Too Stressed to Teach? Teaching Quality, Student Engagement and IEP Outcomes

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Abstract

Teacher stress and burnout have a detrimental effect on the stability of the teaching workforce. However, the possible consequences of teacher burnout on teaching quality and on student learning outcomes are less clear, especially in special education settings. We applied Maslach and Leiter's model (1999) to understand the direct effects of burnout on teaching in general and stress arising from interaction with a specific student on the IEP outcomes of young children with autism spectrum disorder. We also examined indirect effects through teaching quality and student engagement. The results indicated that one of the three components of burnout—teacher personal accomplishment—was directly related to IEP outcomes, a distal effect, whereas stress was directly related to teaching quality and student engagement, which were more proximal effects. Additionally, teacher stress, emotional exhaustion, and depersonalization had indirect effects on IEP outcomes through teaching quality and student engagement.

Too Stressed to Teach? Teaching Quality, Student Engagement, and IEP Outcomes

The expenses associated with teacher attrition, including recruiting, hiring, and preparing new teachers, are enormous (Alliance for Excellent Education, 2014; McLeskey & Billingsley, 2008). The problem is particularly obvious in special education. The annual attrition rate for special educators (13%) is twice that of general educators, and the three-year attrition rate is approximately 25% (Cook & Boe, 2007; McLeskey & Billingsley, 2008). An additional 20% of special educators each year transfer to general education or to another position in special education (Boe, Cook, & Sunderland, 2008). To address the problems of attrition and retention in special education, researchers need to understand why teachers want to leave or have left their positions. There is a considerable body of research identifying burnout as a major contributor to attrition (Awa, Plaumann, & Walter, 2010; Carlson & Thompson, 1995). Burnout is typically described as the consequence of chronic work-related stress (Billingsley, 2004; Farber & Ascher, 1991). Maslach, Jackson, and Leiter (1997) developed a tripartite model of burnout that includes emotional exhaustion (feelings of being overextended), depersonalization (negative and cynical attitudes), and reduced personal accomplishment (negative evaluation of self in relation to job performance). As many as 40% of teachers may experience burnout (Jarvis, 2002) and thus are at high risk for leaving the profession.

The vast majority of research on teacher burnout and attrition has focused on identifying the antecedents or sources of burnout that include characteristics of the teacher, the organization, and the student (Austin, Shah, & Muncer, 2005; Friedman, 2000; Gersten, Keating, Yovanoff, & Harniss, 2001; Kaufhold, Alverez, & Arnold, 2006; Kyriacou, 2001; Littrell, Billingsley, & Cross, 1994). For example, although teachers view working with students as a significant source of job satisfaction (Billingsley, 1993), it also can contribute to burnout and attrition (Billingsley,

2004; Hastings & Brown, 2002; Male & May, 1997). Student discipline problems, poor teacher-student relationships, lack of student progress, and diversity of student needs have been directly linked to increased teacher attrition (Billingsley, 2004; Billingsley & Cross, 1991). For teachers of students with significant emotional and behavioral problems (Billingsley, Carlson, & Klein, 2004; Boyer & Gillespie, 2000; Hastings & Brown, 2002), the risks of stress and burnout are even higher. For example, teachers of students with emotional or behavioral problems are more likely to leave than teachers of students with learning disabilities, physical disabilities, or intellectual disabilities (Singer, 1993). Similarly, among students with specific disabilities, those with autism spectrum disorders (ASD) appear to be particularly challenging (Jennett, Harris, & Mesibov, 2003). Kokkinos and Davazoglou (2009) found that teaching students with autism posed the most stress in comparison to teaching other groups of students with disabilities such as those with emotional or behavioral problems, ADHD, or intellectual disabilities.

Despite the attention to burnout and stress among special education teachers, the specific differences and similarities between burnout and stress and their differential influences on student learning remain unclear. The following section elaborates on the existing knowledge and gaps in the field.

Teacher Burnout Model

As noted previously, Maslach and Leiter (1999) proposed a working model of teacher burnout. The model suggests that burnout results from the interaction among task qualities (e.g., work demands, work overload, role ambiguity, role conflict), social support (e.g., collegial support), organizational characteristics (e.g., school culture), teachers' personal qualities (e.g., personality, motivation), and political, policy, economic context, and ecology of the school (e.g., societal values, federal laws). Burnout, in turn, is posited to have negative and harmful effects on

teacher behavior, which results in negative student perceptions and behavior and ultimately poor student outcomes.

The results of studies of possible predictors or antecedents of teacher burnout are largely consistent with Maslach and Leiter's model (Dorman, 2003; Jennings & Greenberg, 2009). However, relatively few studies have examined the possible consequences of teacher burnout on teacher behavior and on students. In particular, most of the evidence demonstrating a link between teacher burnout and student outcomes is indirect (Covell, McNeil, & Howe, 2009; Jennings & Greenburg, 2009). Although correlations between student-rated teacher behavior (Klusmann, Kunter, Trautwein, Lüdtke, & Baumert, 2008; Hakanen, Bakker, & Schaufeli, 2006), teacher behavior (Irvin, Hume, Boyd, McBee, & Odom, 2013), student participation (Covell et al., 2009), and student motivation (Shen et al., 2015) with teacher burnout have been reported, correlations between teacher burnout and student educational outcomes have been largely lacking. A small study (N=27) conducted by McLean and Connor (2015) with general education teachers is an exception. Using depressive symptoms as a proxy for burnout and stress, McLean and Connor found that teachers' depressive symptoms were negatively correlated with teaching quality and student achievement in math. However, depression only has modest overlap with burnout (Brenninkmeyer, Van Yperen, & Buunk, 2001) and fails to include all the factors generally thought to underlie burnout (Maslach & Leiter, 1999).

In their 2014 review, Brunsting, Sreckovic, and Lane (2014) identified only two studies that examined associations between special education teacher burnout and the consequences of burnout on teacher behavior and students. Dykstra, Sabatos-DeVito, Irvin, Boyd, and Hume (2013) analyzed the number of words teachers used with preschoolers with ASD and found that teachers who reported higher burnout used fewer words with students. Further, the number of

words used was associated with measures of task quality, such as teacher-student ratio. The second study examining child and teacher predictors of IEP outcomes was based on the same data used in the current study (Ruble & McGrew, 2013). This study provided the only published evidence of a relationship between teacher burnout and student IEP outcomes. The preliminary findings suggest that teacher burnout is inversely correlated with student IEP goal attainment. However, the potential mechanism linking the two variables remains unclear. In summary, although correlational research on the effect of teacher burnout on student behaviors is available, more research is needed in order to confirm the relationship (Ashley, 2016).

An important conceptual issue with regard to burnout and teacher attrition is a failure to specify the differences between teaching stress and burnout. As mentioned, burnout is often defined as an outcome or an associated consequent feature of chronic stress (Collings & Murray, 1996; Fore, Martin, & Bender, 2002; Jamal & Baba, 2000; Leiter, 1991) – a definition used frequently in the field of education (Beer & Beer, 1992; Hendrickson, 1979; Farber, 1984). Despite the pervasive use of burnout and stress as constructs for studying teacher mental health, the two concepts remain vague and the causal relationship between the two has limited empirical support (Riolli & Savicki, 2003; Schaufeli & Enzmann, 1998). Emerging evidence suggests that burnout and stress are related but may have different antecedents, correlates, and consequences. For instance, Pines and Keinan (2005) in a study of 1182 police officers, found that job demands, modeled as antecedent variables, were more highly correlated with perceptions of stress than with burnout. The authors speculated that the stress response was a reactive construct tied to specific stressful situations (Pines & Keinan, 2005). In contrast, job importance correlated more strongly with burnout than with stress, consistent with the idea that burnout is a generalized, negative psychological condition that restricts positive views towards one's job. In addition,

burnout rather than stress correlated most strongly with decreased job-related and health outcomes, such as job dissatisfaction, intention to leave the job, physical and emotional symptoms, and perceived performance, indicating that burnout may have a stronger influence on negative psychosocial outcomes. Another large-scale, longitudinal study of 331 doctors conducted over three years provides further evidence for rejecting the simple one-way relationship between stress and burnout (McManus, Winder & Gordon, 2002). Instead, emotional exhaustion and stress demonstrated reciprocal causation. Moreover, low levels of personal accomplishment led to increased levels of stress, whereas high levels of depersonalization led to decreased levels of stress. Overall the findings suggest the features of burnout are differentially related to stress.

The differential effects of burnout and stress may be explained by dissimilarities at the construct-level (e.g., McManus et al., 2002; Pines & Keinan, 2005), as well as by differences in the operationalization of measures of the two constructs. Specifically, stress is intended to measure the immediate influence of stressors on the individual and can be assessed in terms of a specific stressor (a particular student) or more generally (teaching in general); whereas burnout is intended to measure the chronic influence of such stressors and is usually assessed globally rather than specifically. However, more studies are needed to clarify the associations between stress and burnout, which are more complicated than usually assumed (McManus et al., 2002). Moreover, there is an underappreciation of the conceptual and practical differences between burnout and stress in the area of special education.

In addition to establishing that burnout and stress directly influence student outcomes, there is a need to understand the potential mediating role of teacher and student variables on the relationship. According to Maslach and Leiter's (1999) model, proximal variables of teacher

behaviors and student engagement in learning could be viewed as mediating factors between teacher burnout and a distal variable of student learning outcomes. The purpose of the current study is to identify mediators or factors that help explain the proximal and distal effects of special education teacher burnout and stress on student outcomes. Emerging evidence suggests that teacher behavior (teaching quality) and student engagement (learning responsiveness) – two consequential factors of burnout within Maslach and Leiter's model – may mediate the effect of teacher mental health on student outcomes (Klusmann et al., 2008; Hakanen et al., 2006; McLean & Connor, 2015). However, to our knowledge, there has only been one published study directly linking special education teacher burnout with student educational outcomes (Ruble & McGrew, 2013). We were also interested in the relationship between stress and burnout. As mentioned before, many studies assume a simple causal effect of teacher stress on burnout (Abel & Sewell, 1999; Russell, Altmaier, & Van Velzen, 1987) or treat stress and burnout as largely similar constructs (e.g., Howard & Johnson, 2004; Roeser et al., 2013). An oversimplified view does not improve understanding of the effect of either construct on teaching quality or student learning outcomes. More problematically, most studies have been atheoretical and have neither proposed nor tested a model for understanding the antecedent and consequent variables of teacher burnout and its effects on teacher behavior and student outcomes as suggested by Maslach and Leiter (1999; Shen et al., 2015).

Accordingly, we were interested in the potential consequences of burnout and stress, examined separately, on teacher and student behavior and outcomes when applying Maslach and Leiter's (1999) model. Because of limitations of the student participant samples available from the RCTs, we were only able to explore these questions for special education teachers of young children with ASD. We had two primary questions: (a) What are the effects of burnout and stress

on teaching quality, student engagement, and individual educational program (IEP) outcomes? and (b) Do teaching quality and student engagement mediate the effect of burnout and stress on educational outcomes? The variables tested are shown in Figure 1 (Maslach & Leiter, 1999).

Method

Participants

The data are from a secondary analysis of two randomized controlled trials of a parent-teacher consultation called the Collaborative Model for Promoting Competence and Success (COMPASS; Ruble, Dalrymple, & McGrew, 2010; Ruble, McGrew, Toland, Dalrymple, & Jung, 2013) for students with autism spectrum disorder (ASD). The current study was approved by the Institutional Review Board at the University of Kentucky. The data set was originally used for another primary purpose, and the research questions of the current study were finalized after data collection. The same eligibility requirements, recruitment strategies, and group assignment procedures were used in both studies. Seventy-nine special education teachers and one student with ASD selected randomly from each teacher's caseload were recruited. Forty-seven of the dyads were assigned to the experimental group receiving COMPASS. To verify ASD, students were screened for autism with the Modified Checklist for Autism in Toddlers (M-CHAT; Robins, Fein, Barton, & Green, 2001) or the Social Communication Questionnaire (SCQ; Berument, Rutter, Lord, Pickles, & Bailey, 1999), depending on age. Students were then evaluated using the Autism Diagnostic Observation Schedule (Lord et al., 2000) to verify diagnosis by an evaluator with research reliability (second author).

Student and teacher demographic information is provided in Table 1. The mean age of the students was 5.9 years (*SD* = 1.6). On average, the child participants spent 2.9 hours in a general education classroom (*SD* = 2.2) and received 2.5 hours (*SD* = 1.0) of one-on-one support

daily, such as individual instruction in the resource room. For the teacher participants, the mean number of years teaching students with ASD was 11. Ninety-six percent of the teachers were female (N = 76). On average, teachers taught 12.6 students (SD = 7.9).

Measures

Student engagement. The 6-item Autism Engagement Rating Scale (AES; Ruble et al., 2010; Ruble & McGrew, 2013) assessed the quality of interaction during an instructional situation with the teacher. Student engagement in learning, viewed as students' reaction to teacher behavior, was rated using six domains of child behavior: (a) cooperation; (b) functional use of objects; (c) productivity; (d) independence; (e) consistency of the child's and the teacher's goals; and (f) attention to the activity using a 5-point Likert-type scale. The AES demonstrated good internal consistency (Cronbach's alpha = .86) and interrater reliability (r = 0.88, p < .01). The average score was used to represent overall student engagement.

Student IEP outcome. Psychometric Equivalence Tested Goal Attainment Scaling (PET-GAS) assessed individual educational outcomes (Ruble et al., 2013). PET-GAS uses a 5-point scale for measuring progress (−2 = present levels of performance, −1 = progress, 0 = expected level of outcome, +1 = somewhat more than expected, +2 = much more than expected) toward accomplishment of personalized goals reflective of the students Individualized Educational Program (IEP). Students' progress on three IEP goals representing a social, communication, and learning skill was evaluated by PET-GAS. Two independent raters, an experienced consultant who worked with students with ASD and a trained graduate student, scored the IEP goals at the beginning prior to group assignment. One rater unaware of group assignment scored progress at the end of the school year. To check reliability, raters independently coded 20% of PET-GAS forms for comparability of three psychometric properties:

measurability, equidistance, and difficulty. The intraclass correlation (ICC) for average agreement on these features was high ($r > .90$, $p < .01$). The raters also independently evaluated interobserver reliability for a subsample of forty percent of the participants. The ICC was also high ($r > .90$, $p < .01$). Change scores (mean score at the end of the school year minus mean score at the start of the school year) were used to represent student progress over the school year. For additional information about PET-GAS, see Ruble and colleagues (2013).

Teaching quality. The 7-item Teacher Behavior Scale (TBS; Mahoney & Wheeden, 1999) assessed teaching quality. The TBS captures seven behaviors thought to represent quality teaching: (a) enjoyment, (b) supportiveness, (c) responsiveness, (d) achievement orientation, (e) effectiveness, (f) verbal praise, and (g) participation. Items were rated using a 5-point, Likert-type scale (1= very low; 5= very high). The TBS has good internal consistency (Cronbach's alpha = .85; Mahoney & Wheeden, 1999) and was also good in the current study (Cronbach's alpha = .85). The average score across was used for analysis.

Teacher burnout. The 22-item Maslach Burnout Inventory Educators Survey (MBI; Maslach et al., 1997) was used to measure teachers' subjective level of general burnout with teaching along three dimensions: emotional exhaustion (EE, 9 items), depersonalization (DP, 5 items), and personal accomplishment (PA, 8 items). Higher scores in EE and DP and lower scores in PA reflect greater burnout. Items are rated using a 7-point, anchored scale (0 = never; 6 = every day). The MBI has good internal consistency (α = 0.71-.90; Maslach et al., 1997). The average scores of the subscale items were used for analysis.

Teacher stress. Teacher stress was measured using the 43-item Index of Teaching Stress (ITS; Greene, Abidin, & Kmetz, 1997). The ITS has two scales; the first evaluates job related stress, and the second evaluates stress related to a specific student. For the current study, we used

the second scale to assess subjective stress in response to teaching the student with ASD. That is, the ITS measures the situational stress associated with teaching a particular student, and thus targets a more specific subset of stressors compared to the MBI. Items are rated on a 5-point Likert scale (1 = never distressing; 5 = very distressing). Internal consistency (α) was very good .96 (Greene et al., 1997). The average score across items was used for analysis.

Data Collection and Analysis

Student engagement, teaching quality, teacher burnout, and stress were collected before randomization at the beginning of the school year, Time 1. After randomization, teacher participants completed their group assignment activities. At the end of the school year, Time 2, student IEP outcomes were assessed using PET-GAS by an observer unaware of group assignment. PET-GAS scores collected at the end of the school year represented the overall improvement across the school year.

COMPASS accounted for 23% of the variance in learning outcomes of students with ASD, favoring the experimental group (Ruble et al., 2010; Ruble et al., 2013). Because the current secondary data analysis included data from both the experimental and control groups, group assignment was controlled in all analyses using variables collected after randomization. In particular, only PET-GAS was collected after randomization. First, bivariate analyses were used to obtain a preliminary picture of the relationships among variables. To answer the first research question about the effects of burnout and stress on teaching quality, student engagement, and IEP outcomes, partial correlation was used to examine the relationships between IEP outcomes and teacher burnout and stress. Pearson correlation was used to assess the relationships among teacher burnout, stress, teaching quality, and student engagement. Then, regression analyses were used to explore the multivariate effect of burnout and stress on IEP outcomes. To account

for shared variances, we analyzed the three burnout components and stress simultaneously in the regression analyses. Group assignment was used as a control variable in the regression analyses because PET-GAS was an outcome measure.

To answer the second research question of whether teaching quality and student engagement mediate the relationship between burnout and stress and educational outcomes, a test of serial mediation was performed using the PROCESS procedure for SPSS (Hayes, 2012). Serial mediation is "a causal chain linking the mediators, with a specified direction of causal flow" (Hayes, 2012, p. 14). Group assignment was also controlled in the mediation analyses.

Results

The effects of burnout and stress on teaching quality are discussed first, followed by the influence on student outcomes, and concluding with the mediating role of teaching quality and student engagement.

Correlations among Variables

To obtain a preliminary picture of the relationships among the variables, we first conducted bivariate analyses (see Table 2). As expected, teacher stress and the three burnout components were significantly correlated with each other (r = -.27 - .50, p = <.001 - .018). Teacher stress was correlated with teaching quality (r = -.44, p < .001) and student engagement (r = -.31, p = .006). Personal accomplishment (r = .29, p = .015) and teaching quality (r = -.29, p = .028) were correlated with IEP outcomes.

Effects of Burnout and Stress on Teaching Quality

As the first step of the multivariate analyses, we wanted to understand if burnout and stress influenced teaching quality. The multivariate regressions showed that teacher stress was

the only significant predictor of decreased teaching quality (b = -.07, t(54) = -3.08, p = .003; F(4, 54) = 3.41, p = .015) (see Table 3).

Effects of Burnout and Stress on Student Engagement and IEP Outcomes

Student engagement. The second part of the analysis involved examining the effect of teacher burnout and stress on student engagement. The multivariate regression indicated that teacher stress was the only significant predictor (b = -.03, t(66) = -2.82 , p = .031) of decreased student engagement, F(4,66)= 2.21, p = .078 (see Table 3).

IEP outcomes. The third step involved understanding the influence of teacher burnout and stress on IEP outcomes. Personal accomplishment was the only significant predictor (b = .06, t(60) = 2.90, p =.005) of student IEP outcomes, F(1,60) = 6.70, p < .001. (See Table 3).

The Mediating Role of Teaching Quality and Student Engagement

As noted previously, burnout, as measured by personal accomplishment, had a significant direct effect on long-term student IEP outcomes, whereas teaching stress had a significant influence on teaching quality and student engagement. According to Maslach and Leiter's model (1999), proximal variables, such as teacher behaviors and student reactions to learning could be viewed as factors mediating the relationships between teacher burnout and student learning outcomes, which is viewed as a distal variable to burnout. To examine the proposed mediating effect, we tested the potential indirect effects or mediating roles of teaching quality and student engagement in the relationship between stress or burnout and IEP outcomes. The potential mediating effects were examined separately for stress and the three burnout subscales. Thus, four separate mediational analyses were conducted, one for stress and one for each of the burnout subscales (i.e., emotional exhaustion, depersonalization, and personal accomplishment). We included stress and all three burnout subscales in the analyses even though some of the variables

did not have a direct effect on the dependent variable (i.e., IEP outcomes) because significant indirect relationships are possible without a significant direct effect between an independent and dependent variable. Such phenomena are not uncommon and are often neglected in the literature (Hayes, 2009). The PROCESS procedure simultaneously calculated the significance of all possible indirect paths and direct paths between burnout or stress and IEP outcomes.

Burnout-Emotional exhaustion. The results indicated that student engagement alone significantly mediated the relationship between teachers' emotional exhaustion and IEP outcomes (indirect effect = -.08, *SE* = .05, 95% *CI* = -.20, -.01). A significant indirect effect is indicated because the confidence interval did not contain zero (Hayes, 2009; MacKinnon, Krull, & Lockwood, 2000). Thus, although not directly correlated with IEP outcomes, emotional exhaustion influenced IEP outcomes indirectly. Specifically, high levels of emotional exhaustion was related to less student engagement, which in turn was related to poor IEP outcomes (see Figure 2).

Burnout-Depersonalization. Results indicated that depersonalization influenced IEP outcomes through an indirect effect on teaching quality and student engagement (indirect effect = -.06, *SE* = .05, 95% *CI* = -.21, -.001). Similar to emotional exhaustion, depersonalization did not have a direct effect on IEP outcomes, but did influence IEP outcomes through a serial indirect effect. That is, when depersonalization was high, teaching quality decreased, which led to less student engagement, which was related to worse IEP outcomes (see Figure 2).

Burnout-Personal accomplishment. The results indicated that there was a significant direct effect, but no indirect effect, between teachers' personal accomplishment and IEP outcomes (see Figure 2). Personal accomplishment directly influenced IEP outcomes, and the

relationship was not mediated through teaching quality or student engagement (total indirect effect = -.05, *SE* = .08, 95% *CI*= -.22, .08; direct effect = -.33, *SE* = .15, *95% CI* = -.65, -.03).

Stress. There was a significant indirect effect of stress on IEP outcomes via teaching quality and student engagement (indirect effect = -.001, *SE* = .001, 95% *CI* = -.004, -.0001). Specifically, increased stress was related to lower teaching quality, which in turn was related to lower student engagement in learning and, then, to poorer IEP outcomes (see Figure 2). As with the bivariate analyses, teacher stress did not have a direct effect on student IEP outcomes (direct effect = -.0007, *SE* = .004, 95% *CI* = -.01, .01).

In summary, when considering direct effects, teacher stress was directly related to teaching quality and student engagement, whereas personal accomplishment, but not emotional exhaustion or depersonalization, was directly related to student learning outcomes. When indirect effects were examined, the three burnout subscales had differential influences on IEP outcomes. Emotional exhaustion and depersonalization influenced student IEP outcomes indirectly, either through student engagement alone or through student engagement and teaching quality, and, personal accomplishment had only a direct influence on student IEP outcomes. Similar to emotional exhaustion and depersonalization, increased stress was related to student outcomes indirectly through lowered teaching quality, which in turn was related to decreased student engagement and IEP outcomes.

Discussion

To the best of our knowledge, the current secondary analysis is the first to demonstrate empirically the direct and indirect effects of special education teacher burnout and stress on teaching quality, student engagement, and IEP outcomes. The current study is an improvement on prior research by its use of a fairly large sample of teacher and student dyads and its

independent measurement of the effects of burnout and stress on student IEP outcomes over the course of the school year.

The existing literature has described burnout as having an indirect negative influence on student learning through its effect on attrition. Teachers who are stressed or experience burnout are more likely to leave school, leading to an unstable and potentially lower quality teaching workforce, which in turn may negatively influence student learning (see McLeskey & Billingsley, 2008; McLean & Connor, 2015). The current study showed that, in addition, burnout has a more direct influence on student learning. Specifically, one out of three components of burnout, reduced personal accomplishment, was negatively and directly related to achievement of long-term IEP outcomes for students. In contrast, the other two components of burnout, emotional exhaustion (EE), and depersonalization (DP), had indirect effects on student IEP outcomes either through student engagement alone or through teaching quality and student engagement together. The implications of such results are twofold. First, teacher burnout (i.e., personal accomplishment) assessed at the beginning of the school year can actually predict student learning outcomes at the end of the school year, demonstrating the potentially long-standing negative effect of burnout on student IEP outcomes. Second, consistent with previous studies (e.g., McManus et al., 2002), the effect of the three burnout components on teaching quality, student engagement, and IEP outcomes are different. Moreover, all three subscales have either a direct or indirect effect on student outcomes, supporting the potential importance of all three factors of the tripartite framework (Maslach & Lieter, 1999). However, additional research is needed to replicate these results.

In particular, more studies are needed to examine the conceptual and practical differences among the three burnout components (i.e., emotional exhaustion, depersonalization, and personal

accomplishment) to understand the weight of these components on outcomes of interest. For instance, a previous study indicated that emotional exhaustion was the strongest predictor of intention to leave (Carlson & Thompson, 1995). The current study complements this previous study and supports the idea that the three components of burnout have a differential influence on student learning outcomes. For example, it is possible that personal accomplishment directly influences student learning, whereas emotional exhaustion directly influences attrition. The potential applicability for future research in the area of teacher burnout intervention and prevention is significant.

The results also offer insight into the differential effects of burnout and stress. Specifically, burnout, but not stress, may be a more important factor when predicting long-term distal outcomes, whereas stress may be a more significant predictor of proximal teaching quality and student engagement. As mentioned previously, such a differential effect may be explained by differences between the definitions of burnout and stress at the construct-level (McManus et al., 2002; Pines & Keinan, 2005), as well as by differences in the operationalization of the measures of the two constructs. Stress is intended to measure the immediate effect of stressors on the individual, whereas burnout is intended to measure the chronic effect of such stressors. Thus, it would make logical sense that burnout, rather than stress, should have a stronger influence on long-term student IEP outcomes. For example, teachers who experience burnout may have decreased resources necessary for effective instruction. They may think that their job is not meaningful, do not see themselves relating to the students' learning progress, and do not think they have the necessary competence to teach the students. Subsequently, such teachers may lose the ability to manage student learning and make good decisions with regard to students' progress

on IEP goals (Maslach, Schaufeli, & Leiter, 2001; McGee, 1989). This finding is consistent with the way in which burnout and stress were measured.

The Index of Teacher Stress (ITS) measures teacher stress toward a particular student. In the current study, the ITS was used to measure teacher stress toward the student participant targeted in our randomized-controlled trial (Ruble et al., 2010; Ruble et al., 2013). That is, the measures of stress, teaching quality, and engagement targeted the same student with ASD. In contrast, unlike the stress measure, the MBI is a more generalized questionnaire about teacher burnout and thus does not necessarily capture the teacher's views of and interactions with a particular student. It is therefore understandable that the ITS was a better predictor of teaching quality and student engagement because the ITS, Teacher Behavior Scale (TBS), and Autism Engagement Scale (AES) essentially measured the views and interactions of the same teacher-student dyads at the same time point.

Additionally, the results show that stress has an indirect effect similar to depersonalization, influencing IEP outcomes through teaching quality and student engagement. Teachers who are stressed demonstrated poorer teaching quality. As a result, their students tend to show less engagement, resulting in poorer outcomes. Even though some aspects of burnout and stress directly correlate with different intermediating and outcome variables, the indirect effect of stress on the long-term IEP outcomes can be similar to the components of burnout. For instance, both stress and depersonalization influence IEP outcomes through teaching quality and student engagement.

Additional studies are needed to confirm the direct and indirect effects of burnout and stress on student outcomes. However, if replicated, teachers who experience burnout and stress should be provided with enough instructional support to ensure high teaching quality and student

engagement, as well as instrumental and emotional support to monitor students long-term progress, including monitoring IEP goals, ensuring collaboration with stakeholders, and providing constructive feedback (Awa et al., 2010; Russell et al., 1987).

Additionally, the current study provides some empirical support for the teacher burnout model proposed by Maslach and Leiter (1999). Consistent with the model, burnout can operate via a distant, indirect effect on student's long-term educational outcomes through teaching quality and student engagement. That is, even though some burnout components may not have a direct effect on students learning outcomes, they could lead to decreased teaching quality and lowered student engagement in learning, which then may result in poorer learning outcomes at the end of the school year.

The current results clearly show that teacher burnout and stress are not only intrapersonal and fiscal issues for teachers and administrators, but are problems that affect students at the individual level. Although school reform efforts emphasize the importance of quality teaching (Council for Exceptional Children, 2013), school administrative staff, policymakers, and stakeholders should not underestimate the role of teacher mental health in student learning. Instead of viewing the potential mental health risk factors among teachers as a stand-alone problem (Cherniss, 1988), interventions to reduce teacher stress and burnout should be taken into account when developing strategic plans to increase teaching quality and student engagement.

Lastly, the current study has a number of limitations. First, although the sample size was adequate for an ASD intervention study, the sample size was too small for more sophisticated model testing. Further, the sample represents a relatively homogeneous group, focusing on teachers of young children with ASD in preschool and elementary school settings. Even though the existing research supports the need to understand burnout for teachers of younger students

with ASD in particular (Coman et al., 2013), there is a need to examine special education teacher burnout more generally. It is also important for researchers to be aware that the quality of instruction provided to children with different levels of challenging behaviors and the degree of teacher stress engendered can be very different. We did not attempt to disentangle the impact of these variables. Additionally, due to the focus on individualized goals, the current study did not include standardized measures. However, researchers might consider using standardized, normed-referenced or criterion-referenced measures to provide a more global picture of the influence of burnout and stress on learning progress. Moreover, the stress measure and burnout measure were conceptually different – the stress measure focused on a single student, whereas the burnout measure captured general burnout. Researchers are encouraged to explore the use of measures that capture general stress towards teaching. Furthermore, although the measures used in the current study obtained good inter-rater reliability and internal consistency, there is a concern that a potential halo effect may inflate the results. Also, because the current study was designed primarily as a test of an intervention rather than as a direct test of the effects of stress and burnout, other important organizational, teacher-level, and student-level factors were not included (e.g., school climate). The current study also fails to isolate and compare the effects of burnout from conceptually and empirically related constructs. For instance, although the current study shows that personal accomplishment predicts student learning outcomes; it fails to provide additional information about the unique effect of personal accomplishment compared to other similar yet different constructs, such as teacher self-efficacy (Evers, Brouwers, & Tomic, 2002; Savas, Bozgeyik, & Eser, 2014). Lastly, the study focuses solely on the consequences of burnout. We did not attempt to understand the potential interactions among all the antecedent and consequent variables associated with burnout and stress.

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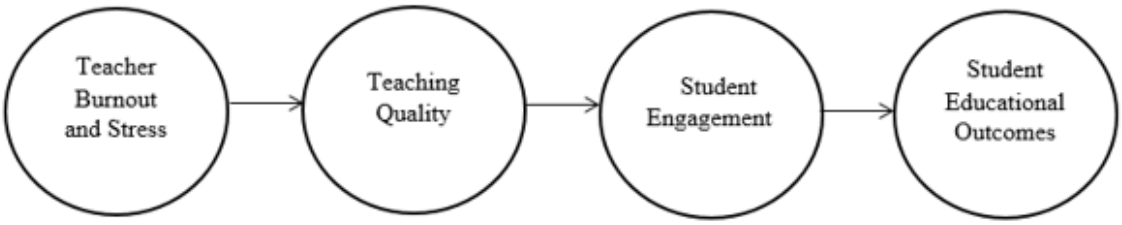

Figure 1. Tested model adapted from Maslach and Leiter (1999).

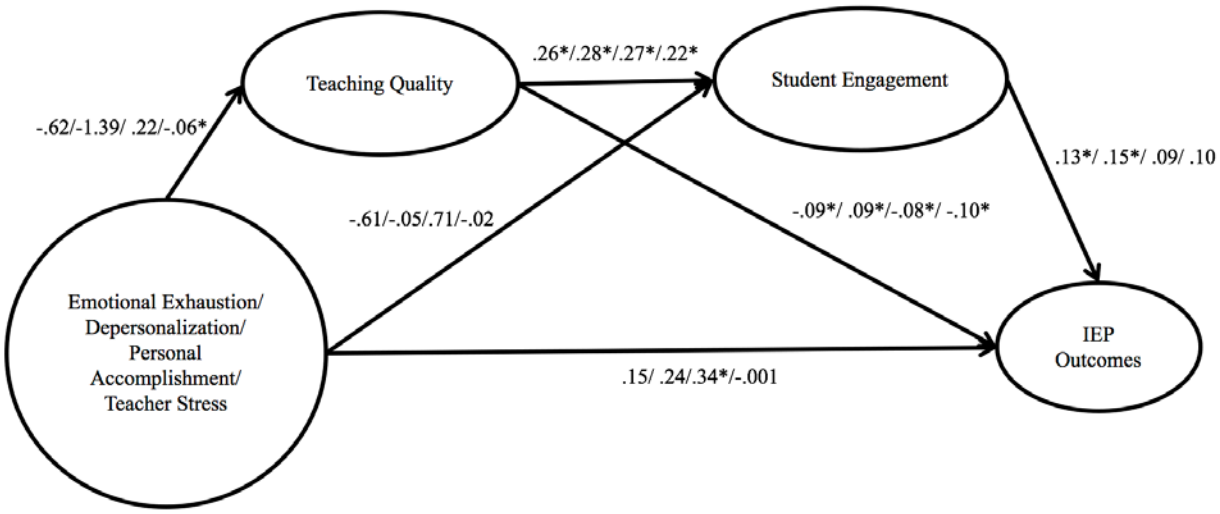

Figure 2. The mediating role of teaching quality and student engagement between teacher burnout (emotional exhaustion-depersonalization-personal accomplishment) and teacher stress and student educational outcomes. * = $p<.05$. Parameters are listed in order corresponding to the particular path being tested. That is, in each case, the first listed parameter corresponds to path one, the second listed parameter to path two, etc. The first path tested was Emotional Exhaustion → Teaching Quality → Student Engagement → IEP Outcomes. The second path tested was Depersonalization → Teaching Quality → Student Engagement → IEP Outcomes. The third path tested was Personal Accomplishment → Teaching Quality → Student Engagement → IEP Outcomes. The fourth path tested was Teacher Stress → Teaching Quality → Student Engagement → IEP Outcomes.

Table 1

Demographic Information

School variables	*n*	*%*
Urban/ suburban	70	88.6
Rural (Population less than 5,000)	9	11.4
Teacher variables	***M (SD)***	**Range**
Teaching experience (years)	11.02 (7.90)	0-32
Caseload (number of current students)	12.61(6.53)	3-36
Education	*n*	*%*
Bachelor	33	41.8
Master	37	46.8
Emergency Certificate	2	2.5
Other	1	1.3
Gender		
Male	3	3.8
Female	76	96.2
Student variables	***M (SD)***	**Range**
Age (years)	5.89 (1.60)	3-9
Gender	*n*	*%*
Male	66	83.5
Female	13	16.5

Table 2

Relationships among Stress, Burnout, Teaching Quality, Student Engagement, and IEP Outcome

	1	2	3	4	5	6.
1. Teacher stress	-	-	-	-	-	
2. Burnout emotional exhaustion	.39**	-	-	-	-	
3. Burnout depersonalization	.36**	.50**	-	-	-	
4. Burnout personal accomplishment	-.37**	-.40**	-.27*	-	-	
5. Teaching quality	-.44**	-.22	-.21	.09	-	
6. Student engagement	-.31**	-.21	-.07	.15	.45**	
7. IEP outcome[+]	-.03	.04	.17	.29*	-.29*	-.03

*=p<.05; **=p<.01; [+]partial correlation was used to control for group assignment. With the exception of Personal Accomplishment, higher scores indicate more of the construct.

Table 3

Summary of Regression Prediction

DV	*IEP outcomes*			*Teaching quality*			*Student engagement*		
	Standardized coefficient	*Unstandardized coefficients*		*Standardized coefficient*	*Unstandardized coefficients*		*Standardized coefficient*	*Unstandardized coefficients*	
	β	*β*	*SE*	*β*	*β*	*SE*	*β*	*β*	*SE*
Emotional exhaustion	.07	.01	.02	-.07	-.03	.07	-.15	-.04	.04
Depersonalization	.21	.08	.05	.05	.07	.20	.11	.10	.15
Personal accomplishment	.34**	.06	.02	-.11	-.07	.10	.01	.01	.06
Stress	.00	.00	.01	-.43**	-.07	.02	-.29*	-.03	.01
Group assignment	.51**	1.21	.26	---	---	---	---	---	---
R^2	.60			.20			.12		
F	6.70			3.41			2.21		

* = $p<.05$; ** = $p<.01$. With the exception of Personal Accomplishment, higher scores indicate more of the construct.