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Comparing Stress, Coping, and Burnout
Symptoms between Elementary Teachers in the
United States and Germany

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Abstract

Transactional models of stress posit that perceptions of both resources and demands determine whether stress will be experienced. To test this model cross-nationally, previous research examining the relationship of elementary teachers' experience, stress, and coping resources to burnout symptoms in the United States was replicated with elementary teachers in Germany. Specifically, levels of elementary teachers' burnout symptoms were examined: (1) between schools, with individual/teacher perceptions of demands and resources aggregated to the group level, and (2) at the individual teacher within schools level, where perceptions of classroom demands and resources, as well as teachers' personal coping resources and experience, were taken into account.

Participants were 469 elementary teachers in Baden-Wüurttemberg, Germany. Hierarchical linear modeling was used to nest teachers within schools. Results showed little variance in reported burnout symptoms between schools which was consistent with findings from a U.S. sample. However, the overwhelming majority of the variance was found between teachers within the same school. Replicating previous research, individual teacher factors were associated with burnout symptoms in the predicted direction, but the pattern of statistical significance varied for German and U.S. teachers. These findings may offer cross-cultural support for transactional models of stress in elementary school settings.

Relationship of German Elementary Teachers' Experience, Stress,and Coping Resources to

Burnout Symptoms: A Comparison to United States Elementary Teachers

Teacher burnout is an international phenomenon, but most research focuses on the

experiences of teachers within a single nation (Lambert & McCarthy, 2006). Kyriacou's (1998)

definition of teacher stress as "the experience by a teacher of unpleasant emotions such as

tension, frustration, anxiety, anger and depression, resulting from aspects of his or her work as a

teacher" (p. 4) seems to accurately depict the experiences of teachers in a number of countries,

including China (Chan, 2002), the Netherlands (Brouwers & Tomic, 2000), England (Hastings &

Bham, 2003), Turkey (Kiziltepe, 2006), Malaysia (Segumpan & Bahari, 2006), Israel (Friedman,

1995), and Greece (Kokkinos, 2007). While these similar themes emerge internationally,

conceptual models that could help predict and explain which factors are determinative of teacher

stress are lacking.

In order to better understand commonalities and differences in the specific factors that

predict teacher stress and burnout across national borders, this study replicated McCarthy,

Lambert, O'Donnell, and Melendres' (2009) research on the relationship of United States (U.S.)

elementary teachers' experience, stress, and coping resources to burnout symptoms with

elementary teachers in Germany. Both McCarthy et al.'s research and the current study were

based on Lazarus and Folkman's (1984) transactional model of stress, which hypothesizes that

when life demands are encountered, a subjective transaction occurs in which the person weighs

perceived demands of the event against perceived capabilities for coping. Perceptions that life

demands outweigh available resources for coping lead to the stress response, which includes the

experience of negative emotions and, in the long term, burnout symptoms and health problems

(Sapolsky, 1998).

Following the data analysis strategy used by McCarthy et al. (2009) with U.S. teachers, the following levels of German elementary teachers' burnout symptoms were examined in this study: (1) between schools, with individual/teacher perceptions of demands and resources aggregated to the group level, and (2) at the individual teacher within schools level, where teachers' experience level, perceptions of classroom demands and resources, and personal coping resources were taken into account. The first research question was designed to examine if any of the variance in reported burnout symptoms among German elementary teachers could be attributed to building-level characteristics, such as the climate promoted by school administrators and the availability of school-wide materials and resources. The second research question was designed to examine whether specific individual teacher factors were associated with burnout symptoms, which allowed for an examination of the appraisals that elementary teachers make about demands and resources in the classroom. This second research question was designed to test the theoretical framework developed by Lazarus and Folkman (1984) by assessing the role of individual teacher perceptions of resources and demands. Elementary school teachers are particularly relevant for this second research question as their classroom environment is relatively stable from day to day, i.e., they typically work with the same students and have similar demands and resources from day to day.

In order to provide a context for comparing the results of elementary teachers from the U.S. and Germany, the educational systems in the United States and Germany will be described first. Then the theoretical framework for the study will be reviewed, including a rationale for the variables examined in both McCarthy et al.'s (2009) study and the current investigation.

Elementary teaching in U.S. and German schools

Compared to the education system in the United States, which is based on the idea of educating all students in integrated kindergartens, elementary schools, and comprehensive middle and high schools, Germany has a stratified school system. After the fourth elementary grade, children get separated on the basis of test scores and teacher recommendations (Powell, 2006). There are different types of schools that offer specific levels of qualifications, and based on academic performance in most "Länder" (federal states) children get to either attend basic secondary schools (grades 5 to 9: Hauptschulen), general level schools (grades 5 to 10: Realschulen), or advanced secondary schools (grades 5 to 12: Gymnasien). Hauptschulen lead to the lowest of all German school diplomas and prepare students for learning a trade (Unterbrink et al., 2007). Children with special needs in the German system are placed in separate schools while students in the U.S. are taught in the same schools. In the U.S. the funding level of the resources available and the resources available to schools can differ from community to community.

While the U.S. has a universal secondary school system with some degree of intra-school separation or stratification occurring via tracking, the German school system is hierarchically stratified and is characterized by inter-school segregation (Powell, 2003). Homogeneous learning groups are constructed in different types of schools (Werning, Löser, & Urban, 2008), which is the most important institutional distinction between the two school systems. Such early classifications of students in German elementary schools have been criticized repeatedly on the grounds that it is difficult to make decisions about a child's educational career by age 10 (Döbert, 2007). Further, such a system leads to inequities for students from families with lower socioeconomic status or immigrant background who are overrepresented in special schools as well as in Hauptschulen and underrepresented in Realschulen and Gymnasien (Powell, 2004). As evidence, according to the German Federal Bureau of Statistics (Statistisches Bundesamt

Deutschland, 2008) an annual survey of school statistic showed that, only 8.9% of students with an immigration background achieve an advanced high school and university entrance diploma (Abitur) in contrast to 24.3% of native German students.

Occupational pressures experienced by U.S. and German teachers. While there are notable structural differences in elementary education in the U.S. and Germany, there is evidence that teacher stress and burnout are prevalent in both countries. Both in the United States and in Germany burnout rates of up to 50% have been reported (Barth, 1997; Bauer et al., 2007; Byrne, 1999). In the U.S., stress and burnout have been identified as contributors to the shortage and attrition of teachers (Burke, Greenglass, & Schwarzer, 1996; Weisberg & Sagie, 1999) while in Germany, early retirement based on health-related reasons has been a concern for several years (Unterbrink et al., 2007). According to Ingersoll and Smith (2004), the attrition rate of teachers after 5 years is close to 50%.

Intense political debate about the civil servant status of teachers in Germany has also focused on the premature retirement of teachers in Germany (Weber, 2002). In the federal state (Land) of Baden-Württemberg, Germany, approximately 50% of teachers who left the profession in 1999 retired early based on medical reasons, which may be related to stress and burnout (Bauer et al., 2001; Finanzministerium Baden-Württemberg, 1999; Reinke-Nobbe, & Vernier, 2001; Rudow, 1999). Weber, Weltle, and Lederer (2002) conducted a document analysis of 7,103 medical assessments between 1996 and 1999 and found that a psychological diagnosis was given for 52% of teachers who retired early in this time period. In 2000, according to the German Federal Bureau of Statistics, 64% of teachers who retired early did so based on health-related reasons. This number is much lower for other professionals such as judges and administrative positions. In addition, an increase was noted for teachers retiring for medical reasons before

retirement age from 28% in 2004 to 30% in 2005 (Statistisches Bundesamt Deutschland, 2008). In the same year, 26% of teachers retired at the normal retirement age, whereas the same was true for 54% of employees in other public services (Unterbrink et al., 2007).

These findings are alarming not only because of the economic consequences, but also because of the consequences for teacher welfare and student learning. For example, Weber et al. (2002) showed that Bavaria is spending 250 million Euro per year on pensions for teachers who retire early. It can also be assumed that teachers who are experiencing burnout out are not able to teach effectively, thus negatively impacting student learning and achievement (Burke, Greenglass, & Schwarzer, 1996). It seems clear then that a deeper understanding of factors that may place German elementary school teachers at risk for stress and burnout is needed. In the following section, a rationale is offered for understanding teacher stress and burnout from the perspective of transactional models of stress.

Examining Occupational Burnout and Elementary Teacher Well-Being from a Transactional Perspective

This section will review the rationale for including burnout as the primary outcome variable for the study. Burnout is a term first coined by Freudenberger (1974), who defined it as a loss of idealism and enthusiasm for work. Examining predictors of burnout in teachers was the focus of McCarthy et al.'s (2009) research with U.S. teachers, as well as the current study with German teachers. Teachers represent the largest homogeneous occupational group investigated in burnout research (Schaufeli & Enzmann, 1998) and are widely recognized to be at high risk for excessive stress levels and professional burnout (Dunham & Varma, 1998; Kyriacou & Sutcliffe, 1977). The impact of burnout on the personal well-being of teachers is but one of its negative consequences. Ingersoll (2001) also noted that current teachers shortages in the U.S. are

not due to lack of professionals entering the field, but rather a "revolving door" in which large numbers of teachers leave for reasons other than retirement.

Maslach and Jackson developed the construct of burnout in the 1980s (Maslach & Jackson, 1981; Maslach & Schaufeli, 1993) as well as The Maslach Burnout Inventory (MBI; Maslach, Jackson, & Leiter, 1996) to measure it. The MBI is by far the most common measure found in burnout research, and has been used in over 90% of burnout research (Hastings, Horne, & Mitchell, 2004; Schaufeli & Enzmann, 1998). Maslach, Schaufeli, and Leiter (2001) theorized that burnout has three essential components, which will be briefly described next (interested readers are referred to Maslach et al. for a more in-depth discussion of each construct).

The MBI assesses each of the three core dimensions of burnout hypothesized by Maslach et al. (1996): emotional exhaustion, depersonalization, and personal accomplishment. Emotional exhaustion (EE), which is the most obvious and central aspect of burnout, refers to a depletion of one's emotional resources (Maslach et al., 2001) and feeling exhausted and unable to cope with life demands. Depersonalization (DP) refers to disconnecting oneself from others, and for elementary teachers this may involve the development of negative, unfeeling, callous, and cynical attitudes towards students and the school environment. The third component of burnout is personal accomplishment (PA), which refers to a reduced sense of efficacy and devaluing of one's work with others. In other words, burnout involves a decline in feelings of personal accomplishment owing to lowered feelings of competence and personal achievement. Maslach et al. (2001) noted that while emotional exhaustion and depersonalization may emerge from external factors such as work overload and social conflict, the lower personal accomplishment seems to arise more clearly from insufficient personal resources (Maslach et al., 2001).

While there is theoretical interest in the possibility of causal relation between these three constructs, Taris, Le Blanc, Schaufeli, and Schreurs (2005)'s review of the literature showed little evidence for such a relationship between the three components of burnout. Therefore, and in accordance with Maslach et al.'s (1996) suggestion, in both McCarthy et al.'s (2009) study and the current study with German elementary teachers, each component of burnout was analyzed separately for research questions one and two.

The first research question in this study parallels McCarthy et al. (2009)'s analysis with U.S. teachers. German teachers burnout symptoms were examined across schools, with individual perceptions of demands and resources aggregated to the group school level. McCarthy et al. (2009), using a sample of 451 U.S. elementary teachers, found that most of the variance in burnout symptoms as measured by 22 items on the MBI within 451 respondents was explained between teachers (93.2%) and not between schools (6.8%). Research question one for this study will therefore test whether the same pattern is observed with German elementary school teachers: i.e., that most of the variance will be found between teachers within the same school, as opposed to the school building level.

Teacher-Specific Factors as Predictors of Stress and Burnout

In examining their second research question, McCarthy et al. (2009) found that individual teacher factors (overall teaching experience as well as experience at their current school, perceived resources and demands, and preventive coping resources) were more strongly associated with burnout symptoms than building level characteristics. Each of these individual factors, and the justification for their inclusion in the current study in research question two, will next be provided.

McCarthy et al. (2009) measured both classroom demands and classroom resources hypothesized to contribute to elementary teachers' stress using the Classroom Appraisal of Resources and Demands (CARD, school-age version; Lambert, McCarthy, & Abbott-Shim, 2001). As noted by McCarthy et al. (2009), the CARD focuses on the demands of the elementary classroom environment as well as specific material resources available to teachers to meet those demands. In order to account for teacher perceptions of resources and demands in accordance with Lazarus and Folkman's (1984) theory, McCarthy et al. (2009), created a classroom "stress" score from the CARD for each respondent by calculating the difference between her/his total score for the demands section of the CARD and the total score for the resources section of the CARD. This was done because transactional models of stress and coping would predict that teachers who rated demands greater than available resources would be at risk for experiencing occupational stress. Additionally, McCarthy et al. also used the demands score from the CARD as a separate predictor.

In addition to examining specific demands and resources (as measured by the CARD), McCarthy et al. (2009) examined the role of teacher's psychological coping resources as predictors of burnout. More specifically, and in line with the study's focus on identification of early burnout symptoms, McCarthy et al. examined psychological resources useful in preventing stress as a predictor of teacher burnout symptoms. The identification of coping resources most useful for preventing stress is based on research by Matheny, Aycock, Pugh, Curlette, and Canella (1986), who identified psychological coping resources as either useful for either combating or preventing stress based on a meta-analysis of the coping literature. Their taxonomy suggests that combative coping resources are most useful after the stress response has been triggered, to bring the individual back to a state of equilibrium (for example, the ability to

disclose negative emotions to others, and use relaxation and problem-solving skills). In contrast, preventive coping resources allow the individual to recognize and deal with life demands so as to avoid the experience of stress in the first place (for a further review, see Matheny et al., 1986, and McCarthy, Lambert, Beard, & Dematatis, 2002).

McCarthy et al. (2009) used the total score from the Preventive Resources Inventory (McCarthy et al., 2002) to measure overall preventive resources with U.S. elementary teachers. Results from a pilot study with the German versions of the CARD and the PRI showed that the survey packet was perceived to be very long. Therefore a modification was made to the research design used by McCarthy et al. (2009) and only the Self-acceptance (SAC) scale of the PRI was used. This decision was based on findings from previous research, which indicated that SAC was the strongest predictor of stress and health. Therefore, a German translation of one scale, Self-Acceptance (SAC), was used as a proxy for overall preventive coping resources. McCarthy et al. (2002) defined SAC as "a set of beliefs and behaviors indicating acceptance of self, others, and the world" (p. 25), and it was included in this study due to suggestions by Lambert, O'Donnell, Kusherman, and McCarthy (2006) that SAC can be considered as a higher order factor that is theoretically central to the construct of preventive coping.

With respect to the above variables, regression analyses conducted by McCarthy et al. (2009) found that the depersonalization scale score from the MBI was related to stress (β =.169) and preventive coping (β = -.154). The personal accomplishment scale score from the MBI was related to classroom demands (β =.158) and preventive coping (β = -.280). The total burnout score from the MBI was related to years at current school (β = .015), classroom demands (β =.159), stress (β =.129), and preventive coping (β = -.261). This model explained 37.3% of the between-teacher variance in burnout.

As can be see in the above results, McCarthy et al. (2009) found that only teachers' experience at their current school, not in the profession, was a predictor of EE and total burnout, with more experience related to higher EE and overall burnout. We included teacher experience in the HLM in this study to replicate the variables examined by McCarthy et al. (2009) and because McCarthy, Kissen, Yadley, Wood, & Lambert (2006) found that being a first-year teacher (as opposed to being a teacher with more experience) was a significant predictor of emotional exhaustion among preschool and elementary teachers. Schwarzer and Greenglass (1999) referred to work experience as an "internal coping resource" but previous research has yielded inconsistent findings about how much it helps teachers cope with job demands. Russell, Altmaier, and Van Velzen (1987) found a weak relation between teacher characteristics, including experience, and job-related stress, whereas Malik, Mueller, and Meinke (1991) found no relation between experience and stress. A number of studies have found that teachers with more experience exhibit lower levels of burnout (Zabel & Zabel, 2001) and that first-year teachers have reported higher levels of stress (McCarthy et al., 2006). With respect to burnout in particular, Sari (2004) found in a sample of 33 Turkish special school teachers and 262 special school teachers that teachers with a higher number of years of experience in teaching also experienced higher levels of EE and DP than their less experienced colleagues. On the other hand, experienced teachers scored higher on PA than their colleagues with lower numbers of years in teaching.

Clearly, the research on teacher experience and stress has provided mixed results, and a meta-analysis by Edmonson and Thompson (2002) noted some inconsistency in the operationalization of the construct experience in the literature. While most authors use it to describe the total number of years a person has been working in education, some authors use it

when referring to a person's tenure in his or her current position. Therefore the current investigation distinguishes between these four variables: (a) total years of experience in teaching, (b) number of years at current school, (c) whether the teacher is new to the profession (less than two years of experience), and (d) whether the teacher is new to the current school (less than two years of experience at the current school).

Method

Participants

Data were collected from German elementary teachers in Baden-Württemberg, an area with similar socioeconomic characteristics to the Cabarrus County area of North Carolina sampled in the study by McCarthy et al. (2009). Baden-Württemberg is the third biggest of the 16 German federal states. It has a total of 10,738,753 inhabitants, 35 counties (Landkreise), nine city counties (Stadtkreise), and four administrative districts (Regierungsbezirke): Freiburg (2,195,694 inhabitants), Karlsruhe (2,738,609 inhabitants), Stuttgart (4,006,537 inhabitants), and Tübingen (1,806,616 inhabitants).

Procedures

Principals were approached by email by the first author to ask for permission to recruit teachers in their school to participate in the study. Three different alternatives as to how the survey was administered, were described. Thirteen prinicipals chose the option of the senior author coming to a teacher staff meeting in order explain the study and for teachers to complete the questionnaire on site. Twelve schools opted to print off and distribute the questionnaire by themselves and to send them back to the researcher with each questionnaire being in an individually sealed envelope to ensure confidentiality. The questionnaire did not ask for participants to reveal their grade level to ensure confidentiality. In many smaller schools, this

may have revealed teachers' identity. A printing/photocopying and postage reimbursement form was provided on the project website, which could be filled out with the necessary bank information and included in the package. Third, the researcher offered to send the respective number of questionnaires including individual envelopes for each questionnaire as well as a large business reply envelope addressed to the researcher in which to send the completed questionnaires back. Twelve schools chose this option. Principals were also offered an individual summary report for their schools if a minimum of five teachers completed a questionnaire. Five schools requested an individual summary. Finally, the letter outlined that a summary of the results of the study would be posted on the website upon completion of data analyses. Four weeks later, a follow-up reminder email was sent out.

Initially, approval from the Ministry of Education to conduct a survey in the Baden-Württemberg school system was obtained. Then a list of all elementary schools was obtained from the Baden-Württemberg Ministry of Education (Ministerium für Kultus, Jugend und Sport in Baden-Württemberg). In collaboration with administrators from the four districts in Baden-Württemberg elementary principals from at least four four counties were selected in each one of the four districts in Baden-Württemberg (Freiburg, Karlsruhe, Stuttgart, and Tübingen). A sampling list was established and principals were contacted by administrators from the respective district. One district administrator preferred providing the researcher with a list of school addresses. Then schools were contacted by a personalized E-mail from the researcher using Pegasus Mail.

The final sample consisted of 469 elementary teachers (grade levels 1 through 4) from 62 schools in Baden-Württemberg, Germany. Of those, thirteen principals had agreed to invite the researcher to a staff meeting to administer the survey package. A total of 49 general education

elementary schools were included and 13 special education elementary schools. The response

rate was calculated based on teacher counts in the participating schools ranged from 17.65% to

100.00% with an overall response rate of 60.56%.

Measures

Classroom Appraisal of Resources and Demands (CARD; Lambert, McCarthy, Abbott-

Shim, & Ullrich, 2008)

Classroom resources and demands were measured by the CARD (Lambert et al., 2008).

This instrument measures the situationally specific nature of teacher stress by examining

teachers' perceptions of classroom resources and demands. It consists of 84 items developed

based on a review of literature on teacher stress as well as interviews with teachers and

administrators (Lambert, O'Donnell, Kusherman, & McCarthy, 2006). The classroom demands

section examines how the classroom environment affects teachers. It consists of 35 items that ask

teachers to rate the severity of demands based on various aspects of the classroom using a five

point Likert scale ranging from 1, "Not Demanding," to 5, "Extremely Demanding." The

Classroom Resources scale has 30 items that address the helpfulness of various school resources.

Lambert, McCarthy, O'Donnell, and Melendres (2007) found high sample-specific

reliability for both the Demands scale score (Cronbach's alpha = .92) and for the Resources scale

score (α = .95). The same study also yielded factor analysis results that contribute to confirming

the construct validity of the two sections of the CARD (Resources and Demands). The

Administrative Demands subscale addresses demands associated with meetings, paperwork,

assessments, and various non-instructional duties. The Availability of Instructional Materials

subscale involves demands associated with access to materials and supplies. The Children with

Problem Behaviors subscale addresses the demands associated with behavior management and

interactions with children who present challenges to the learning environment. The Children with Other Special Needs subscale outlines demands involved with children who have needs in terms of language acquisition or other disabilities.

The Specialized Resources subscale refers to resources designed to help teachers with children who have special needs. The General Program Resources subscale allows the teachers to rate how helpful they perceive administrators, other teachers, general instructional materials, and staff development opportunities. The Additional Adults in the Classroom subscale refers to the help and support teachers receive from parents and other volunteers in the classroom. The Support Personnel subscale addresses the helpfulness of individuals within the school system who are charged with providing assistance to teachers, particularly for working with exceptional children. The Instructional Resources subscale involves ratings of the helpfulness of the supplies and material resources that are available for the teachers. All of the subscales and the total score for the Resources section yielded sample-specific information with adequate reliability (.828 to .951).

Preventive Resources Inventory (PRI) - Self-Acceptance scale (SAC; McCarthy, Lambert, & Ullrich, 2008).

The SAC scale from the PRI was used to measure teachers' preventive coping resources (McCarthy et al., 2008). It is a self-report measure designed to explore level of agreement with statements related to personal habits and perceived ability to prevent stressful reactions to life circumstances. The entire PRI contains 82 items and uses a five point Likert-like scale ranging from "Strongly Disagree" to "Strongly Agree." This instrument in its current version includes 5 scale scores and 18 subscale scores (Lambert, McCarthy, Gilbert, Sebree, & Steinley-Bumgarner, 2006), and it was judged to be too lengthy for use in the current study.

McCarthy et al. (2002) defined Self-acceptance as the degree to which one can accept and overcome personal strengths and weaknesses in demanding life situations. It has been related to level of perceived stress and burnout in teachers (Lambert et al., 2006; Lambert, McCarthy, O'Donnell, & Ullrich, 2008; McCarthy et al., 2002; 2006). The items on the Self-Acceptance scale follow a conceptual theme of balance and acceptance. The importance of those aspects as a preventive coping resource has previously been supported by research on the role of self-esteem as an anxiety buffer (Greenberg et al., 1992).

Lambert et al. (2006) confirmed the factor structure of the PRI suggested by McCarthy et al. (2002) using a modified version of the PRI with a sample of 344 undergraduate educational psychology students from a large, southwestern university. Lambert et al. (2006) hypothesized that Self-Acceptance would play the role of a higher-order factor and explain the covariances between the other three scales. Existing items were modified and additional items were written for each of the other three factors Perceived Control, Maintaining Perspective, and Social Resourcefulness as well as for the fifth factor labeled Scanning as another important aspect of coping (Aspinwall & Taylor, 1997). A confirmatory factor analysis supported the construct validity for the three primary preventive resources and the role of Self-Acceptance as a higher-order factor.

McCarthy et al. (2006) examined the relationship between preventive coping resources and burnout in a survey of 36 preschool and 112 elementary education teachers in North Carolina and South Carolina. The dependent or criterion variable (burnout) was measured by the Maslach Burnout Inventory (MBI). The independent or predictor variable (preventive coping resources) was measured by the PRI. Using Multiple Regression, they found that lower Self-Acceptance and being a first year teacher was associated with the EE component of burnout.

Cronbach's alpha was used to estimate sample-specific reliability estimates for the subscales and factors of the PRI. Cronbach's alphas as calculated in McCarthy et al. (2002) and Lambert et al. (2006) were as follows: Perceived Control (.909/.897), Maintaining Perspective (.870/.873), Social Resourcefulness (.873/.822), Self-Acceptance (.708/.850). The Cronbach's alpha for Scanning, a scale not used by McCarthy et al. (2002) was .861. Cronbach's Alpha for the SAC scale in this study was .835 (see Table 1).

Maslach Burnout Inventory - Educator Survey (MBI-ES)

The MBI-ES by Maslach et al. (1996) and the German version by Enzmann and Kleiber (MBI-D; 1989) were used to measure teacher burnout. The MBI assesses three dimensions of burnout: (1) Emotional Exhaustion (EE), (2) Depersonalization (DP), and (3) Personal Accomplishment (PA). It consists of 22 items related to the following three scales: EE is the central quality of the complex syndrome of burnout referring to feelings of being exhausted and overextended emotionally by contact with other people and work, DP refers to the development of a cynical stance toward the individuals one is working for, and PA refers to lowered feelings of competence and personal achievement in one's work (Maslach et al., 2001). Items are rated using a 7-point frequency scale ranging from "never" (score = 0) to "everyday" (score = 6). The 9 MBI items indicating EE ask participants to rate how frequently they experience fatigue, frustration, and interpersonal stress. Example items are, "Working with people all day is really a strain for me" and "I feel frustrated by my job." The DP scale is comprised of 5 items which relate to negative experiences with colleagues and clients. Examples of DP items are, "I feel that I treat my students as if they were impersonal objects" and "I don't really care what happens to some students." The PA subscale has 8 items and asks about positive job experiences. Examples of items indicating PA are, "I feel exhilarated after working closely with my students" and "I

have achieved many worthwhile things in this job." Higher scores both on the EE and the DP subscale indicate greater risk for burnout symptoms. To facilitate data analysis, the PA scores were reverse coded (to make higher scores on the PA scale correspond with higher burnout levels) (McCarthy et al., 2006). The average score of each of those three scales was the overall burnout score for each participant in this study. Scores in the upper third of the normative distribution of the MBI are considered high (Maslach & Jackson, 1985).

The MBI has been used in over 90% of the research on burnout (Hastings et al., 2004). The MBI Manual (Maslach et al., 1997) provides a review of the extensive research that has been conducted on the psychometric properties of the MBI in many countries, which support the validity of the three-dimensional structure of the measure; however, more recent research has suggested that burnout may consist of four constructs: The three measured in this study and a fourth one called cynicism (Salanova et al., 2005).

Maslach et al. (1997) also conducted research on the validity and reliability of the MBI-ES and reported Cronbach's alphas ranging from .88 to .90 for EE, .74 to .76 for DP, and .72 to .76 for PA. The overall Cronbach's alpha for the MBI in a study conducted by Lambert et al. (2009) was .909 with values of .903, .684, and .750 for the EE, DP, and PA scales. Cronbach's Alpha reliability coefficients for the U.S. and the German teacher sample examined in this study are reported in Table 1.

Translation. The German translations of the CARD and the PRI were completed using accepted translation procedures (Hambleton & Patsula, 2000). The first author, who is a native German speaker, conducted the initial translations of the instruments. They were translated back into English by a university graduate student and professional translator as well as a professor from the Department of Language and Culture Studies, who was also a native speaker of

German. Backward translation designs are popular for test adaptation (Hambleton & Patsula, 2000); however, the fact that a test can be back-translated correctly is not necessarily a guarantee of the validity of the target language test version. Therefore, a panel consisting of one of the authors of the instruments, the two native German speakers, and a professional translator met to compare and reconcile the original and the back-translated source language versions. Cultural and systemic differences in the school systems of the U.S. and Germany as well as language issues were discussed and various discrepancies resolved. This step included examination of semantic and idiomatic as well as experiential and conceptual equivalence (Hambleton & Patsula, 2000). Based on the panel discussion, modified versions of the target language instruments were finalized. The instrument was then field-tested with a small sample of German teachers from two of the participating schools.

<div align="center">Analyses</div>

In order to replicate the findings of McCarthy et al. (2009), we used hierarchical linear modeling (HLM) to nest teachers within the elementary schools where they worked at the time of the study. HLM was used to facilitate variance decomposition in order to examine the source of variability in burnout responses between schools to address the first research question and for teachers within schools to address the second research question. As suggested by McCarthy et al. (2009), if we found between-school variance, this would suggest the importance of school-level demographic, organizational, and structural factors in contributing to teacher burnout in a school. Conversely, if little between-school variance was found in burnout symptoms, it would suggest the viability of transactional perspectives on stress and coping (Lazarus & Folkman, 1984), which presumes that stress, and ultimately burnout, results from appraisal transactions about both environmental demands and resources for coping.

A multivariate three-level measurement model was used, in which teachers were nested within their schools (third level). Scale scores were nested within teachers (second level). MBI items were nested within their scales (first level). The highest two levels of the model (levels 2 and 3) can be thought of as a multivariate two-level model for the latent scores for each construct, and the lowest level (level 1) served as a measurement model. It was used to estimate the latent scores for each construct. It may also be viewed as analogous to a Confirmatory Factor Analysis (CFA) model as the items within the measures are nested within their scale scores. This method also allows for partitioning the total variation in a scale score into three components: Variation among schools, variation among teachers, and variation within teachers among item scores in one scale. Level two serves as the between-persons model and level three as the between-schools model (Raudenbush, Rowan, & Kang, 1991). See Raudenbush et al. (1991) for further details concerning this type of modeling and an example of this type of analysis.

An initial unconditional model was specified that contained no predictors and was used to estimate the decomposition of the variance in the outcome measures into the components that were between MBI items within teachers, between teachers, and between schools. This analysis addressed the first research question.

Next, following the data analysis strategy used by McCarthy et al. (2009), conditional models were specified to include the predictor variables to address research question two. The first level nested the items of the Maslach Burnout Inventory (MBI) within their respective scales. Each individual teacher's response to a specific MBI item was the dependent variable in this model. The model contained no intercept, and three uncentered dummy predictor variables, each indicating the scale score assignment for each given item response (Raudenbush & Bryk, 2002). The estimated coefficient for each of these three dummy variables (π_{pjk}) can be interpreted

as the mean score for each person on one of the three MBI scales (EE, DP, and PA), and is the model estimated latent score for teacher j within school k on construct p (burnout scale score). The term "latent" means that an underlying construct or property of a person (burnout) is estimated using the information from the items in the model. The model also includes a residual term that represents the item effect within respondent, or, in this case, the within-teacher error around a teacher's mean for each construct. The MBI total score was also modeled in a similar but separate univariate model where the level one model contained only an intercept and error term and in this way nested all item responses within a single construct, overall burnout symptoms.

The second-level model was a multivariate one in which the dependent variables (π_{pjk}) were the latent total scores for each teacher on each construct, in this case the scale scores from the MBI. Therefore, the level two models nested scale scores within teachers. Demographic predictor variables included the teachers' years of experience and the total number of years they worked at their current school (each entered as group mean centered), a dummy variable indicating whether teachers were new to the profession (entered as uncentered), and a dummy variable indicating whether they were new to their current school (entered as uncentered). We also included three other predictors based on perceptions of demands and resources: the Self-Acceptance scale score from the PRI, and two predictors derived from the CARD: The total scores for the classroom demands scale and a "classroom stress" score (entered as group mean centered). The CARD and SAC scale score were standardized ($M = 0$, $SD = 1$) prior to entry into the models to enhance the interpretation of their coefficients as standardized beta weights.

The models include intercepts (β_{pk}) that can be interpreted as the mean for school k for construct p, that is each MBI scale score. Due to the centering decisions we made, the intercepts

in these models can be interpreted as the school-level mean for each construct for teachers who were not new to their schools or to the education profession and had the school mean number of years of experience. These models include residual terms that represent the teacher effect around the school mean.

The third level nested teachers within their schools. The dependent variables for these models were the school means (β_{pk}). These models contained an intercept (γ_p) that can be interpreted as the grand mean for construct p or each MBI scale score. The residual term in these models represents the school-specific effect, or error around the grand mean. Predictor variables were not entered into the level three models, because the purpose of this study was to test the transactional model of stress and coping by examining the variance decomposition and to determine whether there will be sufficient between-school variance to warrant the measurement and modeling of school-level contextual variables in future research.

Again following procedures used by McCarthy et al. (2009), the classroom stress score from the CARD was calculated for each respondent by computing the difference between her/his total score for the demands section of the CARD and the total score for the resources section of the CARD. This was done to test the prediction of transactional models of stress and coping that teachers who rated demands greater than available resources would be at risk for experiencing occupational stress. We used the general form of the reliability of a difference score formula that allows for different variances for each of the component scale scores (Crocker & Algina, 1986) to examine the reliability of the stress score. Given the high reliabilities of the scale scores (demands, α =.926), resources, α =.945) and the relatively low correlation between the scales. The reliability of the difference score for this sample was .965. The reliability of the difference score, using the same method, in previous studies was .945 (McCarthy et al., 2009), .949

(Lambert, 2009) and .950 (Lambert, O'Donnell et al., 2006). Table 1 contains the reliability coefficients and the correlation matrix for all measures used in the models. It should be noted that these correlation coefficients reflect the ordinary relation between the variables, without respect to the nesting of teachers within schools.

Results

Data were screened prior to beginning analyses as to whether they conformed to the assumptions of using the proposed analytic methods. The intercorrelations between the scales used in this study as well as reliability coefficients for internal consistency (Cronbach's Alpha) for each scale score of both samples are reported in Table 1. The results indicated that the reliabilities of all scales can be considered satisfactory (α between .623 and .881).

HLM models assume that the error variance term in level 1 is normally distributed with a mean of zero and a constant variance. Therefore, the variances and distributional properties of the item responses were examined. It was found that distributions of item responses were approximately symmetric and the variances were similar. Some item responses had more positively skewed distribution, i.e., the perceptions or behaviors assessed by those items were reported to occur less often than others. These items consequently had smaller variances. Given that the estimation process in HLM models is likely to be unaffected substantially if items are reasonably symmetrically distributed and if they have relatively similar variances, a decision was made not to transform those items and to proceed using them in their original scaling in the following analyses (Raudenbush & Bryk, 2002). Nine participants were eliminated due to missing data.

Variance in Burnout Symptoms between Schools – Research Question One

In order to test each HLM model, the first step was to fit unconditional models for both the MBI scale scores and the total score. For that purpose the level 2 variables were aggregated to the school level. Variability in burnout between schools was then examined. Initially this was done using a random-effects model for all three MBI scale scores; however, this model did not converge on an interpretable solution. Similar to what McCarthy et al. (2009) found, this was not due to model misspecification. The reason was the lack of between-school variance to model several of the outcome measures.

For the total score, most of the variance across the 9,965 item responses (22 items within 460 respondents) was between items within persons (84.19%) and ranged from 81.31 to 87.65 percent. Differences between teachers accounted for 15.81% of the variance, and 0.003% of the variance was found between schools. Table 2 also provides the values obtained from the unconditional models for each MBI scale score for the German sample.

Between teacher variance ranged from 18.67% of total variance for the EE scale to 12.35% for the PA scale. The percentage of variance between schools ranged from as little as 0.0016% for the PA scale to 0.0170% for the EE scale.

U.S. sample. McCarthy et al. (2009) found that most of the variance across the 9,922 item responses (22 items within 451 participants) was between items within persons (84.01%). Differences between teachers accounted for 14.91% of the variance and 1.08% of the variance was found between schools.

They also found that between teacher variance ranged from as much as 28.9% of the total variance for the EE scale to 9.6% for the PA scale. The percentage of variance between schools ranged from as little as 0.5% for the PA scale to 2.1% for the EE scale.

Comparing variance decomposition in the two samples. In answering research question three, this suggests that individual teacher appraisal of resources and demands was a stronger indicator of burnout than school level variables.

In the German teacher sample, the same pattern could be observed except that the percentage of variance between schools was even smaller. This result indicates that in both samples there was very little variability in burnout between schools. Based on the extremely small amount of between-school variance, the same decision was made, which was not to proceed entering level 3 predictors into the models. Those would have been the aggregated scores (from teacher to school level) for the 5 variables New to teaching, New to school, Demands, Stress, and Self-acceptance.

In addition, very similar to the findings of McCarthy et al. (2009), sufficient between-teacher variance was found for the EE and the total MBI score. Therefore, both were tested within random-effects models. Person mean and school mean reliabilities were slightly lower but acceptable in the German sample (.6 and .8) for both of these scale score models. For the DP and PA scale scores not enough variance was found between teachers within schools to use random effects models. The HLM person mean and school mean reliabilities for both of these scales were less than .5 when the models were initially attempted as random-effects models. This further confirmed the decision to forego using the random effects models for these outcomes. Since random-effects models were not used for DP and PA, the variance covariance matrices (τ matrices) that were estimated, did not include the covariances between these MBI scale scores or their respective school means. Therefore, like in McCarthy's study one advantage of the HLM measurement model approach was not realized in the analysis of the German sample either;

however, since the variance between schools was very low in both samples, nesting effects on this level were not a concern anyways.

When the unconditional models were initially estimated using random effects for all MBI outcomes, the correlations between the scale scores were considerably higher (above .7) than those presented in Table 1, which indicates that the constructs may be more related when the nested structure of teachers within schools data set is taken into consideration than what has been reported in single-level analyses. This was also the case in the U.S. sample.

Difference between special and general education. An examination of differences between special and general education teachers was not the purpose of this investigation and was not possible for the U.S. sample, because the questionnaire did not assess type of school or type of teacher; however, in the German sample such an analysis was performed since special education teachers could easily be identified, because they usually teach in special schools. A univariate analysis of variance (ANOVA) was conducted to examine if there was a difference between general (n=371) and special educators (n=94) for the variables stress and burnout. The Levene's test for homogeneity of variances was not statistically significant. There were no statistically significant differences between general and special educators, the means for burnout as well as for stress were approximately the same.

Research Question Two

Results of the analysis of the level 2 predictors used to answer research question two are reported in Table 3. The first two columns show the intercepts, or grand means, for the unconditional and conditional models. The small differences in these values for each outcome indicate the difference between the overall mean for all teachers (the unconditional model) and the overall mean for teachers within a school who are not new to the school and not new to

teaching (conditional model). This small difference illustrates the relatively small explanatory power of the variable Years of experience.

The intercept (school mean) becomes the DV in the level 3 model (for teachers within a school in number of years of experience). The variable years of experience was group-mean centered and predicted the BO school mean for teachers within a school in number of years of experience.

Relationships between EE and Level 2 Predictors

In the German sample, the EE scale score from the MBI was related to years at current school, but in the opposite direction than in the U.S. sample (U.S. $\beta=0.024$/ German $\beta=-0.010$). In the German sample being new to teaching was also negatively related to EE ($\beta=-0.248$), whereas in the U.S. sample it was not related. In both samples, EE was related to classroom demands (German $\beta=0.199$/ U.S. $\beta=0.224$). Similarly, EE and stress were not related in the German sample, but only in the U.S. sample ($\beta=.190$). Self-Acceptance (preventive coping) and EE were inversely related in both samples (German $\beta=-0.314$/ U.S. $\beta=-.305$). In the U.S. sample this model explained 36.1% of the between-teacher variance in EE. The deviance test comparing the explanatory power of the conditional model with the unconditional model (no predictors) was statistically significant ($\chi^2_{(21)}=394.13$, $p<.001$), indicating the value of the predictors.

In the German sample this model explained 65.1% of the between-teacher variance in EE. This percentage could be calculated by dividing the variance component for EE in the conditional model with all predictors (EE variance left over and not explained after all predictor variables have been modeled) by the variance component for EE in the unconditional model and subtracting it from 1. The deviance test comparing the explanatory power of the conditional

model with the unconditional model (no predictors) was statistically significant ($\chi^2_{(390)}$ =635.14, p<.001), indicating the value of the predictors.

Relationships between DP and PA and Level 2 Predictors

In the U.S. sample, the DP scale score was related to stress (β =.169) and inversely to preventive coping (β = -.154). The PA scale score was related to classroom demands (β =.158) and inversely to preventive coping (β = -.280). The remaining predictors were not statistically significantly related to the outcome measures in either model.

In the German sample, the DP scale score was related to more predictors than in the U.S. sample but not to stress. Like in the U.S. sample, DP was also inversely related to Self-Acceptance (β = -0.263), but stronger (U.S. sample β = -0.154). Different than in the U.S. sample, DP was additionally related to classroom demands (β = 0.217), to years of experience (β = 0.013) and inversely to years at current school (β = -0.019).

The PA scale score in the German sample was related to classroom demands (β = 0.110) (U.S. sample β = 0.158), inversely to Self-Acceptance (β = -.225) (U.S. sample preventive coping β = -.280), and different from the U.S. sample, it was additionally related to stress (β = 0.129). The remaining predictors were not statistically significantly related to the outcome measures in either model.

The Relationship between Total Burnout and Level 2 Predictors

The total burnout score in both samples was related to the same predictors. In the U.S. sample it was related to years at current school (β = .015), but in the German sample it was inversely related to years at current school (β = -0.011). In both samples the total burnout score was related to classroom demands (U.S. β = .159/ German β = 0.177), to stress (U.S. β = .129/

German $\beta = 0.100$), and in both samples it was inversely related to preventive coping (Self-acceptance) (U.S. $\beta = -.261$/ German $\beta = -.271$).

In the U.S. sample, this model explained 37.3% of the between-teacher variance in burnout. The deviance test comparing the explanatory power of the conditional model with the unconditional model (no predictors) was statistically significant ($\chi^2_{(7)} = 154.44$, $p<.001$), indicating the value of the predictors.

In the German sample, this model explained 46.3% of the between-teacher variance in burnout. Again, this percentage was calculated by dividing the variance component for total burnout in the (univariate) conditional model with all predictors (EE variance left over and not explained after all predictor variables have been modeled) by the variance component for total burnout in the unconditional model (for total burnout) and subtracting it from 1. The deviance test comparing the explanatory power of the conditional model with the unconditional model (no predictors) was statistically significant ($\chi^2_{(391)} = 1263.08$, $p<.001$), indicating the value of the predictors.

Discussion

The results of using HLM analyses to facilitate variance decomposition in this study for research question one suggested that the majority of variance occurred between teachers, which is also what McCarthy et al. (2009) found for U.S. elementary teachers. In other words, teachers' experience of burnout in both countries appeared to have little to do with differences between individual schools. The most variance was accounted for by individual differences within teachers, suggesting that individual perceptions of the balance between resources and demands were most predictive of burnout. This may suggest the accuracy of transactional models of stress

and coping. According to Lazarus and Folkman (1984) stress results from individual cognitive appraisals of demands and resources.

McCarthy et al. (2009) found little variance between schools in U.S. teacher burnout symptoms, and the variation between schools was even lower for German elementary teachers in this sample. The fact that there was no difference for the variables examined between special and general education teachers in the German sample in this study is also supportive of transactional models of stress.

Research question two addressed whether there was an association between individual teacher factors (perceived classroom demands, stress, teacher's Self-acceptance scores, and teaching experience) and burnout symptoms. The central component of the burnout construct as suggested by Maslach and colleagues (1986), emotional exhaustion, was predicted by a number of variables in McCarthy et al.'s (2009) study of U.S. teachers: years at their current school, classroom demands, stress, and preventive coping resources. These variables accounted for approximately one third of the variance in EE, which is not surprising given that EE is the most obvious manifestation of the burnout syndrome (Taris et al., 2005; Brouwers & Tomic, 2000).

It was interesting that among U.S. teachers, teachers with more experience at the same school reported higher levels of burnout. Teachers in the U.S. sample scored higher on EE the longer they worked at a school, while the opposite was the case for the teachers in this study: we found that as German teachers' time spent in a school increased, the level of EE decreased. In addition, being a new German elementary teacher was associated with lower levels of EE. Finally, the stress score did not predict EE in the German sample. This result is in line with the finding that demands were perceived to be higher in the U.S. sample than in the German sample (Ullrich, 2009). It may suggest that for U.S. teachers, tenure in a school contributes to their

perceptions of more demands and fewer resources. Although it is beyond the scope of the current study to further explain this finding, McCarthy et al. (2009) speculated that more experienced teachers may sometimes be given greater non-classroom responsibilities and administrative functions. They may also be assigned a proportionally greater number of students with challenging behavior.

For German teachers, EE decreased with increasing experience and was lower for new teachers. This model explained more than two thirds of the between-teacher variance in EE. The finding that EE goes down if experience increases may be explained by the fact that with experience, skills in coping with the demands of teaching increase, because teachers develop routines and a classroom management repertoire. New teachers may benefit from a sense of invigoration and moral responsibility, which motivated them to choose teaching as a career. The fact that EE was lower for new teachers in the German sample may be attributed to a good system of support or teacher induction process, which needs further investigation.

In the McCarthy et al. study, only the classroom stress score from the CARD and lower preventive coping resources predicted symptoms of DP (evaluation of others component) (see Table 2). In the German sample, DP was predicted by demands and by SAC. Like EE, it was not predicted by classroom stress. In addition, DP increased with an increasing number of years of teaching experience, but it decreased with an increasing number of years at the current school.

A possible explanation for this finding may be that for the German sample with a higher number of years taught at the same school, social support through the development of long-term relationships with colleagues becomes stronger, which may serve as a buffer for the DP dimension of burnout. This supports findings from other studies which found social support to be an important buffering factor. For example, Greenglass et al. (1996) found that support from

coworkers and supervisors protected teachers from depersonalization. Therefore, similar to what McCarthy et al. (2009) suggested, there is a need for administrators in schools to facilitate more formalized opportunities for teachers to support each other, e.g., structured mentoring programs or staff development activities. This finding confirms the importance of promoting a sense of community and collaboration among teachers, which may attenuate the impact of stressors and contribute to a decrease in the depersonalization dimension of burnout.

The fact that years at current school was inversely related to the EE and DP dimension of burnout in the German sample, indicates an important difference between the two samples. On the other hand, years of experience in teaching was positively associated with the DP dimension of burnout in the German sample. This is worthy of a note in light of Hughes' (2001) finding that many teachers who wish to leave the profession may be unable to do so for reasons such as unavailability of alternative work or geographic immobility. As a consequence they stay in the profession in spite of being burned out, which may include emotional detachment or depersonalization as a form of coping (Maslach et al., 2001). Dworkin (1986) also suggested that teacher entrapment is a problem in schools, i.e., many teachers spend their entire career in a surrounding that they dislike and that they would like to leave, but because they fear a loss of personal safety they stay based on the relatively stable conditions and benefits that are associated with teaching positions. Interestingly, Maslach et al. suggested that the burnout component EE can be interpreted as a coping mechanism, which prompts individuals to distance themselves from work-related matters or relationships, therefore leading to DP (McCarthy et al., 2006).

In the McCarthy et al. study, only classroom demands and preventive coping predicted lack of PA (evaluation of self component). Given that a decline in PA is associated with lowered feelings of efficacy in one's work (Maslach et al., 2001), it is not surprising that excessive

demands would lead to reduced feelings of accomplishment. Interestingly, teachers' scores on preventive resources were an even stronger predictor of reduced PA (β = -0.280 for preventive resources versus β = 0.158 for classroom demands). This makes sense given that EE and DP may emerge from external factors such as work overload and social conflict, whereas the decreased efficacy associated with lower PA seems to arise more clearly from insufficient personal resources (Maslach et al., 2001).

In the German sample, lack of PA was also predicted by classroom demands and Self-acceptance. It is an important difference that PA was the only burnout dimension that was predicted by stress, whereas it was in the U.S. sample the only burnout dimension, which was not predicted by stress (see Table 2). Stress (in this study defined as perceived imbalance between resources and demands) was a strong predictor of PA, the evaluation of self component in the burnout construct in the German sample. But in the U.S. sample stress predicted only the DP (evaluation of others) and EE (stress component) dimensions of burnout. While a causal explanation for those findings is beyond the scope of this study, this is a difference that deserves further investigation.

The total burnout score was associated in the predicted directions with four variables in both samples, namely classroom stress, classroom demands, preventive coping (Self-acceptance for the German teachers in this study), and years at current school; however, in the German sample burnout decreased if the number of years at the current school increased while it increased in the U.S. sample if the number of years at the current school increased. This model accounted for 37.3% of the between-teacher variance in burnout in the U.S. sample and for 46.3% in the German sample.

The results of the HLM analyses for the U.S. sample suggested that increased experience at the current school was associated with both symptoms of EE and overall feelings of burnout. In contrast, it appeared that in the German sample more experience at the current school functioned as a buffer for EE, for DP, and for total burnout. It was also associated with lack of PA in teachers in the same direction, but it was not statistically significant.

According to Shirom and Mazeh (1988), levels of burnout vary across the career span and cycle from high to low over approximately 5-year periods. This being said, a higher number of years spent at the same school would not predict burnout, but rather a teacher's place in the cycling period.

In addition, Savicki (2002) found in a pan-cultural analysis of burnout in child care workers in 13 cultures that individuals in the low burnout configuration group were significantly older than in the mixed and high burnout configuration groups. The fact that the German teacher sample was older could therefore be another possible explanation for this finding. Older age being related to lower burnout is a consistent finding in the literature. Two possible reasons exist for this relationship. First, it may be that only teachers with good coping skills continue teaching, which would explain if burnout went down with increased number of years at the current school. The second explanation is more probable, i.e., teachers gain experience, which helps them to focus on developing their teaching skills, their coping strategies, and on actively working towards creating a good environment for themselves.

McCarthy et al. (2009) suggested that elementary school administrators should consider teacher stress as an important contextual variable when allocating classroom resources, because teachers' professional functioning may be affected by perceived inequalities between classrooms with respect to such factors as number of children with special needs, available sources of

support and assistance in the classroom, and duties outside the classroom. Administrators may need to assess the classroom social environment early in the academic year and consider reallocating resources so that teachers perceive equity in these factors. In addition, teachers with more experience should not be considered immune to the effects of stress.

As for the German sample, a stronger focus should be directed towards promoting preventive resources, social support, and on reducing classroom demands, in particular administrative demands, and other student-related demands. Efforts to attenuate teacher stress and burnout should focus on establishing learning communities for teachers, where ongoing, collaborative opportunities for teacher learning are encouraged and teachers can benefit from each other's expertise and experience. For example, the formation of support teams, which collaborate with teachers in helping individual children with learning or other behavior difficulties may be very helpful for teachers to reduce classroom demands.

Summary

In both the study by McCarthy et al. and this study, the strongest predictor for all burnout dimensions and the total burnout score was preventive coping or Self-acceptance, which substantiates empirically the importance of this factor. Findings suggest that it may serve as a mediator variable through which effects of environmental stressors are filtered (Lambert et al., 2006). The finding that both personality-related and classroom demands are associated with burnout dimensions is consistent with most recent research (Kokkinos et al., 2005; Kokkinos, 2007).

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Table 1

Correlation Matrix and Reliability Coefficients for All Scale Scores

Measure	U.S. Sample										German Sample									
	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10
1. Years of Experience	*										*									
2. Years at Current School	.652	*									.740	*								
Preventive Resources Inventory																				
3. Self-acceptance	.058	.046	.842								.045	.002	.835							
Classroom Appraisal of Resources and Demands																				
4. Demands	.086	-.137	.130	.926							.099	.054	-.241	.932						
5. Stress	.050	.094	-.073	.738	.945						.096	.011	-.273	.778	.965					
6. Challenging Student Behavior	-.071	-.001	-.078	.625	.453	.892					.078	.049	-.178	.732	.523	.909				
Maslach Burnout Inventory																				
7. Emotional Exhaustion	.018	.118	-.371	.415	.319	.348	.859				.062	.008	-.459	.459	.427	.375	.853			
8. Depersonalization	.038	.099	-.185	.257	.210	.201	.556	.630			.016	-.070	-.223	.248	.283	.156	.492	.619		
9. Personal Accomplishment	-.028	.011	-.403	.364	.228	.255	.651	.426	.623		-.008	-.072	-.397	.324	.382	.288	.635	.485	.604	
10. Total Score	.012	.098	-.394	.426	.314	.338	.938	.727	.813	.881	.034	-.039	-.454	.439	.452	.354	.919	.703	.843	.868

NOTE. - All correlation coefficients greater than or equal to .155 are statistically significant at p < .001 given *n* = 451. Reliability coefficients are reported in the main diagonal.

* Reliability coefficent not applicable for this variable because it is not a scale measure.

All correlation coefficients greater than or equal to .091 are statistically significant at p < .001 given n = 469. Reliability coefficients are reported in the main diagonal.

Table 2

Teacher-level Models

Maslach Burnout Inventory Scale	Unconditional model intercept	Conditional intercept	Years of teaching experience	Years at current school	New to teaching	New to school	Classroom demands	Stress	Self-acceptance
Emotional exhaustion									
β	1.384	1.388	0.006	-0.01	-0.248	0.016	0.199	0.095	-0.314
SE	0.036	0.039	0.004	0.005	0.107	0.087	0.049	0.051	0.040
p	0.000	0.000	0.149	0.024	0.021	0.857	0.000	0.062	0.000
Depersonalization									
β	1.601	1.604	0.013	-0.019	-0.029	-0.022	0.217	0.080	-0.263
SE	0.034	0.035	0.005	0.006	0.109	0.097	0.058	0.051	0.042
p	0.000	0.000	0.004	0.002	0.789	0.82	0.000	0.120	0.000
Personal accomplishment									
β	1.534	1.534	0,000	-0.004	0.014	0.002	0.110	0.129	-0.225
SE	0.033	0.034	0.004	0.006	0.152	0.068	0.055	0.055	0.040
p	0.000	0.000	0.942	0.452	0.929	0.979	0.045	0.020	0.000
Total score									
β	1.500	1.501	0.006	-0.011	-0.113	0.002	0.177	0.100	-0.271
SE	0.030	0.032	0.004	0.005	0.100	0.074	0.045	0.043	0.038
p	0.000	0.000	0.096	0.016	0.261	0.975	0.000	0.021	0.000

Note . N = 460 teachers within 62 schools