

2010-01-01

# Teacher Commitment and Burnout: Their Effects on the Fidelity of Implementation of Comprehensive Treatment Programs for Preschool Children with Autism Spectrum Disorders

Drew Carson Coman

*University of Miami*, [d.coman@umiami.edu](mailto:d.coman@umiami.edu)

Follow this and additional works at: [https://scholarlyrepository.miami.edu/oa\\_theses](https://scholarlyrepository.miami.edu/oa_theses)

---

## Recommended Citation

Coman, Drew Carson, "Teacher Commitment and Burnout: Their Effects on the Fidelity of Implementation of Comprehensive Treatment Programs for Preschool Children with Autism Spectrum Disorders" (2010). *Open Access Theses*. 67.  
[https://scholarlyrepository.miami.edu/oa\\_theses/67](https://scholarlyrepository.miami.edu/oa_theses/67)

This Open access is brought to you for free and open access by the Electronic Theses and Dissertations at Scholarly Repository. It has been accepted for inclusion in Open Access Theses by an authorized administrator of Scholarly Repository. For more information, please contact [repository.library@miami.edu](mailto:repository.library@miami.edu).



UNIVERSITY OF MIAMI

TEACHER COMMITMENT AND BURNOUT: THEIR EFFECTS ON THE FIDELITY  
OF IMPLEMENTATION OF COMPREHENSIVE TREATMENT PROGRAMS FOR  
PRESCHOOL CHILDREN WITH AUTISM SPECTRUM DISORDERS

By

Drew Carson Coman

A THESIS

Submitted to the Faculty  
of the University of Miami  
in partial fulfillment of the requirements for  
the degree of Master of Science

Coral Gables, Florida

December 2010

©2010  
Drew C. Coman  
All Rights Reserved

UNIVERSITY OF MIAMI

A thesis submitted in partial fulfillment of  
the requirements of the degree of  
Master of Science

TEACHER COMMITMENT AND BURNOUT: THEIR EFFECTS ON THE FIDELITY  
OF IMPLEMENTATION OF COMPREHENSIVE TREATMENT PROGRAMS FOR  
PRESCHOOL CHILDREN WITH AUTISM SPECTRUM DISORDERS

Drew Carson Coman

Approved:

---

Michael Alessandri, Ph. D.  
Clinical Professor of Psychology

---

Terri A. Scandura, Ph. D.  
Dean of the Graduate School

---

Heather Henderson, Ph. D.  
Associate Professor of Psychology

---

Michael Cuccaro, Ph. D.  
Associate Professor of  
Medicine

---

Craig D. Marker, Ph. D.  
Clinical Assistant Professor of Psychology

COMAN, DREW CARSON

Teacher Commitment and Burnout: Their Effects on the Fidelity of Implementation of Comprehensive Treatment Programs for Preschool Children with Autism Spectrum Disorders

(M.S., Psychology)  
(December 2010)

Abstract of a thesis at the University of Miami

Thesis supervised by Clinical Professor Michael Alessandri

No. of pages in text. (76)

For more than two decades, special education teacher shortages and attrition have concerned policymakers and administrators who work to recruit and retain special educators. It is imperative, therefore, to investigate the possible causes underlying the decision of special educators to leave the field. The aim of this current study was to explore teacher commitment to model philosophy and burnout across two well-established preschool treatment models for children with ASD: TEACCH (Treatment and Education of Autistic and Related Communication-Handicapped Children) and LEAP (Learning Experiences and Alternative Program for Preschoolers and their Parents). Additionally, these constructs were explored in Business As Usual (BAU) classroom models. Results indicated that LEAP teachers were significantly more committed to LEAP philosophy and practice relative to the TEACCH and BAU teachers and TEACCH teachers were not significantly more committed to TEACCH philosophy relative to the LEAP and BAU teachers. Additionally, BAU teachers are not significantly more committed to either LEAP or TEACCH, but do share commitment to both classroom approaches. Lastly, post hoc analyses provided support for a quadratic relationship between teacher commitment and aspects of teacher burnout. Implications for school districts and teachers working within the field of special education are discussed.

## Table of Contents

	Page
LIST OF TABLES .....	iv
LIST OF FIGURES .....	v
Chapter	
1 Introduction .....	1
2 Method .....	15
3 Measures .....	21
4 Results .....	25
5 Discussion .....	36
Appendix .....	69
References .....	72

## LIST OF TABLES

	Page
Table 1 .....	52
Table 2 .....	53
Table 3 .....	55
Table 4 .....	56
Table 5 .....	57
Table 6 .....	66



## LIST OF FIGURES

	Page
Figure 1 .....	54
Figure 2 .....	58
Figure 3 .....	59
Figure 4 .....	60
Figure 5 .....	61
Figure 6 .....	62
Figure 7 .....	63
Figure 8 .....	64
Figure 9 .....	65
Figure 10 .....	67
Figure 11 .....	68

## Chapter1: Introduction

Of all the developmental disabilities, autism spectrum disorders (ASD) are the second most common after intellectual impairment (Center for Disease Control and Prevention [CDC], 2009). A recent review of epidemiological studies on ASD estimated the current prevalence rates to be between 35/10,000 and 60/10,000 (Fombonne, 2005). Relative to studies conducted in the 1960s to mid-1980s, which reported rates of .7/10,000 to around 2/10,000, these new findings suggest a marked increase in the prevalence of the disorder (Zahner & Pauls, 1987). However, it is argued that the upward trend in prevalence cannot be attributed to an increase in the incidence of ASD (*see* CDC, 2009; Fombonne, 2005). A myriad of variables such as changes in diagnostic criteria, diagnostic substitution, improvements in the assessment of ASD, changes in special education policies related to eligibility, enhanced availability of services, and a better understanding of this syndrome among health professionals may be contributing to this result (Fombonne, 2005). Despite this ongoing debate, an alarming 1 out of every 110 children is classified with an ASD and autism has become a global health concern (CDC, 2009; Autism and Developmental Disabilities Monitoring Network [ADDM], 2007).

The autism prevalence statistic alone carries significant implications for current and future service delivery needs for young children affected by ASD and their families (Fombonne, 2005). However, to date, the specific etiologies are undetermined in the vast majority of ASD cases and no medical treatments are known to be curative (Tartaglia, Hansen, & Hagerman, 2007). Therefore, the primary objective for most families is to access school-based educational services focused on functional skill acquisition and the remediation of maladaptive symptoms (Lord et al., 2005). Given that the primary source

of intervention is provided through the school system, it is critical to ensure that there are highly qualified special education teachers implementing these interventions for children with ASD; as mandated by the 2001 No Child Left Behind Act (U.S. Department of Education, 2009).

For more than two decades, however, special education teacher shortages have been of concern to policymakers and administrators who work to recruit and retain special educators (Council for Exceptional Children [CEC], 2000; Morsink, 1982; Smith-Davis & Billingsley, 1993; Smith-Davis, Burke, & Noel, 1984). Although the causes of the shortage problem are likely complex, teacher attrition has proven to be a major contributor (Billingsley, 2004). Data released from the national Teacher Follow-up Survey (TFS), conducted by the National Center for Education Statistics (NCES), reported that approximately 10 % or nearly 41,300 public school special educators decided to leave their field entirely after the 2004-2005 academic year (U.S. Department of Education, 2007). More recently, this same TFS survey reported an increase in attrition, indicating that approximately 12.3 % or nearly 48,600 public special educators decided to leave the field completely after the 2008-2009 academic year (U.S. Department of Education, 2010). What is more, is the fact that the attrition rates are estimated to be even higher because these national data bases do not calculate interstate transfers within their estimates (Brownell & Smith, 1992). Overall, this deficiency of qualified teachers is disconcerting and may have serious and far-reaching consequences for children with disabilities, particularly those with ASD.

In an effort to explore this issue, the overall aim of the present study was to investigate potential causes of the decision by teachers to leave the field of special

education. Specifically, this study investigated teacher commitment and teacher burnout, two variables that prior literature has shown to be related to attrition, in special educators of children with ASD. Teacher commitment is defined here as an understanding and commitment to the underlying philosophy, assumptions, practices, and principles of an intervention and/or teaching approach. Teacher burnout is defined as a unique stress syndrome that results from coping unsuccessfully with chronic stress in the classroom. Additionally, this study examined the effects of these two variables on the fidelity of implementation of preschool intervention programs for this population. A better understanding of these factors may provide school districts, policymakers, and administrators with information that would enable them to make the necessary adaptations in policy and practice which may help ameliorate the current issue of attrition within the field. This study was completed as part of a larger multi-site preschool treatment comparison investigation. Due to the design of the larger parent project entitled, *Comparison of Two Comprehension Treatment Models for Preschool-aged children with Autism and their families* (P.I. Odom, S.; IES: R324B070219), these constructs were examined in a group of teachers implementing classroom models at above average levels of fidelity.

#### *Stressors in Special Education and Teacher Attrition*

Teachers of children with developmental disabilities experience an extraordinary amount of chronic stress (Fore, Martin, & Bender, 2002; Miller, Brownell, & Smith, 1999). They are required to take on cumbersome workloads far exceeding those in general education (Jennett, Harris, & Mesibov, 2003). Outside of their core teaching duties, their responsibilities extend to implementing Individualized Education Plans

(IEPs), managing challenging student behavior, collecting substantial individual student data, completing extensive paperwork, and dealing with increased demands relative to parent-teacher relationships (Jennett, et al., 2003). These additional demands and responsibilities have been strongly linked to higher levels of stress among teachers as well as teacher attrition (*see* Billingsley et al., 1995; Corcoran, Walker, & White, 1988; Brownell et al., 1994-1995; George et al., 1995; Fore, Martin, & Bender, 2002). In particular, one extensive review of the teacher attrition literature conducted by Billingsley (2004) indicated that a combination of multiple interacting work environment factors such as unmanageable workloads (Morvant et al., 1995), role ambiguity (Billingsley & Cross, 1992), excessive paperwork (Paperwork in Special Education, 2002), and a lack of resources (Miller et al., 1999) all lead to high levels of stress, withdrawal from students, and eventually attrition.

Few would argue that demands and expectations are even greater among educators of children with ASD, potentially leading to an increased risk for high stress levels and ultimately attrition. Often it is necessary for these teachers to have higher levels of involvement and collaboration to help meet the diverse individual needs and goals of their students and families (Dymond, Gilson, & Myran, 2007). Additionally, teachers of students with ASDs are typically confronted with many disorder-specific challenges associated with educating this population. The characteristics central to autism (i.e., impairments in communication, social interaction, and restricted and repetitive activities or interests), along with the pervasiveness of these deficits, set children with ASD apart from other children with special needs and may make educating these children especially challenging (Jennett, et al., 2003). Furthermore, these teachers

sometimes need to cope with the slower progress of students in their classroom because of the cognitive deficits commonly seen in this population (Jennett et al., 2003). Prior research has even suggested a direct link between teachers' perceived lack of student progress to teacher attrition (Billingsley et al., 1995; Brownell et al., 1994-1995). Lastly, there are also various comorbid disorders (e.g., anxiety, depression, intellectual disability, and seizure disorders) commonly associated with ASDs which may also prove to be increasingly challenging and stressful within the context of educating this population. For example, a study conducted by Billingsley (2004) reported that teachers working with children with emotional problems and speech impairments, both commonly present in children with ASD, were most likely to leave their field. Although all teachers of students with developmental disabilities may be at risk for experiencing stress, the additional challenges faced by educators of those with ASD may put this population of teachers at even greater risk.

It is critical, therefore, to investigate factors that may be contributing to teacher attrition among educators of students with ASD. These teachers are the primary interventionists in most cases, and due to the additional challenges they face, they are potentially at greater risk for leaving the field. Moreover, there is a global increase in the number of children being identified with the disorder. This signals an increased need to attend to factors impacting the retention rates of these educators as well as their ability to deliver *consistent* and *effective* educational services to students on the autism spectrum. Although we are not directly addressing attrition rates in this study, we believe it is important to shed light on constructs that prior literature suggests may be responsible for

teacher attrition, as well as impact the ability of teachers to effectively implement classroom treatments for children with ASD.

### *Teacher Burnout*

One unique type of stress syndrome resulting from these challenges, and one considerable research has shown to directly influence teacher attrition rates, is teacher burnout (*see* Billingsley, 2004; Winiewski & Gargiulo, 1997; [CEC], 1998). Burnout is the endpoint in the process of coping unsuccessfully with chronic stress. It is conceptualized as a psychological syndrome that results from occupational stress among human service workers, including teachers, in response to chronic interpersonal stressors on the job (e.g., Cherniss, 1980; Farber, 1991; Maslach, Schaufeli, & Leiter, 2001).

Teacher burnout can be described as a syndrome with three dimensions: *emotional exhaustion* (occurs when emotional resources are depleted and teachers feel they can no longer give psychologically of themselves), *depersonalization* (occurs when teachers withdraw from their students and their work and develop negative, cynical, and indifferent attitudes and feelings about their students), and reduced feelings of *personal accomplishment* (occurs when teachers perceive themselves as less effective in their work with their students; Chernis, 1980, 1985; Maslach & Jackson, 1981).

Teacher burnout is a central problem within the field of special education and its associations with attrition are alarming. Researchers have determined that levels of burnout among special education teachers are higher relative to teachers in general education (Boe, Bobbit, Cook, Whitener, & Weber, 1997; Boe, Bobbit, & Cook, 1997). Additionally, Miller, Brownell, and Smith (1999) conducted a study with 1,576 special education teachers and their results suggested that 20 % of these teachers transferred to

regular education and 21 % left the field entirely. Furthermore, both those who transferred and those who left the field entirely indicated high stress significantly contributed to their decision. Lastly, prior research also suggests that teachers' thoughts about leaving their jobs are significantly associated with their reported levels of all three of the aforementioned burnout domains, and actual turnover was significantly associated with the Emotional Exhaustion domain (Jackson, Schwab, & Schuler, 1986; Cordes & Dougherty, 1993). In light of this evidence, it seems that many teachers of children with developmental disabilities may be at risk for burnout, and ultimately attrition. However, with the additional challenges faced by teachers of children with ASD, it is logical to conjecture that these educators are at even greater risk for developing this syndrome and leaving their field.

Teacher burnout is likely to be detrimental to the education of children with ASD as well. Frequent absenteeism along with decreases in the quality of job performance have been shown to be related to burnout and to negatively impact student outcomes (Firth & Britton, 1986; Maslach & Jackson, 1985). Occupational stress and burnout have been found to affect the quality of educational services by impacting instructional and interpersonal interactions as well as educators' physical and mental health (Wisniewski & Gargiulo, 1997). Teachers who experience burnout are less task-oriented, deliver less positive reinforcement, attend less to instructional tasks, and withdraw from students (Wisniewski & Gargiulo, 1997). Wisniewski and Gargiulo (1997) summarize the consequences of burnout best by stating, "When stress reached the burnout level, educators directed their energies to basic survival: getting through the day became the first priority" (p. 340).



### *Teacher Commitment*

While the negative effects of teacher burnout may be far reaching in terms of the impact on educators and student outcomes, there are factors that have been shown to mitigate the onset of this syndrome. Prior research suggests that commitment to the theoretical underpinnings of a teaching orientation may serve as an adaptive coping mechanism among educators. Cherniss (1995) proposed that professionals who have the appropriate tools, such as adequate training or training in innovative techniques, may use these tools as effective coping mechanisms. Additionally, Cherniss and Krantz (1983) purported that identifying with a formal ideology provides human service workers with “moral support” when making difficult decisions. This support, in turn, serves as an “antidote” to burnout because it reduces the role of ambiguity and conflict and increases social support, control, and feelings of competence and self-efficacy (Jennett et al., 2003).

One study in particular was able to demonstrate this phenomenon. Jennett et al. (2003) investigated two groups of teachers of students with ASD who had either received specialized training in Applied Behavior Analysis (ABA) or TEACCH (Treatment and Education of Autistic and Related Communication Handicapped Children). Jennett and colleagues proposed that understanding and being committed to the philosophical tenets of either ABA or TEACCH can be equated to identifying with a formal ideology because both provide external frameworks that specify how to achieve certain goals and why these goals are important. It was proposed that the philosophy, defined as the assumptions and principles that lead to the intervention, underlying each teaching approach for students with ASD provides teachers with the tools to cope with the

stressors of being a special education teacher. Their results suggested that teachers who endorse the underlying philosophy of their teaching approach were indeed more satisfied with the work they were doing and exhibited less burnout. It was concluded that exposure to training that elicits an understanding in the theory of a particular teaching approach may serve as a buffer for experiencing burnout. In the present study, the primary goals were to extend the previous findings with TEACCH teachers to one other theoretically-driven teaching approach implemented within the public school system: LEAP (Learning Experiences and Alternative Program for Preschoolers and Their Parents). Additionally, we also examined these factors in a Business As Usual (BAU) or technically eclectic classrooms that are not grounded in any one philosophical or theoretical approach.

#### *TEACCH, LEAP, and BAU classrooms*

TEACCH and LEAP are both preschool comprehensive treatment models that have clearly established program features, a manualized set of procedures, a long history of implementation, established training and outreach procedures, and replications in multiple sites (Odom & Boyd, 2006). Undoubtedly, there is a need for additional research on the effectiveness of the individual components as well as the overall efficacy of both the TEACCH and LEAP programs. However, this is beyond the scope of this proposed study. Nonetheless, both of these preschool comprehensive treatment models arguably consist of some of the most effective intervention components including multiple modalities of treatment (e.g., child-focused intervention and family focused-support), a broad scope (i.e., often occurring over an entire instructional session or in multiple settings, such as a school or clinic and home), and longevity (i.e., occurring over

months or even years; Odom et al., 2007). It is important to study these two models because they both meet the criteria for well-developed and well-established practice according to the Institute of Education Science (IES; Odom & Boyd, 2006) and prior research has suggested promising data on their efficacy (*see* Mesibov & Shea, 2010 and Strain, Kohler, & Goldstein, 1996).

The TEACCH program is a “Structured Teaching,” intervention model where the environment and instructional procedures are arranged around an understanding of the core features of autism (Mesibov & Shea, 2010). Established in 1972 by Eric Schopler, TEACCH is one of the oldest classroom-based comprehensive intervention programs for children with autism and their families (Odom & Boyd, 2006; Lord & Schopler, 1994). The theoretical and conceptual foundations for TEACCH are largely based on cognitive-social learning theory, developmental theory, neuropsychological theories of executive function, and applied behavior analysis (Bandura & Walters, 1963; Mischel, 1971; Hill, 2004; Ozonoff, 1995; Lovaas, 1987). The essential programmatic components of Structured Teaching include: (a) structuring the environment and activities in ways that are understandable; (b) using individuals’ relative strengths in visual skills and interest in visual details to supplement relatively weaker skills; (c) using individuals’ special interest to engage them in learning, and (d) supporting self-initiated use of meaningful communication (Mesibov & Shea, 2010).

LEAP, a more naturalistic classroom approach, was established in 1981 by Phillip Strain through the Handicapped Children’s Early Education Network (Strain & Cordisco, 1994). The theoretical and conceptual foundations are largely based on applied behavior analysis and developmental theory with the early childhood education model based on

constructivist theories of Piaget and Vygotsky (Fosnot, 1996). The individualized instruction procedures are based on applied behavior analysis (Baer, Wolf, & Risley, 1986), incidental teaching approaches (Hart & Risley, 1975), social learning theory (Bandura, 1977), and parent education (Koegel, Gahn, & Neiminen, 1978). The key programmatic features of LEAP include: (a) individualized learning programs which are monitored through data collection and analysis; (b) typically developing children are enrolled as full-time class members; (c) individualized instruction mostly occurs through incorporating learning experiences in general childhood activities and routines; (d) parents participate in parent education programs; (e) transition to the next educational setting is systematically planned and supported through in-class learning activities and communication with the “next” teacher (Strain, Kohler, & Goldstein, 1996).

BAU classrooms are eclectic classrooms without an autism-specific theoretical or conceptual framework. BAU is the type of service that children would typically receive from the local school system outside of an autism-specific treatment approach, such as TEACCH or LEAP. In an attempt to determine normal intervention practices in BAU models, Stahmer, Collings, and Palinkas (2005) reported that over 50% of the programs implemented the following: individualized support, systematic instruction, structured environments, specialized curriculum, functional behavior assessment, and family involvement. It is important to explore the constructs of interest within BAU classroom models because they are widely utilized, seem to share many program features that parallel both TEACCH and LEAP, and serve as a comparison group to the more theory-driven classroom approaches. Due to the fact TEACCH and LEAP are considered well-developed and well-established; it is likely that BAU teachers may be committed to some

of the philosophical tenets underlying TEACCH and LEAP and may utilize a constellation of their programmatic features in addition to other practices. Therefore, we were interested in investigating BAU teachers' relative commitment to TEACCH and LEAP philosophies and practices, and how that may impact burnout and the fidelity of implementation of these eclectic classroom models.

There was a multilevel purpose to this current study. Preliminary investigations were conducted to verify and explore levels of teacher commitment within all three groups of teachers. In reference to the BAU teachers, since the programmatic features of TEACCH and LEAP are considered well-developed and well-established, it was hypothesized that the BAU educators would be committed to a conglomeration of TEACCH and LEAP practices. Therefore, we explored the specific levels of commitment BAU teachers have to the philosophical underpinnings of both TEACCH and LEAP. The specific research questions and associated hypotheses associated with the commitment variable include the following:

I. In regards to TEACCH and LEAP teachers, are they significantly more committed to the philosophical tenets and theory underlying the autism treatment model in which they have been formally trained and are currently working in?

*Hypothesis 1:* TEACCH teachers would be more committed to the underlying philosophies of the TEACCH model than the LEAP and BAU teachers.

*Hypothesis 2:* LEAP teachers would be more committed to the underlying philosophies of the LEAP model than the TEACCH and BAU teachers.

II. What are the specific levels of commitment of the BAU or "eclectic" teachers in respect to the philosophical underpinnings of both TEACCH and LEAP?

*Hypothesis 3:* BAU teachers would not be significantly more committed to the underlying philosophies of the TEACCH model relative to their commitment to the LEAP model.

*Hypothesis 4:* BAU teachers would not be significantly more committed to the underlying philosophies of the LEAP model relative to their commitment to the TEACCH model.

In regards to teacher burnout, preliminary investigations were conducted to explore whether there were group differences on all three of the burnout domains (i.e., Emotional Exhaustion, Depersonalization, and the Personal Accomplishment). This was an exploratory part of the investigation, thus, no definitive hypotheses were offered. In addition, we investigated the relationship between teacher commitment and burnout within all three of the intervention models. The research questions and hypotheses were as follows:

III. Are the three groups of teachers experiencing different levels of burnout across the school year? This is an exploratory part of the investigation, therefore, no definitive hypotheses are offered.

IV. Does teacher commitment to their treatment model serve as a “buffer” to the onset of certain aspects of teacher burnout experienced during the entire school year?

*Hypothesis 5:* A TEACCH teacher’s level of commitment to the theoretical underpinnings of TEACCH, a LEAP teacher’s level of commitment to the theoretical underpinnings of LEAP, and a BAU teacher’s level of overall commitment to both the TEACCH and LEAP teaching models would be:

- a) Negatively correlated with the Emotional Exhaustion domain of burnout.
- b) Negatively correlated with the Depersonalization domain of burnout.
- c) Positively correlated with the Personal Accomplishment domain of burnout.

Lastly, we investigated the relationship between teacher commitment, teacher burnout, and the fidelity of implementation of all three of these classroom approaches. As aforementioned, teacher commitment has been shown to predict aspects of teacher burnout, and burnout has been consistently shown to be linked to the quality of job performance, particularly within the classroom. Therefore, it is plausible there is a relationship between commitment, burnout, and how well teachers are implementing these treatments. See Figures 6 through 8 for the three separate mediation models hypothesized. Specifically, the research questions and hypotheses include:

V. What is the relationship between teacher commitment, teacher burnout, and the fidelity of implementation within these classroom treatment models for children with ASD?

*Hypothesis 6:* The three teacher burnout domains (i.e., Emotional Exhaustion, Depersonalization, and Personal Accomplishment) will mediate the relationship between teacher commitment and the fidelity of implementation of these treatment models.

## Chapter 2: Method

### *Overview*

This study was conducted in conjunction with a larger treatment comparison project entitled, *Comparison of Two Comprehension Treatment Models for Preschool-aged children with Autism and their families* (P.I. Odom, S.; funded by the Institute for Education Sciences; IES: R324B070219). The parent study is a four-year national multi-site project involving institutions throughout four states including North Carolina, Florida, Colorado, and Minnesota. The institutions participating in the larger project include the University of North Carolina at Chapel Hill, the University of Miami, the University of Colorado at Denver, and the University of Minnesota. The overarching goal of the larger project is to contribute to the improvement of the cognitive, communication, academic, social and behavioral outcomes of preschool-aged children identified with ASD and their families. The specific objective is to establish the comparative efficacy of TEACCH and LEAP treatment models relative to BAU classrooms.

### *Inclusion Criteria for Teachers and Classrooms*

Rigorous inclusion criteria were employed to ensure equivalence amongst the three groups of teachers. The inclusion criteria for *all* participants were: a) teachers and classrooms must have operated within a public system, b) teachers must have been certified in special education in their respective states, and c) teachers and classrooms must have been rated at an acceptable level of fidelity of implementation of their respective treatment models (*see* Measures Section). The level of fidelity of each of the classrooms was assessed in the early spring prior to study enrollment and a maximum of



two fidelity assessments were used to select potential classrooms. If an acceptable level of fidelity (*see* below) was not met on the second fidelity assessment, that classroom was excluded from the project.

In order to ensure high fidelity TEACCH classrooms, specific criteria were used to identify the participants for the TEACCH group. The participants must have previously attended a formal TEACCH training either by model developers or appropriately trained personnel within the school districts. Additionally, they must have been implementing the model for at least two years prior to study enrollment. Further, an average score of 3.5 out of 5 across three sections (items 1-13; Physical Structure, Visual Schedules, and Work Systems) on the TEACCH fidelity measure was necessary to meet inclusion criteria. In addition, each TEACCH classroom was required to obtain an average score of 3 out of 5 on the entire Professional Development in Autism (PDA) instrument or an average score of 3 on 4 sections of the measure which include: (a) Classroom Structure, (b) Classroom Environment, (c) Curriculum & Instruction, and (d) Positive Instructional Climate. This was to ensure that only teachers who were implementing the TEACCH program at an above average level fidelity were included into the sample. Lastly, each TEACCH participant attended a mandatory two-day TEACCH booster training session at each site; which was provided by a certified TEACCH trainer at the end of the summer prior to the start of the academic year of participation.

In order to ensure high fidelity LEAP classrooms, specific criteria were used to identify the participants for the LEAP group. These participants must have previously attended a formal LEAP training either by model developers or appropriately trained

personnel within the school districts. Also, they must have been implementing the model for at least two years prior to the study enrollment. Further, an average score of 3.5 out of 5 across two sections (Teaching Strategies and Promoting Social Interactions) on the LEAP fidelity measure was necessary to meet inclusion criteria. In addition, each classroom needs an average score of 3 out of 5 on the entire Professional Development in Autism (PDA) instrument (*see* Measures Section) or an average score of 3 on 4 sections of the measure which includes: (a) Classroom Structure, (b) Classroom Environment, (c) Curriculum & Instruction, and (d) Positive Instructional Climate. This was to ensure that only teachers who were implementing the LEAP program at an above average level fidelity were included into the sample. Lastly, each LEAP participant attended a mandatory two-day LEAP booster training session at each site; which was provided by a certified LEAP trainer at the end of the summer prior to the start of the academic year of participation.

There were specific inclusion criteria for the BAU participants as well. Each BAU teacher must have taught in a classroom for preschool children with autism for at least two years prior to enrollment in the study. In addition, an average score of 4 out of 5 across the entire PDA instrument or an average score of 4 across 4 sections of which includes: (a) Classroom Structure, (b) Classroom Environment, (c) Curriculum & Instruction, and (d) Positive Instructional Climate was necessary to meet inclusion criteria. These criteria were used to ensure that only teachers who were implementing the BAU program at an above average level fidelity were included into the sample. BAU classrooms were held to a higher standard (i.e., criteria scores of 4 out of 5) because these

teachers did not have the benefit of attending any booster trainings nor were they required to have had any prior formal training in an autism-specific intervention or model.

As previously noted, this study investigated these relationships in TEACCH and LEAP teachers who were implementing their programs at an above average (greater than or equal to 3.5) level. This was due to the fact that these were the inclusion criteria utilized in the parent project. Therefore, these criteria excluded teachers falling within the lower range of fidelity or the lower end of the hypothetical normal curve. Although a limitation, we were still interested in exploring these constructs within this sample because it is a population of teachers who have been in prior TEACCH and LEAP formal training and who presumably have an understanding of the philosophical tenets and practices of TEACCH or LEAP. If a teacher has gone through a formal training and is successfully able to implement a TEACCH or LEAP program at an above average fidelity level we propose that this is not by chance alone and they have an adequate understanding of their treatment models. Moreover, since we were interested in the construct of teacher commitment, we can assume that teachers who have an understanding of the treatment model are capable of acquiring certain levels of commitment to that model. In other words, teachers who understand their model and implement it well, are likely to have some level of commitment to the underlying philosophy of the model they are implementing. In contrast, if a teacher is not implementing a program at an above average level, it cannot be assumed that they have a complete understanding of the theory underlying that model. Therefore, we would not expect for them to have a commitment to a particular treatment model.

### *Participants*

After receiving approval from respective institutional review boards and local school districts within each of the sites, three groups of preschool teachers of children with ASD were screened and then recruited as part of the larger study: a TEACCH group, a LEAP group, and a Business As Usual (BAU) or eclectic control group. All the teachers were identified based on the classroom model they were implementing within a public school district. A total of 53 teachers were recruited for participation including: 17 TEACCH, 15 LEAP, and 21 BAU. This includes 14 teachers (25.5%) from North Carolina, 14 (25.5%) from Colorado, 16 (29.1%) from Florida, and 9 (16.4%) from Minnesota. All of the participants were female, with the exception of 1 male in the LEAP group. The sample consisted of teachers who reported themselves to be the following ethnicities and races: non-Hispanic (n= 44; 83%); Hispanic (n= 9; 17%); White (n= 52; 98.1%); and Bi/Multi-Racial (n= 1; 1.9%).

### *Procedures*

After completing the screening, enrollment, and consent processes, participants were asked to complete the Autism Treatment Philosophy Questionnaire – Adapted Version at the beginning of the school year [Pre time point (e.g., September)]. To allow teachers to settle into their classrooms, classroom fidelity assessments began one month after the school year started. Following this one month period, each classroom was evaluated with regard to fidelity of treatment implementation at four time points throughout the school year [e.g., T1 = early Fall (e.g., October), T2 = late Fall (e.g., November), T3 = early Spring (e.g., March), and T3 = Late Spring (e.g., April)]; with two of these time points consisting of reliability checks. The teachers were also asked to

complete the Classroom Demographic form at each of these four time points. In addition, the Maslach Burnout Inventory – Educators Survey was collected at four time points throughout the school year (e.g., Pre = the start of the school year [September], at fidelity T2, at fidelity T3, and Post = the end of the school year [May]). Teachers were compensated a total of \$500 for their participation in the larger parent study. They were given this compensation in two increments including \$250 at the Pre time point and \$250 after the Post time point. Refer to Figure 1 for a summary of procedures.

### Chapter 3: Measures

#### *Autism Treatment Philosophy Questionnaire-Adapted Version (TPQ-A)*

To determine all participants' commitment to treatment model philosophy, an instrument with items that are representative statements about TEACCH and LEAP treatment approaches for autism was administered. Each of the statements reflects the underlying theory and values of either the TEACCH approach or the LEAP approach. This questionnaire is an adaptation of the Autism Treatment Philosophy Questionnaire (Jennett et al., 2003). The original scale included items specifically designed to capture ABA and TEACCH philosophy and instruction. The research team worked with the TEACCH model developers to confirm items that reflect the TEACCH philosophy and with the LEAP model developers to add items that reflect the LEAP philosophy (See Appendix).

The final questionnaire has 27 statements, 14 for TEACCH and 13 for LEAP, yielding a TEACCH commitment score, a LEAP commitment score, and an overall commitment score. The order of the statements was randomized and this revised questionnaire was field tested with LEAP, TEACCH, and BAU teachers in NC, CO, and FL in Phase I (Year 1) of the larger project. A total of 154 teachers (78 TEACCH, 20 LEAP, and 54 BAU) completed the scale and each of the participants were asked to rate each item on a 6-point continuum (1 = strongly disagree, 6 = strongly agree) relative to how well that item fit their personal teaching approach. Psychometric analysis indicated coefficient alpha reliability for the 27 items of the scale to be 0.957. Descriptive discriminant analysis indicated individual items that comprise the measure's total score are able to discriminate between the three groups of teachers,  $F(54, 242) = 2.46, p < .001$ .

The internal consistency for both the TEACCH subscale score (Cronbach's  $\alpha = 0.92$ ) and the LEAP subscale score (Cronbach's  $\alpha = 0.91$ ) were adequate. Discriminant analyses also indicated that the omnibus test for the LEAP subscale was significant,  $F(2, 147) = 4.23, p < .05$ , however, it only discriminated LEAP teachers from TEACCH teachers, but not BAU teachers. Lastly, discriminant analyses indicated that the omnibus test for the TEACCH subscale was not significant,  $F(2, 147) = 1.13, p = n.s.$  Thus, the discriminant validity of the TEACCH subscale was not supported.

*Maslach Burnout Inventory – Educators Survey (MBI-ES)*

To measure burnout, the Maslach Burnout Inventory-Educators Survey was administered (Maslach, Jackson, & Schwab, 1996). This measure consists of 22 statements comprising three subscales which include: Emotional Exhaustion (EE), Depersonalization (DP), and Personal Accomplishment (PA). The participant rates the frequency of the feelings addressed through each of the statements on a 7-point continuum (0 = never, 6 = every day). The EE subscale assesses feelings of being emotionally overextended and exhausted by one's work (e.g., "I feel emotionally drained from my work."). The DP subscale measures negative feelings, impersonal response, and an unfeeling towards one's students (e.g., "I feel I treat some students as if they were impersonal objects."). The PA subscale measures the contentment and satisfaction one has relative to their accomplishments with their students (e.g., "I feel I'm positively influencing other people's lives through my work."). Adequate internal consistency and discriminant validity have been established for this inventory (*see* Maslach, Jackson, & Leiter, 1996). In regard to reliability, Cronbach  $\alpha$  estimates have been reported to be 0.88 to 0.90 for the EE subscale, 0.74 to 0.76 for the DP subscale, and 0.72 to 0.76 for the PA

subscale (Iwanicki & Schwab, 1981; Gold 1984). Within the sample, tests of the reliability of each subscale across the four time points were evaluated and indicated Pearson  $r$  values from 0.57 to 0.86 for the EE subscale, 0.73 to 0.88 for the DP subscale, and 0.63 to 0.85 for the PA subscale.

#### *TEACCH, LEAP, & BAU Fidelity Measures*

The fidelity of implementation within each of the classrooms was assessed by three different treatment fidelity measures which were empirically-validated in year 1 of the larger treatment comparison project. Research staff across three states were trained in the use of each fidelity measure and met criterion for inter-rater reliability. Generally, 4 observations were then conducted in 11 TEACCH, 10 LEAP, and 13 BAU preschool classrooms serving students with ASD across study sites over a four month period. During each classroom observation all 3 fidelity measures were completed. Test-retest reliability for the four observations was  $M = .77$  for the BAU measure (.53-.86 across 8 subscales),  $M = .61$  for the LEAP measure (.45-.86 across 8 subscales), and  $M = .63$  for the TEACCH measure (.43-.86 across 9 subscales). Internal consistency was examined using Cronbach's alpha. Alpha was .94 (.71-.95) for the BAU measure, .93 for LEAP (.55-.90), and .93 for TEACCH (.42-.93). Inter-rater reliability was measured as the proportion of agreement between observers. Inter-rater reliability was 93% (BAU, 82-97%), 95% (LEAP, 82-100%), and 89% (TEACCH, 87-96%), respectively. Discriminant analyses were performed to identify the subscales of the fidelity measures that best discriminated between classroom types. On the BAU measure, two subscales (i.e., social/peer relations and curriculum and instruction) primarily contributed to the ability of the measure to discriminate between the 3 treatment models. On the LEAP measure,



social interaction and teaching communication subscales best contributed to the discrimination between model types, and on the TEACCH measure four subscales, communication, assessment, visual schedules, and social and leisure discriminated between the models. Overall, results indicated that the TEACCH, LEAP, and BAU fidelity measures are psychometrically robust and clearly discriminate between the intervention models.

### *Classroom Demographics*

Participants were asked to complete a demographic form which includes the following information: gender, ethnicity, race, total # of years teaching, total # of years teaching children with ASD, types of formal training, highest degree earned, classroom type, class size (e.g., # of students with ASD and DD), # of full time classroom staff, length of instructional day, duration/time of school day, and classroom model. This measure was administered at each of the fidelity observations (i.e. four time points across the school year).

## Chapter 4: Results

### *Descriptive Data*

Results indicated there were no significant differences in the number of years of teaching,  $F(2, 50) = 2.22, p = n.s.$ , nor did the three groups differ on the number of years teaching children with ASD,  $F(2, 50) = 1.37, p = n.s.$  Additionally, there were no differences between groups on the average number of fulltime staff in the classroom across the year,  $F(2, 50) = 2.70, p = n.s.$  and there were no group differences in the highest degree attained [ $\chi^2(6, n = 53) = 0.68, p = n.s.$ ]. Refer to Table 1 and Table 2 for the specifics on the demographics of the sample.

There were significant differences noted between the three groups on the length of instructional day (i.e., < 2 hours, between 2 and 3 hours, between 3 and 4 hours, between 4 and 5 hours, and > 5 hours) of the classrooms session recruited for the project,  $\chi^2(6, n = 53) = 28.93, p < .001$ . The majority of teachers in the TEACCH group ( $n = 10$ ) were working within a classroom in which the length of the instructional day was > 5 hours. The majority of the LEAP ( $n = 15$ ) and BAU ( $n = 17$ ) classroom sessions recruited had a length of the instructional day that was between 2 and 3 hours. Additionally, the three groups differed on the duration/time of day of the classroom session that was recruited for the project [i.e., Full Day, Morning (AM) ½ Day, and Afternoon (PM) ½ Day],  $\chi^2(4, n = 53) = 35.19, p < .001$ . The majority of teachers in the TEACCH group ( $n = 14$ ) were working in classrooms that were Full Day, the majority of LEAP teachers ( $n = 13$ ) were working in classrooms that were AM ½ Day sessions, and the majority of BAU teachers were split between AM ½ Day sessions ( $n = 8$ ) and PM ½ Day sessions ( $n = 9$ ). These differences were not surprising due to the fact that TEACCH classrooms are traditionally

scheduled as full day sessions, LEAP classrooms are traditionally scheduled as two ½ day sessions (different students in each half-day session), and BAU classrooms are typically scheduled as either full day or two ½ day sessions (different students in each half-day session) within public school systems. See Table 1 for frequencies between each group.

The three groups also significantly differed on the average number of students within their classroom throughout the year,  $F(2, 50) = 11.48, p < .001$ . It should be noted that the Levene's Test of Equality of Error Variance was significant,  $F(2, 50) = 8.10, p < .01$ , indicating the error variance of the dependent variable is not equal across the three groups. This is more than likely due to the discrepancy in the number of participants within each of the groups. Due to the fact that equal variances could not be assumed, post hoc comparisons utilizing the Dunnett's C test were employed and revealed that the TEACCH classrooms, on average, had significantly fewer students relative to the LEAP and BAU classrooms. See Table 2 for means and standard deviations.

Additionally, the three groups differed on the average number of ASD students within their classroom,  $F(2, 50) = 20.60, p < .001$ , and the average number of typically developing (TD) students per classroom,  $F(2, 50) = 22.85, p < .001$ . However, it should be noted again that the Levene's Test of Equality of Error Variance was significant for both of these analyses. Therefore, due to the fact that equal variances could not be assumed, post hoc comparisons utilizing the Dunnett's C test were employed. The post hoc tests revealed that the TEACCH classrooms, on average, had significantly more children with an ASD and less TD students relative to the LEAP and BAU classrooms. These significant differences were expected because only developmentally delayed

children, particularly those who are diagnosed or suspected of having an ASD, are staffed into TEACCH classrooms. In contrast, TD students are staffed into all LEAP classrooms and most BAU classrooms as part of the criteria of the classroom models. Refer to Table 2 for means and standard deviations.

The three groups differed on their overall scores on the TEACCH fidelity measure,  $F(2, 48) = 15.90, p < .001, \eta^2 = .40$ , the LEAP fidelity measure,  $F(2, 48) = 11.05, p < .001, \eta^2 = .32$ , and the PDA fidelity measure,  $F(2, 48) = 8.87, p < .001, \eta^2 = .27$  as well. Post hoc Dunnett's C test were employed to evaluate the pairwise differences among the means and tests indicated that the TEACCH group ( $M = 136, SD = 12.1$ ) and the LEAP group ( $M = 126, SD = 11.1$ ) scored significantly higher on the TEACCH fidelity measure than the BAU group ( $M = 98.1, SD = 30.7$ ). In addition, the LEAP group ( $M = 180, SD = 4.83$ ) scored significantly higher on the LEAP fidelity measure than the TEACCH ( $M = 154, SD = 12.1$ ) and BAU ( $M = 150, SD = 27.0$ ) groups. Lastly, the LEAP group ( $M = 255, SD = 3.86$ ) scored significantly higher on the PDA fidelity measure than the TEACCH ( $M = 232, SD = 17.5$ ) and BAU ( $M = 229, SD = 22.2$ ) groups.

#### *Data Diagnostics and Missing Variables*

All predictor and outcome variables were examined to ensure values for skew were less than four and kurtosis less than 10. Multicollinearity for each analysis was examined by ensuring tolerance values close to 1 and variance inflation factor (VIF) values less than 10. Additionally, the data were examined to detect potential outliers by utilizing calculations of standardized residuals and Cook's D for measures of significant

influence. No outliers were identified. Refer to Table 3 for the correlations between all continuous variables utilized within the analyses.

There were no known systematic processes or predictors contributing to missing data; therefore, all missing data were classified as *Missing At Random*. There were missing demographic data (class size, # of children with ASD per class, # of TD children per class, # of full time classroom staff) at one of the four time points for 2 of the 53 participants (approximately 4%). Additionally, there were missing MBI-ES data (all three domains) at 1 of the 4 time points for four of the participants (approximately 8%). Lastly, two of the participants (approximately 4%) had missing fidelity data. The missing demographic and MBI-ES data points were reconciled by inputting an average of the data collected at the three other time points. The missing fidelity data were coded as 999 and inputted as missing within the analyses. It should be noted that analyzing the data with *all* missing data points coded as 999 (i.e., missing) did not reveal significantly discrepant results.

#### *Mean Differences of Levels of Commitment between Groups*

A one-way multivariate analysis of variance (MANOVA) was employed to compare the three groups on the TPQ-A TEACCH commitment score, the TPQ-A LEAP commitment score, and the Overall TPQ-A score. Refer to Table 4 for means and standard deviations. The TEACCH commitment score was calculated as a proportion or percentage of the maximum score (maximum TEACCH score = 84) that is obtainable on all the TEACCH items (i.e.,  $\text{Obtained TEACCH Score} / 84 = \text{TEACCH commitment score}$ ). The LEAP commitment scores was calculated as a proportion or percentage of the maximum score (maximum LEAP score = 78) that is obtainable on all the LEAP

items. (i.e., Obtained LEAP Score / 78 = LEAP commitment score). The overall score was calculated as a proportion or percentage of the maximum score (maximum overall score = 162) that is obtainable on the entire TPQ-A measure (e.g., Obtained overall TPQ-A score / 162 = Overall TPQ-A Score). Due to the fact that equal variances could not be assumed (Levene's Test of Equality of Error Variance,  $F(2, 50) = 3.66, p < .05$ ) with this particular analysis, post hoc Dunnett's C tests were conducted to evaluate the pairwise differences among the means. Lastly, a paired samples t-test was utilized to test differences in the levels of TEACCH and LEAP commitment within the BAU group.

The results of the MANOVA indicated no significant differences between the groups on the TEACCH commitment score,  $F(2, 50) = 0.130, p = n.s.$  However, the groups did significantly differ on the LEAP commitment score,  $F(2, 50) = 9.16, p < .001, \eta^2 = .27$ , such that the LEAP group ( $M = 0.93$ ) had a significantly higher LEAP commitment score than the TEACCH group ( $M = 0.81$ ) and the BAU group ( $M = 0.87$ ). Additionally, there were significant differences between the groups on the overall commitment score,  $F(2, 50) = 3.27, p < .05$ . Specifically, the LEAP group ( $M = 0.91$ ) had a higher overall commitment score than the TEACCH group ( $M = 0.86$ ) and the BAU group ( $M = 0.88$ ). Lastly, paired samples t-tests revealed no significant differences between the TEACCH and LEAP commitment levels within the BAU group,  $t(20) = 0.83, p = n.s.$

#### *Mean Differences of Levels of Burnout between Groups*

A MANOVA was also employed to compare the three groups on each of the three dimensions of burnout: Emotional Exhaustion (EE), Depersonalization (DP), and Personal Accomplishment (PA). An average of the four burnout scores across the year

(i.e., data collected at PRE, T2, T3, and POST) for each dimension was calculated and used as the dependent variable. Due to the fact that equal variances could be assumed in this evaluation, Post hoc Tukey HSD tests were conducted to evaluate the pairwise differences among the means. Results of the MANOVA indicated that there were no significant differences between the three groups on the EE subscale,  $F(2, 50) = 1.02, p = n.s.$ , the DP subscale,  $F(2, 50) = 1.28, p = n.s.$ , or the PA subscale,  $F(2, 50) = 1.26, p = n.s.$  Refer to Table 5 for means and standard deviations.

#### *Relationship between Commitment and Burnout*

A series of hierarchical regression analyses were conducted to evaluate the relationship between the TPQ-A commitment variable and the reported levels of the three dimensions of burnout across the entire academic year. The predictor variable, the TPQ-A commitment variable, was constructed of the following scores: the TEACCH teachers' TPQ-A TEACCH commitment score (a proportion; as calculated above), the LEAP teachers' TPQ-A LEAP commitment score (a proportion; as calculated above), and the BAU teachers' overall TPQ-A commitment score. See Figure 2 for an illustration of the construction of the TPQ-A commitment variable. An average of the four burnout scores across the year (i.e., PRE, T2, T3, and POST) for each dimension was used as the criterion variable.

Control variables were selected and entered into the analyses to evaluate the unique contribution of the TPQ-A commitment variable while accounting for potentially confounding factors. The selection of these variables was based on the examination of the Pearson  $r$  correlations between all the variables (Refer to Table 1). The variable consisting of the average # of TD children per class (Td) was not selected as a control

variable due to its high correlation ( $r = .874, p < .001$ ) with the average class size (Cs) variable. The control variables were entered into the first block which included the following factors: total # of years teaching (Ttl); total # of years teaching children with ASD (TtAs); highest degree earned (Hd); average class size (Cs); average # of children with ASD per class (As); # of full time classroom staff (Fs); length of instructional day (Ld); and duration/time of day (Du). Next, the TPQ-A commitment variable (Ct) was entered into the second block. The Hd, Ld, and Du variables are categorical variables, therefore, they were dummy coded (i.e., binary coded into 0's and 1's) before being entered into the analyses. The three regression models are shown below:

- $Y_{(emotional\ exhaustion)} = \alpha + \beta(Ttl) + \beta(TtAs) + \beta(Hd) + \beta(Cs) + \beta(As) + \beta(Fs) + \beta(Ld) + \beta(Du) + \beta(Ct) + \varepsilon$
- $Y_{(depersonalization)} = \alpha + \beta(Ttl) + \beta(TtAs) + \beta(Hd) + \beta(Cs) + \beta(As) + \beta(Fs) + \beta(Ld) + \beta(Du) + \beta(Ct) + \varepsilon$
- $Y_{(personal\ accomplishment)} = \alpha + \beta(Ttl) + \beta(TtAs) + \beta(Hd) + \beta(Cs) + \beta(As) + \beta(Td) + \beta(Fs) + \beta(Ld) + \beta(Du) + \beta(Ct) + \varepsilon$

Refer to Figure 3, Figure 4, and Figure 5 for the bivariate scatterplots of the three burnout domains regressed onto the TPQ-A commitment variable. The first set of hierarchical regression analyses revealed that the overall model did not account for a significant proportion of the variance in the average level of EE experienced across the year,  $F(13, 39) = 1.43, p = n.s.$  In the examination of the individual regression coefficients, it was noted that the dummy coded highest degree earned variable (Hddummy2: Associate's of Arts degree), ( $\beta = 0.46$ ),  $t(39) = 2.57, p < .05$ , and the average class size (Cs) variable ( $\beta = -0.49$ ),  $t(39) = -3.08, p < .01$ , were the only variables



that accounted for a significant proportion of the variance in EE. In addition, the second set of analyses revealed that the overall model did not account for a significant proportion of the variance in the average level of DP experienced across the year,  $F(13, 39) = 1.12$ ,  $p = n.s.$  Lastly, the third set of analyses also revealed that the overall model did not account for a significant proportion of the variance in the average level of PA experienced across the year,  $F(13, 39) = 1.05$ ,  $p = n.s.$  Further examination of the last two models revealed that no other individual regression coefficients accounted for a significant proportion of the variance in the DP or PA criterion variables.

*Mediation Model: The Relationship between Commitment, Burnout and Fidelity*

A mediation model was next employed in accordance with Baron and Kenny's 1986 theory to test whether the three burnout domains (assessed in the middle of the year) mediated the relationship between the TPQ-A commitment variable and the fidelity of implementation of the classroom models (see Figure 6, Figure 7, and Figure 8). This mediation model investigated a sequence of relationships between the TPQ-A teacher commitment assessed at the PRE time point (i.e., beginning of the school year), the average level of burnout assessed at T2 and T3 (i.e., during middle of school year), and levels of fidelity assessed at T4 (i.e., the end of the school year). The Fidelity variable was constructed of the following scores: the TEACCH teachers' Z-score on the TEACCH fidelity observation measure; the LEAP teachers' Z-score on the LEAP fidelity observation measure; and a BAU teachers' Z-score on the PDA fidelity observation measure. Due to the fact that there was a discrepancy in the number of items between the three fidelity measures, each of the obtained scores were transformed into Z-scores. Refer to Figure 9 for an illustration of the construction of the Fidelity variable. It was

noted that there was a significant difference between the groups on the Fidelity variable,  $F(2, 48) = 12.96, p < .001, \eta^2 = .35$ . Post hoc Dunnett's C test were employed to evaluate the pairwise differences among the means and tests indicated that the TEACCH group scored significantly higher on the Fidelity variable ( $M = 0.71, SD = 0.52$ ) than the BAU group ( $M = -0.38, SD = 1.17$ ), but not the LEAP group. Additionally, these tests indicated that the LEAP group scored significantly higher on the Fidelity variable ( $M = 0.89, SD = 0.21$ ) than the BAU group, but not the TEACCH group.

Step 1 in testing the mediation hypothesis was to confirm a significant relationship between the predictor variable (i.e., TPQ-A commitment variable) and the criterion variable (i.e., the Fidelity variable), while controlling for the selected variables. Refer to Figure 10 for the bivariate scatter plot of the Fidelity variable regressed onto the TPQ-A commitment variable. The control variables entered into the analyses at block 1 included the following: total # of years teaching (Ttl); total # of years teaching children with ASD (TtAs); highest degree earned (Hd); average class size at T2 and T3 (Cs2); average # of children with ASD per class at T2 and T3 (As2); # of full time classroom staff at T2 and T3 (Fs2); length of instructional day (Ld); and duration/time of day (Du). The TPQ-A commitment variable was entered at block 2. Results indicated that the overall model accounted for a significant proportion of the variance in the fidelity variable  $R^2 = 0.61$ , adjusted  $R^2 = 0.47$ ,  $F(13, 37) = 4.44, p < .001$ . However, further examination of the individual regression coefficients indicated the TPQ-A commitment variable ( $\beta = 0.21$ ) was not a significant predictor, although it approached significance, of the Fidelity variable,  $t(37) = 1.78, p = .09$ . It should be noted that this relationship was not supported, despite the fact that there was a statistically significant zero order

correlation (Pearson  $r = 0.368$ ,  $p < .01$ ) between the TPQ-A commitment variable and the Fidelity variable (*see* Table 3). The individual regression coefficients that accounted for a significant proportion of variance included the following control variables: total # of years teaching (Ttl;  $\beta = 0.34$ ); highest degree earned (Hddummy2: Associate's of Arts degree;  $\beta = 0.54$ ); length of instructional day (Lddummy2: Between 2 & 3 hours;  $\beta = 0.86$ ); duration/time of day (Dddummy1: Full Day;  $\beta = 1.35$ ); average class size at T2 and T3 (Cs2;  $\beta = 0.27$ ); average # of children with ASD per class at T2 and T3 (As2;  $\beta = -0.42$ ); and # of full time classroom staff at T2 and T3 (Fs2;  $\beta = 0.58$ ). Refer to Table 6 for further statistics and proportions of variance accounted for by these variables.

Due to the fact that the first criterion for testing a mediation model was not met, we did not proceed with employing the second step of testing whether the independent variable (i.e., TPQ-A commitment variable) significantly predicted the hypothesized mediators (i.e., average level of EE, DP, and the PA subscale scores at T2 and T3). Additionally, we did not proceed with employing step 3 which was to test whether the mediators significantly predicted the level of fidelity while controlling for the TPQ-A commitment variable. Thus, conducting a Sobel test of significance of the indirect effect was not necessary.

#### *Post-hoc Exploratory Analyses*

Due to the unexpected findings that the TPQ-A commitment variable did not significantly predict overall levels of burnout and the criteria for the hypothesized mediated relationship were not met, additional exploratory analyses were performed. Further examination of the bivariate scatter plots of the overall Emotional Exhaustion variable regressed onto the TPQ-A commitment variable (see Figure 1) raised speculation

regarding a nonlinear relationship. Therefore, a quadratic relationship between the TPQ-A commitment variable and the overall EE variable was tested. The TPQ-A commitment variable was first squared to create the TPQ-A quadratic variable. Next, the linear TPQ-A commitment variable and the TPQ-A quadratic variable were then centered to control for multicollinearity. The control variables were entered into the first block, the linear TPQ-A commitment variable was entered into the second block, and then the quadratic term was entered into the third block. Results indicated that that the overall model did not account for a significant proportion of the variance in the average levels of Emotional Exhaustion experienced across the year,  $F(14, 38) = 1.73, p = .09$ , although it approached significance.

The quadratic relationship was then examined between the TPQ-A commitment variable and the average levels of EE experienced at T2 and T3 (i.e., the middle of the school year). See Figure 11 for the bivariate scatter plot of the average levels of Emotional Exhaustion experienced at T2 and T3 regressed onto the TPQ-A commitment variable. Results indicated that the overall model did account for a significant proportion of variance  $R^2 = 0.66$ , adjusted  $R^2 = 0.44$ ,  $F(14, 38) = 2.09, p < .05$ . Specifically, our results indicated that after controlling for the control variables and the linear effects of the TPQ-A variable, the individual regression coefficient for the TPQ-A quadratic variable ( $\beta = 0.37$ ),  $t(38) = 2.28, p < .05$  was a significant predictor of the average levels of Emotional Exhaustion assessed at T2 and T3. The quadratic term accounted for approximately 8% of the variance in the Emotional Exhaustion variable. Thus, the quadratic effects of the TPQ-A commitment variable was significant, indicating a curvilinear relationship.

## Chapter 5: Discussion

This study aimed at investigating teacher commitment to the underlying philosophy and practices of two “well-established” classroom approaches for preschool students with autism spectrum disorders, the effects this commitment has on the levels of burnout experienced by teachers, and a mechanism by which these factors may impact the actual implementation of the models. This study was conducted in an effort to understand the processes that may underlie the current attrition issues within the field of special education and to identify variables that affect the quality of classroom based interventions for children and families affected by ASD. Participants were teachers of students on the autism spectrum who are argued herein to be at a greater risk for experiencing exceptionally high levels of burnout; ultimately increasing the likelihood of them leaving their field. The results provided mixed support for the hypothesized group differences between commitment levels to TEACCH and LEAP model philosophy, however, failed to demonstrate that teacher commitment significantly predicted aspects of teacher burnout. Additionally, the proposed mediated relationship between commitment and fidelity via the effects on teacher burnout was not supported. In contrast, post hoc results did provide support for a quadratic relationship between teacher commitment and the Emotional Exhaustion domain of teacher burnout. These findings raise several interesting theoretical issues and implications.

### *Group Differences between Levels of Commitment*

The lack of significant group differences between TEACCH, LEAP and BAU teachers’ level of commitment to the underlying philosophies of the TEACCH model was unexpected. TEACCH teachers did not report significantly higher commitment levels to

the TEACCH model relative to the two other groups. In fact, the three groups of teachers reported an equally high level of commitment to the philosophical tenets and practices underlying the TEACCH approach. This finding is inconsistent with the study conducted by Jennett and colleagues who concluded that the TEACCH teachers were significantly more committed to TEACCH philosophy relative to teachers implementing a contrasting model (i.e., ABA). One of the most probable explanations for this result, as well as a fundamental limitation of this study, is the fact the discriminant validity of the TEACCH subscale on the TPQ-A measure had not been supported. Despite working with TEACCH model developers to confirm that TEACCH items on the instrument reflected TEACCH philosophy and practices, these items did not discriminate TEACCH teachers from the other two groups on the basis of their levels of commitment. This limits the statistical power of the instrument's TEACCH subscale and may be the underlying reason why results did not reveal the expected group differences.

In contrast to the lack of group differences on the levels of commitment to TEACCH philosophy, there were significant group differences in teachers' level of commitment to the philosophy and practices underlying the LEAP model. Specifically, LEAP teachers reported significantly higher levels of commitment to LEAP items on the TPQ-A relative to the TEACCH and BAU teachers. It should be noted that, unlike the TEACCH subscale, the discriminant validity of the LEAP subscale on the TPQ-A measure was supported in a concurrently conducted validation study of the measure. Collaborating with LEAP model developers to confirm the LEAP items on the instrument reflected LEAP philosophy was successful in that they discriminated between the three groups of teachers. Thus, the statistical power of the instrument's LEAP subscale was

able to significantly discriminate LEAP teachers from the two other groups. This may be one explanation why this statistically significant group difference was observed with the LEAP group and not the TEACCH group. However, extending the discussion beyond the limitations of the TPQ-A measure raises several interesting implications as to why LEAP teachers, and not TEACCH teachers, reported significantly higher levels of commitment to their teaching orientation relative to the other groups.

One alternative explanation for these results may be that LEAP teachers share a degree of commitment to some of the underlying principles and practices of TEACCH. As previously mentioned, TEACCH and LEAP are both preschool comprehensive treatment models that share a set of global programmatic features including a manualized set of procedures, multiple modalities of treatment (e.g., child-focused intervention and family focused-support), a broad scope (i.e., often occurring over an entire instructional session or in multiple settings, such as a school or clinic and home), and longevity (i.e., occurring over a month or even years; Odom et al., 2007). Moreover, both of these classroom approaches are driven by some overlapping theoretical and conceptual foundations such as developmental theory and principles of applied behavior analysis (Bandura & Walters, 1963; Mischel, 1971; Hill, 2004; Ozonoff, 1995; Lovaas, 1987; Fosnot, 1996; Baer, Wolf, & Risley, 1986). In light of these considerations one may initially postulate that the LEAP and TEACCH teachers may inherently share similar degrees of commitment to some of their overlapping philosophical tenets and practices. Hence, it would be logical to conjecture that LEAP teachers would share equally high levels of commitment to TEACCH; and TEACCH teachers would have equally high levels of commitment to LEAP. However, this is not what was supported by the results

and, thus, leads us to the following question: why would LEAP teachers report having equally high levels of commitment to the TEACCH approach relative to TEACCH teachers when this same reciprocity in commitment does not hold true for the TEACCH group?

Perhaps it is the case that the core principles of TEACCH are more generalizable across classroom settings than the core principles underlying the LEAP approach. It is possible that some of the classroom components underlying the TEACCH approach (e.g., classroom structuring, positive behavior management, utilization of visual schedules, and visual stimulation) are all generally considered good classroom practices in early childhood development and education; and are likely to be utilized in LEAP classrooms. Although TEACCH has undoubtedly tailored and improved these early education elements for students on the autism spectrum, the TEACCH elements mirror many of the practices that have been used throughout the years in educating young children. Hence, it is possible that through normal professional development within the field of education teachers may have more exposure to these types of principles, thus, making it likely for LEAP teachers to endorse many practices underlying the TEACCH approach. For example, LEAP teachers may report commitment levels to many of the practices assessed within the TPQ-A TEACCH subscale (*see Appendix*) such as: “*Behavior management strategies emphasize positive, antecedent based approaches and the prevention of behavior problems;*” “*Teaching a child to play independently is as important as teaching a child to play cooperatively with others;*” “*One of my responsibilities as a teachers is to understand the personal experience of a student with autism;*” and “*I find that my students with autism learn the best when their strengths and interests are emphasized and*



*their deficits are accepted and minimized.*” All of these aforementioned items were considered hallmarks of TEACCH philosophy and practice, yet they are also effective general education practices. Thus, having exposure to these generally effective classroom based practices for young children, which TEACCH philosophy and practice mirrors, may elicit endorsement from teachers implementing other models, in this case LEAP.

The same reasoning and considerations may also hold true for the BAU teachers who reported similar degrees of commitment to TEACCH philosophy, relative to the TEACCH group. If the philosophy and practices of TEACCH are indeed generalizable, and teachers have more exposure to them, than BAU teachers are also likely to endorse elements of this model within their classroom. In addition and as previously discussed, TEACCH is considered a well-developed and well-established classroom approach, therefore, school districts may be exposing teachers of students with ASD to some of the philosophies and practices of TEACCH. This informal exposure and/or training may inadvertently elicit a commitment to some of the elements of the TEACCH approach. In support of this theory is the study conducted by Stahmer and colleagues, who reported that over 50% of early intervention community service providers implemented components such as individualized support, systematic instruction, structured environments, specialized curriculum, and functional behavior assessment. All of these classroom components are strongly associated with the TEACCH classroom model and are evidently being utilized frequently within early intervention community settings, including public schools. This brings into question which theoretical tenets and practices underlying the LEAP model are difficult for TEACCH and BAU teachers to adopt within

their classrooms. In other words, why are TEACCH and BAU teachers not reporting as high a degree of commitment to LEAP relative to LEAP teachers?

The LEAP approach strongly emphasizes that teachers should instruct their students through naturally occurring events within the classroom, incidental teaching approaches, and should utilize same-aged typically developing peers to facilitate learning within the classroom (Strain, Kohler, & Goldstein, 1996). LEAP model developers would contend that children with ASD learn best, and deficits are more successfully remediated, through peer-mediated interventions in natural classroom environments. These teaching modalities are vastly different than the more individualized approach of TEACCH; where the environment and instructional procedures are arranged around an understanding of the core features of autism. In contrast, the TEACCH approach focuses on molding the classroom environment around the “culture of autism,” in efforts to facilitate learning through how children with ASD think, understand, and integrate information (Mesibov & Shea, 2010). TEACCH teachers may not share similar levels of commitment to the LEAP philosophical tenets and practices because of the theoretical differences underlying the LEAP approach. Integrating the components of LEAP into a TEACCH classroom, particularly a self-contained classroom, is much more difficult and probably logistically unfeasible. For example, TEACCH classrooms do not generally consist of typically developing peers, therefore, one would not expect TEACCH teachers to report high levels of commitment to many of the hallmark components of LEAP including peer-mediation and naturally occurring classroom environments. Thus, it is plausible that TEACCH teachers did not report higher levels of commitment to LEAP philosophy and practice because they are not likely to endorse items such as: “*Children*

*with disabilities should follow the same classroom routines as children without disabilities;” “Peer mediated strategies allow all children (with and without disabilities) to have opportunities to help and support each other;” and “My instructional strategies focus on teaching social skills within naturally occurring routines and events in the classroom.”* These elements of LEAP are vastly discrepant to how TEACCH teachers are formally trained to implement their classrooms. In further support of this theory, the results indicated that the LEAP group had a higher overall commitment score (i.e., commitment to both TEACCH and LEAP) in comparison to the TEACCH and BAU teachers. This result in particular suggests that the LEAP group is more likely to report similar levels of commitment to not only LEAP philosophy and practice, but to TEACCH as well. Overall, it is likely that the LEAP teachers share similar commitment levels to TEACCH philosophy and practice; however, the TEACCH teachers may not share similar commitment levels to LEAP because LEAP classroom elements are less generalizable to typical TEACCH environments.

Similar to the TEACCH group, the BAU teachers also did not report similar commitment levels to the LEAP model philosophy relative to the LEAP group. Although they reported some levels of commitment to the LEAP philosophy, the BAU group may have not reported as high a commitment level because they have not received formal training in the classroom approach. Therefore, despite the fact that BAU classrooms may utilize peer-mediation and implement more naturalistic strategies in their classroom, they did not report as high a commitment level as the LEAP group. Moreover, results indicated that the BAU teachers did not report significantly higher commitment levels to either the TEACCH or LEAP philosophies. It is possible that since TEACCH and LEAP

are considered well-developed and well-established classroom approaches for students with ASD, the BAU teachers may be committed to and may be implementing a constellation of TEACCH and LEAP practices. School districts may be informally training BAU teachers to utilize these highly regarded classroom practices from both TEACCH and LEAP which inadvertently elicit a commitment to both philosophies.

From a more global perspective, all teachers of preschool students on the autism spectrum may be committed to utilizing classroom techniques that have simply proven to be effective in research or in their own prior experiences. Educators may implement these strategies regardless of the specific program or classroom model these techniques are historically subscribed under. Of important note, is the fact that the sample of teachers recruited for this current study were implementing their classroom models at relatively higher levels of fidelity as compared to what we would expect to observe in the general population of teachers. Therefore, it is possible that this particular sample of teachers has received more high quality trainings or are perhaps more likely to independently research and adopt additional practices outside of their current teaching model. For example, a LEAP or BAU teacher may find the use of visual cues and schedules within the classroom, hallmarks of the TEACCH classroom approach, to be an effective classroom strategy for transitioning their students to a new classroom area. Despite the fact that these teachers are formally trained and subscribe to a particular teaching approach, there may be significant overlap in their commitment and use of practices within their classroom regardless of what classroom approach a particular technique is traditionally subscribed under.

*Commitment and Teacher Burnout*

In an effort to elucidate the salience of teacher commitment within the field of special education, the relationship between teacher commitment to model philosophy and experienced levels of burnout was explored. Analyses did not reveal any group differences in the levels of burnout, indicating that the three groups of teachers are not experiencing significantly different levels of Emotional Exhaustion (EE); Depersonalization (DP); or Personal Accomplishment (PA) across the school year. This finding suggests that the level of experienced burnout across the year does not differ amongst the three groups. Theoretically, this implies that implementing one classroom approach over the other does not increase the likelihood of experiencing higher or lower levels of burnout. Furthermore, there was a lack of support for teacher commitment to philosophy serving as: 1) a buffer to the experienced levels of EE and DP across the year; and 2) a catalyst to experiencing increased levels of PA. The commitment levels of the teachers were not significant predictors of any of the three domains of the burnout construct, suggesting that commitment does not increase nor decrease the experienced levels of teacher burnout. These results are inconsistent with the investigation conducted by Jennett and colleagues who found that a teacher's commitment to the theoretical underpinnings of a teaching orientation was significantly positively correlated with PA and significantly negatively correlated with EE in the TEACCH group. They concluded that as teachers adhere more to the underlying philosophy of their teaching approach, they become more satisfied with the work they are doing, experience lower levels of EE, and moved farther away from clinically significant levels of experienced burnout (Jennett et al., 2003). Additionally, these results only provide marginal support for the theory

purported by Cherniss (1995) who proposed that professionals, who have adequate training and identify with a formal ideology (i.e., teacher commitment), have the tools and support necessary to cope with stressful environments, such as the classroom. These factors were purported to serve as an “antidote” to burnout because it reduces the role of ambiguity and conflict and increases social support, control, and feelings of competence and self-efficacy (Jennett et al., 2003). Although individuals in the sample did not report significantly high levels of burnout, the results did not support that the teacher commitment variable was a significant predictor or contributor to their levels of experienced burnout. The results of this study did not provide additional support for these theories, however, further research is warranted and is discussed later on in this section.

The factors that did significantly contribute to experienced level of burnout were two control variables, the highest degree earned and the average classroom size, both significantly predicting levels of EE. Specifically, having a lower degree increased the levels of EE experienced across the year. Teaching children with ASD, and teaching in general, may become an increasingly more daunting and cumbersome task when individuals do not have higher levels of degrees within the field of education. This may invariably increase the experienced stress levels for a particular teacher. However, as Table 1 indicates, there was only one teacher who reported being certified in Early Childhood Education at the Associate’s of Arts degree level. Therefore, further research is warranted in this area. In regards to classroom size, results revealed that as classroom size increases the average level of experienced EE across the year decreases. Although this finding is counterintuitive, it may be the case that classrooms with a higher number

of students within their classroom had a higher number of typically developing children (e.g., LEAP classrooms). Thus, it is possible that having more typically developing students within the classroom may be a less stressful classroom environment in comparison to a classroom comprised of only students with developmental disabilities. Further research is also warranted in this area.

*Commitment, Teacher Burnout, Fidelity, and Post-hoc Findings*

The final aspect of this current study purported to evaluate the mechanism by which the relationship between teacher commitment and burnout impacts the fidelity of implementation of the three classroom models. Unexpectedly, teachers' level of commitment to their subscribed classroom models did not significantly predict the fidelity of implementation, thus, failing to meet the necessary criteria of a meditated relationship (*see* Baron & Kenny, 1986). However, it should be noted that that this relationship was not supported, despite the fact that there was a statistically significant zero order correlation between the TPQ-A commitment variable and the Fidelity variable (*see* Table 3). Nevertheless, this suggests that teachers' level of commitment and its effect on the experienced level of burnout is not an underlying process that ultimately impacts the level of fidelity of implementation when controlling for the selected covariates in these particular analyses. However, further post hoc exploratory analyses of the data did provide some support for the prior literature. After further examination of the data, an evaluation of a quadratic relationship between teacher commitment and EE was conducted. The results approached significance for a quadratic relationship between teacher commitment and the levels of EE experienced across the entire school year.

Moreover, there was a significant relationship between the levels of teacher commitment and EE, experienced during the middle of the year (i.e., T2 and T3; Refer to Figure 11).

It is possible that teacher commitment did not predict average levels of EE across the year because this variable included time points at both the beginning and the end of the school year (e.g., September and May). Although this warrants further investigation, these periods of time are plausibly less stressful during the academic year. Classroom environments are plausibly much more stressful in the middle of the year (e.g., November and March) relative to the start and end of the year. The midpoint of the academic year is a time when the classroom is in “full swing,” and teachers are inundated with the implementation of their programs and the associated responsibilities such as paperwork, data collection, and IEP management. Additionally, during this period of time many teachers are also responsible for conducting assessments to measure progress of their students, help families prepare for transitions into the next classroom, and help plan for their students’ future educational needs. Thus, commitment to model philosophy may be more important to buffering burnout in the middle of the year; a potentially more stressful time point for teachers.

This study provides marginal support for the prior literature by demonstrating the potential salience of teacher commitment in decreasing the levels of EE experienced by special educators in the middle of the academic year. Moreover, and perhaps more importantly, these findings extend past our current knowledge in the field. The results provide us further insight into the nature of the relationship between teacher commitment and burnout. Specifically, they suggest that higher commitment levels to model philosophy may predict lower levels of EE experienced in the middle of the academic



year. However, this phenomenon only exists beyond a certain threshold. Evidently, teachers with the lowest levels of commitment also reported lower levels of EE during the middle of the year. Figure 11 illustrates this relationship quite clearly. The quadratic relationship suggests that teachers who reported the highest levels of commitment appeared to experience a buffering effect or reported lower levels of EE. Thus, it may be the case that a TEACCH teacher's commitment to TEACCH, a LEAP teacher's commitment to LEAP, and a BAU teacher's commitment to both philosophies and practices serves as a buffer to burnout for those with exceptionally higher commitment levels. It is logical to conjecture that teachers with higher commitment levels are actually benefitting from the TEACCH and LEAP philosophical tenets and practices. They are both theory-driven approaches that provide a systematic approach to educating students on the autism spectrum and may indeed represent exactly what Cherniss suggested as the "appropriate tools," to avoid the onset of burnout. Among special educators, one work condition that has emerged as a primary source of stress is role ambiguity; which occurs when an educator feels that they have insufficient information to carry out their teaching duties (Crane & Iwanicki, 1986; Wisniewski & Gargiulo 1997). Therefore, being committed to these theory-driven and manualized approaches allows teachers to not only have a better understanding of the implementation of their classroom approach (i.e., the ability to adhere to the treatment) but it also helps them utilize the principles and theory underlying these approaches in a flexible manner (i.e., competency in the approach) when faced with difficult situations within the classroom.

Interestingly, those teachers who reported the lowest levels of commitment also reported experiencing lower levels of EE. Therefore, the results indicated a relationship

between teacher commitment and EE such that lower levels of teacher commitment predicted lower levels EE in the middle of the year. Teachers are experiencing a buffering affect of burnout in a direction that opposes the relationship described above. This decrease in EE likely exists for a vastly different reason, however. It is possible that those teachers with commitment levels on the lower end of the distribution are not experiencing higher levels of burnout because they may have developed a sense of apathy towards their responsibilities as an educator. A myriad of interacting factors such as inadequate training, continuous unmanageable workloads, role ambiguity, excessive paperwork, extensive and chronic stressors, and a lack of support from school administration can all be culprits of this indifference. This apathy may have developed through chronically experienced high levels of burnout. It is often true that special educators are expected to implement current practices without sufficient administrative support and minimal resources (Wisniewski & Gargiulo, 1997). It is quite easy to become disinterested or “uncommitted,” with an extremely difficult task at hand such as teaching when there is a lack of sufficient support. Moreover, it is even easier to be insensitive to the stressors that are associated with that task when there is little investment in, or commitment to, the efforts underlying that task. Further research is needed to provide support for this theory. However, if supported this would elucidate a clear need for increased support and adequate trainings these special educators.

#### *Limitations and Future Directions*

There are several noteworthy limitations to this study. First, the discriminant validity of the TEACCH subscale was not supported, thus, a re-evaluation of the TEACCH items and psychometrics is warranted. Additionally, the generalizability of the

results are unknown due to the fact these constructs were investigated in a sample of special education preschool teachers who were implementing their programs at high levels of fidelity. Therefore, future research should be geared towards investigating these constructs within a randomly sampled group of teachers from varying theoretical orientations and students with varying age levels and functioning.

In regards to commitment and burnout, future research should also investigate the overlapping commitment levels of TEACCH and LEAP teachers. This study suggested that LEAP teachers may be committed to similar levels of TEACCH philosophy, relative to TEACCH teachers. However, future investigations should examine the specific aspects that are shared between the two groups of teachers. Likewise, research should also be more rigorous in the investigation of the shared commitment levels to TEACCH and LEAP reported by the BAU group. Additionally, future studies should address whether teachers have commitment to other classroom approaches (e.g., Denver Model) and whether they share similar beneficial value in buffering aspects of burnout. Lastly, it will be necessary to examine how much training is necessary to elicit commitment and the degree of commitment that is necessary to buffer the onset of burnout. Moderators of burnout, such as depression and anxiety should also be examined to further understand the onset of this syndrome. Prior literature has shown that individuals who are depressed or demonstrate symptoms of anxiety may be more subject to experience these affects due to higher scores on neuroticism (Maslach, Schaufeli, & Leiter, 2001).

It would also be important to statistically analyze the amount of overlap between the practices of TEACCH, LEAP, and BAU classrooms. For example, one important examination to conduct would be to evaluate how much of the LEAP practice is

implemented into formally recognized TEACCH or BAU classrooms within public school districts. Also, it would be beneficial to the field to investigate additional mediators and moderators of treatment fidelity and to include a direct measurement of attrition. Overall, a longitudinal study consisting of assessments of commitment, burnout, fidelity, direct measures of teacher attrition, and the effects of these constructs on student outcomes would be optimal in furthering our knowledge within the field of special education.

### *Summary and Conclusions*

In summary, this study extends previous research in that it provides a clearer understanding of the relationship, specifically the curvilinear relationship, between teacher commitment and experienced levels of burnout. Additionally, it is the first of its kind, to our knowledge, that addresses such constructs in an effort to obtain a clearer understanding of the processes underlying the current attrition issues in special education. Our findings indicate that teachers of preschool children of ASD who are committed to the underlying philosophical tenets and practices of TEACCH and LEAP may have the tools and support necessary to cope more adaptively to stressful environments. Overall, this study suggests that training that elicits a commitment to an approach may serve as a buffer of the onset of some aspects of experienced burnout experienced at particular time periods throughout the school year. This further understanding may provide school districts, policymakers, and administrators with salient information that helps facilitate the necessary adaptations in special education policy and practice that assists in the amelioration of teacher attrition.

Table 1. *Teacher and Classroom Demographic Data.*

<i>Variable</i>	<i>Level</i>	<i>Number (N = 53)</i>		
		<i>TEACCH</i>	<i>LEAP</i>	<i>BAU</i>
Education	AA	0	1	0
	BS/BA	6	5	9
	MEd/MS/MA	10	7	11
	Above MEd/MS/MA	1	2	1
Ethnicity	non-Hispanic	14	11	19
	Hispanic	3	4	2
Race	White	17	14	21
	Bi/Multi	0	1	0
Gender	Female	17	14	21
	Male	0	1	0
Length of Day	2-3 hrs	3	15*	17*
	3-4 hrs	1	0	0
	4-5 hrs	3	0	2
	> 5 hrs	10*	0	2
Duration/Time of Day	Full Day	14*	0	4
	½ Day AM	2	13*	8
	½ Day PM	1	2	9*

*Note:* \* indicates a significant difference at  $p < .001$

Table 2. *Additional Demographics.*

<i>Variable</i>	<i>Mean (SD)</i>		
	<i>TEACCH</i>	<i>LEAP</i>	<i>BAU</i>
Years Teaching	7.44 (3.62)	11.46 (5.82)	10.59 (7.07)
Years Teaching Children with ASD	5.18 (2.83)	7.80 (5.31)	6.45 (4.91)
Average # of Fulltime Staff per Class	3.04 (0.89)	3.37 (0.89)	2.72 (0.73)
Average # of Children with ASD per Class	6.49 (1.44)*	3.37 (0.85)	3.67 (1.98)
Average # of Typically Developing Children per Class	0.56 (1.85)*	8.22 (2.71)	3.45 (4.25)
Average Class Size	7.29 (2.08)*	12.62 (2.64)	10.31 (4.19)

*Note:* The TEACCH group reported a significantly higher average # of ASD children per class, significantly lower # of TD children per class, and significantly lower average class size relative to LEAP and BAU groups.

\*  $p < .001$

<b><u>Measures</u></b>	<b>PRE (September)</b>	<b>T 1 (October)</b>	<b>T 2 (November)</b>	<b>T 3 (March)</b>	<b>T4 (April)</b>	<b>POST (May)</b>
TPQ	X					
TEACCH Fidelity Instrument		X	X	X	X	
LEAP Fidelity Instrument		X	X	X	X	
PDA Fidelity Instrument		X	X	X	X	
Demographic Form		X	X	X	X	
MBI-ES	X		X	X		X

*Figure 1. Illustration of Procedures.* An “X” indicates that the measure in that row was administered during that time point.

Table 3. *Pearson r Correlations between Continuous Controlled Variables, TPQ-A Commitment, Burnout subscales, and Fidelity Variable.*

---

Variable	1	2	3	4	5	6	7	8	9	10	11
1. Ttl	---										
2. TtAs	0.598**	---									
3. Cs	.111	.142	---								
4. As	-.072	-.080	-.397**	---							
5. Td	.090	.015	.874**	-.511**	---						
6. Fs	.074	-.185	.062	-.004	.275*	---					
7. Ct	-.079	.147	.117	-.170	.279*	.123	---				
8. EE	-.114	-.027	-.313*	.056	-.313*	.008	-.173	---			
9. DP	-.211	-.174	-.296*	.179	-.223	.073	-.074	.663**	---		
10. PA	.316*	.283*	.223	-.178	.188	.030	.143	-.691**	-.704**	---	
11. Fd	-.172	.020	.293*	-.136	.472**	.270	.368**	-.094	-.003	.048	---

---

*Note:* The variables are defined by the following: total # of years teaching (Ttl), total # of years teaching children with ASD (TtAs), average class size (Cs), average # of children with ASD per class (As), average # of TD children per class (Td), # of full time classroom staff (Fs), average level of Emotional Exhaustion (EE) across the year, average level of Depersonalization (DP) across the year, average level of Personal Accomplishment (PA) across the year, TPQ-A commitment variable (Ct), and fidelity variable (Fd).

\*  $p < .05$ . \*\*  $p < .01$



Table 4. Mean (percentages) of Commitment to Philosophy for the Three Groups.

	TEACCH (n = 17)			LEAP (n = 15)			BAU (n = 21)		
	<i>M</i>	<i>SD</i>	<i>n</i>	<i>M</i>	<i>SD</i>	<i>n</i>	<i>M</i>	<i>SD</i>	<i>n</i>
Teacher Philosophy Questionnaire									
TEACCH %	0.90	0.05	17	0.89	0.07	15	0.89	0.06	21
LEAP %	0.81	0.10	17	0.93**	0.05	15	0.87	0.07	21
Overall %	0.86	0.07	17	0.91*	0.06	15	0.88	0.06	21

Note: The LEAP group reported significantly higher LEAP commitment scores relative to both the TEACCH and BAU group.  
 \*  $p < .05$  \*\*  $p < .001$

Table 5. Means and Standard Deviations of Burnout Scores Across Groups.

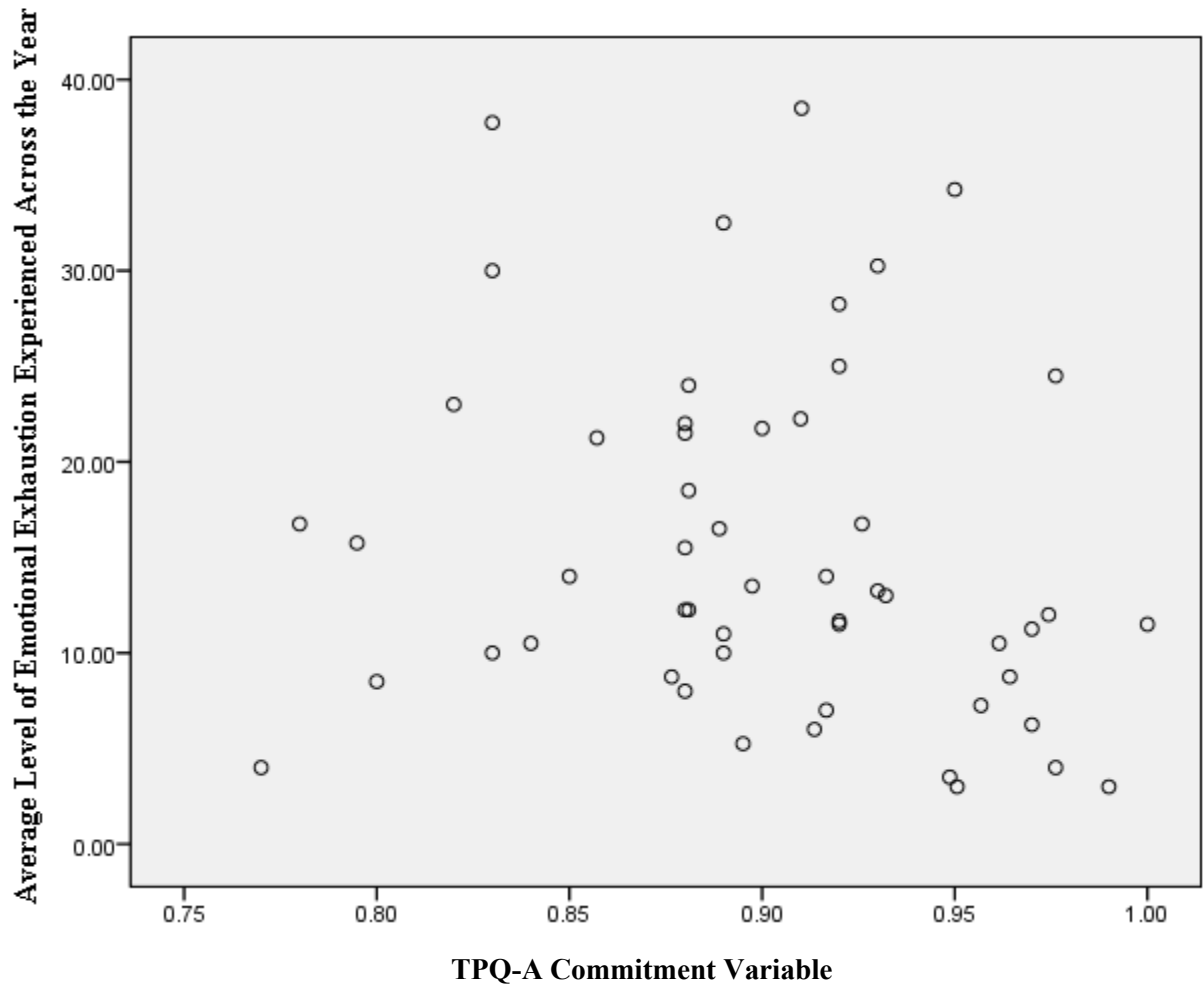
	TEACCH (n = 17)		LEAP (n = 15)		BAU (n = 21)		Overall (n = 53)	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Maslach Burnout Inventory								
Emotional Exhaustion	18.03	8.81	15.0	9.68	13.83	9.02	15.51	9.15
Depersonalization	2.95	3.76	1.72	2.66	1.45	2.45	2.00	3.00
Personal Accomplishment	41.10	5.24	42.80	6.10	43.47	2.81	42.51	4.75

*Note:* Higher scores on the Emotional Exhaustion domain and Depersonalization domain indicate higher levels of burnout. In contrast, higher scores on the Personal Accomplishment domain indicate lower levels of burnout.

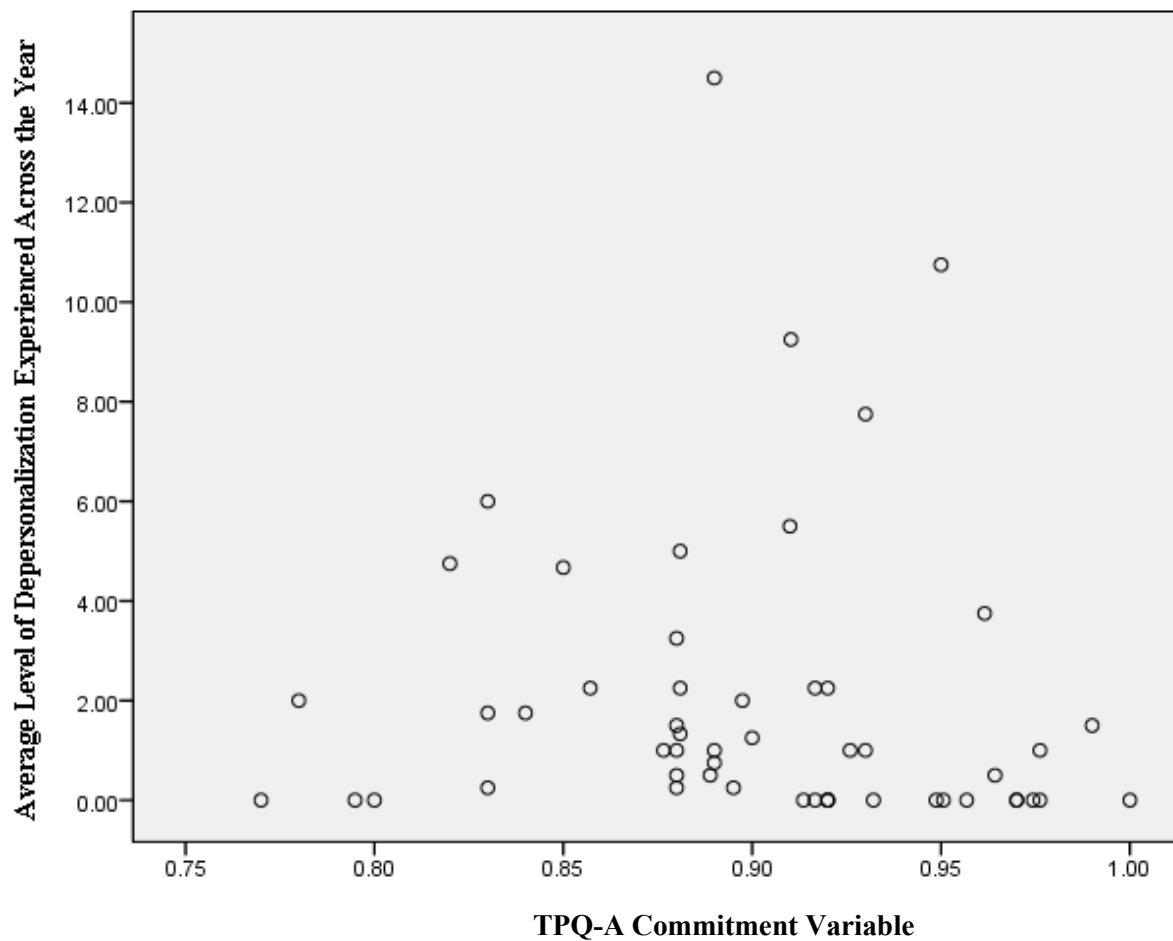
ID	TEACCH (%)	LEAP (%)	Overall (%)	TPQ Variable
01	◆	▲	●	◆
02	◆	▲	●	◆
03	◆	▲	●	◆
04	◆	▲	●	◆
05	◆	▲	●	▲
06	◆	▲	●	▲
07	◆	▲	●	▲
08	◆	▲	●	▲
09	◆	▲	●	●
10	◆	▲	●	●
11	◆	▲	●	●
12	◆	▲	●	●

KEY: TEACCH = Red      LEAP = Green      BAU = Blue

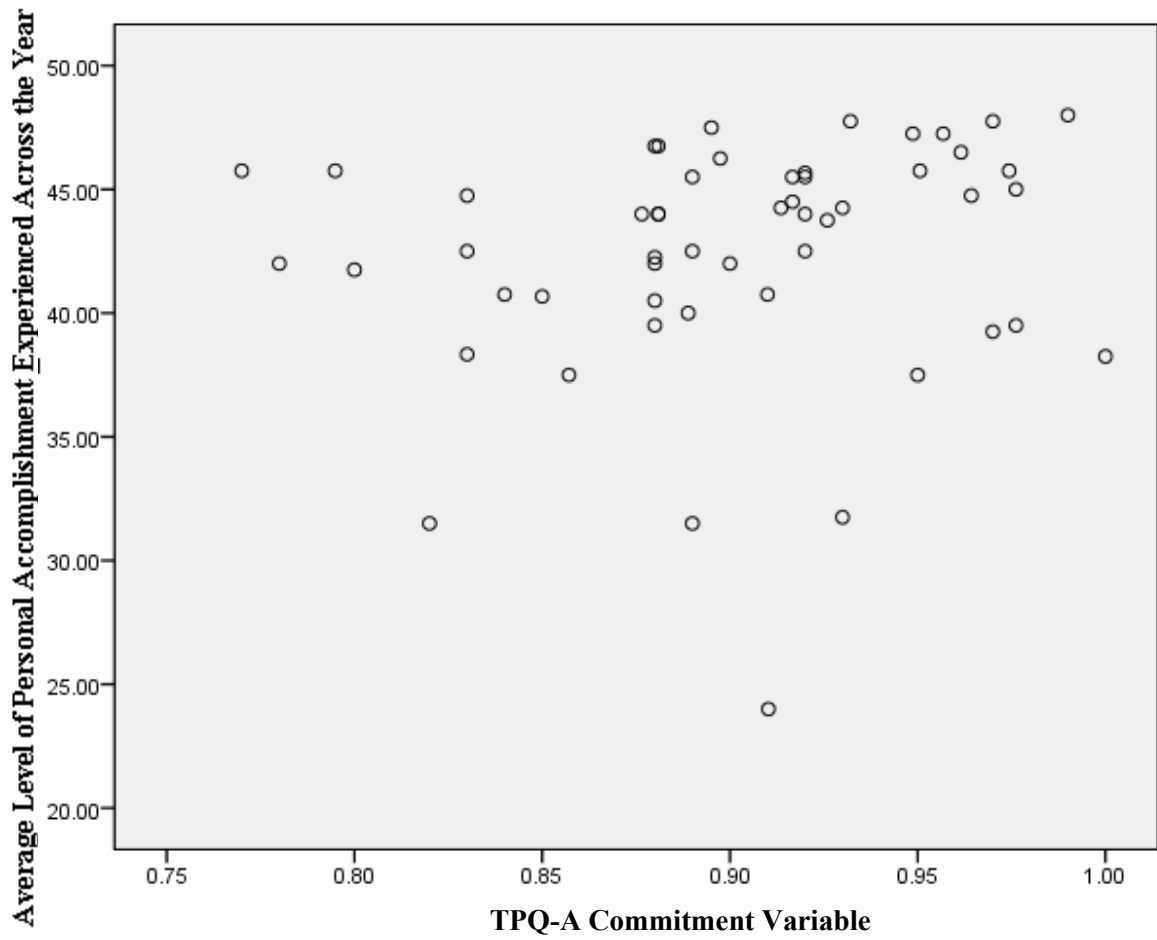
Figure 2. Illustration of the construction of the TPQ-A predictor variable. Cases that are listed in red are TEACCH teachers, in green are LEAP teachers, and in blue are BAU teachers.



*Figure 3.* Bivariate scatter plot of the average levels of Emotional Exhaustion across the year regressed onto the TPQ-A Commitment variable.



*Figure 4.* Bivariate scatter plot of the average levels of Depersonalization across the year regressed onto the TPQ-A Commitment variable.



*Figure 5.* Bivariate scatter plot of the average levels of Personal Accomplishment across the year regressed onto the TPQ-A Commitment variable.

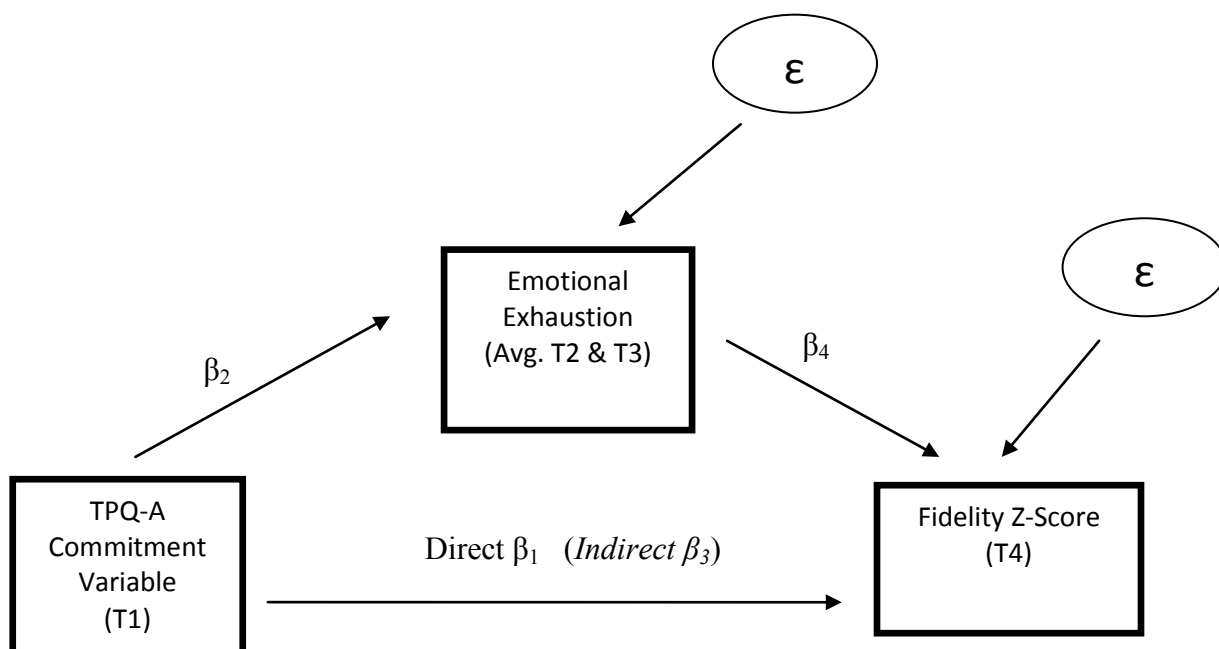
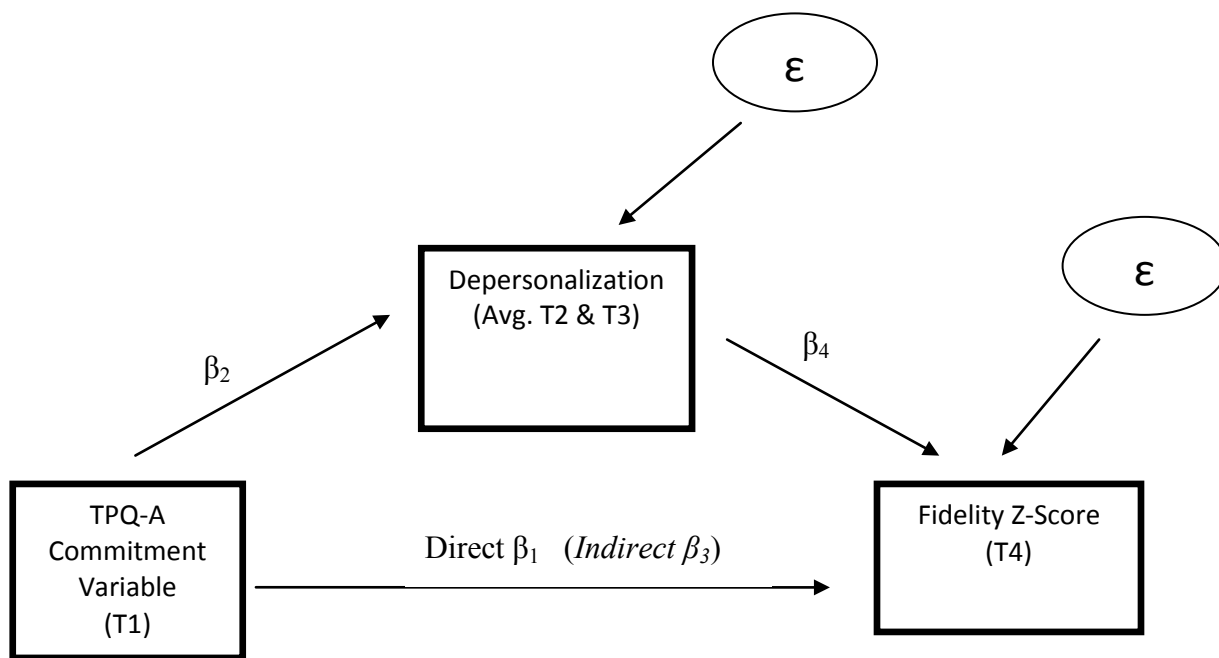


Figure 6. Mediation Model A. Emotional Exhaustion (Avg. of Time 2 & Time 3 scores) as a mediator of the relationship between Teacher Commitment (measured at Time 1) and the converted Fidelity Z-score (measured at Time 4).



*Figure 7. Mediation Model B.* Depersonalization (Avg. of Time 2 & Time 3 scores) as a mediator of the relationship between Teacher Commitment (measured at Time 1) and the converted Fidelity Z-score (measured at Time 4).



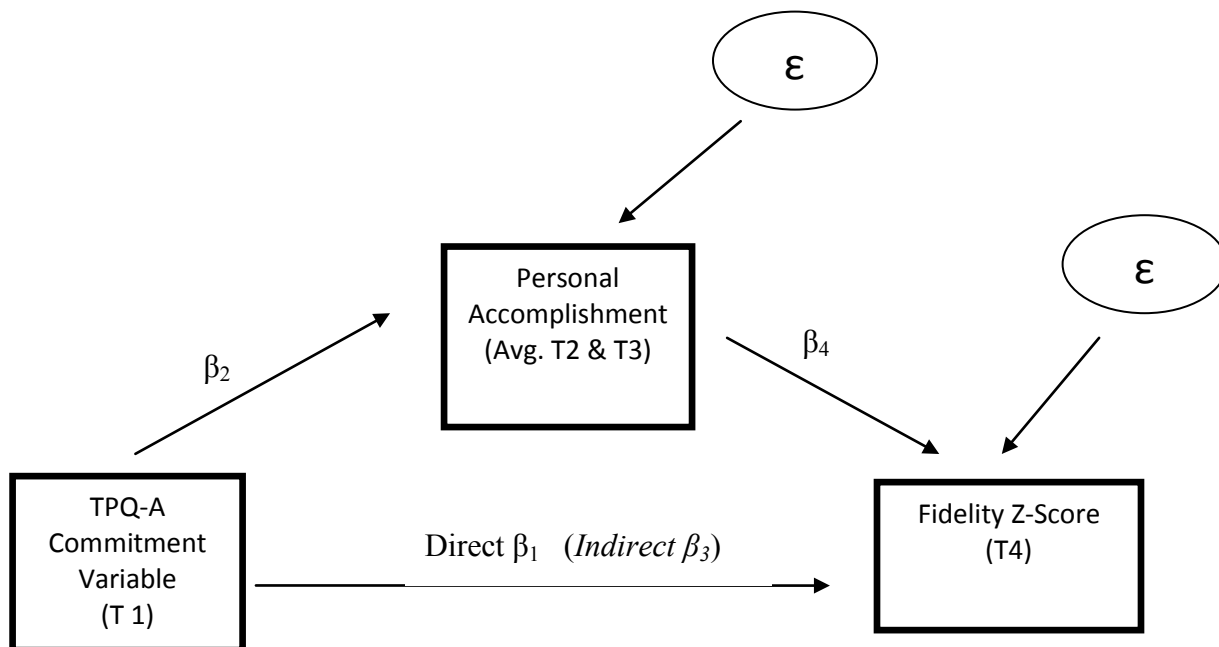


Figure 8. Mediation Model C. Personal Accomplishment (Avg. of Time 2 & Time 3 scores) as a mediator of the relationship between Teacher Commitment (measured at Time 1) and the converted Fidelity Z-score (measured at Time 4).

ID	TEACCH Fidelity Z-score	LEAP Fidelity Z-Score	PDA Fidelity Z-score	Fidelity Variable
01	◆	▲	●	◆
02	◆	▲	●	◆
03	◆	▲	●	◆
04	◆	▲	●	◆
05	◆	▲	●	▲
06	◆	▲	●	▲
07	◆	▲	●	▲
08	◆	▲	●	▲
09	◆	▲	●	●
10	◆	▲	●	●
11	◆	▲	●	●
12	◆	▲	●	●

KEY: TEACCH = Red      LEAP = Green      BAU = Blue

*Figure 9. Fidelity Variable.* Illustration of the construction of the fidelity variable utilizing Z-scores. Cases that are listed in red are TEACCH teachers, in green are LEAP teachers, and in blue are BAU teachers.

Table 6. *Individual Regression Coefficients in Step 1 of Mediation Model.*

<i>Variable</i>	<i>Standardized Beta (<math>\beta</math>)</i>	<i>t</i>	<i>df</i>	<i>Proportion of Variance</i>
Total # of years teaching	-0.34*	-2.37	37	6 %
Highest degree earned (A.A.)	0.54*	-2.20	37	5%
Length of Instructional Day (Between 2&3)	0.86*	2.21	37	5%
Duration of Day/Time of Day (Full Day)	1.35***	3.18	37	11%
Average class size at T2 and T3	0.27*	-0.89	37	5%
Average # of ASD per class at T2 and T3	-0.42**	-3.20	37	11%
Average # of fulltime staff at T2 and T3	.214***	1.77	37	3%

*Note:* \*  $p < .05$  \*\*  $p < .01$  \*\*\* $p < .001$

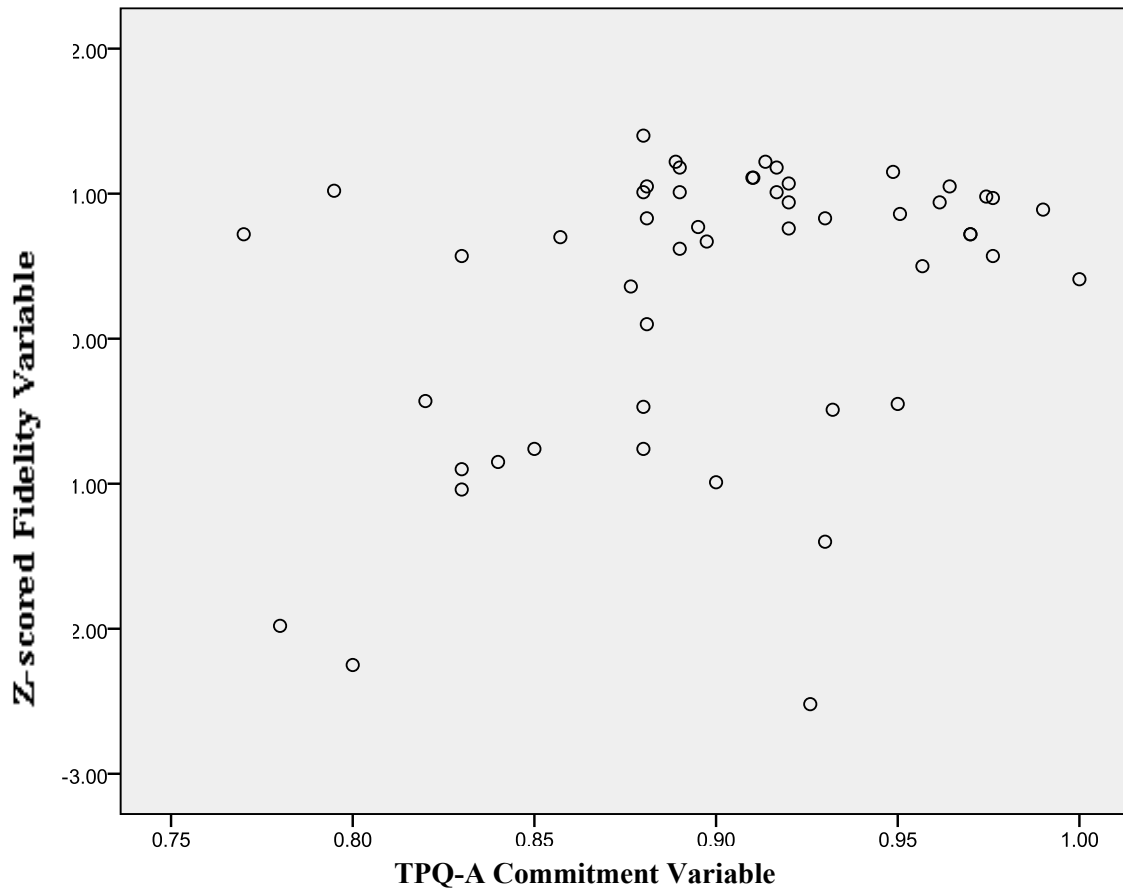


Figure 10. Bivariate scatter plot of the Fidelity variable z-scored regressed onto the TPQ-A Commitment variable.

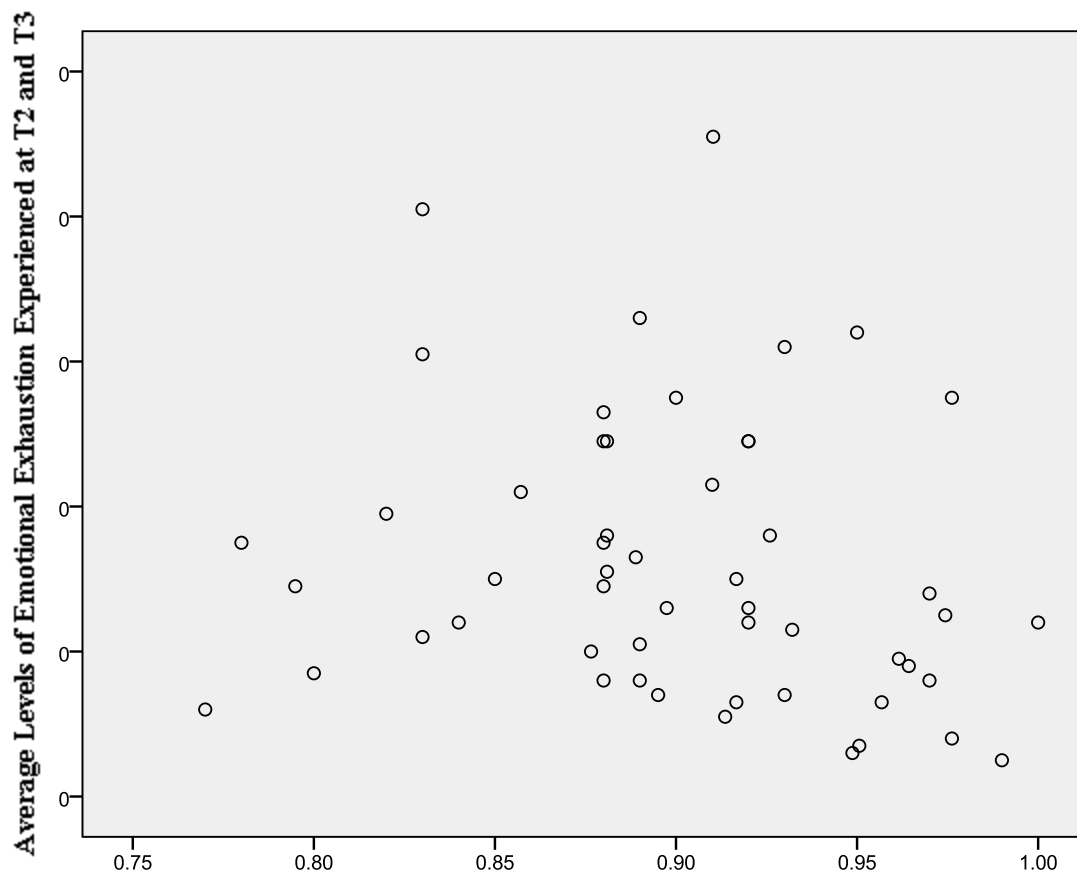


Figure 11. Bivariate scatter plot showing Average Levels of Emotional Exhaustion Experienced at T2 and T3 regressed onto the TPQ-A Commitment variable.

## APPENDIX

### Autism Treatment Philosophy Questionnaire-Adapted Version (TPQ-A)

**Directions:** Below are statements that may or may not reflect your philosophy in teaching children with Autism Spectrum Disorders (ASD). Please indicate the degree to which you agree or disagree with each statement by circling the appropriate number below.

Please use the following scale:

- 1 = Strongly disagree with statement
- 2 = Moderately disagree with statement
- 3 = Disagree slightly more than agree with statement
- 4 = Agree slightly more than disagree with statement
- 5 = Moderately agree with statement
- 6 = Strongly agree with statement

1. My approach to teaching focuses on both observable behaviors and other unobservable variables, such as understanding the culture of autism, how my student thinks, understands the environment and integrates information.

(strongly disagree) 1      2      3      4      5      6 (strongly agree)

2. Behavior management strategies emphasize positive, antecedent based approaches and the prevention of behavior problems.

(strongly disagree) 1      2      3      4      5      6 (strongly agree)

3. Classroom activities should be designed so that all children (with and without disabilities) can participate.

(strongly disagree) 1      2      3      4      5      6 (strongly agree)

4. Leisure and social activities should incorporate appropriate elements of visual structure.

(strongly disagree) 1      2      3      4      5      6 (strongly agree)

5. Teaching a child to play independently is AS IMPORTANT as teaching a child to play cooperatively with others.

(strongly disagree) 1      2      3      4      5      6 (strongly agree)

6. Children with disabilities should follow the same classroom routines as children without disabilities.

(strongly disagree) 1      2      3      4      5      6 (strongly agree)

7. The use of schedules is essential to help children make transitions.

(strongly disagree) 1      2      3      4      5      6 (strongly agree)

8. Peer mediated strategies allow all children (with and without disabilities) to have opportunities to help and support each other.

(strongly disagree) 1      2      3      4      5      6 (strongly agree)

9. Children with ASD should be integrated with their same-aged typical peers and be provided with the same opportunities to develop friendships.

(strongly disagree) 1      2      3      4      5      6 (strongly agree)

10. Although some children with ASD will make enough progress to be fully integrated, many will still need some form of support in specialized classrooms.

(strongly disagree) 1      2      3      4      5      6 (strongly agree)

11. Children with ASD learn many important skills (e.g., social skills, language skills, appropriate behaviors) from their typically developing peers.

(strongly disagree) 1      2      3      4      5      6 (strongly agree)

12. My instructional strategies focus on teaching social skills within naturally occurring routines and events in the classroom.

(strongly disagree) 1      2      3      4      5      6 (strongly agree)

13. Verbal communication to students should be supplemented with or replaced by visual systems to address their receptive language deficits.

(strongly disagree) 1      2      3      4      5      6 (strongly agree)

14. Communication opportunities should be set up through play and naturally occurring classroom routines to foster communication between the child with ASD and typical peers.

(strongly disagree) 1      2      3      4      5      6 (strongly agree)

15. Communication activities should incorporate appropriate elements of visual structure.

(strongly disagree) 1      2      3      4      5      6 (strongly agree)

16. The learning characteristics of children with ASD make it necessary for them to have specialized education services and, if needed, those services occur in a self-contained autism specific classroom.

(strongly disagree) 1      2      3      4      5      6 (strongly agree)

17. Completing reinforcement inventories and making available powerful extrinsic reinforcers is one of the best ways to engage a child in an activity.

(strongly disagree) 1      2      3      4      5      6 (strongly agree)

18. I regularly introduce novelty within established routines (like changes in schedules) to prevent resistance to change.

(strongly disagree) 1      2      3      4      5      6 (strongly agree)

19. My curriculum planning should include providing numerous opportunities for children with ASD and typical developing peers to participate and interact together within the same activities.

(strongly disagree) 1      2      3      4      5      6 (strongly agree)

20. I expect my student with ASD to respond to instructions in the natural environment despite all its distractions and interruptions.

(strongly disagree) 1      2      3      4      5      6 (strongly agree)

21. Classroom staff should identify natural and effective opportunities to facilitate children's play and social interactions with typical peers.

(strongly disagree) 1      2      3      4      5      6 (strongly agree)

22. I embed instruction for IEP objectives into ongoing teacher-child or child-peer interactions.

(strongly disagree) 1      2      3      4      5      6 (strongly agree)

23. One of my responsibilities as a teacher is to understand the personal experience of a student with autism.

(strongly disagree) 1      2      3      4      5      6 (strongly agree)

24. I am less concerned with finding powerful reinforcers for a child than making sure activities are meaningful for him or her.

(strongly disagree) 1      2      3      4      5      6 (strongly agree)

25. I find that my students with autism learn the best when their strengths and interests are emphasized and their deficits are ACCEPTED and minimized.

(strongly disagree) 1      2      3      4      5      6 (strongly agree)

26. When a student demonstrates a behavior problem, I try to figure out the underlying autism deficit that could have triggered behavior.

(strongly disagree) 1      2      3      4      5      6 (strongly agree)

27. When a child demonstrates a problem behavior, I utilize peer models to increase the child's appropriate behavior.

(strongly disagree) 1      2      3      4      5      6 (strongly agree)



## References

- American Psychiatric Association (1994). *Diagnostic and statistical manual of mental disorders* (4<sup>th</sup> ed.). Washington, DC: Author.
- Baer, D.M., Wolf, M.M., & Risley, T.R. (1968). Some current dimension of applied behavior analysis. *Journal of Applied Behavior Analysis, 1*, 91-97.
- Bandura, A. (1977). *Social learning theory*. Englewood Cliffs, NJ: Prentice-Hall.
- Bandura, A., & Walters, R.H. (1963). *Social learning and personality development*. New York: Holt, Rinehardt, & Winston.
- Baron, R.M., & Kenny, D.A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality & Social Psychology, 51*, 1173-1182.
- Billingsley, B., (2004). Special education teacher retention and attrition: a critical analysis of the research literature. *The Journal of Special Education, 38* (1), 39-55.
- Billingsley, B.S., Pyecha, J., Smith-Davis, J., Murray, K., & Hendricks, M.B. (1995). *Improving the retention of special education teachers: final report* (Prepared for Office of Special Education Programs, Office of Special Education and Rehabilitative Services, U.S. Department of Education, under Cooperative Agreement H023Q10001). (ERIC Document Reproduction Service No. ED379860).
- Billingsley, B. S., & Cross, L. H. (1992). Predictors of commitment, job satisfaction, and intent to stay in teaching: A comparison of general and special educators. *The Journal of Special Education, 25*, 453-471.
- Boe, E., (1991, July). *National and state teacher attrition data: Analysis and policy implications*. Paper presented at the Elementary/Secondary Education Data Conference. National Center for Educational Statistics. U.S. Department of Education.
- Boe, E., Bobbit, S. A., Cook, L. H. (1997). Whither didst thou go? Retention, reassignment, migration, and attrition of special and general education teachers from a national perspective. *Journal of Special Education, 30*(4), 371-389.
- Boe, E., Bobbit, S. A., Cook, L. H., Whitener, S. D., Weber, A. L. (1997). Why didst thou go? Predictors of retention, transfer, and attrition of special and general education teachers from a national perspective. *Journal of Special Education, 30*(4), 390-411.
- Brownell, M.T., Smith, S.W. (1992). Attrition/Retention of Special Education Teachers: Critique of Current Research and Recommendations for Retention Efforts. *Teacher Education and Special Education: The Journal of the Teacher Education Division of the Council for Exceptional Children, 15*, 229-248.

- Brownell, M.T., Smith, S.W., McNellis, J., & Lenk, L. (1994-1995). Career decisions in special education: Current and former teachers' personal views. *Exceptionality*, 5, 83-102.
- Chernis, C. (1980). *Staff burnout: Job stress in the human services*. Beverly Hills, CA: Sage Publications.
- Chernis, C. (1985). Stress, burnout, and the special services provider. *Special Services in the Schools*, 2(1), 45-61.
- Chernis, C. (1995). *Beyond Burnout: Helping teachers, nurses, therapists and lawyers recover from stress and disillusionment*. New York: Routledge.
- Chernis, C. & Krantz, D. (1983). The ideological community as an antidote to burnout in human services. In B. Farber (Ed.), *Stress and burnout in human service professions* (pp. 198-212). New York NY: Pergamon.
- Corcoran, T.B., Walker, L.J., & White, J.L. (1988). *Working in urban schools*. Washington, DC: Institute for Educational Leadership.
- Cordes, C. L., & Dougherty, T. W. (1993). A review and an integration of research on job burnout. *Academy of Management Review*, 18(4), 621-656.
- Council for Exceptional Children. (2000). *Bright futures for exceptional learners: An action to achieve quality conditions for teaching and learning*. Reston, VA: Author.
- Dymond, S.K., Gilson, C.L., & Myran, S.P. (2007). Services for children with autism spectrum disorders. *Journal of Disability Policy Studies*, 18, 133-147.
- Department of Health and Human Services. Centers for Disease Control and Prevention. (2007). Autism and Developmental Disabilities Network. Atlanta: Author. Retrieved May 15, 2009, from <http://www.cdc.gov/ncbddd/Autism/addm.htm>.
- Department of Health and Human Services. Centers for Disease Control and Prevention. (2009). Autism. Atlanta: Author. Retrieved May 15, 2009, from [http://www.cdc.gov/ncbddd/Autism/faq\\_prevalence.htm](http://www.cdc.gov/ncbddd/Autism/faq_prevalence.htm).
- Farber, B.A. (1991). *Crisis in education: Stress and burnout in the American teacher*. San Francisco: Jossey-Bass.
- Fombonne, E. (2005). Epidemiology of autistic disorder and other pervasive developmental disorder. *Journal of Clinical Psychiatry*, 66(Suppl. 10), 3-8.
- Fore, C., Martin, C., & Bender, W., (2002). Teacher burnout in special education: The causes and the recommended solutions. *The High School Journal*, October/November, 36-44.

- George, N.L., George, M.P., Gersten, R., & Grosenick, J.R. (1995). To leave or to stay? An exploratory study of teachers of students with emotional and behavioral disorders. *Remedial and Special Education, 16*, 227-236.
- Gold, Y. (1984). The factorial validity of the Maslach Burnout Inventory in a sample of California elementary and junior high school classroom teachers. *Educational and Psychological Measurement, 44*, 1009-1016.
- Hart, B.M., & Risley, T.R. (1975). Incidental teaching of language in preschool. *Journal of Applied Behavior Analysis, 8*, 411-420.
- Hill, E. (2004). Evaluating the theory of executive dysfunction in autism. *Developmental Review, 24*, 189-223.
- Hume, K., Boyd, B., McBee, M., Coman, D.C., Gutierrez, A., Shaw, E., Sperry, L., Alessandri, M.A., Odom, S., (submitted). Discriminant analysis and reliability evaluation of fidelity measures for comprehensive treatment models serving young children with ASD. *Research in Autism Spectrum Disorders*.
- Jackson, S. E., Schwab, R. L., & Schuler, R. S. (1986). Toward an understanding of the burnout phenomenon. *Journal of Applied Psychology, 71*(4), 630-640.
- Iwanicki, E. F., & Schwab, R. L. (1981). A cross-validated study of the Maslach Burnout Inventory. *Educational and Psychological Measurement, 41*, 1167-1174.
- Jennett, H.K., Harris, S.L., & Mesibov, G.B. (2003). Commitment to philosophy, teacher efficacy, and burnout among teachers of children with autism. *Journal of Autism and Developmental Disorders, 33* (6), 583-593.
- Koegel, R.L., Glahn, T.J., & Nieminen, G.S. (1978). Generalization of parent-training results. *Journal of Applied Behavior Analysis, 11*, 95-109.
- Kohler, F.W., Strain, P.S., Goldstein, H., (2005). Learning experiences . . . an alternative program: Peer-mediated interventions for young children with autism. In Hibbs, E., Jensen, P.S. (Eds.), *Psychosocial treatments for child and adolescent disorders: Empirically based strategies for clinical practice*. Second Edition. Washington, DC: American Psychological Association.
- Lord, C., Wagner, A., Rogers, S., Szatmari, P., Aman, M., Charman, T., Dawson, G., Durand, M., Grossman, L., Guthrie, D., Harris, S., Kasari, C., Marcus, L., Murhpy, S., Odom, S., Pickles, A., Scahill, L., Shaw, E., Siegel, B., Sigman, M., Stone, W., Smith, T., & Yoder, P. (2005). Challenges in evaluating psychosocial interventions for autistic spectrum disorders. *Journal of Autism and Developmental Disabilities, 35* (6), 695-708.
- Lovaas, O.I. (1987). Behavioral treatment and normal educational intellectual functioning in young autistic children. *Journal of Consulting and Clinical Psychology, 55*, 3-9.

- Maslach, C., & Jackson, S.E. (1981). The measurement of experienced burnout. *Journal of Occupational Behavior*, 2, 99-113.
- Maslach, C., Jackson, S. E., & Schwab, R.L. (1996). Maslach Burnout Inventory-Educators Survey (MBI-ES). In C. Maslach, S. E. Jackson, & M. P. Leiter (Eds.), *MBI Manual*. (3<sup>rd</sup> ed.). Palo Alto, CA: Consulting Psychologists Press.
- Maslach, C., Schaufeli, W. B., & Leiter, M. P. (2001). Job burnout. In S. T. Fiske, D. L. Schacter, & C. Zahn-Waxler (Eds.), *Annual Review of Psychology*, 52, 397-422.
- Mesibov, G.B., & Shea, V., (2010). The TEACCH Program in the era of evidence-based practice. *Journal of Autism and Developmental Disorders*, 40 (5), 570-579.
- Miller, M. D., Brownell, M., & Smith, S. W. (1999). Factors that predict teachers staying in, leaving, or transferring from the special education classroom. *Exceptional Children*, 65, 201-218.
- Mischel, W. (1971). *Introduction to personality*. Oxford, England: Holt, Rinehardt, & Winston.
- Morsink, C.V., (1982, February). Changes in the role of special educators: Public perceptions and demands. *Exceptional Education Quarterly*, 15-25.
- Morvant, M., Gersten, R., Gillman, J., Keating, T., & Blake, G. (1995). *Attrition/retention of urban special education teachers: Multi-faceted research and strategic action planning*. Final performance report, Volume 1. (ERIC Document Reproduction Service No. ED338154).
- National Research Council. (2001). *Educating children with autism*. Washington, DC: National Academy Press.
- Odom, S., & Boyd, B. (2006). Comparison of two comprehensive treatment models for preschool-aged children with autism and their families. Proposal submitted for the Autism Spectrum Disorders Research Competition of the Institute of Education Sciences.
- Ozonoff, S. (1995). Executive function impairments in autism. In E. Schopler & G. Mesibov (Eds.), *Learning and cognition in autism* (pp. 199-220). New York: Plenum Press.
- Paperwork in Special Education. (n.d.). *SPeNSE factsheet*. Retrieved June 17, 2010, from [www.spense.org](http://www.spense.org)
- Singer, J. D. (1992). Are special educators' career paths special? Results from a 13-year longitudinal study. *Exceptional Children*, 59, 262-279.
- Smith-Davis, J., & Billingsley, B., (1993). The supply/demand puzzle. *Teacher Education and Special Education*, 16, 205-220.

- Smith-Davis, G., Burke, P.J., & Noel, M. (1984). *Personnel to educate the handicapped in America: Supply and demand from a programmatic viewpoint*. College Park: University of Maryland, Institute for the Study of Exceptional Children and Youth.
- Sobel, M.E. (1982). Asymptotic confidence intervals for indirect effects in structural equation models. In S. Leinhardt (Ed.), *Sociological methodology 1982* (pp. 290-312). San Francisco: Josey-Bass.
- Stahmer, A.C., Collings, N.M., & Palinkas, L.A. (2005). Early intervention practices for children with autism: Descriptions from community providers. *Focus on Autism and Other Developmental Disabilities, 20*, 66-79.
- U.S. Department of Education. (2001). No child left behind act of 2001. Retrieved May 15, 2009, from <http://www.ed.gov/policy/elsec/guid/states/index.html#tq>.
- U. S. Department of Education, Institute of Education Sciences, National Center for Education Statistics. (2007). *Teacher Attrition and Mobility: Results from the 2004-05 Teacher Follow-up Survey*. Retrieved June 1, 2010, from <http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2007307>.
- U. S. Department of Education, Institute of Education Sciences, National Center for Education Statistics. (2010). *Teacher Attrition and Mobility: Results from the 2008-09 Teacher Follow-up Survey*. Retrieved August 1, 2010, from <http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2010353>.
- Tartaglia, N.R., Hansen, R.L., Hagerman, R.J. (2007). Advances in genetics. In S. Odom, R. Horner, M. Snell, & J. Blacher (Eds.), *Handbook of Developmental Disabilities* (pp 98-128). New York: Guilford Press.
- Wisniewski, L., & Gargiulo, R.M. (1997). Occupational stress and burnout among special educators: a review of the literature. *The Journal of Special Education, 31* (3), 325-346.
- Zahner, G. E. P., & Pauls, D. L. (1987). Epidemiological surveys of infantile autism. In D. J. Cohen & A. M. Donnellan (Eds.), *Handbook of autism and pervasive developmental disorders* (pp. 199-207). Toronto: Wiley.