autism. Reducing undesirable behaviors facilitates the inclusion of children with autism. According to Castelloe and Dawson (1993), individuals with autism should live in more normalized settings, avoiding aggressive behaviors that may result in termination of employment or limit recreational opportunities. Therefore, all kinds of activity allowing a complete involvement of the individual with autism in common living activities (playground activities, small-groups participation, etc.) should be emphasized.

Developing and applying intervention for modifying challenging behaviors in children with autistic characteristics is a treatable task for both researchers and therapists. Lovaas, Newsome, and Hickman (1987) reviewed self-stimulatory behavior and perceptual reinforcements by developing a series of theories to explain these psychological phenomena. Self-stimulatory behavior is defined as repetitive, stereotypical, and functionally autonomous behaviors presented by children with developmental disabilities. Perceptual reinforcement was defined for the purpose of this review as psychological behaviors to be taught for children.
with disabilities, in order to extinguish the effects of self-stimulatory behaviors. Reinforcers are characterized as sensory and perceptual.

The authors provided descriptions for behavioral events such as: sensory extinction (removing perceptual consequences of self-stimulatory behaviors to decrease the strength of the behavior); inverse relationship (when self-stimulatory behaviors are strong, alternative behaviors are weak, and vice-versa); blocking (delay or block the effect of self-stimulatory behaviors, by providing the acquisition of alternative behaviors); response substitution (manipulation of a self-stimulatory response and observation of other self-stimulatory response), and sensory deprivation (deprive the individual of perceptual and sensory stimulation, in order to arouse biological needs) (Lovaas et al., 1987).

Although some intervention programs for the treatment of children with autistic behaviors have been used for more than 20 years (e.g. Lovaas' behavioral-intervention therapy), there are still critiques about those programs. Lewis, Baumeister, and Mailman (1987) critiqued Lovaas' et al. (1987) article relative to self-stimulatory behavior and perceptual reinforcement. The authors argued that the theories provided by Lovaas' et al. (1987) fail because biological and pathological stereotypical acts should be taken into account when studying such behaviors. Lewis et al. (1987) suggest that the theories proposed by Lovaas et al. (1987) should be expressed only in terms of recommendations or suggestions.
A study by Hobbs, Blalock, and Chambliss (1995) gathered information about the expenses associated with the use of Lovaas' behavioral-intervention therapy. In this study, the authors also examined parents' stress relative to problems in raising their children. A survey instrument with a 30 item self-report questionnaire was used to obtain data from 22 parents of children with autism (12 mothers and 10 fathers). Results showed that the average cost for the treatment of one child with autism, using the Lovaas behavioral-intervention method, was about $1,237 per month. The cost for an initial consultation ranged from 0 to $1,500. Parents also reported a series of difficulties raising a child with autism, such as feeding, sensory and behavioral problems, hearing impairments, and severe mental retardation, among others. The authors suggest that a provision of additional government funding for treatment of children with autism, might facilitate the lives of many American families in the same situation (Hobbs et al., 1995).

Repp, Felce, and Barton (1988) compared intervention procedures in order to understand stereotypic and self-injures behaviors of children with autism. Participants for this study consisted of one male and two female students (ages 7, 7 and 6 respectively) in special education classes. Hypothesis testing and treatment procedures were used as methods for this study. Results showed that "intervention programs should be based on a functional analysis of behavior in its environmental context" (Repp et al., 1988).

Koegel and Koegel (1990) investigated whether or not students with severe autistic behaviors could learn appropriate behaviors when exposed to a
self-management treatment package. Four children with autism were selected as the participants for this study. A multiple baseline design was used relative to speech, language, and other communicative behaviors. Results showed that all students learned how to use the self-management treatment to improve their communication skills (Koegel & Koegel, 1990).

Gresham and McMillan (1997) evaluated the Lovaas behavioral-intervention therapy, and the UCLA Young Autism Project, and reported a serious threat to experimental validity (internal, external, and construct validity). The evaluation reported a weakness in statements relative to description, outcomes, and critical analysis of the Early Intervention Program (EIP). They also reported problems with the experimental design (e.g., no random selection of the participants, error of instrumentation, and errors in statistical analysis of data). In conclusion, the authors recommended that school district personnel consider the experimental nature of the EIP program, before adopting any kind of treatment for children with autism (Gresham & McMillan, 1997).

In a study by Strawbridge, Drmach, Sisson, and Van Hasselt (1989) a combination of methods and procedures, commonly used in behavior and physical therapy, was employed in order to provide ambulation training for a child with mental retardation, deafness, blindness, and autistic-like behaviors. The participant was a nine-year-old boy diagnosed as having mental retardation, functioning at approximately the 11-month level of motor skill. Other conditions presented by the boy were limited communication responses, and severe bilateral impairment. Initial assessment and training were conducted, with
measurement of target behaviors (on-task and stereotypic behaviors), and stepping (independent stepping, prompted step, and guided step). Interrater agreement percentages, ranging from 77 to 100% with a mean of 91.8%, were achieved among the coders. Sessions were conducted three times a day, four days per week. An approximate duration of 17 minutes for on-task behaviors was noted. Four step training sessions were conducted each day, four days a week, for approximately 30 minutes each. A withdrawal single-case experimental design (Barlow & Hersen, 1984) was used for treatment of on-task behaviors.

Results showed that a reciprocal relationship exists between stereotypic behaviors and time on-task, and that the acquisition of independent stepping skills were enhanced with the use of graduated prompting. Results also indicated that movement-oriented (walking) activities are more likely to decrease stereotypic behaviors than stationary (standing) activities. This single subject study provides important information for physical therapists, applied behavior analysis specialists, and other professionals working with individuals with profound disabilities exhibiting autistic like behaviors. The research emphasizes the development and application of single subject research techniques associated with a combination of movement and behavior therapy, supporting previous research in the area of self-stimulation for improvement of attention-on-task (Sisson, Van Hasselt, & Hersen, 1987). In conclusion, the authors stressed the importance of combining behavior therapy with physical therapy to achieve maximum gains in individuals with multiple disabilities. Future investigations were recommended to explore the use of behavior therapy associated with other
therapeutic techniques, to improve skill performance, and behavior management.

A very useful approach for changing socially significant behaviors for individuals with disabilities, especially those with autistic behavior, is applied behavior analysis (ABA). ABA is defined as the science in which procedures are systematically applied to improve significant behaviors to demonstrate that the procedures used in the treatment are responsible for the improvement of the behavior (Cooper, Heron, & Heward, 1987). ABA is derived from the early studies of Skinner (1938). The most important purposes of ABA are: a) to investigate socially significant behaviors, which are important to the subject(s); b) to provide precise measurement of the behavior to be changed or improved; c) to ascertain that the outcomes are meaningful and generalizable; d) to make certain that the outcomes of the treatment last over time; and, e) to assure that the improved behavior(s) are applicable to other settings or situations. The basic characteristics of ABA are to increase existing behaviors, evaluate and analyze behavior changes, decrease non-acceptable behaviors, and develop new behaviors (Cooper et al., 1987).

In ABA one always identifies the behaviors and skills to be modified or improved, and proceeds with the sequential application of the strategies: a) identification of the behavior; b) selection of the desirable intervention; c) determination of the appropriate reinforcers for the procedures; d) reinforcement of the student's efforts; and, e) provision of ongoing evaluation of the changes in the behaviors (Auxter et al., 1997). A variety of techniques (e.g., active student response, academic games, and daily time trial among others) based on ABA
principles are in large use today in the teaching/learning process of students with special needs.

Active Student Response (ASR) refers to specific teacher behaviors within the classroom environment, used to provide equal opportunities for each student to make responses during the development of the lesson (Heward, 1994). Some examples of ASR used to enhance student participation during a lesson are: problem solving, package sorting, word spelling, sentence reading, and word reading.

As a strategic way to enhance ASR in special classrooms, Heward (1994) identified three strategies, which would be recommended for use in special education teaching settings (choral responding, response cards, and guided notes). The first strategy, choral responding, refers to the students responding orally in unison to an inquiry presented during the lesson. In order to provide most effective results in using choral responding, some procedures must be adopted: a) provide directions stating the type of response desired, modeling the action in one or two trials; b) if a thinking pause is needed, determine the length of the pause; c) use cues to indicate the time of the unison response (e.g. "class, get ready, now"); d) provide feedback for the responses according to the number of correct or incorrect responses; e) eventually call students individually; and, f) keep an animated pace during the performance of the technique (Heward, Courson, & Narayan, 1989). Research in choral responding for students with autistic behaviors and other disabilities, shows that there is an increase in the number of responses, an increase in the number of correct responses, an
increase in opportunity to respond during group instruction, and an increase in group engagement (Bowen, 1996; Kamps, Dugan, Leonard, & Daoust, 1994).

The second strategy described by Heward (1994) was the use of response cards. Students indicating the correct response for a question provided during the lesson hold up cards or signs. According to Heward (1994), the advantage of response cards is the opportunity for the teacher to immediately detect correct or incorrect responses for each student. Two types of response cards (pre-printed or write-on) can be used by students depending on the purposes of the lesson. Pre-printed response cards have the advantages of providing faster responses, ease of teacher identification, and helping students learn by watching others. Write-on response cards on the other hand, have the advantages of flexibility for student responses (e.g., multiple answers in one card), multiple uses, the use of spelling, and the use of recall-type responses. Response cards for students with disabilities were found to increase daily test scores, rate of participation, on-task behavior, number of responses, and student learning (Gardner, Heward, & Grossi, 1994; Inwood, 1995; King, 1997; Shields, 1996; Sterling, Barbetta, Heward, & Heron, 1997).

The last strategy described by Heward (1994) for enhancing ASR was guided notes (teacher-prepared handouts that "guide" a student through a lecture with standard cues and prepared space in which to write the key facts, concepts, and/or relationships). In Rindfuss’s (1997) study relative to the use of guided notes, five general education classes of 8th graders (N=85) were used. The dependent variables were: frequencies of response, accuracy of response, next
day quiz scores, and final exam scores. Reversal applied behavioral analysis design was used as the experimental design, and guided notes, response cards, and single student response (hand raising) were the independent variables. Results showed that the frequency of responses was significantly higher for response cards, and that the accuracy of responses demonstrated that students responded accurately to a greater number of questions. When comparing the rates of responses between cards and guided notes, response cards rated higher. Response cards rate was also higher when compared with hand raising. For the final exam score, 67% of the students scored equal to or higher in response cards, compared with hand rising (Rindfuss, 1997).

Beckley (1996) studied the effects of guided notes during social studies lectures. The participants were eighth grade students attending a suburban public school. The ages of the students ranged from 13 to 14 years. Three students were diagnosed with learning disabilities, one was a gifted student, and five were attending regular education classes. Students were selected from evaluation of note taking accuracy and they all presented different levels of academic ability at the time of the investigation. The observed class session had a duration of 40 minutes. Two teachers (one special education and one social studies) participated in the study and delivered the lesson content using the guided notes technique. Next day quiz scores and accuracy of notes by the students were taken during class. The research design consisted of reversal and alternating treatment tactics. The independent variables were effects of guided notes and use of a resource room review procedure during the guided notes
phase. Results demonstrated that daily next day quiz performance improved for all students involved during guided notes phases and an improvement in next day quiz scores for students' with learning disabilities with resource room review was noted. Resource room review for regular education proved to be helpful, and both students' accuracy improved significantly in note taking skills. An improvement was observed in the accuracy of students with learning disabilities (they learned to take better notes) (Beckley, 1996).

**Cognitive Ability**

Another important area in the intervention management for children with autistic behaviors is related to strategies relative to cognitive ability development. Haywood, Brooks, and Burns (1986) developed a preschool curriculum for children with autism, in which the main purpose was to stimulate cognitive development. The *Bright Star Curriculum* (BSC) emphasizes a metacognitive strategy, where children are encouraged to acquire thinking competence, and at the same time learn to generate cognitive strategies. The basic goals of the BSC are: a) develop basic cognitive functions (e.g., Piaget's stage of concrete operations); b) remediate deficient cognitive functions after its identification; c) develop task-intrinsic motivation; d) develop representational thoughts; e) enhance learning and reading effectiveness to increase school performance; and, f) prevent inappropriate placement in special education settings (Haywood, Brooks, & Burns, 1986).

Three distinctive components form the curriculum-based structure for the BSC. The first component is the theoretical structure, which was based on the
cognitive theories of Haywood and Switzky (1992) (transactional perspective on development), Vygotsky’s social context of cognitive acquisition (Vigotsky, 1978), the constructivism theory of Piaget (1952), and the theory of structural cognitive modifiability of Feuerstein (1970). Within this component, the development of learning concepts by the children is grounded on issues such as growth of specific cognitive processes resulting in educational experiences, social interactions with adults, a sequential cognitive development, and learning a variety of processes of logical thoughts (Butera & Haywood, 1995).

The second component, known as mediational teaching, includes characteristics such as: a) intentionality (the use of interactions by adults to induce changes in child’s behavior); b) transcendence (the generalization of the desired changes (rules, concepts, and habits); c) communication of meaning and purpose (generalization of purposes throughout the specification of each encounter meaning); d) mediation of feelings of competence (use of a variety of feedback (e.g., positive, negative, etc.); e) regulation of behavior (inhibition of undesirable behaviors); and, f) shared participation (emphasis on adult-child partnership and interactions).

The last component of the BSC is the use of cognitive small-group units. The curriculum is organized in 150 small-group lessons, with a variation of 14 to 28 lessons per unit. The study groups must have no more than three to five children, and the focus of the teaching/learning process is on direct teaching and learning of specific cognitive operations and concepts (Butera & Haywood, 1995).
Evaluation studies on the BSC showed that, in many cases, the IQ level of the children participating in the program increased more when compared with children in the other comparison curriculum. There were also gains in cognitive processes, and task-intrinsic motivation, as well as a greater likelihood for regular classroom placement (about four years after Bright Star experience). Results from this evaluation also indicated a greater use of planning and organizational strategies, increase in receptive language, and higher quality answers to questions. The Bright Star Curriculum is a recommended tool to be used for the education of children with autistic behaviors. Because enough assessment data are not yet available to substantiate the benefits of the program for this particular population, further studies are strongly recommended in this area (Butera & Haywood, 1995).

Views of Inclusion for Children with Autistic Behaviors and Other Disabilities

Inclusion is an issue of great debate in general education, and especially in physical education settings. Perceived as a very sensitive topic, the concepts of inclusion and "full" inclusion divide the opinions of a large number of individuals and professionals involved in the education of children with disabilities. Although inclusion today is one of the most important issues in the area of physical education, there are still some concerns relative to this process at different educational levels.

Heikinaho-Johansson and Vogler (1996) reported that inclusion did not seem to be an obstacle in the learning process for children with disabilities. The authors developed a review of literature related to inclusive schooling in regular
education and physical education settings, presenting models of inclusion that have been successfully used. In this particular context, inclusion is defined as a process that allows students to experience, as normal as possible, a regular educational program. Inclusion is contrasted with mainstreaming that implies little or no changes in the classroom environment. As related to children with severe disabilities, the study focused on social acceptance, peer interaction, and meaningful outcomes. Attitudes and perceptions of teachers and students are discussed according to different types of disabilities. Curricular adaptations and instructional strategies for inclusion are presented and discussed. In this review study, Heikinaho-Johansson and Vogler (1996) emphasized the use of students without disabilities as peer tutors during physical education. A framework for adapted physical education consultation was presented at three levels: a) conduct student needs assessment; b) design and implement the program; and, c) evaluate the program. According to the authors, the research base is helping teachers understand if the inclusion of children with disabilities into general physical education works, and in what circumstances it works best.

A variety of strategies may be used to facilitate the inclusionary process. The Hawaiian Model (Murata & Little, 1995) stresses the importance of using part-time teachers (PTTs) as consultants, direct service providers, and facilitators of appropriate inclusion in physical education. Specific modifications and adaptations for all students, based on individual assessment data, and the State of Hawaii's K-12 physical education curriculum guide, is the primary goal of the Honolulu School District (Murata & Little, 1995). The Hawaiian Model is
supported by the State of Hawaii (Department of Education, Honolulu District Office, Special Education), and provides direct physical education to students with disabilities. The program supports 475 students with a variety of disabilities from preschool through high school. PTTs are allowed to view only parts of the student's Individualized Education Program (IEP), and the classroom teacher or adapted physical education resource teachers are responsible for writing the physical education section of the IEP. One goal of the project is to use the district educational specialist as an instrument to allocate funds toward the end of successful student learning. A lot of reorientation training, loss of instruction time to students, and limited flexibility to provide needed supports are stated by the authors as limitations of the model. The use of PTTs facilitating inclusion in regular physical education has been successful in order to provide individualized instruction with opportunities for interactions with students without disabilities (Murata & Little, 1995).

According to Block (1994), inclusion is a process that requires a lot of planning by specialized personnel. Inclusion also stresses that all students with disabilities should attend their community school on a regular basis. Block (1994) describes a series of benefits of inclusion such as: a) opportunity to learn skills in a natural environment; b) more stimulating and motivated environment; c) opportunity to learn appropriate social skills; d) age-appropriate role models; and, e) participation in a variety of school activities with potential to develop new friendships. In another words, a variety of accommodations, alternative placements, and other arrangements are necessary in order to provide for
individuals with disabilities the essential tools for a successful educational life in inclusive environments (Block, 1994).

Advocacy groups for inclusion support the idea that it should occur in all levels and settings of educational programs. Inclusion is defined as the education of children with disabilities in regular classes, with the necessary support of specialized personnel, equipment, special resources, and adapted curricula (Block & Vogler, 1994). Particularly in physical education settings, full inclusion refers to the placement of an individual with disabilities in regular physical education classes with total support.

Block and Vogler (1994) described a scenario where an 8-year-old child was successfully included in a regular physical education class. Organizational models such as curricular adaptation, multilevel curriculum, curricular overlapping, instructional modifications, direct instruction, and the strategies intervention model, are discussed and recommended by Block and Vogler (1994) as efficient approaches for the successful integration of children with disabilities in inclusive physical education settings. The use of human resources such as special education teachers, therapists, paraprofessionals, and peer tutors are suggested as tools for facilitating integration. According to Block and Vogler (1994), more research is needed to examine the effectiveness of specific curricular and instructional adaptations on integration, and to determine what teacher factors positively affect integration.
The Roles of Physical Educators in Inclusion

The process of inclusion of children with disabilities in physical education settings could not be effective without the participation of teachers and school administrators. Successful intervention and the development of goals and short-term instructional objectives are strategies that will enhance the process, and promote integration between students with disabilities and teachers. Well-developed interaction of both parties (students and teachers) is the key for the success of the teaching/learning process within the inclusionary environment.

Stanton and Colvin (1996) described some of the important roles physical educators should play during the inclusion process. A major concern is that in the public education system, the physical education teacher is often times not included in determining the goals and objectives for a child with special needs during the development of the Individualized Education Program (IEP). According to Stanton and Colvin (1996), in the school system, general education teachers almost always schedule IEP meetings during their own conference period, which is when their classes are attending physical education sessions. The time conflict that exists in this event is usually used as an excuse to eliminate the physical education teacher from an IEP’s development. Stanton and Colvin (1996) provided a few recommendations to facilitate the inclusion of physical educators in the school multidisciplinary team. Among others, the physical educator should: a) report to the classroom teacher, principal, and parents the need of physical educators to participate in IEP meetings; b) prior to the meeting, recommend ways to improve the child’s motor skills, and ask for suggestions; c)
submit a written request to attend multidisciplinary meetings; d) ask to be excused from duties to attend multidisciplinary meetings, explaining the importance of attending in relation to the child's educational progress; and, e) demonstrate a willingness to be involved in the child's progress by collecting assessment information about the child's motor skills.

Another recommendation provided by Stanton and Colvin (1996) is the importance of the physical educators' commitment to inclusion. A key point is, in a case of absence from the meeting, as soon as possible the physical educator should contact the IEP team, requesting the following information: a) behavior management strategies to ensure consistent teaching style; b) physical education goals proposed for the child; and, c) other information discussed in the meeting concerning physical education matters.

In order to successfully participate in the inclusionary process, physical educators must be aware of several circumstances that occur within the school environment on a daily basis. In this context, Ellery (1995) proposed some tips that will benefit physical education teachers, helping them feel more comfortable when including students with disabilities into their programs. The first tip was to check for any medical conditions present in the child's files, that in anyway would limit the student's participation in specific physical activities. In this case, it is especially important to observe if there are life threatening medical conditions present, and provide the necessary accommodations to ensure safety relative to that child's performance in physical activities.
A second tip refers to the importance of checking the child's Individualized Education Plan (IEP). The IEP should contain detailed information concerning the student's needs relative to skills and motor development. To guarantee that the child's goals and objectives recommended in the IEP will be achieved, a detailed assessment of the child's motor abilities and fitness levels needs to be provided. Results from the assessment strategies will determine the student's present level of performance, helping the instructors to provide the necessary changes and accommodations to meet the child's needs.

Third, Ellery (1995) provided tips relative to the changes teachers should provide to ensure the student's success in the physical education environment. Among others: a) design individual instruction to help the student attain goals and objectives; b) emphasize cooperation strategies, in order to match the level of performance of the student with a disability with that of peers without disabilities; c) develop new games or modify old ones that make every student equal; d) modify games, environment, equipment, and performance levels to ensure success for all students; and, f) help students develop a mental image of the skill by giving concise directions and clear demonstrations.

The general philosophy of inclusion for physical educators is another important point to be observed in order to fully understand the inclusionary process in physical education settings. Craft (1994) discussed the implications of the inclusion process for physical educators, describing seven areas where inclusion directly affects the teaching of physical education. According to Craft (1994), these areas are: a) disregarding criteria for placement; b) preparing
adapted physical education resource specialists; c) certifying consultants in adapted physical education; d) infusing adapted physical education content across curriculum; e) educating teachers to collaborate; f) reconsidering the teachers' role; and, g) redirecting special education resources.

A major point described by Craft (1994) is that, since all students with disabilities should be included in regular physical education classes, criteria for special placements are not necessary. Students with disabilities should only be pulled out as needed for supplemental instruction. Relative to teachers' preparation, the idea is that, since all students should be included in regular physical education classes, adapted physical education specialists should be prepared to be consultants and resource specialists. Also, training teachers how to teach students with disabilities should be included in all professional preparation curriculums. Other important aspects of making inclusion successful dealt with having proper support systems, and the redirection of special education funds and resources (Craft, 1994).

Blake and Moir (1995) discussed the roles of physical education teachers, when cooperative group work is needed, requiring the involvement of other professionals within the school environment. Working as a team, physical educators, and school personnel will certainly assure that the whole process of including a child with disabilities in physical education will come together. Eight stages occurring during the inclusion process were described by Blake and Moir (1995) that will work positively for the successful inclusion of the student with disabilities in physical education. Stage one refers to the need for requesting
specialist support during the development and implementation of the student’s goals and objectives. In stage two, the reading of the students’ personal file by advisors and teachers is recommended, with the subsequent writing of a synopsis of background information. The next stage (stage three) consists of a meeting with all the school personnel who will be involved in the child’s education program, to discuss issues relative to goals and objectives to be attained in each specific setting. The purposes highlighted in stage four, are to talk with students to get their likes and dislikes related to physical education activities, and observe the physical education environment to detect possible behavior management problems. Stage five suggests the development of a summary report with specific recommendations. After the development of suggestions for student’s goals, another group meeting is recommended in stage six, with the purpose of discussing the report, and the content of the Individualized Education Program (IEP). In stage seven, following the group meeting, amendments are made to the final report and the IEP. The final stage (stage eight) proposed by Blake and Moir (1995), consists of periodic follow up meetings to monitor the students’ progress, and for consultations with the team involved in the process.

Including Students with Autistic Behaviors Using Play Strategies

A variety of treatment and program strategies such as integrated play groups, self-management play, and sociodramatic play have been employed by researchers to find the best ways to develop integration, social interaction, and appropriate play behavior for children with autistic behaviors. The lack of symbolic play skills is one of the peculiarities of the autistic syndrome (Matson,

In 1993, Jarrold, Boucher, and Smith defined symbolic play for children with autism as a simulative or nonliteral behavior where the child acts "as if" something was real when it is really not. They also described the evolution of symbolism in play based on the initial Piaget (1962) description, investigating the developmental trends associated with symbolic play. These trends are: a) Decentration, when the child is moving self, pretending to be another (e.g., imitation of a TV character); b) decontextualization, referring to the use of pretence (imitative) movements without the use of realistic objects (e.g., imitating an airplane flight using hands); and, c) integration, when the child combines pretend acts, and then forms a sequence of movements (e.g., mimics in story telling) (Jarrold et. al., 1993). In Jarrold et al.'s review of literature, many studies did not use adequate methodology when matching control groups, or even failed to include control groups in their investigation.

Integrated or functional play, as opposed to symbolic play, is defined as the appropriate use of an object (toy or a conventional object) or even the combination of two or more objects, in order to create imaginary worlds (Sigman & Ungerer, 1984). In a study by Wolfberg and Schuler (1993), they described the use of a model to promote peer play, evaluating the impact of this model on social and cognitive dimensions in play of three children with autism. Eight features were used in the model. These are: 1) Natural integrated settings, where socially competent children without disabilities were included with children with
autism in such a way as to develop and promote peer integration; 2) well-designed play spaces taking into consideration organization of materials, the density and size of the space, accessibility and spatial arrangements in order to promote full participation of all children; 3) selection of play materials such as constructive and sociodramatic toys, and toys representing diversity (i.e., gender, cultural values, and abilities) as a manner to influence participation and better social behavior during play time; 4) establishing a consistent schedule and routine to prevent the appearance of unusual behaviors from the children with autistic behaviors included in that setting; 5) forming balanced play groups to provide opportunities for the development of social relationships among the participants; 6) focus on child competence to promote a variety of social, and imaginative forms of play, and to provide corresponding developmental levels of creativity, and self-selected play activities; 7) guided participation, referring to the orientation, and guidance of the activities by an adult instructor in order to facilitate the play activities, and integration of the group, without interfering with the activity, and also avoiding an adult-imposed structure; and, 8) full immersion in play, in which the children are engaged in all activities, carrying out tasks in a system of collaboration and mutual support.

The Wolfberg and Schuler (1993) study design consisted of an association of qualitative and quantitative methods. Pre-post samples of solitary play were used and compared with stereotypical play. Videotaped recordings of each session were used, and the observations were conducted for 30 minutes two times a week over a period of approximately seven months. Results showed that
integrated playgroups are beneficial in enhancing play for children with autism placed in inclusive environments. The research also showed evidence of a decrease in aberrant autistic behaviors across school and home settings (Wolfberg & Schuler, 1993).

According to Sherrill (1998), to enhance and develop play and game behaviors in children with autistic behaviors, permanent contact with toys during the activities must be stressed. Other strategies should include permanent contact with typically developing peers, and use of a continuum for play, progressing from solitary to cooperative games. To teach appropriate skills using play activities, instructors must emphasize the need of skill generalization, prompts, the use of organized practices, a reduction in the amount of stimuli, and maintenance of a routine schema for program development (Auxter, Pyfer, & Huettig, 1997; Winnick, 1995).

To promote better levels of interaction of children with autism and peers without disabilities, by reducing undesirable behaviors, teachers should be familiar with autistic characteristics. Teachers’ use of similar skills, constant use of diverse play activities supported with a variety of toys, less verbalization, and other recreational equipment are cues to enhance the quality of the physical education program (Connor, 1990).

Best Practices for Children with Autistic Behaviors in Physical Education

Developing motor and sports skills, aquatic skills, and a variety of other physical activities, requires from the physical educator knowledge and practice of the basic pedagogical skills involved in the teaching/learning process. The
appropriateness of practices that fulfill students' needs in a particular context, will contribute to efficacy in the development of an accurate and precise program. Meanwhile, whether or not the contents to be taught are aligned to the purposes and objectives of the curriculum, and the development of suitable assessment strategies, determines the levels of success for teaching children with disabilities in inclusive environments.

Physical education programs for children with disabilities must be based on the development and implementation of best practices, grounded in the many theories of education. The application of best practice strategies in physical education settings will improve the teaching/learning process, facilitate students' achievement, and at the same time promote the development of socialization and integration patterns. The skepticism that remains among professionals in the area of physical education for children with special needs is based on whether or not best practices can and are being implemented in physical education, and to what extent children are benefiting from these practices.

Best Practice, Malpractice, and Wise Practice in Physical Education

What is “good”, what is “wise”, or what is “best” in terms of teaching physical education for children with disabilities in inclusive settings? This is a question that has been raised in discussions among professionals in education around the world. Best practice relative to teacher effectiveness had a great impact on education, especially during the 1970's, 1980's and 1990's (Cohen, 1994; Doyle, 1983; Kounin, 1983; Rosenshine, 1979; Soar & Soar, 1979). Research on teaching in physical education has focused on a series of variables
in teacher behavior (Anderson & Barrette, 1978; Carneiro Da Costa & Pieron, 1992; Silverman, 1992), student behavior (Martinek & Griffin, 1994; Metzler, 1983; Rife, Shute, & Dodds, 1985; Siedentop, 1983), feedback and skill analysis (Lee, Keh, & Magill, 1993; Magill, 1994; Stroot & Oslin, 1993), planning (Solmon & Lee, 1991; Stroot & Morton, 1989), task structure (Jones, 1992; Siedentop, 1988; Tousignant & Siedentop, 1983), classroom context (Griffin, 1985; Martinek, 1983; Stroot, Collier, O'Sullivan, & England, 1994), and content development (Rink, 1994; Rink, French, Werner, Lynn, & Mays, 1992; Turner & Martinek, 1995). In order to form a strong basis of knowledge across these specific variables in physical education, more research is still needed, particularly as it relates to physical activities for students with special needs.

Some criticisms have risen relative to the concepts and application of best practice strategies in the educational domain. One of these criticisms comes from Davis (1997) who comments "best practice ignores reasonable options by its insistence upon a singular path". In his remarks, Davis (1997) suggested that the best way to improve performance in educational settings would be using "wise practices", including the encouragement of diverse practices, no standardization, and the construction of individual interpretation during curriculum and program preparation.

Malpractice in inclusive settings was also a theme of great discussion in the early 1980's. In this matter, DePaepe (1984) provided a review of the inclusion literature, revealing that articles in adapted physical education are a portrait of teachers' beliefs, not an accountable representation of results from
research relative to behavioral changes in individuals with disabilities. A series of
topics are reviewed and discussed by DePaepe (1984). These include, among
others: a) Historical perspectives — evolution of the inclusive process since the
first studies in the early sixties; b) mainstreaming malpractice suspects — studies
relative to efficacy, paucity in research, and placement; c) support for
segregation — benefits of appropriate physical education programs for children
with disabilities; d) misinterpretation aided malpractice — the implication of the
least restrictive environment (LRE) for the inclusion process; and, e)
administrative mismanagement — budgeting procedures, funding, and financial
incentives. In conclusion, DePaepe (1984) implies a practical alternative to
solving some of these problems, by making use of a few educational strategies
such as studentHelpers in self-contained settings, an increase in the systematic
evaluation process, and use of an alternate placement system.

The Teaching/Learning Environment in Physical Education Settings

Student learning is a key for success in the teaching/learning environment.
Webster (1993) reviewed the most effective instruction strategies for children
with disabilities in inclusive settings, providing a picture of the most recent
research findings. According to Webster (1993), a key to facilitate the learning
process for students with disabilities is the use of individualized instruction,
especially to develop motor skills. Relative to a learning environment, a positive
climate must be stressed, with intensification on the student-teacher relationship,
and a minimization of criticisms, to the lowest levels possible, during the
instructional period. Practice conditions with the use of open environment
activities should be accentuated, and reinforcements should target student's needs and difficulties in the performance of specific tasks (Webster, 1993). The use of corrective feedback is emphasized with a suggestion that it should be brief, specific, and friendly.

With the purpose of achieving student success in educational settings, Reiser and Dick (1996) proposed an effective instructional planning model as a meaningful tool to be used for teacher preparation. The aim of instructional design is to clearly identify goals and objectives within the teaching/learning process in such a way that the end result would be the accomplishment of the intended objectives. The first step in this process is the identification of instructional goals. The ability of the teacher to define the characteristics of the class (e.g., level of abilities, skills, knowledge, interests, needs) must be taken into consideration, when identifying instructional goals. For instance, teachers should make use of available resources such as curriculum and teacher guides, as well as the recommendations and suggestions of the local school board, parents, school administrators, and other interest groups.

The second step recommended by Reiser and Dick (1996) is the identification of objectives. The three components of an objective (behavior, condition, and criteria) should be observed, in order to accentuate the behavior to be learned. To achieve the proposed objectives, it is necessary to identify the prerequisites that the students must possess, and also provide a clear classification of the objectives according to the domains of learning (knowledge, intellectual skills, motor skills, and attitudes).
Once goals and objectives are identified, it is time to move to the third step in the process: planning instructional activities. For developing a strong strategic plan for instruction, Reiser and Dick (1996) described several activities that must be incorporated during the lessons: a) provide strategies to develop student motivation; b) make all students aware of the proposed objectives for a particular lesson; c) help students with the recollection of previous instructions related to the lesson content; d) develop strategies to enhance student participation (i.e., different types of information, and examples); e) emphasize practice of the learned content, as well as the use of instructional feedback; and, f) provide a summary of the lesson at the end of the instructional period.

The fourth and fifth parts of the instructional planning process as recommended by Reiser and Dick (1996) refer to the selection of instructional media and development of assessment tools. Instructional media, also known as pedagogical tools (e.g., instructional games, slides, software, PowerPoint presentations) must be practical to use, appropriate to the student's level of understanding, and suitable for the particular content to be taught. Assessment, on the other hand, requires from the instructor specific knowledge in how to design assessment instruments. Those instruments should determine exactly what the students' knowledge is in a determined area of content, in order to provide information relative to the quality of the instruction, as well as to support necessary remediation in the instruction.

The sixth part of the instructional planning model is the implementation of instruction. Reiser and Dick (1996) suggested the use of a teaching alternative
(mastery learning approach) in which, after the presentation of a unit of instruction, students are assessed within the taught content. Those who mastered the instruction receive refinement activities. Those who did not learn the content will receive remediation. After everybody in the class has learned (mastered) the proposed content, the teacher can move to the next unit of instruction.

The final part of the process is referred to as the revision of instruction. The data collected with the use of a variety of assessment (formal and informal) instruments will serve as the key to detect strengths and weaknesses during a particular unit of instruction, or by the end of the teaching/learning procedures. Teachers should be able to identify problems that should be immediately fixed not only relative to students' achievements, but also to their own (teachers') performance.

**Adaptation as the Key for Success in Inclusive Physical Education**

Adapted physical education refers to the act of physical educators modifying instruction, equipment, and/or the environment in order to provide opportunities for participation in physical activities with high levels of safety, success, and satisfaction by children with disabilities (Lavay & French, 1993). Along these lines, McCubbin, Jansma, and Houston-Wilson (1993) attributed creativity and adaptability (the capacity of the physical educator to adapt instruction for children with disabilities) as major qualities in a teacher. According to McCubbin et al. (1993), the adaptability level of a good instructor is
demonstrated by the ability to adapt equipment and facilities, modify rules and regulations, and display reasonable organizational skills.

The philosophical view of adaptation in physical education is clearly demonstrated by the development of "adaptation theory" (Sherrill, 1995). The idea developed by Sherrill (1995) is to propose a "grand theory" emphasizing the needs of adapted physical educators in pursuing creativity, problem-solving skills, acceptance, imagination, and curiosity as parts of the affective domain. Also, still relative to affective domain concepts, other characteristics such as self-efficacy, perceived competency, locus of control, and self-esteem should be a part of the professional preparation of the adapted physical educator. As part of the preparation of adapted physical education specialists, Sherrill (1994) suggested a model with seven aspects relative to system delivery: a) planning – emphasizing the goals of the system; b) assessment – developing a close relationship with the ecosystem; c) prescription and placement – observing the concepts of least restrictive environment (LRE); d) teaching, counseling, and coaching – electing the student as the major target; e) evaluation – indicating service delivery as its major component; f) coordination of resources – consulting and administration being areas of dominant interest; and, g) advocacy – emphasizing political and social changes within the profession.

Sherrill (1998) suggested several principles of adaptation to be part of the foundation of any best practice physical education program related to adapting instruction and/or activities for children with special needs. Some of the "principles of adapting" described by Sherrill (1998) are: a) observe the
individual, the environment, and most of all, the interactions between them; b) use task analysis when developing motor skill teaching strategies; c) devote high importance to goals and objectives related to the cognitive and affective domains; d) make use of cooperation approaches within the educational team (teachers, instructors, class helpers, administrative personal, and the students); e) adapt with minimal changes in the environment, as a matter of developing challenging situations for the student; f) use good sense relative to social treatment of the students (e.g., do not ridicule); and, g) use functional sport classification systems stressing equal opportunities for all.

Research on Physical Activity for Children with Autistic Behaviors

It is very important to observe several factors when teaching children with autistic behavior in physical education classes: a) the use of classroom aides seems to be of fundamental importance for the achievement of psychomotor goals and objectives; b) the need for teachers to have high expectations relative to motor performance and integration in order to contribute to the successful adjustment of children with autistic behavior in a physical education setting; c) the avoidance of delivering a large amount of information that requires too much knowledge or thinking; d) a realization that frequent changes in activities during the class period may cause confusion, while classes organized with few transitions appears to be more effective and successful; and, e) the usage of consistent methods of teaching during a given unit, which appear to provide a steady balance between the context of the class and the involvement of children with autistic behavior (Lisboa, 1994).
Research in physical activities for children with autistic behaviors has grown substantially in the last two decades. The greatest areas of interest include the use of physical exercise to decrease self-stimulatory behaviors, integration in physical education settings, and the development of movement and motor skills. Results from several studies (Kern, Koegel, & Dunlap, 1984; Kern, Koegel, Dyer, Blew, & Fenton, 1982; Leary & Hill, 1996; Levinson & Reid, 1993; Morin & Reid, 1985; Reid, Cauchon, & Collier, 1991; Schleien, Krotee, Mustonen, Kelterborn, & Schermer, 1987; Watters & Watters, 1980) suggest that the involvement of children with autistic behaviors in regular physical activity reduces undesirable behaviors, improves motor task performance, and provides higher levels of motivation and integration with normal developing peers.

Related to the influence of physical activity on self-stimulatory behavior for children with autistic behaviors, a study by Watters and Watters (1980), compared the performance of children with autism in three different tasks: physical activity, TV watching, and regular academic work. Five male children, ages ranging from 9 to 11 years, participated in the study that occurred during a language training session. A 5-second observe / 5-second record sampling method was used to measure behaviors. Results indicated that the physical exercises, chosen to match each behavior to be eliminated, decreased the probability of self-stimulatory behaviors. According to Watters and Watters (1980), the children involved in this study showed the lowest levels of self-stimulatory behaviors after physical activity, when compared with the levels obtained after TV watching and regular academic work.
Two other studies, Kern et al. (1982) and Kern, Koegel, and Dunlap (1984) investigated the influence of physical activity on self-stimulation in children with autistic behaviors. Kern et al. (1982) investigated the effects of increased physical activity (jogging) on self-stimulatory behaviors in seven children with autistic behaviors. During the first portion of the study, three experimental settings (an open field, a clinic room, and a quiet room) were used for the collection of data, while in the second part children were observed in a regular classroom. A repeated-reversal design was employed. The independent variable for the study was jogging and the dependent variables were self-stimulation, ball-playing, and academic responses. Results demonstrated that the levels of self-stimulatory behaviors decreased subsequent to jogging, and this change in the children behaviors was demonstrated in all three experimental settings.

The second study (Kern et al., 1984) investigated whether or not mild or vigorous exercises would affect stereotyped behaviors. Participants for this study were three children, ages 7, 11, and 11 years, all presenting high levels of stereotypical behaviors. The research sites consisted of a large open field and a living room. A simultaneous-treatment design was used. Two independent variables (vigorous exercise – jogging, and mild exercise – ball playing), and one dependent variable (stereotypic behavior) were targeted. Continuous and vigorous exercise (jogging) decreased the subsequent levels of stereotypical behaviors in children during the experiment, while mild exercise (ball playing), appeared to have no influence in the same observed behavior.
Similar results from the previous study (Kern et al, 1984) were observed by Levinson and Reid (1993) in a study to measure the effects of exercise intensity on the stereotypical behavior of children with autism. Participants were three children (ages 11 years) previously diagnosed as having autism. A reversal design with two treatment conditions (walking and jogging) were employed during a nine-week period. Results from this study showed a significant reduction in stereotypical behavior as a function of the vigorous exercise condition, while mild exercises had little effect on the observed behaviors.

Morin and Reid (1935) measured motor task performance in a variety of skills (balance, throwing, catching, jumping, and running) for eight individuals with autistic behavior. The results were then compared with the levels of performance of the same skills for eight individuals with mental retardation. Quantitative and qualitative assessment measurements were used to assess the performance of the individuals in this study. According to the results, individuals with autistic behaviors exhibited poor motor performance; however, this may have been a result of the mental retardation levels coexisting with the syndrome of autism.

Collier and Reid (1987) investigated two instructional models designed to teach a motor task (bowling) for children with autism. The first teaching strategy (extra-stimulus prompt model) used physical, visual, and verbal prompts, and the second strategy (within-stimulus prompt model) de-emphasized the prompts. Participants for this study consisted of six children with autism (males, ages of 7 to 10 years), enrolled in a special education school. The two treatment conditions
(extra-stimulus prompt and within-stimulus prompt) were used to observe the performance of the six children (three of them in each condition), during three phases: a) a three half-hour period for acquaintance purposes; b) baseline; and, c) experimental conditions. Results from the study showed that extra-stimulus prompting (visual, verbal, and physical prompts) appeared to be a very effective strategy to teach bowling for children with autistic behavior.

As a replication of the previously described research, Reid, Cauchon, and Collier (1991) developed a study with the purpose of contrasting the effectiveness of a teaching model stressing visual prompts, with another model stressing physical prompts, both for teaching bowling skills. In this study, Reid et al (1991) observed four children with autism (two boys ages 15 years, and two girls, ages 11 and 15 years), given one-to-one instruction, with 120 trials for each instructional module in a counter-balanced design. Although replicating previous research (Collier & Reid, 1987), the authors emphasized that reinforcement, task analysis, and physical prompts are important instructional strategies to improve motor task achievement for children with autistic behaviors.

A more recent study by Andrews, Decker, and Boswell (1998) also compared the effectiveness of within-stimulus prompting, and extra-stimulus prompts in teaching bowling skills to children with autistic behaviors. Similar to previous studies (Collier & Reid, 1987; Reid, Cauchon, & Collier, 1991), the results demonstrated that extra-stimulus prompts were more effective than within-stimulus prompts.
The importance of including children with autistic behaviors in physical education settings was discussed in a review article by Reid and Morin (1981) which focused on motor performance, program organization, and teaching principles. The article discusses previous studies (Kanner, 1943; Wing, 1976; DeMyers, 1976) with reference to delays in the motor skill development of children with autistic behaviors, when compared with normal developing children. According to these authors, children with autistic behaviors tend to perform poorly in terms of motor skills when the autistic behavior levels are more severe. As for program organization and teaching principles, Reid and Morin (1981) recommended: a) obtaining as much information as possible about the children's levels of performance; b) using volunteer-helpers to obtain a low student-teacher ratio; c) establishing objectives that can be easily adjusted to the children's needs; d) maintaining a constant routine and structured formation design for instructional purposes; e) developing strategies to increase eye contact; f) using reinforcement for motivational purposes; g) keeping records of children's performances; h) avoiding overuse of environmental stimuli; and, i) targeting skills that can be generalized to other settings.

Schleien et al. (1987) studied the effects of integrating children with autism into physical activity and recreational settings. The purpose of the study was to investigate changes in children's behaviors (social patterns, leisure skills, and adaptive skills) after participating in a physical activity and recreational program. Subjects were two children with autism (ages 8 and 11 years), included in a three-week summer program with 67 normal developing peers. Ecological
analysis and a peer-match (one normal developing child for each child with autism) were employed for behavior modification purposes. Children performances were observed relative to appropriate play, inappropriate play, and orientation to play with objects and/or peers. Results showed a significant increase in appropriate behaviors, and consequently, a significant decrease in inappropriate behavior after participation in the summer program.

The importance of including children with autistic behaviors in physical education settings was also evidenced in other research in this area (Connor, 1990; Lisboa, 1997; Matson, 1994; Thorp, Stahmer & Schreibman, 1995). The deprivation of physical activity and recreation for children with autistic behavior results in a lack of opportunity for the development of social and integrative behaviors, indispensable elements in the children’s lives.

An important strategy for successful inclusion is to assist children without disabilities and teachers in building relationships with children exhibiting autistic behaviors. Christof and Kane (1991) provided the following guidelines and recommendations to improve inclusion: a) observe the environment to accentuate things that interest the child (e.g., games, peers, and people); b) develop self-concept strategies, focusing on the child’s strengths; c) develop communication strategies for each particular child; d) provide reciprocal interactions with the enhancement of natural (non-threatening) actions; e) provide meaningful opportunities for the child’s participation, and allow sufficient time for responses; f) use modifications and adaptations to ensure the child’s success in activities; g) establish limits (e.g., short-term objectives) to help the
child to learn; and h) establish positive options (feedback), in order to decrease negative behaviors (Christof & Kane, 1991).

Connor (1990) provided practical suggestions to facilitate the instructional process for children included in physical education settings. Among other strategies, Connor (1990) suggested: a) knowing the child relative to motor behavior and abilities to learn motor skills; b) reducing undesirable external stimuli; c) emphasizing the use of visual (e.g., posters, demonstrations, videos), and auditory (e.g., verbal directions) teaching strategies; d) avoiding skills that are hard to discriminate (e.g., tennis and badminton); e) using within-stimulus prompting; f) using natural environment teaching strategies (e.g., practice soccer in the soccer field); and, g) adapting equipment to make it as similar as possible to the original implement.

Grandin (1998) presented several tips to help teachers achieve success when teaching children and adults with autistic behavior. They are: a) the use of visual cues; b) avoidance of long verbal instructions; c) avoidance of noisy environments; d) the use of pressure attire (a tight type vestment) to calm the nervous system; e) using strategies to improve the child's eye contact and speech; f) the use of paused language with a singing connotation; g) providing visual and auditory tasks at the same time to improve communication patterns; h) using sensory strategies for communication (e.g., let the child hold a ball before skill practice); and, i) using pictures and flash cards.
Best Physical Education Practices for Children with Autistic Behaviors: Textbook Reviews

The use of a variety of resources to collect information on the subject of autistic behaviors and best teaching practices is warranted for this dissertation especially for comprehensiveness purposes. In such a review process, it is recommended that various resources be examined as a strategy to find pertinent information regarding any particular topic (Thomas & Nelson, 1990). The following literature review is a synopsis of guidelines and recommendations for educating children with autistic behaviors in physical education settings, gleaned from key textbooks in adapted and general physical education. The reviewed textbooks were selected because they were current and contained recommendations and guidelines for teaching children with autistic behaviors in physical education settings. The only exception was for the textbook titled "A practical approach to adapted physical education" (Wiseman, 1982). Although not current, it contained specific best physical education practices for children with autistic behaviors. The best practices were selected based on the following criteria: a) recommended in the textbook; b) related to autistic behavior; and, c) applicable in physical education settings. Other textbooks in the area of adapted and general physical education were reviewed. Because they did not meet the established criteria, they were not included in this study. The following topics were targeted: a) assessment and evaluation strategies; b) program development and teaching; and, c) behavior management. A complete list of reviewed texts and references is presented in Table 2.1.
<table>
<thead>
<tr>
<th>Title</th>
<th>Author(s)</th>
<th>Ed.</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Adapted physical activity, recreation and sport</td>
<td>Sherrill, C.</td>
<td>5th ed.</td>
<td>1998</td>
</tr>
<tr>
<td>4 A practical approach to adapted physical education</td>
<td>Wiseman, D.</td>
<td>-</td>
<td>1982</td>
</tr>
<tr>
<td>5 Adapted physical education for students with autism</td>
<td>Davis, K.</td>
<td>-</td>
<td>1990</td>
</tr>
<tr>
<td>7 Adapted physical education and sport</td>
<td>Winnick, J.</td>
<td>2nd ed.</td>
<td>1995</td>
</tr>
<tr>
<td>8 Special physical education: Adapted, individualized, developmental</td>
<td>Dunn, J.</td>
<td>7th ed.</td>
<td>1997</td>
</tr>
<tr>
<td>9 A teacher's guide to including students with disabilities in regular physical education</td>
<td>Block, M.</td>
<td>-</td>
<td>1994</td>
</tr>
</tbody>
</table>

Table 2.1: List of reviewed adapted AND GENERAL physical education texts.
Inclusion and Integration

Auxter et al. (1997) suggested that reverse mainstreaming appears to be a successful strategy for the inclusion of children with autistic behavior in physical education. Also, the use of a peer tutor would help the child with autistic behaviors to maintain an optimal level of concentration in specific tasks. However, a well-designed program, with special arrangements and explicit instructions, must be implemented, in order to ensure high levels of participation, and interactions among the students with and without disabilities. Auxter et al. (1997) also emphasized the need for a highly structured program for the purpose of placing children with autistic behaviors in physical education settings.

Block (1990) defined inclusion as a process that requires considerable planning by specialized personnel. Inclusion requires the belief that the process will change other people attitudes, and also that all students with disabilities should attend their community school physical education programs from the beginning.

Block (1994) stated that there is an inadequate recognition of the importance of staff development and curriculum adaptations. Another important concern is the lack of teacher training materials addressing needs of students with disabilities, which leads to a limited pre-service or in-service experience of teachers resulting in instructional mediocrity. See Table 2.2 for Block's systematic approach to inclusion.
| Step 1 | Determine the student's individual goals and objectives | - Recognize student's weaknesses and strengths;  
- Determine present level of performance. |
|--------|--------------------------------------------------------|----------------------------------------------------------------------------------|
| Step 2 | Analyze the regular PE curriculum                       | - Determine the most suitable activities to fulfill needs and also ensure success;  
- Develop long-term plans and goals;  
- Analyze lesson plans for the provision of future (if needed) adaptations. |
| Step 3 | Determine how the program will be implemented           | - Decide teaching methods to be employed;  
- Plan activities to be implemented in curriculum;  
- Plan modifications for activities;  
- Choose team work members;  
- Decide types of assessment strategies. |
| Step 4 | Determine who will help the student during the physical education session | - Advocate peers, classroom aids, teacher, assistant, senior citizen, etc. |
| Step 5 | Develop strategies to prepare the team that will work together | - Meet together;  
- Discuss plans;  
- Develop IEP’s;  
- Know the student’s limitations and strengths. |
| Step 6 | Implementation of the program                           | - Determine support team to work with the student; |
| Step 7 | Evaluation                                              | - Develop strategies to promote ongoing evaluation. |

Table 2.2: A Systematic approach to inclusion in physical education

(Block, 1994).
A summary of best practices in inclusion and integration for children with autistic behaviors reviewed from adapted physical education textbooks is presented in Table 2.3. The suggested best practices in Table 2.3 were selected from the following sources: Item 1 (Block, 1994); Items 2 and 7 (Sherrill, 1998); Items 3 and 4 (Auxter et al., 1997); item 5 (Dunn, 1997); Items 6 and 9 (Jansma & French, 1994); item 8 (Lavay, French, & Henderson, 1997); and, item 10 (Davis, 1990).

Assessment and Evaluation

The desired outcome of any educational program is learner success relative to goals and objectives. To obtain this success, instructors must concentrate their efforts on promoting a motivational environment, and develop instructional assessment, which includes a variety of tools or instruments to facilitate learning. Assessment is a process by which teachers make decisions about appropriate diagnostic and screening tools, placement, and curriculum/program effectiveness (Horvat & Kalakian, 1985).

Sherrill (1998) developed a social play behavior inventory to assess play, and game behavior to guide programming. According to Sherrill (1998), goals related to play and game behaviors should include: a) Spontaneous play; b) progress from solitary to cooperative games; c) promotion of contact and interactions with peers and toys; and, d) learning of basic game formations. The social play behaviors inventory is composed of five items: a) autistic/unoccupied (characterized by inquiries about the child's self behaviors, such as object
Best Practices

1. Choose a functional approach to facilitate the child's inclusionary process
2. Use reverse mainstreaming environments as much as possible
3. Use a peer tutoring approach
4. Emphasize the need for a highly structured program
5. Develop communication strategies for both children with and without disabilities
6. Provide meaningful opportunities for participation
7. Use modifications and adaptations
8. Use positive feedback to enhance acceptable behaviors
9. Focus on factors (e.g., games, people, peers) that interest the child
10. Provide reciprocal interactions among peers with and without disabilities, the teacher, and classroom aides.

Table 2.3: Summary of best practices in inclusion and integration.

preferences, self-mutilation, stereotyped and repetitive movements; b) solitary/exploratory (reactions to persons, environment, and exploration of body parts, toys); c) parallel (establishes play spaces near others); d) associative/interactive (development of communication and socialization patterns); and, e) cooperative (participation in group activities, understanding
teacher’s directions, and games rules). Those items are divided into sub-items that cover a variety of behaviors such as spontaneous play, self-stimulation, object preference, play space establishment, contact initiation, and understanding of commands (stop/go, safety zone) among others.

Auxter et al. (1997) suggested the use portfolio assessment strategies (ecobehavioral assessment) to collect sufficient information in order to develop a good individualized education plan (IEP) for students with autistic behaviors. The ecobehavioral assessment refers to ongoing observational data collection in a variety of settings and activities (home, classroom, playground, free play, academic work, leisure and recreation time). Particular attention should be given to motor competency skills such motor performance assessment of children with autistic behaviors. These include: a) Videotaping of child’s movements in different contexts (playing, home activities, recreation and physical activities, etc.); b) photographing child’s play behaviors; c) writing journals and logs about child’s interactions/play behaviors; and, d) developing anecdotal reports of parents and teachers. As a component of the formal assessment/evaluation in the portfolio, Auxter et al. (1997) suggest the use of: a) the Childhood Autism Rating Scale (CARS) (Schopler, Reicher, DeVellis, & Daly, 1980); b) the Autism Behavior Checklist (ABC); c) the Behavior Summarized Evaluation (BSE); d) the Autism Prescreening Checklist; and, e) the North Carolina TEACCH Autistic Children Program Evaluation.

Davis (1990) referred to specific objectives for physical education assessment. Davis state that assessment is the most important tool in learning
about the child's weaknesses and strengths in the motor domain and suggested
some pre-assessment considerations. They are: a) What are the reasons for
referral; b) what is the present level of performance; c) what are the differences
in motor performance between home and school; d) what is the weakest area of
motor development; and, e) what is the assessment schedule. Selection of
assessment instruments must be the next step to be followed by teachers. In this
matter, Davis (1990) suggested using informal observations and criterion-
referenced tests, structured assessment (prior planning), and free time
observations (adaptations to large open spaces, preferred equipment, potential
activities that produce failure, communication patterns, problem-solving skills,
play/social independent skills, etc.). Assessment and evaluation strategies for
children with autistic behaviors are summarized in Table 2.4. The suggested best
practices in Table 2.4 were selected from the following sources: Items 1, 3, and 4
(Auxter et al., 1997); Items 2 and 10 (Winnick, 1995); Items 5, 8 and 9 (Davis,
1990); Items 6 and 11 (Sherrill, 1998); and, item 7 (Jansma & French, 1994).

Program Development

In order to teach skill acquisition and play to children with autistic
behaviors, Winnick (1995) recommended four things: a) minimize or significantly
reduce the amount of stimuli in the learning environment; b) provide prompts
(i.e., cues, instructions, demonstrations); c) offer opportunities to generalize the
use of learned skills; and, d) organize practice using task variation (distributed
practice).
Auxter et al. (1997) referred to the importance of choosing appropriate activities according to the children's age, severity of disability, and level of

Best Practices

1. Use of an assessment portfolio
2. Use ongoing observational evaluation strategies
3. Use a variety of data collection strategies (e.g., videotape, observations, photographs, journal and logs, anecdotal reports, etc.)
4. Use specific assessment instrument designed to assess autistic tendencies (e.g., Childhood Autism Rating Scale, Autism Behavior checklist, etc.)
5. Examine the reasons for referral
6. Use of structured assessment
7. Check the child's present level of motor performance
8. Check for differences in motor performance among different environments (e.g., home, school, playground, etc.)
9. Develop a good schedule for assessment implementation
10. Use informal assessment strategies
11. Assess child's play behaviors

Table 2.4: Summary of best practices in assessment and evaluation.
performance. Recommendations are made relative to the implementation of functional, prevocational, work-related, and leisure recreational skills for older children, and motor development for youngsters. According to Auxter et al. (1990), the physical education program for children with autistic behaviors should contain vigorous aerobic exercises and exercises to develop cardiovascular endurance.

With regards to the individualized education program (IEP), Davis (1990) recommends: a) individualization of instruction; b) development of gross motor skills, and interactive games; c) tricycle riding; d) interaction games; e) use of a current physical fitness test; f) participation in recess-type activities; g) swimming activities; and, h) independent performance in circuit training. The class structure should be designed to provide one-to-one instruction in a consistently structured (routine) schedule, for children with low functioning levels of autistic behaviors. However a little guidance is enough to provide success for high functioning children with autistic behaviors.

The Autism Society of America (1999) identified areas of potential needs when writing IEPs for children with autistic behaviors. The plan must contain information regarding the present level of performance, statement of annual goals, appropriate objective criteria, evaluation procedures, schedule of short term objectives, description of related services, initiation date and duration of the program, and description of transitional services for children over 16 years of age. According to the Autism Society of America (1999), the content areas in the
IEP should focus on: a) communication skills; b) behavior management; c) academic performance; d) transition planning; and, e) an extended school year.

Wiseman (1982) provided several recommendations for program development for children with autistic behaviors in physical education settings. They are among others: a) matching play equipment with child’s ability levels; b) improving skills that could be generalized for other settings; c) using diverse settings (social and geographical structures); d) planning for the child’s success; e) using consistent methods of instruction; f) being aware of how to deal with undesirable behaviors in the presence of typical developing children; g) avoiding punishment for negative behaviors; h) avoiding exclusion; i) using praise; and, j) sequencing activities. For a summary of best practices in program development, see Table 2.5. The suggested best practices in Table 2.5 were selected from the following sources: Item 1 (Winnick, 1995); Items 2, 10, 11, 12, and 13 (Wiseman, 1982); Item 3 (Auxter et al., 1997); Items 4, 5, and 8 (Davis, 1990); Item 6 (Dunn, 1997); Item 7 (Jansma & French, 1994); and Item 9 (Sherrill, 1998).

**Behavior Management**

Behavior management for children with autistic behaviors is a highly recommended strategy (Auxter et al., 1997; Dunn, 1997; Jansma & French, 1994; Sherrill, 1998) for teaching purposes in physical education settings. The use of such techniques will prevent undesirable behaviors, improve communication and integration patterns, and enhance the teaching/learning process (Jansma & French, 1994).
**Best Practices**

1. Use distributed practice (task variation)
2. Use skills that could be generalized to other settings
3. Provide vigorous aerobic exercises, and activities to promote cardiovascular endurance
4. Individualize instruction to ensure success
5. Develop a variety of games (e.g., interactive, gross motor skills)
6. Enhance the child's participation in recess activities
7. Use various physical activities (e.g., swimming, individualized circuit-training, tricycle riding, etc.)
8. Use a methodical schedule of activities and consistent methods of teaching
9. Concentrate on important content areas such as: communication, behavior management, transition, and academic performance
10. Match play equipment with the child's ability level
11. Avoid exclusion and punishment
12. Provide strategies to prevent or reduce undesirable behaviors
13. Emphasize the use of praise

---

**Table 2.5: Summary of best practices in program development**

According to Auxter et al. (1997), a behavior management system for children with autistic behavior should focus on strategies to decrease
inappropriate behaviors, reduce task demands, and encourage communication patterns. The use of applied behavior analysis (ABA) techniques is emphasized, with particular concentration on modeling, shaping, prompting and fading, chaining, repetitions, and reinforcements. Wiseman (1982) described a behavior modification plan using an operant conditioning method. The plan consists of two conditions. The first one refers to the occurrence of voluntary behavior (behavior under control) such as: skipping, running, jumping, etc. The second condition is the development of an appropriately planned system of reinforcement, shaping, and stimulus control, with procedures such as rewarding, task analysis, and targeting selected movement patterns.

Lavay, French, and Henderson (1997) proposed a behavior management strategy checklist to increase teacher’s awareness of controlling undesirable behaviors within physical education environments. The checklist consists of 10 steps as follows: step 1 – examining one’s philosophy of teaching and behavior management (values, beliefs, and roles); step 2 – establishing goals for behavior management and teaching strategies; step 3 – evaluating teaching effectiveness (methods, student learning abilities, uniqueness of each student, teacher-student relationships, development of positive peer relationships, rules and routines, methods for developing desirable behaviors, and methods of solving conflicts and adjustments); step 4 – implementing changes and analyzing the results; step 5 – making decisions about remaining problems to be solved; step 6 – examining and determining causes for behavior problems; step 7 – designing intervention procedures to solve behavioral problems; step 8 – implementing and evaluating
interventions; step 9 – repeating steps 6 through 8 for other behaviors; and step 10 – repeating the process at least once each year. A summary of best practices in behavior management can be found in Table 2.6. The suggested best practices in Table 2.6 were selected from the following sources: Item 1 (Auxter et al., 1997); Item 2 (Wiseman, 1982); Item 3 (Davis, 1990); and, Items 4, 5, 6 and 7 (Lavay, French, & Henderson, 1997).

<table>
<thead>
<tr>
<th>Best Practices</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Use applied behavior analysis techniques (e.g., modeling, shaping, prompting, fading, chaining, reinforcements)</td>
</tr>
<tr>
<td>2 Use rewards for good behavior patterns</td>
</tr>
<tr>
<td>3 Establish teaching effectiveness planning (e.g., methods, social relationships, rules and routines, methods of problem and conflict solving)</td>
</tr>
<tr>
<td>4 Determine and exam each factor causing disruptive behaviors</td>
</tr>
<tr>
<td>5 Design intervention strategies to solve behavior problems</td>
</tr>
<tr>
<td>6 Use an appropriate system of reinforcement</td>
</tr>
<tr>
<td>7 Examine one’s philosophy of teaching (i.e., values, beliefs, roles)</td>
</tr>
</tbody>
</table>

Table 2.6: Summary of best practices in behavior management.
**Teaching Strategies**

Jansma and French (1994) developed a series of instructional strategies for children with emotional disorders within the three domains of learning (psychomotor, cognitive, and affective). In the psychomotor domain, they recommend selecting people-oriented activities, a variety of teaching resources, reinforcing activities, haptic cues, a systematically paced program, individualized instruction, behavior management strategies, systematic evaluation, and emphasis on games. Within the cognitive domain recommended strategies include: participation in inter-scholastic sports, using honesty to deliver messages, using rules and regulations, using a variety of activities for each session, and observing students' eyes and body languages to detect weakness in communication patterns. Within the affective domain, suggestions are: get to know the child, establish rapport before activities that require manipulations, observe the environment controlling the appearance of undesirable behaviors, apply firm and consistent discipline, use relaxation and noncompetitive activities, use instant feedback, use a teacher-directed approach, structure the environment, and do not force the child to practice rejected activities. As general recommendations, Jansma and French (1994) suggested: a) modeling appropriate behavior; b) observing if the child is under any type of medication; c) using early intervention and exposure to appropriate behaviors; and, d) being familiar with different types of medications used by children with emotional disorders.
Davis (1990) emphasized three areas of concern for teaching physical education for children with autistic behaviors. The first area refers to communication patterns (concentrating on strategies such as signing, using communication boards, short phrases, gestures, and telling the students what to do instead of what not to do). The second area is behavior management (emphasizing the controlled behaviors, establishing routines, and redirecting appropriate behaviors and play skills). The last area of concern refers to skill acquisition (demonstrations and physical assistance, structured play, modeling, consistent activities, verbal assistance, and imitations).

Because one of the characteristics of children with autistic behaviors is resistance to change, Sherrill (1998) offered a continuum of prompts to be used in combination with reinforcements. The ten phases of the continuum contains the following aspects: 1) full physical prompt met with resistance; 2) full physical prompt; 3) partial physical prompt; 4) light touch reminder; 5) pointing prompt; 6) direct verbal prompt; 7) indirect verbal prompt; 8) independent function when in the same setting with same teacher and same materials; 9) independent function when in same setting with different teacher and similar material; and, 10) independent function when in a variety of similar settings with a variety of people and materials. The summarized teaching strategies for children with autistic behaviors are presented in Table 2.7. The suggested best practices in Table 2.6 were selected from the following sources: Items 1, 9, and 10 (Davis, 1990); Items 2 and 3 (Auxter et al., 1997); Items 4, 11, 12, and 13 (Sherrill, 1998); and, Items 5, 6, 7 and 8 (Jansma & French, 1994).
Best Practices

1. Know the child's ability to learn motor skills

2. Reduce undesirable external stimuli and emphasize visual and auditory teaching strategies (e.g., posters, demonstrations, verbal directions)

3. Use natural environments to teach specific skills (e.g., soccer field, bowling alley, basketball court)

4. Provide equipment adaptations to facilitate the child's engagement

5. Use strategies to improve the child's eye contact, speech, and other communication patterns

6. Select people-oriented activities

7. Check for the use of medication, and use of ambulatory equipment (e.g., wheelchair, crunches, braces)

8. Model appropriate behaviors

9. Use a structured environment, with direct teaching, and desirable activities

10. Use of early intervention and exposure to appropriate behaviors

11. Use short phrases, gestures, and tell the child what to do, in order to facilitate communication

12. Provide physical assistance (if needed)

13. Use a continuum of prompts in combination with reinforcements (e.g., from full physical prompts with resistance to independent functioning)

Table 2.7: Summary of best practices in teaching strategies
Summary

The review of literature presented in this Chapter summarizes the current information regarding the challenges and strategies to facilitate the instruction of children with autistic behaviors in physical education settings. Five main topics were reviewed and discussed. Topic one refers to an overview of autism and autistic behaviors, with emphasis on prognosis, diagnosis, treatment, communication, and socialization strategies. The first study in autism was conducted at the Johns Hopkins Hospital in 1938 by Kanner (1943). Autism is defined as “a developmental disability significantly affecting verbal and nonverbal communication and social interaction, generally evident before age three, which adversely affects a child’s educational performance” (Ritvo & Freeman, 1978, p. 565). Family history, prenatal, perinatal, and postnatal factors are attributed as the possible causes of autism. The prognosis is still unclear.

The second part of this Chapter’s review provided a general overview of issues relative to inclusion and integration of children with autistic behavior in physical education. A variety of integration strategies such as integrated play groups, self-management play, and sociodramatic play have been employed by researchers to find the best ways to develop social interaction and appropriate play behavior for children with autistic behaviors. To promote better levels of interaction of children with autism and peers without disabilities, by reducing undesirable behaviors, teachers should be familiar with autistic characteristics (Connor, 1990).
The third topic discussed in this Chapter was issues relative to best physical education practices such as strategies to be used in the teaching/learning environment. Also, this part of the Chapter provided a brief discussion relative to differences among best practices, malpractices, and wise practices.

Research on physical education for children with autistic behaviors was reviewed as topic four. In this part of Chapter Two, a series of studies in this area were presented and discussed (Kern, Koegel, & Dunlap, 1984; Kern, Koegel, Dyer, Blew, & Fenton, 1982; Leary & Hill, 1996; Levinson & Reid, 1993; Lisboa, 1997; Morin & Reid, 1985; Reid, Cauchon, & Collier, 1991; Schleien, Krotee, Mustonen, Kelterborn, & Schermer, 1987; Watters & Watters, 1980).

The last topic presented in the Chapter concerned the development and implementation of best practices for children with autistic behaviors in physical education settings. A review of nine current textbooks (exception to Wiseman, 1982) in adapted and general physical education provided an overview of the most recommended practices. Best practices were listed in tables of content. Relative to inclusion and integration, a well-designed program, with special arrangements and explicit instructions, must be implemented, in order to ensure high levels of participation and interactions among the students with and without disabilities (Auxter et al., 1997).

Davis (1990) stated that assessment is the most important tool in learning about the child's weaknesses and strengths in the motor domain. She also emphasized three areas of concern for teaching physical education for children
with autistic behaviors: a) communication patterns; b) behavior management; and, c) skill acquisition.

Winnick (1995) recommended four strategies to enhance program development: a) minimize or significantly reduce the amount of stimuli in the learning environment; b) provide prompts (i.e., cues, instructions, demonstrations); c) offer opportunities to generalize the use of learned skills; and, d) organize practice using task variation (distributed practice). Lavay, French, and Henderson (1997) provided a behavior management strategy checklist to increase teacher's awareness of controlling undesirable behaviors within physical education environments. Jansma and French (1994) developed a series of instructional strategies for children with emotional disorders, within the three domains of learning (psychomotor, cognitive, and affective).
CHAPTER 3

METHODOLOGY

The content of this Chapter focuses on the methodology used to identify best practices that physical educators can use to teach children with autistic behaviors. The Chapter consists of the following sections: participants, instrument development, data collection, research design, and data analysis. Section one (participants) describes the population from which data were collected. Section two (instrument development) provides an overview of questionnaire development, with information regarding pilot testing, validity, and reliability. Sections three and four (data collection and research design) describe the strategies used to collect data and the design used for development and implementation of the study. Section five (data analysis), discusses the statistical procedures to be used to analyze the data generated from the study.

Participants

For the purpose of this study, the target population was identified as all nationally certified adapted physical educators (CAPEs) in the United States. Certified adapted physical educators are those physical education professionals who have passed the national certification exam based on the adapted physical
education national standards (APENS) (Kelly, 1997). APENS defines content standards in terms of what practicing adapted physical educators should know in order to effectively perform their jobs. The examination is given once a year and consists of 100 multiple-choice questions. As of June 1998, 343 physical educators had been administered this national certification exam (219 in 1997, and 124 in 1998), with 268 passing (78.4%). The accessible population for this study therefore includes the intact group of all the 268 CAPEs across the United States who possess current certification via APENS. These CAPEs represent 39 states and the District of Columbia. The distribution of the population relative to the number of CAPEs by state is presented in Table 3.1.

<table>
<thead>
<tr>
<th>State</th>
<th>#</th>
<th>State</th>
<th>#</th>
<th>State</th>
<th>#</th>
<th>State</th>
<th>#</th>
</tr>
</thead>
<tbody>
<tr>
<td>AL</td>
<td>05</td>
<td>KS</td>
<td>05</td>
<td>NC</td>
<td>12</td>
<td>PA</td>
<td>08</td>
</tr>
<tr>
<td>AZ</td>
<td>05</td>
<td>KY</td>
<td>01</td>
<td>NE</td>
<td>02</td>
<td>SC</td>
<td>01</td>
</tr>
<tr>
<td>CA</td>
<td>18</td>
<td>LA</td>
<td>02</td>
<td>NH</td>
<td>01</td>
<td>TX</td>
<td>22</td>
</tr>
<tr>
<td>CO</td>
<td>04</td>
<td>MD</td>
<td>10</td>
<td>NJ</td>
<td>07</td>
<td>UT</td>
<td>10</td>
</tr>
<tr>
<td>CT</td>
<td>03</td>
<td>ME</td>
<td>02</td>
<td>NM</td>
<td>01</td>
<td>VA</td>
<td>16</td>
</tr>
<tr>
<td>FL</td>
<td>04</td>
<td>MI</td>
<td>01</td>
<td>NV</td>
<td>06</td>
<td>VT</td>
<td>01</td>
</tr>
<tr>
<td>GA</td>
<td>02</td>
<td>MN</td>
<td>02</td>
<td>NY</td>
<td>15</td>
<td>DC</td>
<td>01</td>
</tr>
<tr>
<td>IL</td>
<td>22</td>
<td>MA</td>
<td>21</td>
<td>OH</td>
<td>25</td>
<td>WI</td>
<td>08</td>
</tr>
<tr>
<td>IN</td>
<td>07</td>
<td>MT</td>
<td>01</td>
<td>OK</td>
<td>03</td>
<td>WV</td>
<td>02</td>
</tr>
<tr>
<td>IO</td>
<td>01</td>
<td>MO</td>
<td>01</td>
<td>OR</td>
<td>09</td>
<td>WY</td>
<td>01</td>
</tr>
</tbody>
</table>

Table 3.1: CAPEs distribution by state.

95
Approval for conducting research involving human beings as research subjects was obtained from the Ohio State University Human Subjects Institutional Review Board (Appendix A). Exemption was obtained based on category 2 status.

Instrument Development

The instrument used was the Survey of Best Physical Education Practices for Children with Autistic Behaviors (SBPEPCAB) (Appendix B). The SBPEPCAB was developed during the Spring of 1999, and consisted of 43 questions during the pilot stage, with four sections: 1) Assessment and evaluation; 2) Program development and teaching; 3) Behavior management; and, 4) Demographic information. For the first three sections, a five-point Likert-type scale with choice of responses ranging from 1 (strongly disagree) to 5 (strongly agree), or 1 (never) to 5 (very frequently), was employed for decision making to answer closed-ended questions with ordered choices as proposed by Salant and Dillman (1994). The last section of the questionnaire (demographics) consists of questions relative to the participants' personal information regarding academic level, gender, age, working experience, primary teaching environment, workshop and conference experiences, and teaching resources.

The content of the survey instrument was based on a review of the current primary source literature in physical education for children with autistic behaviors. Information to support the content of the questionnaire was also gathered from a review of guidelines and recommendations, for educating children with autistic behaviors in physical education settings, collected from nine current text books.
(secondary resources) in adapted physical education. The target topics reviewed from the texts included issues relative to: a) inclusion and integration; b) assessment/evaluation; c) program development and teaching strategies; and, d) behavior management (see Chapter Two).

Survey item selection involved a series of standards. During its development, the questionnaire was submitted to a panel of experts (see validity of the instrument for description of the panel) for a series of revisions. The validation process of the instrument consisted of checks for content and face validity, as well as a pilot test to check for internal consistency and alternate-form reliability. In order to be included in the questionnaire, an item needed to meet three of the four following criteria: a) be recommended at least 2 times in reviewed texts; b) be supported by data-based research (e.g., refereed literature, dissertation, etc.); c) be replicated in the extant published research; and, d) be approved by the panel of experts. After meeting the established criteria, in order to be included, each item also needed approval by the dissertation committee.

**Questionnaire Content**

Section One contains 9 closed-ended type questions which focus on best practices relative to assessment and evaluation, and seeks opinions relative to evaluation strategies, data collection strategies, assessment instruments, schedule for assessment, informal assessment strategies, assessment of autistic behaviors, and assessment of child's play behaviors.

Program development and teaching constitutes Section Two of the questionnaire (13 closed-ended questions). This section focuses on the
development and implementation of physical education programs for children with autistic behaviors, and best practice related to teaching strategies. The purpose of this section is to gather information relative to equipment adaptations, use of natural environments to teach, selection of activities, modeling of appropriate behaviors, environmental structure, provision of physical assistance, continuum of prompts, knowledge of child's ability, reducing undesirable external stimuli, distributed practices, application of exercises, individualized instruction, child's participation in activities, physical activities, schedule of activities, and methods of teaching.

Ten closed-ended type questions comprise Section Three of the questionnaire. In this section, information on the application of behavior management techniques for children with autistic behavior in physical education practices is contained. Questions focus on applied behavior analysis techniques, rewards, social relationships, rules and routines, methods of problem and conflict solving, factors causing disruptive behaviors, intervention strategies, and systems of reinforcement.

The last section of the questionnaire (Section Four) consists of demographic information (11 questions) regarding personal information related to academic level, gender, age, working experience, primary teaching environment, workshop and conference experience, and teaching resources.

**Validity of the Instrument**

In order to obtain the necessary information for the purpose of this study, the SBPEPCAB needed to be validated. Validity refers to "the degree to which
the instrument measures what it alleges to measure, and all inferences made by the researcher, based on the responses, are evident" (Horvart & Kalakian, 1996).

Two validation strategies were employed in this study: content and face validity. Content validity refers to "the degree by which: a) the content of the instrument is appropriate for the purposes of the study; b) the format is appropriate and consistent with the population to be investigated; and, c) the items represent the content to be assessed" (Fraenkle & Wallen, 1996). Face validity consists of a review of items by peers or other professionals, to check for clarity, readability, and item appropriateness (Litwin, 1995).

For content validity, a copy of the instrument was sent to a panel of experts, with the purpose of providing feedback on the appropriateness of the questionnaire. Accompanying the instrument was a rating scale (to rate the degree to which the sections of the questionnaire are appropriate), and a narrative section (for reactions and comments regarding the instrument). The panel of experts for establishment of the questionnaire's content validity consisted of two professors and one teacher, all experts in the area of educational issues relative to children with autistic behaviors.

The first member of the panel was an adapted physical education professor in an institution of higher education in Canada, with expertise in physical education for children with autistic behaviors, and with various research studies and publications in this area. A second member of the panel was a special education professor with expertise in the education of children with autistic behaviors. This professor teaches a doctoral seminar in autism (current
dimensions of assessment, intervention, and program development) in an institution of higher education in the United States, and also has a series of publications and research studies in this area of expertise. The third member of the panel was an adapted physical education teacher with a masters degree in adapted physical education. This teacher has published a textbook in physical education for children with autism, and currently is employed at a resource center for autism.

For the purpose of establishing face validity for the instrument (whether the questionnaire is readable, questions are clear, size is acceptable, etc.), a field test was performed using a sample of five non-certified adapted physical educators, but otherwise similar to the target population of this study. Each member of this sample was asked to complete the questionnaire, and subsequently complete an evaluation form regarding the overall presentation of the instrument.

Content Validity

In June 1999, a content validity evaluation package was sent to the three members of the panel of experts, seeking feedback for the Survey of Best Physical Education Practices for Children with Autistic Behaviors (SBPEPCAB) instrument. The package contained a copy of the questionnaire and a content validity evaluation checklist (Appendix C). The evaluators were to indicate whether each content-item represented a potential best physical education practice for children with autistic behaviors. Content items were individually evaluated, as to whether or not they should remain as a part of the questionnaire,
using the following likert-type scale: (1) Dropped, (2) Considered Optional, (3) Considered Worthwhile, and (4) Considered Fundamental. Also, spaces were provided within the form for additional comments relative to the general content of the instrument.

Upon receiving the evaluations from the panel of experts (by June 15) the evaluation checklists were analyzed by the principal investigator and a co-adviser. In order to be considered approved and remain as a part of the questionnaire, an item needed to be “considered fundamental” (score of 4) or “considered worthwhile” (score of 3) by at least 2 members of the panel. Items scored as “dropped” (score of 1) by more than one member of the panel were eliminated from the questionnaire. Also, items “considered optional” (score of 2) by the evaluators were kept or not kept in the questionnaire according to decisions made by the principal investigator and his co-advisers.

Section One-evaluation strategies: For this section (initially containing 10 items), the decision was made to reduce that number to nine items. The reason for that was based on the common comment from the panel of experts that two items were too much alike, and they could be blended in one item. The majority of the other items were scored as “considered fundamental” and/or “considered worthwhile”, thus remaining as part of the questionnaire. A few other modifications were provided in Section One such as specifying types of “performance” (e.g., motor, social) in item five, and inserting an example for item eight “informal assessment” (i.e., assessing while not seen by child).
Section Two—program development and teaching: In section two (initially containing 14 items), one item (reverse mainstreaming) was dropped, because it received two "dropped" (1) scores from the evaluation panel. A comment by one of the members of the panel justifying a "dropped" score for this item was: "this is an organizational structure that CAPEs will not generally be able to change...". All the other items were kept in the questionnaire, and again, the majority of them received scores of being "considered fundamental" (4) and/or "considered worthwhile" (3).

Section Three—behavior management: No major changes were suggested by the panel of experts for the original version of section three of the questionnaire. Only a few modifications (e.g., rewording the item) were provided, relative to re-writing some of the items. All ten initial items received the majority of scores to be considered fundamental or worthwhile for the instrument.

Section Four—demographics: As for the last part of the instrument, the original 11 questions were kept with only some modifications made based on the evaluation from the panel of experts. For the question relative to human resources, "fellow teachers", "consultants", and "parents" were added as options for the responses. Finally, a response option called "other" was added for the items relative to "types of physical education environments", "non-human resources", "human resources", and "level of education".

Face Validity

In June 1999, a face validity evaluation package was sent to five adapted physical educators (with similar characteristics of the study population, but not
certified) seeking feedback for the instrument. The field test package contained a copy of the questionnaire, a cover letter explaining the purpose of this evaluation (Appendix D), as well as a face validity evaluation checklist (Appendix E). First, participants were asked to fill out the questionnaire and time (number of minutes) spent to complete the whole instrument. Second, they were asked to provide feedback (on the evaluation checklist), relative to the questionnaire format, clarity, size of the questionnaire, time to complete, typographical errors, size of the font, directions, rating scales, and overall design. A summary of the evaluation based on the field test responses follows:

1. Time to complete the questionnaire among the five participants was: 15, 11, 12, 8, and 7 minutes. The mean of 10.6 minutes to complete the entire questionnaire was considered acceptable by the participants.

2. The questionnaire's overall format was considered appropriate for the target population by all the participants in the field test. The font size, directions, format, and the rating scales all were considered appropriate.

3. A few modifications were provided relative to typographical errors, and the terms "consistency of methods", "informal assessment" and "prompting" were defined in the glossary portion of the survey instrument as suggested by the participants of the field test. When asked to rate the overall design of the instrument (using a scale of poor, acceptable, good, and very good), three participants rated the questionnaire as very good, and the other two as good.
Reliability of the Instrument

Reliability refers to the "consistency of the scores obtained from one set of items to another" (Fraenkle & Wallen, 1996). For the purpose of this study, two measurements of reliability were employed: a) Internal consistency of the instrument was checked using an alpha coefficient method (Cronbach-Alpha Test); and b) alternate-form reliability, using an inverse scale to measure the same attribute, was established on data collected from a pilot test (Litwin, 1995). The pilot test group consisted of a sample (n=16) of non-certified adapted physical educators, with otherwise similar characteristics (e.g., experience in teaching children with disabilities) to the target survey population. For the alternate-form procedures, participants were asked to respond to the questionnaire two times, with an interval of 15 days between responses. For the second set of questionnaires, the response scale was reversed.

Data Collection

A survey data collection method was used, with a questionnaire mailed to all participants in the population. To this end, Salant and Dillman (1994) recommend a four-step approach for the purpose of mailing a survey instrument. The four steps consist of: 1) mailing an advanced, personalized notice letter, informing the participants of their selection and a request of them to participate in the study; 2) mailing a complete package, containing a cover letter, a questionnaire, and a stamped return envelope, mailed one week later; 3) using a follow-up post-card, reminding those who did not answer the questionnaire, four to eight days later; and, 4) mailing another complete package, with a
questionnaire, a stamped return envelope, and a new cover letter with a solicitation to respond to the survey, following step three.

Mailing Process

Step 1: Pre-response postcards (advanced-notice) (Appendix F) were mailed to all participants in the target population in August 1999 informing them of the forthcoming questionnaire. For 50 participants, this information was provided over electronic mail (e-mail). The card emphasized the fact that they were selected to participate in this study because of their expertise, and that very soon they would receive a questionnaire.

Step 2: Six days later, a complete survey package was mailed. The package included: a) a cover letter describing the importance of the study, and asking for their assistance in answering the questionnaire for the benefit of children with autistic behaviors. The cover letter was printed using paper with a special designed header, specially constructed by the researcher, and co-signed by the two dissertation advisors (Appendix G); b) a booklet with the survey instrument, and directions for responses; c) a pre-addressed, stamped envelope; and, d) an incentive (tea bag).

Step 3: Three weeks after the mailing of the complete package, post card reminders were mailed to non-respondents (Appendix H). These cards contained a rationalization for the need to receive a response. Because the amount of returning questionnaires was high at that point, the delivery of the follow-up was delayed for two more weeks.
Step 4: A second set of complete questionnaires was mailed to non-respondents twelve days following the reminder cards. The package contained a new cover letter (Appendix I), and another questionnaire, tea bag incentive, and pre-addressed stamped envelope.

Research Design

A total design method was employed as the basic format for the study, with slight differences on the procedures recommended by Dillman (1978). These differences included providing fewer details on the preparation of the survey, such as use of a cover page with graphics and color, three signatures (co-advisers and principal investigator) in the cover letter, and personal developed post card. The Total design method (Dillman, 1978) employed such tactics as using incentives and using advanced-notice postcards for the purpose of improving the overall survey response rate.

As reported by Salant and Dillman (1994), an evaluation survey is used to collect information relative to the impact of programs from a particular population. In this research, there was a need to learn about the impact of published guidelines and recommendations (best practice) from physical educators who teach children with autistic behaviors. To this end, the SBPEPCAB survey questionnaire needed to be found valid and reliable in order to best identify such best practices for children with autistic behaviors from certified adapted physical educators (CAPEs) across the United States. Such standardization elements (validity, reliability) were therefore also built into the overall research design of this study.
The accessible population for this study consisted of a national census group (intact sample) of 268 CAPEs. This number represented all those who had passed the national certification exam since 1997, based on the adapted physical education national standards (APENS) (Kelly, 1997).

Data Analysis

Data analysis was to incorporate the use of both descriptive and inferential statistics. Descriptive measures included measures of central tendency (means) as well as measures of variability (ranges and standard deviations). Salant and Dillman (1994) suggested that, initially, questions should be analyzed individually (descriptively) item by item. This strategy prevents error of data entry, as well as stresses the importance of each questionnaire item. Research Questions five [What are the best physical education practices for children with autistic behavior as identified by certified adapted physical educators (CAPEs)?] and six (What best practices presented in the refereed literature on teaching physical education to children with autistic behaviors are practiced by CAPEs in the field?) required descriptive analyses in toto.

The main goal of data collection was to reach a census (study of all units or elements in the population). For the purpose of this study, it was established that in order to reach a census, the survey response rate had to be 90% or higher. If a census could not be reached, parametric tests of significance were to be used to answer the other Research Questions (1-4) in determining how likely the results, based on a sample, would be similar to the results that would have been obtained if a census had been reached. As part of this, early respondents
were to be compared to late respondents with a t-test. Further, if parametric analyses were required, three separate ANOVAs (i.e., one for each of the first three questionnaire sections) were to be employed to assess group differences between targeted independent variables/characteristics (Fink & Kosecoff, 1998). If significant differences were found, a post-hoc test (Tukey) potentially was to be used to determine differences, since one of the variables/characteristics had three elements or levels.

The dependent variables for this study were the questionnaire subscale scores (first three sections). The independent variables were settings (inclusive/segregated/both), teacher types (taught/have not taught children with autism), years of experience teaching (less than 4 / more than 4), and gender (male/female).
CHAPTER 4

RESULTS AND DISCUSSION

This Chapter provides a description and analysis of the results for this study and related discussion. For the purposes of facilitating an understanding and sequence of the statistical information, the chapter is divided into six sections. The first section (introduction) provides a general overview of the study's focus, the research instrument, and the research questions for this study. Instrument reliability check results are presented in section two. Section three (response rate) presents the percentages of returned questionnaires in each phase of the mailing process (e.g., first package; reminder card; and last package). In section four, demographic data for the respondents are presented. In section five, questionnaire data across the research instrument's sections are presented in descriptive and ANOVA form. Lastly, section six provides a discussion of the results based on the study's six research questions.

Introduction

The purpose of this study was to recognize, describe, and analyze best physical education practices for children with autistic behaviors. Best physical education practices for children with autistic behaviors were obtained from
certified adapted physical educators (CAPEs) from throughout the United States.

The *Survey of Best Physical Education Practices for Children with Autistic Behaviors (SBPEPCAB)* was the instrument used for data collection. The instrument was developed during the spring of 1999, and was validated and found reliable during the summer of the same year.

Six research questions defined the directions of this study. Those questions were:

1. Do CAPEs support the same best physical education practices across physical education settings (segregated, inclusive, and both)?
2. Do CAPEs with fewer (less than 4 years) as opposed to more (more than 4 years) years of teaching experience support the same best practices for teaching physical education to children with autistic behaviors?
3. Do male and female CAPEs support the same best practices for teaching physical education to children with autistic behaviors?
4. Do CAPEs who teach or have taught children with autistic behavior support the same best physical education practices identified from those CAPEs who have not taught children with autistic behaviors?
5. What are the best physical education practices for children with autistic behaviors as identified by CAPEs?
6. What best practices presented in the refereed literature on teaching physical education to children with autistic behaviors are practiced by CAPEs in the field?
Reliability of the Instrument

Two measurements of reliability (internal consistency and alternate form reliability) were employed. A sample of 16 non-certified adapted physical educators, otherwise with similar characteristics (e.g., experienced in teaching children with disabilities) of the target population was used to support instrument reliability. In order to reflect the homogeneity of the combined items of the instrument, a minimum alpha level of .70 was established. Litwin (1995) reports that an alpha level of .70 or higher represents good reliability.

Internal Consistency

Adapted physical educators (n=16), representing 6% of the total participants in the target population were used to support internal consistency. A package containing a cover letter and a copy of the survey instrument was mailed to participants in July, 1999. A return rate of 100% (16 out of 16) was obtained.

A Cronbach-Alpha test method 2 (covariance matrix) was used for data analysis using the software program SPSS for Windows, version 9.0, 1998. Individual results for each of the three sections showed an alpha coefficient of .78 for Section One, .84 for Section Two, and .87 for Section Three. Results across the first three sections showed an alpha coefficient of .84 and a standardized item alpha coefficient of .85.

Alternate-Form Reliability

The alternate-form reliability test consisted of using differently ordered response sets for the same item questions, throughout the entire instrument.
Within each section and across all sections, items addressed the same conditions for each particular variable, equivalent terminology, and the same level of difficulty, as recommended by Litwin (1995).

Another package containing a cover letter and an alternate-form of the survey instrument was mailed to the same participants of the pilot test in July, 1999. Participants were asked to respond to the first three parts of the questionnaire, and to return it no later than five days after the receiving date. Again, a return rate of 100% (16 out of 16) was obtained.

A Cronbach-Alpha test method 2 (covariance matrix) was used for the analysis, using the software program SPSS for Windows, version 9.0, 1998. Individual results for each of the three sections showed an alpha coefficient of .84 for Section One, .82 for Section Two, and .80 for Section Three. Results across the three sections showed an alpha coefficient of .84 and a standardized item alpha coefficient of .85. Results across the first three sections of the instrument revealed an alpha coefficient of .88 and a standardized item alpha coefficient of .89.

The levels of reliability (.85 for internal consistency and .89 for the alternate-form) across the 32 items of the three sections of the SBPEPCAB instrument were considered good, and therefore represented support for overall reliability levels for the questionnaire. Therefore, the decision was made to keep all 32 items.
Response Rate

After reviewing the frame list provided by Luke Kelly (APENS Director), the population for this study was identified as 268 certified adapted physical educators (CAPEs). After the first set of mailed pre-response postcards (advanced-notice), the first package was mailed to all members of the population.

The first package mailing resulted in a return of 166 usable questionnaires, representing 61.9% of the total population, and 3 blank (non-usable) questionnaires (1.1%). Fourteen envelopes (5.2%) were undelivered by the U.S. Postal Service for one reason or another. The third mailing (first postcard reminder), resulted in a return of an additional 16 questionnaires (6.0%). The final complete mailing (2nd package) resulted in the return of an additional 34 questionnaires (12.7%), for a total return rate of 216 usable questionnaires, representing 80.6% (216/268) of the total population. Ary, Jacobs, and Razavieh (1996) suggested that a rational and acceptable response rate in survey research after three follow-ups is 75 to 90%. Because the return rate at this point (80.6%) was within the Ary et al. (1996) range, a decision was made to terminate data collection. The decision to terminate data collection was made in agreement with the co-advisers. This decision was based on the small numbers of returned surveys (only one in the course of three days), and the satisfactory return rate obtained at that point. As a result, there were a total of 35 non-respondents (13.0%). Table 4.1 presents a summary of the data relative to response rate.

In order to control for non-response error and be able to generalize the results to all members of the target population, Miller and Smith (1983) suggest
that the researcher should "compare early to late respondents". If there are no differences between early and late respondents, the responses by early respondents can be assumed to be the same as non-respondents (Miller & Smith, 1983). The total number of early and late respondents (including means and standard deviations) is displayed in Table 4.2.

<table>
<thead>
<tr>
<th></th>
<th>f</th>
<th>%</th>
<th>Cum. %</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st package</td>
<td>166</td>
<td>61.9</td>
<td>61.9</td>
</tr>
<tr>
<td>1st follow-up</td>
<td>16</td>
<td>6.0</td>
<td>67.9</td>
</tr>
<tr>
<td>2nd package</td>
<td>34</td>
<td>12.7</td>
<td>80.6</td>
</tr>
<tr>
<td>Undelivered</td>
<td>14</td>
<td>5.2</td>
<td>85.8</td>
</tr>
<tr>
<td>Not usable</td>
<td>3</td>
<td>1.1</td>
<td>86.9</td>
</tr>
<tr>
<td>No responses</td>
<td>35</td>
<td>13.0</td>
<td>~100.0</td>
</tr>
<tr>
<td>Total</td>
<td>268</td>
<td>~100.0</td>
<td></td>
</tr>
</tbody>
</table>

Table 4.1: Summary of response rate data.

<table>
<thead>
<tr>
<th>Group</th>
<th>n</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Early</td>
<td>166</td>
<td>131.32</td>
<td>75.41</td>
</tr>
<tr>
<td>Late</td>
<td>34</td>
<td>134.29</td>
<td>78.28</td>
</tr>
</tbody>
</table>

Table 4.2: Group statistics for early and late respondents.
To this end, a t-test of independent samples (Levene's Test for Equality of Variances and t-test for Equality of Means) was performed using early respondents (n=166) and later respondents (n=34). Results from the t-test (see Table 4.3) revealed non-significant t values of -0.208 (p = .835) for equal variances, and -0.203 (p = .840) for unequal variances. Because the test statistic value was greater than the established alpha (.05), there was at least 95% confidence that there were no significant differences between the means of “early” and “late” respondents. Based on these results, the data were collapsed and the results from the survey became generalizable to the entire population.

Demographic Information (Descriptive data)

Data for the demographic section of the instrument (Section Four) were collected using rating scales. Respondents answered questions regarding years teaching adapted and general physical education, teaching settings, experience teaching children with autistic behaviors, continuing education, human and non-human resources, level of education, gender, and age.

Question 1 (number of years teaching adapted physical education) had 215 respondents, and question 2 (years teaching general physical education) had 216 respondents. Frequency and percentages for questions 1 and 2 are displayed in Table 4.4.

Relative to setting (question 3), a response rate of 69.49% (186/268) was obtained for adapted physical education (segregated), inclusive physical education (inclusive), and both (segregated and inclusive). This response rate is explained because respondents were asked to “check all that apply”. In other
Levene's Test for Equality of Variances

<table>
<thead>
<tr>
<th></th>
<th>F</th>
<th>Sig.</th>
<th>t</th>
<th>df</th>
<th>p</th>
<th>Mean dif.</th>
<th>SE Dif.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equal variances assumed</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.045</td>
<td>.852</td>
<td>.208</td>
</tr>
<tr>
<td></td>
<td>-.208</td>
<td>198</td>
<td>.835</td>
<td>-2.97</td>
<td>14.29</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Equal variances not assumed</td>
<td>-.203</td>
<td>46.403</td>
<td>.840</td>
<td>-2.97</td>
<td>14.65</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 4.3: Independent sample test for early and late respondents.
words, many respondents checked other items in this question (i.e., general physical education, reversed mainstreaming, consultant/research specialist, and other). The independent variables of interest in this question were only segregated, inclusive, and both.

Segregated adapted physical education obtained the highest number of 166 respondents, general physical education (GPE) had 51, inclusive physical education had 107, reversed mainstreaming had 39, and consultant/research specialist had 80. For the last option, 25 participants responded that they were teaching in "other" settings (e.g., higher education, APE as enrichment, special needs school, teacher preparation programs, motor aquatics, itinerant, preschool, supervision, and community recreation programs).

<table>
<thead>
<tr>
<th>Years teaching APE</th>
<th>Freq.</th>
<th>%</th>
<th>Years teaching GPE</th>
<th>Freq.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than one year</td>
<td>2</td>
<td>0.9</td>
<td>46</td>
<td>21.3</td>
<td></td>
</tr>
<tr>
<td>1-3 years</td>
<td>22</td>
<td>10.2</td>
<td>53</td>
<td>24.5</td>
<td></td>
</tr>
<tr>
<td>4-7 years</td>
<td>54</td>
<td>25.1</td>
<td>58</td>
<td>26.9</td>
<td></td>
</tr>
<tr>
<td>8 or more years</td>
<td>137</td>
<td>63.7</td>
<td>59</td>
<td>27.3</td>
<td></td>
</tr>
<tr>
<td>Totals</td>
<td>215</td>
<td>99.9</td>
<td>216</td>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>

Table 4.4: Frequency and percentages for years of teaching adapted physical education (APE) and general physical education (GPE).
For question 4 (teacher type), 212 respondents revealed that they teach or had taught children with autistic behaviors, while only 4 respondents never taught children with autistic behaviors. The number of years teaching children with autistic behaviors (question 5), ranged from 1 to 33, with a mean of 9.11 years. Relative to continuing education (question 6), 184 responded "yes", and 30 responded "no" to whether or not they ever attended conferences, courses, or workshops on teaching children with autistic behaviors.

Relative to non-human resources (question 7), academic journals received the highest number of responses (192), followed by textbooks (184), Internet (117), and software and CD-ROM's (49). For the last option, 25 participants responded that they use "other" non-human resources (e.g., university methods courses, trial + error, handouts, Special Education Regional Resource Center (SERRC), video and audio tapes, conference proceedings, Treatment and Education of Autistic and Related Communication Handicapped Children (TEACH) programs, biographies, observations, test packets, student records, newsletters, college notes, and established curriculums).

Relative to human resources (question 8), fellow teachers received the highest number of 204 responses, followed by 169 for parents, 137 for consultants, and 90 for administrators. For the last option, 55 participants responded that they use "other" human resources (e.g., physical therapists, occupational therapists, peer tutors, students, psychologists, physicians, behavior specialists, aides, speech therapists, musicians, presenters at
conferences, community personnel, college professors, volunteers, co-workers, and networking).

Question 9 (level of education) revealed that 32 respondents had a bachelor's degree, 163 had a master's degree, and 15 had a doctorate. Six respondents answered the option "other" (e.g., Ph. D. student, graduate credits in special education, and special education certificate). Frequencies of responses for questions 10 and 11 revealed that the respondents consisted of 170 females and 46 males, with ages varying from 23 to 62 and a mean of 40.7 years.

Descriptive and Parametric Results

Data analysis for the first three sections of the questionnaire (assessment and evaluation; program development and teaching; and behavior management) was performed using data from the 216 returned usable questionnaires. Frequencies, percentages, ranges, means, and standard deviations are reported as the descriptive data for each item in each section. In addition, item-by-item analyses were performed in order to check and report high and low means, as well as potential outliers. The complete set of raw data is available in Appendix I.

A 3 X 2 X 2 (setting X years of experience X gender) independent analysis of variance (ANOVA) was used to determine mean differences across the three dependent variable sections/subscales (i.e., assessment and evaluation = ASSESS; program development and teaching = PROGDEV; and behavior management = BEHAMA). The three levels for independent variable one (SETTINGS) were: 1) segregated adapted physical education; 2) inclusive physical education; and, 3) both (respondents who were teaching in both
settings). The two levels of independent variable two (YEARS OF EXPERIENCE) were: 1) less than four years, and 2) four years or more. The two levels of independent variable three (GENDER) were: 1) male, and 2) female.

Section One Results – Assessment and Evaluation

Descriptive data. Descriptive statistics for the assessment and evaluation section of the questionnaire revealed that "ongoing observation" (item 1) and "ongoing check of performance" (item 2) obtained the highest means (4.74 and 4.21) and the smallest standard deviations (.52 and .71). These two items also received responses with a minimum of 2 (rarely) and a maximum of 5 (very frequently) in the response scale. All other items in the section obtained mean scores between 3.13 ("structured assessment") and 3.63 ("plan set schedule for assessment"), with standard deviations between 1.21 and .89. With the exception of item 5 ("ongoing check of performance") which received responses from 215 participants, all the other items received responses from 216 participants. Overall response rate, ranges, means, and standard deviations for Section One are presented in Table 4.5.

Observation of the data from separate items in this section revealed that the highest frequency of responses for a particular choice in the 1-5 scale was made for item 1 ("ongoing observation"), where 167 respondents (77.3%) chose "very frequently" (choice 5 in the scale). The other highest frequencies of responses were for item 5 ("ongoing check of performance") with 100 responses (46.5%) for "frequently" (choice 4 in the scale), and for item 6 ("check for
generalization") with 95 responses (44.0\%) for “occasionally” (choice 3 in the scale).

<table>
<thead>
<tr>
<th></th>
<th>n</th>
<th>Range</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>ongoing observation</td>
<td>216</td>
<td>2 - 5</td>
<td>4.74</td>
<td>.52</td>
</tr>
<tr>
<td>varied data collection</td>
<td>216</td>
<td>1 - 5</td>
<td>3.54</td>
<td>1.05</td>
</tr>
<tr>
<td>structured assessment</td>
<td>216</td>
<td>1 - 5</td>
<td>3.13</td>
<td>1.21</td>
</tr>
<tr>
<td>examine/re-examine info.</td>
<td>216</td>
<td>1 - 5</td>
<td>3.45</td>
<td>.89</td>
</tr>
<tr>
<td>ongoing check</td>
<td>215</td>
<td>2 - 5</td>
<td>4.21</td>
<td>.71</td>
</tr>
<tr>
<td>check for generalization</td>
<td>216</td>
<td>1 - 5</td>
<td>3.37</td>
<td>.95</td>
</tr>
<tr>
<td>plan set schedule</td>
<td>215</td>
<td>1 - 5</td>
<td>3.63</td>
<td>1.01</td>
</tr>
<tr>
<td>informal assessment</td>
<td>216</td>
<td>1 - 5</td>
<td>3.38</td>
<td>1.06</td>
</tr>
<tr>
<td>assess child's play</td>
<td>216</td>
<td>1 - 5</td>
<td>3.61</td>
<td>.96</td>
</tr>
<tr>
<td><strong>Grand Mean</strong></td>
<td></td>
<td></td>
<td>3.67</td>
<td></td>
</tr>
</tbody>
</table>

Table 4.5: Descriptive statistics for Section One (assessment and evaluation).

The highest rate of responses in the section for choices below 3 (occasionally) in the frequency scale was for item 3 (“structured assessment”), where 65 respondents (30.1\%) chose “never” or “rarely” (choices 1 and 2 in the scale). A grand mean of 3.67 for Section One revealed that the majority of responses were for choices 3 (occasionally), 4 (frequently), and 5 (very frequently). Table 4.6 presents an item-by-item summary of frequencies and percentages for Section One.
### Types of Responses

<table>
<thead>
<tr>
<th>Section One Items</th>
<th>N</th>
<th>R</th>
<th>O</th>
<th>F</th>
<th>V</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
<td>(4)</td>
<td>(5)</td>
</tr>
<tr>
<td>1 - Ongoing observation</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>.5</td>
<td>5</td>
</tr>
<tr>
<td>2 - Varied data collection</td>
<td>5</td>
<td>2.3</td>
<td>33</td>
<td>15.3</td>
<td>62</td>
</tr>
<tr>
<td>3 - Structured assessment</td>
<td>24</td>
<td>11.1</td>
<td>41</td>
<td>19.0</td>
<td>67</td>
</tr>
<tr>
<td>4 - Examine/re-examine information</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>related to student referral</td>
<td>2</td>
<td>.9</td>
<td>31</td>
<td>14.4</td>
<td>73</td>
</tr>
<tr>
<td>5 - Ongoing check of performance</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>.5</td>
<td>33</td>
</tr>
<tr>
<td>6 - Check for generalization of motor performance in different settings</td>
<td>4</td>
<td>1.9</td>
<td>30</td>
<td>13.9</td>
<td>95</td>
</tr>
<tr>
<td>7 - Plan set schedule for assessment</td>
<td>4</td>
<td>1.9</td>
<td>26</td>
<td>12.1</td>
<td>63</td>
</tr>
<tr>
<td>8 - Informal assessment</td>
<td>11</td>
<td>5.1</td>
<td>31</td>
<td>14.4</td>
<td>71</td>
</tr>
<tr>
<td>9 - Assessment of child's play behaviors</td>
<td>3</td>
<td>1.4</td>
<td>21</td>
<td>9.7</td>
<td>78</td>
</tr>
</tbody>
</table>

Table 4.6: Response frequencies and percentages of items for Section One.
ANOVA for assessment and evaluation (ASSESS) data. The test of between-subjects effects for ASSESS revealed only non-significant values ($p > .05$). For all variables across the ANOVA, $p$ values varied between .367 and .923. The values of "F" varied from .062 to 1.035. See Table 4.7 for ANOVA information for Section One (ASSESS) data.

<table>
<thead>
<tr>
<th>Source</th>
<th>SS</th>
<th>df</th>
<th>Mean$^2$</th>
<th>F</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Setting</td>
<td>.525</td>
<td>2</td>
<td>.263</td>
<td>1.04</td>
<td>.367</td>
</tr>
<tr>
<td>Gender</td>
<td>.058</td>
<td>1</td>
<td>.058</td>
<td>.222</td>
<td>.638</td>
</tr>
<tr>
<td>Yearexp</td>
<td>.072</td>
<td>1</td>
<td>.078</td>
<td>.276</td>
<td>.600</td>
</tr>
<tr>
<td>Setting and Gender</td>
<td>.376</td>
<td>2</td>
<td>.188</td>
<td>.722</td>
<td>.487</td>
</tr>
<tr>
<td>Setting and Yearexp</td>
<td>.505</td>
<td>2</td>
<td>.253</td>
<td>.972</td>
<td>.381</td>
</tr>
<tr>
<td>Gender and Yearexp</td>
<td>.016</td>
<td>1</td>
<td>.016</td>
<td>.062</td>
<td>.803</td>
</tr>
<tr>
<td>Setting, Gender and Yearexp</td>
<td>.041</td>
<td>2</td>
<td>.020</td>
<td>.080</td>
<td>.923</td>
</tr>
<tr>
<td>Error</td>
<td>44.4</td>
<td>171</td>
<td>.260</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 4.7: Three-way ANOVA for Section One (ASSESS) data.

For independent variable one (SETTINGS), the mean results for the three levels were 3.69 for segregated, ($n=78$, standard error = .105), 3.51 for inclusive ($n=19$, standard error=.134), and 3.75 for both ($n=86$, standard error=.106). However, an item-by-item analysis revealed that the lowest total mean of this section was for "structured assessment". Among the three settings, "structured
assessment" had low means for segregated settings (3.09), inclusive settings (3.10), and both settings combined (3.22). "Ongoing observation" obtained the highest total mean of the section (4.75), in particular for both settings combined (4.86), the highest mean among all three settings. In addition, for the item "ongoing check of performance", an outlier was detected for the setting "both", with a mean of 4.40, much higher than those for segregated (4.01), and inclusive (4.20). Low means were also found for "check for generalization" (3.10) in inclusive settings, and "assessment of child’s play behaviors", with a low mean of 3.15 for inclusive setting.

The second independent variable (YEARS OF EXPERIENCE) showed means of 3.68 for less than 4 years (n=33, standard error=.111), and 3.61 for four years or more (n=150, standard error=.076). The majority of means item-by-item across the two levels of "years of experience" (less than 4 years and more than 4 years) were very similar. However, two items ("examine/re-examine information related to student referral and informal assessment") for CAPEs with less than 4 years of experience, presented means of 3.56 and 3.51 respectively, which were higher than those (3.43 and 3.34 respectively) for CAPEs with more experience. Also, the item "ongoing observation" presented the highest total mean (4.75), with individual means of 4.76 for less than 4 years, and 4.77 for more than 4 years of experience. The lowest total mean (3.13) was for "structured assessment", with individual means of 3.10 for less than 4 years, and 3.14 for more than 4 years of experience.
For independent variable three (GENDER), the means were 3.62 for males (n=38, standard error=.117), and 3.68 for females (n=145, standard error=.065). Analyses item-by-item revealed an outlier for the use of “structured assessment”, with females showing a low mean of 3.04, for a total mean of 3.13 for the item. Finally, “ongoing observations” with a very high total mean of 4.74, was found to be more used by females (4.76) than by males (4.67).

Section Two Results – Program Development and Teaching

Descriptive data. Descriptive statistics for the assessment and evaluation section of the questionnaire, revealed that “adapt activity as needed” (item 11) obtained the highest mean (4.80) and the smallest standard deviation (.44) for the entire section. This item also received responses with a minimum of 3 (sometimes) and a maximum of 5 (always) in the response scale. All the other items in the section obtained mean scores between 3.35 (child choice) and 4.44 (match play equipment), with standard deviations between .67 and 1.00. Item 1 (“distributed practices”), item 3 (“promote vigorous exercises”), item 9 (“a peer tutoring approach”), and item 10 (“enhance communication”), received responses with a minimum of 1 (never) and a maximum of 5 (always), while the other items received responses with a minimum of 2 (rarely) and a maximum of 5 (always) in the response scale. A total of 212 participants provided responses for item 2 (“generalization of skills”), 215 for item 4 (“individualization of instruction”), item 6 (“match play equipment”), item 7 (“consistency of methods”), and item 11 (“adapt activity”). All the remaining items received responses from 216 participants.
Overall response rates, ranges, means, and standard deviations for Section Two are presented in Table 4.8.

<table>
<thead>
<tr>
<th></th>
<th>n</th>
<th>Range</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>distributed practices</td>
<td>216</td>
<td>1 - 5</td>
<td>3.78</td>
<td>.92</td>
</tr>
<tr>
<td>generalization of skills</td>
<td>212</td>
<td>2 - 5</td>
<td>3.85</td>
<td>.77</td>
</tr>
<tr>
<td>promote vigorous exerc.</td>
<td>216</td>
<td>1 - 5</td>
<td>3.76</td>
<td>.85</td>
</tr>
<tr>
<td>Individ. of instruction</td>
<td>215</td>
<td>2 - 5</td>
<td>4.27</td>
<td>.75</td>
</tr>
<tr>
<td>variety of games</td>
<td>216</td>
<td>2 - 5</td>
<td>4.05</td>
<td>.80</td>
</tr>
<tr>
<td>match play equip.</td>
<td>215</td>
<td>2 - 5</td>
<td>4.44</td>
<td>.67</td>
</tr>
<tr>
<td>consistency of methods</td>
<td>215</td>
<td>2 - 5</td>
<td>4.35</td>
<td>.62</td>
</tr>
<tr>
<td>a functional curriculum</td>
<td>216</td>
<td>2 - 5</td>
<td>4.20</td>
<td>.75</td>
</tr>
<tr>
<td>a peer tutoring approach</td>
<td>216</td>
<td>1 - 5</td>
<td>3.25</td>
<td>.92</td>
</tr>
<tr>
<td>enhance communication</td>
<td>216</td>
<td>1 - 5</td>
<td>3.68</td>
<td>1.00</td>
</tr>
<tr>
<td>adapt activity</td>
<td>215</td>
<td>3 - 5</td>
<td>4.80</td>
<td>.44</td>
</tr>
<tr>
<td>child choice</td>
<td>216</td>
<td>2 - 5</td>
<td>3.35</td>
<td>.76</td>
</tr>
<tr>
<td>enhance interaction</td>
<td>216</td>
<td>2 - 5</td>
<td>3.99</td>
<td>.83</td>
</tr>
<tr>
<td>Grand Mean</td>
<td></td>
<td></td>
<td>3.98</td>
<td></td>
</tr>
</tbody>
</table>

Table 4.8: Descriptive statistics for Section Two (program development and teaching).
Observation of the data from separate items in this section revealed that the highest frequencies of responses for a particular choice in the 1-5 scale was made for items 6 (match play equipment) and 11 (adapt activity), where "very frequently" was chosen by 112 respondents (52.1%), and 175 respondents (80.9%), respectively. The other highest frequencies of responses were for item 12 ("child choice") with 124 respondents (57.4%) for "sometimes" (choice 3 in the scale), and for item 2 ("generalization of skills"), item 5 ("variety of games"), and item 8 ("a functional curriculum") with 104 responses (49.1%), 101 responses (46.8%), and 101 responses (46.8%), respectively, for "occasionally" (choice 3 in the scale).

The highest rate of responses in the section for choices below 3 (occasionally) in the frequency scale was for item 9 ("a peer tutoring approach"), where 41 respondents (19.0%) choose "never" or "rarely" (choices 1 and 2 in the scale). A grand mean of 3.98 for Section Two revealed that the majority of responses were for choices 3 (occasionally), 4 (frequently), and 5 (very frequently). Table 4.9 presents an item-by-item summary of frequencies and percentages for Section Two.

ANOVA for program development and teaching (PROGDEV) data. The test of between-subjects effects for PROGDEV revealed only non-significance ($p > .05$). For all variables across the ANOVA, $p$ values varied between .091 and .431. The values of "F" varied from 1.08 to 2.88. See Table 4.10 for ANOVA information for Section Two (PROGDEV) data.
<table>
<thead>
<tr>
<th>Section Two Items</th>
<th>Types of Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
</tr>
<tr>
<td></td>
<td>(1) f</td>
</tr>
<tr>
<td>1 - Distributed practices</td>
<td>2</td>
</tr>
<tr>
<td>2 - Generalization of skills</td>
<td>-</td>
</tr>
<tr>
<td>3 - Promote vigorous exercises</td>
<td>2</td>
</tr>
<tr>
<td>4 - Individualization of instruction</td>
<td>-</td>
</tr>
<tr>
<td>5 - Variety of games</td>
<td>-</td>
</tr>
<tr>
<td>6 - Match play equipment</td>
<td>-</td>
</tr>
<tr>
<td>7 - Consistency of methods</td>
<td>-</td>
</tr>
<tr>
<td>8 - A functional curriculum</td>
<td>-</td>
</tr>
<tr>
<td>9 - A peer tutoring approach</td>
<td>4</td>
</tr>
<tr>
<td>10 - Enhance communication</td>
<td>6</td>
</tr>
<tr>
<td>11 - Adapt activity</td>
<td>-</td>
</tr>
<tr>
<td>12 - child choice</td>
<td>-</td>
</tr>
<tr>
<td>13 - Enhance interaction</td>
<td>-</td>
</tr>
</tbody>
</table>

Table 4.9: Response frequencies and percentages of items for Section Two.
<table>
<thead>
<tr>
<th>Source</th>
<th>SS</th>
<th>df</th>
<th>Mean²</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Setting</td>
<td>.398</td>
<td>2</td>
<td>.199</td>
<td>1.73</td>
<td>.180</td>
</tr>
<tr>
<td>Gender</td>
<td>.199</td>
<td>1</td>
<td>.199</td>
<td>1.73</td>
<td>.190</td>
</tr>
<tr>
<td>Yearexp</td>
<td>.125</td>
<td>1</td>
<td>.125</td>
<td>1.08</td>
<td>.299</td>
</tr>
<tr>
<td>Setting and Gender</td>
<td>.460</td>
<td>2</td>
<td>.230</td>
<td>2.00</td>
<td>.138</td>
</tr>
<tr>
<td>Setting and Yearexp</td>
<td>.316</td>
<td>2</td>
<td>.158</td>
<td>1.37</td>
<td>.256</td>
</tr>
<tr>
<td>Gender and Yearexp</td>
<td>.332</td>
<td>1</td>
<td>.332</td>
<td>2.88</td>
<td>.091</td>
</tr>
<tr>
<td>Setting, Gender and Yearexp</td>
<td>.194</td>
<td>2</td>
<td>.097</td>
<td>.845</td>
<td>.431</td>
</tr>
<tr>
<td>Error</td>
<td>19.7</td>
<td>171</td>
<td>.115</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 4.10: Three-way ANOVA for Section Two (PROGDEV) data.

For independent variable one (SETTINGS), the mean results for the three levels were 4.05 for segregated, \( n=78 \), standard error = .070, 3.84 for inclusive \( n=19 \), standard error=.089, and 3.92 for both \( n=86 \), standard error=.070. Individual means across the three settings (segregated, inclusive, and both), revealed that "a peer tutoring approach" had the lower total mean of 3.26 for the section, with an extremely low mean of 3.08 for segregated settings, and a relatively low mean of 3.33 for inclusive setting. Another very low mean of 3.30 was found for "child choice" in both (segregated and inclusive) settings. Finally, "adapt activity" showed the highest total mean of 4.77, with individual high means of 4.73 for segregated, 4.70 for inclusive, and 4.83 for both.
The second independent variable (YEARS OF EXPERIENCE) showed means of 3.98 for less than 4 years (n=33, standard error=.074), and 3.89 for four years or more (n=150, standard error= .050). Analyses item-by-item across the two levels of years of experience, revealed that CAPEs with “less” than 4 years teaching use “adaptations” more (mean=4.90) than those with “more” years of experience (mean=4.77), for a total mean of 4.80 across years of experience. This particularly high mean of 4.90 for “adapt activity” was found to be the highest across the three sections of the questionnaire. A “peer tutoring approach”, however, obtained the lower total mean of 3.26, with individual means of 3.28 for “less” than 4 years, and 3.26 for “more” than 4 years of experience.

For independent variable three (GENDER), the means were 3.88 for males (n=38, standard error=.078), and 4.00 for females (n=145, standard error=.043). The majority of means item-by-item across the two levels of “gender” (male and female) were very similar. However, a much lower total mean of 3.25 was noted, with means of 3.20 and 3.27 for males and females respectively. Again, “adapt activity” had the highest total mean of 4.80, with individual means of 4.72 for males, and 4.82 for females.

**Section Three Results – Behavior Management**

**Descriptive data.** Descriptive statistics for the behavior management section of the questionnaire revealed that item 4 (reinforce good behavior) and item 8 (model appropriate behaviors) obtained the same highest means (4.63). All the other items in the section obtained mean scores between 3.66 (problem solving) and 4.42 (provide physical assistance), with standard deviations
between .65 and .94. Items 1 (shaping), 2 (fading), 3 (establish goal), 5 (problem solving), and 10 (provide physical assistance) received responses with a minimum of 1 (never) and a maximum of 5 (always) in the response scale. With the exception of item 8 (model appropriate behaviors), which received responses from 215 participants, all the other items received responses from 216 participants. Overall response rates, ranges, means, and standard deviations for Section Three are presented in Table 4.11.

<table>
<thead>
<tr>
<th>Item</th>
<th>n</th>
<th>Range</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>shaping</td>
<td>216</td>
<td>1-5</td>
<td>3.89</td>
<td>.84</td>
</tr>
<tr>
<td>fading</td>
<td>216</td>
<td>1-5</td>
<td>3.87</td>
<td>.83</td>
</tr>
<tr>
<td>establish goals</td>
<td>216</td>
<td>1-5</td>
<td>4.24</td>
<td>.84</td>
</tr>
<tr>
<td>reinforce good behavior</td>
<td>216</td>
<td>2-5</td>
<td>4.63</td>
<td>.57</td>
</tr>
<tr>
<td>problem solving</td>
<td>216</td>
<td>1-5</td>
<td>3.66</td>
<td>.94</td>
</tr>
<tr>
<td>prevent disruptive behavior</td>
<td>216</td>
<td>2-5</td>
<td>4.19</td>
<td>.65</td>
</tr>
<tr>
<td>a highly structured program</td>
<td>216</td>
<td>2-5</td>
<td>4.25</td>
<td>.72</td>
</tr>
<tr>
<td>model appropriate behaviors</td>
<td>215</td>
<td>2-5</td>
<td>4.63</td>
<td>.56</td>
</tr>
<tr>
<td>use a continuum of prompts</td>
<td>216</td>
<td>2-5</td>
<td>4.27</td>
<td>.67</td>
</tr>
<tr>
<td>provide physical assistance</td>
<td>216</td>
<td>1-5</td>
<td>4.42</td>
<td>.76</td>
</tr>
<tr>
<td><strong>Grand Mean</strong></td>
<td><strong>216</strong></td>
<td><strong>1-5</strong></td>
<td><strong>4.20</strong></td>
<td></td>
</tr>
</tbody>
</table>

Table 4.11: Descriptive statistics for Section Three (behavior management).
Observation of the data from separate items in this section revealed that, for items 4 ("reinforce good behavior"), 8 ("model appropriate behaviors"), and 10 ("provide physical assistance"), choice 5 (always) was chosen by 146 respondents (67.6%), 144 respondents (67.0%), and 122 (56.5%) respondents, respectively. The other highest frequencies of responses were for items 6 ("prevent disruptive behaviors") with 122 responses (56.5%), and item 9 ("use a continuum of prompts") with 107 responses for "most of the time" (choice 4 in the scale).

The highest rate of responses in the section for choices below 3 (sometimes) in the frequency scale was for item 5 ("problem solving"), where 21 respondents (.9%) choose "never" or "rarely" (choices 1 and 2 in the scale). This item also obtained the same frequency of responses (75) for both choices 3 (sometimes) and 4 (most of the time). A grand mean of 4.20 for Section Three revealed that the majority of responses were for choices 4 (most of the time), and 5 (always). Table 4.12 presents an item-by-item summary of frequencies and percentages for Section Three.

ANOVA for behavior management (BEHAMA) data. The test of between-subjects effects for BEHAMA revealed a significant difference for SETTINGS, $F(2, 171) = 7.59$, ($p < .05$) and another significant difference for GENDER and YEARS OF EXPERIENCE, $F(1, 171) = 5.17$, ($p < .05$). Additional statistical analysis (Tukey HSD) was used to find which specific means differed significantly. For all variables across the ANOVA, $p$ values varied between .001
### Types of Responses

<table>
<thead>
<tr>
<th>Section Three Items</th>
<th>N</th>
<th>R</th>
<th>S</th>
<th>M</th>
<th>A</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>(N = Never)</em></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>(R = Rarely)</em></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>(S = Sometimes)</em></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>(M = Most of the time)</em></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>(A = Always)</em></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Item</th>
<th>f</th>
<th>%</th>
<th>f</th>
<th>%</th>
<th>f</th>
<th>%</th>
<th>f</th>
<th>%</th>
<th>f</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 - Shaping</td>
<td>2</td>
<td>.9</td>
<td>7</td>
<td>3.3</td>
<td>56</td>
<td>25.9</td>
<td>99</td>
<td>45.8</td>
<td>52</td>
<td>24.1</td>
</tr>
<tr>
<td>2 - Fading</td>
<td>1</td>
<td>.5</td>
<td>10</td>
<td>4.6</td>
<td>55</td>
<td>25.5</td>
<td>101</td>
<td>46.8</td>
<td>49</td>
<td>22.7</td>
</tr>
<tr>
<td>3 - Establish goal</td>
<td>1</td>
<td>.5</td>
<td>8</td>
<td>3.7</td>
<td>27</td>
<td>12.5</td>
<td>82</td>
<td>38.0</td>
<td>98</td>
<td>45.4</td>
</tr>
<tr>
<td>4 - Reinforce good behavior</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>.5</td>
<td>7</td>
<td>3.2</td>
<td>62</td>
<td>28.7</td>
<td>146</td>
<td>67.6</td>
</tr>
<tr>
<td>5 - Problem solving</td>
<td>2</td>
<td>.9</td>
<td>19</td>
<td>8.8</td>
<td>75</td>
<td>34.7</td>
<td>75</td>
<td>34.7</td>
<td>45</td>
<td>20.8</td>
</tr>
<tr>
<td>6 - Prevent disruptive behaviors</td>
<td>-</td>
<td>-</td>
<td>2</td>
<td>.9</td>
<td>23</td>
<td>10.6</td>
<td>122</td>
<td>56.5</td>
<td>69</td>
<td>31.9</td>
</tr>
<tr>
<td>7 - A highly structured program</td>
<td>-</td>
<td>-</td>
<td>3</td>
<td>1.4</td>
<td>27</td>
<td>12.5</td>
<td>99</td>
<td>45.8</td>
<td>87</td>
<td>40.3</td>
</tr>
<tr>
<td>8 - Model appropriate behaviors</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>.5</td>
<td>6</td>
<td>2.8</td>
<td>64</td>
<td>29.8</td>
<td>144</td>
<td>67.0</td>
</tr>
<tr>
<td>9 - Use a continuum of prompts</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>.5</td>
<td>24</td>
<td>11.1</td>
<td>107</td>
<td>49.5</td>
<td>84</td>
<td>38.9</td>
</tr>
<tr>
<td>10 - Provide physical assistance</td>
<td>1</td>
<td>.5</td>
<td>1</td>
<td>.5</td>
<td>27</td>
<td>12.5</td>
<td>65</td>
<td>30.1</td>
<td>122</td>
<td>56.5</td>
</tr>
</tbody>
</table>

Table 4.12: Response frequencies and percentages of items for Section Three.
and .886. The values of “F” varied from .021 to 7.59. See Table 4.13 for ANOVA information for Section Three (BEHAMA) data.

<table>
<thead>
<tr>
<th>Source</th>
<th>SS</th>
<th>df</th>
<th>$\mu^2$</th>
<th>F</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Setting</td>
<td>2.29</td>
<td>2</td>
<td>1.14</td>
<td>7.59</td>
<td>.001</td>
</tr>
<tr>
<td>Gender</td>
<td>.034</td>
<td>1</td>
<td>.034</td>
<td>.226</td>
<td>.635</td>
</tr>
<tr>
<td>Yearexp</td>
<td>.031</td>
<td>1</td>
<td>.031</td>
<td>.021</td>
<td>.886</td>
</tr>
<tr>
<td>Setting and Gender</td>
<td>.610</td>
<td>2</td>
<td>.305</td>
<td>2.02</td>
<td>.135</td>
</tr>
<tr>
<td>Yearexp</td>
<td>.267</td>
<td>2</td>
<td>.133</td>
<td>.886</td>
<td>.414</td>
</tr>
<tr>
<td>Gender and Yearexp</td>
<td>.779</td>
<td>1</td>
<td>.779</td>
<td>5.17</td>
<td>.024</td>
</tr>
<tr>
<td>Setting, Gender, and Yearexp</td>
<td>.048</td>
<td>2</td>
<td>.024</td>
<td>.160</td>
<td>.853</td>
</tr>
<tr>
<td>Error</td>
<td>25.7</td>
<td>171</td>
<td>.151</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 4.13: Three-way ANOVA for Section Three (BEHAMA) data.

For independent variable one (SETTINGS), the mean results for the three levels were 4.20 for segregated (n=78, standard error = .080), 3.80 for inclusive (n=19, standard error=.102), and 4.29 for both (n=86, standard error=.081). Individual analyses for the three settings (segregated, inclusive, and both) revealed that the highest total mean across all items was 4.63 for both, “reinforce good behavior” and “model appropriate behavior”. “Reinforce good behavior” also had high means by CAPEs teaching in segregated settings (4.62), and both (4.71). “Model appropriate behavior” showed high means of 4.61, 4.60, and 4.66.
respectively across the three settings. On the other hand, "problem solving" showed the lowest total mean of 3.63, as well as the lowest individual mean of 3.30 by CAPEs in inclusive settings.

The second independent variable (YEARS OF EXPERIENCE) showed means of 4.10 for less than 4 years (n=33, standard error=.084), and 4.09 for four years or more (n=150, standard error=.058). Very similar total and individual means were observed for two items ("reinforce good behavior" and "model appropriate behavior"). A total mean of 4.64 was noted for "reinforce good behavior", with individual means of 4.54 for "less than 4 years", and 4.66 for "more than 4 years of experience". "Model appropriate behaviors" showed a total mean of 4.63, with individual means of 4.56 for "less than 4 years", and 4.65 for "more than 4 years of experience". "Problem solving" on the contrary, showed a low total mean of 3.66, with a considerably low 3.44 for CAPEs with "less than 4 years" of experience.

For the independent variable three (GENDER), the means were 4.07 for males (n=38, standard error=. 089), and 4.12 for females (n=145, standard error=. 050). Analyses item-by-item revealed an identical data set for "reinforce good behavior" and "model appropriate behavior", both with a total mean of 4.63, and individual means of 4.54 and 4.66 for "male" and "female". The lowest total mean was 3.66 for "problem solving", with individual means of 3.54 and 3.69 for "male" and "female" respectively.

In order to check the significant difference between the means of GENDER and YEARS OF EXPERIENCE relative to the BEHAMA dependent
variable, a univariate analysis of variance was performed. The test of between-subjects effects for BEHAMA revealed a non-significant difference for GENDER and YEARS OF EXPERIENCE, \( F (1, 208) = .615, (p > .05) \). For all variables across the ANOVA, \( p \) values varied between (.16 and .43). The "F" statistic varied from .61 to 1.97. Table 4.14 provides ANOVA information for Section Three (BEHAMA) data across the GENDER and YEARS OF EXPERIENCE independent variables.

<table>
<thead>
<tr>
<th>Source</th>
<th>SS</th>
<th>df</th>
<th>Mean²</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>.145</td>
<td>1</td>
<td>.145</td>
<td>.911</td>
<td>.341</td>
</tr>
<tr>
<td>Yearexp</td>
<td>.313</td>
<td>1</td>
<td>.313</td>
<td>1.97</td>
<td>.162</td>
</tr>
<tr>
<td>Gender and Yearexp</td>
<td>.098</td>
<td>1</td>
<td>.097</td>
<td>.615</td>
<td>.434</td>
</tr>
<tr>
<td>Error</td>
<td>33.0</td>
<td>208</td>
<td>.159</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 4.14: Three-way ANOVA for Section Three (BEHAMA) data across gender and years of experience.

Relative to the dependent variable BEHAMA and independent variable SETTING, a Post Hoc Tukey HSD (honest significant difference) was used to determine which pair(s) of means differed by more than would be expected.
Results from the post hoc testing showed significant differences between segregated (mean=4.19) and inclusive (mean=3.92) \((p < .05)\), and inclusive (mean=3.92) and both (mean 4.25) \((p < .05)\). No significant differences were found between the means of segregated and both \((p > .05)\).

Discussion

The basic focus of this research was to validate the best methods and strategies used by certified adapted physical educators (CAPEs) to teach children with autistic behaviors in physical education settings. The Survey of Best Physical Education Practices for Children with Autistic Behaviors (SBPEPCAB) instrument, designed for this study, included 32 suggested best practices based on the current literature. This instrument was categorized into three sections: 1) Assessment and Evaluation; 2) Program Development and Teaching; and, 3) Behavior Management. Data were collected and examined in order to respond to six research questions across four independent variables (setting, years of experience, gender, and teacher type). Data-based answers to each research question and related discussion follows. Information in this section also includes discussions relative to findings from results of raw data analyses.

Research Question # 1

Research question # 1 examined in this study was: “Do CAPEs support the same best physical education practices across physical education settings (segregated, inclusive, and both)?”. Relative to settings, a response rate of 69.49% \((186/268)\) was obtained (See page 114).
For this question concerning the variable "settings", results from analysis of variance showed that there were no significant differences between the means of settings for the "assessment and evaluation" and "program development and teaching" sections of SBPEPCAB. These data therefore provide evidence that similar assessment and programming best practices are being implemented by CAPEs in both segregated and inclusive physical education environments. These results were somewhat expected, because it is an increasingly common practice in the field to have adapted physical educators teaching in general physical education classes with the current emphasis on inclusion of children with disabilities (inclusive setting).

However, relative to assessment and evaluation, "structured assessment" appeared to be the least used best physical education practice by CAPEs across the three settings. Likewise, "assessment of child's play behaviors" and "check for generalization", presented very low levels of use by CAPEs in inclusive settings, while "ongoing check of performance" appeared to be more used by CAPEs in both settings. On the other hand, "ongoing observations" had the highest total mean of use, with a particularly high manifestation of use by CAPEs teaching in both settings. These results contradict recommendations provided by various authors (See Table 2.1) in the current literature, emphasizing the use of "structured assessment" and "generalization of skills" as important strategies to facilitate placement of children with autistic behaviors in physical education settings, as well as to promote better levels of participation in any physical education settings.
Closer analyses of responses for best practices in program development and teaching revealed that CAPEs teaching in segregated settings are using "vigorous exercises" much more than CAPEs teaching in inclusive settings. In contrast, "peer tutoring approach", "development of communication patterns", and "enhancement of interactions" appeared to be less used in segregated than in the other settings (inclusive and both). The use of vigorous exercises was suggested in the current literature (Kern, Koegel, & Dunlap, 1984; Kern, Koegel, Dyer, Blew, & Fenton, 1982; Levinson & Reid, 1993), as a powerful tool to decrease self-stimulatory behaviors in physical education settings. "Peer tutoring", "development of communication patterns", and "enhancement of interactions" are strongly recommended in all physical education settings, in order to maintain optimal levels of concentration in specific tasks and build relationships (Auxter, Pyfer, & Huettig, 1997; Christof & Kane, 1991; Lisboa, 1997; Schleien et al., 1987). The most used best practice by CAPEs was "adapt activity", which is in agreement with recommendations in adapted physical education textbooks. On the other hand, "child choice" in both (segregated and inclusive settings) was the strategy less used by CAPEs across all settings and all items. This result may be explained because children with autistic behavior generally require large amounts of prompts, in order to perform activities in physical education settings, as reported by Andrews, Decker, and Boswell (1998), and in replication studies of the same variable conducted by Collier and Reid (1987), and Reid, Cauchon, and Collier (1991).
Some significant differences were found between the setting means for the behavior management section of SBPEPCAB. A post hoc analysis showed interactions between segregated (mean=4.19) and inclusive (mean=3.92) ($p < .05$), and inclusive (mean=4.19) and both (mean 4.25) ($p < .05$). No significant differences were found between the means of segregated and both ($p > .05$). A possible explanation why those levels of settings are interacting, may be due to the fact that many adapted physical education teachers are developing their activities in both (segregated and inclusive) settings. The best practices reported by those teachers are the same used in both (segregated and inclusive) environments, which represents a benefit for children with autistic behavior who are receiving services from experts in their area of disability, both in adapted or inclusive physical education.

In addition, when analyzing raw outlier data on behavior management items, very similar mean scores were observed across all items, with the exception of the use of “problem solving”, use of a “continuum of prompts”, and “provision of physical assistance”, which presented much higher means in segregated settings. Those results are in accordance with the suggested best practices presented in the literature for children with autistic behaviors in physical education settings (See Table 2.6). Also, the importance of using such strategies in adapted physical education settings is well known, in order to provide changes in children’s behaviors (Andrews, Decker, & Boswell, 1998; Colier & Reid, 1987; Reid, Cauchon, & Clier, 1991; Reid & Morin, 1981). Equal high means across all three settings were observed for “reinforcement of good behavior” and “model
appropriate behaviors". This information reinforces results from previous research (McGee, Paradis, & Feldman, 1993), and from current refereed literature (Cooper, Heron, & Heward, 1987), that modeling appropriate behaviors decreases considerably the appearance of undesirable behaviors.

**Research Question # 2**

Research question # 2 for this study was: "Do CAPEs with fewer (less than 4 years) as opposed to more (more than 4 years) years of teaching experience support the same best practices for teaching physical education to children with autistic behaviors?". For this question concerning the variable "years of experience", results from analysis of variance showed that there were no significant differences between the means of years of experience for the first three sections of SBPEPCAB.

However, when analyzing the data for each particular item relative to assessment and evaluation, it was observed that "examine student referral" and "informal assessment" are more used by CAPEs with less experience than by those CAPEs with more years of experience. Both CAPEs with fewer and more years of experience reported "ongoing observations" as the most used strategy relative to assessment and evaluation. Finally, a very low use of "structured assessment" was shown in data from less and more experienced CAPEs. "Structured" or formal assessment using special tools for children with autistic behaviors [e.g., Childhood Autism Rating Scale (CARS), Autism Behavior Checklist (ABC), Behavior Summarized Evaluation (BSE)] is recommended as an important component of the child's portfolio (Auxter, Pyfer, & Huettig, 1997;
Matson, 1994). However, "ongoing observations" produces better results because children with autistic behaviors do not perform well on request, making more difficult the assessment process (Heikinaho-Johansson & Vogler, 1996). The use of these two strategies by CAPEs is in total alignment with the recommendations in the refereed literature.

Also, surprising results were observed for program development and teaching strategies. Again, CAPEs with less experience presented higher levels of use of suggested best practices in this section of the instrument than those CAPEs with more years of experience. The particular items of interest were the use of "variety of games", "adapt activity", and "functional curriculum". Special attention should be given to "adapt activity" that was reported as the best practice of highest use (across all items of the entire instrument) by CAPEs with less than 4 years of experience. It is an important finding for the field that CAPEs with less than 4 years teaching children with autistic behaviors are already implementing such a strategy as strongly recommended in the literature (e.g., Block, 1994; Jansma & French, 1994; Lavay & French, 1993; Murata & Little, 1995; Sherrill, 1998).

Finally, relative to behavior management, it appears that CAPEs with more than 4 years of experience are using those strategies more than less experienced CAPEs. Although the means across each particular item were similar for both CAPEs with fewer and more years of experience, lower means were observed for the use of "fading", "establishing goals", "problem solving", and "continuum of prompts". These results show that behavior management
strategies require a lot of practice and understanding of their basic concepts, in order to be used by teachers in physical education settings (Blake & Moir, 1995; Block & Vogler, 1994; Stanton & Colvin, 1996). The use of those practices, meanwhile, is enhanced with more years of experience in the teaching process. In addition, "reinforce good behavior" and "model appropriate behaviors" presented very similar high levels of use by CAPEs. This result is in agreement with recommendations from the current literature, relative to the use of such behavior management strategies to increase levels of performance and participation of children with autistic behaviors (Cooper, Heron, & Heward, 1987; McGee, Paradis, & Feldman, 1993).

Identified best physical education practices are being implemented by CAPEs at the same level of use, independent of their experience teaching children with autism. More specifically, although the experience of CAPEs ranged from 1 to 33 years teaching children with autistic behaviors, 78% of them had been teaching children within this special population for more than four years. However, as revealed in the data analysis, the group of teachers (27%) with less than four years of teaching experience also supports the same best practices as those who were more experienced. These results are encouraging, because it is now known that even less experienced CAPEs, are implementing best physical education practices across three important areas of the teaching/learning process (i.e., assessment and evaluation; program development and teaching; and, behavior management) in this country's schools.
Research Question # 3

Research question # 3 for this study was: "Do male and female CAPEs support the same best practices for teaching physical education to children with autistic behaviors?". For this question concerning the variable "gender", results from analysis of variance also showed that there were no significant differences between males and females for the first three sections of SBPEPCAB.

Item-by-item analyses for outliers in assessment and evaluation revealed that two items ("assessment of child's play behaviors" and "check for generalizations") are more used by females. On the other hand, males use more "structured assessment" than females (the lowest indicator of use for a particular strategy across the section). "Ongoing observation" on the other hand, received the highest mean scores by males and females across the section, as well as the highest total mean across the section.

Relative to program development and teaching, female CAPEs demonstrated low use of "individualization of skills", "variety of games", "enhancement of communication", and "enhancement of interactions". "Adapt activity" presented the highest level of use for total mean, as well as across males and females. "A peer tutoring approach" presented the lowest total and individual means across males and females.

Finally, relative to the use of behavior management strategies, females presented higher means than males, across all items in the section, particularly for "establish goals" where the difference favoring females was much higher. The only observed exception for this section was for "shaping", where males...
presented higher means than females. From the item-by-item analyses, results showed that “problem solving” obtained the lowest total and individual means. These means, especially by males, were very low when compared to other means across the section. An interesting finding was the two identical data sets for “reinforce good behaviors” and “model appropriate behaviors”, with males and females presenting exactly the same level of use for both strategies.

No study in the reviewed literature in the area of adapted physical education provides information relative to differences between males and females teaching children with autistic behaviors in physical education settings. However, results from this study showed that male and female CAPEs are equally using best physical education practices for assessment and evaluation, program development and teaching, and behavior management.

Research Question # 4

Research question # 4 for this study was: “Do CAPEs who teach or have taught children with autistic behavior support the same best physical education practices identified from those CAPEs who have not taught children with autistic behaviors?”. For this question concerning the variable “teacher type”, 98.1% (212 participants) responded that they are having or have had some practice teaching children with autistic behaviors. Only 4 participants (1.9%) responded that they never taught children with autistic behavior in physical education settings.

This overwhelming result made impossible an independent analysis of mean data differences for this particular variable. More specifically, because the great majority of participants (98.1%) checked “yes” (teach or have taught), the
teacher type variable was considered unfit for inferential analysis due to insufficient statistical power for an appropriate analysis. However, the fact that virtually the whole population of CAPEs teaches or has taught children with autistic behaviors in physical education settings provides evidence that this particular population of children is receiving services from specialists in adapted physical education. As reported by Block (1994), the advantage of using experienced teachers certainly will improve opportunity to learn by children with autistic behaviors and, collaterally, promote better levels of integration and interactions with their peers without disabilities. Lastly, because of the homogeneous participant responses for this question, other discussion points essentially mirror those provided for research question #5.

Research Question #5

Research question #5 for this study was: "What are the best physical education practices for children with autistic behaviors as identified by CAPEs?". The use of Section One's assessment and evaluation strategies for children with autistic behaviors produced a considerably high grand mean of 3.67, indicating that CAPEs are frequently or very frequently using the suggested best physical education practices in the current literature (See Table 2.4).

"Ongoing observation" and "ongoing check of performance" received the highest means (4.74 and 4.21 respectively) supporting previous studies and authors recommendations (Davis, 1990; Jansma & French, 1994; Reid & Morin, 1981; Sherrill, 1998). This suggests that some pre-assessment considerations,
such as what is the present level of performance and what are the differences in motor performance between home and school must be observed.

In the same light, the frequent use of these two assessment and evaluation strategies by CAPEs, emphasize the need of using ecobehavioral assessment (ongoing observational data collection in different settings) to develop a good individualized education plan (IEP) as suggested in the literature (Auxter, Pyfer, & Huettig, 1997; Connor, 1990; Matson, 1994).

The item “structured assessment” on the other hand, received the lowest mean for the assessment and evaluation section, contradicting Davis (1990) who recommended the use of prior planning (structured assessment). Less frequent use of “structured assessment” by CAPEs can be explained because the evaluation of motor performance for children with autistic behaviors requires continuing observations based on their constant change in behaviors. Further, Sherrill (1998) emphasizes the need for assessing play behavior and checking for the generalization of skills for children with autistic behaviors. The responses in the SBPEPCAB with means of 3.61 and 3.37 for “assessment of child’s play behavior” and “check for generalization” demonstrate that CAPEs are in agreement with the Sherrill’s recommended strategies.

The occasional and/or frequent use of “varied data collection” and “informal assessment”, reported by CAPEs, suggests that these strategies also should be a permanent element of a teacher’s repertoire when planning for assessment and evaluation of their pupils with autistic behaviors. Finally, unobtrusive test tools to gather information about students’ functional capabilities
in a natural environment (informal assessment) were reported by CAPEs as a very usable strategy. The use of informal assessment reinforces the idea that data collected with "no interference" (absence of outside stimuli) is a very usable strategy. The use of informal assessment also reinforces the idea that data collected with "no interference" (absence of outside stimuli) in the environment provides accurate information relative to a child's behaviors (Baranek & Berkson, 1994).

The grand mean for program development and teaching (3.98) was the second highest across the questionnaire's three sections. One explanation for this result is that CAPEs are committed to the importance of developing better programs to fulfill the needs of children with autistic behaviors in physical education settings. This endorses those areas of program development and teaching (e.g., distributed practice, generalization of skills, and functional curriculum) when addressing skill acquisition and play instruction for children with autistic behaviors as recommended in the reviewed literature (See Tables 2.5 and 2.7), improving effective teaching and strengthening physical education programs for children with autistic behaviors.

One theoretical framework for this study (adaptation theory expanded by Sherrill, 1995) emphasizes the need for adapted physical educators to teach and empower lifespan physical activity, providing adaptations to activities for instructional purposes. Therefore, the importance of teaching individuals how to "adapt" physical education programs to meet the needs of children with disabilities must be taken in consideration. Use of "adaptation of activities" was
the item with the highest total mean (4.80) for the entire questionnaire, and an almost perfect mean of 4.90 for a particular item ("adapt activity") by CAPEs with less than 4 years of experience. This piece of datum demonstrates that 98.6% of all CAPEs are always or most of the time adapting activities, with the purpose of increasing performance levels for the success of children with autistic behaviors.

Also, associated with the results are responses from the SBPEPCAB revealing that CAPEs are aligned with the adaptation theory, specifically related to issues relative to the development of adapted physical education programs for children with disabilities. The use of "individualization of instruction" when teaching children with autistic behaviors received a mean of 4.27, with more than 86% of the CAPE participants indicating that this strategy is always or most of the time used during their physical education sessions. Individualization of instruction when teaching children with autistic behaviors has been recommended in refereed literature (Lisboa, Butterfield, Reif, & McIntire, 1995; Webster, 1993) as an important element to enhance academic learning time in physical education (ALT-PE). ALT-PE is an observational instrument (Siedentop, 1983) with the purpose of measuring the amount of time in a lesson that students are engaged in motor activity at an appropriate success rate. To this end, CAPEs largely use strategies for program development and teaching in their instruction, providing a successful educational life for children with autistic behaviors in physical education environments.

"Enhancement of interactions" and "communication patterns" during the physical education lesson also received high mean scores (3.99 and 3.68).
These two teaching strategies were previously recommended as powerful tools to facilitate inclusion (Craft, 1994; Lisboa, 1997; Stanton & Colvin, 1996; Thorp, Stahmer, & Schreibman, 1995). In addition, “consistency of methods”, “variety of games”, “functional curriculum”, and “match play equipment with child’s ability level” also received means higher than 4.0, to further characterize effective teaching with the consistent (always or most of the time) use of targeted best physical education practices for children with autistic behaviors as reported in the literature (Jansma & French, 1994; Weber & Thorpe, 1992; Webster, 1993).

On the other hand, although the majority of CAPEs used most of the identified suggested best practices for program development and teaching, a few doubts were “voiced” relative to the use of “promoting vigorous aerobic, cardiovascular endurance activities”. According to the results, almost 40% of CAPEs suggested that they rarely, sometimes, or most of the time use this strategy, albeit strongly recommended in the literature (Auxter et al., 1997; Kern, Koegel, & Dunlap, 1984; Kern, Koegel, Dyer, Blew, & Fenton, 1982; Levinson & Reid, 1993).

Section Three of the SBPEPCAB (behavior management) produced the highest grand mean (4.20) for the questionnaire’s three sections, with more than 60% of CAPEs indicating that they always, or most of the time, use all the questionnaire’s suggested best practices for behavior management. This consensus evidence of the powerful benefits of using behavior management such as “reinforcement of good behavior” (99.5%) and “modeling appropriate behaviors” (99.4%), support the recommendations from Lavay, French, and
Henderson (1997) and previous research by Jansma and Surburg (1995) where the need to understand and use behavior management techniques was emphasized.

Other strategies highlighted by the CAPE respondents included basic techniques of applied behavior analysis such as "shaping" (95.8%), "fading" (95.0%), "prevent disruptive behaviors" (99.0%), and "use of a continuum of prompts" (99.5%). The use of these best practices have been emphasized by Peters and Heron (1993), who suggested that such strategies should be implemented in current teaching practices and that such best practices in the field needed to be consistent with existing literature to produce desirable outcomes. Finally, "establishing goals" and using "highly structured programs" also received means higher than 4.00, with more than 95.0% of all CAPEs indicating their use of those strategies.

Research Question #6

Research question #6 for this study was: "What best practices presented in the refereed literature on teaching physical education to children with autistic behaviors are practiced by CAPEs in the field?" Results from the SBPEPCAB-generated data inform those in the field of physical education for children with autistic behaviors that, generally, they are using the best practices in their teaching performances, as recommended in the current literature. The high grand mean results across the three sections of the questionnaire (3.67, 3.98, and 4.20) evidences the frequent or very frequent use by CAPEs of best physical education practices, as suggested by researchers in the area of adapted physical
education (See Tables 2.3 through 2.7). These results are supportive of targeted competencies necessary for adapted physical educators to perform job functions relative to service delivery as recommended by Sherrill (1998). Sherrill (1998) specifically recommended reading journals and books that publish research methods and strategies (best practices) for teaching adapted physical education. Results from the SBPEPCAB, suggest that CAPEs are not only learning best physical education practices for children with autistic behavior from specialized journals and textbooks in the area, but also implementing these best practices in their instruction. These results also provide evidence that CAPEs are abiding by the Adapted Physical Education National Standards (APENS) competency requirements, relative to human development, motor behavior; measurement and evaluation, program development, assessment, instructional design planning, teaching, and continuing education (Kelly, 1994).

Lastly, results from the SBPEPCAB also challenge a recent nationwide survey study conducted by Kelly and Gansneder (1998), which examined the preparation of adapted physical educators (APEs). According to the authors, there is a lack in defining whether or not adapted physical educators are qualified to provide services for children with disabilities in physical education settings. Results revealed a substantial need by adapted physical educators for training (e.g., teaching strategies and motor development), as well as a stated need for continuing education (Kelly & Gansneder, 1998). The results from the SBPEPCAB, however, show that CAPEs use the best physical education
practices for children with autistic behaviors, especially because these practices are the same as those recommended in the literature.
This chapter is divided into three sections. Section One provides a summary of this project. Conclusions related to this investigation are presented in Section Two. Section Three identifies areas for future related research.

Summary

This study had two theoretical orientations: a) Adaptation Theory (Kiphard, 1984) and, b) Conceptual Model of Teaching (Reiser & Dick, 1996). The purpose of this survey research was to collect data relative to best physical education practices for children with autistic behaviors from certified adapted physical educators (CAPEs), exploring and validating methods and strategies (i.e., best practices) that physical educators use in physical education environments. The importance of this study is the determination of whether or not physical educators are using appropriate and successful best practices to meet the needs of children with autistic behaviors in physical education settings. Three important areas of the teaching/learning process were investigated in this study (e.g., assessment and evaluation; program development and teaching; and, behavior
management). The only limitation to this study was that data were collected from CAPEs certified in 1997 and 1998.

A review of literature includes information relative to the syndrome of autism (e.g., definitions, theories, etiology, diagnosis, prognosis, and treatment), behavior modification techniques (e.g., applied behavior analyses, Lovaas Technique), and cognitive abilities. Also included in the review is information on inclusion, roles of the physical educator, adaptations in inclusive settings, and a summary of research studies in physical education for children with autistic behaviors. Lastly, a broad review of best physical education practices was provided, based on current primary and secondary literature.

Participants for the study were selected based on a frame list of all CAPEs (N=268) in the United States. Luke Kelly (APENS Director) provided the frame list with CAPEs distributed across 39 states and the District of Columbia.

A survey instrument (Survey of Best Physical Education Practices for Children with Autistic Behaviors - SBPEPCAB) was specially developed for this study. Both validity (face and content) and reliability (α=.85 for internal consistency and α=.89 for the alternate-form) were established. Participants in the field test (N=5) indicated that the questionnaire's overall format was considered appropriate for the target population, and that font size, directions, format, and the rating scales were suitable. A panel of experts evaluated the instrument for content validity purposes, indicating that all items represented potential best physical education practice for children with autistic behaviors.
The overall questionnaire contained four sections with content related to assessment and evaluation, program development and teaching, behavior management, and demographics. A total design method was employed as the basic format for the study (Dillman, 1978). Data collection consisted of mailing the questionnaire to all participants, using a four-step approach (e.g., pre-response card, 1st complete package, card remainder, and 2nd complete package), as suggested by Salant and Dillman (1994). After the completion of the mailing process, a return rate of 216 (80.6%) was obtained. Based on this return rate, a decision was made to terminate survey data collection, and declare the remaining subjects non-respondents.

To check for differences between respondents and non-respondents and for the purposes of generalization of results for the target population, a t-test of independent samples (Levene's Test for Equality of Variances and t-test for Equality of Means) was performed using early respondents (n=166) and late respondents (n=34). If there were no differences between early and late respondents, the responses by late respondents can be assumed to be the same as non-respondents (Miller & Smith, 1983). Results from the t-test revealed non-significance ($p > .05$), and thus, later respondents were considered similar to early respondents. Data were therefore collapsed and a decision was made to generalize the results to the entire population.

Statistical analysis for this study was conducted using the Statistical Package for Social Studies (SPSS), version 9.0 for Windows 9X & NT. Results from demographic information revealed that the majority of respondents (137)
had experience teaching adapted physical education for 8 years or more. Relative to the number of years teaching general physical education, responses were very similar: less than 1 year (46), 1-3 years (53), 4-7 years (58), and 8 or more years (59). As for settings, 166 CAPEs had experience teaching in adapted physical education classes, 51 in general, 107 in inclusive, 39 in reversed mainstreaming, and 80 worked as a consultant/research specialist. Out of 216 respondents, 212 taught children with autistic behaviors, while only 4 did not. Journals with 192 respondents, followed by textbooks (184) were the more used non-human resources, and fellow teachers (204) followed by parents (169) were the more used human resources. Relative to level of education, 163 CAPEs completed a master’s degree, 32 a bachelor’s degree, and 15 a doctorate. The mean age was 40.7 years, for 170 females and 46 males.

Based on the descriptive data gathered, Section Three (behavior management) had the highest grand mean of 4.20, followed by Section Two (program development and teaching) with a grand mean of 3.98, and then by Section One (assessment and evaluation) with a grand mean of 3.67. Frequencies for all items across the three sections revealed that the highest mean for a single item was for item 11 (adapt activity) in Section Two, with 201 responses (93.5%) for choices 4 (most of the time) and 5 (always).

Since a census of data was not obtained, a 3 X 2 X 2 [setting / years of experience / gender] independent analysis of variance (ANOVA) was used to determine the relationship of these independent variables with the three dependent variables [assessment and evaluation (ASSESS); program
development and teaching (PROGDEV); behavior management (BEHAMA)). The test of between-subjects effects for ASSESS and PROGDEV revealed non-significant values ($p > .05$). However, significant differences were found for BEHAMA ($p < .05$) relative to setting. A Tukey HSD was performed and significant differences were identified between segregated (mean=4.19) and inclusive settings (mean=3.92) ($p < .05$), and inclusive (mean=4.19) and both settings (mean 4.25) ($p < .05$).

Based on all the data gathered, the following summary of results is offered relative to the six research questions addressed in this study:

1. Do CAPEs support the same best physical education practices across physical education settings (segregated, inclusive, and both)?

   No significant differences were found between CAPEs' responses for the assessment and evaluation, and program development and teaching sections of SBPEPCAB. However, CAPEs' teaching in segregated settings appeared to use "structured assessment" less than those teaching in inclusive or both (segregated and inclusive) settings. On the other hand, "check for generalizations" was more used by CAPEs teaching in inclusive settings, than those who teach in segregated and both settings. CAPEs are also using much more "Vigorous exercises" in segregated settings than in inclusive settings. In contrast, "peer tutoring approach", "development of communication patterns", and "enhancement of interactions" appeared to be less used in segregated than in the other settings (inclusive and both).
Significant mean differences between segregated (mean=4.19) and inclusive (mean=3.92) ($p < .05$), and inclusive (mean=4.19) and both (mean 4.25) ($p < .05$) were found for the behavior management section. A plausible explanation for this is because many adapted physical education teachers are developing their activities in both (segregated and inclusive) settings. It was also observed that the use of strategies for "problem solving", use of a "continuum of prompts", and "provision of physical assistance", were more used in segregated settings than in inclusive and both combined.

These results were somewhat expected, because adapted physical educators are also teaching in general physical education classes with the current emphasis on inclusion of children with disabilities (inclusive setting). Results from this study show that overall CAPEs are implementing similar best practices in segregated, inclusive, and both settings.

2. Do CAPEs with fewer (less than 4 years) as opposed to more (more than 4 years) years of teaching experience support the same best practices for teaching physical education to children with autistic behaviors?

Although the experience of CAPEs ranged from 1 to 33 years teaching children with autistic behaviors, 78% of them have been teaching this special population for more than four years. However, as demonstrated in the data analysis, the group of teachers (27%) with less than four years of teaching experience is also supporting the same best practices as those specialists who are more experienced. Best physical education practices such as "examine student referral", "informal assessment", "adaptations", "variety of games", and
“functional curriculum” are more used by CAPEs with less experience than by those CAPEs with more years of experience. Finally, relative to behavior management, it appears that CAPEs with more years of experience favor those strategies at higher levels, compared to those less experienced CAPEs. It is therefore known that best physical education practices across three important areas (assessment and evaluation; program development and teaching; and behavior management) of the teaching/learning process are being implemented in this country’s school settings even by less experienced teachers.

3. Do male and female CAPEs support the same best practices for teaching physical education to children with autistic behaviors?

No differences were found between males and females for the three sections of SBPEPCAB. The strategies reported as more used by females were “assessment of child’s play behaviors”, “check for generalizations”, and almost all (9 out of ten) best practices in the behavior management section of the questionnaire. On the other hand, males used more “structured assessment”, “individualization of skills”, “variety of games”, “enhancement of communication”, “enhancement of interactions”, and “shaping”. Overall, the data in this study show that male and female CAPEs are using best physical education practices for behavior management, assessment and evaluation, and program development and teaching at the same level.

4. Do CAPEs who teach or have taught children with autistic behavior support the same best physical education practices identified from those CAPEs who have not taught children with autistic behaviors?

160
No inferential analysis was performed for this question due to insufficient statistical power for an appropriate analysis (98.1% of participants responded that they had experience teaching children with autistic behaviors). Because of this high level of teaching experience, it can be concluded that numerous children with autistic behaviors are receiving services from specialists in adapted physical education in the U.S. It is therefore recognized that children with autistic behaviors in school settings are receiving opportunities to learn, and better levels of integration and interactions with their peers without disabilities, because specialists in adapted physical education are implementing the teaching/learning process for them.

5. What are the best physical education practices for children with autistic behaviors as identified by CAPEs?

For Section One (assessment and evaluation), the best physical education practices reported by CAPEs were the use of "ongoing observations", "ongoing check of performance", and "assessment of child's play behaviors". For Section Two (program development and teaching), the best physical education practices were "adaptation of activities as needed", "matching play equipment with child's ability level", and "consistency of methods". Finally, for Section Three (behavior management), the reported best practices were "reinforcement of good behavior", "modeling appropriate behaviors", and "providing physical assistance". Overall, the best practice reported by CAPEs was "adapt activity", with an almost perfect mean of 4.90.
6. What best practices presented in the refereed literature on teaching physical education to children with autistic behaviors are practiced by CAPEs in the field?

Results across the three sections of the questionnaire indicate that CAPES frequently or very frequently use all the best physical education practices suggested in the literature. This provides evidence that CAPEs are not only learning best physical education practices for children with autistic behavior from specialized journals and textbooks in the area, but also implementing these best practices in their classes. Based on the results of this study, the best practices suggested by authors of current refereed literature are being used by CAPEs most of the time or always, improving effective teaching and strengthening physical education programs for children with autistic behaviors.

Conclusions

Based on the findings of this survey research, and given the limitations reported in Chapter One, the following conclusions seem warranted. These conclusions are applicable only for CAPEs who teach children with autistic behaviors in physical education settings:

1. The best physical education practice reported as least used by CAPEs when teaching children with autistic behavior in physical education settings is "structured assessment". This result contradicts recommendations made by authors in the refereed literature who emphasize the use of structured assessment to facilitate placement and promote better levels of participation in any physical education settings.
2. CAPEs use “ongoing observation” and “ongoing check of performance” as the best physical education practices for children with autistic behaviors in the area of assessment and evaluation. This corroborates with the literature that suggests these are powerful strategies to assess children with autistic behaviors in physical education settings.

3. “Adapting activities as needed” is the most used best physical education practice when teaching children with autistic behaviors, supporting the adaptation theory which emphasizes the need for adapted physical educators to teach and empower lifespan physical activity, providing adaptations of activities for instructional purposes.

4. The use of behavior management strategies is very common among the majority of CAPEs. This consensus highlights the powerful benefits of using behavior management strategies such as “reinforcement of good behavior” and “modeling appropriate behaviors” as recommended in the reviewed literature. It also stresses behavior management as the foundation of teaching in any instructional hierarchy.

5. Similar assessment and programming best practices are being implemented by CAPEs in segregated, inclusive, and a combination of physical education settings, also confirming literature suggesting that it is an increasingly common practice in the field to have adapted physical educators teaching in general physical education classes, with the current emphasis on inclusion of children with disabilities (inclusive setting).
6. Male and female CAPEs are equally using best physical education practices for behavior management, assessment and evaluation, and program development and teaching for children with autistic behaviors, suggesting that gender is not an issue relative to service delivery among this population.

7. Children with autistic behaviors in different physical education settings are receiving best physical education practices by teachers (CAPEs) who are specialists and experienced professionals in this area of disability.

8. Overall results across the three dependent variables (assessment and evaluation; program development and teaching; behavior management) indicated that the best physical education practices for children with autistic behaviors suggested by the current refereed literature are, in fact, being implemented in this country's school settings by CAPEs.

Recommendations

This study provided an exploration and description of what are the best physical education practices used by certified adapted physical educators (CAPEs) in their everyday teaching of children with autistic behaviors in physical education settings. Moreover, it attempted to verify if the teaching strategies suggested by authors in their primary publications (textbooks), and by researchers in their data-based publications were being used by CAPEs when delivering their instruction.

To extend this, this study should be considered as a starting point for researchers in this important area of adapted physical education for children with
autistic behaviors. Therefore, the following recommendations for future studies in this area or similar areas are offered:

1. Longitudinal study, similar to the present one, should be undertaken to collect data relative to the use of best physical education practices by certified adapted physical educators every five years.

2. A study, similar to the present one, should be conducted at a national level to identify what best physical education practices are being used by non-certified adapted physical educators when teaching children with autistic behaviors.

3. A related survey should be conducted in different countries in order to compare the use of best physical education practices for children with autistic behaviors in other cultural environments.

4. A broad series of related research studies should be conducted using physical education programs for children with autistic behaviors in which all the best practices presented here are implemented, with a comparison program (no best practice available), to confirm the effectiveness of these practices.

5. A series of studies, similar to this one, should be conducted to identify what best physical education practices were employed with children displaying autistic behaviors who later obtained successful levels of performance in athletic competitions.
References


APPENDIX A

Human Subjects Institutional Review Board Approval
APPLICATION FOR EXEMPTION FROM THE HUMAN SUBJECTS INSTITUTIONAL REVIEW BOARD

All research activities that will involve human beings or research subjects must be reviewed and approved by the appropriate human subjects IRB, or receive exemption status, prior to implementation of the research.

Principal Investigator: JAMES PAUL
(Must be OSU Faculty) Last First Initial

Academic Title: professor Phone No. (614) 292-0839 Fax No. (614) 292-7229

Department: School of PAES Department No. 1270

Campus Address: 209 Pomerene Hall Room Number 160 Neil Av. Columbus, OH 43210 Building

Co-Investigator(s): LISBOA FABIO L.F. (Typed Name) Last First Initial

PROTOCOL TITLE: BEST PHYSICAL EDUCATION PRACTICES FOR STUDENTS WITH AUTISTIC BEHAVIORS

The only involvement of human subjects in the proposed research activity will be in one or more of the exemption categories listed on the back of this application.

CATEGORY: (Check one or more) #1 __ #2 X __ #3 __ #4 __ #5 __ #6 __

SOURCE OF FUNDING FOR PROPOSED RESEARCH: (Check A or B)

A. OSURF: Sponsor ______________________ RF Proposal/Project No. ______________________

B. Other (Identify) ______________________

EXEMPTION STATUS: __ APPROVED __ DISAPPROVED**

Date 5/18/99

** Principal Investigator must submit a protocol to the appropriate Human Subjects Review Committee.

IMPORTANT NOTICE TO INVESTIGATORS: Exempting an activity from review DOES NOT absolve the investigators of the activity from ensuring that the welfare of human subjects in the activity is protected and that methods used, and information provided, to gain subject consent are appropriate to the activity.
APPENDIX B

Survey of Best Physical Education Practices for Children with Autistic Behaviors

(SBPEPCAB)
PURPOSE

Although almost sixty years have passed since the first studies about autism (Kanner, 1943), the prognosis for the syndrome is still unfavorable. Because the number of children with autistic behaviors in public schools has increased rapidly, school personnel, including physical educators, now have to adapt or modify instruction, (Block, 1996).

The collective goal of physical education is to provide appropriate instruction to all students, meeting their individual needs, respecting individual differences, refining teaching practices, and providing the necessary adaptations so that students can achieve instructional objectives. One way to accomplish this overall goal is to incorporate "best practice" when designing, planning, and delivering physical education instruction. The purpose of this study is to collect data relative to best physical education practices for children with autistic behaviors from certified adapted physical educators (CAPEs). The results of this study will be used to validate best practice interventions used by physical educators to teach children with autistic behaviors.

If you are interested in receiving a summary of the results after the completion of this study, we will be glad to mail it to you. Please indicate below:

I am interested ______  I am not interested ______
HERE YOU CAN MAKE ANY COMMENT YOU WISH ABOUT THIS INSTRUMENT. FEEDBACK IS WELCOMED!

GLOSSARY

CONSISTENCY OF METHODS - Using the same methods of teaching regularly (e.g., maintain a routine).
DISTRIBUTED PRACTICE - Practicing a variety of tasks interspersed with periods of rest.
FADING - Gradual withdrawal of prompts.
FUNCTIONAL CURRICULUM - Curriculum that includes only items of importance and relevance for the student.
INFORMAL ASSESSMENT - Use of unobtrusive test tools to gather information about a student's functional capabilities in natural environments.
MODELING - Correct demonstration of a task in the presence of a target student.
PEER TUTORING - One student teaching another (e.g., typically developing child teaching child with autistic behavior).
PROBLEM SOLVING - Finding adequate solution for dilemmas occurred among students during the teaching period.
PROMPTING - Use of a stimulus to induce a student's performance/behavior.
REVERSE MAINSTREAMING - Placement of children without disabilities into a segregated environment to promote inclusion with children having disabilities.
SCHEDULE OF ASSESSMENT - Pre-planned strategies for testing (e.g., date, time, site).
SHAPING - Systematic reinforcement of successive approximations of a target behavior.
STRUCTURED ASSESSMENT - Use of test tools formally and obtrusively to gather information about a student's capabilities.
### SECTION I. ASSESSMENT AND EVALUATION

**Directions:** For all items, use the following scale of 1-5 for frequency of use: 1 = never, 2 = rarely, 3 = occasionally, 4 = frequently, and 5 = very frequently.

**HOW FREQUENTLY DO YOU USE THE FOLLOWING ASSESSMENT AND EVALUATION STRATEGIES?**

<table>
<thead>
<tr>
<th>Strategy</th>
<th>N</th>
<th>R</th>
<th>O</th>
<th>F</th>
<th>V</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ongoing observation</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Varied data collection (e.g., videotape, observations, photographs,</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>journal and logs, anecdotal reports)</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Structured assessment (e.g., administering the Test of Gross Motor</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Development (TGM)</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Examine/re-examine information related to student referral</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ongoing check of performance (e.g., motor, social)</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Check for generalization of motor performance in different settings</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(e.g., home, school, playground)</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Plan set schedule for assessment</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Informal assessment (e.g., assessing while not seen by child)</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Assessment of child's play behaviors</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

### SECTION II. PROGRAM DEVELOPMENT AND TEACHING

**Directions:** For all items, use the following scale of 1-5 for frequency of use: 1 = never, 2 = rarely, 3 = sometimes, 4 = most of the time, and 5 = always.

**HOW OFTEN DO YOU USE THE FOLLOWING STRATEGIES WHEN DEVELOPING PHYSICAL EDUCATION PROGRAMS AND TEACHING?**

<table>
<thead>
<tr>
<th>Strategy</th>
<th>N</th>
<th>R</th>
<th>O</th>
<th>F</th>
<th>V</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distributed practices</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Generalization of skills</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Promote vigorous aerobic, cardiovascular endurance activities</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Individualization of instruction</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Variety of games (e.g., fitness games)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Match play equipment with child's ability level</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Consistency of methods (i.e., teaching strategies)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A functional curriculum</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>A peer tutoring approach</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Enhance communication between children who disabilities</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adapt activity as needed</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Child choice</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Enhance interaction of children with disabilities among teachers and</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>classroom aides</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>
SECTION III. BEHAVIOR MANAGEMENT

Directions: For all items, use the following scale of 1-5 for frequency of use: 1 = never, 2 = rarely, 3 = sometimes, 4 = most of the time, and 5 = always.

HOW OFTEN DO YOU USE THE FOLLOWING BEHAVIOR MANAGEMENT STRATEGIES WHEN TEACHING?

Please circle your answer:

N R S M A

- Shaping.......................... 1 2 3 4 5
- Fading............................ 1 2 3 4 5
- Establish goals for behavior management.......................... 1 2 3 4 5
- Reinforce good behavior (e.g., positive feedback, tangible reward)............. 1 2 3 4 5
- Problem solving.......................... 1 2 3 4 5
- Prevent disruptive, inappropriate behaviors.......................... 1 2 3 4 5
- A highly structured program ...... 1 2 3 4 5
- Model appropriate behaviors..... 1 2 3 4 5
- Use a continuum of prompts in combination with reinforcements 1 2 3 4 5
- Provide physical assistance (if needed).......................... 1 2 3 4 5

SECTION IV. DEMOGRAPHIC INFORMATION

DIRECTIONS: Please answer the following questions by placing a checkmark ☐ in the appropriate box.

- Including this year, please indicate the total number of years you have taught adapted physical education.
  - 1. less than one year ☐ 2. 1-3 years ☐ 3. 4-7 years ☐ 4. 8 or more years ☐
- Including this year, please indicate the total number of years you have taught generic physical education.
  - 1. less than one year ☐ 2. 1-3 years ☐ 3. 4-7 years ☐ 4. 8 or more years ☐
- Please indicate the type of physical education environment in which you are currently teaching. (Check all that apply)
  - 1. adapted PE ☐ 2. general PE ☐
  - 3. inclusivity PE ☐ 4. reversed mainstreaming ☐
  - 5. consultant/research specialist ☐
  - 6. Other ______________________
- Do you currently teach or have you taught students with autistic behaviors in physical education settings?
  - 1. no ☐ 2. yes ☐
- If yes, how many years have you taught students with autistic behaviors? ______
- Did you ever attend a conference, course, or workshop on teaching students with autistic behaviors?
  - 1. no ☐ 2. yes ☐
- What non-human resources do you use to assist your teaching. (Check all that apply)
  - 1. textbooks ☐ 2. journals ☐
  - 3. software, CD ROM's ☐ 4. internet ☐
  - 5. Other ______________________
- What human resources do you use to assist your teaching. (Check all that apply)
  - 1. parents ☐ 2. fellow teachers ☐
  - 3. consultants ☐ 4. administrators ☐
  - 5. Other ______________________
- Please indicate your highest level of education.
  - 1. bachelor's degree ☐
  - 2. master's degree ☐
  - 3. doctorate ☐
  - 4. if other, specify: ______________________
- Please indicate your gender.
  - 1. male ☐ 2. female ☐
- Please indicate your age (optional). ______
IN THIS SECTION, PLEASE FEEL FREE TO WRITE OTHER TECHNIQUES YOU WOULD RECOMMEND FOR TEACHING CHILDREN WITH AUTISTIC BEHAVIORS IN PHYSICAL EDUCATION.

HERE YOU CAN MAKE ANY COMMENT YOU WISH ABOUT THIS INSTRUMENT. FEEDBACK IS WELCOMED!
Please return to:

Fabio Lisboa, Ph. D. candidate
1530 Zollinger Road
Upper Arlington, OH
43221 - USA
APPENDIX C

Content validity evaluation checklist
CONTENT VALIDITY EVALUATION CHECKLIST

Directions: Please complete this checklist form rating the degree to which the proposed items represent potential best physical education practices for children with autistic behaviors relative to assessment and evaluation, program development and teaching, and behavior management. Please use the 4 point scale to indicate whether the content item should be: (1) Dropped, (2) Considered Optional, (3) Considered Worthwhile, and (4) Considered Fundamental. Please make additional comments on the spaces provided at the end of the form.

1. Teachers will be asked how often they use the following assessment and evaluation strategies. Please rate each for content.

   Please circle your choice
   
<table>
<thead>
<tr>
<th>D</th>
<th>O</th>
<th>W</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

   ➢ Assessment portfolio
   ➢ Ongoing observation
   ➢ Varied data collection (e.g., videotape, observations, photographs, journal and logs, anecdotal reports)
   ➢ Structured assessment (e.g., administering the TGMD)
   ➢ Examine the reasons for student referral
   ➢ Ongoing check of motor performance
   ➢ Check for generalization of motor performance in different settings (e.g., home, school, playground)
   ➢ Plan set schedule for assessment
   ➢ Informal assessment (e.g., assessing behind a one-way glass)
   ➢ Assessment of child's play behaviors

2. Teachers will be asked how often they use the following program development and teaching. Please rate each for content.

   Please circle your choice
   
<table>
<thead>
<tr>
<th>D</th>
<th>O</th>
<th>W</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

   ➢ Distributed practices
   ➢ Generalization of skills
   ➢ Promote vigorous aerobic, cardiovascular endurance activities
   ➢ Individualization of instruction
   ➢ Variety of games (e.g., interactive games, fitness games)
   ➢ Match play equipment with child's ability level
   ➢ Consistency of methods
   ➢ A functional curriculum
   ➢ Reverse mainstreaming
   ➢ A peer tutoring approach
   ➢ Enhance communication between children who have disabilities
   ➢ Adapt as needed (e.g., activity, equipment)
   ➢ Child choice
   ➢ Enhance interaction of children with disabilities among teachers and classroom aides
3. Teachers will be asked how often they use the following behavior management strategies. Please rate each for content.

<table>
<thead>
<tr>
<th>Strategy</th>
<th>D</th>
<th>O</th>
<th>W</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shaping</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Fading</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Establish goals for behavior management</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Reinforce good behavior (e.g., positive feedback, tangible reward)</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Problem/conflict solving</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Prevent disruptive/inappropriate behaviors</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>A highly structured program</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Model appropriate behaviors</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Use a continuum of prompts in combination with reinforcements</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Provide physical assistance (if needed)</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

COMMENTS ON THE DEMOGRAPHIC INFORMATION SECTION


PLEASE FEEL FREE TO PROVIDE ANY OTHER COMMENTS ON THE FOLLOWING LINES (USE ADDITIONAL PAPER IF NEEDED)
APPENDIX D

Cover letter for face validity participants
June 22, 1999  
Participant  
School of PAES  
Pomerene Hall  

Dear Colleague,  

As a part of my Ph. D. requirements, I am conducting research relative to best physical education practices for children with autistic behaviors from certified adapted physical educators (C.A.P.E.s) within the United States. To this end, a questionnaire will be specifically constructed, pre-tested, and validated for the purpose of gathering data. The survey questions will concentrate on topics that are fundamental for the education of children with autistic behaviors in physical education environments. Three target areas of the teaching/learning process will be addressed: a) assessment and evaluation strategies; b) program development and teaching; and, c) behavior management.  

After developing the questionnaire, I need a few APE teachers to review the instrument for the purpose of establishing face validity. Therefore, I have chosen you to be a part of this study.  

Please take a few minutes of your busy time to complete the enclosed questionnaire, and then provide some feedback on aspects (i.e., format, clarity, size, time to complete, etc.) relative to the survey instrument. Along with the questionnaire, I am sending a form to be completed with your perceptions of the instrument. You are also welcome to provide comments and reactions to the general parts and format of the instrument. All your comments and responses will remain confidential, and your name will never be cited in any part of the study.  

My co-advisers (Dr. Jansma and Dr. Porretta), and I would greatly appreciate your support in this matter. It would be very helpful if you could return the evaluation at your soonest convenience to my mail box at Pomerene Hall. Your cooperation on the validation of this instrument is greatly appreciated and Dr. Jansma, Dr. Porretta and I would like to thank you, in advance, for your support of my study.  

Sincerely,  

Fábio Lisboa  
Doctoral Candidate, APE  
The Ohio State University
APPENDIX E

Face validity evaluation checklist
EVALUATION CHECKLIST FOR FACE VALIDITY

Directions: Please complete this checklist form after completing the SURVEY OF BEST PHYSICAL EDUCATION PRACTICES FOR CHILDREN WITH AUTISTIC BEHAVIORS. You can make additional comments on the spaces provided after each item, as well as at the end of the form.

We really appreciate your collaboration.

1. How much time did it take to complete the questionnaire?
   _____________ minutes.

2. Was the length of the questionnaire acceptable?
   □  NO  □  YES
   Comments:

3. Are there any typographical errors?
   □  NO  □  YES
   Comments:

4. Is the size of the font acceptable?
   □  NO  □  YES
   Comments:

5. Are the question and response options clear?
   □  NO  □  YES
   Comments:

6. Are the questionnaire directions clear?
   □  NO  □  YES
   Comments:

7. Does the questionnaire format flow well?
   □  NO  □  YES
   Comments:

    197
8. Are the rating scales appropriate for the questionnaire format?

☐ NO  ☐ YES

Comments:

9. How would you evaluate the overall design of the instrument?

☐ POOR  ☐ ACCEPTABLE  ☐ GOOD  ☐ VERY GOOD

GENERAL COMMENTS

_________________________________________________________________________
_________________________________________________________________________
_________________________________________________________________________
_________________________________________________________________________
_________________________________________________________________________
_________________________________________________________________________

😊 THANK YOU! 😊
APPENDIX F

Cover letter for CAPEs (first package)
August 23, 1999

Dear C.A.P.E.,

As a part of my Ph. D. requirements, I am conducting my dissertation research on best physical education practices for children with autistic behavior, from nationally certified adapted physical educators (CAPEs) within the United States. The use of best practices can ensure appropriate instruction and achievement for such children. This survey questionnaire therefore concentrates on topics that are fundamental for the education of children with autistic behaviors in physical education environments. Three target areas of the teaching/learning process are addressed: a) assessment and evaluation strategies; b) program development and teaching; and, c) behavior management.

As CAPE, you have been chosen to be a part of this study. It will take only about 12 minutes of your time to complete the enclosed questionnaire. The success of this study depends on your cooperation. If you wish, we will be glad to mail you a summary of the results after the completion of this study. Also, we want to let you know that your individual answers will be confidential and will in no way be revealed.

My co-advisers (Dr. Jansma and Dr. Porretta), and I would greatly appreciate your support in this matter. It would be very helpful if you could return the questionnaire in the enclosed stamped, self-addressed envelope by September 04. Your cooperation in this research is greatly appreciated. Drs. Jansma, Porretta, and I would like to thank you, in advance, for your support of this study.

Sincerely,

[Signatures]

Paul Jansma, Ph. D.
Professor, APE

David Porretta, Ph.D.
Associate Professor, APE

Fábio Lisboa
Doctoral Candidate, APE

😊Enjoy the enclosed bag of tea while answering the questionnaire😊
APPENDIX G

Reminder postcard for CAPEs
Dear C.A.P.E.,
A few weeks ago we invited you to participate in our survey, mailing you a copy of our questionnaire. To date, we did not hear from you. We need a few more respondents (including you) to reach a census (90%), and gather precious information for APE. Here is your chance to participate!
Take only 11 minutes of your busy time to fill up the questionnaire, and make a great difference to the kids on the other side of this card!
MAKE US HAPPY... SEND BACK YOUR ANSWERS...
P.S. If you already responded, please do not consider this card!

Thanks again for your help.
Sincerely,
Dr. Paul Jansma, Ph. D.
Dr. David Porretta, Ph. D.
Fabio Lisboa - Ph.D. std.

TO:

Fabio Lisboa
1530 Zollinger Road
Upper Arlington, OH 43221
USA
APPENDIX H

Cover letter for CAPEs (second package)
October 27, 1999

Dear C.A.P.E.,

Within this passing month, we mailed you a few post-cards (reminders) and a complete package with our survey questionnaire. Unfortunately, we still did not receive your answers. Once again we are trying to reach you and give you chance to participate in this study. We realize your schedule is a busy one and that your time is valuable, but we are sure that you want to improve the quality of adapted physical education instruction as much as we do. We need a few more responses (including yours) to reach a CENSUS (90%), and gather precious information for adapted physical education.

It will take only 12 minutes of your time to complete the enclosed questionnaire. The success of this study depends on your cooperation. If you wish, we will be glad to mail you a summary of the results after the completion of this study. Also, we want to let you know that your individual answers will be confidential and will in no way be revealed.

My co-advisers (Dr. Jansma and Dr. Porretta), and I would greatly appreciate your support in this matter. Also, we will greatly appreciate it if you will complete the questionnaire and return it in the enclosed stamped, self-addressed envelope by October 05. Your cooperation in this research is extremely valuable. Drs. Jansma, Porretta, and I would like to thank you, in advance, for your support of this study.

Sincerely,

Paul Jansma, Ph. D.
Professor, APE

David Porretta, Ph.D.
Associate Professor, APE

Fabio Lisboa
Doctoral Candidate, APE

😊 Enjoy the enclosed bag of tea while answering the questionnaire😊
Appendix I

Item by Item Descriptive Data for Independent Variables *

- Setting, Years Teaching, and Gender
<table>
<thead>
<tr>
<th>SETTING</th>
<th>ongoing observation</th>
<th>varied-data</th>
<th>exam-ret-exam info.</th>
<th>ongoing check</th>
<th>check for generalization</th>
<th>plan set schedule</th>
<th>informal assess</th>
<th>assess of child's play</th>
</tr>
</thead>
<tbody>
<tr>
<td>Segregated</td>
<td>Mean</td>
<td>4.65</td>
<td>3.51</td>
<td>3.09</td>
<td>3.27</td>
<td>4.01</td>
<td>3.34</td>
<td>3.67</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>79</td>
<td>79</td>
<td>79</td>
<td>79</td>
<td>79</td>
<td>79</td>
<td>79</td>
</tr>
<tr>
<td></td>
<td>Std. Deviation</td>
<td>.60</td>
<td>1.04</td>
<td>1.28</td>
<td>.96</td>
<td>.71</td>
<td>.93</td>
<td>1.00</td>
</tr>
<tr>
<td>Inclusive</td>
<td>Mean</td>
<td>4.65</td>
<td>3.40</td>
<td>3.10</td>
<td>3.25</td>
<td>4.20</td>
<td>3.10</td>
<td>3.89</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>Std. Deviation</td>
<td>.49</td>
<td>1.14</td>
<td>.85</td>
<td>.91</td>
<td>.77</td>
<td>1.25</td>
<td>1.20</td>
</tr>
<tr>
<td>Both</td>
<td>Mean</td>
<td>4.86</td>
<td>3.63</td>
<td>3.22</td>
<td>3.61</td>
<td>4.40</td>
<td>3.47</td>
<td>3.53</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>87</td>
<td>87</td>
<td>87</td>
<td>87</td>
<td>87</td>
<td>87</td>
<td>87</td>
</tr>
<tr>
<td></td>
<td>Std. Deviation</td>
<td>.44</td>
<td>1.02</td>
<td>1.20</td>
<td>.83</td>
<td>.62</td>
<td>.94</td>
<td>.97</td>
</tr>
<tr>
<td>Total</td>
<td>Mean</td>
<td>4.75</td>
<td>3.55</td>
<td>3.15</td>
<td>3.42</td>
<td>4.22</td>
<td>3.38</td>
<td>3.63</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>186</td>
<td>186</td>
<td>186</td>
<td>186</td>
<td>185</td>
<td>186</td>
<td>185</td>
</tr>
<tr>
<td></td>
<td>Std. Deviation</td>
<td>.53</td>
<td>1.04</td>
<td>1.20</td>
<td>.90</td>
<td>.70</td>
<td>.97</td>
<td>1.01</td>
</tr>
</tbody>
</table>
## Assessment and Evaluation X Years of Experience

<table>
<thead>
<tr>
<th>YEARSEXP</th>
<th>ongoing observation</th>
<th>varied-data</th>
<th>struc. assess</th>
<th>exam-re-ex am info.</th>
<th>ongoing check</th>
<th>check for generalizati on</th>
<th>plan set schedule</th>
<th>informal assess</th>
<th>assess of child's play</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 4 years</td>
<td>Mean</td>
<td>4.67</td>
<td>3.38</td>
<td>3.10</td>
<td>3.56</td>
<td>4.13</td>
<td>3.38</td>
<td>3.56</td>
<td>3.51</td>
</tr>
<tr>
<td></td>
<td>Std. Deviation</td>
<td>.62</td>
<td>1.25</td>
<td>1.17</td>
<td>.60</td>
<td>.73</td>
<td>.96</td>
<td>.97</td>
<td>.97</td>
</tr>
<tr>
<td>More than 4 years</td>
<td>Mean</td>
<td>4.77</td>
<td>3.60</td>
<td>3.14</td>
<td>3.43</td>
<td>4.23</td>
<td>3.38</td>
<td>3.65</td>
<td>3.34</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>173</td>
<td>173</td>
<td>173</td>
<td>173</td>
<td>173</td>
<td>173</td>
<td>173</td>
<td>173</td>
</tr>
<tr>
<td></td>
<td>Std. Deviation</td>
<td>.47</td>
<td>1.00</td>
<td>1.23</td>
<td>.85</td>
<td>.71</td>
<td>.95</td>
<td>1.02</td>
<td>1.07</td>
</tr>
<tr>
<td>Total</td>
<td>Mean</td>
<td>4.75</td>
<td>3.56</td>
<td>3.13</td>
<td>3.45</td>
<td>4.21</td>
<td>3.38</td>
<td>3.64</td>
<td>3.37</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>212</td>
<td>212</td>
<td>212</td>
<td>212</td>
<td>212</td>
<td>212</td>
<td>212</td>
<td>212</td>
</tr>
<tr>
<td></td>
<td>Std. Deviation</td>
<td>.50</td>
<td>1.05</td>
<td>1.21</td>
<td>.90</td>
<td>.72</td>
<td>.95</td>
<td>1.01</td>
<td>1.05</td>
</tr>
</tbody>
</table>
## Assessment and Evaluation X Gender

<table>
<thead>
<tr>
<th>GENDER</th>
<th>ongoing observation Mean</th>
<th>varied-data Mean</th>
<th>struc. assess Mean</th>
<th>exam-re-exam info Mean</th>
<th>ongoing check Mean</th>
<th>check for generalization Mean</th>
<th>plan set schedule Mean</th>
<th>informal assess Mean</th>
<th>assess of child's play Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>male</td>
<td>4.67</td>
<td>3.59</td>
<td>3.48</td>
<td>3.41</td>
<td>4.28</td>
<td>3.24</td>
<td>3.67</td>
<td>3.46</td>
<td>3.50</td>
</tr>
<tr>
<td></td>
<td>46</td>
<td>46</td>
<td>46</td>
<td>46</td>
<td>46</td>
<td>46</td>
<td>46</td>
<td>46</td>
<td>46</td>
</tr>
<tr>
<td>Std. Deviation</td>
<td>.60</td>
<td>.98</td>
<td>1.13</td>
<td>.88</td>
<td>.72</td>
<td>.99</td>
<td>1.14</td>
<td>.94</td>
<td>.98</td>
</tr>
<tr>
<td>female</td>
<td>4.76</td>
<td>3.53</td>
<td>3.04</td>
<td>3.46</td>
<td>4.20</td>
<td>3.40</td>
<td>3.62</td>
<td>3.35</td>
<td>3.64</td>
</tr>
<tr>
<td></td>
<td>170</td>
<td>170</td>
<td>170</td>
<td>170</td>
<td>169</td>
<td>170</td>
<td>169</td>
<td>170</td>
<td>170</td>
</tr>
<tr>
<td>Std. Deviation</td>
<td>.49</td>
<td>1.07</td>
<td>1.22</td>
<td>.90</td>
<td>.71</td>
<td>.94</td>
<td>.98</td>
<td>1.09</td>
<td>.96</td>
</tr>
<tr>
<td>Total</td>
<td>4.74</td>
<td>3.54</td>
<td>3.13</td>
<td>3.45</td>
<td>4.21</td>
<td>3.37</td>
<td>3.63</td>
<td>3.38</td>
<td>3.61</td>
</tr>
<tr>
<td></td>
<td>216</td>
<td>216</td>
<td>216</td>
<td>216</td>
<td>215</td>
<td>216</td>
<td>215</td>
<td>216</td>
<td>216</td>
</tr>
<tr>
<td>Std. Deviation</td>
<td>.52</td>
<td>1.05</td>
<td>1.21</td>
<td>.89</td>
<td>.71</td>
<td>.95</td>
<td>1.01</td>
<td>1.06</td>
<td>.96</td>
</tr>
<tr>
<td>SETTING</td>
<td>distributed practices</td>
<td>generalizability of skills</td>
<td>promote exerc.</td>
<td>individ. instruction</td>
<td>variety of match play games</td>
<td>consistency of methods equip.</td>
<td>a peer tutoring approach</td>
<td>enhance communication</td>
<td>adapt activity</td>
</tr>
<tr>
<td>------------</td>
<td>------------------------</td>
<td>----------------------------</td>
<td>----------------</td>
<td>---------------------</td>
<td>-----------------------------</td>
<td>-------------------------------</td>
<td>--------------------------</td>
<td>----------------------</td>
<td>----------------</td>
</tr>
<tr>
<td>Segregated Mean</td>
<td>3.77</td>
<td>3.92</td>
<td>3.61</td>
<td>4.15</td>
<td>3.91</td>
<td>4.44</td>
<td>4.37</td>
<td>4.10</td>
<td>3.05</td>
</tr>
<tr>
<td>N</td>
<td>79</td>
<td>78</td>
<td>79</td>
<td>79</td>
<td>79</td>
<td>79</td>
<td>79</td>
<td>79</td>
<td>79</td>
</tr>
<tr>
<td>Std. Deviation</td>
<td>.95</td>
<td>.72</td>
<td>.88</td>
<td>.77</td>
<td>.77</td>
<td>.57</td>
<td>.58</td>
<td>.76</td>
<td>.68</td>
</tr>
<tr>
<td>Inclusive Mean</td>
<td>3.90</td>
<td>3.79</td>
<td>3.50</td>
<td>4.15</td>
<td>4.10</td>
<td>4.20</td>
<td>4.15</td>
<td>4.35</td>
<td>3.65</td>
</tr>
<tr>
<td>N</td>
<td>20</td>
<td>19</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>Std. Deviation</td>
<td>.85</td>
<td>.92</td>
<td>.83</td>
<td>.93</td>
<td>.64</td>
<td>.89</td>
<td>.75</td>
<td>.59</td>
<td>.88</td>
</tr>
<tr>
<td>Both Mean</td>
<td>3.83</td>
<td>3.58</td>
<td>3.76</td>
<td>4.34</td>
<td>4.24</td>
<td>4.47</td>
<td>4.37</td>
<td>4.18</td>
<td>3.33</td>
</tr>
<tr>
<td>N</td>
<td>87</td>
<td>85</td>
<td>87</td>
<td>87</td>
<td>87</td>
<td>87</td>
<td>87</td>
<td>87</td>
<td>87</td>
</tr>
<tr>
<td>Std. Deviation</td>
<td>.87</td>
<td>.75</td>
<td>.86</td>
<td>.71</td>
<td>.85</td>
<td>.71</td>
<td>.63</td>
<td>.80</td>
<td>.83</td>
</tr>
<tr>
<td>Total Mean</td>
<td>3.81</td>
<td>3.89</td>
<td>3.75</td>
<td>4.24</td>
<td>4.09</td>
<td>4.43</td>
<td>4.35</td>
<td>4.17</td>
<td>3.26</td>
</tr>
<tr>
<td>N</td>
<td>186</td>
<td>182</td>
<td>186</td>
<td>186</td>
<td>186</td>
<td>186</td>
<td>186</td>
<td>186</td>
<td>186</td>
</tr>
<tr>
<td>Std. Deviation</td>
<td>.90</td>
<td>.75</td>
<td>.87</td>
<td>.75</td>
<td>.81</td>
<td>.68</td>
<td>.62</td>
<td>.75</td>
<td>.82</td>
</tr>
<tr>
<td>YEARSEXP</td>
<td>distributed practices</td>
<td>generalization of skills</td>
<td>promote vig. exerc</td>
<td>indiv. of instruction</td>
<td>variety of games</td>
<td>match play equip.</td>
<td>consistency of methods</td>
<td>a fictional curriculum</td>
<td>a peer tutoring approach</td>
</tr>
<tr>
<td>---------------</td>
<td>-----------------------</td>
<td>---------------------------</td>
<td>-------------------</td>
<td>----------------------</td>
<td>-----------------</td>
<td>------------------</td>
<td>----------------------</td>
<td>------------------------</td>
<td>--------------------------</td>
</tr>
<tr>
<td>Less than 4 years</td>
<td>Mean: 3.56</td>
<td>3.74</td>
<td>3.80</td>
<td>4.21</td>
<td>4.13</td>
<td>4.41</td>
<td>4.29</td>
<td>4.33</td>
<td>3.28</td>
</tr>
<tr>
<td></td>
<td>N: 30</td>
<td>30</td>
<td>30</td>
<td>30</td>
<td>30</td>
<td>30</td>
<td>30</td>
<td>30</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>Std. Deviation: .89</td>
<td>.65</td>
<td>.77</td>
<td>.77</td>
<td>.61</td>
<td>.66</td>
<td>.57</td>
<td>.82</td>
<td>.94</td>
</tr>
<tr>
<td>More than 4 years</td>
<td>Mean: 3.61</td>
<td>3.68</td>
<td>3.70</td>
<td>4.30</td>
<td>4.00</td>
<td>4.45</td>
<td>4.38</td>
<td>4.18</td>
<td>3.26</td>
</tr>
<tr>
<td></td>
<td>Std. Deviation: .69</td>
<td>.75</td>
<td>.87</td>
<td>.73</td>
<td>.81</td>
<td>.67</td>
<td>.64</td>
<td>.70</td>
<td>.83</td>
</tr>
<tr>
<td>Total</td>
<td>Mean: 3.70</td>
<td>3.64</td>
<td>3.75</td>
<td>4.20</td>
<td>4.07</td>
<td>4.45</td>
<td>4.35</td>
<td>4.21</td>
<td>3.28</td>
</tr>
<tr>
<td></td>
<td>N: 212</td>
<td>208</td>
<td>212</td>
<td>211</td>
<td>212</td>
<td>211</td>
<td>212</td>
<td>212</td>
<td>212</td>
</tr>
<tr>
<td></td>
<td>Std. Deviation: .91</td>
<td>.77</td>
<td>.85</td>
<td>.74</td>
<td>.78</td>
<td>.87</td>
<td>.92</td>
<td>.74</td>
<td>.93</td>
</tr>
<tr>
<td>GENDER</td>
<td>distributed practices</td>
<td>generalization of skills</td>
<td>promotevig. exorc</td>
<td>indiv. of instruction</td>
<td>variety of games</td>
<td>match play equip</td>
<td>consistency of methods</td>
<td>a functional curriculum</td>
<td>a peer tutoring approach</td>
</tr>
<tr>
<td>--------</td>
<td>------------------------</td>
<td>--------------------------</td>
<td>------------------</td>
<td>----------------------</td>
<td>----------------</td>
<td>----------------</td>
<td>----------------------</td>
<td>----------------------</td>
<td>------------------------</td>
</tr>
<tr>
<td>male</td>
<td>Mean</td>
<td>3.83</td>
<td>3.76</td>
<td>3.63</td>
<td>4.07</td>
<td>3.83</td>
<td>4.30</td>
<td>4.26</td>
<td>4.15</td>
</tr>
<tr>
<td>N</td>
<td>46</td>
<td>45</td>
<td>46</td>
<td>46</td>
<td>46</td>
<td>46</td>
<td>46</td>
<td>46</td>
<td>46</td>
</tr>
<tr>
<td></td>
<td>Std. Deviation</td>
<td>.93</td>
<td>.88</td>
<td>.88</td>
<td>.76</td>
<td>.82</td>
<td>.79</td>
<td>.61</td>
<td>.84</td>
</tr>
<tr>
<td>female</td>
<td>Mean</td>
<td>3.78</td>
<td>3.88</td>
<td>3.79</td>
<td>4.32</td>
<td>4.11</td>
<td>4.47</td>
<td>4.37</td>
<td>4.22</td>
</tr>
<tr>
<td>N</td>
<td>170</td>
<td>167</td>
<td>170</td>
<td>170</td>
<td>169</td>
<td>169</td>
<td>170</td>
<td>170</td>
<td>170</td>
</tr>
<tr>
<td></td>
<td>Std. Deviation</td>
<td>.92</td>
<td>.79</td>
<td>.84</td>
<td>.73</td>
<td>.79</td>
<td>.64</td>
<td>.62</td>
<td>.73</td>
</tr>
<tr>
<td>Total</td>
<td>Mean</td>
<td>3.78</td>
<td>3.85</td>
<td>3.78</td>
<td>4.27</td>
<td>4.05</td>
<td>4.44</td>
<td>4.35</td>
<td>4.20</td>
</tr>
<tr>
<td>N</td>
<td>216</td>
<td>212</td>
<td>216</td>
<td>216</td>
<td>215</td>
<td>215</td>
<td>216</td>
<td>216</td>
<td>216</td>
</tr>
<tr>
<td></td>
<td>Std. Deviation</td>
<td>.92</td>
<td>.77</td>
<td>.85</td>
<td>.75</td>
<td>.80</td>
<td>.67</td>
<td>.62</td>
<td>.75</td>
</tr>
<tr>
<td>SETTING</td>
<td>shaping</td>
<td>fading</td>
<td>establish goal</td>
<td>reinforce good behavior</td>
<td>problem solving</td>
<td>prevent disruptive behavior</td>
<td>a highly structured program</td>
<td>model appropriate behaviors</td>
<td>use a continuum of prompts</td>
</tr>
<tr>
<td>-----------</td>
<td>---------</td>
<td>--------</td>
<td>----------------</td>
<td>-------------------------</td>
<td>----------------</td>
<td>-----------------------------</td>
<td>----------------------------</td>
<td>-----------------------------</td>
<td>-----------------------------</td>
</tr>
<tr>
<td>Segregated Mean</td>
<td>3.89</td>
<td>3.90</td>
<td>4.10</td>
<td>4.62</td>
<td>3.77</td>
<td>4.16</td>
<td>4.16</td>
<td>4.61</td>
<td>4.20</td>
</tr>
<tr>
<td>N</td>
<td>79</td>
<td>79</td>
<td>79</td>
<td>79</td>
<td>79</td>
<td>79</td>
<td>79</td>
<td>79</td>
<td>79</td>
</tr>
<tr>
<td>Std. Deviation</td>
<td>.75</td>
<td>.79</td>
<td>.86</td>
<td>.56</td>
<td>.88</td>
<td>.65</td>
<td>.74</td>
<td>.54</td>
<td>.59</td>
</tr>
<tr>
<td>Inclusive Mean</td>
<td>3.55</td>
<td>3.50</td>
<td>3.60</td>
<td>4.35</td>
<td>3.30</td>
<td>4.15</td>
<td>4.00</td>
<td>4.60</td>
<td>3.85</td>
</tr>
<tr>
<td>N</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>Std. Deviation</td>
<td>1.10</td>
<td>1.05</td>
<td>1.06</td>
<td>.81</td>
<td>1.26</td>
<td>.75</td>
<td>.79</td>
<td>.50</td>
<td>.88</td>
</tr>
<tr>
<td>Both Mean</td>
<td>4.01</td>
<td>3.91</td>
<td>4.36</td>
<td>4.71</td>
<td>3.57</td>
<td>4.24</td>
<td>4.37</td>
<td>4.66</td>
<td>4.37</td>
</tr>
<tr>
<td>N</td>
<td>87</td>
<td>87</td>
<td>87</td>
<td>87</td>
<td>87</td>
<td>87</td>
<td>87</td>
<td>87</td>
<td>87</td>
</tr>
<tr>
<td>Std. Deviation</td>
<td>.88</td>
<td>.83</td>
<td>.78</td>
<td>.50</td>
<td>.88</td>
<td>.65</td>
<td>.68</td>
<td>.63</td>
<td>.67</td>
</tr>
<tr>
<td>N</td>
<td>186</td>
<td>186</td>
<td>186</td>
<td>186</td>
<td>186</td>
<td>186</td>
<td>186</td>
<td>186</td>
<td>186</td>
</tr>
<tr>
<td>Std. Deviation</td>
<td>.86</td>
<td>.85</td>
<td>.86</td>
<td>.57</td>
<td>.93</td>
<td>.66</td>
<td>.73</td>
<td>.56</td>
<td>.67</td>
</tr>
<tr>
<td>YEARSEXP</td>
<td>shaping</td>
<td>fading</td>
<td>establish goal</td>
<td>reinforce good behavior</td>
<td>problem solving</td>
<td>prevent disruptive behavior</td>
<td>a highly structured program</td>
<td>model appropriate behaviors</td>
<td>use a continuum of prompts</td>
</tr>
<tr>
<td>------------------</td>
<td>---------</td>
<td>--------</td>
<td>----------------</td>
<td>-------------------------</td>
<td>----------------</td>
<td>-----------------------------</td>
<td>-----------------------------</td>
<td>-----------------------------</td>
<td>-----------------------------</td>
</tr>
<tr>
<td>Less than 4 years</td>
<td>Mean</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3.87</td>
<td>3.51</td>
<td>4.08</td>
<td>4.54</td>
<td>3.44</td>
<td>4.06</td>
<td>4.18</td>
<td>4.58</td>
<td>4.13</td>
</tr>
<tr>
<td></td>
<td>Std. Deviation</td>
<td>.92</td>
<td>1.02</td>
<td>.96</td>
<td>.61</td>
<td>1.02</td>
<td>.81</td>
<td>.72</td>
<td>.60</td>
</tr>
<tr>
<td>More than 4 years</td>
<td>Mean</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3.89</td>
<td>3.94</td>
<td>4.29</td>
<td>4.66</td>
<td>3.71</td>
<td>4.21</td>
<td>4.28</td>
<td>4.65</td>
<td>4.31</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>173</td>
<td>173</td>
<td>173</td>
<td>173</td>
<td>173</td>
<td>173</td>
<td>172</td>
<td>173</td>
</tr>
<tr>
<td></td>
<td>Std. Deviation</td>
<td>.82</td>
<td>.77</td>
<td>.81</td>
<td>.59</td>
<td>.91</td>
<td>.62</td>
<td>.73</td>
<td>.56</td>
</tr>
<tr>
<td>Total</td>
<td>Mean</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>212</td>
<td>212</td>
<td>212</td>
<td>212</td>
<td>212</td>
<td>212</td>
<td>212</td>
<td>212</td>
</tr>
<tr>
<td></td>
<td>Std. Deviation</td>
<td>.84</td>
<td>.83</td>
<td>.84</td>
<td>.57</td>
<td>.93</td>
<td>.65</td>
<td>.72</td>
<td>.57</td>
</tr>
<tr>
<td>GENDER</td>
<td>shaping</td>
<td>fading</td>
<td>establish goal</td>
<td>reinforce good behavior</td>
<td>problem solving</td>
<td>prevent disruptive behavior</td>
<td>a highly structured program</td>
<td>model appropriate behaviors</td>
<td>use a continuum of prompts</td>
</tr>
<tr>
<td>--------</td>
<td>---------</td>
<td>---------</td>
<td>----------------</td>
<td>------------------------</td>
<td>----------------</td>
<td>-----------------------------</td>
<td>----------------------------</td>
<td>-----------------------------</td>
<td>-----------------------------</td>
</tr>
<tr>
<td>male</td>
<td>Mean</td>
<td>3.96</td>
<td>3.80</td>
<td>3.96</td>
<td>4.54</td>
<td>3.54</td>
<td>4.09</td>
<td>4.15</td>
<td>4.54</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>46</td>
<td>46</td>
<td>46</td>
<td>46</td>
<td>46</td>
<td>46</td>
<td>46</td>
<td>46</td>
</tr>
<tr>
<td></td>
<td>Std. Dev.</td>
<td>.80</td>
<td>.91</td>
<td>.89</td>
<td>.66</td>
<td>1.03</td>
<td>.69</td>
<td>.76</td>
<td>.55</td>
</tr>
<tr>
<td>female</td>
<td>Mean</td>
<td>3.88</td>
<td>3.88</td>
<td>4.32</td>
<td>4.66</td>
<td>3.69</td>
<td>4.22</td>
<td>4.26</td>
<td>4.66</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>170</td>
<td>170</td>
<td>170</td>
<td>170</td>
<td>170</td>
<td>170</td>
<td>169</td>
<td>170</td>
</tr>
<tr>
<td></td>
<td>Std. Dev.</td>
<td>.65</td>
<td>.81</td>
<td>.79</td>
<td>.55</td>
<td>.91</td>
<td>.64</td>
<td>.71</td>
<td>.57</td>
</tr>
<tr>
<td>Total</td>
<td>Mean</td>
<td>3.89</td>
<td>3.87</td>
<td>4.24</td>
<td>4.63</td>
<td>3.66</td>
<td>4.19</td>
<td>4.25</td>
<td>4.63</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>216</td>
<td>216</td>
<td>216</td>
<td>216</td>
<td>216</td>
<td>216</td>
<td>216</td>
<td>216</td>
</tr>
<tr>
<td></td>
<td>Std. Dev.</td>
<td>.84</td>
<td>.83</td>
<td>.84</td>
<td>.57</td>
<td>.94</td>
<td>.65</td>
<td>.72</td>
<td>.56</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>