

**The Teacher-Student Relationship is Beneficial for Both Sides:  
Associations with Students' School Adjustment and  
Teachers' Occupational Well-Being**

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## Zusammenfassung

Auf die Frage danach, was eine gute Lehrkraft und guten Unterricht ausmacht, haben die meisten Menschen intuitiv eine Antwort (Terhart, 2007). Dabei wird insbesondere die Bedeutung einer positiven Lehrer-Schüler-Beziehung für die Motivation und den Lernerfolg der Schülerinnen und Schüler betont (Spiegel Online, 2014). Auch aus wissenschaftlicher Perspektive erscheint diese Annahme berechtigt: Spätestens seit John Hatties Meta-Analyse ist bekannt, dass die Lehrer-Schüler-Beziehung in bedeutsamem Zusammenhang mit dem Lernen der Schülerinnen und Schüler steht (Hattie, 2009). Darüber hinaus zeigten sich in anderen Arbeiten Zusammenhänge mit der psychosozialen Entwicklung der Lernenden (z.B. Kunter et al., 2013; Roorda, Koomen, Spilt & Oort, 2011). Insgesamt lag dabei der Fokus allerdings auf fachspezifischen Outcomes wie dem Selbstkonzept oder dem Engagement im Unterricht der entsprechenden Lehrkraft. Die Frage danach, ob die Lehrer-Schüler-Beziehung auch mit allgemeinen Aspekten der schulischen Anpassung beispielsweise Schulzufriedenheit und Selbstwert in Zusammenhang steht, kann daher bislang nicht beantwortet werden. Weiterhin wurde die Rolle der Lehrer-Schüler-Beziehung für das berufliche Wohlbefinden von Lehrkräften vergleichsweise selten erforscht. Dies ist überraschend, wenn man bedenkt, dass die Identifikation von Determinanten des beruflichen Wohlbefindens von Lehrkräften seit Langem Gegenstand empirischer Forschung und der Aufbau vertrauensvoller, enger Beziehungen zu den Lernenden ein wesentliches Merkmal des Lehrerberufs ist (Kyriacou, 2011; O'Connor, 2008).

Im Rahmen von drei empirischen Teilstudien untersucht die vorliegende Arbeit daher zwei zentrale Fragestellungen. Zum einen wird betrachtet, ob eine positive Lehrer-Schüler-Beziehung in Zusammenhang mit der allgemeinen schulischen Anpassung der Schülerinnen und Schüler steht. Zum anderen wird der Frage nachgegangen, ob die Lehrer-Schüler-Beziehung mit dem beruflichen Wohlbefinden von Lehrkräften im Sinne eines hohen beruflichen Enthusiasmus und geringerer emotionaler Erschöpfung assoziiert ist. Im Theorieteil der vorliegenden Arbeit wird zunächst der Begriff definiert und Merkmale einer positiven Lehrer-Schüler-Beziehung auf Basis der *Interpersonal Theory* (Kiesler, 1983; Leary, 1957; Wubbels, Créton, Levy & Hooymayers, 1993) und prominenter Modelle der Unterrichtsqualität herausgearbeitet (z.B. Hamre & Pianta, 2007; Kunter & Voss, 2013). Aus Perspektive der Bindungstheorie (Bowlby, 1969), des Transaktionalen Stressmodells (Lazarus & Folkman, 1984) sowie der Selbstbestimmungstheorie (Ryan & Deci, 2000) wird anschließend die Relevanz der Lehrer-Schüler-Beziehung für beide Akteure theoretisch abgeleitet. Daran anschließend wird der empirische Forschungsstand referiert und kritisch beleuchtet. Daraus werden die zentralen For-

schaftsfragen der vorliegenden Arbeit abgeleitet, welche die Grundlage für die drei empirischen Teilstudien bilden, die im Anschluss dargestellt werden. Die Ergebnisse der vorliegenden Arbeit werden in der abschließenden Gesamtdiskussion zusammengefasst, in den aktuellen Forschungsstand eingeordnet und ihr theoretischer Beitrag aufgezeigt. Zudem werden Limitationen diskutiert und ein Ausblick auf zukünftige Forschung sowie praktische Implikationen gegeben.

## Theoretischer Hintergrund

Grundlage der vorliegenden Arbeit bildet die Annahme, dass Beziehungen als Interaktionsmustern zwischen zwei Individuen definiert werden können (Berscheid & Reis, 1998). Interaktionen—Episoden in denen die Beteiligten sich wechselseitig beeinflussen—bilden demnach die Grundlage jeder Beziehung (Berscheid & Regan, 2005).

### *Soziale Interaktionen als Basis der Lehrer-Schüler-Beziehung*

Um aufzuzeigen, welche Aspekte positive Interaktionen und folglich eine positive Lehrer-Schüler-Beziehung kennzeichnen, wird zunächst ein allgemeines Modell vorgestellt. Die *Interpersonal Theory* (Kiesler, 1983; Leary, 1957) betrachtet *Nähe* (= *proximity*) und *Einfluss* (= *influence*) als zentrale Dimensionen, die zur Beschreibung sozialer Interaktionen herangezogen werden können. Nähe bezieht sich dabei ganz allgemein auf das Ausmaß an Kooperation und Zuwendung und steht im Gegensatz zu Abweisung. Einfluss beschreibt, wer die Interaktion lenkt und kann auf einem Kontinuum von Dominanz versus Unterordnung dargestellt werden. Eine weitere wichtige Annahme der *Interpersonal Theory* (Kiesler, 1983; Leary, 1957) ist, dass die Beteiligten ihr Verhalten während der Interaktion aneinander anpassen. In Bezug auf Nähe wird davon ausgegangen, dass zugewandtes Verhalten von Person A zu ähnlich positiven Reaktionen von Person B führt. In Bezug auf Einfluss wird angenommen, dass dominantes Verhalten von Person A zu entgegengesetzten Reaktionen von Person B führt und diese sich entsprechend unterordnet.

Wubbels et al. (1993) haben die *Interpersonal Theory* (Kiesler, 1983; Leary, 1957) auf die Lehrer-Schüler-Beziehung übertragen. Eine positive Beziehung kennzeichnet demzufolge ein hohes Maß an schüler- und lehrerseitiger Nähe bei gleichzeitiger Dominanz der Lehrkraft und Unterordnung der Schülerinnen und Schüler (Brekelmans, Wubbels & Levy, 1993). Um zu spezifizieren, wie sich Nähe und Einfluss im interpersonellen Verhalten der Lehrkraft zeigen, wurden in der vorliegenden Arbeit prominenten Modellen der Unterrichtsqualität (Hamre



& Pianta, 2007; Kunter & Voss, 2013) herangezogen, in denen sich diese Dimensionen konsistent widerspiegeln.

*Nähe* drückt sich zum einen in einem hohen Ausmaß an emotionaler Unterstützung aus, das heißt die Lehrkraft zeigt Wertschätzung, Empathie, Verständnis und Interesse, respektiert die Lernenden als autonome Individuen und ist bei persönlichen Problemen ansprechbar (Hamre & Pianta, 2007; Kunter & Voss, 2013). Vielfach wird dieser Aspekt des interpersonellen Lehrerverhaltens mit dem Beziehungsbegriff gleichgesetzt (z.B. Kunter & Voss, 2013). Zum anderen kann jedoch auch die akademische Unterstützung als Aspekt der Lehrer-Schüler-Beziehung verstanden werden. Sie zeigt sich darin, dass die Lehrkraft ein angemessenes Tempo wählt, mit Fehlern konstruktiv umgeht und bei individuellen Lernschwierigkeiten geduldig bleibt (Klieme & Baumert, 2001; Kunter & Voss, 2013).

*Einfluss* bezieht sich auf das Ausmaß, in welchem die Lehrkraft die Lehrer-Schüler-Interaktion lenkt und Kontrolle über das Verhalten der Schülerinnen und Schüler ausübt (Wubbels et al., 1993). Ziel ist, dass die Lernenden ihr Verhalten an die Unterrichtssituation adaptieren und ein reibungsloser Stundenverlauf sichergestellt wird (Doyle, 2006). Dies kann zum Beispiel durch die Definition klarer Regeln und Verhaltenserwartungen durch die Lehrkraft sowie eine unmittelbare und konsistente Reaktion bei unerwünschtem Schülerverhalten gelingen (Emmer & Stough, 2001).

Vor dem Hintergrund, dass wechselseitige Interaktionen Grundlage der Lehrer-Schüler-Beziehung sind, stellte sich außerdem die Frage, wie sich das interpersonelle Verhalten der Schüler und Schülerinnen beschreiben lässt: Schülerseitige Nähe zeigt sich darin, dass sie Kontakt zu der Lehrkraft suchen und sich bei Problemen an sie wenden (Pianta, 2001). Auf Basis der *Interpersonal Theory* (Kiesler, 1983; Leary, 1957) kann angenommen werden, dass diese Verhaltensweisen vor allem dann auftreten, wenn die Lehrkraft ein hohes Maß an Unterstützung und Zuwendung zeigt (Pennings et al., 2014). Schülerseitiger Einfluss, was entsprechend der *Interpersonal Theory* (Kiesler, 1983; Leary, 1957) ein Indikator für mangelnde Lenkung durch die Lehrkraft ist, spiegelt sich in einem hohen Maß an Disziplinproblemen wie Unterrichtsstörungen, Verspätungen oder Schwänzen wider (Aloe, Shisler, Norris, Nickerson & Rinker, 2014). Nachdem die Dimensionen Einfluss und Nähe als zentrale Determinanten der Beziehungsqualität herausgearbeitet wurden, werden im Folgenden theoretische Perspektiven vorgestellt, um ihre Relevanz für die Entwicklung der Lernenden und der Lehrkraft abzuleiten.

*Theoretische Perspektiven zur Rolle der Lehrer-Schüler-Beziehung*

Die vorliegende Arbeit begründet die Bedeutung der Lehrer-Schüler-Beziehung vor dem Hintergrund dreier zentraler Theorien: Aus einer bindungstheoretischen Perspektive (Bowlby, 1969; Pianta, 1999) wird die Relevanz der Lehrer-Schüler-Beziehung vor allem darin gesehen, Kindern eine sichere Basis zu bieten. Schließlich wird durch die Lehrer-Schüler-Beziehung das angeborene Bedürfnis nach einer engen Bindung zu einer Bezugsperson erfüllt, die dem Kind Sicherheit und Schutz bietet und es dadurch zu Explorationsverhalten anregt. Ähnlich wie Mary Ainsworth, welche die Sensitivität der Mutter für die Signale und Bedürfnisse des Kindes als zentrale Voraussetzung für die Entstehung einer sicheren Bindung ansah (Ainsworth, Blehar, Waters & Wall, 1978), betont Pianta (1999) die Bedeutung der Sensitivität der Lehrkraft für eine positive Lehrer-Schüler-Beziehung. Im Rahmen der Bindungstheorie (Bowlby, 1969) wird außerdem angenommen, dass potentielle Bezugspersonen von Natur aus dazu tendieren, in entsprechender Weise auf Kinder zu reagieren. Dementsprechend könnte es gerade für Lehrkräfte bedeutsam sein, eine sichere Bindung zu ihren Schülerinnen und Schülern aufzubauen, da Fürsorglichkeit eng mit dem Beruf verbunden ist (O'Connor, 2008).

Die Bedeutsamkeit, die Lehrkräfte einer positiven Lehrer-Schüler-Beziehung zuschreiben, wird im anschließenden Abschnitt näher beleuchtet. Dabei werden sowohl die Etablierung enger persönlicher Beziehungen wie auch erfolgreiche Klassenführung als berufliche Ziele von Lehrkräften herausgearbeitet und entsprechende Studien angeführt (z.B. Butler, 2012; Hagger & Malmberg, 2011). Diese Überlegungen werden als Ausgangspunkt dafür gesehen, dass eine nicht gelingende Lehrer-Schüler-Beziehung zu verringertem beruflichem Wohlbefinden bei Lehrkräften führen könnte. Diese Annahme wurde mit dem Transaktionalen Stressmodell (Lazarus & Folkman, 1984) begründet. Demzufolge resultiert Stress dann, wenn durch äußere Stimuli die Erreichung subjektiv bedeutsamer Ziele gefährdet wird und eine Person nicht die notwendigen Ressourcen besitzt, um mit dieser Herausforderung umzugehen. Wenngleich diese Betrachtungsweise einen ersten Hinweis darauf gab, dass nicht gelingende Lehrer-Schüler-Beziehung das Wohlbefinden von Lehrkräften beeinträchtigen könnten, schloss sich die Frage nach den zugrundeliegenden psychologischen Prozessen an. In dieser Hinsicht wird in der vorliegenden Arbeit die Selbstbestimmungstheorie (Ryan & Deci, 2000) angeführt.

Aus Perspektive der Selbstbestimmungstheorie (Ryan & Deci, 2000) kann die Lehrer-Schüler-Beziehung als sozialer Kontext verstanden werden, der zur Befriedigung der psychologischen Grundbedürfnisse nach sozialer Eingebundenheit, Kompetenz und Autonomie beiträgt—sowohl für die Lernenden als auch für die Lehrkraft (Klassen, Perry & Frenzel, 2012;

Skinner & Belmont, 1993). Dies sollte nicht nur die Motivation, sondern auch die Persönlichkeitsentwicklung und das Wohlbefinden fördern (Ryan & Deci, 2000).

Die Zuwendung der Schülerinnen und Schüler sowie die emotionale Unterstützung durch die Lehrkraft können zur Erfüllung des Bedürfnisses nach sozialer Eingebundenheit auf beiden Seiten beitragen (Klassen et al., 2012; Niemiec & Ryan, 2009; Skinner & Belmont, 1993). Das Bedürfnis nach Kompetenz kann durch Einfluss und akademische Unterstützung der Lehrkraft erfüllt werden. Schließlich werden so eine effektive Nutzung der Lernzeit sowie Unterstützung bei Verständnisproblemen gewährleistet, sodass die Schülerinnen und Schüler ihr Wissen erweitern und die Lehrkräfte ihre Unterrichtsziele erreichen können (Brophy, 2006; Frenzel, 2014; Niemiec & Ryan, 2009). Zudem kann das Bedürfnis nach Autonomie der Lernenden durch die Lehrer-Schüler-Beziehung befriedigt werden, indem die Lehrkraft auf die individuellen Interessen und Bedürfnisse eingeht.

### *Empirischer Forschungsstand*

Bei der Darstellung des Forschungsstandes werden zunächst zwei Forschungslinien unterschieden, welche sich auf die schulische Anpassung der Schülerinnen und Schüler konzentrieren. Im Rahmen der ersten Forschungslinie liegt der Fokus auf der Entwicklung von Kindern im Vorschul- und Elementarbereich. Hier wird die Lehrer-Schüler-Beziehung zumeist mit der *Student-Teacher Relationship Scale* (Pianta, 2001) erfasst, welche das interpersonelle Verhalten individueller Schülerinnen und Schüler aus Perspektive der Lehrkraft misst (z.B. Baker, 2006; Hamre & Pianta, 2001). Im Rahmen der zweiten Forschungslinie wird dagegen das interpersonelle Verhalten der Lehrkraft fokussiert und Zusammenhänge mit der schulischen Anpassung im späten Grundschul- und Sekundarschulalter untersucht (z.B. Allen et al., 2013; Fauth, Decristan, Rieser, Klieme & Büttner, 2014). Dabei werden hauptsächlich Schüler- und Beobachterratings des Lehrerverhaltens eingesetzt. Die empirischen Befunde beider Forschungslinien deuten darauf hin, dass die Dimension Einfluss mit der Leistungsentwicklung der Schülerinnen und Schüler sowie ihrem Verhalten assoziiert ist beispielsweise mit behavioralem Engagement oder Disziplinverstößen. Zusammenhänge mit emotional-motivationalen Outcomes wie Freude, Interesse oder Selbstkonzept sind dagegen heterogen. Für die Dimension Nähe zeigen sich konsistente Zusammenhänge mit Outcomes sowohl im emotional-motivationalen als auch im behavioralen Bereich, nicht aber in Bezug auf die Schülerleistung. Erste Studien zeigen außerdem, dass die Erfüllung der psychologischen Grundbedürfnisse diese Zusammenhänge mediiert (z.B. Skinner, Furrer, Marchand & Kindermann, 2008).

Ein weiterer Forschungsstrang zur Lehrer-Schüler-Beziehung lässt sich in der Lehrerwohlbefindensforschung verorten und fokussiert daher weniger die Lernenden, sondern vielmehr die Lehrkräfte. Mit Blick auf erlebte schülerseitige Nähe erscheint ein Zusammenhang mit dem beruflichen Wohlbefinden aufgrund der sozialen Natur des Lehrerberufs theoretisch plausibel, jedoch wurde dies empirisch bislang kaum untersucht (Spilt, Koomen & Thijs, 2011). Im Gegensatz dazu wurde vielfach gezeigt, dass Lehrkräfte fehlenden Einfluss und Disziplinprobleme der Schülerinnen und Schüler als zentralen Stressor wahrnehmen, der mit einem verringerten Wohlbefinden assoziiert ist (für eine Zusammenfassung siehe Aloe et al., 2014).

### *Kritische Würdigung bisheriger Forschung*

Die Darstellung des aktuellen Forschungsstands hat gezeigt, dass die Bedeutung der Lehrer-Schüler-Beziehung für die schulische Anpassung der Lernenden sowie das berufliche Wohlbefinden der Lehrkräfte vielfältig untersucht wurde. Jede der drei Forschungslinien zeichnet sich dabei durch einige Stärken, aber auch Limitationen aus.

Im Rahmen der ersten Forschungslinie ist besonders der Fokus auf die dyadische Beziehung zwischen der Lehrkraft und den individuellen Lernenden positiv hervorzuheben. Kritisch kann allerdings angemerkt werden, dass die Befunde nur eingeschränkt Aussagen darüber erlauben, inwieweit die Lehrkraft die Entwicklung der Schülerinnen und Schüler positiv beeinflussen kann. Schließlich wird in dieser Forschungslinie vornehmlich das interpersonelle Verhalten der Lernenden erfasst. Die theoretische Annahme, dass dieses im Wesentlichen das interpersonelle Verhalten der Lehrkraft widerspiegelt (z.B. Bindungstheorie, Ainsworth et al., 1978; Interpersonal Theory, Kiesler, 1983), kann vor dem Hintergrund aktueller empirischer Befunde kritisch betrachtet werden (z.B. Doumen, Koomen, Buyse, Wouters & Verschueren, 2012; Hughes, Luo, Kwok & Loyd, 2008).

Die zweite Forschungslinie überwindet diese Limitation, indem sie sich auf das interpersonelle Verhalten der Lehrkraft fokussiert. Ein kritischer Aspekt ist allerdings, dass viele Arbeiten die Mehrebenenstruktur nicht adäquat berücksichtigen, die aus der Befragung ganzer Schulklassen resultiert. Dies birgt die Gefahr einer Unterschätzung der Standardfehler und erschwert zudem die Interpretierbarkeit der Befunde, da konzeptuell unterschiedliche Ebenen vermischt werden—die individuellen Wahrnehmungen auf Schülerebene und die geteilten Wahrnehmungen auf Klassenebene (Lüdtke, Robitzsch, Trautwein & Kunter, 2009; Raudenbush & Bryk, 2002). In der vorliegenden Arbeit wird daher der Nutzen von simultanen Analysen auf Schüler- und Klassenebene betont. Weiterhin ist in dieser Forschungslinie ein starker Fokus auf domänenspezifische Outcomes zu beobachten. Daher ist weitgehend unklar, inwiefern das interpersonelle Verhalten einer Lehrkraft mit der Entwicklung der Schülerinnen und

Schüler auch jenseits des entsprechenden Unterrichtsfachs in Zusammenhang steht. Zudem wurden bislang vornehmlich Schüler- und Beobachterratings zur Erfassung des Lehrerverhaltens herangezogen. In der vorliegenden Arbeit wird argumentiert, dass der zusätzliche Einbezug von Lehrerratings sinnvoll sein könnte, da diese aufgrund ihrer fachlichen Expertise Aspekte des Unterrichts wahrnehmen könnten, die perspektiven-spezifische Validität für die Vorhersage von Schüleroutcomes haben (Clausen, 2002; Kunter & Baumert, 2006).

Hinsichtlich der dritten Forschungslinie, die sich auf das Lehrerwohlbefinden fokussiert, kann zunächst ein starker Fokus auf die Dimension Einfluss beobachtet werden und Disziplinprobleme der Schülerinnen und Schüler wurden vielfältig als potentieller Stressor untersucht. Aspekte der Nähe und Zuneigung wurden dagegen seltener betrachtet, sodass hier ein deutlicher Forschungsbedarf besteht. Allerdings ist auch die Aussagekraft der zahlreichen Befunde zum Zusammenhang von Disziplinproblemen und Lehrerwohlbefinden eingeschränkt. Schließlich wurden vornehmlich Lehrerselbstberichtsinstrumente eingesetzt, was die Gefahr von Methodenverzerrungen birgt (Podsakoff, MacKenzie, Lee & Podsakoff, 2003). Demzufolge erscheint es sinnvoll, auch andere Quellen zur Beurteilung von Disziplinproblemen, Unterrichtsstörungen und ähnlichen Schwierigkeiten bei der Kontrolle von Schülerverhalten heranzuziehen. In der vorliegenden Arbeit werden insbesondere Schülerratings als vorteilhaft angesehen, da diese im Gegensatz zu externen Beobachtenden kontinuierlich am Unterricht teilnehmen und daher eine geringere Gefahr besteht, kritische Episoden nicht zu erfassen (vgl. Praetorius, Pauli, Reusser, Rakoczy & Klieme, 2014). Ein weiteres Desideratum ist ein besseres Verständnis der psychologischen Prozesse, die erklären könnten, warum die Lehrer-Schüler-Beziehung eine Rolle für das Lehrerwohlbefinden spielt. Aufbauend auf der Selbstbestimmungstheorie (Ryan & Deci, 2000) und den Befunden aus der zweiten Forschungslinie, könnten hier die psychologischen Grundbedürfnisse als Mediator angenommen werden. Ziel der vorliegenden Arbeit war es, diese offenen Fragen zu adressieren und Limitationen vorheriger Studien zu überwinden.

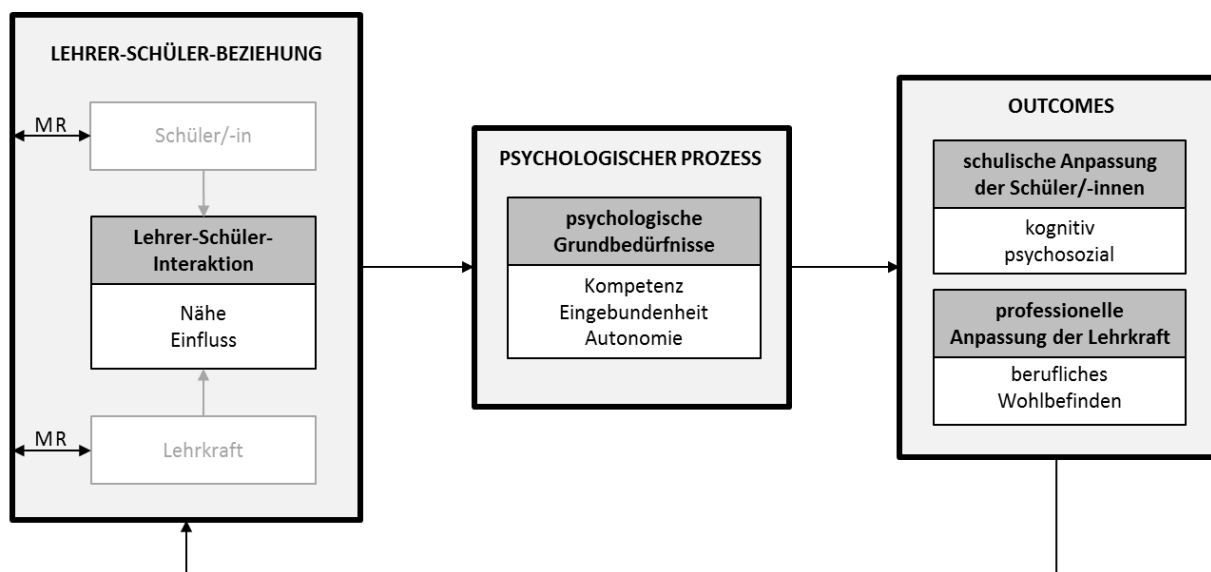
### *Fragestellungen der vorliegenden Arbeit*

Im Rahmen der vorliegenden Arbeit wurden zwei übergeordnete Fragestellungen zur Lehrer-Schüler-Beziehung untersucht: Zum einen der Zusammenhang mit der schulischen Anpassung der Lernenden, zum anderen die Assoziation mit dem beruflichen Wohlbefinden der Lehrkraft. Dabei wurden Einfluss und Nähe als zentrale Dimensionen der Lehrer-Schüler-Beziehung betrachtet (Wubbels et al., 1993). Es wurde angenommen, dass eine positive Beziehung sowohl die schulische Anpassung der Lernenden als auch das berufliche Wohlbefinden der Lehrkraft fördert, vermittelt über die Erfüllung der psychologischen Grundbedürfnisse (Ryan & Deci, 2000). Eine positive Lehrer-Schüler-Beziehung wurde dabei durch wechselseitige

Nähe einerseits und hohen lehrerseitigen Einfluss und ein geringes Maß an Disziplinproblemen der Schülerinnen und Schüler andererseits charakterisiert (Brekelmans et al., 1993). Das heuristische Arbeitsmodell der vorliegenden Arbeit (siehe Abbildung 1) fasst diese Annahmen zusammen und integriert damit die unterschiedlichen theoretischen Perspektiven und Forschungsstränge, die in den vorangegangenen Abschnitten dargestellt wurden.

Die erste zentrale Fragestellung befasste sich mit dem Zusammenhang zwischen der Lehrer-Schüler-Beziehung und der Entwicklung der Schülerinnen und Schüler (*Teilstudie 1*). Dabei wurde das interpersonelle Lehrerverhalten (Nähe, Einfluss) durch die Lernenden sowie ihre Lehrkräfte eingeschätzt. Dies ermöglichte es, perspektivenspezifische Validitäten zu betrachten, das heißt der Frage nachzugehen, ob Lehrkräfte und Lernende verschiedene Aspekte ihrer Beziehung wahrnehmen, die in unterschiedlicher Weise mit Schüleroutcomes assoziiert sind. Als Schüleroutcomes wurden dabei neben der Leistung auch domänenübergreifende Aspekte betrachtet, nämlich Schulzufriedenheit, Schwänzen und Selbstwert. Zudem wurden Mehrebenenanalysen eingesetzt, um differenzielle Zusammenhänge auf Schüler- und Klassen-ebene aufdecken zu können.

Im Rahmen der zweiten zentralen Fragestellung wurde untersucht, ob die Lehrer-Schüler-Beziehung mit dem beruflichen Wohlbefinden der Lehrkraft assoziiert ist. Als Indikatoren des beruflichen Wohlbefindens wurden hoher beruflicher Enthusiasmus und geringe emotionale Erschöpfung herangezogen. *Teilstudie 2* untersuchte den Zusammenhang von schülerseitiger Nähe und Disziplinproblemen mit dem beruflichen Wohlbefinden der Lehrkräfte. Im Gegensatz zu bisherigen Studien wurden Disziplinprobleme sowohl durch die Lehrkraft als auch durch die Lernenden beurteilt, was wiederum die Untersuchung perspektivenspezifischer Validitäten zur Vorhersage des Lehrerwohlbefindens erlaubte. Basierend auf einem theoretischen Modell von Spilt et al. (2011) wurde zudem analysiert, inwieweit die Nähe durch die Schülerinnen und Schüler als Mediator fungiert, das heißt ob Disziplinprobleme mit einem geringeren Wohlbefinden in Zusammenhang stehen vermittelt über das Gefühl, von den Lernenden nicht wertgeschätzt zu werden. Um ein tiefergehendes Verständnis der psychologischen Prozesse zu erlangen, welche möglichen Zusammenhängen zwischen der Lehrer-Schüler-Beziehung und dem beruflichen Wohlbefinden der Lehrkraft zugrunde liegen, untersuchte *Teilstudie 3* die Erfüllung des psychologischen Grundbedürfnisses nach sozialer Eingebundenheit mit den Schülerinnen und Schülern als Mediator. In einem ersten Schritt wurde außerdem betrachtet, wie tägliche soziale Interaktionen mit Schülern und Schülerinnen mit dem beruflichen Wohlbefinden von Lehrkräften zusammenhängen. Weiterhin wurden inter-individuelle Unterschiede hinsichtlich dieser Zusammenhänge in Abhängigkeit der Berufserfahrung exploriert.



**Abbildung 1:** Heuristisches Arbeitsmodell der Lehrer-Schüler-Beziehung: Lehrer-Schüler-Interaktionen werden als Grundlage der Beziehung angesehen, von der Lehrkraft und Schüler/-in eine individuelle mentale Repräsentation (MR) entwickeln. Es wird angenommen, dass eine positive Beziehung zur Erfüllung der psychologischen Grundbedürfnisse beiträgt, was wiederum eine positive Entwicklung auf Seiten der Lernenden und der Lehrkräfte begünstigt. Aspekte, die für die aktuelle Arbeit weniger zentral sind, sind hellgrau dargestellt.

### Teilstudie 1

Die zentrale Fragestellung von Teilstudie 1 war, ob Einfluss und Nähe durch die Klassenlehrkraft mit der allgemeinen schulischen Anpassung der Lernenden assoziiert sind. Zur Untersuchung dieser Frage wurden Daten von  $N = 5607$  Schülern und Schülerinnen ( $N = 227$  Klassen), die eine Mittelschule, Hauptschule oder Realschule besuchten, genutzt. Zwei Kohorten wurden zu zwei Messzeitpunkten im Abstand von einem Jahr befragt. Beim ersten Messzeitpunkt befanden sich  $n = 3123$  Schülerinnen und Schüler in der fünften Klasse ( $n = 131$  Klassen) und  $n = 2484$  Schülerinnen und Schüler in der achten Klasse ( $n = 96$  Klassen). Des Weiteren nahmen die Klassenlehrkräfte der befragten Klassen teil ( $N = 211$ ). Der erste Messzeitpunkt diente zur Erhebung des Ausgangsniveaus hinsichtlich der allgemeinen schulischen Anpassung, genauer: Schulzufriedenheit, Schwänzen, Selbstwert und Leistung in standardisierten Deutsch- beziehungsweise Mathematiktests. Der zweite Messzeitpunkt stand im Fokus von

Teilstudie 1. Hier wurden neben der allgemeinen schulischen Anpassung sowohl die Schülerinnen und Schüler als auch ihre Klassenlehrkräfte über ihre Einschätzung von Nähe und Einfluss befragt. Nähe wurde dabei operationalisiert über die emotionale und akademische Unterstützung der Lehrkraft und Einfluss über ein geringes Maß an Unterrichtsstörungen.

Mehrebenenstrukturgleichungsmodelle (Marsh et al., 2009) wurden genutzt, um Zusammenhänge zwischen Einfluss und Nähe mit der allgemeinen schulischen Anpassung auf der Schüler- und auf der Klassenebene zu untersuchen. Dabei wurden die Lehrer- und die Schülerwahrnehmung als Prädiktoren genutzt, um perspektivenspezifische Zusammenhänge aufdecken zu können. Die schulische Anpassung zum ersten Messzeitpunkt, sowie Geschlecht, Migrationshintergrund, sozioökonomischer Status, Schulform und Kohorte (5./8 Klasse) dienten als Kovariaten.

Dabei zeigte sich, dass Nähe auf Schülerebene positiv mit Leistung, Schulzufriedenheit und Selbstwert und negativ mit Schwänzen assoziiert war. Im Gegensatz dazu zeigten sich für die individuellen Schülerwahrnehmungen von Einfluss lediglich für die Schulzufriedenheit statistisch signifikante positive Zusammenhänge. Auf Klassenebene war die Schülerwahrnehmung von Nähe mit der Schulzufriedenheit und Selbstwert assoziiert und ihre Einschätzung von Einfluss mit dem Schwänzen. Die Lehrerwahrnehmung stand in Zusammenhang mit der Leistung der Schülerinnen und Schüler.

Die Befunde können als eine wertvolle Ergänzung zu bisheriger Forschung betrachtet werden. Sie stellen die Bedeutung der Klassenlehrkraft für die allgemeine schulische Anpassung heraus und erweitern den Fokus über domänenspezifische Schüleroutcomes hinaus. Zudem verdeutlicht Teilstudie 1, dass die Beurteilerperspektive und Analyseebene die Zusammenhänge beeinflussen können, was beim Design, der Auswertung und Interpretation von Studien berücksichtigt werden sollte.



## Teilstudie 2

Ziel von Teilstudie 2 war die Beantwortung der Frage, ob Nähe durch die Schülerinnen und Schüler und Einfluss im Sinne einer erfolgreichen Prävention von Unterrichtsstörungen und Disziplinproblemen mit einem höheren beruflichen Wohlbefinden der Lehrkraft assoziiert sind. Basierend auf einem Modell von Spilt et al. (2011), welches die zentrale Rolle einer engen, persönlichen Lehrer-Schüler-Beziehung betont, wurde dabei Nähe als Mediator untersucht, welcher den Zusammenhang zwischen mangelndem Einfluss einerseits und verringertem beruflichen Enthusiasmus und erhöhter emotionaler Erschöpfung andererseits vermittelt.

Teilstudie 2 nutzte dieselbe Datenbasis wie Teilstudie 1 und konnte auf Daten von  $N = 222$  Klassenlehrkräften und ihrer  $N = 4111$  Schüler und Schülerinnen zurückgreifen. Der erste Messzeitpunkt diente zur Erfassung des Ausgangsniveaus des beruflichen Wohlbefindens der Lehrkräfte, wobei sie Angaben zu ihrer emotionalen Erschöpfung und ihrem beruflichen Enthusiasmus machten. Ein Jahr später schätzten die Lehrkräfte erneut ihr Wohlbefinden ein. Zudem beurteilten sie inwieweit sie Nähe von ihren Schülerinnen und Schülern erlebten. Wie in Teilstudie 1 schätzten sowohl die Lehrkraft als auch ihre Schülerinnen und Schüler die Dimension Einfluss, das heißt das Ausmaß an Unterrichtsstörungen und Fehlverhalten durch die Schüler und Schülerinnen, ein.

Zur Untersuchung der Fragestellungen wurden vier Mediationsmodelle gerechnet getrennt für Erschöpfung und Enthusiasmus sowie die Schüler- und Lehrereinschätzung von Unterrichtsstörungen. Dabei dienten das Ausgangsniveau des beruflichen Wohlbefindens, das Geschlecht und die Berufserfahrung der Lehrkraft, Schulart, Klassenstufe und Migrationsanteil als Kovariaten. Die Ergebnisse zeigten, dass Lehrkräfte, die mehr Unterrichtsstörungen und weniger Nähe durch die Lernenden berichteten, einen Anstieg ihrer emotionalen Erschöpfung und einen verringerten beruflichen Enthusiasmus aufwiesen. Die Schülereinschätzung von Unterrichtsstörungen war nicht mit dem Wohlbefinden ihrer Lehrkraft assoziiert. Weiterhin zeigte sich, dass die Nähe durch die Schülerinnen und Schüler den Zusammenhang zwischen der Lehrerwahrnehmung von Unterrichtsstörungen und ihrem beruflichen Enthusiasmus medierte. Dagegen zeigte sich für emotionale Erschöpfung kein statistisch signifikanter indirekter Effekt.

Teilstudie 2 unterstreicht die Bedeutung von Zuwendung und Wertschätzung durch die Schülerinnen und Schüler für das Lehrerwohlbefinden. Dabei fungiert die empfundene Nähe zu den Lernenden als Mediator zwischen wahrgenommenen Unterrichtsstörungen und dem beruflichen Enthusiasmus der Lehrkraft. Damit erlaubt Teilstudie 2 erste Einblicke in die psychologischen Prozesse, die erklären können, warum Disziplinprobleme und Unterrichtsstörungen von Lehrkräften vielfach als belastend erlebt werden. Darüber hinaus erweitert Teilstudie 2

vorherige Arbeiten durch den Einbezug der Lehrer- und Schülerwahrnehmung von Einfluss, da so Rückschlüsse über die Zusammenhänge zwischen Unterrichtsstörungen und Lehrerwohlbefinden über den reinen Selbstbericht der Lehrkräfte hinaus gezogen werden können.

### Teilstudie 3

Anknüpfend an die Ergebnisse aus Teilstudie 2 widmete sich Teilstudie 3 der Frage, welche psychologische Bedeutung die Etablierung einer engen, persönlichen Beziehung zu den Lernenden für die Lehrkräfte hat. Wird dadurch lediglich ein berufliches Ziel erfüllt, sodass sich Lehrkräfte als kompetent erleben können? Oder ist es darüber hinaus bedeutsam, ein Gefühl von sozialer Eingebundenheit mit den Schülerinnen und Schülern zu erleben? Diese Fragen adressierte Teilstudie 3 vor dem Hintergrund der Selbstbestimmungstheorie (Ryan & Deci, 2000) und untersuchte Eingebundenheit mit den Lernenden als Mediator zwischen dem täglichen Stresserleben (z.B. durch negative soziale Interaktionen mit Schülerinnen und Schülern) und einem verringerten Wohlbefinden. Teilstudie 3 basierte auf einer Stichprobe von  $N = 152$  Lehrkräften im Berufseinstieg, die an einer 14-tägigen Onlinetagebuchstudie teilnahmen. Sie schätzten dabei ihr berufliches Wohlbefinden (emotionale Erschöpfung und beruflicher Enthusiasmus) sowie die Erfüllung der psychologischen Grundbedürfnisse ein (Eingebundenheit mit den Lernenden, Kompetenz, Eingebundenheit mit dem Kollegium). Darüber hinaus gaben sie in einem offenen Antwortformat Auskunft über tägliche berufliche Ereignisse. Die Ereignisse bezogen sich dabei vielfach auf die soziale Interaktion mit Schülern und Schülerinnen (z.B. Unterrichtsstörungen und fehlende Wertschätzung; siehe Abbildung A im Anhang), aber auch auf Aspekte wie die Vor- und Nachbereitung oder den Austausch mit dem Kollegium. Zwei unabhängige Raterinnen ordneten die Ereignisse in zwei Kategorien ein: (1) im Unterricht und (2) außerhalb des Unterrichts. Die Lehrkräfte bewerteten außerdem, wie positiv oder negativ sie die Ereignisse erlebten, was als Grundlage für die Einteilung in *hassles* (= tägliche negative Ereignisse) und *uplifts* (= tägliche positive Ereignisse) genutzt wurde. Basierend auf der Annahme, dass berufliches Stresserleben aus einer Dysbalance von positiven und negativen Aspekten resultiert (z.B. Bakker & Demerouti, 2007), wurde anschließend ein Differenzwert aus *hassles* und *uplifts* gebildet (tägliches Stresserleben = *hassles* – *uplifts*).

Eine within-subject Mediationsanalyse wurden genutzt, um zu untersuchen, inwieweit intraindividuelle Schwankungen im täglichen Stresserleben (z.B. durch negative Lehrer-Schüler-Interaktionen) sich in dem Gefühl von Eingebundenheit mit den Lernenden und dem täglichen Wohlbefinden widerspiegeln. Prädiktoren waren dabei das Stresserleben im Unterricht und außerhalb des Unterrichts; Mediatoren waren die psychologischen Grundbedürfnisse nach

Eingebundenheit mit den Lernenden, Kompetenz und Eingebundenheit mit dem Kollegium; Outcomes waren beruflicher Enthusiasmus und emotionale Erschöpfung.

Die Ergebnisse zeigten, dass Lehrkräfte mehr emotionale Erschöpfung und weniger beruflichen Enthusiasmus empfanden an Tagen, an denen sie mehr Stresserleben berichteten als im Mittel der teilgenommenen Tage. Das Gefühl der Eingebundenheit mit Schülerinnen und Schülern medierte diesen Zusammenhang für beruflichen Enthusiasmus, das heißt Stresserleben ging mit einer geringeren Eingebundenheit einher, was wiederum mit einem niedrigeren Enthusiasmus verknüpft war. Für emotionale Erschöpfung dagegen zeigte sich im Mittel kein Zusammenhang mit der Eingebundenheit mit den Lernenden. Explorative Cross-Level Interaktionsanalysen ergaben aber, dass dieser Zusammenhang durch die Berufserfahrung moderiert wurde: Bei den am wenigsten erfahrenen Lehrkräften ging eine geringere Eingebundenheit mit den Lernenden mit einer höheren emotionalen Erschöpfung einher.

Teilstudie 3 erweitert bisherige Forschung in mehrfacher Hinsicht. Zum einen wird der Fokus auf das Gefühl der sozialen Eingebundenheit mit Schülerinnen und Schülern gerichtet. Dadurch konnte gezeigt werden, dass die Nähe zu den Lernenden nicht nur ein berufliches Ziel darstellt, dessen Erfüllung den Lehrkräften ein Gefühl von Kompetenz vermittelt. Vielmehr scheint die Etablierung einer vertrauensvollen, engen Beziehung auch intrinsisch motiviert zu sein. Zum anderen ist die Nutzung eines Onlinetagebuchs eine zentrale Stärke, da es die Untersuchung intraindividuelle Prozesse erlaubt, zu einer hohen ökologischen Validität und einer Verringerung von Erinnerungsverzerrungen beiträgt.

## **Gesamtdiskussion**

Die Gesamtdiskussion fasst zunächst die zentralen Ergebnisse der vorliegenden Arbeit zusammen und ordnet sie in bisherige Forschung und theoretische Modell ein. Insgesamt zeigte sich, dass Einfluss und Nähe durch die Lehrkraft positiv mit der kognitiven und psychosozialen Entwicklung der Lernenden assoziiert waren, wobei sich differentielle Zusammenhänge in Abhängigkeit der Dimension (Einfluss, Nähe), der Perspektive (Lehrer-, Schülerwahrnehmung) und der Analyseebene (Schüler-, Klassenebene) ergaben. Dies verdeutlicht die Relevanz der individuellen Lehrkraft für die Entwicklung der Schülerinnen und Schüler über das jeweilige Fach hinaus. Zudem können die Befunde als Hinweis auf perspektivenspezifische Validitäten von Schüler- und Lehrerratings gedeutet werden. Sie weisen ferner darauf hin, dass die Berücksichtigung der Schüler- und Klassenebene wertvolle Erkenntnisse über differenzielle Zusammenhänge auf beiden Analyseebenen ermöglicht.

Mit Blick auf die Bedeutung der Lehrer-Schüler-Beziehung für die Lehrkraft zeigte sich, dass tägliches Stresserleben im Allgemeinen (z.B. durch soziale Interaktionen), sowie Einfluss und Nähe durch die Schülerinnen und Schüler im Speziellen mit höherem beruflichen Enthusiasmus und geringerer emotionaler Erschöpfung assoziiert waren. Die Rolle der affektiven Aspekte der Beziehung (Nähe und Gefühl der Eingebundenheit mit den Schülerinnen und Schülern), die in vorherigen Arbeiten weitgehend unberücksichtigt blieben, konnte empirisch untermauert werden und damit das Modell des Lehrerwohlbefindens von Spilt et al. (2011) stützen.

Trotz des empirischen und theoretischen Beitrags, den die vorliegende Arbeit leistet, werden in der Gesamtdiskussion zentrale Limitationen beschrieben. Hier wird zunächst kritisch auf die Operationalisierung der Lehrer-Schüler-Beziehung sowie auf die fehlende kausale Interpretierbarkeit eingegangen. Eine weitere Schwäche wird darin gesehen, dass das heuristische Rahmenmodell nur in Teilen getestet werden konnte. Folglich bleiben zahlreiche interessante Fragestellungen offen, zum Beispiel inwieweit individuelle Merkmale der Lernenden und der Lehrkraft die Qualität der Beziehung beeinflussen und ob sie die Stärke der postulierten Zusammenhänge moderieren.

Dennoch lassen sich einige praktische Implikationen aus der vorliegenden Arbeit ableiten. Aufgrund der Relevanz der Lehrer-Schüler-Beziehung für die schulische Anpassung und das berufliche Wohlbefinden werden Interventionen vorgeschlagen, um die Qualität der sozialen Interaktionen zwischen Lehrkraft und Lernenden zu verbessern. Insbesondere Trainings zur Klassenführung und sozial-emotionalen Kompetenzen, die bereits im Studium aber auch im Beruf eingesetzt werden könnten, werden hier als vielversprechend angesehen.

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## Summary

A positive teacher-student relationship that is characterized by mutual trust, warmth, and teacher support (= proximity) as well as clear limits for student behavior (= influence) is considered central for students' cognitive and psychosocial development and this assumption has widely been supported empirically. However, these studies largely focused on domain-specific student outcomes such as achievement or interest in particular subjects and less so on general aspects of school adjustment such as school satisfaction or self-esteem. At the same time, the teacher-student relationship can also be considered vital for teachers: Teachers who perceive difficulties in controlling student behavior report reduced occupational well-being. In addition, the teachers' need to feel appreciated and liked by students is increasingly emphasized as an important resource for their occupational well-being. However, this assumption has not been investigated sufficiently. Therefore, the present work addressed the question of whether the teacher-student relationship in terms of proximity and influence is associated with students' general school adjustment and teachers' occupational well-being.

*Study 1* drew on data from a large longitudinal research project in which German secondary students from the vocational track as well as their homeroom teachers were investigated ( $N = 5607$  students,  $N = 227$  classes). The study applied student and teacher ratings of teacher proximity and influence. In addition, students' general school adjustment in terms of achievement, school satisfaction, truancy, and self-esteem was assessed. Results from multilevel structural equation modeling revealed that teacher proximity and influence were associated with students' general school adjustment: Student-rated proximity was linked to all outcomes at the student level and to school satisfaction and self-esteem at the class level. Influence showed only few associations with outcomes at the student level, but at the class level student-rated influence was related to truancy and teacher-rated influence was linked to student achievement. In contrast to Study 1, Study 2 and Study 3 were concerned with the role of the teacher-student relationship for teachers rather than students.

*Study 2* drew on the same research project as Study 1 and again used both student and their homeroom teachers' ratings of influence in terms of few disturbances and disciplinary problems in their class. The use of both teacher and student ratings of influence was a particular strength of the present work because prior research on teacher well-being mostly relied on teacher self-report measures which evokes the risk of common rater bias. Moreover, teachers reported on their emotional exhaustion, work enthusiasm, and student proximity which reflected the extent of appreciation and sympathy teachers perceived from students. Thereby, based on a theoretical model by Spilt et al. (2011) student proximity was tested as a mediator

between student influence, that is, student misbehavior and well-being. Results of mediation analyses indicated that student-rated misbehavior was not reflected in teacher well-being. However, teacher-rated misbehavior was linked to lower exhaustion and higher enthusiasm. Similarly, student proximity was positively associated with teacher well-being and mediated the link between teacher-perceived misbehavior and work enthusiasm.

*Study 3* largely drew on ideas from self-determination theory (Ryan & Deci, 2000) and investigated the basic psychological need for relatedness with students as a mediator to better understand which psychological mechanisms explain the relevance of the teacher-student relationship for teacher well-being.  $N = 152$  beginning teachers participated in a two-week diary study in which they reported on their daily work-related positive and negative events, satisfaction of the need for relatedness with students, and their occupational well-being in terms of emotional exhaustion and work enthusiasm. Results of within-subject mediation analyses revealed that more stress exposure (i.e., an imbalance of work-related positive and negative events, e.g., due to negative social interactions with students) was associated with higher exhaustion and lower enthusiasm. Whereas the need for relatedness mediated the link with work enthusiasm, no association was found between relatedness with students and emotional exhaustion in the overall sample. However, exploratory cross-level interaction analyses showed that the least experienced teachers felt more emotionally exhausted when they felt less related with students.

The results from the three empirical studies that were part of the present work underlined the importance of the teacher-student relationship for both students' school adjustment and teachers' occupational well-being. In shifting the focus to the degree of closeness and affection in the relationship as an important predictor of teacher well-being and to students' general school adjustment as a relevant outcome, the present work importantly contributed to the research field. Moreover, the sophisticated methodological approaches such as the daily diary, the combination of different raters, or the use of multilevel modelling provided new insights about questions that appeared to be well-understood.





## Table of Contents

<b>ZUSAMMENFASSUNG.....</b>	<b>5</b>
<b>SUMMARY.....</b>	<b>25</b>
<b>LIST OF FIGURES.....</b>	<b>33</b>
<b>LIST OF TABLES.....</b>	<b>35</b>
<b>CHAPTER 1: THEORETICAL BACKGROUND .....</b>	<b>37</b>
Introduction.....	39
Defining Teacher-Student Relationships .....	40
Teacher-Student Interactions as the Basis of a Positive Relationship.....	41
Importance of the Teacher-Student Relationship: Theoretical Perspectives.....	48
Empirical Evidence for the Significance for Students' School Adjustment .....	55
Empirical Evidence for the Significance for Teacher Well-Being.....	61
Critical Appraisal of Prior Research .....	62
Research Questions .....	67
References.....	71
<b>CHAPTER 2: SOCIAL SUPPORT AND CLASSROOM MANAGEMENT ARE RELATED TO SECONDARY STUDENTS' GENERAL SCHOOL ADJUSTMENT: A MULTILEVEL STRUCTURAL EQUATION MODEL USING STUDENT AND TEACHER RATINGS [STUDY 1].....</b>	<b>93</b>
<b>CHAPTER 3: STUDENT MISBEHAVIOR AND TEACHER WELL-BEING: TESTING THE MEDIATING ROLE OF THE TEACHER-STUDENT RELATIONSHIP [STUDY 2]... </b>	<b>133</b>
<b>CHAPTER 4: DOES BASIC NEED SATISFACTION MEDIATE THE LINK BETWEEN STRESS EXPOSURE AND WELL-BEING? A DIARY STUDY AMONG BEGINNING TEACHERS [STUDY 3].....</b>	<b>163</b>
<b>CHAPTER 5: GENERAL DISCUSSION.....</b>	<b>195</b>
Summary of Central Empirical Findings .....	197
Theoretical and Empirical Contributions .....	200
Limitations .....	208
Future Research.....	210
Practical Implications.....	214
References.....	217
<b>APPENDIX .....</b>	<b>229</b>
<b>CURRICULUM VITAE .....</b>	<b>231</b>





## List of Figures

<b>Figure 1.1:</b> Conceptual model of the teacher-student relationship.....	41
<b>Figure 1.2:</b> Illustration of the concept of complementarity.....	48
<b>Figure 1.3:</b> Heuristic working model of the teacher-student relationship.....	68
<b>Figure 2.1:</b> Measurement model [Study 1] .....	111
<b>Figure 3.1:</b> Heuristic working model [Study 2] .....	142
<b>Figure 3.2:</b> Mediation model [Study 2] .....	148
<b>Figure 4.1:</b> Heuristic working model [Study 3] .....	172
<b>Figure 4.2:</b> Within-subject mediation model [Study 3]. .....	180
<b>Figure 4.3:</b> Plot of the moderating effect of job experience [Study 3] .....	182



## List of Tables

<b>Table 1.1:</b> Denotation and conceptualization of proximity and influence in the model for interpersonal teacher behavior (Wubbels, Créton et al., 1993) and selected models of instructional quality.....	44
<b>Table 2.1:</b> Descriptive results [Study 1] .....	109
<b>Table 2.2:</b> Prediction of students' school adjustment: Results of multilevel structural equation modeling [Study 1].....	113
<b>Table 3.1:</b> Descriptive results [Study 2] .....	146
<b>Table 3.2:</b> Total effects, indirect effects, and direct effects [Study 2] .....	147
<b>Table 4.1:</b> Descriptive results [Study 3] .....	177
<b>Table 4.2:</b> Within-subject intercorrelations [Study 3].....	178
<b>Table 4.3:</b> Total effects, indirect effects, and direct effects [Study 3] .....	179



# CHAPTER 1



## Theoretical Background

### Introduction

Perhaps, based on our personal experience at school many of us would agree that positive teacher-student relationships were important for us to enjoy learning, feel comfortable at school, and grow as autonomous, self-confident individuals. In line with this, asking students, teachers, or politicians what they consider to be a “good teacher” they emphasize qualities that can be considered to represent aspects of a positive teacher-student relationship (Wubbels, Créton, Levy, & Hooymayers, 1993): For example, they refer to attributes such as caring, understanding, patience, kindness, and helpfulness, and point out that teachers should like students, be able to assert themselves, and define rules in a respectful and fair manner (Murphy, Delli, & Edwards, 2004; New York Times, 2015; Spiegel Online, 2014).

The important role of the teacher-student relationship for students’ development is not only recognized by the public. Drawing on attachment theory (Bowlby, 1969) and self-determination theory (Deci & Ryan, 1985; Ryan & Deci, 2000), developmental and educational psychologists have acknowledged its central role for children’s school adjustment for a long time (Deci, Vallerand, Pelletier, & Ryan, 1991; Pianta, 1999). Its potential for students’ learning progress has become evident at least since Hattie’s meta-analysis. Hattie (2009) found an effect size of  $d = 0.72$  so that the teacher-student relationship was placed at rank 11 of the 138 factors that were investigated and was found to be more closely associated with student achievement than teachers’ subject matter knowledge, class size, or socioeconomic background, for example. Furthermore, the importance of the teacher-student relationship for students’ psychosocial development, for instance, their self-concept, behavioral or affective engagement has been underpinned across a number of school subjects and age groups (Downer, Stuhlman, Schweig, Martinez, & Ruzek, 2014; Kunter et al., 2013; McGrath & van Bergen, 2015; Roorda, Koomen, Spilt, & Oort, 2011).

Beyond that, it seems reasonable that a positive relationship does not only foster student development, but that teachers could also profit, especially, in terms of their occupational well-being. Considering that the teaching profession is inherently social, one can image that teachers who feel that their students like them and follow directions effortlessly, will be more enthusiastic about their work instead of becoming emotionally exhausted. These ideas have been integrated in a theoretical model of teacher well-being by Spilt, Koomen, and Thijs (2011) in which the central role of the teacher-student relationship is emphasized. In line with this, prior research consistently showed that teachers perceive student misbehavior as one of the main stressors

which induces negative emotions and symptoms of burnout (Aloe, Shisler, Norris, Nickerson, & Rinker, 2014). Qualitative interviews also indicated that teachers' close, affectionate bonds with students might be an important resource for positive emotions and job satisfaction (Hargreaves, 2000).

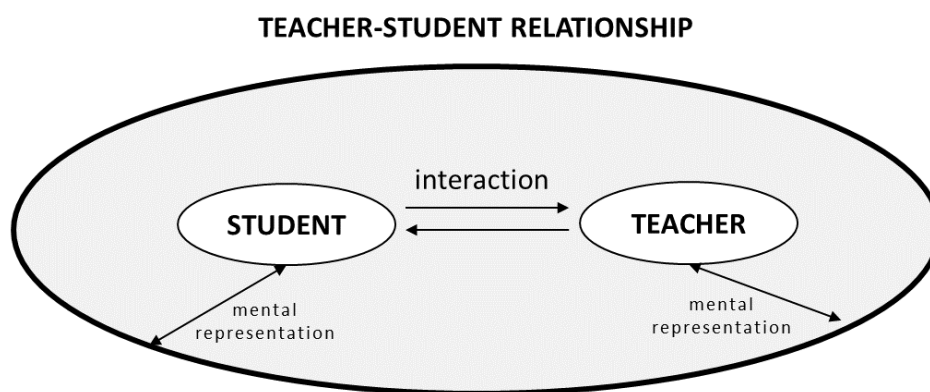
In summary, the significance of the teacher-student relationship for both students and teachers is theoretically well-founded and there are empirical studies in support of this view. Nonetheless, some central questions have not been investigated sufficiently in prior research. First, due to a strong focus on domain-specific student outcomes little is known about the question of whether the teacher-student relationship is associated with important, more general aspects of students' school adjustment, for example, school satisfaction or self-esteem. Second, empirical evidence for the link between teachers' closeness and affection with students and their occupational well-being is relatively scarce and more research based on representative, longitudinal data is needed. The present work addresses these desiderata within three empirical studies—one study concentrates on students' general school adjustment and two studies focus on teachers' occupational well-being and, thereby, highlight specific aspects of their relationships with students. In answering these questions the present work will allow for a more far-reaching understanding of the factors conducive to positive developmental trajectories of the two most relevant actors in schools which will, in turn, offer implications for teacher education and training.

In the following sections, I will first define the construct and organize the different concepts that have been used to refer to aspects of the teacher-student relationship. Then, I will provide an overview about the theoretical models which have motivated research on the teacher-student relationship. The different lines of research are illustrated and their findings are summarized and discussed before deriving the research questions that guided the empirical studies in this work.

### **Defining Teacher-Student Relationships**

In social psychology a relationship is generally described as “the association between two individuals that resides in the interaction that occurs between them” (Berscheid & Regan, 2005, p. 465). Hence, interactions—episodes in which the partners' behaviors influence each other—are at the core of a relationship (Berscheid & Regan, 2005; Pennings et al., 2014). Considering that systems can generally be defined as entities that emerge from the interactions between its parts, relationships can be conceived of as dyadic, dynamic systems (Ford &





**Figure 1.1:** Conceptual model of the teacher-student relationship (modified from Pianta et al., 2003, p. 206).

Lerner, 1992). Importantly, for a relationship to be present these interactions must occur several times so that a pattern of interactions evolves (Berscheid & Reis, 1998; Wubbels & Brekelmans, 2005). Another precondition is that each relationship partner must have internalized a mental representation of their relationship (Berscheid & Reis, 1998).

According to this general definition, Pianta, Hamre, and Stuhlman (2003) developed a conceptual model of the teacher-student relationship. Figure 1.1 illustrates the idea that teacher-student relationships are dyadic systems. The system is composed of the teacher and the student, it is formed based on their regular interactions, and either part has internalized a unique mental representation of the relationship. Furthermore, Pianta et al. (2003) emphasize that teachers' and students' individual characteristics shape their own interpersonal behavior as well as the ways in which the other relationship partner reacts to them (Bronfenbrenner & Morris, 2007; Nurmi & Kiuru, 2015). Having carved out that interactions form the basis of relationships, the question arises how to describe the interaction quality and, hence, the quality of relationships.

### **Teacher-Student Interactions as the Basis of a Positive Relationship**

To understand which qualities of teacher-student interactions are central for a positive relationship to emerge, I will start with a model that has been used to describe the quality of social interactions in general. Interpersonal theory (Kiesler, 1983; Leary, 1957) suggests that people's interactions can be described through the two basic dimensions of *proximity* (= cooperation versus opposition) and *influence* (= dominance versus submission). Proximity refers to the level of closeness and cooperation in the relationship. Influence indicates who is directing the interaction and is in control. Thereby, interpersonal theory (Kiesler, 1983; Leary, 1957), more precisely, the concept of complementarity, implies that people are likely to adapt their

behaviors to one another while they are interacting (Sadler, Ethier, Gunn, Duong, & Woody, 2009). With regards to the dimension of proximity, complementarity is defined through correspondence which means, for example, that helpfulness and kindness of person A will likely lead to helpfulness and kindness of person B. For the dimension of influence, complementarity is defined through reciprocity so that it is likely that person A will be submissive, if person B is directing the interaction.

The idea that proximity and influence are basic dimensions of people's interactions and can therefore be used to describe the quality of their relationships is also reflected in research on teacher-student relationships. For example, Wubbels, Créton et al. (1993) developed their model for interpersonal teacher behavior based on interpersonal theory (Leary, 1957). Accordingly, proximity refers to the level of teachers' closeness and cooperation with students. Influence indicates the degree to which the teacher is directing the interaction. Based on studies that linked teachers' interpersonal behavior to student achievement and affective outcomes, they determined that teachers who displayed both a high degree of proximity and influence attained better student outcomes (Brekelmans, Wubbels, & Levy, 1993). Therefore, a positive teacher-student relationship has been characterized in terms of a high degree of proximity and influence by the teacher. Similarly, Robert Pianta, a pioneer in research on teacher-student relationships, stated:

The key qualities of these relationships appear to be related to the ability or skill of the adult to read the child's signals accurately, to convey acceptance and emotional warmth, to offer assistance as necessary, to model regulated behavior, and to enact appropriate structures and limits for the child's behavior (Pianta, 1999, p. 67).

Hence, even though Pianta (1999) did not explicitly refer to the dimensions of proximity and influence, they are largely reflected in his ideas: Reading the child's signals, conveying acceptance, warmth, and assistance could be seen as aspects of teacher proximity, whereas teachers' modelling of regulated behavior, and of setting structures and limits for student behavior could be considered aspects of teacher influence.

Beyond that, aspects that largely parallel the dimensions of proximity and influence are consistently mentioned in models of instructional quality. These models allow for a more profound understanding of which interpersonal teacher behaviors are indicators of influence and proximity, so that I will provide an overview in the following sections. This will also help to

organize the numerous labels that have been used to refer to rather similar underlying constructs.

### *Proximity: Emotional and Academic Support of Students*

In general, Wubbels, Créton et al. (1993) describe proximity as the level of teachers' closeness and cooperation with students which also includes that teachers appreciate their students, accept them as autonomous individuals, and are patient and sensitive to comprehension problems. As Table 1.1 shows, recent models of instructional quality subsume similar aspects under the terms *supportive climate* (Klieme, Schümer, & Knoll, 2001) or *individual learning support* (Kunter & Voss, 2013) which implies that *teacher support* is often used as a synonym for the dimension of proximity. Thereby, two central facets of teacher support need to be distinguished: emotional support and academic support (Malecki & Demaray, 2003; Strati, Schmidt, & Maier, 2017).

Aspects of *emotional support* are evident in all models that are displayed in Table 1.1. Emotional support is indicated by the teacher's appreciation of and sympathy for the student. In addition, emotionally supportive teachers show understanding and are interested in their students because they carefully listen to them, offer advice with personal problems, consider the student perspective and their individual needs. Furthermore, these teachers view their students as autonomous individuals, respect their opinions, and show trust in them. To describe concrete teacher behaviors that convey emotional support to students, Patrick, Turner, Meyer, and Midgley (2003) observed classes of  $N = 8$  sixth-grade teachers in the first lessons of the schoolyear. An emotionally-supportive teacher shared personal information about herself and showed that she understood her students and cared for their individual needs:

My older son is physically handicapped and so I'm very, very aware of lots of things that go in with attention problems that go with having a disability. And so if you're having a bad day or you just need a little bit of room or you just need to stand up, you need to let me know. (Patrick et al., 2003, p. 1539).

The teacher also showed that she valued each student: "Ramon Mead...Ms. Weber says so many nice things about you. I'm glad I got you." (Patrick et al., 2003, p. 1539). In contrast, a non-supportive teacher sent messages that indicated she did not really care for her students at a personal level: "Some people I remember, some people I don't. I'll try to remember who you are." (Patrick et al., 2003, p. 1541).

**Table 1.1:** Denotation and conceptualization of proximity and influence in the model for interpersonal teacher behavior (Wubbels, Créton et al., 1993) and selected models of instructional quality

	<b>Proximity</b>	<b>Influence</b>
<b>Model of interpersonal teacher behavior</b> (Wubbels, Créton et al., 1993)	<i>Proximity</i> cooperation, closeness, trust, appreciation, accepting students as autonomous individuals, sensitivity to comprehension problems, patience	<i>Influence</i> management, control, monitoring, enforcement of rules
<b>CLASS framework</b> (Hamre & Pianta, 2007)	<i>Emotional support</i> emotional tone, sensitivity and responsiveness, perspective taking	<i>Classroom organization</i> preventing and redirecting student misbehavior to prohibit chaos and disruptions, clear behavioral expectations, effective use of learning time
<b>Model of basic dimensions of instructional quality</b> (Klieme et al., 2001; also see Lipowsky et al., 2009)	<i>Supportive climate</i> positive and constructive feedback, positive approach to student errors and misconceptions, caring for personal and social problems, acceptance and respect, showing confidence	<i>Classroom management</i> maximizing time on task, developing and sustaining order, preventing and dealing with disruptions and disciplinary problems, establishing clear rules and procedures, monitoring, planning and structuring lessons
<b>Model of instructional quality in COACTIV</b> (Kunter & Voss, 2013)	<i>Individual learning support</i> attention and sensitivity to comprehension difficulties, positive approach to errors, patience, valuing students as autonomous individuals, respect, responsiveness to personal and social problems	<i>Classroom management</i> coordinating and managing student behavior, optimal use of learning time, proactive and preventive approach to discipline, withitness, clear behavioral expectations and rules
<b>Tripod 7C's</b> (Ferguson, 2012; see also Kane, Kerr, & Pianta, 2014)	<i>Care</i> emotional security, taking a personal interest, perspective taking and listening to students' ideas, support, encouraging students	<i>Control</i> managing disruptive or off-task behavior, maintaining order, effective use of learning time, rule clarity

*Note.* This overview does not claim to be exhaustive, but rather aims to give examples of how the dimensions of proximity and influence have been conceptualized. The interested reader is referred to Helmke (2009) for a comprehensive summary of models of instructional quality.

Perhaps, these emotionally supportive behaviors are what most people would think of if they were to define qualities of a positive teacher-student relationship. Indeed, in models of instructional quality emotional support is often equated with the term teacher-student relationship, whereas academic support or aspects that reflect the dimension of influence are not considered part of the relationship (Kunter & Voss, 2013). However, based on interpersonal theory (Kiesler, 1983; Leary, 1957) the present work takes a broader conceptualization of teacher-student relationships so that I will proceed with describing what characterizes academic support.

*Academic support* can be conceived of as a way by which teachers show that they honestly care about each student's learning progress and want to help them succeed in school. It includes an adequate tempo, a constructive approach to mistakes, and sensitive, patient reactions to individual learning difficulties (Klieme et al., 2001; Kunter & Voss, 2013). A study by Strati et al. (2017) in which  $N = 11$  high school classrooms were observed, provided concrete examples of teachers' academic support. For instance, one teacher helped students understand a concept in that he illustrated it on the board and then asked "Does that help?" (Strati et al., 2017, p. 6). Another teacher was less supportive because he failed to notice or acknowledge a student who obviously needed help which made the student get frustrated and, finally, disinterested in the task.

#### *Influence: Controlling Student Behavior*

Wubbels, Créton et al. (1993) described the dimension of influence as the degree to which the teacher is controlling the interaction, manages student behavior, and enforces rules effectively. As displayed in Table 1.1, *classroom management* is frequently used as a synonym for the dimension of influence (Klieme et al., 2001; Kunter & Voss, 2013). Similar to the definition by Wubbels, Créton et al. (1993), teacher behaviors that are aimed to establish and maintain order to maximize time on task have been subsumed under this dimension (Brophy, 2006; Doyle, 2006). Importantly, order does not necessarily imply that students are silent and rigidly keep their seats, but rather means that they adapt their behavior to different instructional situations so that the lesson continues smoothly (Doyle, 2006).

Teacher behaviors that have been found to be particularly effective for establishing order include communicating clear behavioral expectations and rules, establishing routines, continuously monitoring student behavior, and reacting to classroom disturbance and disciplinary problems consistently and immediately (Emmer & Stough, 2001; Kounin, 1970). Thereby, teachers should set limits and enforce rules in an informative rather than a punishing way (Kunter, Baumert, & Köller, 2007; Nie & Lau, 2009; Wubbels, Créton et al., 1993). One example of a

teacher who enforced her expectations adequately was provided in a video study (Patrick et al., 2003, p. 1544): After the students had been too noisy during their first visit to their lockers, she told them “I know you guys had a good time out there talking to your friends and getting your locker done, but that was a good example of too loud.”

To summarize, the previous sections provided a profound understanding of what teachers do to build positive relationships with students. Models of instructional quality provided detailed descriptions of teachers’ interpersonal behavior and, thereby, used several different terms. Nonetheless, the models subsumed similar aspects that can largely be mapped onto the dimensions of proximity and influence. However, considering that teacher-student relationships are based on bidirectional interactions (Pianta et al., 2003), the question remains open of how students’ interpersonal behavior can be described. With this regard, the literature is rather scarce, perhaps, because students are not considered responsible for creating a positive teacher-student relationship (Knierim, Raufelder, & Wettstein, 2016). Nonetheless, it is important to understand students’ interpersonal behavior in the classroom, in particular, because it has been hypothesized to affect teachers’ emotional experience (Pianta, 2001).

### *Students’ Interpersonal Behavior*

Drawing on interpersonal theory (Kiesler, 1983; Leary, 1957), Wubbels, Créton et al. (1993) suggested that not only teachers’, but also students’ interpersonal behavior can be characterized in terms of proximity and influence. In order to clarify, whose interpersonal behavior is referred to, the terms *teacher proximity/student proximity* and *teacher influence/student influence* will be used in the following.

Student behaviors that can be considered to reflect aspects of student proximity and student influence are included in one of the most prominent measures of teacher-student relationships, the student-teacher relationship scale (STRS; Pianta, 2001). The STRS includes three subscales that are rated from the teacher perspective: closeness, conflict, and dependency. Dependency indicates that a student is overly clingy and reacts strongly if separated from the teacher. Closeness and conflict are considered the central dimensions of the relationship so that I will focus on describing how student proximity and influence are reflected in these two scales (Hughes, 2011; Roorda et al., 2011).

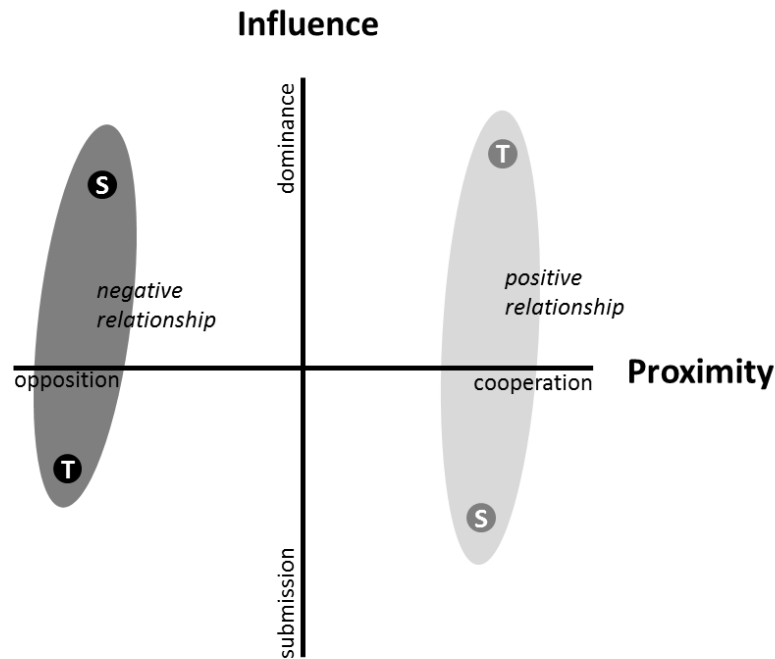
Closeness measures the degree of warmth and affection in the teacher-student relationship. Most of the items assess the child’s interpersonal behavior, for example, whether the child openly shares his or her feelings and thoughts, seeks comfort, and looks up at his or her teacher (e.g., “If upset, this child will seek comfort from me.”, “When I praise this child, he/she beams

with pride”, “This child spontaneously shares information about himself/herself”). Therefore, the closeness scale can be conceived of as an indicator of student proximity.

Conflict refers to the degree of negativity in the teacher-student relationship. Like in the closeness scale, the items mostly measure students’ interpersonal behavior and reflect the child’s resistance and anger (e.g., “This child easily becomes angry with me”, “This child remains angry or resistant after being disciplined.”, “When this child is in a bad mood, I know we’re in for a long and difficult day.”). Hence, the conflict scale indicates that the student is struggling with the teacher and refuses to follow directions. This could be interpreted as a high degree of student influence or, at least, shows that the teacher has difficulties to obtain influence.

In addition, an interview study among  $N = 60$  elementary and secondary teachers, provided examples of how student proximity and student influence are displayed (Hargreaves, 2000): With regards to *student proximity*, students made teachers feel liked in that they regularly said “hello” in the corridors or communicated that they were sad when the teacher was departing. However, students may also show disliking of their teacher and in the interviews teachers reported, for example, that some students parroted their words or even told them they hated them. Concerning *student influence*, teachers talked about students who refused to comply with classroom rules or to go to the principal’s office when instructed to do so. In general, all types of student misbehavior can be seen as an indicator of student influence. These include off-task and out-of-seat behavior, talking out of turn, noncompliance, tardiness, truancy, and serious disciplinary problems such as disrespect towards the teacher, verbal abuse, or fighting (Aloe et al., 2014; Blase, 1986; Robinson & Ricord Griesemer, 2006).

Based on the concept of complementarity (Kiesler, 1983; Sadler et al., 2009) it can be assumed that student proximity and student influence are largely a function of teachers’ interpersonal behavior. For example Pennings et al. (2014) hypothesize that supportive behaviors on part of the teacher will tend to make students react to the teacher in a similarly friendly manner and a teacher who takes control is likely to make students follow rules. Figure 1.2 provides an example of how students’ and teachers’ interpersonal behavior can be mapped along the two dimensions of proximity and influence in order to characterize the quality of their relationship. Thereby, a positive relationship is reflected in a high degree of both student and teacher proximity and high teacher influence, yet low student influence (Brekelmans et al., 1993). The following section will illustrate, why such a relationship can be considered to promote students’ school adjustment and teachers’ occupational well-being.



**Figure 1.2:** Illustration of the concept of complementarity in teacher-student relationships (Kiesler, 1983; Pennings et al., 2014; Sadler et al., 2009): Students (S) and teachers (T) in one dyad have similar levels of proximity and opposing degrees of influence. Positive relationships (light gray) are high on proximity and teacher influence, yet low on student influence; negative relationships (dark gray) are, for example, low on proximity and teacher influence, but high on student influence (Brekelmans et al., 1993).

### Importance of the Teacher-Student Relationship: Theoretical Perspectives

There are essentially three theoretical perspectives which offer an answer to the question as to why the teacher-student relationship is important for teachers and students. These theories are not mutually exclusive but rather complement each other. First, teacher-student relationship can be considered important for providing a secure base for children's development which is grounded in attachment theory (Bowlby, 1969). Second, establishing positive teacher-student relationships is supposed to be a central professional goal for teachers (Butler, 2012; Hagger & Malmberg, 2011). According to the transactional model of stress and coping (Lazarus & Folkman, 1984), teachers' occupational well-being will be reduced if they do not reach this goal. Third, based on self-determination theory (Ryan & Deci, 2000) teacher-student relationships may satisfy human's basic psychological needs and, therefore, foster their motivation, personality development, and well-being.



*Teacher-Student Relationships as a Secure Base*

Drawing on attachment theory (Bowlby, 1969), Pianta (1999) suggested that the central function of the teacher-student relationship is to provide a secure base for children's healthy development. Attachment theory (Bowlby, 1969) was developed based on observations of mother-child interactions in the first years of life and was guided by psychoanalytical and behavioral biological ideas. Bowlby (1969) suggested that children have an innate need for security, contact, and love from attachment figures, for instance, their mothers. Attachment figures provide protection and security and, therefore, secure survival of the species. Furthermore, they are seen as an important resource to regulate young children's behavior and emotions in stressful situations. Therefore, Bowlby (1969) proposed that children need to form a positive relationship with at least one attachment figure for their successful social and emotional development. This assumption has been underpinned in various longitudinal studies and meta-analyses report associations with outcomes such as internalizing behavior, peer relationships, and delinquency (Hoeve et al., 2012; Madigan, Atkinson, Laurin, & Benoit, 2013; Pallini, Baiocco, Schneider, Madigan, & Atkinson, 2014; for an extensive review also the Ainsworth, Blehar, Waters, & Wall, 2015).

To conform to the children's need for attachment, adults are naturally prepared to nurture children and to react to their signals. Their sensitivity plays a key role for the quality of the attachment relationship which has been underpinned in a series of studies by Mary Ainsworth (Ainsworth et al., 2015; Ainsworth, Blehar, Waters, & Wall, 1978). Using the so-called strange situation protocol, she observed one-year old babies' reactions to an unfamiliar situation and their reactions to their mothers' attempts to comfort them. Thereby, babies differed in their reactions and these inter-individual differences were largely a function of mothers' interpersonal behavior (Ainsworth et al., 1978): In general, caregivers who show empathy, encourage children to show their emotions, and respond immediately and appropriately provide a dependable, secure base. If needed, these children will seek comfort and help from their caregiver. Furthermore, because these children feel physically and emotionally secure, they are encouraged to explore their environment which will enable them to learn. In contrast, an insecure attachment relationship will result in caregivers who do not react to the child's needs reliably, expect them to self-regulate their emotions, or even display hostility toward the child. These children will either behave as if they were indifferent about their caregiver or they will switch between overly dependent and angry behavior.

Analogous to the findings that the caregiver's sensitivity is ascribed a key role in forming a secure attachment relationship, the dimension of teacher proximity can be considered to

be most important for a positive teacher-student relationship to emerge (Davis, 2003). However, teacher influence could also contribute to providing a secure base for children because setting limits and defining clear rules will help them to self-regulate their behavior (Pianta, 1999; Pianta & Hamre, 2009).

Regardless of the strong emphasis on how attachment relationships foster children's development, attachment theory indicates that positive teacher-student relationships may also be experienced as beneficial from the teacher perspective. After all, adults are thought to be naturally inclined to nurture children. This could be even more true for teachers because caring is inherent to the profession (O'Connor, 2008). The following section will amplify this point.

### *Teacher-Student Relationships as a Professional Goal*

To establish positive teacher-student relationships is considered a central professional goal of teachers. Regarding the dimension of proximity, Butler (2012) conducted a study among  $N = 530$  teachers who taught at all grade levels. Teachers' reported that their ability to show caring for students and to connect with them on a personal level were key criteria for them to feel successful as a teacher. Furthermore, in an interview study among three secondary school teachers, O'Connor (2008) established that caring was considered an inherent part of teaching. Thereby, caring fulfilled three functions from the teachers' point of view: First, caring was used to engage students in learning in order to reach learning goals. Second, building appropriate relationships was considered part of one's professional role. And third, caring was seen as a way to express one's personal values and a humanistic stance towards teaching. A study that asked  $N = 88$  pre-service teachers to report on their goals and concerns about teaching added to these findings (Hagger & Malmberg, 2011). Teachers reported that they wished to find a good way to connect with students and to experience closeness in their relationship (17% of all participants), but that they were concerned students would not like them and that their relationships would lack reciprocity (7%). Whereas these thoughts largely reflected the dimension of proximity, teacher influence was also important for pre-service teachers. They hoped that they would be able to manage student behavior and to set boundaries effectively (27%), but also feared they could fail in exerting control (32%). Aspects related to influence were the most central concern, and among the most important goals of pre-service teachers. Hence, both influence and proximity can be considered important professional goals for teachers. Due to the subjective relevance teachers attach to this goal, failing to achieve positive teacher-student relationships could impair teachers' occupational well-being according to the transactional model

of stress and coping (Lazarus & Folkman, 1984). In the following, I will first define the construct of well-being and then outline the transactional model of stress and coping (Lazarus & Folkman, 1984).

Occupational well-being is defined as optimal psychological functioning and experience at work which denotes the presence of positive and the absence of negative aspects (Bakker & Oerlemans, 2012; Diener, Suh, Lucas, & Smith, 1999; Ryan & Deci, 2001; Watson, Clark, & Tellegen, 1988). The positive dimension includes, for example, teachers' work engagement and enthusiasm which results in feelings of enjoyment, excitement, and pleasure, dedication and absorption in one's work (Kunter et al., 2008; Schaufeli, Salanova, González-romá, & Bakker, 2002). The negative dimension of well-being is characterized by the absence of stress and burn-out. Stress refers to teachers' negative, work-related emotions (Kyriacou & Sutcliffe, 1978). Burnout is seen as a consequence of prolonged work-related stress and is composed of three symptoms—emotional exhaustion, cynicism, and a subjective feeling of inefficacy (Maslach, Schaufeli, & Leiter, 2001): Emotional exhaustion is considered to be the core quality of burn-out. It reflects feelings of chronic stress and depletion of one's emotional and physical resources. Cynicism indicates distancing from work and development of an indifferent attitude. Inefficacy means that a person perceives a lack of achievement at work and feels unable to master work tasks. To understand how the teacher-student relationship might affect teacher well-being, the transactional model of stress and coping (Lazarus & Folkman, 1984) provides an explanation.

The *transactional model of stress and coping* (Lazarus & Folkman, 1984) defines stress as a consequence of complex interactions between potential stressors in a person's environment and his or her individual appraisals thereof. Thus, people might largely differ in their reactions towards similar, potentially stressful situations. More precisely, these inter-individual differences are attributable to two cognitive appraisal processes that occur when people are exposed to potential stressors. Primary appraisal includes the subjective evaluation of the extent to which the potential stressor is relevant for a person's individual goals and well-being. Potential stressors that are perceived as challenging, threatening, or harmful will turn into actual stressors. For example, a student who does not follow directions and shows disliking of the teacher will likely become an actual stressor for many teachers because, as has been outlined above, situations related to influence and proximity are highly relevant for them. In addition, a secondary appraisal process occurs in which people analyze whether their resources are sufficient to cope with the stressor. If the stressor exceeds the resources a stress response will unfold which will impair well-being in the long run. For example, a teacher will experience stress in response to

student misbehavior, if he or she does not know about classroom management strategies. If the person feels he or she can cope with the situation, the stressor will not induce stress. Thereby, several coping strategies are available that differ in their effectiveness depending on the situation: Problem-focused coping means that the person solves the problem, for example, by attending classroom management training. Emotion-focused coping aims to reduce the negative emotions that are experienced in the situation. For example, the teacher could use cognitive reappraisal and put him- or herself in the position of the child who might be resistant because it is the last lesson of a long school day. In a last step, people reflect the situation and evaluate the extent to which their coping strategy was successful. This will enable them to adapt their response in future situations.

In summary, the transactional model of stress and coping is useful for explaining when potential stressors turn into actual stressors and why people differ in their reaction to similar situations. Furthermore, the model has been supported empirically, for example, in clinical settings or the work context (Compas, Connor-Smith, Saltzman, Thomsen, & Wadsworth, 2001; Gardner, Rose, Mason, Tyler, & Cushway, 2007; Tennen, Affleck, Armeli, & Carney, 2000). Most importantly, the model can be applied to understand why a negative teacher-student relationship is likely to induce stress among teachers considering that it is a highly relevant professional goal (Spilt et al., 2011). In the next section I will provide a complementary perspective on why teacher-student relationships are central for teachers' occupational well-being as well as their students' school adjustment. Self-determination theory (Ryan & Deci, 2000) which suggests that teacher-student relationships are a context in which both satisfy their basic psychological needs.

#### *Teacher-Student Relationships as a Basic Psychological Need*

Self-determination theory (Ryan & Deci, 2000) is an organismic metatheory on human motivation and personality development. A central concept within the theory is that of the universal and innate basic psychological needs for autonomy, competence, and relatedness. *Autonomy* refers to the need to determine one's actions as opposed to being controlled by others (de Charms, 1968). The need for *competence* means that people strive to experience challenge and mastery in their activities (White, 1959). Finally, *relatedness* is defined as the orientation towards bonding with others and forming strong interpersonal relationships (Baumeister & Leary, 1995). The social context is attributed a central role for basic need satisfaction versus need thwarting. Importantly, relationships are considered to be vital in satisfying not only the need for relatedness, but also the needs for competence and autonomy (Deci & Ryan, 2014; La Guar-

dia & Patrick, 2008). Hence, from a self-determination theory perspective, the quality of relationships is determined through the extent to which they are conducive to basic need satisfaction.

By satisfying the three basic psychological needs, relationships are assumed to promote autonomous motivation which involves feelings of choice and volition and prohibit controlled motivation which is characterized by coercion and pressure (Deci & Ryan, 2008, 2014; La Guardia & Patrick, 2008). After all, people will be more willing to perform activities voluntarily and internalize them if significant others value these behaviors, illustrate how a task relates to one's personal goals, and provide support to master challenges (Ryan & Deci, 2000). Furthermore, because the needs for autonomy, competence, and relatedness are considered fundamental and inherent to all humans, Ryan and Deci (2000) emphasize that basic need satisfaction is necessary for people's health and well-being. The importance of basic need satisfaction for motivation and well-being has widely been supported empirically across different life domains (Milyavskaya & Koestner, 2011; Van den Broeck, Vansteenkiste, de Witte, & Lens, 2008; for an overview see also Ryan & Deci, 2000). One of these domains is the educational context and it has been suggested that teachers can foster students' motivation and, in turn, their learning outcomes if they create need-supportive classroom contexts (Deci & Ryan, 1994; Skinner, Furrer, Marchand, & Kindermann, 2008). Similarly, self-determination theory has been applied to the work context and it was hypothesized that need-supportive work contexts would promote occupational well-being and performance (Baard, Deci, & Ryan, 2004; Ilardi, Leone, Kasser, & Ryan, 1993). In the following, I will outline how influence and proximity can promote both students' and teachers' basic need satisfaction:

In general, a sense of relatedness is promoted when other people show involvement, interest, and affection instead of rejection. Students will feel related if the teacher cares for them at a personal level and is interested in every student's learning progress. Teachers will feel related if their students seek contact and express liking of the teacher. Hence, the dimension of proximity essentially determines teachers' and students' sense of relatedness with each other (Klassen, Perry, & Frenzel, 2012; Nie & Lau, 2009). Surprisingly, even though teaching is a genuinely caring profession (O'Connor, 2008; van der Want et al., 2014), the idea that teachers aim to build positive affective relationships with their students not only because it is a professional duty, but rather because they actually strive to relate to students has long been neglected (Klassen et al., 2012).

Feelings of competence are fostered if goals are accomplished and if others offer support to meet challenges successfully, communicate clear expectations, and provide structure rather

than imposing unrealistic expectations and goals. For example, teachers who enact consistent rules and communicate behavioral expectations establish an orderly classroom environment where learning time is maximized (Brophy, 2006; Kounin, 1970). These behaviors—reflecting aspects of teacher influence—will allow students to attain new knowledge and skills which will, in turn, make students as well as teachers feel competent. Similarly, providing academic support, and adjusting instructional methods and pace to individual students' potential will help students to meet classroom goals and to master their tasks (Nie & Lau, 2009; Skinner & Belmont, 1993). These behaviors reflect aspects of teacher proximity.

Finally, the need for autonomy is satisfied when others understand and consider a person's interests and preferences instead of exhibiting external control by using rewards or punishments. Teachers who are autonomy supportive offer children choices regarding their learning activities, provide rationales, draw connections between tasks in class and children's interests, and avoid external regulators such as rewards or punishments (Reeve, 2006; Skinner & Belmont, 1993). Teacher's readiness to be responsive to students' individual interests, in particular, could be considered an aspect of teacher proximity, whereas the use of external regulators could be thought of as an ineffective strategy of teacher influence. Regarding this, it is important to point out that teacher influence as defined in the present work does not necessarily interfere with students' need for autonomy and teachers who set limits in an informative rather than a punishing way will not undermine this need (Koestner, Ryan, Bernieri, & Holt, 1984; Kunter et al., 2007; Nie & Lau, 2009). For teachers the need for autonomy is less likely to be influenced by their interactions with students, but rather through the principal, political or curricular standards which determine whether teachers can choose their teaching methods, student goals, and contents (Bartholomew, Ntoumanis, Cuevas, & Lonsdale, 2014; De Neve, Devos, & Tuytens, 2015; Pelletier, Séguin-Lévesque, & Legault, 2002).

In summary, self-determination theory (Ryan & Deci, 2000) allows for a profound understanding of how the dimensions of influence and proximity support students' as well as teachers' basic need satisfaction in order to support their motivation, well-being, and performance. In contrast to attachment theory (Bowlby, 1969), it draws attention to the bidirectional benefits rather than focusing on the relationship as a context for children's healthy development only. In comparison to the transactional model of stress and coping (Lazarus & Folkman, 1984), taking a self-determination theory perspective is beneficial because it is applicable to a broader range of outcomes. Similar to attachment theory (Bowlby, 1969) and the transactional model of stress and coping (Lazarus & Folkman, 1984), teacher-student relationships are considered important from a self-determination theory perspective (Ryan & Deci, 2000) because they help

students and teachers reach their goals. The following sections will provide empirical evidence for the significance of teacher-student relationships for both students and teachers.

## **Empirical Evidence for the Significance for Students' School Adjustment**

### *Student Achievement*

In the introduction, I referred to Hattie's meta-analysis that reported an effect size of  $d = 0.72$  ( $r = .34$ ) for teacher-student relationships and implied it was one of the most relevant variables associated with student learning (Hattie, 2009). However, a closer look shows that this conclusion is disputable: Hattie (2009) based his calculation on a meta-analysis by Cornelius-White (2007) who focused on learner-centered instruction. Learner-centered instruction includes many aspects that characterize a positive teacher-student relationship, for example, empathy and warmth, but other characteristics such as encouragement of thinking that are not part of teacher-student relationships. Hence, Hattie's conclusion needs to be interpreted with caution and, in fact, another meta-analysis by Roorda et al. (2011) reported a considerably smaller, yet statistically significant association between teacher-student relationships and student achievement. Positive relationships showed an association of  $r = .16$  and were characterized by mutual closeness and warmth which largely reflected student and teacher proximity. Negative relationships and achievement were correlated with  $r = -.15$ . Negativity was indicated by coercion, conflict, and teachers' unfairness and blended aspects of influence and proximity.

The meta-analysis by Roorda et al. (2011) indicates that there are bivariate correlations between teacher-student relationships and student achievement. Nonetheless, a closer inspection of original empirical studies appears advisable. First, to examine the robustness of findings when additional covariates are considered. Second, to disentangle how the relationship dimensions of influence and proximity are uniquely associated with student achievement. And third, to gain a more profound understanding of how the meta-analytic findings can be interpreted. After all, Roorda et al. (2011) combined studies from two essentially different lines of research that are distinct in their conceptualization and measurement of teacher-student relationships and therefore allow for different conclusions.

In the first line of research, the focus is on relationships between teachers and young children in preschool, kindergarten, and elementary school. The quality of the relationship is often measured with the STRS (Pianta, 2001) and, thus, conceptualized in terms of *students' interpersonal behavior* as perceived by the teacher. A particularly sophisticated study in this line of research has been conducted by Hamre and Pianta (2001). They investigated how nega-

tive teacher-child relationships in kindergarten ( $N = 179$  students,  $N = 26$  classrooms) as assessed with the subscales of conflict and dependency in the STRS (Pianta, 2001) were linked to students' math and language arts grades and standardized achievement tests in lower elementary school, upper elementary school, and middle school. Gender, ethnicity, verbal IQ, and behavior problems in kindergarten were used as covariates in all analyses. In addition, lower elementary school performance was controlled for in predicting outcomes in upper elementary school and middle school. Hierarchical regression analyses showed that students with a negative teacher-student relationship in kindergarten had worse grades in lower elementary school and lower scores on the achievement tests in upper elementary and middle school. Many studies in this line of research yielded similar findings and showed an association between students' grades and scores on standardized tests and the teacher-student relationship (Baker, 2006; Birch & Ladd, 1997; Hughes, 2011; Hughes, Luo, Kwok, & Loyd, 2008; Jones, Bub, & Raver, 2013; Tsai & Cheney, 2012; Vitaro, Boivin, Brendgen, Girard, & Dionne, 2012). Thereby, a composite of subscales was often used. Comparing the bivariate correlations between achievement and either conflict or closeness, there appeared to be similar or stronger associations for conflict than for closeness (e.g., Baker, 2006; Hamre & Pianta, 2001; Hughes, 2011; for an overview see Roorda et al., 2011).

In the second line of research, older students in upper elementary school or secondary school are often investigated and the quality of the relationship is mostly assessed using observer or student ratings of *teachers' interpersonal behavior*. For example, Allen et al. (2013) used data from  $N = 37$  secondary classrooms ( $N = 643$  students) that teachers considered "challenging" to teach. Allen et al. (2013) examined how teachers' classroom organization and emotional support at the beginning of the school year were linked to student achievement on standardized tests at the end of the school year. Thereby, they applied the Classroom Assessment Scoring System (CLASS; Pianta, La Paro, & Hamre, 2008) which is a standardized observation measure of overall classroom quality based on the CLASS framework (Hamre & Pianta, 2007). Using multilevel modeling and controlling for achievement at the end of the prior school year, Allen et al. (2013) found that classes that were well-organized and had high mean levels of emotional support attained better overall achievement scores.

Another ambitious study in the second line of research that applied student instead of observer ratings was contributed by Fauth, Decristan, Rieser, Klieme, and Büttner (2014). The study was part of a longitudinal intervention study in which  $N = 89$  teachers conducted two pre-designed units on the topic of floating and sinking. Prior to the intervention, students' ( $N = 1556$ ) scientific literacy was assessed with a standardized test which served as covariates in the



analyses. Between the two units, students rated their teachers' classroom management and supportive climate. After the intervention, students' knowledge about floating and sinking was measured with a standardized test. Fauth et al. (2014) applied multilevel modeling to investigate differential associations between the teachers' interpersonal behavior and student achievement at the individual student level and at the class level. Analyses at the student level allow for inferences about the extent to which students' individual perceptions of teachers' interpersonal behavior explain variance in student outcomes within one classroom. Thereby, students' individual interpretations are conceptualized as an individual student's deviation from the class average. At the class level, one can investigate how students' shared perceptions of teachers' interpersonal behavior contribute to explaining variance in class level outcomes. To reflect students' shared perceptions, their individual ratings are aggregated at the class level to form a class mean. Results from multilevel modeling showed no associations between teachers' interpersonal behavior and student learning at the student level. Hence, the extent to which students' individual perceptions of teachers' interpersonal behavior differed from their classmates view was not associated with their learning outcomes. Results at the class level showed that classes that reported higher levels of classroom management attained higher scores on the post-test whereas no association with supportive climate was found. Thus, like Allen et al. (2013) the study by Fauth et al. (2014) implied a link between teacher influence and learning outcomes and other studies in this line of research have widely supported the association with students' achievement on standardized reading, mathematics, and science tests in upper elementary and secondary school (Blank & Shavit, 2016; Downer et al., 2014; Kunter et al., 2013; Lipowsky et al., 2009; Scherer, Nilsen, & Jansen, 2016; Wagner et al., 2016). In studies in preschool/first grade, however, this link was not supported indicating that a teacher who controls student behavior and sets limits might be less important for learning outcomes among young children (Hamre, Hatfield, Pianta, & Jamil, 2014; Ponitz, Rimm-Kaufman, Brock, & Nathanson, 2009).

With regards to teacher proximity the results by Fauth et al. (2014) and Allen et al. (2013) were contradictory. Similarly, some studies in this line of research showed an association between teacher proximity and students' scores on standardized reading and mathematics tests (Downer et al., 2014; Guo, Piasta, Justice, & Kaderavek, 2010; Hughes, 2011), whereas other researchers did not support this finding (Hamre et al., 2014; Kunter et al., 2013; Lipowsky et al., 2009; Scherer et al., 2016; Tennant et al., 2015; Yildirim, 2012). Perhaps, the contrasting findings were due to the fact that Allen et al. (2013) and others who found an association between achievement and proximity estimated separate models for each dimension of teachers'

interpersonal behavior. In contrast, Fauth et al. (2014) and others who did not find a link, modeled both dimensions simultaneously which provides a more rigorous test.

How can the results from the two lines of research be summarized? Results in the first line of research implied that students who are compliant and seek contact with their teacher attain better learning outcomes. This points to the significance of the dimensions of student proximity and student influence, however, the associations with student influence seemed to be more pronounced. Similarly, results in the second line of research showed that student achievement was higher when teachers successfully managed student behavior. Teachers' support of students, in contrast, did not add to explaining variance in student outcomes beyond teacher influence. Thus, teacher proximity appeared to be less central than teacher influence. In summary, these findings may seem contradictory to the meta-analysis by Roorda et al. (2011) where positive relationships, which largely reflected student and teacher proximity, were statistically significantly associated with student achievement. However, the meta-analysis did not control for covariates. Furthermore, the previous section presented mostly studies that used standardized achievement tests because they are a more valid indicator of students' learning outcomes than grades. In these studies the association between the relationship and achievement is typically smaller and Roorda et al. (2011) found the indicator of achievement (grades versus standardized tests) to moderate the link.

### *Student Behavior*

For students' behavioral outcomes, findings from both lines of research imply positive associations with influence and proximity. For example, one study in the first line of research investigated the link between the teacher-student relationship and children's social skills and class conduct in a sample of  $N = 1,310$  students from kindergarten to fifth grade (Baker, 2006). Thereby, teachers rated the subscales of conflict and closeness in the STRS (Pianta, 2001), students' social skills, and work habits. Teachers also evaluated students' internalizing and externalizing behavior problems as well as learning problems which served as covariates in the analyses. Results from regression analyses revealed a positive association between the STRS total score and students' concurrent social skills and work habits. Other studies in this line of research attained similar results and found a link between a positive teacher-student relationship and more behavioral engagement, higher social skills, as well as less internalizing and externalizing behavior problems (Archambault, Pagani, & Fitzpatrick, 2013; Hughes et al., 2008; Hughes, 2011; Jones et al., 2013; Tsai & Cheney, 2012). Whereas these studies are prone to common rater bias because they applied teacher ratings of both the relationship and student

outcomes, some studies showed that higher scores on the STRS are also associated with observer, parent, or student perceptions of students' engagement and social skills (Birch & Ladd, 1997; Decker, Dona, & Christenson, 2007; Doumen, Koomen, Buyse, Wouters, & Verschueren, 2012; Maldonado-Carreño & Votruba-Drzal, 2011; Skalicka, Stenseng, & Wichstrom, 2015).

Results from the second line of research largely resemble these findings. For example, Nie and Lau (2009) surveyed  $N = 3196$  ninth-grade students ( $N = 117$  classes) about their behavioral engagement in class as well as their teachers' behavioral control and care for students. Multilevel analyses showed that teachers who displayed higher behavioral control and care had classes that were more behaviorally engaged. Other studies yielded similar results and linked both influence and proximity to students' effort and behavioral engagement in class (den Brok, Brekelmans, & Wubbels, 2004; Dietrich, Dicke, Kracke, & Noack, 2015; Federici & Skaalvik, 2013; Hughes, 2011; Nie & Lau, 2009; Patrick, Ryan, & Kaplan, 2007; Ruzek et al., 2016; Strati et al., 2017; Wentzel, Battle, Russell, & Looney, 2010). However, some studies that investigated teacher proximity and influence simultaneously revealed a link between behavioral engagement in class and either teacher proximity (Reyes, Brackett, Rivers, White, & Salovey, 2012) or teacher influence only (Rimm-Kaufman, Baroody, Larsen, Curby, & Abry, 2015; Rimm-Kaufman, Curby, Grimm, Nathanson, & Brock, 2009).

Beyond that, there is initial evidence that the proximity and influence provided by the teacher is not only associated with positive behavioral outcomes in his or her class, but also with students' general behavioral adjustment, that is, the number of overall disciplinary referrals (Downer et al., 2014). The role of teachers' interpersonal behavior for students' general adjustment has also been supported in research that investigated students' overall relationships with teachers at school rather than focusing on individual teachers. For instance, in a sample of  $N = 3629$  sixth- to tenth-grade students, Havik, Bru, and Ertesvåg (2015) investigated reasons for students' truancy and school refusal and found an association with students' perception of little monitoring, academic and emotional support from teachers (e.g., "I feel that my teachers care about me.", "The teachers ensure that we behave well in our classes."). Other studies also showed that students who felt overall supported by their teachers had fewer conduct problems and higher behavioral school engagement (Laet et al., 2016; Murray, Kosty, & Hauser-McLean, 2016; Raufelder, Sahabandu, Martinez, & Escobar, 2015).

### *Students' Emotional-Motivational Outcomes*

Regarding students' emotional-motivational outcomes the majority of studies has been conducted in the second line of research. Perhaps, because the first line of research mostly

investigated young children from whom it is difficult to obtain reports on their emotional-motivational experience. There is a large amount of studies showing that teacher proximity is positively associated with students' emotional-motivational school outcomes. For instance, in a study by Wentzel et al. (2010) students ( $N = 358$  secondary school students) reported to be more interested in class when they perceived their teacher to be emotionally supportive and helpful with academic tasks rather than criticizing mistakes. Other studies also linked teacher proximity to students' emotional engagement, self-determined motivation, interest, enjoyment, self-efficacy, and self-concept in the respective subject of the teacher (Bieg, Rickelman, Jones, & Mittag, 2013; Cox & Williams, 2008; den Brok et al., 2004; Federici & Skaalvik, 2013; Hughes, 2011; Jen, Lee, Chien, Hsu, & Chen, 2013; Koka, 2013; Kunter et al., 2013; Maulana, Opdenakker, & Bosker, 2014; Patrick et al., 2007; Riconscente, 2014; Scherer et al., 2016; Skinner & Belmont, 1993; Strati et al., 2017). Furthermore, there is initial evidence that the proximity provided by the teacher is not only associated with positive outcomes in his or her class, but also with students' general adjustment, that is, school belonging, school and life satisfaction, or psychological health (Murray et al., 2016; Tennant et al., 2015; Vollet, Kindermann, & Skinner, 2017). The role of teacher proximity for students' general adjustment has also been supported in research that investigated students' overall relationships with teachers at school. One such study that drew on data from the PISA study ( $N = 193,073$  15-year-old students) has been conducted by Chiu, Chow, McBride, and Mol (2016). Using multilevel modeling, the study showed that students at schools where they feel that teachers generally support them emotionally and academically report a greater sense of school belonging. Other studies that took a similar approach found that students who felt overall cared for by teachers had higher self-determined motivation for school, more emotional school engagement, school satisfaction, school belonging, self-esteem, and psychological health (Bergh, Hagquist, & Starrin, 2011; Havik et al., 2015; Jia et al., 2009; Jiang, Huebner, & Siddall, 2013; Murray, 2009; Raufelder et al., 2015; Tian, Liu, Huang, & Huebner, 2013).

In comparison to research regarding proximity and students' emotional-motivational outcomes, research on teacher influence is less conclusive. In some studies influence has been linked to higher interest, enjoyment, emotional engagement, autonomous motivation, and self-concept in specific subjects (den Brok, Levy, Brekelmans, & Wubbels, 2005; Kunter et al., 2007; Kunter et al., 2013; Pakarinen et al., 2010; Rimm-Kaufman et al., 2009; Scherer et al., 2016; Stroet, Opdenakker, & Minnaert, 2015). In other studies—in particular, those that applied analyses at the class level—these positive associations were not found. For instance, Reyes et al. (2012), found no link between teacher influence as observed with the CLASS (Pianta et al.,

2008) and students' emotional engagement at the class level. Furthermore, teacher influence was not linked to students' domain-specific self-concept and their autonomous motivation at the class level and even showed negative associations with confidence in science and English learning (den Brok et al., 2004; Maulana et al., 2014; Wagner et al., 2016).

In summary, these studies consistently showed that proximity is positively associated with students' emotional-motivational outcomes, and some studies implied that this may be also true for influence. Building on that, some researchers tested the assumption of self-determination theory (Ryan & Deci, 2000) that teacher-student relationships are linked to student outcomes because they foster basic need satisfaction. For instance, Skinner et al. (2008) found that students' overall basic need satisfaction mediated the association between need-supportive teacher behaviors (structure, involvement, autonomy support) and students' emotional engagement. In addition, studies in the context of physical education classes found that students' feelings of belonging with their teacher mediated the link between teachers' relatedness support and students' autonomous motivation in physical education (Gairns, Whipp, & Jackson, 2015; Sparks, Dimmock, Lonsdale, & Jackson, 2016). The role of a sense of relatedness with the teacher for students' psychosocial adjustment has also been supported in other studies which established an association between relatedness with the teacher and students' emotional engagement in class and at school in general (Furrer & Skinner, 2003; King, 2015).

### **Empirical Evidence for the Significance for Teacher Well-Being**

The previous section showed that associations between the teacher-student relationship and students' school adjustments have been extensively studied. Considering that teacher-student relationships are a central professional goal for teachers and might promote their basic need satisfaction, it appears reasonable that a high level of student proximity could promote teachers' occupational well-being or that the failure to influence student behavior could impair it. The following section will provide empirical evidence for these assumptions.

An extensive body of research has identified common stressors in the teaching profession. A typical approach that is often applied in these studies is to ask teachers to complete self-report scales to measure their exposure to certain stressors and how these are linked to teachers' occupational well-being. Typical stressors include extensive workload, poor working conditions, and little recognition from the public (Boyle, Borg, Falzon, & Baglioni, 1995; Hakanen, Bakker, & Schaufeli, 2006; Kyriacou, 2011; van Droogenbroeck, Spruyt, & Vanroelen, 2014). Beyond that, social interactions with students were consistently found to be one of the central aspects that contributes to teacher well-being (Friedman, 2006; Pyhältö, Pietarinen, & Salmela-

Aro, 2011). For example, Chaplain (2008) asked  $N = 268$  pre-service teachers “How stressful have you found...” and listed 23 potential stressors (e.g., controlling pupil behavior, maintaining positive rapport with pupils, lesson planning, attitude/behavior of other teachers in your department, attitude of parents) which teachers were supposed to rate on a scale ranging from 1 = *not at all stressful* to 5 = *extremely stressful*. Thereby, controlling student behavior was considered most stressful by teachers, whereas maintaining positive rapport with pupils was not perceived as stressful on average. In another study, Dicke et al. (2014) applied a questionnaire on classroom disturbances (e.g., “At the beginning of the lesson it takes a long time until the students calm down and start to work.”) to  $N = 1,227$  pre-service teachers and found a positive relationship with teachers’ concurrent emotional exhaustion. Other studies that used similar methodological approaches supported these findings and showed that student misbehavior—an indicator of high student influence and a lack of teacher influence—is associated with feelings of anger, anxiety, and emotional exhaustion as well as reduced enjoyment, job satisfaction, and work engagement (Aloe et al., 2014; Bakker, Hakanen, Demerouti, & Xanthopoulou, 2007; Boyle et al., 1995; Frenzel, Goetz, Stephens, & Jacob, 2009; Hagenauer, Hascher, & Volet, 2015; Klusmann, Kunter, Trautwein, Lüdtke, & Baumert, 2008; Skaalvik & Skaalvik, 2010).

In contrast, the role of student proximity for teachers’ occupational well-being has been examined less frequently (Spilt et al., 2011). Even though the study by Chaplain (2008) implied that teachers did not experience maintaining student rapport as stressful, other studies found that it was central for promoting positive aspects of well-being. Interview studies revealed the impact of teachers’ bonds with students on their emotions, work enthusiasm, job satisfaction, and commitment (Hargreaves, 2000; Le Cornu, 2013; Shann, 1998; Veldman, van Tartwijk, Brekelmans, & Wubbels, 2013). Moreover, cross-sectional studies found that teachers who reported a close and non-conflictual relationship with their students, who felt appreciated and related to them had more positive emotions and work engagement as well as less anger and burnout (Gastaldi, Pasta, Longobardi, Prino, & Quaglia, 2014; Jo, 2014; Klassen et al., 2012; Milatz, Luftenegger, & Schober, 2015).

### **Critical Appraisal of Prior Research**

The previous sections illustrated that there is a large body of research that has investigated the importance of teacher-student relationships for both students and teachers using diverse methodological approaches. The following part will reflect on what we can learn from these studies and point out questions that were not addressed sufficiently to date.

#### *Students’ School Adjustment*

With regards to students' school adjustment, both influence and proximity have been linked to behavioral outcomes, whereas achievement was associated only with influence. Furthermore, proximity has been consistently linked to students' emotional-motivational outcomes, whereas findings for influence were less consistent. In accordance with self-determination theory (Ryan & Deci, 2000), students' basic need satisfaction has been found to mediate these links. Notably, many studies used longitudinal data and substantial sample sizes, and also controlled for relevant covariates such as prior achievement. Nonetheless, there are also some limitations I will discuss in the following.

Regarding the first line of research, that focused on students' interpersonal behavior as assessed with the STRS (Pianta, 2001), findings should be interpreted with caution because they do not necessarily allow for conclusions about ways in which teachers could contribute to students' development. Certainly, the STRS is an economic way to investigate teacher-student relationships among young children. In this age group student ratings of the relationship would be difficult to obtain and observer ratings are time and cost intensive (Hughes, 2011; Turner et al., 1998). Furthermore, focusing on dyadic relationships is a particular strength and acknowledges that the qualities of the relationships teachers form with each child may differ. However, the question arises as to whether the instrument is conducive to the goal of discovering how teachers and their relationships with students can foster children's positive development. Put differently, do the studies in this line of research actually allow for the conclusion that teachers significantly contribute to students' adjustment? On the one hand, drawing on the concept of complementarity and Ainsworth's observation that children's reactions to their mothers largely mirror their mothers' sensitivity, it appears to be a straightforward approach to infer from students' interpersonal behavior that the teacher behaves in a certain way (Ainsworth et al., 1978; Sadler et al., 2009). On the other hand, the conceptual model of the teacher-child relationship (see Figure 1.1) also implied that students' behavior towards teachers is only in part a function of teachers' behavior and, in addition, determined by students' individual characteristics such as aggressive behaviors, externalizing problems, or prior attachment experiences (McGrath & van Bergen, 2015; Pianta, 1999).

In particular, teacher ratings for conduct problems and conflict in the teacher-student relationship were found to be highly correlated (Hughes et al., 2008). Therefore, it has been argued that teachers' perceptions of conflict reflect negative effects of challenging student behaviors rather than dysfunctional interactions on the part of the teacher (Hughes et al., 2008; Silver, Measelle, Armstrong, & Essex, 2005). In contrast, Silver et al. (2005) hypothesized that teacher reports of closeness in the relationship—that is, their perception that children show

affection and seek contact—to a great extent reflect the teachers' provision of warmth and support for their students. However, there is now sufficient evidence that teacher reports of closeness might not be as closely connected with teachers' interpersonal behavior as expected. For example, Buysse, Verschueren, and Doumen (2011) used the STRS to ask  $N = 36$  kindergarten teachers about closeness in their individual relationships with students ( $N = 127$ ). At the same time, standardized observations were applied to evaluate teachers' sensitivity in their interactions with children. Observed teacher sensitivity and teacher-rated closeness were not statistically significantly correlated. A similar study among  $N = 33$  kindergarten teachers and their  $N = 148$  students found that teachers' reports of closeness converged to a limited extent with observer ratings of teachers' sensitivity and positive affect displayed towards individual children (Doumen et al., 2012). Furthermore, studies that asked students to evaluate whether they felt supported and cared for by their teachers indicated that student reports of teacher behavior were literally uncorrelated with teacher reports of closeness (Hughes, 2011; Li, Hughes, Kwok, & Hsu, 2012; Rey, Smith, Yoon, Somers, & Barnett, 2007; Suldo, McMahan, Chappel, & Bateman, 2014).

Hence, the empirical studies in this line of research cannot be interpreted in such a way that students will largely profit from supportive, caring teachers because the quality of the teacher-student relationship was largely conceptualized in terms of students' interpersonal behavior with teachers (e.g., "This child easily becomes angry with me.", "If upset, this child will seek comfort from me."; STRS; Pianta, 2001). Rather, the studies indicate that students who are easy to handle and approach their teachers positively will attain more favorable outcomes than children who are resistant and withdraw from their teachers. To draw conclusions about ways in which teachers could promote student development, findings from the second line of research are more appropriate for answering this question due to their explicit focus on teachers' interpersonal behavior.

Even though this is a particular strength of studies in the second line of research, one limitation is that some studies did not use appropriate statistical methods for analyzing the multilevel data that naturally result when multiple students per classroom are investigated (e.g., Bieg et al., 2013; Patrick et al., 2007). On the one hand, ignoring the nested data structure is problematic because it may lead to underestimated standard errors and false positive findings (Snijders & Bosker, 2012). On the other hand, it makes the interpretation of results difficult because the different levels of analyses were not disentangled so that it remains unclear to what extent the results are attributable to students' shared perceptions of teachers' interpersonal behavior or rather their individual interpretations thereof (Lüdtke, Robitzsch, Trautwein, &



Kunter, 2009; Raudenbush & Bryk, 2002). With this regard, it has been suggested to focus on the class level because it corrects for student idiosyncrasies and allows for investigating teacher effects (Lüdtke et al., 2009; Marsh et al., 2012). As a consequence, most of the studies that conducted multilevel analyses exclusively considered the class level (e.g., Kunter et al., 2013; Nie & Lau, 2009). However, this ignores the fact that teachers' interpersonal behavior with each student and the quality of each dyadic teacher-student relationship in the classroom may differ (Babad, 2009; Downer et al., 2014; Schweig, 2016). Therefore, it will also prove worthwhile to consider the individual student level in addition to the class level. The advantage of conducting analyses at the class level and student level simultaneously was not only demonstrated in the study by Fauth et al. (2014) who found that results could differ depending on the level of analyses. Similarly, Dietrich et al. (2015) showed that students' perceptions of teacher support were related to a positive development of their effort in German at the individual student, but not at the class level.

Beyond this limitation, the second line of research has strongly focused on domain-specific outcomes such as self-concept or engagement in a particular subject. The studies that investigated broader aspects of students' school adjustment such as school satisfaction or school belonging mostly relied on students' perceptions of their overall relationships with teachers at school. On the one hand, this seems reasonable because students particularly in secondary schools have many teachers at the same time. Therefore, it could be assumed that one teacher's interpersonal behavior might be less important for students' general school adjustment. On the other hand, drawing practical implications from these studies is difficult. For example, the question arises as to how many teachers would be needed to attain positive effects for students. Therefore, it might be more useful to focus on the dyadic relationship between the student and the individual teacher. This appears even more compelling when considering that certain teachers, for example, homeroom teachers have a key role in students' school lives and represent significant others who can largely impact their developmental trajectories (Chetty et al., 2010; Pajares & Urdan, 2008; van Ryzin, 2010).

In addition, the second line of research has rarely applied teacher ratings of their own interpersonal behavior. Perhaps, this is due to the fact that the reliability of teacher ratings has been questioned because their perceptions are assumed to be largely influenced by self-serving strategies or teaching ideals (Wubbels, Brekelmans, & Hooymayers, 1993). However, teachers are considered experts regarding classroom interactions due to their professional training and experience (Kunter & Baumert, 2006). Furthermore, because they are responsible for planning lessons, teachers' perceptions might be particularly valuable for indicating whether they were

able to control student behavior sufficiently in order to achieve desired goals. Hence, teacher ratings of influence, in particular, could be informative and have perspective-specific validity for predicting student outcomes (Clausen, 2002; Kunter & Baumert, 2006).

### *Teachers' Occupational Well-Being*

In terms of teachers' occupational well-being, in particular the association with the dimension of influence is empirically well-founded and student misbehavior has been consistently reported as one of the major stressors of teachers. There are also first empirical findings showing that feeling cared for and appreciated by students is related to higher occupational well-being. Yet, due to the reduced generalizability of qualitative interviews and the cross-sectional design in prior quantitative studies, more research is needed to underpin these findings. The question of whether the basic psychological needs could mediate the link between student behavior and teacher well-being, as suggested by self-determination theory (Ryan & Deci, 2000), has also not been addressed sufficiently.

Furthermore, the reliance on teacher self-report scales is a central limitation of research on predictors of teacher well-being. On the one hand, this is reasonable considering that the transactional model of stress and coping (Lazarus & Folkman, 1984) emphasizes the importance of a person's subjective experiences in the stress process. On the other hand, these studies cannot inform us about the extent to which teacher well-being is affected by stressors which other people except for the teachers would also recognize (Klusmann et al., 2008; Pas & Bradshaw, 2014). In particular, common rater bias represents a major issue (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003): This means that the covariance between job-related stressors and occupational well-being might be artificially inflated because both are rated by teachers. In particular, teachers' general positive/negative affectivity might represent a specific form of common rater bias that could reduce the validity of findings. For instance, negative affectivity or neuroticism could make teachers more likely to view both their teacher-student relationships and occupational well-being negatively (Boyle et al., 1995; Moyle, 1995; Watson & Clark, 1984). In addition, to feel less effective at work is a core symptom of burnout (Maslach, Schaufeli, & Leiter, 2001). Therefore, to perceive oneself as less successful in building positive relationships with students is likely to be part of experiencing burnout even if teacher-student relationships, in fact, did not change. Therefore, it would be useful to include other perspectives in addition to that of the teacher and to ask observers or students about their perceptions of potential stressors and resources (e.g., teacher-student relationship) as well. In particular student ratings might be suitable because, in contrast to external observers, students are less likely to miss critical episodes (cf. Praetorius, Pauli, Reusser, Rakoczy, & Klieme, 2014). A critical point that

is related to this is that observers could miss subtle signals that are readily apparent to teachers and students who have been involved in the relationship for a long period of time (Doumen et al., 2012). In addition, the presence of an observer might influence teachers' or students' behaviors (Clausen, 2002).

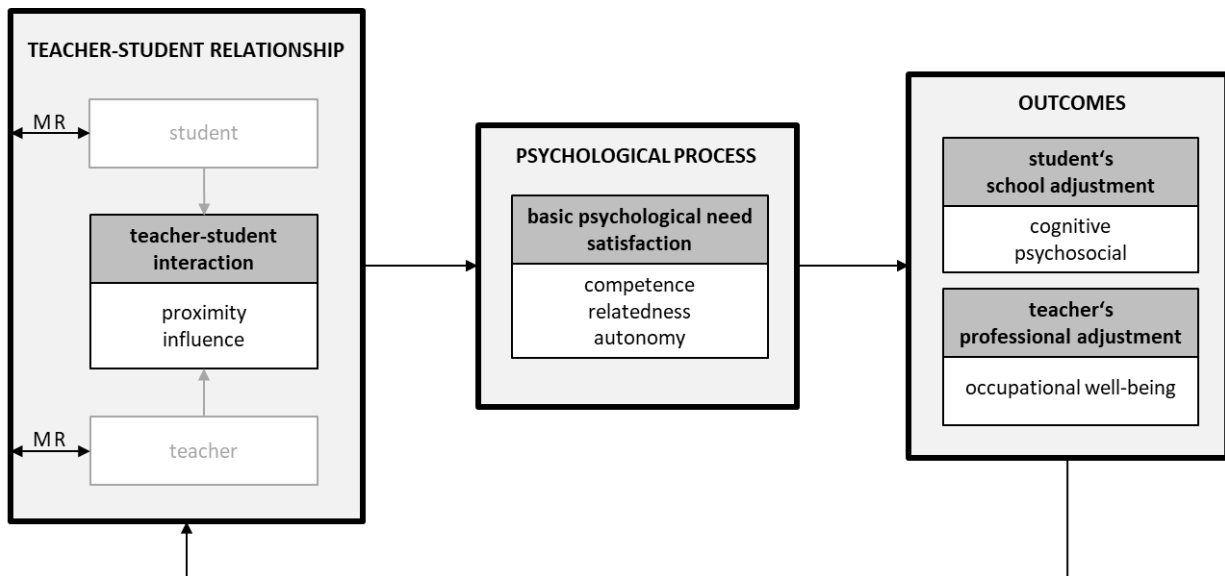
In summary, prior research largely emphasized the significance of teacher-student relationships for teachers' occupational well-being and students' school adjustment. Nonetheless, several questions remain open that include the association with students' general school adjustment rather than only focusing on domain-specific outcomes and the association between student proximity and teachers' occupational well-being. The present work aims to address these questions.

## Research Questions

The present work investigated the superordinate research question of whether the teacher-student relationship is associated with the development of both parties involved. Based on interpersonal theory (Kiesler, 1983; Leary, 1957) and prominent models of instructional quality (e.g., Hamre & Pianta, 2007; Kunter & Voss, 2013), a positive teacher-student relationship was conceptualized in terms of mutual proximity and teacher influence along with little student misbehavior. Drawing on self-determination theory (Ryan & Deci, 2000), it was hypothesized that a relationship in which both care for and respect each other, teachers support students academically and guide their behavior effectively would promote students' and teachers' basic psychological needs and, in turn, their positive development. These assumptions are visualized in the heuristic working model in Figure 1.3 which integrates ideas from the different theoretical perspectives and lines of research. In the present work parts of these assumptions were tested in three empirical studies of which the first focused on students' school adjustment whereas the second and the third concentrated on teachers' occupational well-being.

### *The Teacher-Student Relationship and Students' General School Adjustment*

*Study 1* was based on a large longitudinal research project (TRAIN; Jonkmann, Rose, & Trautwein, 2013) investigating German secondary students from the vocational track as well as their homeroom teachers. The study drew on students' and teachers' ratings of teacher proximity and influence. Drawing on German models of instructional quality (e.g., COACTIV model; Kunter & Voss, 2013), in the respective paper (Chapter 2) the terms social support and classroom management will be used instead. Students' general school adjustment was also assessed



**Figure 1.3:** Heuristic working model of the teacher-student relationship: Teacher-student interactions in terms of proximity and influence are considered to be the basis of the relationship of which both relationship partners form an individual mental representation (MR). The teacher-student relationship is assumed to determine the extent to which students' and teachers' basic psychological needs are satisfied to promote positive outcomes. Components that were not central for the present work are displayed in light gray.

and multilevel modeling was applied to examine associations with students' achievement, school satisfaction, truancy, and self-esteem. Thus, the extensive studies on the significance of the teacher-student relationship for students' school adjustment were complemented in three important ways.

First, the view was widened beyond students' domain-specific outcomes to more general indicators of their school adjustment. The assumption that the homeroom teachers' proximity and influence would be linked to their students' general school adjustment was based on their distinguished role in students' school life. After all, they teach a disproportionately high number of lessons, have a counselling function, go on school excursions, and often fulfill this role for several years.

Second, the use of both student and teacher ratings of teacher proximity and influence allowed for insights regarding their perspective-specific validity. As the few studies which combined different perspectives on teachers' interpersonal behavior showed (e.g., Clausen, 2002; Kunter & Baumert, 2006; Wagner et al., 2016), each rater may perceive different aspects when rating similar items about the teacher-student relationship so that findings may largely depend on the perspective of the rater.

Third, multilevel modelling was applied to investigate the association between teacher proximity and influence and students' school adjustment at the individual student level and at the class level simultaneously. Conceptually, this is an interesting question because analyses at the individual student level show whether students' individual perceptions are linked to differential outcomes for students' within the same classroom whereas analyses at the class level focus on students' shared perceptions and the association with variance in outcomes between classrooms. Some studies indicated that the consideration of both levels is valuable because findings can actually differ across levels (e.g., Dietrich et al., 2015).

### *The Teacher-Student Relationship and Teachers' Occupational Well-Being*

The second and third empirical study of the present work investigated the role of the relationship with students for teachers' occupational well-being. To extend prior studies on teachers' occupational well-being that mostly focused on student misbehavior (= lack of teacher influence) as a central stressor of teachers, Study 2 and Study 3 drew attention to student proximity as an important resource for teachers' occupational well-being. Due to the social, caring nature of the teaching profession, it appears reasonable that feeling appreciated by and related with students should play an important role for teachers' occupational well-being (Klassen et al., 2012; Spilt et al., 2011). Nonetheless, there is only limited empirical evidence in support of this assumption and most prior research was based either on cross-sectional data or on small samples due to the qualitative approaches that were applied. To address these desiderata, Study 2 and Study 3 examined associations between student proximity and satisfaction of the teachers' need for relatedness with students and the positive as well as the negative dimension of well-being in terms of work enthusiasm and emotional exhaustion.

*Study 2* drew on the same data as *Study 1* and again, both students' and teachers' ratings of teacher influence/student misbehavior were used. In addition, the homeroom teachers reported on their work enthusiasm, emotional exhaustion, and student proximity. Note that in Chapter 3 the term student proximity will be replaced by the term teacher-student relationship. This was done to facilitate the connection to the large number of researchers that use a narrow definition of the teacher-student relationship and equate the term with its emotional dimension.

The first way in which *Study 2* extended prior study was to use both teacher and student ratings of student misbehavior. Hence, the problem of common rater bias was avoided and the study gave insights whether teacher well-being was associated with behavior problems that were uniquely perceived by teachers or with problems their students acknowledged as well.

The central aim of *Study 2* was to investigate the association between student proximity and teachers' occupational well-being. Based on the theoretical model by Spilt et al. (2011),

student proximity was not only considered a predictor of teacher well-being, but also a mediator for the widely found link between student misbehavior and teacher well-being. The model proposes that student misbehavior could make teachers feel rejected so that teachers might feel that their students do not care about them or value them as a person. This, in turn, was suggested to induce negative emotions and reduce teachers' well-being because student proximity is considered vital for teachers' professional identities.

Even though Study 2 provided insights about student proximity as a resource for teacher well-being, it did not explain *why* feeling appreciated and liked by students could be associated with teacher well-being. Is it merely a professional goal that, if reached, would satisfy teachers' need for competence? Or are close relationships with students also important in their own right for supporting teachers' need for relatedness with students?

Because *Study 3* aimed to address these questions it was largely based on ideas from self-determination theory (Ryan & Deci, 2000). More precisely, the study provided a test of the hypothesis that the basic psychological need for relatedness with students mediates the link between teachers' daily stress exposure (e.g., due to difficult social interactions with students; see Figure A in the Appendix) and their occupational well-being. Furthermore, inter-individual differences regarding these processes were investigated and based on the theoretical assumption that job experience makes teachers less reactive to stress exposure, this variable was explored as a potential moderator (Almeida, 2005; Huberman, 1989). To investigate these research questions, beginning teachers filled in an online diary about their daily work-related experiences (e.g., rewarding or conflictual social interactions with students), their need satisfaction, and occupational well-being for two weeks. The diary methodology was a particular strength of this study which distinguishes it from a similar, yet cross-sectional study by Klassen et al. (2012). After all, diaries capture the daily intra-individual processes that account for changes in teachers' occupational well-being as they unfold and, therefore, reduce the risk of retrospective bias and increase ecological validity (Bolger & Laurenceau, 2013; Zirkel, Garcia, & Murphy, 2015).

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**Social Support and Classroom Management are Related to  
Secondary Students' General School Adjustment:  
A Multilevel Structural Equation Model Using  
Student and Teacher Ratings  
[Study 1]**

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*Abstract*

Teachers' social support and classroom management are related to secondary students' achievement, domain-specific interest, and self-concept. However, little is known about the question of whether social support and classroom management shape secondary students' general school adjustment beyond these domain-specific outcomes. To investigate this question, we drew on data from a large longitudinal research project ( $N = 5,607$  secondary students,  $N = 227$  classes). We applied student and teacher ratings of social support and classroom management to investigate their perspective-specific validities for predicting student outcomes. To measure students' school adjustment, we assessed achievement as a domain-specific indicator and school satisfaction, truancy, and self-esteem as more general aspects. Multilevel confirmatory factor analyses showed that teachers as well as students distinguished between social support and classroom management. Teacher and student ratings of classroom management largely converged whereas their perceptions of social support were not statistically significantly associated with each other. In multilevel structural equation modeling both perspectives uniquely predicted students' school adjustment: Student-rated social support was linked to all outcomes at the student level and to school satisfaction and self-esteem at the class level. Classroom management showed only few associations with outcomes at the student level, but at the class level student-rated classroom management was related to truancy and teacher-rated classroom management was linked to student achievement. These findings highlight the important role of teachers for students' general school adjustment and show the benefit of considering different perspectives and levels of analyses.

*Keywords:* Social support, classroom management, school adjustment, teacher effectiveness, student and teacher ratings





**Social Support and Classroom Management are Related to  
Secondary Students' General School Adjustment:  
A Multilevel Structural Equation Model Using Student and Teacher Ratings  
[Study 1]**

Social support and classroom management are key dimensions of teachers' interpersonal behavior and are considered vital for students' cognitive and psychosocial development above and beyond content-related interactions: Social support and classroom management help teachers to create a positive learning environment where students focus on their tasks, receive the instructional help they need, and feel valued and cared for (Hamre et al., 2013; Kunter & Voss, 2013; Wubbels, Créton, Levy, & Hooymayers, 1993). There is cumulated empirical evidence that teachers' social support and classroom management affect secondary students' domain-specific achievement, interest, and self-concept (den Brok, Brekelmans, & Wubbels, 2004; Kunter et al., 2013; Scherer, Nilsen, & Jansen, 2016).

Yet, to date some important questions have remained mostly unaddressed. First, prior research focused on domain-specific outcomes. Less is known about the question of whether one teachers' classroom management and social support also affects domain-independent, general aspects of secondary students' school adjustment. Second, some methodological challenges have not received sufficient attention in previous research. For instance, it is unclear to what extent different raters' perceptions of classroom management and social support converge and which perspective—student, teacher, or observer—provides most valid information for predicting student outcomes (Wagner et al., 2016). In addition, student ratings yield information on different conceptual levels of analysis, (Lüdtke, Robitzsch, Trautwein, & Kunter, 2009), but this advantage has rarely been employed in previous research on classroom management and social support because a large number of classes is needed to disentangle the effects of student ratings at the individual and class level.

To address these issues, we used data from a large longitudinal research project among two cohorts of German secondary students (TRAIN; Jonkmann, Rose, & Trautwein, 2013). We asked 5,607 students and their homeroom teachers ( $N = 227$  classes) to rate the teacher's social support and classroom management. In Germany, homeroom teachers not only teach at least one subject, they also go on school trips with their class, counsel students and parents, and bear special responsibility for the classroom climate. Moreover, homeroom teachers in Germany retain their class for several years. Therefore, homeroom teachers, in particular, could be as-

sumed to have an impact that goes beyond their subject. Our methodological approach of combining student and teacher ratings had some compelling advantages. It enabled us to investigate whether both teachers and students—at the individual student and at the class level—perceive classroom management and social support as distinct dimensions of teachers' interpersonal behavior. Moreover, this allowed for insights regarding the extent to which students' and teachers' perceptions of classroom management and social support converge. And most importantly, it enabled us to investigate differential relations between classroom management and social support with students' school adjustment depending on the perspective of the rater and the level of analyses. Thereby, students' school adjustment was broadly measured: Achievement was used as a cognitive, domain-specific outcome, while school satisfaction, truancy, and self-esteem were assessed to measure affective and behavioral indicators of students' general school adjustment.

### **Classroom Management and Social Support**

Social support and classroom management are widely considered to represent the two central dimensions of teachers' interpersonal behavior (e.g., Hamre et al., 2013; Kunter & Voss, 2013; Wubbels, Créton et al., 1993). Scholars agree that social support subsumes a variety of teacher behaviors (Kunter & Voss, 2013; Tennant et al., 2015): On the one hand, it refers to the overall emotional tone in the classroom, the extent to which teachers take a personal interest in their students, encourage them and show affection, acceptance, and respect. On the other hand, supportive teachers provide additional help with content-related difficulties so that students are enabled to solve their tasks and succeed in learning. Effective classroom management includes organizational and group management methods teachers use to establish and maintain order and discipline as well as strategies to handle persistent behavior problems by individual students, for example, disruptions, tardiness, or truancy (Emmer & Stough, 2001). In this regard communicating clear behavior expectations and rules, introducing routines, and monitoring student behavior is particularly effective (Emmer & Stough, 2001). The assumption that social support and classroom management represent two distinct dimensions of teachers' interpersonal behavior has been supported empirically (Downer, Stuhlman, Schweig, Martinez, & Ruzek, 2014; Fauth, Decristan, Rieser, Klieme, & Büttner, 2014; Kunter & Baumert, 2006; Wagner, Göllner, Helmke, Trautwein, & Lüdtke, 2013). Yet, both factors were often highly correlated and some studies cast their separability into doubt (Hamre, Hatfield, Pianta, & Jamil, 2014; Wallace, Kelcey, & Ruzek, 2016).

## **Classroom Management, Social Support, and School Adjustment**

Both social support and classroom management are considered vital for student development (Hamre et al., 2013; Wubbels, Créton et al., 1993). From a self-determination theory perspective (Ryan & Deci, 2000), classroom management and social support provide a motivating learning environment conducive to their basic need satisfaction. For instance, in classrooms where teachers prohibit interferences, assure that lessons start punctually, and offer assistance with difficulties, students will receive more opportunities to develop their skills in order to feel a sense of accomplishment (Brophy, 2006; Kounin, 1970; Niemiec & Ryan, 2009). Furthermore, teachers who react sensitively to their students' emotional needs and take a personal interest in them will promote their sense of relatedness (Ruzek et al., 2016; Skinner, Furrer, Marchand, & Kindermann, 2008). Thus, it is feasible from a theoretical point of view to expect positive effects of classroom management and social support for secondary students' cognitive, affective, and behavioral school adjustment.

As to cognitive student outcomes, various studies found that secondary students' overall achievement level was higher in well-organized classrooms (Blank & Shavit, 2016; Kunter et al., 2013; Scherer et al., 2016; Wagner et al., 2016). In contrast, social support appeared to be less important for their achievement (King, 2015; Kunter et al., 2013; Scherer et al., 2016; Wagner et al., 2016; Yildirim, 2012).

In terms of secondary students' affective outcomes, social support was consistently positively associated with domain-specific self-efficacy and self-concept, attitude, motivation, and enjoyment (den Brok et al., 2004; Dietrich, Dicke, Kracke, & Noack, 2015; Kunter et al., 2013; Rice, Barth, Guadagno, Smith, & McCallum, 2013; Wagner et al., 2016). Beyond that, sharing a positive relationship with one's teacher contributed to secondary students' general affective school adjustment because it was linked to positive affect and school satisfaction (King, 2015; Nie & Lau, 2009). In contrast, classroom management appeared to be less central for secondary students' affective adjustment. Even though the research project by Kunter and colleagues revealed a relationship to students' satisfaction with the teacher, interest, and enjoyment in mathematics (Kunter et al., 2013; Kunter & Baumert, 2006; Kunter, Baumert, & Köller, 2007), in other studies no such association was found (den Brok et al., 2004; Wagner et al., 2016).

With regard to behavioral outcomes, classes with strong social support and classroom management showed higher engagement in the respective subject (den Brok et al., 2004; Nie & Lau, 2009). Moreover, some studies already showed links of social support and classroom management to secondary students' general behavioral adjustment in school, for instance, they

were correlated with less truancy and higher school engagement (Havik, Bru, & Ertesvåg, 2015; Jelas, Azman, Zulnaidi, & Ahmad, 2016; King, 2015).

In summary, the empirical evidence for the developmental significance of classroom management and social support appears to be compelling and sufficient. However, as we indicated earlier, most studies concentrated on domain-specific outcomes and did not investigate effects of classroom management and social support on secondary students' school adjustment in more general terms. Therefore, the present study examined achievement in the homeroom teachers' subjects, and, most importantly, the impact of their classroom management and social support on important, more general indicators of school adjustment—school satisfaction, truancy, and self-esteem. School satisfaction and the reduction of truancy are of particular interest to increase school engagement and decrease the risk of school dropout (Elmore & Huebner, 2010; Kearney, 2008; Sälzer, Trautwein, Lüdtke, & Stamm, 2012). Moreover, schools are increasingly requested to foster students' self-esteem because it helps them cope with their emotions and it improves psychological well-being (Lipnevich, Preckel, & Roberts, 2016; Moksnes, Moljord, Espnes, & Byrne, 2010; Orth, Robins, & Roberts, 2008). In addition to these content-related desiderata, some important methodological challenges have not been addressed sufficiently in prior research.

### **Methodological Issues in Research on Social Support and Classroom Management**

Three informants have been used to assess social support and classroom management: students, teachers, or external observers (Turner & Meyer, 2000). Which rater provides most valid information for predicting student outcomes is still a controversial issue (Wagner et al., 2016). Nonetheless, most prior studies relied on only one of these informants and did not consider how this could impact their findings. Moreover, the multilevel nature of the data has often been ignored, in particular, in research on social support. Therefore, we combine student and teacher ratings and analyses at the individual student level and at the class level in the present investigation.

#### *Assessment of Social Support and Classroom management: The Student and the Teacher Perspective*

Teacher as well as student ratings are associated with specific advantages, but also drawbacks. Teachers are experts regarding classroom processes due to their professional background (Kunter & Baumert, 2006). However, their ratings could be influenced by self-serving strate-

gies or teaching ideals (Wubbels, Brekelmans, & Hooymayers, 1993). Student ratings are particularly appealing because their individual experiences should be most relevant for their development (Lüdtke et al., 2009). On the contrary, they are suspected to be affected by students' idiosyncrasies and teacher popularity (Marsh & Roche, 1997; Stern, 1970). The presumption that student and teacher ratings are largely shaped by personal interpretations seems to be supported by the finding that their perceptions often diverge considerably: Studies that administered identical items to students and teachers found low-to-moderate correlations for social support whereas convergence was larger for classroom management (Kunter & Baumert, 2006; Wagner et al., 2016; Wubbels, Brekelmans et al., 1993). However, Kunter and Baumert (2006) argued that this was not simply ascribable to unreliability, but rather to the fact that students and teachers may focus on different aspects when evaluating social support and classroom management. Thereby, teachers' perceptions of classroom management, in particular, might add a valuable perspective to student ratings because they can best evaluate whether their teaching objectives have been disturbed or not whereas they might be less sensitive to students' need for individual support (Kunter & Voss, 2013). Hence, when assessing identical items of social support and classroom management, student and teacher ratings should represent empirically distinguishable factors that may be uniquely linked to student outcomes. Studies among mathematics teachers supported these assumptions and showed that student and teacher ratings of classroom management and social support loaded on different factors (Kunter & Baumert, 2006; Wagner et al., 2016). Moreover, student and teacher ratings had perspective-specific validity: Student-rated classroom management was consistently linked to achievement, students' perceptions of social support were related to their engagement, and both student- and teacher-rated classroom management were associated with students' satisfaction with the teacher, but in general, the findings for teacher ratings were inconsistent (Kunter & Baumert, 2006; Skinner et al., 2008; Wagner et al., 2016).

### *Multilevel Issues in the Study of Classroom Management and Social Support*

The second issue we raised with regard to the empirical findings presented above was that the multilevel nature of student ratings has often been neglected. This point is crucial because interpretation of results largely depends on the level of analyses (Lüdtke et al., 2009; Raudenbush & Bryk, 2002): At the class level, students' individual ratings are aggregated to represent their shared perception of classroom management and social support. Analyses at the class level are used to explain differences in outcomes between classrooms. In contrast, analyses at the student level focus on students' individual interpretations, that is, the extent to which

individual student perceptions diverge from the class average, in order to explain different student outcomes within the same classroom. In most studies referred to above both levels have not been disentangled appropriately or analyses focused exclusively on the class level. From a theoretical standpoint, it has been argued that the class level is of particular interest because classroom management and social support have been conceptualized as a feature of the classroom (Marsh et al., 2012). Moreover, analyses at the class level have methodological advantages because they counterbalance student idiosyncrasies so that effects can more likely be attributed to between class differences in classroom management and social support instead of general rater tendencies (Lüdtke et al., 2009). However, students' individual interpretations can also hold valuable information (Downer et al., 2014; Schweig, 2016). On the one hand, students' individual perceptions can reveal whether teachers' behaviors match each student's individual needs (Eccles et al., 1993). On the other hand, diverging perceptions may actually be grounded in unequal treatment of different students in response to their individual characteristics and behaviors (Babad, 2009; Nurmi & Kiuru, 2015). Thus, students' individual perceptions might be particularly relevant concerning social support because, in contrast to classroom management, supportive behaviors often address individual students rather than the whole class.

Multilevel modeling can be applied to simultaneously predict student outcomes at the individual and at the class level in order to combine the advantages of the individual student and the class perspective (Raudenbush & Bryk, 2002). Before such analyses can be performed, one must investigate the factorial structure at each level separately in order to attain valid results (Muthén, 1994). Initial studies among elementary students indicated that classroom management and social support represent empirically distinguishable factors at both levels (Downer et al., 2014; Fauth et al., 2014). These studies also showed that simultaneous analyses at the student and class level are a very informative approach because the relationships between classroom management and social support with school adjustment may largely depend on the level of analyses. For instance, social support was positively linked to affective outcomes at the student level, but not to behavioral outcomes and achievement (Dietrich et al., 2015; Downer et al., 2014; Fauth et al., 2014). At the class level, in contrast, it was related to behavioral outcomes, whereas findings for affective outcomes and achievement were mixed (Dietrich et al., 2015; Downer et al., 2014; Fauth et al., 2014). Classroom management was linked to higher achievement and behavioral outcomes at the class level, but not to affective outcomes (Downer et al., 2014; Fauth et al., 2014). At the student level, classroom management was again related to behavioral outcomes, but not to affective school adjustment, whereas findings for achievement were mixed (Downer et al., 2014; Fauth et al., 2014).

## **Present Study**

In the present study we drew on longitudinal data from a large sample of secondary school students and their homeroom teachers and linked both informants' perceptions of social support and classroom management to achievement, school satisfaction, self-esteem, and truancy. We addressed three central research questions using multilevel analyses.

First, because only very few studies combined student and teacher ratings with simultaneous analyses at the student and the class level (for exceptions see e.g., Downer et al., 2014; Kunter & Baumert, 2006), we tested whether social support and classroom management represented distinct factors at both levels and regardless of whether student or teacher ratings are applied. This appears particularly crucial considering recent contributions that challenged their distinctness (e.g., Wallace et al., 2016).

Second, we examined the convergence of student and teacher ratings of social support and classroom management. We followed the idea that disagreement between students and teachers is based on the fact that both perceive perspective-specific aspects of the classroom social environment (Kunter & Baumert, 2006). Therefore, we expected that student- and teacher-rated social support and classroom management, respectively, would represent distinct factors which would result in a four-factor solution at the class level with moderate to high correlations for student- and teacher-rated classroom management, yet small correlations for student- and teacher-rated social support.

Our third and main research question was concerned with the association between social support and classroom management with school adjustment. Thereby, the study is innovative in three aspects. First, prior research among secondary students has mostly focused on domain-specific outcomes. We argued that homeroom teachers could also affect their students with regard to their domain-independent, general school adjustment due to their special function in students' lives. Therefore, we included achievement, truancy, school satisfaction, and self-esteem in order to extend our knowledge to broader outcomes. Furthermore, building upon our second research question, we investigated the perspective-specific validity of student and teacher ratings in predicting student outcomes. Finally, we disentangled the student and the class level which enabled us to discover potentially different patterns depending on the level of analyses. From a theoretical point of view (e.g., self-determination theory, Ryan & Deci, 2000), generally positive effects of classroom management and social support on student development are plausible. However, based on prior research, we assumed that classroom management would be most closely linked to achievement and truancy, whereas social support would be related to truancy and the affective outcomes, namely school satisfaction and self-esteem.

Thereby, we expected differential relations that would depend on the level of analyses and whether the student or the teacher perspective is considered. More precisely, we assumed that social support would be predictive at both the student and the class level whereas classroom management would primarily be a class level construct. After all, management strategies usually address the classroom as a whole whereas teachers might contribute varying levels of social support to individual students (Nurmi & Kiuru, 2015). Moreover, we hypothesized that the student perspective, especially students' ratings of social support, would be more predictive for student development than the teacher perspective (Kunter & Voss, 2013; Lüdtke et al., 2009).

## **Method**

### *Procedure*

The present study draws on data from two cohorts and two measurement points: The first measurement took place in the fall of the schoolyear 2008/09 when the students were in fifth and eighth grade; the second measurement took place approximately one year later when students were in sixth/ninth grade. The first measurement point was used to assess students' baseline levels of school satisfaction, truancy, self-esteem, and German and mathematics achievement. The second measurement point represented the prime focus of our study because at this time teachers had spent over a year with their class so that potential effects could have unfolded. Students and teachers rated classroom management and social support. In addition, students' school satisfaction, truancy, self-esteem, and achievement were assessed again. Participation was voluntary and parents were asked for consent.

### *Sample*

The present study was conducted in 227 classrooms in 106 German schools. The study was part of a larger longitudinal research project that was carried out in two German federal states (Baden-Württemberg and Saxony) and investigated student development in secondary school, namely in the vocational track (TRAIN; Jonkmann et al., 2013). In Germany students are either allocated to the vocational track or to the academic track at the end of primary school based on prior achievement (Maaz, Trautwein, Lüdtke, & Baumert, 2008). In contrast to the academic track, students in the vocational track do not qualify for higher education. The structure of the vocational track depends on the federal state: Either there is only one comprehensive school (Saxony) or students are further divided into a lower and an intermediate track (Baden-Württemberg).



Our final sample included  $N = 5,607$  students:  $n = 5,030$  students at the first ( $M = 22.26$  students per classroom,  $SD = 5.01$ ) and  $n = 4,930$  students at the second measurement point ( $M = 21.72$  students per classroom,  $SD = 5.15$ ). Of these students  $n = 4,353$  participated at both measurement points. We found no statistically significant differences between students who participated at the first or the second, respectively, both measurement points in terms of grade level or socio-economic status, but boys, students with a migration background and from lower track schools were slightly overrepresented in the group of students who participated only once.

We assessed  $n = 3,123$  fifth grade students (age:  $M = 11.14$ ,  $SD = 0.59$ ; 131 classes) and  $n = 2,484$  eighth grade students (age:  $M = 14.26$ ,  $SD = 0.67$ ; 96 classes). Of these students, 54% were male, 28% had a migration background, and the highest socio-economic index (Ganzeboom, Graaf, & Treiman, 1992) was on average 45.52 ( $SD = 12.89$ ). Students attended a comprehensive school ( $n = 2,155$ ), the lower ( $n = 1,991$ ), or the intermediate track ( $n = 1,461$ ).

The homeroom teachers participated ( $N = 211$ ) in addition to the students. In Germany, homeroom teachers not only see their students every day, they also have a counseling function and usually accompany their class for at least two years. At the second measurement point, most of the homeroom teachers had been teaching their class for at least one year, but some (15%) had only been teaching their class for three months. The teachers were on average 45.14 years old ( $SD = 10.09$ ), had 19.74 years of job experience ( $SD = 11.00$ ), and 30% were male. 169 teachers were teaching German and/or mathematics, and only this subsample of teachers and their students ( $n = 4,151$ ) were included in the analyses regarding achievement in these subjects.

### *Instruments*

Students and teachers evaluated classroom management and social support on a 4-point scale ranging from 1 = *completely disagree* to 4 = *completely agree*. The items are displayed in Table 2A in the Appendix. Most items were retrieved from Baumert et al. (2008); two items for social support were newly developed based on the concept of transformational leadership (Bass, 1990) to measure the extent to that teachers believed in their students' future. Students' school adjustment was assessed broadly and included truancy, school satisfaction, self-esteem, and achievement to include behavioral, affective, and cognitive aspects. The items are included in Table 2B in the Appendix.

*Classroom management.* Six items assessed the lack of disciplinary problems and disruptions in class as an indicator of efficient classroom management ( $\alpha_{\text{teacher}} = .84$ ;  $\alpha_{\text{student}} = .88$ ).

*Social support.* Teachers' patience and help regarding content-learning as well as their appreciation of and personal interest in their students was measured with eight items ( $\alpha_{\text{teacher}} = .81$ ;  $\alpha_{\text{student}} = .93$ ).

*Truancy.* Six types of truancy ( $\alpha_{t1} = .92$ ,  $\alpha_{t2} = .93$ ) were measured on a scale from 1 = *never*, 2 = *two or three times*, 3 = *three or four times* to 4 = *five times or more*.

*School satisfaction.* Students' enjoyment and effort regarding school was assessed with seven items ( $\alpha_{s1} = .79$ ,  $\alpha_{s2} = .79$ ) by Baumert, Gruehn, Heyn, Köller, and Schnabel (1997) on a 4-point scale ranging from 1 = *completely disagree* to 4 = *completely agree*.

*Self-esteem.* Four items ( $\alpha_{e1} = .73$ ,  $\alpha_{e2} = .75$ ) by Ravens-Sieberer and Bullinger (2000) were used to measure the students' appraisal of their own value on a 5-point scale ranging from 1 = *never* to 5 = *always*.

*Achievement.* Mathematics achievement and German language achievement were assessed via standardized achievement tests that covered the standard content of the federal states' curricula in mathematics and German language. The German test measured reading comprehension with 60-76 items in total depending on the measurement point and the cohort of students. Students read several short texts and were asked open ended, closed ended, and multiple choice questions about them (for a more detailed description see also Dumont, Trautwein, Nagy, & Nagengast, 2014). The mathematics test comprised 73-84 items that covered grade-specific contents such as arithmetic rules, the metric system, fractions and percentages, stochastics, linear equations, creating and interpreting graphs, power calculation, areas, volumes, angles, and symmetry. The items had an open ended, closed ended, or multiple choice format. All answers were subsequently recoded into a binary format indicating whether students answered correctly or incorrectly to the test item. A longitudinal balanced incomplete booklet design with anchor items was used to ensure a common metric of IRT person parameter estimates. The number of anchor items ranged between 25-42 across measurement occasions for each domain (German language and mathematics). On this basis, item and person parameters for students' mathematics and German language competence were estimated with a longitudinal multidimensional 2-PL IRT model (one dimension for each measurement time point including measurement invariance across measurement occasions). Item parameters were estimated in a first step using marginal maximum likelihood (MML) estimation. Dimensionality, measurement invariance across different subpopulations (school type, gender), and partial measurement invariance across measurement points were checked (Jonkman et al., 2013). Person parameter estimates were generated in a second step based on item parameters obtained from the previous MML estimation. We used a weighted maximum likelihood estimator (WLE) for further statistical analyses,

as they are individually unbiased person parameter estimates that do not suffer from shrinkage effects and inflated correlations. Therefore the WLE scores are superior to EAP or MAP estimates in longitudinal research. Reliabilities of students' competencies were all above  $\alpha = .70$  indicating good reliabilities for the two achievement domains and the two cohorts. In addition, results of IRT models revealed changes with a standardized mean difference of  $0.17 \leq d \leq 0.34$  from one school year to the next. For our analyses, we standardized the WLE scores for each test separately to assure comparability across subjects and cohorts. Finally, we calculated the achievement variable which included students' mathematics achievement in case the homeroom teacher taught mathematics, German achievement in case the homeroom teacher taught German, and the average of both tests in case the homeroom teacher taught both subjects.

*Covariates.* All outcome variables were assessed at both measurement time points so that we were able to control for the baseline level. In addition, we used gender (0 = female, 1 = male), migration background (0 = no migration background, 1 = migration background), and socio-economic background (highest socio-economic index of occupational status; Ganzeboom et al., 1992) as covariates at the student level. At the class level, we controlled for cohort (0 = fifth/sixth grade, 1 = eighth/ninth grade) and created two dummy variables for school type (lower: 0 = other, 1 = lower track; intermediate: 0 = other, 1 = intermediate track).

### *Data analyses*

As we were interested in investigating effects at the student and the class level, we used multilevel modeling (Raudenbush & Bryk, 2002). To test whether the factorial structure for social support and classroom management was equal at the student and class level as well as for student and teacher ratings, we proceeded as suggested by Muthén (1994). Thereby, student and teacher ratings were included in a joint model. First, we investigated the factor structure at each level separately using exploratory factor analyses (EFA) with oblique geomin rotation. Next, we applied multilevel confirmatory factor analysis (MCFA). Each item only loaded on the factor expected and the residuals of parallel items from the student and the teacher questionnaire were allowed to be correlated (Little, 2013). To evaluate model fit, we drew on Hu and Bentler (1999) and considered TLI and CFI values  $\geq .95$ , RMSEA values  $\leq .06$ , and SRMR values  $\leq .08$  as good model fit. In comparing different models we evaluated changes in CFI and assumed the fit of two models to be equivalent with  $\Delta\text{CFI} \leq -.01$  (Cheung & Rensvold, 2002).

To predict truancy, school satisfaction, self-esteem, and achievement, we used multilevel structural equation models (MSEM) as proposed by Marsh et al. (2009). MSEM have the advantage of simultaneously controlling for measurement error and sampling error. To control for measurement error at the student and the class level, classroom management and social

support were measured with multiple indicators at both levels. To control for sampling error, the class mean was treated as a latent variable which was estimated by correcting the aggregated manifest class mean for its unreliability. We set up a series of MSEMs. Model 1 included classroom management and social support and the background variables were controlled for (gender, migration, SES, school type, cohort). In model 2, the baseline level of the outcome variable was entered in addition. In these models, we group-mean centered social support and classroom management which allowed us to disentangle within-class and between-class effects of social support and classroom management on student outcomes (Lüdtke et al., 2009). The covariates gender, socioeconomic status, migration background, and the baseline measures of the outcome variables were added at level 1 and were grand-mean centered to adjust for individual differences between classes. Analyses were performed with Mplus 7 (Muthén & Muthén, 1998-2012) using maximum likelihood estimation with robust standard errors.

Like in most empirical studies, we had to deal with missing data. Two different types of missing data occurred: (1) no participation at the respective measurement point or (2) missing values on single items or scales. The covariance coverage was 74% on average. To avoid list-wise deletion, missing data were handled using a full information maximum likelihood algorithm (Enders, 2010).

## Results

### *Preliminary Analyses*

The means, standard deviations, intraclass correlations (ICC), and correlations for social support, classroom management, and student outcomes at the second measurement point are displayed in Table 2.1. The means indicate that students ( $M = 3.07$ ) and teachers ( $M = 3.52$ ) perceived high levels of social support. Classroom management was around the scale's midpoint ( $M_{\text{student}} = 2.50$ ,  $M_{\text{teacher}} = 2.66$ ). As the ICC(1) shows, 22% and 24% of the variance in student ratings of classroom management as well as social support could be attributed to differences between classrooms. Thus, nearly 80% of the variance was due to within classroom variation. To investigate whether the reliability of the aggregated student ratings was sufficient to carry out analyses at the class level, we calculated the ICC(2), which is a reliability index for the class-mean rating (Lüdtke et al., 2009). It was satisfactory for both constructs (classroom management:  $\text{ICC}(2) = .86$ ; social support:  $\text{ICC}(2) = .87$ ).

The correlations showed statistically significant and moderate associations between teacher-rated classroom management and achievement ( $r = .17$ ,  $p = .03$ ), but no association between student outcomes and teacher-rated social support ( $.02 \leq r \leq .06$ ). For student-rated

classroom management and social support there was a statistically significant, small to moderate association with all outcomes at the student level. At the class level classroom management was moderately linked to truancy ( $r = -.25, p = .01$ ) and school satisfaction ( $r = .19, p = .03$ ) whereas there was a strong relationship between social support and self-esteem ( $r = .55, p = .001$ ) and school satisfaction ( $r = .51, p < .001$ ).

### *Classroom Management and Social Support as Key Dimensions of the Classroom Social Environment*

Our first research question aimed to investigate whether the same factorial structure holds for student and teacher ratings at the class level as well as for student ratings at the student level. Results of EFA at the student level implied a 2-factor solution (first five eigenvalues: 5.97, 2.39, 0.75, 0.63, 0.54). Items assessing *classroom management* loaded on the first factor ( $.51 \leq \lambda \leq .77$ ), items related to *social support* loaded on the second factor ( $.68 \leq \lambda \leq .80$ ), and cross loadings were small ( $.00 \leq |\lambda| \leq .25$ ). At the class level, where student as well as teacher ratings were included, EFA indicated a 5-factor solution (first six eigenvalues: 11.10, 4.13, 3.73, 1.71, 1.10, 0.86). As the 5-factor model did not converge, we continued with a 4-factor model. The first factor comprised items that measured *classroom management* from the

**Table 2.1:** Descriptive results for classroom management, social support, and student outcomes at the second measurement point as well as correlations at the class level (above diagonal) and the student level (below diagonal)

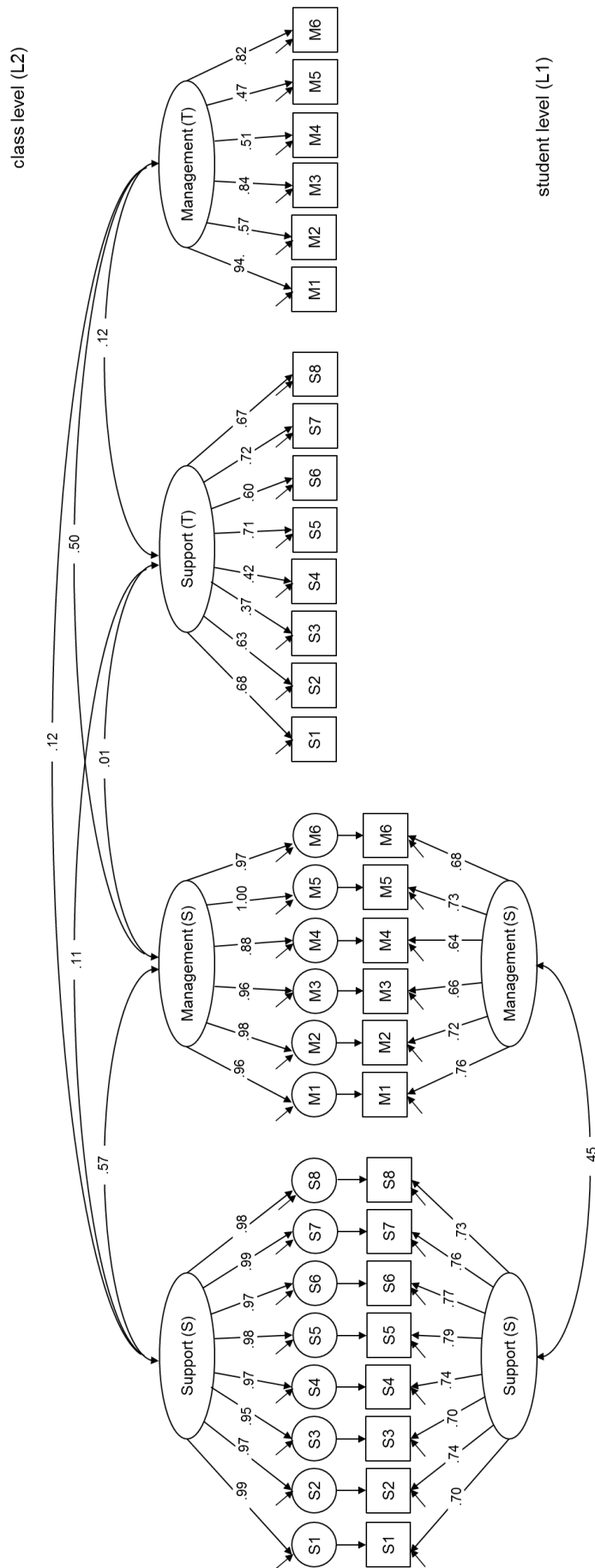
	Descriptive statistics				Correlations							
	<i>M</i>	<i>Var<sub>w</sub></i>	<i>Var<sub>b</sub></i>	ICC(1)	1	2	3	4	5	6	7	8
1 Management (T)	2.66		0.38		.13	<b>.51</b>	<b>.18</b>	-.19	.10	.04	<b>.17</b>	
2 Support (T)	3.52		0.12			.03	.11	.06	.06	.02	.02	
3 Management (S)	2.50	0.39	0.11	.22			<b>.57</b>	<b>-.25</b>	<b>.19</b>	.14	-.00	
4 Support (S)	3.07	0.41	0.13	.24			<b>.40</b>	-.17	<b>.51</b>	<b>.55</b>	-.05	
5 Truancy	1.19	0.24	0.02	.08			<b>-.08</b>	<b>-.15</b>		<b>-.24</b>	.03	<b>-.77</b>
6 Satisfaction	2.61	0.38	0.04	.10			<b>.21</b>	<b>.30</b>	<b>-.20</b>		<b>.78</b>	.08
7 Self-esteem	2.61	0.76	0.01	.01			<b>.12</b>	<b>.15</b>	-.04	<b>.27</b>		.09
8 Achievement	0.43	0.69	0.30	.30			<b>.07</b>	<b>.09</b>	<b>-.10</b>	<b>.04</b>	-.01	

Note. S = Student rating, T = teacher rating; *Var<sub>w</sub>* and *Var<sub>b</sub>* refer to the variances within and between classes, respectively, and were used for the calculation of the intraclass correlation (ICC(1)). Significant coefficients at  $p < .05$  are bold.

student perspective. Items measuring *social support* from the teacher perspective had their highest loading on the second factor. The third factor represented teacher-rated *classroom management* and the fourth factor was related to student-rated *social support*. Cross loadings were small for student ratings and below .30 for all but one teacher-rated item. Factor loadings for the EFA at the class level are displayed in Table 2A in the Appendix.

In the next step, we used MCFA to provide further support of a model with two factors at the student level (student-rated *social support* and *classroom management*) and four factors at the class level (student-/teacher-rated *social support* and *classroom management*). The model showed acceptable fit ( $\chi^2 = 2158.08$ ,  $df = 406$ , CFI = .94, TLI = .93, RMSEA = .03, SRMR<sub>w</sub> = .05, SRMR<sub>b</sub> = .08) that was superior to a model with only one factor at the student level and two factors at the class level in which the first factor subsumed all student-rated items and the second factor comprised all teacher-rated items ( $\chi^2 = 9991.32$ ,  $df = 412$ , CFI = .69, TLI = .65, RMSEA = .07, SRMR<sub>w</sub> = .13, SRMR<sub>b</sub> = .20). As can be seen in Figure 2.1, correlations between student-rated social support and classroom management at the student ( $r = .45$ ,  $p < .001$ ) and the class level were substantial ( $r = .57$ ,  $p < .001$ ). In contrast, social support and classroom management were only weakly correlated when using the teacher report ( $r = .12$ ,  $p = .16$ ).

In the last step, we tested measurement invariance across cohorts as well as cross-level measurement invariance of the student ratings, that is, invariance of the factor loadings across levels (Marsh et al., 2009). In a multiple group MCFA, the model where factor loadings were constrained to be equal for both cohorts ( $\chi^2 = 2961.17$ ,  $df = 872$ , CFI = .94, TLI = .93, RMSEA = .03, SRMR<sub>w</sub> = .05, SRMR<sub>b</sub> = .09) showed similar model fit as a model where the loadings were allowed to vary ( $\chi^2 = 2846.65$ ,  $df = 830$ , CFI = .94, TLI = .93, RMSEA = .03, SRMR<sub>w</sub> = .05, SRMR<sub>b</sub> = .09). Similarly, constraining the loadings to be equal across the student and the class level resulted in a similar model fit ( $\chi^2 = 2203.69$ ,  $df = 418$ , CFI = .94, TLI = .94, RMSEA = .03, SRMR<sub>w</sub> = .05, SRMR<sub>b</sub> = .08) compared to the model where loadings varied across levels. Because  $\Delta$ CFI was less than  $-.01$  in both cases, we assumed that measurement invariance holds for student and teacher ratings across cohorts and for students ratings across levels (cross-level measurement invariance).



**Figure 2.1:** Standardized coefficients and factor intercorrelations for the measurement model with four factors at the class level and two factors at the student level. Correlated residuals for parallel student and teacher items were estimated, but are not displayed.

### *Convergence Between the Teacher and the Student Perspective*

Our second research question was concerned with the extent to that student and teacher ratings of social support and classroom management converged. As the results of the MCFA indicated, student and teacher ratings of social support and classroom management could clearly be separated as distinct factors. Hence, students and teachers perceived perspective-specific aspects. Nonetheless, Figure 2.1 shows that there was a large latent correlation between student- and teacher-rated classroom management ( $r = .50, p < .001$ ). In contrast, the latent correlation for social support was small and statistically not significant ( $r = .11, p = .22$ ).

### *Classroom Management, Social Support, and School Adjustment*

The third and central aim of the present study was to investigate the association among the homeroom teacher's social support and classroom management as perceived by students and teachers on the one hand and students' affective, behavioral, and academic school adjustment on the other hand. The results of our MSEMs are displayed in Table 2.2. The models reported showed satisfactory fit ( $CFI = .94$ ;  $TLI = .93$ ;  $RMSEA = .03$ ;  $SRMR_w = .04$ ;  $.07 \leq SRMR_b \leq .08$ ). We describe results at the student level first and then present findings at the class level.

At the student level, we first see that student characteristics notably contribute to their school adjustment. For instance, students with a migration background had higher school satisfaction ( $B = 0.09, p = .03$ ) and self-esteem ( $B = 0.11, p = .02$ ), but lower achievement ( $B = -0.21, p < .001$ ). Moreover, their self-esteem developed more positively than that of students without a migration background ( $B = 0.10, p = .02$ ). Boys reported higher self-esteem ( $B = 0.24, p < .001$ ) and truancy ( $B = 0.17, p < .001$ ), but lower school satisfaction ( $B = -0.29, p < .001$ ) than girls. Whereas boys' self-esteem developed more positively, their school satisfaction, truancy, and achievement levels showed less favorable changes compared to girls. Beyond these background variables, students' individual perceptions of their homeroom teachers' interpersonal behavior importantly contributed to their general school adjustment. Social support was statistically significantly related to school satisfaction ( $B = 0.25, p < .001$ ), self-esteem ( $B = 0.13, p < .001$ ), truancy ( $B = -0.14, p < .001$ ), and achievement ( $B = 0.08, p = .01$ ). This means that—when comparing students within the same classroom—those students who perceived their teacher to be more supportive had higher achievement, school satisfaction and self-esteem and were less truant. As the results from model 2 show, social support was



**Table 2.2:** Prediction of students' school adjustment: Results of multilevel structural equation modeling

	Satisfaction						Self-esteem						Truancy						Achievement						
	model 1			model 2			model 1			model 2			model 1			model 2			model 1			model 2			
	B	SE		B	SE		B	SE		B	SE		B	SE		B	SE		B	SE		B	SE		
<b>Class Level</b>																									
Management (S)	-0.02	0.12	0.07	0.11	0.07	0.11	-0.10	0.26	-0.02	0.25	0.25	-0.28	0.11	-0.25	0.10	0.06	0.09	0.07	0.07	0.07	0.07	0.09	0.09	0.07	0.07
Support (S)	<b>0.30</b>	0.10	0.15	0.10	<b>0.47</b>	0.23	0.30	0.30	0.21	0.21	0.21	-0.01	0.11	0.00	0.10	-0.07	0.09	-0.05	0.07	0.07	0.09	0.09	-0.05	0.07	
Management (T)	0.17	0.10	0.05	0.08	0.05	0.21	-0.02	0.18	0.18	0.18	0.18	0.04	0.10	0.04	0.10	<b>0.12</b>	0.06	0.08	0.08	0.05	0.06	0.06	0.08	0.05	
Support (T)	-0.01	0.08	0.00	0.07	0.00	0.18	0.03	0.16	0.16	0.16	0.08	0.08	0.08	0.06	0.07	0.02	0.05	0.03	0.04	0.04	0.05	0.05	0.03	0.04	
Cohort	-0.70	0.16	-0.18	0.15	-0.31	0.34	-0.34	0.30	0.30	0.30	<b>1.02</b>	0.18	<b>0.98</b>	0.17	0.17	-1.31	0.11	-0.73	0.09	0.09	0.11	-0.73	0.09	0.09	
Lower	<b>0.80</b>	0.18	<b>0.49</b>	0.16	0.53	0.41	0.46	0.37	0.37	0.37	<b>0.95</b>	0.19	<b>0.78</b>	0.18	0.18	-1.05	0.13	-0.52	0.10	0.13	0.13	-0.52	0.10	0.10	
Intermediate	<b>0.72</b>	0.17	<b>0.38</b>	0.15	<b>1.24</b>	0.37	<b>1.20</b>	0.34	0.34	0.34	0.25	0.16	0.18	0.16	0.16	<b>0.43</b>	0.13	0.19	0.19	0.13	0.13	0.19	0.19	0.10	
<b>Student Level</b>																									
Management (S)	<b>0.12</b>	0.02	<b>0.07</b>	0.02	<b>0.06</b>	0.02	0.04	0.02	0.02	0.02	0.04	0.02	-0.03	0.02	-0.02	0.05	0.03	<b>0.05</b>	0.02	0.02	0.03	0.03	<b>0.05</b>	0.02	0.02
Support (S)	<b>0.25</b>	0.02	<b>0.17</b>	0.02	<b>0.13</b>	0.02	<b>0.09</b>	0.02	0.02	0.02	<b>0.13</b>	0.02	-0.14	0.02	-0.11	<b>0.08</b>	0.03	<b>0.05</b>	0.02	0.02	0.03	<b>0.05</b>	0.02	0.02	0.02
Migration	<b>0.09</b>	0.04	0.02	0.04	<b>0.11</b>	0.05	<b>0.10</b>	0.04	0.04	0.04	<b>0.11</b>	0.05	<b>0.10</b>	0.04	0.04	-0.21	0.05	-0.03	0.05	0.05	0.05	-0.03	0.05	0.05	0.05
Male	-0.29	0.03	-0.15	0.03	<b>0.24</b>	0.03	<b>0.17</b>	0.03	0.03	0.03	<b>0.17</b>	0.04	<b>0.13</b>	0.03	0.03	-0.05	0.04	-0.07	0.03	0.03	0.04	-0.07	0.03	0.03	0.03
SES	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	<b>0.00</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Baseline level					<b>0.71</b>	0.03					<b>0.40</b>	0.02						<b>0.62</b>	0.02						
<i>R</i> <sup>2</sup> Level 1	0.13		0.32		0.04		0.17		0.17		0.03		0.08		0.02			0.30						0.30	
<i>R</i> <sup>2</sup> Level 2	<b>0.55</b>		<b>0.68</b>		<b>0.64</b>		<b>0.91</b>		<b>0.91</b>		<b>0.50</b>		<b>0.56</b>		<b>0.78</b>			<b>0.90</b>						<b>0.90</b>	

Note. S = Student rating, T = teacher rating; to control for school type, "Lower" and "Intermediate" are two dummy variables indicating whether a class is located in the lower track or the intermediate track, comprehensive schools are the reference category; "Baseline level" refers to the respective outcome at the first measurement point; coefficients were standardized at each level by multiplying the unstandardized coefficient with the ratio of the level-specific standard deviations (Snijders & Bosker, 2012);  $SD(x)/SD(y)$ , for categorical predictors, unstandardized coefficients were divided by  $SD(y)$  only; significant coefficients at  $p < .05$  are bold.

associated with students' individual school satisfaction, self-esteem, truancy, and achievement beyond their prior school adjustment (school satisfaction:  $B = 0.17, p < .001$ ; self-esteem:  $B = 0.09, p < .001$ ; truancy:  $B = -0.11, p < .001$ ; achievement:  $B = 0.05, p = .03$ ). Furthermore, students who perceived their classroom to be better organized and calm reported a more favorable development of their school satisfaction ( $B = 0.07, p < .001$ ) and achievement ( $B = 0.05, p = .05$ ) compared to their classmates. Besides this, relations between students' individual perceptions of classroom management and their adjustment were weak.

At the class level, background variables were again associated with general school adjustment: Classes in the second cohort (ninth grade) had lower school satisfaction ( $B = -0.70, p < .001$ ) than students in the first cohort (sixth grade). Furthermore, they attained smaller learning gains ( $B = -0.73, p < .001$ ) and their truancy ( $B = 0.98, p < .001$ ) increased more compared to students in the first cohort. Moreover, classes differed depending on the school type and most of these differences became more pronounced over time. Compared to classes in comprehensive schools, classes in the lower track ( $B = 0.49, p = .002$ ) and in the intermediate track ( $B = 0.38, p = .01$ ) were more satisfied with school. Classes in the intermediate track reported higher self-esteem ( $B = 1.20, p < .001$ ), whereas classes in the lower track were more truant ( $B = 0.78, p < .001$ ) and learned less ( $B = -0.52, p < .001$ ). Beyond that, social support and classroom management were linked to general school adjustment at the class level as well, but the pattern of results differed from that at the student level. For social support we found that classes that felt more supported by their teachers showed higher school satisfaction ( $B = 0.30, p = .003$ ) and self-esteem ( $B = 0.47, p = .04$ ). However, the associations were no longer statistically significant when the baseline measurement was included. This means that social support did not relate to student outcomes at the class level beyond students' prior adjustment. Teacher-rated classroom management was statistically significantly linked to student achievement ( $B = 0.12, p = .05$ ), but the association was marginally significant once students' prior achievement was entered into the model ( $B = 0.08, p = .09$ ). In addition, student-rated classroom management was statistically significantly linked to truancy beyond the baseline level ( $B = -0.25, p = .01$ ). Hence, classes that were rated as well-managed by students developed more positively in terms of truancy.

Finally, we specified multiple group models and used  $\chi^2$ -difference tests (Little, 2013) to assess whether the effects were similar across cohorts. Thereby, we allowed the effects of student- and teacher-rated classroom management and social support on the outcome variables to vary freely across cohorts and found the relations to be similar.

## Discussion

The present study investigated whether the levels of social support and classroom management provided by the homeroom teacher affect secondary student achievement and, beyond that, their domain-independent, general school adjustment in terms of school satisfaction, self-esteem, and truancy. Thereby, we drew on student and teacher ratings of classroom management and social support and applied MSEM to investigate effects at the student and the class level simultaneously. In support of our hypotheses the results showed that classroom management and social support were empirically distinguishable constructs regardless of the level of analyses and whether the student or the teacher perspective was considered. Thereby, student and teacher ratings of social support and classroom management could be clearly separated as distinct factors at the class level. However, student and teacher ratings of classroom management were correlated substantially, whereas their perceptions of social support were largely unrelated. Regarding the relationship between social support and classroom management with school adjustment, we found particularly students' idiosyncratic interpretations of social support to be closely linked to their outcomes: Students who felt more supported as compared to their classmates developed more positively in terms of school satisfaction, self-esteem, truancy, and achievement. At the class level, relations were more heterogeneous: Student-rated social support was linked to more school satisfaction and self-esteem and teacher-rated classroom management was associated with higher achievement. However, only student-rated classroom management was related to lower truancy beyond students' baseline level.

### *Classroom Management and Social Support as Key Dimensions of the Classroom Social Environment*

Theoretically and empirically, classroom management and social support represent two central and distinct dimensions of teachers' interpersonal behavior (Hamre et al., 2013; Wubbels, Brekelmans et al., 1993). However, student and teacher ratings and analyses at the student and the class level have rarely been combined. Therefore, it was unclear whether the same factorial structure would emerge across different levels and perspectives which is, however, an important precondition to gather valid findings. Moreover, prior studies were conducted in elementary schools or with mathematics classes only (e.g., Downer et al., 2014; Kunter & Baumert, 2006). Therefore, our results complemented these studies and validated the factorial structure across levels and perspectives in a sample of secondary students.

*Convergence Between the Teacher and the Student Perspective*

The question of whether different informants generate the same information about teaching processes has often been raised (Desimone, Smith, & Frisvold, 2010; Turner & Meyer, 2000). With regards to classroom management, students and teachers provided similar information. Nonetheless, there was a meaningful proportion of variance that was uniquely tied to each perspective so that teacher- and student-rated classroom management could be distinguished as two separate factors at the class level. Consequently, students and teachers perceived somewhat different aspects of classroom management which is an important precondition for perspective-specific validities in predicting student outcomes. In contrast, there appeared to be no relationship between students' and teachers' perceptions of social support. Searching for possible explanations we noted on the one hand, that every single teacher rated his or her own social support rather positive. This reduction in variance makes it difficult to discover substantial correlations. On the other hand, our finding raises the question whether teachers and students actually refer to the same underlying construct when rating identical items about the teacher's social support. However, we can only speculate why their evaluations of social support do not overlap. Whereas students most likely assess to what extent their teacher responds to their personal and learning needs, teachers may refer to their teaching ideals instead of their actual behaviors. After all, social support of students, in particular, is closely connected to the teachers' identity because social interests are a major reason for choosing the teaching profession (Roloff Henoch, Klusmann, Lüdtke, & Trautwein, 2015). Therefore, social support may be especially prone to self-serving strategies (Wubbels, Brekelmans et al., 1993) and it might be harder for teachers to admit difficulties with social support than regarding other aspects of their teaching, for example, classroom management. Classroom management problems could also be ascribed to the class instead of one's own competence. Moreover, classroom management can be observed more easily which could facilitate more objective judgments.

*Classroom Management, Social Support, and School Adjustment*

The main purpose of the present study was to investigate whether the homeroom teacher's classroom management and social support are related to secondary students' general school adjustment. Our findings not only support the numerous stories of teachers who made a difference for students far beyond their subject (Pajares & Urdan, 2008), they are also in line with theoretical assumptions that a positive classroom social environment importantly contributes to student development (e.g., self-determination theory; Ryan & Deci, 2000). Even though

our findings largely matched our expectations, there are some interesting results that need further explanation. First, social support was related with a positive development of school satisfaction, self-esteem, truancy, and achievement at the student level, whereas social support was not linked to student outcomes at the class level beyond their baseline adjustment. In contrast, classroom management was related to changes in truancy at the class level, but for students' idiosyncratic interpretations associations with individual school adjustment were weak. On the one hand, differences in students' perceptions of social support within one class apparently carried valuable information. Students seem to be particularly sensitive to the social support they perceive in comparison to their classmates and it appears to be less important for predicting student outcomes whether the teacher is, on average, more supportive than other teachers. In light of these findings, earlier work on differential teacher behavior and the teacher's pet phenomenon, which indicated that students easily detect subtle nuances in teachers' emotional relationships with different students, appears to be of great interest and should be considered in future research (for an overview see Babad, 2009). On the other hand, these findings imply that it is less important for individual student outcomes whether they perceive their classroom to be more or less organized compared to their classmates. Therefore, classroom management rather appears to be a class level construct. However, our finding that teacher-, but not student-rated classroom management was linked to achievement at the class level, appears contradictory and is not clearly in line with previous research that has widely established a relationship between student-rated classroom management and achievement (e.g., Blank & Shavit, 2016). One explanation might be that prior studies have included diverse student populations, whereas we focused on students of the vocational track only. Because achievement levels as well as the quality of classroom management vary greatly between school types (Dupriez, Dumay, & Vause, 2008), this could have likely reduced the variance between classes in our sample and therefore decreased the correlation between classroom management and achievement. Moreover, the finding that teacher-rated classroom management predicted achievement is in line with the argument of perspective-specific validities put forward by Kunter and Baumert (2006). It also indicates that teachers are, indeed, able to validly evaluate whether or not they were able to establish a disciplinary climate where time on task is sufficient to promote learning.

### *Limitations*

The consideration of different perspectives on social support and classroom management and the use of multilevel modeling in investigating their unique relationships with a broad range of student outcomes is a central advantage of the present study. Nonetheless, some limitations need to be discussed. First, we focused on fifth/eighth grade students in the vocational

track only. Whereas the sampling procedure assured representativeness within the vocational track, our sample was not representative of the total student population. Therefore, effects of social support and classroom management on student development might vary with different student populations, for example, children in primary school may be affected differently by their relationship with teachers (Lynch & Cicchetti, 1997; Roorda, Koomen, Spilt, & Oort, 2011). Second, we exclusively focused on teachers' interpersonal behaviors. Even though we controlled for relevant covariates, for instance, gender and migration background, we could not include other possibly relevant features of the classroom environment, such as content-related aspects of teaching or peer relationships. Thus, we cannot rule out that the relations found would change if other variables of the classroom environment were included. Third, it was unfeasible to formulate student and teacher items completely identical which possibly reduced the correlations between both perspectives. Moreover, caution is warranted in drawing causal inferences even though we controlled for students' baseline measures. Particularly, at the student level—where individual rater tendencies are not accounted for—a reverse order is possible so that students with positive developmental trajectories would evaluate their homeroom teacher more positively. In contrast, analyses at the class level counterbalanced student idiosyncrasies so that reverse causality is less likely. Finally, we want to point out that the baseline level was assessed when the teachers had already taught their class for three months. Therefore, the teachers might have already affected the baseline level to some extent so that our approach was rather conservative.

### *Implications and Conclusion*

The present study was a first step to extend our understanding of the significance of homeroom teachers' social support and classroom management beyond secondary students' domain-specific outcomes. Our findings imply that there is no clear-cut answer to this question and that it is of great importance to consider the perspective of the rater and the level of analyses.

Regarding the question of which rater provides most valid information for predicting student outcomes, we supported the usefulness of student ratings. Therefore, recent efforts to improve teacher evaluation using student surveys should be highly encouraged (Raudenbush & Jean, 2014). In addition, it can also be worthwhile to consider teacher ratings of classroom management because the teacher perspective includes specific information that is not detected by students and uniquely associated with student achievement. However, teacher ratings of social support were independent of what their students perceived and unrelated to student development. Therefore, researchers must carefully consider whether student and/or teacher ratings

are best-suited for capturing the construct of interest. In order to understand more profoundly, which aspects of social support and classroom management are assessed from the student and the teacher perspective and why they are differently related to student outcomes, qualitative interview or thinking-aloud techniques could be an appropriate tool to understand how students and teachers derive their ratings. In addition, integrating observer ratings with student and teacher ratings would complement our findings regarding the unique predictive value of different perspectives (Turner & Meyer, 2000).

Beyond that, our results indicate that simultaneous analyses at the student and the class level provide an interesting pathway for future research (Lüdtke et al., 2009). Comparing results across the student and the class level showed that associations between social support and classroom management with school adjustment varied considerably between both levels: Classroom management largely appeared to be a class level construct whereas students' individual perceptions had little predictive power. Social support, in contrast, was predictive of students' school adjustment at the student level, in particular. This finding is compelling considering the class-level formulation of the items (e.g., "*Our teacher tries to understand us.*") and the fact that we controlled for a number of individual student characteristics that could potentially influence their ratings (e.g., gender, migration background, baseline level at T1 of student outcomes). All in all, this challenges the assumption that diverging student perceptions within the same classroom should be conceptualized as pure measurement error or rater bias (Raudenbush & Jean, 2014). Thus, future research would profit from addressing the class level appropriately, and considering the student level at the same time. However, more research is needed to investigate why students within the same classroom perceive social support differently. On the one hand, student characteristics may systematically influence their perceptions, for example, girls perceive higher levels of social support than boys (Levy, Wubbels, den Brok, & Brekelmans, 2003). On the other hand, these differential perceptions could be grounded in teachers' differential behaviors towards boys and girls (Beaman, Wheldall, & Kemp, 2006). In this regard, classroom observations could help to uncover differences in social support displayed towards different students.

Finally, further research is needed to learn more about the impact of teachers' interpersonal behavior on diverse aspects of students' general school adjustment. For instance, well-being, school engagement or hope and optimism regarding one's future could be included as additional outcomes because—like self-esteem, school satisfaction, and the reduction of truancy—they are increasingly emphasized as central goals of schooling (Lopez & Calderon, 2011; Ministry of Education, 2014). Moreover, in order to promote educational equality, it

would be interesting to focus on at-risk students and investigate the extent to that one teacher could make a difference in their lives (Chetty et al., 2010). After all, these students have been shown to be in particular need of positive teacher-student relationships and it is assumed that having at least one adult reference person is an important protective factor (McGrath & van Bergen, 2015).

In summary, our results provide new insights for research and practice. The study underlines the importance of the homeroom teacher's social support and classroom management for secondary students' affective, behavioral, and cognitive development beyond their domain-specific school adjustment. The use of student and teacher ratings and multilevel structural equation modeling enabled us to discover that the relationships were particularly pronounced for student-rated social support at the student level. Thus, it appears to be crucial for teachers to build positive relationships with every single student, in particular, because they affect student outcomes beyond the subject they are teaching. It would be an interesting path for future research to investigate what teachers need to respond sensitively to each student. In this regard, attaining socio-emotional competence through teacher training could help teachers in providing the support each student needs (Jennings & Greenberg, 2009).

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## Appendix

**Table 2A:** Items that were administered to students and teachers to assess classroom management and social support as well as factor loadings from exploratory factor analyses at the class-level

	I	II	III	IV
<b>Student items</b>				
In this class, instruction is barely disturbed.	<b>0.97</b>	-0.03	-0.01	0.01
In this class, we rarely gabble loudly.	<b>0.57</b>	-0.07	0.03	-0.12
In this class, we are seldom fooling around.	<b>0.83</b>	0.05	0.00	0.01
In this class, we listen to our teacher.	<b>0.74</b>	-0.01	0.13	-0.03
In this class, we are calm and everything is well-ordered.	<b>0.43</b>	0.10	0.09	0.09
In this class, we become calm quickly.	<b>0.35</b>	-0.03	0.19	0.28
Our homeroom teacher is interested in every student's learning progress.	-0.03	-0.06	0.02	<b>0.64</b>
Our homeroom teacher provides additional support when we need help.	-0.02	-0.06	0.03	<b>0.62</b>
Our homeroom teacher stays patient even when we progress slowly.	-0.01	0.03	0.03	<b>0.36</b>
Our homeroom teacher encourages us to ask if there is something we do not understand.	-0.08	-0.07	0.23	<b>0.47</b>
Our homeroom teacher believes in us.	0.17	0.05	-0.05	<b>0.69</b>
Our homeroom teacher has confidence in us to make something good of our lives.	0.21	0.04	-0.27	<b>0.58</b>
Our homeroom teacher tries to understand us.	-0.01	0.06	-0.04	<b>0.68</b>
Our homeroom teacher is someone we can trust.	-0.03	-0.02	0.02	<b>0.72</b>
<b>Teacher items</b>				
In this class, instruction is barely disturbed.	-0.05	0.04	<b>0.97</b>	0.02
In this class, students rarely gabble loudly.	0.02	-0.07	<b>1.01</b>	-0.02
In this class, students are seldom fooling around.	0.02	0.02	<b>0.94</b>	-0.05
In this class, it is easy to assert myself.	0.05	0.23	<b>0.83</b>	0.00
In this class, I am able to establish calm and order.	0.02	0.08	<b>0.92</b>	-0.01
In this class, I need to admonish students rarely to ensure calm.	0.05	<b>0.48</b>	<b>0.59</b>	0.03
I am interested in every student's learning progress.	-0.05	<b>0.96</b>	0.07	-0.02
I provide additional support when my students need help.	0.03	<b>1.01</b>	-0.07	-0.05
I stay patient even when we progress slowly.	0.00	<b>0.99</b>	-0.09	-0.04
I encourage my students to ask at any time if there is something they do not understand.	-0.02	<b>0.92</b>	0.11	0.00
I believe in my students.	-0.04	<b>0.94</b>	0.07	0.09
I am confident that my students will make something good of their lives.	0.05	<b>0.93</b>	0.05	0.05
I show understanding of my students.	0.01	<b>0.98</b>	-0.01	0.03
I build trust to my students.	-0.01	<b>0.99</b>	-0.02	-0.03

Note. I: Student-rated classroom management, II: Teacher-rated social support, III: Teacher-rated classroom management, IV: Student-rated social support; loadings  $\geq .30$  are bold. Results are based on the estimated between-group correlation matrix (see Muthén, 1994).

**Table 2B:** Items that were administered to students to measure general school adjustment

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**School satisfaction***What applies to you?*

School is a place I enjoy being at.

It would be nice if I did not have to go to school anymore. (–)

I enjoy doing my tasks at school.

In the morning I look forward to a day at school to learn something new.

I do my homework as good as possible.

I only need to think about school to be in a bad mood in the morning. (–)

There are only a few things at school for that I exert myself. (–)

**Self-esteem***Last week...*

I was proud of myself.

I felt on top of the world.

I felt pleased with myself.

I had lots of good ideas.

**Truancy***In the current school year, how often have you...*

skipped certain subjects?

skipped school in the morning or in the afternoon (half a day)?

skipped a single day?

skipped more than two days in a row?

skipped only the first or the last lesson?

skipped a test or exam?

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## CHAPTER 3

**Student Misbehavior and Teacher Well-Being:  
Testing the Mediating Role of the Teacher-Student Relationship  
[Study 2]**

Aldrup, K., Klusmann, U., Lüdtke, O., Göllner, R. & Trautwein, U. (2017). *Student misbehavior and teacher well-being: Testing the mediating role of the teacher-student relationship*. Manuscript submitted for publication.



*Abstract*

Teachers report student misbehavior as their major stressor which reduces their occupational well-being. However, there is still a pressing need to uncover the psychological processes explaining why misbehavior is detrimental to teachers' occupational well-being. In their model of teacher well-being Spilt, Koomen, and Thijs (2011) suggested the teacher-student relationship as a mediator. The present study used longitudinal data from  $N = 222$  teachers who rated student misbehavior in their classroom, the teacher-student relationship, and their occupational well-being in terms of emotional exhaustion and work enthusiasm to test this assumption. In addition, the teachers' classroom students ( $N = 4,111$ ) were asked about the number of behavior problems in their classroom. Results indicated that student-rated misbehavior was not reflected in teacher well-being. However, teacher-rated misbehavior was linked to increased exhaustion and decreased enthusiasm. Furthermore, the teacher-student relationship was positively associated with teacher well-being and mediated the link between teacher-perceived misbehavior and enthusiasm.

*Keywords:* Teacher-student relationship, student misbehavior, emotional exhaustion, work enthusiasm, student and teacher ratings





**Student Misbehavior and Teacher Well-Being:  
Testing the Mediating Role of the Teacher-Student Relationship  
[Study 2]**

## **Introduction**

Teachers' occupational well-being, for example, their emotional exhaustion and work enthusiasm, is a highly important topic from both a theoretical and practical perspective. It is related to instructional quality, student motivation, and achievement as well as teachers' attrition, their general mental and physical health (Bauer et al., 2006; Klusmann, Kunter, Trautwein, Lüdtke, & Baumert, 2008b; Klusmann, Richter, & Lüdtke, 2016; Scheuch, Haufe, & Seibt, 2015; Shen et al., 2015). In investigating factors that affect teacher well-being, an exhaustive number of studies found that teachers rate student misbehavior as particularly stressful and consistently report poorer well-being when they perceive elevated levels of inattentiveness, classroom disturbances, or disciplinary problems (Aloe, Shisler, Norris, Nickerson, & Rinker, 2014; Kyriacou, 2011). However, there is still a pressing need to examine the underlying psychological processes. Spilt, Koomen, and Thijs (2011) proposed the teacher-student relationship as a mediator. After all, student misbehavior has been found to make teachers feel rejected and to impede them from building affectionate relationships with students (Hargreaves, 2000; Newberry & Davis, 2008; Nurmi & Kiuru, 2015). In turn, negative teacher-student relationships are supposed to harm teacher well-being because they are a central goal of teachers (Butler, 2012; Klassen, Perry, & Frenzel, 2012).

To investigate the mediating role of the teacher-student relationship, we drew on longitudinal data from  $N = 222$  teachers who evaluated their occupational well-being in terms of emotional exhaustion and work enthusiasm, student misbehavior and the overall quality of the relationship with the students in their classroom. In addition, student misbehavior was rated by students ( $N = 4,111$ ). This allowed us to investigate whether teachers' and students' perceptions of student misbehavior were similarly related to teacher well-being. Most prior research has mostly relied on teacher self-report of student misbehavior so that the question remained open of whether teacher well-being is reduced by behavior problems other people such as their students would recognize as well or rather by problems that are uniquely perceived by the teachers themselves.

## **Teachers' Occupational Well-Being and Student Misbehavior**

Teachers' occupational well-being, which refers to their optimal psychological functioning and experience regarding work (Ryan & Deci, 2001), has been described by the presence of positive aspects, such as job satisfaction and work enthusiasm, and the absence of negative experience, such as stress and emotional exhaustion (Diener, Suh, Lucas, & Smith, 1999; Watson, Clark, & Tellegen, 1988). To represent the negative as well as the positive dimension of well-being, the present study focused on emotional exhaustion and work enthusiasm. Emotional exhaustion is the central quality of burnout and refers to its stress dimension (Maslach, Schaufeli, & Leiter, 2001). It includes feelings of strain and depletion of one's emotional resources (Maslach et al., 2001). Emotional exhaustion has negative implications for student outcomes because it compromises instructional quality as well as student engagement, school satisfaction, and achievement (Klusmann et al., 2008b; Klusmann et al., 2016; Shen et al., 2015). In contrast, work enthusiasm refers to teachers' enjoyment, excitement, and pleasure in their work as teachers (Kunter et al., 2008). Teachers who feel enthusiastic about their work accomplish higher instructional quality, student motivation, and learning outcomes (Keller, Goetz, Becker, Morger, & Hensley, 2014; Kunter et al., 2013).

A number of models have been proposed to explain the origins of occupational well-being, for example, the transactional model of stress and coping (Lazarus & Folkman, 1984) or the job demands-resources model (Demerouti, Bakker, Nachreiner, & Schaufeli, 2001). Central to these models is the assumption that job stressors require prolonged physical, psychological, or emotional effort so that they cause stress when a person's resources are exceeded (Bakker & Demerouti, 2007). There is an extensive line of research that has identified common stressors in the teaching profession (Kyriacou, 2011). Categories that were typically found include extensive workload, lack of support from colleagues, poor working conditions, and little recognition from the public (Hakanen, Bakker, & Schaufeli, 2006; Kyriacou, 2011). However, student misbehavior, for example, dealing with disturbances, students' disrespect, and disciplinary problems, is widely considered to be the most influential stressor (Aloe et al., 2014; Dicke et al., 2014). For instance, student misbehavior has been linked to feelings of anger, anxiety, and emotional exhaustion as well as reduced enjoyment, job satisfaction, and work engagement (Aloe et al., 2014; Boyle, Borg, Falzon, & Baglioni, 1995; Dicke et al., 2014; Frenzel, Goetz, Stephens, & Jacob, 2009; Hagenauer, Hascher, & Volet, 2015; Klusmann, Kunter, Trautwein, Lüdtke, & Baumert, 2008a; Skaalvik & Skaalvik, 2010). However, the question of the psychological processes by which student misbehavior affects teacher well-being has not been addressed sufficiently. Because student misbehavior likely harms the teacher-student relationship

which is, in turn, supposed to be vital for teacher well-being, the teacher-student relationship has been suggested as a mediator (Spilt et al., 2011).

### **The Mediating Role of the Teacher-Student Relationship**

A positive teacher-student relationship is characterized by respect, warmth, and trust as well as low levels of interpersonal conflict and the importance for students' development has been emphasized and investigated from various theoretical perspectives (Davis, 2003): Based on attachment theory (Bowlby, 1969) and self-determination theory (Ryan & Deci, 2000) it is assumed that students have an innate need to bond with their teachers (Deci, Vallerand, Pelletier, & Ryan, 1991; Pianta, 1999). Thus, students who feel appreciated and supported by their teacher attain more positive affective, behavioral, and cognitive outcomes (Kunter et al., 2013; Roorda, Koomen, Spilt, & Oort, 2011). However, teachers also strive to connect with their students, to feel valued, respected and liked (Butler, 2012; Klassen et al., 2012). Surprisingly, this has long been neglected even though building a caring, affectionate relationship with one's students is inherent to the teaching profession and at the core of their professional identity (O'Connor, 2008; van der Want et al., 2014).

Therefore, Spilt et al. (2011) developed a theoretical model of teacher well-being in which the importance of the teacher-student relationship is emphasized in that it is suggested as a mediator between student misbehavior and teacher well-being. More precisely, Spilt et al. (2011) proposed that student misbehavior compromises the teacher-student relationship because it provokes negative interactions and might be interpreted as lack of appreciation of the teacher. In an initial test of the model, Koomen and Spilt (2011) found that teachers' perceptions of conflict in their relationship with a child mediated the link between student misbehavior and teacher stress. Furthermore, there is some evidence regarding the link between student misbehavior and the relationship on the one hand and the relationship and teacher well-being on the other hand.

In terms of the negative impact of student misbehavior on the teacher-student relationship, interview studies revealed that teachers often feel rejected and hurt by difficult student behaviors and struggle with feeling affection towards challenging children (Hargreaves, 2000; Newberry & Davis, 2008). In addition, longitudinal studies provided evidence that student misbehavior threatens the quality of the teacher-student relationship (Birch & Ladd, 1998; Buyse, Verschueren, Doumen, van Damme, & Maes, 2008). Research regarding the importance of the teacher-student relationship for teacher well-being is promising, yet less conclusive and the findings need to be substantiated with longitudinal designs that provide more generalizable

findings. Interview studies showed that teachers bonds with students importantly contributed to their emotional experience and job satisfaction (Hargreaves, 2000; Shann, 1998). Moreover, cross-sectional studies found that teachers who reported a close and non-conflictual relationship with their students, who felt appreciated and related to them had more positive emotions and work engagement as well as less anger and burnout (Gastaldi, Pasta, Longobardi, Prino, & Quaglia, 2014; Jo, 2014; Klassen et al., 2012; Milatz, Luftenegger, & Schober, 2015). Finally, a recent diary study showed that teachers experienced more work enthusiasm when their relatedness with students was higher, but a link to their daily emotional exhaustion was not found (Aldrup, Klusmann, & Lüdtke, 2017).

Hence, the present investigation aimed to address the question as to whether the teacher-student relationship is associated with teacher well-being and mediates the link between student misbehavior and teacher well-being. Thereby, we asked teachers as well as their students about their perceptions of misbehavior in the classroom and, thus, addressed a central methodological issue in research on the association between student misbehavior and teacher well-being.

### **Student Misbehavior: Considering the Teacher and the Student Perspective**

Prior studies in the research field largely relied on teacher self-report measures of student misbehavior. Thereby, one approach is to present lists of potential job stressors and to ask teachers to rate how stressful they find each aspect. Alternatively, teachers evaluate whether they are exposed to certain stressors and subsequently report on their well-being. On the one hand, the use of teacher self-report measures appears reasonable considering that one's subjective interpretations of the social environment play an important role in the stress process (Lazarus & Folkman, 1984). On the other hand, it is difficult to conclude from these studies that teacher well-being is impaired by behavior problems which other people except for the teachers would also recognize (Klusmann et al., 2008a; Pas & Bradshaw, 2014). To address this issue, studies using non-teacher reports of student misbehavior, for example, external observers, colleagues, or students are a promising solution.

Thereby, associations between teachers' emotional exhaustion and job satisfaction with principal reports of schoolwide disciplinary problems were small (Klusmann et al., 2008a). In another study, Geving (2007) asked supervising teachers to rate ten types of student behavior problems and investigated the association with student teachers' self-reported stress. Except for the supervising teachers' perception of a lack of student effort in class, no correlation was statistically significant (Geving, 2007). At first glance, these findings challenge the assumption that teacher well-being is affected by disciplinary issues that can be observed by other people

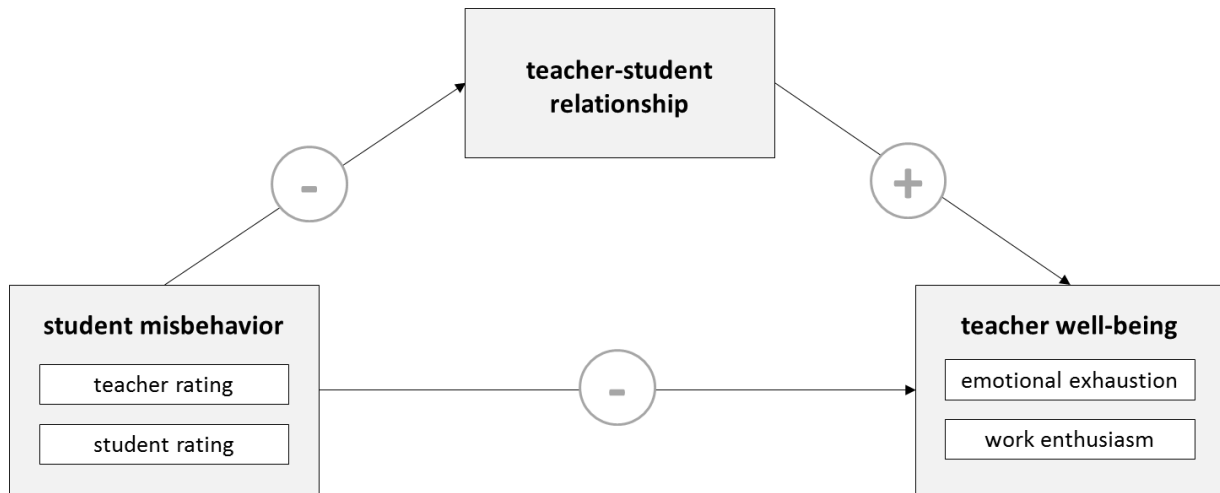
except for the teacher. Rather, one could speculate that the relationship between teacher-rated student misbehavior and their well-being is due to common method bias (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). However, to use principal and supervising teacher ratings might not be the most eligible approach because they are not involved in class on a regular basis and might, therefore, miss critical episodes (Seidel & Prenzel, 2006). Thus, students' perceptions of the number of misbehavior in their classroom could be a more valid source for predicting teacher well-being. In line with this, Klusmann et al. (2008b) found student ratings of classroom behavior problems to be correlated with teachers' emotional exhaustion and job satisfaction.

### **Present Study**

Drawing on longitudinal data from secondary school teachers and their students, the present investigation addressed two central questions regarding the widely found link between student misbehavior and teacher well-being (Figure 3.1).

First, we examined whether student misbehavior was related to teacher well-being regardless of whether teacher self-report or other-report measures were applied. Put differently, we investigated whether teacher well-being was affected by behavior problems that other raters would recognize as well or rather by teachers' individual interpretations thereof. We asked teachers as well as their students to assess the extent to which student misbehavior represented a problem in the respective classroom. Thereby, the use of student ratings was a major strength of the present study. After all, they are less likely to miss critical episodes than external raters. Nonetheless, because a person's individual interpretations are supposed to be particularly important for their well-being (Lazarus & Folkman, 1984), we expected teacher ratings of student misbehavior to be more closely associated with their well-being than student ratings.

Our second research question addressed the underlying psychological mechanisms that explain the association between student misbehavior and teacher well-being. Based on the model of teacher well-being by Spilt et al. (2011), we investigated the teacher-student relationship as a mediator. Based on previous findings, we assumed that student misbehavior would be associated with a less positive teacher-student relationship because it evokes negative interaction patterns and might be interpreted as a personal offence. Second, we hypothesized that a negative teacher-student relationship would be linked to increased emotional exhaustion and decreased work enthusiasm. Investigating the importance of the teacher-student relationship for



**Figure 3.1:** Heuristic working model in which student misbehavior—as rated by students and teachers—is expected to harm teachers’ perceptions of their relationship with students and, in turn, reduce teachers’ occupational well-being.

teacher well-being was of particular interest. After all, examining the teachers’ need for close relationships with students has long been neglected, even though it is a central aspect of their professional identity (Klassen et al., 2012; van der Want et al., 2014).

In taking a relationship-focused perspective and considering both student and teacher ratings of student misbehavior, the present investigation is unique and allows for a more profound understanding of what makes (perceived) difficulties with managing student behavior detrimental for teachers’ occupational well-being.

## Method

### *Procedure*

The present study was part of a larger longitudinal research project (TRAIN; Jonkman, Rose, & Trautwein, 2013) that included two cohorts of secondary school students and their homeroom teachers. Homeroom teachers in Germany have a special function that is distinct from homeroom teachers in many other countries. Most importantly, they teach a disproportionately high number of lessons in this class, undertake extracurricular activities with the students, and bear special responsibility for them. Therefore, the homeroom teacher’s occupational well-being can be assumed to be affected particularly by the students in his or her homeroom.

The first measurement, which served to assess the baseline level of our dependent variables, took place when the students were in fifth/eighth grade. The second measurement took

place one year later in the sixth/ninth grade when most of the homeroom teachers had been teaching their class for at least one year. This measurement point was the focus in the present study. The homeroom teachers and their students received questionnaires that, amongst other things, asked them to evaluate the number of student misbehavior in the respective class. Moreover, teachers rated the overall quality of the relationship with the students in their homeroom as well as their occupational well-being. Participation was voluntary for both teachers and students. Students' parents were asked for consent.

### *Sample*

The data collection was carried out in 106 schools in 227 classes in two German federal states. Our final sample included  $N = 222$  homeroom teachers and the participation rate exceeded 90% at both measurement points. Complete data were available for  $n = 166$  teachers. Data were missing for two reasons for the remaining teachers. In  $n = 32$  classes the homeroom teacher changed between both measurement points so that data for the first measurement point were inevitably missing. In  $n = 24$  classes, teachers did not change, but they participated at the first ( $n = 11$ ) or the second measurement point only ( $n = 13$ ). We found no statistically significant differences between teachers who participated at only one or both measurement points in terms of age, job experience, and their occupational well-being. However, male teachers were more likely to participate at one measurement point only ( $\chi^2(1, N = 252) = 6.76, p = .01$ ).

On average participating teachers were 46.49 years old ( $SD = 10.06$ ), had 21.17 years of job experience ( $SD = 10.99$ ), and 30% were male. They were teaching  $M = 10.48$  ( $SD = 5.41$ ) lessons as a homeroom teacher in their class each week. All teachers were located at secondary schools. However, in Germany there are different types of schools (for a detailed description of the German school system see Maaz, Trautwein, Lüdtke, & Baumert, 2008):  $n = 86$  teachers were teaching in lower track schools,  $n = 48$  in intermediate track schools, and  $n = 88$  in comprehensive schools.

On average, 18.52 students per teacher participated ( $SD = 5.52$ ) which resulted in a total sample of  $N = 4,111$  students. Of the students, 54% were male and 28% had a migration background. At the second measurement point,  $n = 2,347$  students were in sixth grade (cohort 1; age:  $M = 12.11, SD = 0.57$ ) and  $n = 1,764$  students were in ninth grade (cohort 2; age:  $M = 15.21, SD = 0.65$ ).

### *Instruments*

Student misbehavior, the teacher-student relationship, and teachers' occupational well-being were assessed on a 4-point scale ranging from 1 = *completely disagree* to 4 = *completely agree* and were standardized at the teacher level prior to the analyses (see Appendix for items).

*Student misbehavior.* Teachers and students evaluated the extent to which students in the class were paying attention and obeying the teacher (6 items, e.g., "In this class, instruction is barely disturbed."; Kunter & Baumert, 2006). The items were formulated identically for teachers and students. Because we were interested in students' shared perceptions of misbehavior in their class, students' individual ratings were aggregated at the class level. To evaluate the reliability of the class mean, we calculated the intraclass correlation (ICC; Lüdtke, Trautwein, Kunter, & Baumert, 2007) and found  $ICC(2) = .84$  which indicates a satisfactory reliability.

*Teacher-student relationship.* Teachers assessed whether their students appreciated, liked, and respected them personally on a six-item scale (e.g., "The students in this class show me that they like me."). The items were based on the closeness subscale from the widely-used student-teacher relationship scale (STRS; Pianta, 2001). However, the STRS has been developed for students from preschool to grade three so that we modified the items to be appropriate for use in an older age group. In addition, we reformulated the items to assess the overall relationship with the students in the teacher's homeroom instead of the individual relationship with each child (e.g., "students in this class" instead of "this student").

*Occupational well-being.* In order to measure the positive as well as the negative dimension of teachers' occupational well-being, we assessed *work enthusiasm* and *emotional exhaustion*. More specifically, we administered a scale developed by Kunter et al. (2008) to address teachers' enjoyment of teaching (6 items, "I really enjoy teaching.") and a German version of the Maslach Burnout Inventory (MBI; Enzmann & Kleiber, 1989) to assess emotional exhaustion (4 items, "I often feel exhausted at school.").

### *Data Analyses*

We set up a series of mediation models to investigate our research questions, (see Figure 3.1). Our predictor (teacher-/student-rated misbehavior), mediator (teacher-student relationship), and outcome variables (emotional exhaustion, work enthusiasm) were measured at the second measurement point. To control for a priori differences between teachers, we included the teacher-student relationship and well-being at the first measurement point as well as additional teacher, class, and school characteristics (teachers' gender and job experience, proportion of students with a migration background, school type) as covariates.



We specified separate models for teacher- and student-rated student misbehavior. For student ratings the data had a multilevel structure because multiple students in each classroom rated the presence of problem behaviors. Thus, the predictor was located at the level of the individual student (level 1) whereas our mediator and outcome variables were located at the teacher level (level 2). To take the multilevel structure into account, we used multilevel modeling to aggregate the individual student ratings at the teacher level (1-2-2 design in Preacher, Zyphur, & Zhang, 2010). Thereby, the class mean for each teacher was treated as a latent variable which was estimated by correcting the aggregated manifest class mean for its unreliability. The advantage of this procedure was that it allowed for controlling sampling error (Marsh et al., 2009).

To estimate the size of the mediation effect, we calculated the ratio of the indirect to the total effect ( $P_M$ ) as has been suggested by Wen and Fan (2015). All analyses were conducted using Mplus 7 (Muthén & Muthén, 1998-2012) with maximum likelihood estimation with robust standard errors. Missing data, which represent a problem in most empirical studies, were handled with a full maximum likelihood algorithm in order to avoid listwise deletion (Enders, 2010). The amount of missing data per item ranged from 0% to 30% ( $M = 89\%$ ).

## Results

### *Preliminary Analyses*

Table 3.1 displays the means, standard deviations, and correlations between student misbehavior, the teacher-student relationship, and teachers' occupational well-being as well as the associations with the covariates. The correlations show that students' and teachers' ratings of student misbehavior largely converged ( $r = .51, p < .001$ ). Hence, students' and teachers' perceptions overlapped substantially which suggests the possibility that both are associated with similar outcomes. In line with this, student misbehavior was associated with the teacher-student relationship regardless of whether teachers ( $r = -.28, p < .001$ ) or students ( $r = -.25, p = .01$ ) assessed behavior problems in the class. Furthermore, teachers' ( $r = .28, p < .001$ ) as well as students' ( $r = .24, p = .01$ ) perceptions of student misbehavior in the classroom were positively related to teachers' emotional exhaustion. However, only teacher- ( $r = -.17, p = .01$ ), but not student-rated ( $r = -.11, p = .17$ ) misbehavior was statistically significantly correlated with lower work enthusiasm. Beyond that, a positive teacher-student relationship was associated with higher teacher well-being (emotional exhaustion:  $r = -.36, p < .001$ ; work enthusiasm:  $r = .42, p < .001$ ).

*Teacher and Student Ratings of Student Misbehavior and Teacher Well-Being*

Our first research question was whether teachers' and students' perceptions of student misbehavior in the classroom were similarly related to teacher well-being. The total effects retained from our mediation analyses provide an answer to this question (Table 3.2). They show that teacher-rated student misbehavior was statistically significantly linked to teachers' emotional exhaustion ( $\beta = .18, p = .02$ ) and work enthusiasm ( $\beta = -.15, p = .02$ ) after controlling for teachers' baseline well-being and additional teacher, class, and school background characteristics. Thus, teachers who perceived higher levels of disturbances, tardiness, or disciplinary problems in their classes reported increased emotional exhaustion and reduced work enthusiasm. In contrast, students' perceptions of behavioral problems in their classroom showed no statistically significant associations with teachers' work enthusiasm ( $\beta = .03, p = .72$ ) or emotional exhaustion ( $\beta = .12, p = .13$ ). Thus, students' perceptions of behavior problems in their classroom were not reflected in their teachers' occupational well-being once the covariates were controlled for.

**Table 3.1:** Descriptive results and correlations between student misbehavior, the teacher-student relationship, teachers' occupational well-being, and the covariates

	Descriptive statistics			Correlations				
	<i>M</i>	<i>SD</i>	$\alpha$	1	2	3	4	5
<b>Central variables</b>								
1 Misbehavior (T)	2.33	0.62	.84		<b>.51</b>	<b>-.28</b>	<b>.28</b>	<b>-.17</b>
2 Misbehavior (S)	2.54	0.33	.88			<b>-.25</b>	<b>.24</b>	<b>-.11</b>
3 Relationship	3.20	0.49	.85				<b>-.36</b>	<b>.42</b>
4 Exhaustion	2.12	0.68	.81					<b>-.37</b>
5 Enthusiasm	3.38	0.46	.88					
<b>Covariates</b>								
6 Relationship (T1)	3.28	0.46	.84	-.10	-.09	<b>.62</b>	<b>-.22</b>	<b>.31</b>
7 Exhaustion (T1)	2.12	0.68	.77	.16	.14	<b>-.20</b>	<b>.67</b>	<b>-.38</b>
8 Enthusiasm (T1)	3.41	0.45	.88	-.07	-.15	<b>.36</b>	<b>-.44</b>	<b>.62</b>
9 Teacher male (%)	30.00			.01	<b>-.27</b>	-.04	<b>-.15</b>	.14
10 Job experience	21.17	10.99		<b>-.22</b>	-.03	-.07	.13	<b>-.18</b>
11 Cohort 1 (%)	57.09			-.03	-.11	<b>-.19</b>	-.09	.03
12 Proportion migration	27.82	25.33		<b>.13</b>	-.06	<b>.16</b>	-.05	<b>.14</b>
13 Intermediate (%)	21.62			<b>.15</b>	.03	.06	.02	.02
14 Comprehensive (%)	39.64			<b>-.28</b>	-.06	-.10	-.05	<b>-.14</b>
15 Lower (%)	38.74			<b>.15</b>	.03	.03	.04	.12

Note. S = Student rating, T = teacher rating, T1 = first measurement point; "Intermediate", "Comprehensive", and "Lower" are dummy variables referring to the school type; significant coefficients at  $p < .05$  are bold.

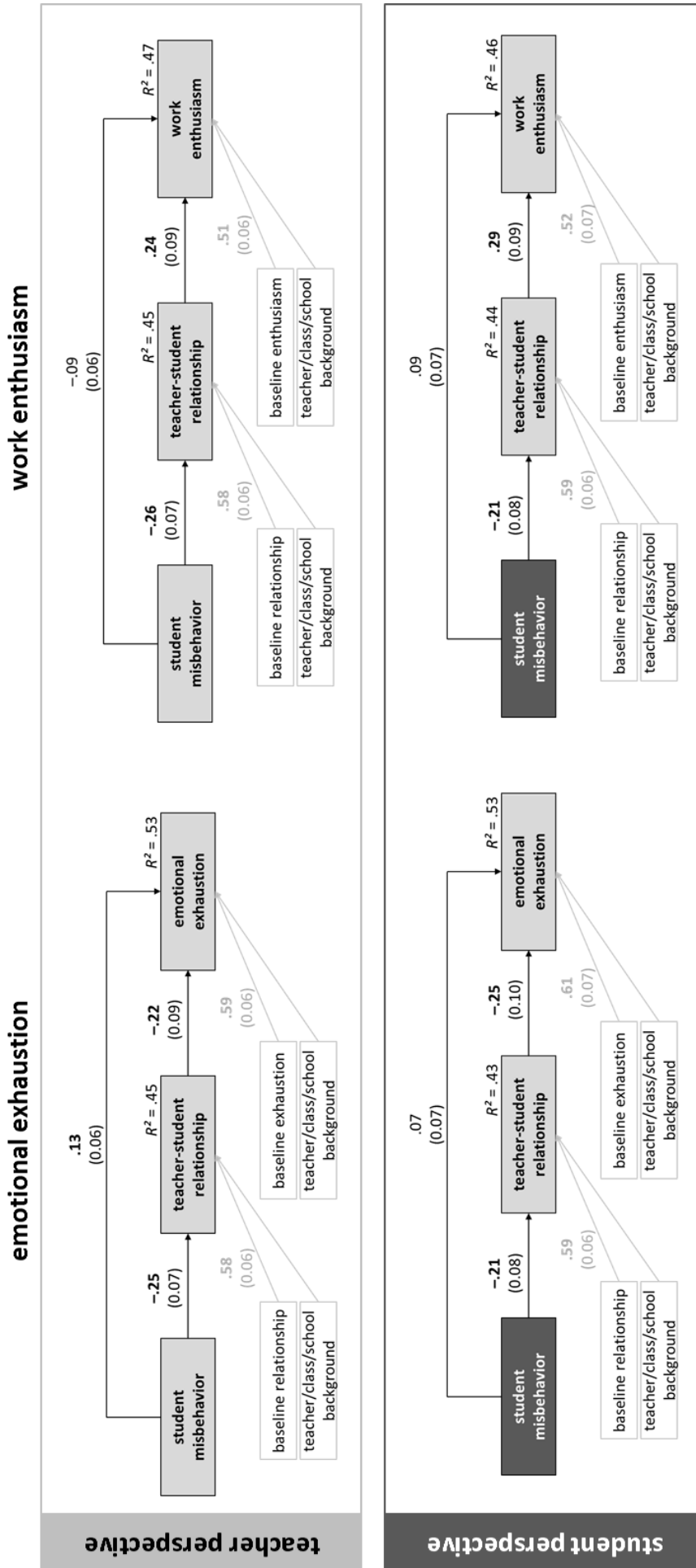
*The Teacher-Student Relationship as a Mediator*

The second aim of our study was to investigate the teacher-student relationship as a mediator that might explain why (perceived) student misbehavior is detrimental for teacher well-being. First, we examined whether our predictor (student misbehavior) was connected to our mediator (teacher-student relationship). As displayed in Figure 3.2, we found a statistically significant association between teachers' ( $\beta = -.25, p < .001$ ) as well as students' ( $\beta = -.21, p = .01$ ) perceptions of student misbehavior and the teacher-student relationship. Hence, the teacher-student relationship improved in classes where students or teachers reported less behavior problems. Next, we examined the relationship between our mediator and the outcome, that is, teacher well-being. The teacher-student relationship was statistically significantly and positively linked to work enthusiasm ( $\beta = .24, p = .01$ ) and negatively associated with emotional exhaustion ( $\beta = -.22, p = .01$ ). Thus, teachers who did not feel they shared a positive relationship with their students had reduced occupational well-being. Last, we looked at the indirect effect of student misbehavior on well-being via the teacher-student relationship (Table 3.2).

**Table 3.2:** Total effects, indirect effects, and direct effects for our mediation models with student misbehavior as the predictor, the teacher-student relationship as the mediator, and teacher well-being as the outcome

	Emotional exhaustion			Work enthusiasm		
	$\beta$	SE	95%-CI	$\beta$	SE	95%-CI
<b>Teacher-rated student misbehavior</b>						
Total effect	<b>.18</b>	0.08	(.03, .33)	<b>-.15</b>	0.06	(-.27, -.03)
Indirect effect <sup>1</sup>	.06	0.03	(-.01, .12)	<b>-.06</b>	0.03	(-.11, -.01)
Direct effect	<b>.13</b>	0.06	(.00, .25)	-.09	0.06	(-.20, .03)
$P_M$	.33			.40		
<b>Student-rated student misbehavior</b>						
Total effect	.12	0.08	(-.04, .28)	.03	0.07	(-.11, .16)
Indirect effect	.05	0.03	(-.01, .12)	<b>-.06</b>	0.02	(-.11, -.02)
Direct effect	.07	0.07	(-.06, .20)	.09	0.07	(-.06, .23)
$P_M$	.42					

Note. <sup>1</sup>Confidence intervals and standard errors for the indirect effect were calculated based on a bootstrap estimation approach with 5,000 samples. We controlled for the baseline levels of our mediator and outcome variables as well as teacher gender and job experience, school type, grade level and proportion of students with a migration background; displayed are the standardized coefficients with standard errors in parentheses; coefficients in bold are significant at  $p < .05$ .



**Figure 3.2:** Mediation model with the teacher-student relationship as the mediator between student misbehavior—as rated by teachers (upper part) or students (lower part)—and teachers’ emotional exhaustion (left) or work enthusiasm (right). All analyses were controlled for teacher gender, job experience, school type, grade level, and proportion of students with a migration background. The models are saturated, but to increase clarity the respective paths are not depicted. Displayed are the standardized coefficients with standard errors in parentheses. Coefficients in bold are significant at  $p < .05$ .

Because the results from the first research question indicated that teacher-, but not student-rated<sup>1</sup> misbehavior was reflected in teacher well-being, we concentrated on the models where teacher ratings were used. As recommended in the methodological literature, we tested the significance of the indirect effects using a bootstrap estimation approach with 5,000 samples (Shrout & Bolger, 2002). For work enthusiasm we found a statistically significant indirect ( $\beta = -.06, p = .01$ ) effect while the direct effect was statistically not significant ( $\beta = -.09, p = .15$ ). Hence, more student misbehavior—as perceived by teachers—was linked to a decrease in teachers' work enthusiasm through a less positive teacher-student relationship. Estimating the size of the mediation effect, we found  $P_M = .40$  which means that 40 % of the total effect were explained by the indirect effect. In contrast, the indirect effect for emotional exhaustion was marginally significant ( $\beta = .06, p = .10, P_M = .33$ ).

## Discussion

The present investigation focused on two understudied questions regarding the well-known link between student misbehavior and teacher well-being. In contrast to prior studies, we combined teachers' evaluations of student misbehavior in their classroom with an additional perspective in that we applied student ratings as well. Moreover, we investigated the psychological processes by which student misbehavior affected teacher well-being and tested the teacher-student relationship as a mediator (Spilt et al., 2011). Our results indicated that emotional exhaustion was higher and work enthusiasm was lower when teachers perceived more student misbehavior. On the contrary, students' perceptions of behavior problems in their classroom were not reflected in teachers' well-being. Investigating if the teacher-student relationship explained the link between teachers' perceptions of student misbehavior and their well-being, we first found that student misbehavior was associated with a reduced teacher-student relationship quality. In turn, a negative teacher-student relationship was correlated with higher emotional exhaustion and lower work enthusiasm. However, the link with student misbehavior was mediated through the teacher-student relationship only for work enthusiasm.

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<sup>1</sup> The statistically significant indirect effect for work enthusiasm in the model for student-rated misbehavior (Table 3.2) is most likely due to a suppressor effect: The bivariate correlations (Table 3.1) show that the relationship between student-rated misbehavior in their classroom and work enthusiasm is opposite in sign compared to the direct effect in the mediation model. Moreover, a direct effect that is opposite in sign to the indirect effect (see Table 3.2) indicates *inconsistent mediation* (MacKinnon, Krull, & Lockwood, 2000) so that we will refrain from interpreting this effect.

*Teacher and Student Ratings of Student Misbehavior and Teacher Well-Being*

A plethora of studies indicate that dealing with tardiness, disturbances, or other problem behaviors is one of the central stressors of teachers with negative consequences for their occupational well-being (e.g., Aloe et al., 2014). However, virtually all of these studies relied on teacher self-reports of student misbehavior. Thus, we know that teachers who *perceive* high levels of student misbehavior report reduced well-being. But, whether these perceptions are based upon difficulties that others recognize as well or rather on teachers' subjective interpretations remains widely unknown. Therefore, we combined student and teacher ratings to provide an additional perspective on the presence of behavior problems in the respective classroom.

Our results are in line with the extensive body of research that established a link between teacher ratings of student misbehavior and teacher well-being. However, we were surprised that student ratings of behavior problems in their classroom were not associated with teacher well-being once teachers' prior well-being and other covariates were controlled for. Especially as student and teacher ratings of behavior problems in their classroom converged substantially so that similar associations with teacher well-being would have been likely. Thus, while there are shared aspects in students' and teachers' views of behavior problems in the classroom, there appear to be perspective-specific aspects. Perhaps, this is due to the fact that teachers may prevent disturbances before they are recognized by students. These events will likely be perceived as stressful by teachers even though they are hardly visible for others. We suppose that these teacher-specific aspects explain inter-individual differences in teacher well-being, especially in terms of work enthusiasm. This phenomenon is referred to as perspective-specific validity (Kunter & Baumert, 2006). However, common method bias provides an alternative explanation (Podsakoff et al., 2003): One can speculate that rater tendencies, for instance, personality traits such as negative affectivity, systematically shape teachers' views of their own competence in managing disciplinary problems and their interpretations of student behavior (Watson & Clark, 1984).

*The Teacher-Student Relationship as a Mediator*

The second way in which we provided a new perspective on the role of student misbehavior for teacher well-being was our focus on underlying psychological mechanisms. Based on the model proposed by Spilt et al. (2011), we investigated the teacher-student relationship as a mediator. Our findings supported the idea that student misbehavior is associated with a more negative teacher-student relationship. Interestingly, teachers felt less liked and appreciated regardless of whether students or teachers reported on the occurrence of behavior problems

in the classroom. Therefore, in contrast to teacher well-being, the teacher-student relationship was linked to difficulties with managing student behavior that students recognized as well. This shows that teachers' emotional experience in the classroom is not merely a product of their individual perceptions. Perhaps, the teacher-student relationship is more closely associated with student-rated misbehavior than teacher well-being because it is more proximal to classroom events and leaves less room for interpretative processes.

Moreover, our results underpinned the hypotheses that a positive teacher-student relationship is linked to increased work enthusiasm and reduced emotional exhaustion. Even though prior studies yielded similar findings, the use of longitudinal data allowed us to investigate how the teacher-student relationship was associated with changes in teacher well-being which was a particular strength of the present study.

However, regardless of the association of the teacher-student relationship with our predictor and outcome variables, our assumptions in terms of the mediating function of the teacher-student relationship were not fully supported. Whereas the teacher-student relationship mediated the link between student misbehavior and work enthusiasm, we found no mediation for emotional exhaustion. Thus, additional mediators might play a role for both work enthusiasm and emotional exhaustion. Possibly, disturbances or other disrespectful behaviors not only interfere with the teacher's goal to build a positive relationship with students, but might also imperil other goals (Frenzel, 2014). For example, a lack of student discipline is likely to disturb a carefully planned lesson so that teachers cannot convey the content they intended which will preclude student learning (Brophy, 2006). The noise that is produced by students talking out of turn might represent another potential mediator because being exposed to a flood of irrelevant information could produce cognitive overload (Kristiansen, Persson, Lund, Shibuya, & Nielsen, 2013; Sweller, van Merriënboer, & Paas, 1998).

### *Limitations*

The present study is unique because it combined the teacher and student perspective on behavior problems in the classroom and investigated the role the teacher-student relationship plays as a mediator between student misbehavior and teacher well-being. Nevertheless, there are also some drawbacks that should be mentioned. First, the teacher-student relationship is widely seen as composed of a positive as well as a negative dimension (closeness and conflict; Pianta, 2001). However, we only focused on positive qualities so that we cannot draw inferences about the correlation between student misbehavior and conflict in the teacher-student relationship or about effects of conflict on teacher well-being. Moreover, teachers provided a global evaluation of the extent to which student misbehavior was generally challenging in the

respective classroom and they assessed the teacher-student relationship with the class as a whole. Although this approach was very economic it did not capture students' individual behavior patterns and how they affect the relationship the teacher forms with each child. However, dyadic teacher-student interactions could affect teachers differently than their interactions at the classroom level so that this perspective might allow for more in-depth insights. Finally, our study does not allow for causal inferences and some researchers have suggested reciprocal effects, for example, that teacher well-being affects their instructional behavior and, thus, student behavior and the quality of the teacher-student relationship (Jennings & Greenberg, 2009). In order to capture these dynamic processes, future studies could include several measurement point throughout the school year.

### *Conclusions and Implications*

Two conclusions can be drawn from the present study. First, teachers perceive perspective-specific aspects of behavior problems in their classroom that are related to their well-being. Thus, future research should investigate whether the teacher-specific aspects reflect concrete student behaviors that are exclusively observed by the teacher or are rather attributable to individual processes on the part of the teacher. In this regard, intensive longitudinal studies could be an interesting approach to assess concrete student behaviors and problematic interaction patterns (Bolger & Laurenceau, 2013). Additionally, studies combining teacher and other-reports of student misbehavior could uncover whether there are teacher characteristics such as personality traits that systematically affect their perceptions.

Gaining more knowledge about the teacher-specific perceptions of student behavior is of great practical relevance because it could help optimize teacher education and interventions to improve teacher well-being. If teacher well-being is impaired by concrete behavior problems, training effective management strategies will prove worthwhile, for instance, communication of clear expectations and rules or prompt and consistent reaction to initial problems (Brophy, 2006). However, if teachers only feel they do not succeed in managing student behavior, it will be more important to change their individual beliefs and perceptions.

The second conclusion we can draw is that the teacher-student relationship plays a major role for teacher well-being. Hence, research on teachers' occupational well-being would profit from taking a relationship-focused perspective. Moreover, improving teacher-student relationships through pre- and in-service training programs could support teacher well-being. In this regard, tools such as the relationship-focused reflection program (Spilt, Koomen, Thijs, & van der Leij, 2012) are available to help teachers understand and improve problematic relationships. In addition, promoting teachers' social-emotional competence through interventions could



prove worthwhile (Jennings & Greenberg, 2009). Importantly, the teachers' capacity to regulate their emotions could also help build positive relationships in light of student behavior problems. This is of great importance because a positive teacher-student relationship is not only an important resource for teachers, but also for their students' development (Roorda et al., 2011).

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## Appendix

Table 3A

*Items that assessed student misbehavior, the teacher-student relationship and well-being*

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**Student misbehavior**

*In this class...* (teacher perspective // student perspective)

instruction is barely disturbed // instruction is barely disturbed

students rarely gabble loudly // we rarely gabble loudly

students are seldom fooling around // we are seldom fooling around

it is easy to assert myself // we listen to our teacher

I am able to establish calm and order // we are calm and everything is well-ordered

I need to admonish students rarely to ensure calm // we become calm quickly

**Teacher-student relationship**

*Students in this class...*

respect me.

show me that they like me.

show me that I am important to them.

see me as a role model.

take the things I say seriously.

turn to me if they have private problems.

**Teachers' occupational well-being**

*Emotional exhaustion*

I sometimes feel really used up at the end of a school day.

I often notice how listless I am at school.

I often feel exhausted at school.

Altogether I feel like I am at the end of my rope.

*Work enthusiasm*

Teaching is fun for me.

I teach with great enthusiasm.

I really enjoy teaching.

I always enjoy teaching students new things.

I enjoy interacting with students.

It's a pleasure to teach.

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## **Does Basic Need Satisfaction Mediate the Link Between Stress Exposure and Well-Being? A Diary Study Among Beginning Teachers [Study 3]**

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*Abstract*

An imbalance between work-related stressors and resources, which we refer to as stress exposure, is often found to impair teachers' occupational well-being. However, the psychological mechanisms that explain this relationship are mostly unknown. We assumed that satisfaction of the basic psychological needs for competence, relatedness with students, and relatedness with colleagues acts as mediators. To test this assumption, we conducted a two-week diary study with 152 beginning teachers. A multilevel within-subject mediation analysis showed that teachers felt less work enthusiasm and more emotional exhaustion on days when stress exposure was high. Whereas the needs for competence and relatedness with students explained the association with work enthusiasm, the need for competence mediated the relationship with emotional exhaustion. Additionally, the least experienced teachers felt more emotional exhaustion when the need for relatedness with students was not satisfied. These findings add to our understanding of the daily intra-individual processes affecting beginning teachers' occupational well-being.

*Keywords:* Self-determination theory, need for relatedness, emotional exhaustion, work enthusiasm, teacher stress



**Does Basic Need Satisfaction Mediate the Link Between  
Stress Exposure and Well-being? A Diary Study Among Beginning Teachers  
[Study 3]**

## **Introduction**

Beginning teachers' occupational well-being is a major concern. The transition from university to practice is often described as particularly stressful and is associated with high attrition rates (Dicke et al., 2015; Smith & Ingersoll, 2004). Moreover, teachers' occupational well-being affects the quality of teaching, student motivation, and student achievement (Arens & Morin, 2016; Klusmann, Kunter, Trautwein, Lüdtke, & Baumert, 2008b; Klusmann, Richter, & Lüdtke, in press; Shen et al., 2015).

Theoretical models (e.g., job demands-resources model; Demerouti, Bakker, Nachreiner, & Schaufeli, 2001) suggest that an imbalance between work-related resources and stressors, which we refer to as *stress exposure*, strongly affects occupational well-being. A vast body of research supports this assumption. However, little is known about the psychological mechanisms underlying these relationships. Furthermore, the daily processes that explain intra-individual variations in well-being have not been investigated up until now. We suggest that daily stress exposure, e.g., a lack of student discipline or of social support from colleagues (Chaplain, 2008; Hakanen, Bakker, & Schaufeli, 2006), accounts for daily changes in beginning teachers' occupational well-being because it inhibits fulfillment of the basic psychological needs for competence, relatedness with students, and relatedness with colleagues. Additionally, we explored whether there are inter-individual differences regarding these processes.

To test these assumptions, we conducted a two-week diary study with 152 teachers, in which they reported on daily stress exposure, basic need satisfaction, and well-being, as indicated by work enthusiasm and emotional exhaustion. Using a within-subject mediation analysis, we modeled the daily intra-individual processes affecting well-being. We also examined the extent to which each of the basic needs contributes to teachers' occupational well-being. Finally, we explored whether teachers differ in these relations and whether these variations can be explained by years of job experience.

## **Teachers' Occupational Well-Being**

Teachers' occupational well-being can be described as their optimal psychological functioning and experience regarding their work as a teacher (Ryan & Deci, 2001). On the one hand, this means that they are engaged and enthusiastic about teaching, which is accompanied by feelings of enjoyment, excitement, and pleasure (Kunter et al., 2008). These positive emotions are reflected in the quality of teachers' instruction and affect students' motivation and learning outcomes (Keller, Goetz, Becker, Morger, & Hensley, 2014; Kunter et al., 2013). On the other hand, well-being requires teachers to experience low levels of stress and burnout. In the present study, we focus on the central quality of burnout: emotional exhaustion, which refers to the stress dimension of burnout and includes feelings of strain and the depletion of one's emotional resources (Maslach, Schaufeli, & Leiter, 2001). This lack of resources impedes teachers in creating a stimulating learning environment and, consequently, students' school satisfaction, engagement, and achievement diminish (Arens & Morin, 2016; Klusmann et al., 2008b; Klusmann et al., in press; Shen et al., 2015). Hence, identifying the sources of teachers' work enthusiasm and emotional exhaustion is an important task.

## **Stress Exposure as a Predictor of Occupational Well-Being**

The job demands-resources model (Demerouti et al., 2001) proposes that a variety of job resources and stressors interact to explain the positive as well as the negative dimension of occupational well-being. According to Demerouti et al. (2001), stressors are aspects of one's job that are associated with physiological and/or psychological costs because they require prolonged effort or skill; job resources, among other things, reduce stressors and the associated costs. The job demands-resources model differs from previous models (e.g., demand-control model, Karasek, 1979; transactional model of stress and coping, Lazarus & Folkman, 1984; effort-reward imbalance model, Siegrist, 1996) because it is not limited to the negative dimension of well-being or to specific stressors and resources. Similar to those previous models, stress is seen as a consequence of work-related stressors outweighing the employee's resources. In line with this, prior studies indicated that an imbalance of stressors and resources is central in predicting well-being, which suggests that it is reasonable to investigate them in combination (de Jonge, Bosma, Peter, & Siegrist, 2000; Siegrist et al., 2004). Drawing on this, we see stress exposure as an imbalance between work-related resources and stressors that, as depicted in our heuristic working model (see Figure 4.1, Hypothesis 1), affects occupational well-being.



For teachers, these stressors and resources may be located in class or outside class. The most prominent stressors in class are related to teacher-student interactions (Pyhältö, Pietarinen, & Salmela-Aro, 2011); primarily to student misbehavior and discipline problems (Fernet, Guay, Senécal, & Austin, 2012; Klusmann, Kunter, Trautwein, Lüdtke, & Baumert, 2008a; Skaalvik & Skaalvik, 2010). A lack of student motivation or conflicting teacher-student relationships have also been found to negatively affect teachers' well-being (Gastaldi, Pasta, Longobardi, Prino, & Quaglia, 2014; Kyriacou, 2001). Outside class, interactions with colleagues are often perceived as stressful (Kyriacou, 2001; Pyhältö et al., 2011). However, social support from colleagues and a positive social climate are also considered to be key resources (Hakanen et al., 2006; Pomaki, DeLongis, Frey, Short, & Woehrle, 2010; Skaalvik & Skaalvik, 2011; van Droogenbroeck, Spruyt, & Vanroelen, 2014), as are positive teacher-student relationships and student motivation (Jo, 2014; Kunter, Frenzel, Nagy, Baumert, & Pekrun, 2011; Veldman, van Tartwijk, Brekelmans, & Wubbels, 2013; van Droogenbroeck et al., 2014). One important shortcoming of these studies is the rather static perspective that interprets work-related stressors and resources as relatively stable characteristics of the work environment. Consequently, these studies tell us whether people who experience more stressors and have fewer resources also have lower levels of well-being, but we cannot infer how *intra*-individual variations in teachers' work-related experience are reflected in their *daily* well-being (Bolger & Laurenceau, 2013).

### **A Daily Perspective on Teachers' Occupational Well-Being**

A growing number of researchers emphasizes that stressors and resources are prone to substantial variation and takes minor daily events into consideration (e.g., Bakker & Bal, 2010; Kitching, Morgan, & O'Leary, 2009; Simbula, 2010). Positive daily experiences that promote well-being are termed *uplifts*; negative daily experiences that threaten well-being are termed *hassles* (Lazarus, 1984). Consequently, uplifts and hassles correspond to work-related resources and stressors, respectively; the only difference is that they are fluctuating entities. In his stress model, Almeida (2005) picks up on these ideas. Moreover, he proposes that sociodemographic and psychosocial resilience and vulnerability factors moderate the strength of the relationship between daily experience and daily well-being. Drawing on Huberman's model of teacher development (Huberman, 1989), more job experience may be one moderator that reduces the impact of daily hassles (see Figure 4.1, Hypothesis 3).

To capture the daily variations in uplifts and hassles, diary studies are frequently applied (for more information on their benefits and guidelines for their application see, e.g., Bolger & Laurenceau, 2013; Gunthert & Wenzel, 2012; Zirkel, Garcia, & Murphy, 2015). They should

include at least five measurement time points and usually last two weeks (Bolger & Laurenceau, 2013, Gunthert & Wenzel, 2012). Daily diaries allow researchers to capture psychological processes as they unfold in everyday life, which also reduces retrospective bias (Zirkel et al., 2015). This is of particular interest as studies asking people about their current experience can yield largely different findings to studies asking about more general characteristics (Goetz, Bieg, Lüdtke, Pekrun, & Hall, 2013; Robinson & Clore, 2002).

The few existing diary studies show that the typical stressors and resources, such as colleague support, student motivation, and student behavior, also function as uplifts and hassles on the day-to-day level (Bakker & Bal, 2010; Kitching et al., 2009; Simbula, 2010; Tadić, Bakker, & Oerlemans, 2013). Additionally, they indicate that there is a lot of variance in the daily uplifts and hassles experienced by one teacher. Nonetheless, the question of which psychological mechanisms lie behind the effects caused by hassles and uplifts remains open. Recently, the concept of basic psychological needs from self-determination theory (SDT; Ryan & Deci, 2000) was proposed as an answer to this question (e.g., Bartholomew, Ntoumanis, Cuevas, & Lonsdale, 2014).

### **Basic Need Satisfaction as a Mediator: Theoretical Foundations**

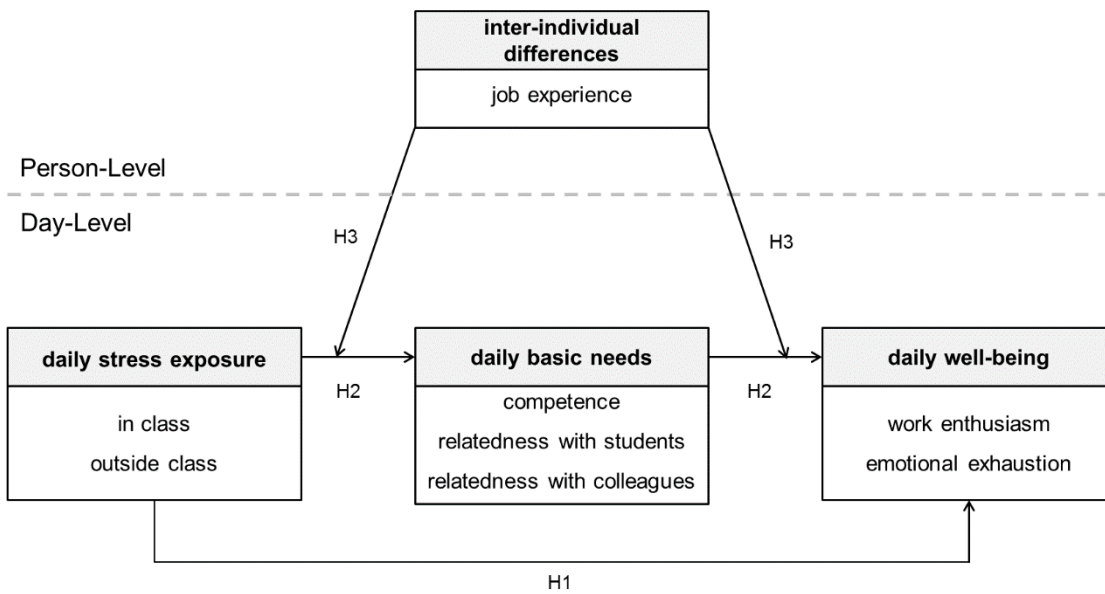
The concept of basic psychological needs—the needs for autonomy, competence, and relatedness—is central to SDT, an organismic metatheory on human motivation and personality (Ryan & Deci, 2000). The theory implies that basic need satisfaction has a mediating role (see Figure 4.1, Hypothesis 2). On the one hand, SDT proposes that basic need satisfaction not only fosters human motivation and personality development but is also vital for well-being. A vast body of research underpins this assumption (Milyavskaya & Koestner, 2011; Van den Broeck, Vansteenkiste, De Witte, & Lens, 2008; for an overview, see also Ryan & Deci, 2000). On the other hand, SDT states that basic need satisfaction largely depends on a person's social context (Ryan & Deci, 2000). The need for autonomy is satisfied when one is able to determine one's actions, whereas the need for competence is fulfilled when one feels able to apply or develop one's abilities and to achieve desired goals. Finally, the need for relatedness is satisfied when one can establish close relationships with others and feels mutual respect.

In the following, we examine the mediating role of the needs for competence and relatedness. We did not further consider the need for autonomy as the main conditions affecting teachers' autonomy (e.g., the freedom to determine teaching methods or goals) could be assumed to be rather stable across single days (De Neve, Devos, & Tuytens, 2015). In contrast,

common daily hassles and uplifts most likely account for daily changes in feelings of competence and relatedness. For instance, disrespectful student behavior could be interpreted as a lack of classroom management skills or as personal disliking, and a chat with colleagues could increase feelings of relatedness with them. This indicates that distinguishing between two sources of relatedness might be beneficial when investigating teachers: relatedness with students and relatedness with colleagues (Klassen, Perry, & Frenzel, 2012). Teachers' need for relatedness with students has mostly been neglected in research so far but may be of great importance for their well-being (Spilt, Koomen, & Thijs, 2011). After all, wanting to work with young people is one of the main reasons for choosing teaching as a career (Watt & Richardson, 2007), and building good interpersonal relationships with students is a central goal of teachers (Butler, 2012).

### **Basic Need Satisfaction as a Mediator: Empirical Findings**

Few studies have investigated basic need satisfaction as a mediator between teachers' stress exposure and well-being. Boudrias et al. (2014) found overall basic need satisfaction to mediate the relationship between job demands and social-organizational resources on the one hand and psychological well-being at work on the other hand. However, the unique contributions of each psychological need were not investigated. Fernet, Austin, Trépanier, and Dussault (2013) demonstrated that such an investigation yields interesting information. In their study, feelings of relatedness mediated the association between social support and burnout symptoms. In contrast, the need for competence explained the link between role ambiguity and job control with burnout symptoms. Similarly, Bartholomew et al. (2014) showed that the needs for competence and relatedness partially mediated the relationship between teachers' job pressure and burnout. Expanding on these studies, Klassen et al. (2012) demonstrated the advantage of investigating the need for relatedness in a more differentiated manner, and of separating the need for relatedness with students from the need for relatedness with colleagues. They found the needs for relatedness with students and for competence to predict teachers' work engagement, anger, and enjoyment, whereas the need for relatedness with colleagues was not or was only slightly associated with these variables. However, these studies only investigated a limited set of stressors and resources, they were cross-sectional in nature, and intra-individual dynamics were not examined. In order to understand intra-individual changes and processes, a daily perspective is necessary (Bolger & Laurenceau, 2013; Zirkel et al., 2015).



**Figure 4.1:** Heuristic working model to illustrate our hypotheses (H1-H3) regarding the daily within-subject processes that affect teachers' daily well-being (Day-Level) and the inter-individual differences that moderate these associations (Person-Level). H1: Association between stress exposure and well-being, H2: Mediation via basic psychological needs, H3: Moderation by job experience.

### Present Study

The present study aimed to examine whether basic need satisfaction explains the link between work-related stress exposure and teachers' occupational well-being. More precisely, we investigated stress exposure in class and outside class as predictors; the basic needs for relatedness with students, relatedness with colleagues, and competence as mediators; and work enthusiasm and emotional exhaustion as outcomes (see Figure 4.1). We focused on intra-individual processes only instead of investigating inter-individual differences in change over time. Our study adds to the research field in two ways: First, the use of diary methodology facilitates conclusions about the daily processes that contribute to changes in teachers' occupational well-being, is close to teachers' everyday experience, and reduces retrospective bias. Second, our findings provide an understanding of the psychological mechanisms that link stress exposure and well-being. In particular, separating the need for relatedness into two components—relatedness with students and relatedness with colleagues—clarifies our understanding of teachers' basic needs and how they relate to teachers' well-being.

Our first research question addressed the association between stress exposure and occupational well-being on the day-to-day level. Based on theoretical models (Almeida, 2005; Demerouti et al., 2001), we expected to find a positive relationship between daily stress exposure in class and outside class and emotional exhaustion on the one hand, and a negative relationship with daily work enthusiasm on the other hand (Hypothesis 1). As teaching is at the core of this profession, we hypothesized to find particularly close connections between stress exposure in class and work enthusiasm and emotional exhaustion. Our second research question asked whether the basic psychological needs for relatedness with students, relatedness with colleagues, and competence mediated this association. While the need for competence is generally seen as vital (Ryan & Deci, 2000), feeling related with students may be more important for teachers' well-being than feeling related with colleagues (Klassen et al., 2012; Spilt et al., 2011). After all, teachers spend far more working hours with students than with colleagues and building good teacher-student relationships is one of their main goals (Butler, 2012). Thus, we expected the needs for competence and for relatedness with students to mediate the relationship between daily stress exposure and well-being (Hypothesis 2). Finally, our third research question investigated possible inter-individual differences in the daily stress process. Based on Almeida's stress model (Almeida, 2005), we expected to find substantial inter-individual variations (Hypothesis 3). Drawing on Huberman (1989), we explored whether years of job experience could explain these variations in such a way that the associations between stress exposure, basic need satisfaction, and well-being would be exacerbated for the least experienced teachers.

## **Method**

### *Procedure*

In our diary study, teachers reported on daily stress exposure at work, basic need satisfaction, and occupational well-being at the end of each workday (between 6 p.m. and 12 a.m.) on 14 consecutive days. The teachers received a reminder via e-mail each day and the items were presented in the same order to all teachers on all days. We only analyzed the 10 workdays because the weekends were considered extraneous to our research questions. A two-week period was chosen in order to gain relatively broad insights into teachers' regular everyday lives while minimizing the burden for the participants. In addition, the teachers provided information on their demographic background in a pre-questionnaire. They were invited to participate via e-mail and received an individual code to access their personal online diary. The questionnaires were programmed and presented with the online platform Unipark by the software provider

Globalpark and participants received a remuneration of up to €50 depending on the number of times they participated.

### *Sample*

As our target population was beginning teachers, we contacted all teachers in one German federal state who had received their degree within the last four years ( $N = 900$ ). 184 teachers participated. 32 teachers filled in the diary only once and were therefore excluded from the data analysis. This left 152 teachers for the final analysis. These teachers completed the diary on 7.4 days on average ( $SD = 2.35$ ), providing a total of 1125 measurement points. 15% participated on two to four days, 24% on five to seven days, and 61% on eight to ten days.

As  $t$ -tests and Fisher's exact tests indicated, those excluded from the analysis did not differ from those included regarding years of job experience ( $t(174) = 0.17, p = .86$ ), school form ( $p = .63$ ), and trait-like emotional exhaustion<sup>2</sup> ( $t(170) = 1.45, p = 0.15$ ), but male participants had a higher probability of being excluded ( $p = 0.04$ ). In addition, the number of days participated was not or was only slightly correlated to overall stress exposure, basic need satisfaction, occupational well-being, and job experience ( $.01 \leq |r| \leq .20$ ). The teachers in our study were 32.0 years old on average ( $SD = 4.85$ ) and 80.3% of them were female. They had 2.3 years of job experience ( $SD = 1.27$ ), 19.7% of them taught at primary schools, and 80.3% at secondary schools.

### *Instruments*

*Daily stress exposure.* In an open format, teachers were asked to enter up to ten events that they had experienced at work each day ("Please write down the positive and negative events you experienced at work today!"). Based on a coding scheme, two independent raters coded the events into eight categories ( $\kappa = .86$ ). The categories described teachers' major fields of activities and were derived from the standards for teacher education as defined by the Standing Conference of the Ministers of Education and Cultural Affairs of the States in the Federal Republic of Germany (KMK, 2004). The first category referred to events regarding instruction *in class* (e.g., classroom management, student motivation; 40.3% of all events). The remaining categories were combined to reduce the complexity of our model. They all described events *outside class* (59.7% of all events): preparation (15.9% of events outside class), interacting with students outside class (5.2%), counseling (6.6%), interacting with colleagues (38.5%), professional development (1.0%), organization (22.7%), and other (10.1%). After the categorization,

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<sup>2</sup> The items are described in the instruments section and were slightly modified to assess trait-like emotional exhaustion in the pre-questionnaire.

several steps were taken to assess teachers' daily stress exposure. We drew on teachers' valence ratings of each event ("To what extent did you perceive the events as positive or negative?"), using a 5-point scale ranging from 1 = *very negative* to 5 = *very positive*. Subsequently, we summed up the number of uplifts (rating = 4 or 5,  $N = 2,495$ ) and hassles (rating = 1 or 2,  $N = 1,457$ ) that each teacher had experienced in class and outside class on a given day. Neutral experiences (rating = 3,  $N = 470$ , 10% of all events) were excluded. Finally, as we regard stress exposure as an imbalance between daily hassles and uplifts, we subtracted the amount of uplifts from the amount of hassles experienced in the respective category. Thus, positive values indicate that a teacher was exposed to more hassles than uplifts. A value of zero implies a balance between hassles and uplifts. This procedure explicitly considers the imbalance between hassles and uplifts while controlling for general inter-individual differences regarding the total amount of experiences reported. A similar approach was applied by Siegrist et al. (2004) and is also common in other related fields (e.g., Diener et al., 2010).

*Daily work enthusiasm.* We used two items ("I taught with great enthusiasm today.", "I really enjoyed my job today.") developed by Kunter et al. (2008) to measure work enthusiasm on a 4-point scale ranging from 1 = *strongly disagree* to 4 = *strongly agree*. As for all daily measures in this study, Cronbach's  $\alpha$  was assessed separately for each day ( $\alpha = .70 - .85$ ).

*Daily emotional exhaustion.* We assessed daily emotional exhaustion with a German version of the Maslach Burnout Inventory (MBI; Enzmann & Kleiber, 1989) on a 4-point scale (4 items, "I felt exhausted at work today.", "I felt like I am at the end of my rope today.", "I noticed how listless I was at work today.", "Today, I felt really exhausted at the end of my workday.",  $\alpha = .73 - .85$ ) ranging from 1 = *strongly disagree* to 4 = *strongly agree*.

*Daily basic need satisfaction.* On the basis of the Basic Need Satisfaction at Work Scale (Ryan & Deci, 2015), we constructed a German short scale to assess the daily fulfillment of teachers' needs for *relatedness with students* (2 items, "I got along well with my students today.", "My students and I understood each other well today.",  $\alpha = .78 - .94$ ), for *relatedness with colleagues* (2 items, "I got along well with my colleagues today.", "My colleagues and I understood each other well today.",  $\alpha = .86 - .97$ ), and for *competence* (2 items, "I really felt competent at work today.", "Altogether, I felt a sense of accomplishment from work today.",  $\alpha = .65 - .84$ ) on a 4-point scale ranging from 1 = *strongly disagree* to 4 = *strongly agree*.

*Demographic background.* In a pre-questionnaire, participants provided information on their gender, the school form at which they were teaching, and their years of job experience. To facilitate interpretation, job experience was grand-mean centered ( $M = 0$ ).

### Data Analysis

In our study, each participant filled in the diary on several days. Therefore, days (Level 1,  $N = 1125$ ) were clustered within subjects (Level 2,  $N = 152$ ) and the observations were not independent. If the hierarchical structure of the data is not taken into account, standard errors might be underestimated, increasing type I errors, and conclusions about the different levels and their interactions cannot be drawn (Snijders & Bosker, 2012). Thus, we used multilevel modeling.

To test our first and second research questions, we used within-subject mediation models with daily stress exposure as the predictor, daily basic need satisfaction as the mediator, and daily well-being as the outcome (see Figure 4.1). We followed a procedure suggested by Bolger and Laurenceau (2013) to set up the models, using the software *Mplus 7* (Muthén & Muthén, 1998-2012). First, we group-mean centered all variables. This removed between-subject differences, allowing us to draw conclusions about mere within-subject processes. Second, we started with a mediation model on Level 1, in which the slopes were random and could thus vary between individuals. As suggested by Kenny, Korchmaros, and Bolger (2003), we included the covariation of paths when calculating the indirect effects, in order to take into account possible effects of co-moderation (i.e., the extent to which the path between  $X$  and  $M$  covaried with the path between  $M$  and  $Y$ ). Third, we estimated the size of the mediation effects. In accordance with Wen and Fan (2015), we calculated the ratio of the indirect effect to the total effect ( $P_M$ ).

To investigate our third research question, we first tested for significant slope variances. Following the recommendations in the methodological literature, we used likelihood ratio tests (Aguinis, Gottfredson, & Culpepper, 2013; Snijders & Bosker, 2012). We fixed one path after another and compared the fit of these models with the fully random model (i.e., variances and covariances of the slopes were freely estimated). To explain statistically significant slope variances, we tested for cross-level interactions by including the Level 2 variable *years of job experience* as a predictor of the Level 1 slopes (Aguinis et al., 2013). All analyses were performed using maximum likelihood estimation with robust standard errors.

Before testing our research questions, several steps were taken to establish the reliability and validity of our instruments in the context of multilevel modeling. We assessed the reliability of the daily measures in detecting within-subject changes (reliability of change,  $R_C$ ; for a detailed description, see Cranford et al., 2006) with SPSS MIXED (Bolger & Laurenceau, 2013; Shrout & Lane, 2012). The size of  $R_C$  can be interpreted according to prevalent reliability coefficients (Cranford et al., 2006).  $R_C$  was satisfactory for all scales, ranging from  $R_C = .71$  for the need for competence to  $R_C = .90$  for the need for relatedness with colleagues (Table 4.1).



Additionally, we used a confirmatory multilevel factor analysis (Muthén, 1994) to confirm that the constructs of interest—the needs for competence, relatedness with students, relatedness with colleagues, work enthusiasm, and emotional exhaustion—were empirically distinguishable. On the within-subject level, we compared the fit of a one-factor model with a model with five inter-correlated factors ( $.05 \leq |r| \leq .81$ ), where each item only loaded on the factor expected and the residuals were uncorrelated. In accordance with Hu and Bentler (1999), the one-factor model did not fit the data well ( $\chi^2 = 1675.03$ ,  $df = 66$ ,  $CFI = .52$ ,  $RMSEA = .15$ ), whereas the five-factor model showed an adequate fit ( $\chi^2 = 166.63$ ,  $df = 57$ ,  $CFI = .97$ ,  $RMSEA = .04$ ). Furthermore, the five-factor model had a statistically significant better fit than the one-factor model ( $\chi^2_{diff} = 850.04$ ,  $\Delta df = 9$ ,  $p < .001$ ).

## Results

### *Preliminary Analysis*

Table 4.1 shows the means for our predictor, mediator, and outcome variables before centering and Table 4.2 shows the correlations. On average, teachers experienced more uplifts than hassles each day, and this is reflected in negative values for stress exposure in class ( $M = -0.49$ ) and outside class ( $M = -0.59$ ). They reported a relatively high satisfaction of the basic

**Table 4.1:** Descriptive results for stress exposure, the basic psychological needs, and occupational well-being

	<i>M</i>	<i>SD<sub>w</sub></i>	<i>SD<sub>b</sub></i>	ICC	<i>R<sub>C</sub></i>
Stress exposure in class	-0.49	1.36	0.43	.09	
Uplifts in class	1.19	0.90	0.38	.15	
Hassles in class	0.70	0.76	0.28	.12	
Stress exposure outside class	-0.59	1.47	0.52	.11	
Uplifts outside class	1.41	1.01	0.52	.21	
Hassles outside class	0.82	0.88	0.38	.16	
Relatedness with students	3.42	0.59	0.25	.16	.87
Relatedness with colleagues	3.59	0.49	0.35	.35	.90
Competence	3.19	0.50	0.32	.28	.71
Work enthusiasm	3.09	0.61	0.34	.24	.78
Emotional exhaustion	1.61	0.51	0.34	.31	.75

*Note.* Stress exposure is the difference between hassles and uplifts; *SD<sub>w</sub>* and *SD<sub>b</sub>* refer to the standard deviations within and between subjects, respectively, and were used for the calculation of the intraclass correlation (ICC). *R<sub>C</sub>* is a reliability coefficient for diary studies (Cranford et al., 2006) and assesses the scale's sensitivity to within-subject changes from day to day.

psychological needs and relatively high work enthusiasm ( $M = 3.09$ ), whereas emotional exhaustion was quite low ( $M = 1.61$ ). Additionally, Table 4.1 shows the standard deviation on the within-subject level ( $SD_w$ ) and the between-subject level ( $SD_b$ ), as well as the intraclass correlation (ICC), which reflects the amount of variance in observations that is due to persons. This offers insights into the degree of intra-individual variation. For example, stress exposure in class (9%) and outside class (11%), and relatedness with students (16%) had the smallest amount of variance on the person level and the largest amount of variance on the day level. In contrast, the intraclass correlations for emotional exhaustion (31%) and relatedness with colleagues (35%) were nearly twice the size but still had the largest amount of variance on the day level.

#### *The Relationship Between Daily Stress Exposure and Teachers' Well-Being*

Our first research question was whether daily stress exposure is related to occupational well-being. To answer this question, we set up our within-subject mediation model with stress exposure as the predictor and well-being as the outcome (see Figure 4.2). The total effects attained from this model (Table 4.3) show that stress exposure in class was negatively and statistically significantly associated with work enthusiasm ( $B = -0.21$ ,  $p < .001$ ) and positively with

**Table 4.2:** Within-subject intercorrelations between stress exposure, the basic psychological needs, and occupational well-being

	1	2	3	4	5	6	7	8	9	10	11
1 Stress exposure in class		<b>-.85</b>	<b>.78</b>	<b>-.08</b>	<b>.09</b>	-.00	<b>-.35</b>	<b>-.06</b>	<b>-.34</b>	<b>-.41</b>	<b>.24</b>
2 Uplifts in class			<b>-.35</b>	<b>.14</b>	<b>-.19</b>	-.02	<b>.27</b>	.05	<b>.28</b>	<b>.34</b>	<b>-.19</b>
3 Hassles in class				.00	-.06	-.06	<b>-.41</b>	-.06	<b>-.35</b>	<b>-.40</b>	<b>.24</b>
4 Stress exposure outside class					<b>-.80</b>	<b>.74</b>	<b>-.11</b>	<b>-.23</b>	<b>-.21</b>	<b>-.23</b>	<b>.30</b>
5 Uplifts outside class						<b>-.20</b>	<b>.13</b>	<b>.14</b>	<b>.19</b>	<b>.20</b>	<b>-.19</b>
6 Hassles outside class							-.04	<b>-.23</b>	<b>-.15</b>	<b>-.17</b>	<b>.31</b>
7 Relatedness with students								<b>.21</b>	<b>.62</b>	<b>.58</b>	<b>-.31</b>
8 Relatedness with colleagues									<b>.26</b>	<b>.13</b>	<b>-.13</b>
9 Competence										<b>.61</b>	<b>-.44</b>
10 Work enthusiasm											<b>-.50</b>
11 Emotional exhaustion											

*Note.* Stress exposure is the difference between hassles and uplifts; coefficients in bold are significant at  $p < .05$ .

emotional exhaustion ( $B = 0.12, p < .001$ ). The same applies to stress exposure outside class and work enthusiasm ( $B = -0.12, p < .001$ ) and emotional exhaustion ( $B = 0.12, p < .001$ ). This means that teachers felt less work enthusiasm and more emotional exhaustion on days on which they experienced more stress in class and outside class than on their average day. The negative relationship between stress exposure in class and work enthusiasm was especially pronounced.

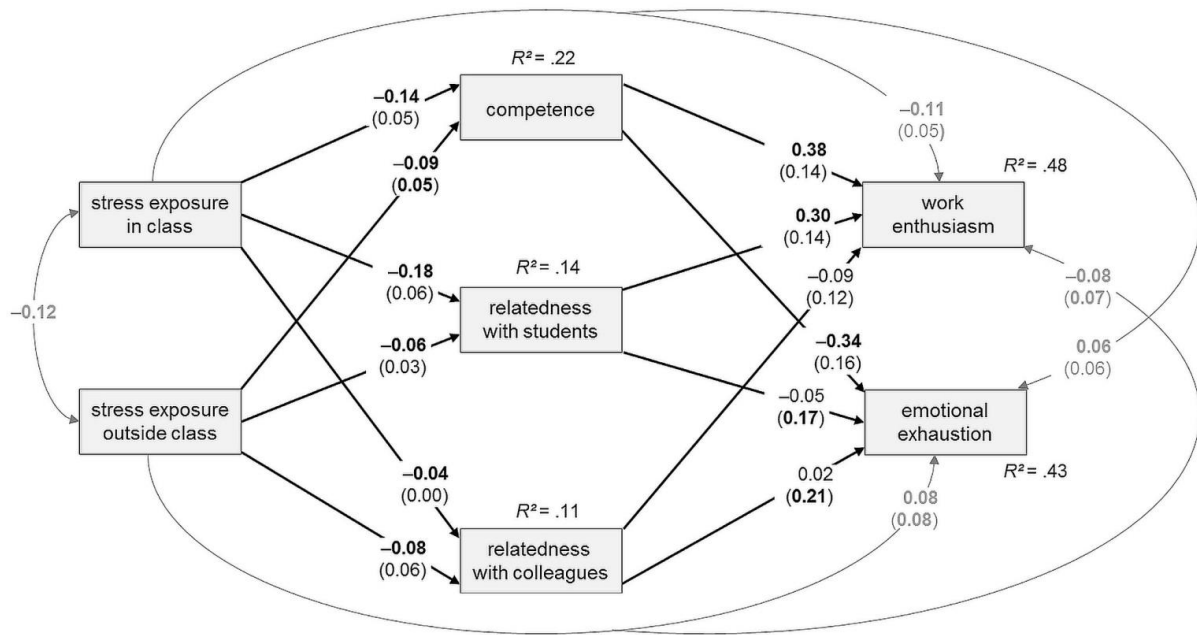
#### *The Basic Psychological Needs as a Mediator*

Our second research question was whether the basic needs for relatedness with students, relatedness with colleagues, and competence are mediators for the link between stress exposure and well-being. First, we investigated whether stress exposure was associated with basic need satisfaction. As Figure 4.2 illustrates, daily stress exposure in class was linked to the needs for relatedness with students ( $B = -0.18, p < .001$ ) and competence ( $B = -0.14, p < .001$ ), whereas the link to relatedness with colleagues was rather small ( $B = -0.04, p = .03$ ). Daily stress

**Table 4.3:** Total effects, indirect effects, and direct effects for the within-subject mediation models

	Enthusiasm		Exhaustion	
	<i>B</i>	<i>SE</i>	<i>B</i>	<i>SE</i>
<b>Stress exposure in class</b>				
Total effect	<b>-0.21</b>	0.02	<b>0.12</b>	0.02
Total indirect effect	<b>-0.11</b>	0.02	<b>0.06</b>	0.01
Specific indirect effects				
via students	<b>-0.06</b>	0.01	0.01	0.01
via colleagues	0.00	0.01	-0.00	0.01
via competence	<b>-0.06</b>	0.01	<b>0.05</b>	0.01
Direct effect	<b>-0.11</b>	0.02	<b>0.06</b>	0.02
<b>Stress exposure outside class</b>				
Total effect	<b>-0.12</b>	0.02	<b>0.12</b>	0.01
Total indirect effect	<b>-0.04</b>	0.02	<b>0.03</b>	0.01
Specific indirect effects				
via students	<b>-0.02</b>	0.01	-0.00	0.01
via colleagues	0.01	0.01	0.00	0.01
via competence	<b>-0.04</b>	0.01	<b>0.03</b>	0.01
Direct effect	<b>-0.08</b>	0.01	<b>0.08</b>	0.02
<b><i>R</i><sup>2</sup></b>	.48		.43	

*Note.* The unstandardized (*B*) coefficients are displayed. Coefficients in bold are significant at  $p < .05$ .



**Figure 4.2:** Within-subject mediation model with stress exposure in class and outside class as predictors, the basic needs for relatedness with students, relatedness with colleagues, and competence as mediators, and work enthusiasm as well as emotional exhaustion as outcomes. The unstandardized multilevel regression coefficients are displayed and the corresponding standard deviations of the random slopes are in parentheses. For the sake of clarity, correlated residuals for the mediator variables and the outcome variables are not displayed. Paths regarding the indirect effects are highlighted. Coefficients in bold are significant at  $p < 0.05$ .

exposure outside class was negatively related to the needs for relatedness with students ( $B = -0.06$ ,  $p < .001$ ), relatedness with colleagues ( $B = -0.08$ ,  $p < .001$ ), and competence ( $B = -0.09$ ,  $p < .001$ ). This means that teachers felt more competent, more related with their students, and more related with their colleagues on days when they were exposed to less stress than on their average day.

Next, we examined basic need satisfaction as a mediator for the relation between stress exposure and work enthusiasm (Table 4.3). We found statistically significant specific indirect effects of the needs for relatedness with students (in class:  $B = -0.06$ ,  $p < .001$ , outside class:  $B = -0.02$ ,  $p = .003$ ) and competence (in class:  $B = -0.06$ ,  $p < .001$ , outside class:  $B = -0.04$ ,  $p < .001$ ). The needs for relatedness with students ( $B = 0.30$ ,  $p < .001$ ) and for competence ( $B = 0.38$ ,  $p < .001$ ) were also statistically significant predictors of work enthusiasm. As the direct effects show, the relationship of stress exposure in class ( $B = -0.11$ ,  $p < .001$ ) and outside class

( $B = -0.08, p < .001$ ) with work enthusiasm was statistically significant, which indicates a partial mediation. Hence, our finding that teachers showed less work enthusiasm on days when they were exposed to more stress, can partly be explained by the fact that stress exposure is linked to feeling less related with students and less competent. Estimating the size of these effects, for stress exposure in class, we found  $P_M = .29$  for both relatedness with students and competence, indicating that 29% of the total effect is explained by the indirect effect. For stress exposure outside class, we found  $P_M = .17$  for relatedness with students and  $P_M = .33$  for competence.

Turning to emotional exhaustion as an outcome, we found a statistically significant indirect effect of stress exposure in class ( $B = 0.06, p < .001$ ) and outside class ( $B = 0.03, p = .01$ ) on emotional exhaustion (Table 4.3). There was a statistically significant specific indirect effect of the need for competence (in class:  $B = 0.05, p < .001$ , outside class:  $B = 0.03, p < .001$ ), which in turn predicted emotional exhaustion ( $B = -0.34, p < .001$ ). Again, this was a partial mediation because the direct effects revealed statistically significant links between stress exposure in class ( $B = 0.06, p = .004$ ) and outside class ( $B = 0.08, p < .001$ ) with emotional exhaustion. Thus, our finding that teachers reported more emotional exhaustion on days when they were exposed to more stress can partly be explained by the fact that stress exposure is related to less satisfaction of the need for competence. We found  $P_M = .42$  for stress exposure in class and  $P_M = .25$  for stress exposure outside class. We modeled possible co-moderations for all of the indirect effects but they were not statistically significant and were only of modest size ( $.00 \leq |r| \leq .40$ ). Moreover, to control for possible time effects across the two weeks, we ran two additional analyses, in which we included either a linear time trend or four dummy variables coding the day of the week. The results were almost identical.

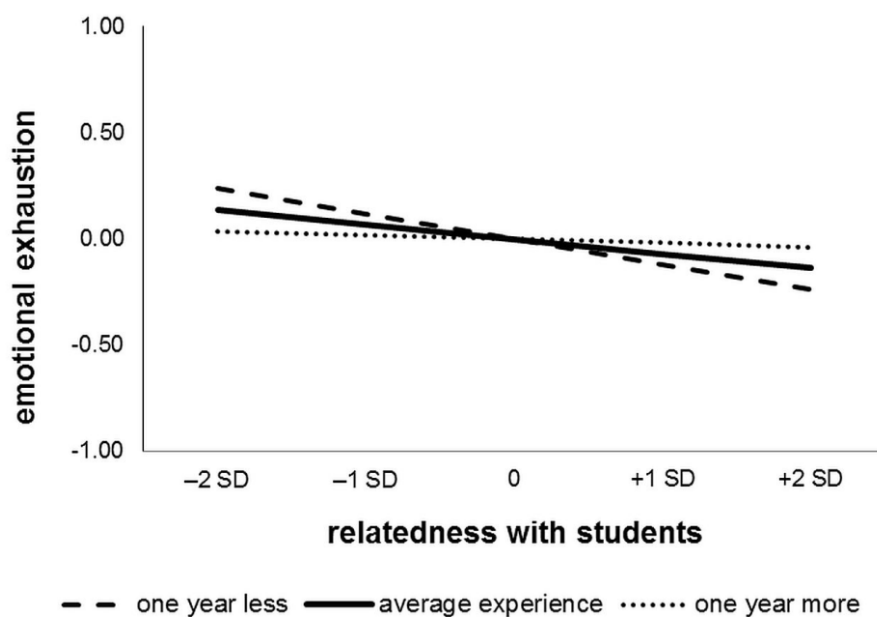
#### *Inter-Individual Differences Regarding Daily Processes*

Our third research question explored whether teachers differ in the daily processes that affect their well-being. To get an impression of the range of the slopes, we calculated prediction intervals ( $PI_{95}$ ; Snijders & Bosker, 2012). These were based on the assumption that the slopes are normally distributed and, thus, that 95% of the slopes would lie within 1.96 standard deviations of the mean slope. Significant slope variance was found for the relations between stress exposure outside class and the need for competence ( $PI_{95} = (-0.25; -0.04), SD = 0.05, \chi^2_{diff} = 14.08, \Delta df = 5, p = .02$ ), work enthusiasm ( $PI_{95} = (-0.22; 0.06), SD = 0.07, \chi^2_{diff} = 16.08, \Delta df = 7, p = .02$ ), and emotional exhaustion ( $PI_{95} = (-0.08; 0.25), SD = 0.08, \chi^2_{diff} = 15.48, \Delta df = 7, p = .02$ ).

= .03). Additionally, there was significant variance in the association between emotional exhaustion and relatedness with students ( $PI_{95} = (-0.39; 0.29)$ ,  $SD = 0.17$ ,  $\chi^2_{diff} = 11.65$ ,  $\Delta df = 5$ ,  $p = .04$ ) and with colleagues ( $PI_{95} = (-0.39; 0.43)$ ,  $SD = 0.21$ ,  $\chi^2_{diff} = 19.46$ ,  $\Delta df = 5$ ,  $p = .002$ ). Next, we specified cross-level interactions to explore whether years of job experience could explain these inter-individual differences. Job experience was a statistically significant moderator of the relationship between emotional exhaustion and fulfillment of the need for relatedness with students ( $B = 0.05$ ,  $p = 0.05$ ,  $R^2_{Slope} = .13$ ): The least experienced teachers reported more emotional exhaustion on days on which they did not feel related with their students (see Figure 4.3). Job experience explained 13% of the slope variance, indicating a medium effect (Cohen, 1988).

## Discussion

The main goal of the present diary study was to investigate whether satisfaction of the basic psychological needs (Ryan & Deci, 2000) can explain the link between teachers' daily stress exposure and their occupational well-being. We focused on the needs for competence, relatedness with students, and relatedness with colleagues to see how these needs contribute to



**Figure 4.3:** Plot of the moderating effect of the Level 2 variable years of job experience on the relationship between the Level 1 variables emotional exhaustion and the basic need for relatedness with students.

occupational well-being as indicated by work enthusiasm and emotional exhaustion. Moreover, inter-individual differences regarding these daily processes were examined.

Our results show that daily stress exposure in class and outside class is negatively associated with teachers' well-being. This relationship could be explained by the fact that stress exposure inhibits satisfaction of the basic psychological needs, which—in turn—impairs well-being: Emotional exhaustion was higher when teachers felt less competent, and work enthusiasm was higher when teachers felt more related to their students and more competent. Relatedness with colleagues played a subordinate role. Additionally, teachers differed regarding these relations: The least experienced teachers appeared to be more prone to emotional exhaustion when their need for relatedness with students was not satisfied.

#### *The Relationship Between Daily Stress Exposure and Teachers' Well-Being*

Previous research has often linked teachers' stress exposure to occupational well-being (e.g., Hakanen et al., 2006; Klusmann et al., 2008a). While most of the studies so far have dealt with the question of which teachers have lower overall well-being, we considered daily intra-individual variations in teachers' stress exposure and well-being. Thereby, we found strong day-to-day fluctuations in teachers' daily experiences and also found that these fluctuations were immediately reflected in their well-being. Our results support our first assumption and show that, on days when teachers are exposed to more stress in class or outside class, they experience more emotional exhaustion and less work enthusiasm than on their average day. This is in accordance with Almeida's stress model (Almeida, 2005). In line with our assumptions, stress exposure in class and work enthusiasm were most closely associated. This is not surprising considering the fact that wanting to teach children is a core motivation to choose this profession (Watt & Richardson, 2007). Surprisingly, emotional exhaustion was linked to stress exposure in class and stress exposure outside class to a similar degree. This indicates that activities such as lesson preparation or interaction with colleagues are just as important in explaining teachers' emotional exhaustion as their daily experience in class.

#### *The Basic Psychological Needs as a Mediator*

The superordinate objective of the present study was to investigate the psychological mechanisms that explain the relationship between teachers' daily stress exposure and their occupational well-being. Drawing on self-determination theory (Ryan & Deci, 2000), we suggested that daily stress exposure might affect well-being because it impairs satisfaction of the basic psychological needs for competence, relatedness with students, and relatedness with colleagues. In particular, the needs for competence and relatedness with students were expected to

be closely associated with teachers' well-being. Our results mostly support these assumptions and underpin previous studies that have suggested basic need satisfaction as a mediator (e.g., Bartholomew et al., 2014). The needs for competence and for relatedness with students partially mediated the relationship between stress exposure and work enthusiasm. Regarding emotional exhaustion, the need for competence turned out to be the only mediator. Consequently, the reason for why social interactions with students are rewarding and demanding at the same time is that they not only reconfirm or damage one's sense of professional competence, but that they also foster or diminish the feeling of being personally connected with one's students. However, more variables need to be taken into account in future research, e.g., considering the emotions that are evoked by stress exposure might add to a more complete picture (Chang, 2009). Interestingly, and in line with the job demands-resources model (Demerouti et al., 2001), the processes that influenced the positive and the negative dimension of occupational well-being differed.

Looking at the role of teachers' relatedness with colleagues, our findings may appear somewhat contradictory to previous findings about colleagues as a source of teacher stress and social support (Pomaki et al., 2010; Skaalvik & Skaalvik, 2011). However, in contrast to other studies, we did not investigate teacher-colleague interactions as a stressor or resource but rather looked at the psychological mechanisms that might link this common stressor and resource to teachers' occupational well-being. Our findings indicate that feeling related to colleagues may not be an important mediator, particularly when compared to the needs for relatedness with students and competence. This is also consistent with the study of Klassen et al. (2012).

#### *Inter-Individual Differences Regarding Daily Processes*

Based on the assumption that stress exposure affects people's well-being differently depending on certain person variables (Almeida, 2005), our third research question aimed to find out whether there were inter-individual differences regarding the relations in our model. Our hypothesis that there would be substantial inter-individual variation was confirmed. Job experience explained some of this variation: The least experienced teachers were particularly prone to feeling more emotional exhaustion when the need for relatedness with students was not satisfied.

#### *Limitations*

To the best of our knowledge, this is the first diary study to investigate the role that the basic needs for competence, relatedness with students, and relatedness with colleagues play as a mediator between daily stress exposure and occupational well-being among teachers, as well



as the inter-individual differences regarding the daily stress process. Nonetheless, there are some limitations that should be mentioned. First, our study focused on beginning teachers because the career entrance is often seen as a particularly important, but stressful phase in teachers' lives (Huberman, 1989). Due to this, our sample is not representative of the teacher population; the relationships between the variables under study may be different in other samples. In addition, there was some variation regarding the number of times each teacher participated and we cannot be sure that the data are missing completely at random. Second, we only used self-report measures, possibly evoking common method bias. The use of objective indicators of occupational well-being could provide a more detailed picture in future studies. Moreover, our instruments were quite brief in order to avoid fatigue among the participants. Consequently, one cannot rule out that the underlying constructs were not fully captured. Future research could avoid this shortcoming and gain deeper insights into the daily processes by additionally including open questions on basic need satisfaction and well-being on some days. Finally, we had no information about the teachers' general well-being at the beginning of the working day. In future research, this should be controlled for because teachers' daily stress exposure may not only be a predictor of well-being at the end of the day, but also a function of their general well-being at the start of the day.

### *Conclusions and Implications*

Our results indicate that work-related stress exposure is linked to beginning teachers' occupational well-being because it is associated with their need for competence and, most importantly, with their need for relatedness with students. This supports recent theoretical and empirical research that emphasizes teachers' need for interpersonal relationships with their students, which is a topic that has largely been neglected in research up until now. Our findings are of focal interest for teacher education and the design of interventions to improve (beginning) teachers' occupational well-being. For example, educators at the pre-service level could foster teachers' awareness of their basic psychological needs, which could help teachers to understand why certain events evoke certain reactions. Particularly, at the start of a career in teaching, critically reflecting on the need for relatedness with students may be useful. To facilitate stress prevention, it could also prove worthwhile to train teacher competencies that are conducive to the satisfaction of both the needs for relatedness with students and competence. More research is needed in this regard, but one promising approach could be the study of socio-emotional competencies. For instance, socially and emotionally competent teachers have high social awareness and are able to manage their emotions and those of others (Jennings & Greenberg, 2009). This enables them to build strong and supportive relationships, to regulate their emotions

in challenging situations, and to set boundaries effectively. Multiple interventions are available to enhance these skills at the in-service level in order to promote positive teacher-student relationships and teachers' well-being (e.g., Brackett & Katulak, 2006; Roeser et al., 2013; Spilt, Koomen, Thijs, & van der Leij, 2012). These programs help teachers to become aware of and understand their emotional reactions so that reflection on their basic psychological needs could easily be integrated as a further valuable component.

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# CHAPTER 5



## General Discussion

Guided by the question of how to promote both students' school adjustment and teachers' occupational well-being, the present work investigated the teacher-student relationship as a potential resource for both parties involved. Thereby, the quality of the teacher-student relationship was described in terms of two central dimensions: proximity and influence (Wubbels, Créton, Levy, & Hooymayers, 1993). *Proximity* refers to the degree of teachers' academic and emotional support for students (= teacher proximity) on the one hand and students' appreciation and liking of the teacher (= student proximity) on the other hand. *Influence* indicates the extent to which the teacher is controlling the interaction (= teacher influence) in order to prevent student misbehavior (= student influence). The assumption that a positive teacher-student relationship is associated with desirable outcomes for the two central actors in school was theoretically derived (e.g., Bowlby, 1969; Ryan & Deci, 2000; Spilt, Koomen, & Thijs, 2011) and is central to the heuristic working model which guided the three empirical studies that were part of the present work (see Figure 1.3). The following sections will summarize the central findings regarding the question of whether the teacher-student relationship is associated with positive outcomes for both teachers and students. Moreover, theoretical and empirical contributions are highlighted, limitations and directions for future research are discussed, and practical implications are illustrated.

### Summary of Central Empirical Findings

As part of the present work, three empirical studies aimed to investigate key assumptions of the heuristic working model displayed in Figure 1.3. The first aim and focus of Study 1 was to investigate whether the teacher-student relationship is linked to students' general school adjustment. The second aim, which was addressed in Study 2 and Study 3, was to examine the association between the teacher-student relationship and teachers' occupational well-being. Thereby, Study 2 focused on the association between the teacher-student relationship and teacher well-being. To enhance this, Study 3 examined teachers' need for relatedness as an underlying psychological process that might explain the association between the relationship and well-being. First, there are some interesting descriptive results regarding the quality of the teacher-student relationship that should be mentioned:

- (1) Students reported that their homeroom teachers displayed much emotional and academic support, that is, a great extent of teacher proximity. In contrast, student ratings of teacher

influence were around the scale's midpoint which implies that there were quite a few disturbances in average classrooms. Regarding their ratings of teacher proximity and teacher influence, students within a classroom agreed to some extent and about 20% of their perceptions reflected shared variance at the class level. However, around 80% of the variance in student ratings was attributable to students' idiosyncratic perceptions. This shows that students within a classroom experience their teachers' interpersonal behavior quite differently (Study 1).

- (2) Teachers perceived the dimension of influence akin to students which was reflected in a similar mean and considerable convergence of both perspectives. In contrast, teachers' and students' perceptions of teachers' academic and emotional support for students were largely uncorrelated. Thereby, teachers tended to view the dimension of teacher proximity more positively than students. With respect to student proximity, on average, teachers felt that their students liked and appreciated them. Furthermore, teachers felt strongly related to their students on a daily level (Study 1, Study 2, Study 3).

With regards to the main research questions of the present work, the central findings regarding the question of how the teacher-student relationship is linked to students' school adjustment can be summarized as follows:

- (3) Students' perceptions of teacher proximity were associated with higher academic test scores, school satisfaction, and self-esteem as well as lower truancy at the individual *student level*. Hence, students who felt more supported by their teacher had more positive outcomes compared to their classmates. Thereby, student gender, migration background, and socioeconomic status were controlled for which showed that students' individual perceptions of teacher proximity explained variance in student outcomes beyond students' background. Furthermore, teacher proximity was associated with changes in students' achievement, school satisfaction, self-esteem, and truancy from one school year to the next which further underpinned the predictive validity of students' individual perceptions of teacher proximity for within-class differences in outcomes (Study 1).
- (4) At the *class level*, students' shared perceptions of *teacher proximity* were positively linked with school satisfaction and self-esteem. This means that teachers who were perceived to be highly supportive had classes that reported higher school satisfaction and

self-esteem on average than classes who had a less supportive teacher. Teachers' perceptions of their own proximity for students were not reflected in student outcomes (Study 1).

- (5) Students' ratings of *teacher influence* were largely uncorrelated with student outcomes at the *student level* which shows that variance in students' perceptions of teacher influence does not contribute to explaining differences in student outcomes within one classroom (Study 1).
- (6) Students' shared perceptions of *teacher influence* were related to lower truancy at the *class level* and these classes also showed a smaller increase in truancy compared to the prior school year. Furthermore, classes in which teachers reported that they succeeded in controlling student behavior had higher achievement levels (Study 1).

The second aim of the present work was to extend the focus of prior research on teacher-student relationships beyond student development and to investigate the association with teachers' occupational well-being. With this regard, the findings can be summarized as follows:

- (7) Teachers' daily interactions with students—more precisely, their daily stress exposure, which reflected an imbalance of work-related positive (e.g., affection from students) and negative experiences (e.g., student misbehavior)—were associated with higher emotional exhaustion and less work enthusiasm on the day level. This means that teachers felt more exhausted and less enthusiastic when they were exposed to more stress than on average days, for example, because they experienced many challenging and few rewarding interactions with students (Study 3).
- (8) Teachers' perceptions of *student proximity* were associated with higher work enthusiasm and lower emotional exhaustion. Hence, teachers who perceived their students to like and appreciate them as a person reported higher occupational well-being. Thereby, teachers' well-being in the prior school year as well as their gender, job experience, class, and school characteristics were used as covariates which shows that student proximity explains inter-individual variance in teacher well-being beyond prior differences (Study 2).
- (9) Similarly, teachers' ratings of *student influence* were related to lower work enthusiasm and higher emotional exhaustion beyond teachers' prior occupational well-being and the other background variables. This means that teachers reported reduced occupational well-being when they experienced much student misbehavior in their classroom. Interestingly, students' perceptions of behavior problems in their classroom were not related to teacher

- well-being even though student and teacher perceptions of misbehavior largely converged (Study 2).
- (10) Mediation analyses showed that student misbehavior per se was not necessarily linked to lower teacher well-being. Rather, teachers' perceptions of student misbehavior were related to lower work enthusiasm via the teachers' feeling that their students did not like and appreciate them at a personal level. For emotional exhaustion, however, no mediation was found and student misbehavior remained a statistically significant predictor when student proximity was added to the model (Study 2).
  - (11) To further advance our understanding of which psychological function a positive teacher-student relationship fulfills for teachers, their role for teachers' basic need satisfaction was investigated. Results of within-subject mediation analyses revealed that feeling related to students mediated the link between teachers' daily stress exposure (e.g., due to negative interactions with students; see Table A in the Appendix) and their daily work enthusiasm. This means that teachers felt less related with their students on days when they were exposed to more stress than on their average day. In turn, feeling less related with students was associated with less work enthusiasm. Thereby, the needs for competence and relatedness with colleagues were also included in the model. Hence, feeling related with students explained variance in teachers' daily well-being beyond these basic psychological needs. No statistically significant indirect effect was found for teachers' daily emotional exhaustion (Study 3).
  - (12) Even though beginning teacher, on average, did not feel statistically significantly more exhausted on days when they felt less related with students, results of cross-level interaction analyses showed that this association was moderated by years of job experience. Thereby, feeling related with students was associated with lower emotional exhaustion among the least experienced teachers (Study 3).

### **Theoretical and Empirical Contributions**

In the following section, the theoretical and empirical contributions of the present work to research on the teacher-student relationship will be discussed in terms of two questions: First, the importance of the relationship for students' school adjustment and, second, its relevance for teachers' occupational well-being.



*The Teacher-Student Relationship and Students' School Adjustment*

Schools are a developmental context for students where they are supposed to develop motivation for and succeed in subject-matter learning and become confident, social-emotional competent adults (Lipnevich, Preckel, & Roberts, 2016; Roeser, Eccles, & Sameroff, 2000; Wentzel, 2003). Many people may remember specific teachers who fostered (or hampered) these outcomes because of the relationship they built with them (Pajares & Urdan, 2008). This idea is also underpinned by theoretical models. Both attachment theory (Bowlby, 1969) and self-determination theory (Ryan & Deci, 2000) suggest that a positive teacher-student relationship is central for student development because teachers who regulate student behavior and support them academically and emotionally create a social context where students feel safe, related with others, autonomous, and competent and are, thus, motivated to learn and enabled to grow as individuals. A large number of empirical studies is in line with these assumptions and shows that teacher proximity and teacher influence are associated with outcomes in the respective class such as achievement, self-concept, interest, or effort (e.g., Scherer, Nilsen, & Jansen, 2016; Wentzel, Battle, Russell, & Looney, 2010). However, these studies have rarely considered the ways in which a particular teacher could have an impact beyond his or her class, for example, in terms of overall school satisfaction or self-esteem. Most studies that addressed the question of how teacher-student relationships are associated with students' general school adjustment concentrated on students' relationships with their teachers at school in general (e.g., Laet et al., 2016; Raufelder, Sahabandu, Martinez, & Escobar, 2015). Perhaps, the assumption that implicitly guided these studies was that one teacher might be less important for students' general experience at school, in particular, at secondary schools where students have many teachers at the same time. This view is contrary to the notion that teachers can be significant others for students and the fact that many students remember individual teachers who had a significant impact on their lives (Pajares & Urdan, 2008; Pianta, 1999). Furthermore, several questions arise from studies asking students about their teacher-student relationships in general, for example: Do students need to experience positive relationships with all teachers to foster their general school adjustment? Do many positive relationships compensate for a few negative relationships? Could one negative relationship overshadow students' experience at school regardless of other teacher-student relationships?

Because of these drawbacks, Study 1 focused on the relationship between students and their homeroom teacher who can be considered particularly central for students' general school experience because they usually spend about ten lessons each week with the class and accom-

pany the students for at least two years. Outcomes not only included achievement in the home-room teacher's subject, but most importantly, students' school satisfaction, truancy, and self-esteem as aspects of students' general school adjustment. Therefore, Study 1 made important contributions to the research field. First, it was one of the first studies showing that a positive relationship between students and individual teachers could foster not only achievement in a particular class, but also students' general school adjustment in terms of school satisfaction, truancy, and self-esteem. Second, the present work extended prior research in methodological respects. Both the teacher and the student perspective on teacher proximity and influence as two central aspects of their relationship were assessed. Moreover, multilevel structural equation modelling was applied to conduct simultaneous analyses at the student level and the class level. This allowed for differentiated insights about the question of how the perspective of the rater and the level of analyses impact the pattern of results.

With regards to the perspective of the rater, students' perceptions of teacher proximity and influence were, in most cases, more closely linked to student outcomes than teachers' perceptions. This was in line with prior research and the theoretical argument that a person's development should be most closely associated with his or her individual interpretation of the social context (Kunter & Baumert, 2006; Lüdtke, Robitzsch, Trautwein, & Kunter, 2009; Wagner et al., 2016). One exception was the finding that teacher-, but not student-rated influence was linked to achievement at the class level. This was contradictory to expectations and not clearly in line with previous research: Student-rated teacher influence has consistently been linked to student achievement (e.g., Fauth, Decristan, Rieser, Klieme, & Büttner, 2014). In addition, the few studies that combined the student and the teacher perspective typically found a stronger association with achievement when student rather than teacher ratings were considered (e.g., Wagner et al., 2016). One explanation might be that prior studies have included diverse student populations, whereas the present work focused on students of the vocational track only. This could have reduced the variance between classes and, in turn, decreased the correlation between influence and achievement. At the same time, the results showed that teachers can also be a valuable source of information. In particular, teachers perceived specific qualities of influence that were associated with achievement, but not recognized by students. Hence, the idea of perspective-specific validity was underpinned and it could be valuable for future research to consider teacher ratings of influence in addition to student or observer ratings (Clausen, 2002; Kunter & Baumert, 2006). Yet, the present work does not allow for conclusions what exactly the teacher-specific aspects represent. Presumably, teachers are especially sensitive to behavior problems that interfere with their plans for a lesson and, therefore, prohibit the achievement of

learning goals. Similarly, teachers might be better able to evaluate whether time on task was sufficient for students to understand specific contents due to their professional expertise (Kunter & Baumert, 2006).

In contrast, teacher ratings of their own proximity for students appeared to be less suitable for predicting student outcomes. This was possibly because teacher and student perceptions of teacher proximity were literally uncorrelated. This could indicate that teacher ratings do not represent their interpersonal behavior, but rather their teaching ideals and are thus prone to self-serving strategies (Wubbels, Brekelmans, & Hooymayers, 1993). After all, working with students and high social interest are major reasons for choosing the teaching profession and caring for students is inherent to teachers' professional identities (O'Connor, 2008; Roloff Henoch, Klusmann, Lüdtke, & Trautwein, 2015; van der Want et al., 2014; Watt & Richardson, 2007). Therefore, it might be particularly difficult for teachers to admit that they do not always care for each student's development. For the dimension of influence this might be less of a problem because challenges could be attributed to the class instead of one's own competence. In addition, influence can be better observed than proximity which could facilitate comparatively objective judgments (Clausen, 2002).

In addition to including teacher ratings of their interpersonal behavior, the present work also extended prior research in that it applied simultaneous analyses at the student level and the class level. For a long time, researchers have not considered that student ratings of teachers' interpersonal behavior are composed of two components (Marsh et al., 2012; Raudenbush & Bryk, 2002): First, each student's unique perception at the student level (level 1) and, second, students' average perception at the class level (level 2). Failing to disentangle the two levels appropriately makes the interpretation of results difficult because it remains unclear whether differences in student outcomes are related to students' idiosyncratic interpretation or rather shared views of teachers' interpersonal behavior (Lüdtke et al., 2009). It has been argued that researchers who are interested in investigating teacher effects should focus on level 2, in particular, because level 1 data have been suspected to represent merely measurement error (Lüdtke et al., 2009; Marsh et al., 2012; Raudenbush & Jean, 2014).

In contrast, the present work took the position that students' idiosyncratic perceptions of teachers' interpersonal behavior may carry valuable information for predicting variance in student outcomes within classrooms. In particular, research showed that teachers do not treat each child equally (Babad, 2009; Nurmi & Kiuru, 2015). These differences could be reflected in students' individual perceptions at level 1 (Downer, Stuhlman, Schweig, Martinez, & Ruzek, 2014; Schweig, 2016). As the results showed, students shared perceptions of teacher proximity

explained variance not only at the class level, but also at the student level where teacher proximity was associated with a positive development of school satisfaction, self-esteem, truancy, and achievement. Hence, students' individual perceptions of whether their homeroom teacher supported them emotionally and academically indeed provided relevant information for predicting student outcomes. One could argue that these findings merely reflect that well-adjusted students will experience their environments more positively. Even though this possibility cannot be ruled out, controlling for students' baseline levels of each outcome and additional potentially confounding variables such as gender or migration background increases the validity of results. In contrast, whether a student perceived the teachers' ability to manage student behavior more positively or negatively as compared to classmates was largely unrelated to the student outcomes that were part of our study. The differential patterns of results for students' individual perceptions of influence and proximity further underpin the validity of findings: If the association between students' individual perceptions of teachers' interpersonal behavior and their school adjustment was attributable to a general tendency of well-adjusted students to perceive their environments more positively, the same pattern of results should have evolved for both proximity and influence. Hence, researchers could largely profit from considering students' individual perceptions of proximity in addition to their shared perceptions at the class level. After all, they appear to carry valid information, for instance, whether the teacher is responsive to their individual needs. On the contrary, the added value of considering individual ratings of teacher influence seems to be limited and, perhaps, within classroom differences in student perceptions are rather unsystematic and random.

### *The Teacher-Student Relationship and Teachers' Occupational Well-Being*

Schools not only provide a context for student development, but are also a professional context where teachers experience diverse rewards and challenges which may promote or harm their occupational well-being (Hakanen, Bakker, & Schaufeli, 2006; Klusmann, Kunter, Trautwein, Lüdtke, & Baumert, 2008a). One work-related aspect that might be a source of enjoyment and enthusiasm, but also of anger and frustration are teachers' social interactions with students. After all, working with young people and shaping their development are key motivators for choosing the teaching profession (Watt & Richardson, 2007). Moreover, building close teacher-student relationships and managing student behavior successfully are important professional goals throughout the career (Butler, 2012; Frenzel, 2014). Therefore, the present work assumed that meeting these goals would promote well-being, whereas the failure to connect with students and to influence their behavior would reduce well-being based on the transactional model of stress and coping (Lazarus & Folkman, 1984).

As a first approach to this question, the association between teachers' daily well-being and their daily interactions with students which form the basis of their relationship were investigated (Berscheid & Regan, 2005; Pianta, 1999; Pianta, Hamre, & Stuhlman, 2003). More precisely, teachers' stress exposure which could, for example, be caused by challenging interactions with students was used as a predictor. The finding that teachers reported more emotional exhaustion and less work enthusiasm on days when they were exposed to more stress than on their average day supported the hypotheses from the transactional model of stress and coping (Lazarus & Folkman, 1984). Thereby, the use of a diary approach was a particular strength of this work (Bolger & Laurenceau, 2013; Schmidt, Klusmann, Lüdtke, Möller, & Kunter, 2017; Zirkel, Garcia, & Murphy, 2015) and distinguishes it from prior research that has mostly examined inter-individual differences in teacher well-being: Diary studies shed light on the daily intra-individual processes that affect teacher well-being, for example, whether teachers feel more emotionally exhausted on days when they had many negative interactions with students. Furthermore, they assess teachers' experiences with students shortly after they happened which increases ecological validity and reduces the risk of retrospective bias.

The present work also investigated more specific aspects of teachers' social interactions and relationships with students, that is, the dimensions of student influence and student proximity. In terms of student influence, there is already a large number of studies showing that teachers who report high levels of student misbehavior in their classrooms feel more anger, anxiety, and emotional exhaustion, but less enjoyment, job satisfaction, and work engagement (Aloe, Shisler, Norris, Nickerson, & Rinker, 2014; Dicke, Elling, Schmeck, & Leutner, 2015; Frenzel, Goetz, Stephens, & Jacob, 2009). However, these studies largely relied on teacher-self reporting of student misbehavior which evokes the problem of common rater bias (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). This means that the covariance between the predictor and the outcome may be artificially inflated because both are rated by the same informant. In the context of research on teacher well-being, one specific form of common rater bias may provide a particular threat to the validity of findings: the teacher's general positive/negative affectivity. With this regard, Watson and Clark (1984) noted that people who are, for example, characterized by high negative affectivity will likely perceive themselves and their environment more negatively than other people. Therefore, a teacher who has high levels of negative affectivity will tend to perceive her relationships with students more negatively and, at the same time, report reduced well-being. Furthermore, perceiving oneself as less effective at work is a core symptom of burnout (Maslach, Schaufeli, & Leiter, 2001). In this vein, a teacher who feels burned out will likely feel that he is less effective in building positive relationships with students

even if, objectively considered, his relationships with students have not deteriorated. Hence, the question of whether teacher well-being is related to behavior problems that are uniquely perceived by teachers or that are also evident to others, for example, students or external observers cannot be answered based on prior studies that relied on teacher self-report measures.

Study 2 provided an answer to this question and indicated that teacher well-being is linked to teachers' individual perceptions of misbehavior and less so to students' perceptions. Whereas teachers' emotional exhaustion showed at least bivariate correlations with students' perceptions of misbehavior in their classroom, for teachers' work enthusiasm no association was found in the final models or in the bivariate correlations. This was remarkable considering that students' and teachers' ratings of misbehavior largely converged which shows that both share a similar impression. Yet, the teacher-specific perceptions in particular were related to their well-being. Based on the idea of perspective-specific validity (Clausen, 2002; Kunter & Baumert, 2006), this finding could indicate that teachers are more sensitive to certain events in the classroom than their students. For instance, teachers may often prevent disturbances before they actually interrupt the lesson and are recognized by students. Nonetheless, these interruptions could impair teacher well-being in the long run: On the one hand, even minor interruptions could be evaluated as a threat to one's self-esteem (Lazarus & Folkman, 1984). On the other hand, dealing with disturbances requires effort and could, therefore, expend teachers' resources (Hobfoll, 1989). However, common rater bias could provide an alternative explanation (Podsakoff et al., 2003). As indicated above, rater tendencies might systematically affect ratings, for instance, negative affectivity could color teacher's view of their own competence in managing disciplinary problems and their interpretations of student behavior (Watson & Clark, 1984). Moreover, teachers' goals for student behavior could affect their ratings such that teachers who have higher expectations are more likely to perceive students to interfere with their goals which would then cause negative emotions and reduce their well-being (Frenzel, 2014).

With regards to teachers' experience of proximity in their relationships with students, research has long disregarded that teachers—like their students—strive for closeness, appreciation, and trust in the teacher-student relationship (Klassen, Perry, & Frenzel, 2012; Spilt et al., 2011). To highlight this lacuna, Spilt et al. (2011) emphasized the central role of teachers' proximity with students in their model of teacher well-being. Thereby, the importance of proximity was further underpinned in that it was suggested as a mediator between student misbehavior and teacher well-being. Hence, it was assumed that student misbehavior primarily impaired teacher well-being because it made teachers feel rejected and ineffective in establishing a pos-

itive, close connection with students. However, these assumptions have rarely been tested empirically and the few studies that addressed the association between student proximity and teacher well-being were mostly qualitative or cross-sectional in nature. Therefore, the use of a large sample and longitudinal data was a particular strength of the present work. In support of the model by Spilt et al. (2011), Study 2 showed that teachers who felt that their students liked and appreciated them reported higher work enthusiasm and lower emotional exhaustion. This is also in line with empirical findings by Butler (2012) or Hagger and Malmberg (2011) who found that to establish a close, affectionate bond with students is an important professional goal for teachers that, if not satisfied, would impair their well-being (Lazarus & Folkman, 1984).

Furthermore, student proximity mediated the link between student misbehavior and teachers' work enthusiasm, whereas no mediation was found for emotional exhaustion. This implies that different psychological processes link student misbehavior to either emotional exhaustion or work enthusiasm. This is consistent with the job demands-resources model which assumes that different mechanisms play a role in the emergence of the negative and the positive dimension of well-being (Demerouti, Bakker, Nachreiner, & Schaufeli, 2001): On the one hand, a health-impairment process is hypothesized in which the depletion of one's resources is thought to explain poor well-being (Hobfoll, 1989). The fact that no mediation was found for emotional exhaustion implies that student misbehavior and student proximity may exhaust teachers' resources for different reasons. With regards to classroom disturbances, the high levels of noise that go along with it may evoke a physiological stress response or produce cognitive overload (Evans, Hygge, & Bullinger, 1995; Kristiansen, Persson, Lund, Shibuya, & Nielsen, 2013; Sweller, van Merriënboer, & Paas, 1998). Instead, a lack of student proximity may reduce teachers' emotional resources if they invest a lot in establishing a positive relationship and feel they get no return (Van Horn, Schaufeli, & Taris, 2001). On the other hand, Demerouti et al. (2001) suggest that the positive side of well-being is affected by a motivational process which is initiated when the achievement of work tasks is facilitated or basic psychological needs are satisfied (Ryan & Deci, 2000). Considering the mediating role of student proximity between student misbehavior and work enthusiasm, students' compliance with rules appears to be in so far motivating as it supports building close, affectionate relationships with students. However, Study 2 could not answer the question as to what might be motivating about student proximity. Is it merely the accomplishment of a professional goal that makes the teacher feel competent and effective? Or is it rather the satisfaction of a basic psychological need for relatedness with students? To provide a better understanding of the psychological processes that explain the

association between the teacher-student relationship and teachers' occupational well-being, Study 3 drew on self-determination theory (Ryan & Deci, 2000).

In general, self-determination theory suggests that the social context of people is conducive to their basic need satisfaction and, thus, their well-being (Ryan & Deci, 2000). The findings from Study 3 largely supported this assumption and also underpinned the result from Study 2 that different psychological processes play a role for the positive and the negative dimension of occupational well-being: Teachers' satisfaction of the needs for relatedness with students and for competence mediated the link between their daily stress exposure and work enthusiasm. This suggests that positive social interactions with students are not merely associated with teacher well-being because they make them feel effective at work, but that teachers also aim to feel connected with their students at a deep, personal level. In contrast, teachers' daily emotional exhaustion showed bivariate correlations with the daily satisfaction of the need for relatedness with students. However, in the final model no statistically significant association was found on average and the need for competence was the only statistically significant mediator for the link between stress exposure and emotional exhaustion. Nonetheless, for teachers at the very beginning of the career the need for relatedness with students was linked to lower emotional exhaustion. This is in line with the assumption that stress results from an interaction between the person and the environment (Almeida, 2005; Lazarus & Folkman, 1984) and also underpins Huberman's model of professional development (Huberman, 1989) which suggests that job experience is a personal resource that makes teachers less vulnerable.

### **Limitations**

The previous section showed that the present work contributes to the research field in many ways. For instance, it shifted the focus from student misbehavior to student proximity as an important predictor of teacher well-being and to students' general school adjustment as a relevant outcome of the relationship. Moreover, the sophisticated methodological approaches such as the daily diary, the combination of the student and the teacher perspective, or the use of multilevel modeling provided innovative insights about ostensibly well-known issues. Nonetheless, there are some limitations that should be mentioned:

The first limitation pertains to the operationalization of the teacher-student relationship. In general, the items were formulated in such a way that they did not explicitly capture the dyadic relationship (e.g., influence: "In this class instruction is barely disturbed."; teacher proximity: "Our homeroom teacher is interested in every student's learning progress"; student proximity: "Students in this class show me that they like me"). For student ratings this may be less



of a problem and it seems that they, at least to some extent, rated the dyadic relationship with the teacher rather than providing a global evaluation of teachers' interpersonal behavior in class. After all, student ratings within the same classroom diverged and carried valid information, in particular regarding teacher proximity.

However, teachers were forced to provide a global rating of their relationship with students in their classroom in general. This could have masked the fact that teachers build differential relationships with each student so that future research could profit from allowing teachers to rate the extent to which they struggle or experience proximity in relation with each individual students. This could help to answer some interesting questions, for example: Is challenging behavior of one specific student enough to make a teacher feel exhausted? Or is it rather a general high level of misbehavior that impairs teacher well-being? And how many positive relationships with students do teachers need to feel enthusiastic about their work?

Beyond that, teacher influence was assessed with items measuring the level of overall student misbehavior in the classroom. This was based on the assumption that a lack of behavior problems is equivalent to teachers' successful use of management strategies (Kunter & Voss, 2013; Pennings et al., 2014). However, this approach does not acknowledge that student problem behavior is not only a function of teachers' interpersonal behavior, but that there are also students/classes that are more difficult to teach than others. Hence, the results from Study 1 allow for inferences about the association between teachers' interpersonal behavior and student outcomes only to a limited degree. Therefore, future research could profit from assessing concrete teacher behaviors instead (e.g., "Reviews classroom rules or routines before a transition or new activity"; Classroom Strategies Scale; Reddy, Fabiano, Dudek, & Hsu, 2013).

Second, the studies that were part of this work used two or more measurement points and the hypotheses were derived from theoretical models. Nonetheless, causal inferences cannot be drawn and future research could profit from using experimental data. For example, teacher training programs could be used to systematically change teachers' management strategies and their academic and emotional support for students. Some intervention studies already showed that such programs improved student outcomes and teacher well-being compared to a control group (Dicke et al., 2015; Jones, Bub, & Raver, 2013; Morrison & Bratton, 2010).

Third, the empirical studies only tested components of the heuristic working model (Figure 1.3) that guided the present work. For instance, the psychological processes that were assumed to explain why the teacher-student relationship contributes to students' and teachers' development were only adumbrated. That is, Study 3 investigated the need for relatedness with students as a mediator between teachers' daily stress exposure and their well-being. However,

the extent to which teacher-student interactions also satisfy the need for competence could not be investigated explicitly because the need for competence was operationalized in terms of teachers' general sense of accomplishment at work rather than teachers' sense of effectiveness in their social interactions with students. The focus on the need for relatedness with students was chosen because it is a largely "underemphasized component of teachers' basic psychological needs" (Klassen et al., 2012, p. 150). Now that its significance for teachers' occupational well-being has been underpinned, it would also be interesting to see how positive teacher-student relationships support teachers' need for competence.

Similarly, the present work did not investigate the psychological processes explaining why the teacher-student relationship is linked to students' school adjustment. The heuristic working model proposed that basic need satisfaction could function as a mediator for students, too. There is empirical evidence that students' basic need satisfaction mediates the link between teachers' interpersonal behavior and students' engagement and autonomous motivation (e.g., Gairns, Whipp, & Jackson, 2015; Skinner & Belmont, 1993). Future research could profit from investigating the processes that play a role for other outcomes such as achievement or self-esteem. Moreover, the question as to whether the same psychological processes come into play at the individual student level and at the class level could be addressed in these studies.

### **Future Research**

Whereas the present work strongly focused on outcomes of the teacher-student relationship, causes have not been investigated. In particular, the question of how teachers' characteristics affect their relationships with students appears to be an important topic for future research. After all, teachers are responsible for creating a positive learning environment. Aspects that might be relevant include teachers' personality traits, professional competence, or well-being (Baumert & Kunter, 2013; Jennings & Greenberg, 2009; Klassen & Tze, 2014). Of the Big Five personality traits (McCrae & Costa, 2008), extraversion and agreeableness, in particular, could be assumed to be associated with the quality of the teacher student relationship. Extraversion means that a person seeks social contact, is friendly, active, and assertive. Hence, high extraversion could promote both teacher proximity and teacher influence. Agreeableness means that a person is sympathetic, caring, and accommodating. Whereas this could lead to more teacher proximity, it could make it difficult for teachers to assert themselves. Kokkinos (2007) found that teachers who were more extraverted reported fewer problems with managing student behavior. A study by de Jong et al. (2014) could not confirm these hypotheses and agreeableness and extraversion were not reflected in students' reports of teacher proximity and influence.

However, the analyses also included teachers' discipline strategies which could function as a mediator and, thus, could have reduced the association between personality and influence and proximity. Another personality trait that has been suggested to be conducive to teacher proximity is their sense of humor and there is first empirical evidence that students who perceived their teachers to have a good sense of humor also reported to feel more emotionally supported (Dresel, Bieg, Fasching, Steuer, & Nitsche, 2014).

In terms of teachers' professional competence, teachers' pedagogical/psychological knowledge could be assumed to be particularly important. It includes teachers' generic knowledge about teaching and learning, for example, about classroom management and interaction/communication as well as student heterogeneity and developmental psychology (Voss, Kunina-Habenicht, Hoehne, & Kunter, 2015). This could help teachers to manage student behavior successfully and to adjust their instruction to individual students' needs. Research implies that pedagogical/psychological knowledge as assessed with standardized tests is associated with student-rated teacher influence and teacher proximity (Kunter et al., 2013). Furthermore, Jennings and Greenberg (2009) suggested that teachers' social-emotional competence could support teachers in building positive relationships with their students. After all, socially and emotionally competent teachers have high social awareness and are able to manage their emotions and those of others which should enable them to sensitively react to students' individual needs and to effectively set limits for student behavior. In support of this, Jennings et al. (2017) found that a respective training improved teachers' emotional support as rated by observers. Teachers' social-emotional competence could have a twofold impact on teacher-student relationships because social-emotional competence has also been found to foster teachers' occupational well-being (Brackett, Palomera, Mojsa-Kaja, Reyes, & Salovey, 2010).

Teachers' occupational well-being, in turn, could also enable teachers to show higher proximity and influence (Jennings & Greenberg, 2009; Klusmann, Richter, & Lüdtke, 2016). It can thus not only be considered a relevant outcome of positive teacher-student relationship but also a supportive factor. For example, teachers who enjoy working with students and are enthusiastic and satisfied with their work could show more personal interest and caring for students. In line with this assumption, teacher enthusiasm and job satisfaction has been linked to higher teacher influence and proximity as rated by students (Klusmann, Kunter, Trautwein, Lüdtke, & Baumert, 2008b; Kunter et al., 2008). On the contrary, teacher burnout has been suggested to make teachers interact with students in a less sensitive, encouraging way (Maslach & Leiter, 1999). In accordance with this, students felt less supported and guided by teachers who had higher levels of emotional exhaustion (Arens & Morin, 2016; Klusmann et al., 2008b).

Research may also be interested in investigating student characteristics that affect the quality of the teacher-student relationship and the added value has been emphasized by Nurmi and Kiuru (2015), for example. Nurmi and Kiuru (2015) differentiated between students' active efforts and students' evocative impact that may affect students' interactions with teachers. Students' active efforts reflect behaviors students intentionally display in order to influence their teachers' reactions, for example, help seeking or impression management (Nurmi & Kiuru, 2015). Evocative impact refers to student characteristics such as academic skills and social-emotional skills, but could also include students' social background or gender by which students unintentionally elicit certain reactions on part of the teacher. For instance, teachers reported that they provided more reading support to those students who had scored lower on a standardized literacy test (Nurmi et al., 2013). Furthermore, teachers typically report more negative relationships with students with a low socioeconomic status, little behavioral engagement, or externalizing problems (McGrath & van Bergen, 2015; Nurmi, 2012; Pianta et al., 2003). This could put students at risk of negative developmental trajectories. For example, externalizing behaviors not only predict more conflictual teacher-student relationships later in time. Reciprocal associations have also been found and negative relationships were linked to an increase of externalizing symptoms over time (Skalicka, Stenseng, & Wichstrom, 2015). This, in turn, could have serious long-term consequences such as lower grades and self-esteem (Zimmermann, Schütte, Taskinen, & Köller, 2013).

Investigating how students influence the quality of teacher-student interactions could also be worthwhile to understand within-class variance in students' perceptions of teachers' interpersonal behavior—a question that could not be answered in the scope of the present work. Ideally, studies concerning this question would combine student and teacher questionnaires with classroom observations. This could reveal the extent to which student characteristics affect (1) teachers' perceptions of the relationship with each child, (2) students' perceptions of teachers' interpersonal behavior, and (3) observable differences in teachers' interpersonal behavior towards different children. A study designed in such a way could also help to understand what the teacher-specific perspective reflects: Are teachers more sensitive to potential classroom disturbances than students because of their professional background? In this case, it could be assumed that the teacher-specific perception is associated with teacher competence tests or ratings from trained observers. Or is it rather the case that some teachers perceive their environments more negatively, for example, due to high neuroticism or symptoms of burnout (Boyle, Borg, Falzon, & Baglioni, 1995; Kokkinos, Panayiotou, & Davazoglou, 2005; Maslach et al., 2001; Watson & Clark, 1984)?

Regarding these questions, it could also prove worthwhile to apply ideas from the social relations model (Kenny & La Voie, 1984) which assumes that people's perceptions of interpersonal phenomena consist of three components: For example, if Mr. Miller perceives Tim as a disruptive student this could be, first, due to a perceiver effect which refers to Mr. Miller's general tendency to view many students as disruptive. Second, it could be due to a target effect which denotes that Tim tends to be seen as disruptive by most teachers. And third, the perception consists of a relationship effect which is independent of the perceiver and the target effect and could imply that Mr. Miller and Tim are not generally struggling with others, but that it is particularly their dyadic relationship that is conflictual. To disentangle the perceiver, target, and relationship affect, a block design could be used in which both Mr. Miller and other teachers report on their perceptions of Tim and other students (Back & Kenny, 2010). Of course, this design could also be used vice versa to determine to what extent students' perceptions of their teachers' interpersonal behavior reflect a student (= perceiver), target (= teacher), or relationship effect. To this effect, Study 1 of the present work could be enhanced by asking students to rate not only their homeroom teacher, but other teachers as well.

In addition to examining predictors of individual perceptions of the relationship, it could also be beneficial to understand inter-individual differences regarding the link between one's perception of the relationship and one's outcomes. As Study 3 implied it could be useful to consider teacher characteristics that moderate the associations hypothesized in the heuristic working model. In addition to teachers' job experience, other interesting moderators could include (a) inter-individual differences in teachers' professional goals and ideals for teaching and (b) self-efficacy, professional competence, or neuroticism (Almeida, 2005; Frenzel et al., 2009; Frenzel, 2014; Hagger & Malmberg, 2011). Based on the transactional model of stress and coping (Lazarus & Folkman, 1984) it can be hypothesized that teachers are more vulnerable to negative interactions with students if they evaluate this goal as highly relevant (a). Furthermore, the transactional model of stress and coping proposes that a potential stressor will only result in stress if a person experiences a lack of resources to cope with the situation (b). In this regard, Dicke et al. (2014) showed that self-efficacy in classroom management makes teachers less prone to suffer from emotional exhaustion in light of student misbehavior. Teachers' professional competence could fulfill a similar function, whereas neuroticism can be assumed to make teachers react more strongly to negative teacher-student interactions (Almeida, 2005). Similarly, student characteristics could moderate the association between their perceptions of teachers' interpersonal behavior and their school adjustment. In line with this, research showed that

older student or students at risk of academic failure profit more from positive teacher-student relationships (Roorda, Koomen, Spilt, & Oort, 2011).

Finally, based on the theoretical model by Spilt et al. (2011) it was assumed that student misbehavior would make teachers feel rejected and, in support of this, Study 2 showed that student proximity and student influence were associated with each other. It would also be interesting to see how teacher proximity and teacher influence relate to each other. Pianta (2006) suggested that students might be more willing to cooperate with teachers who care for them. Therefore, it could be hypothesized that teachers who support their students academically and emotionally promote students' compliance with rules and reduce misbehavior, which would then, make teachers feel that their students care for them, too. Hence, teacher could initiate a virtuous circle with positive consequences for both teachers and students by showing affection, respect, and support of their students.

### **Practical Implications**

The present work showed that supporting positive teacher-student relationships is an important goal to foster students' cognitive and psychosocial development and promote teachers' occupational well-being.

To achieve this, one approach could be to improve teachers' competence in social interactions with students. There are several training programs available to support teachers in managing student behavior effectively (for an overview see Freiberg & Lapointe, 2006). For example, the Classroom Organization and Management Program (COMP; Evertson & Emmer, 2013; Emmer & Evertson, 2013) is a research-based professional development program that helps teachers organize the classroom or teach rules and procedures. Dicke et al. (2015) used a slightly modified version of this program among beginning teachers. Participating teachers reported fewer classroom disturbances and lower emotional exhaustion compared to a control group. Whereas these programs are aimed to train in-service teachers, classroom management training can also be integrated in teacher education. Considering that the transition from university to practice is a critical phase for teacher well-being, this could be an effective way to prevent adverse outcomes for teachers and to reduce the phenomenon of the so-called "reality shock" (Dicke et al., 2015; Huberman, 1989; Veenman, 1984). However, internationally as well as in Germany, few universities prepare prospective teachers for managing student behavior effectively (Greenberg, Putman, & Walsh, 2014; Hohenstein, Zimmermann, Kleickmann, Köller, &

Möller, 2014). With this regard, Greenberg et al. (2014) recommend teacher educators, for example, to analyze videos of real classroom situations with their students, use in-class simulations, and to give concrete feedback about classroom management after practice lessons.

To improve teacher proximity, the Cultivating Awareness and Resilience in Education (CARE for Teachers; Jennings, Snowberg, Coccia, & Greenberg, 2011) appears to be a promising solution. It is a mindfulness-based professional development program for teachers aimed to promote teachers' social-emotional competence. For this purpose, teachers are supported in being more sensitive to students' needs, to be more aware of the classroom emotional climate, to regulate their emotions when dealing with challenging student behaviors, to listen to students more carefully, and to develop positive feelings for students, especially for those who might be perceived as difficult. In a randomized-control trial, teachers who participated in the program reported lower emotional exhaustion and observers rated their emotional support of students higher compared to the control group (Jennings et al., 2017). Another program suitable for improving teacher proximity is the Emotionally Intelligent Teacher Workshop (Brackett & Katulak, 2007). The workshop is based on the assumption that teachers who are aware of their own and others' emotions and are able to regulate them are better able to create a safe, satisfying, caring, and productive school environment. A key component is to help teachers reflect on their reactions in social situations, their own emotions and those of others by providing them with four standardized questions (e.g., "How was each person feeling?"). In follow-up interviews participating teachers reported that they were more aware of their students' emotions and their own emotional biases (Brackett & Katulak, 2007). Because both CARE and EIT strongly emphasize teachers' emotional awareness, reflection on teachers' basic psychological needs could be integrated straightforwardly in these programs to help teachers better understand their emotional reactions in order to promote their well-being.

Whereas these interventions are aimed to train teachers' general interpersonal behavior, Spilt, Koomen, Thijs, and van der Leij (2012) developed a program that focuses on improving teachers' dyadic relationships with disruptive children—the Relationship-Focused Reflection Program. In two interview sessions, strengths and weaknesses in teachers' interactions with individual children are carved out with regards to aspects such as teachers' disciplinary strategies, the level of emotional support and sensitivity, perspective taking, and teachers' emotional experience in the relationship with that particular child. There is initial empirical evidence that the program increases observed teacher sensitivity towards the child, but not the quality of behavior management (Spilt et al., 2012).

In summary, there are a number of interventions available to help teachers improve their relationships with students to foster both students' cognitive and psychosocial development and their own occupational well-being. Ideally, professional development programs should be integrated in teacher education and could continue throughout the teaching career. Because the present work showed that teachers may not always recognize when their students do not feel sufficiently cared for emotionally and academically, it would be advisable to regularly ask students for feedback in order to diagnose potentials for improvement. A convenient tool that allows students to rate their teachers with regards to different aspects of their teaching, for example, proximity and influence is the Tripod survey which also provides teachers with detailed, personalized feedback reports (Bill & Melinda Gates Foundation, 2012; Ferguson, 2012).



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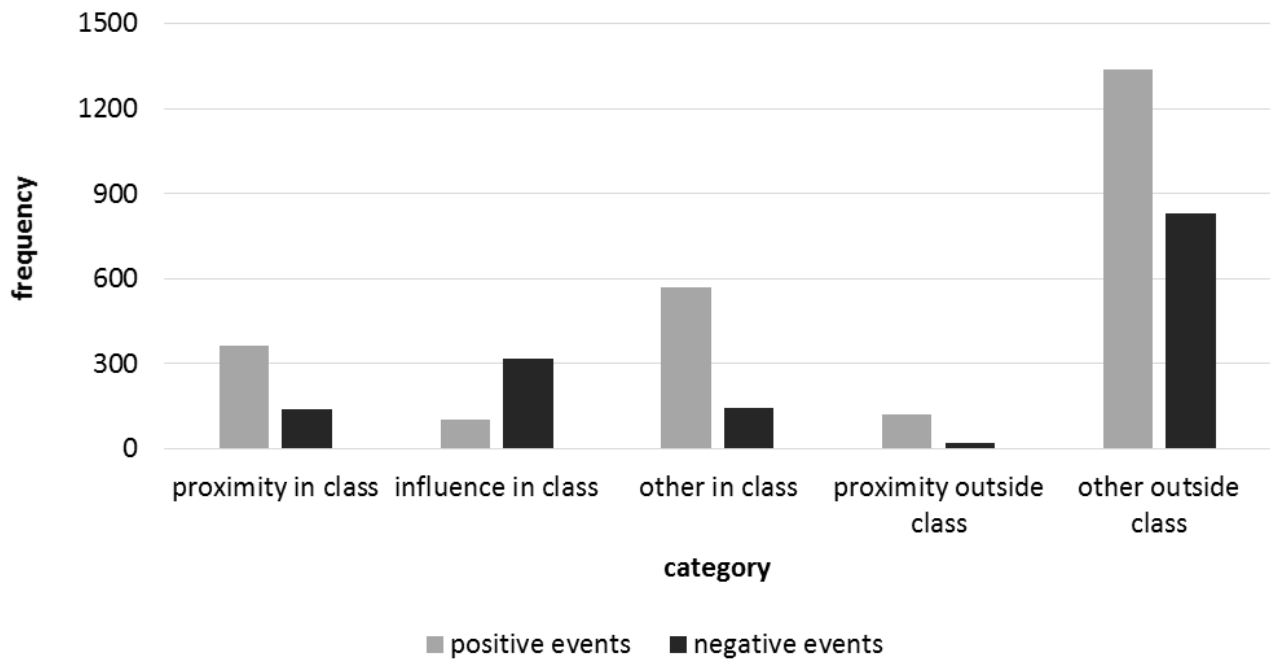
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## Appendix



**Figure A:** Number of events in class and outside class that were related to social interactions with students or other aspects of teachers' work.



## **Curriculum Vitae**

<b>Name</b>	Karen Aldrup
<b>Date of Birth</b>	September 15, 1989
<b>Place of Birth</b>	Hamburg
<b>Citizenship</b>	German

### **Education**

November 2017	Doctor of Philosophy, Kiel University, Germany
November 2014 – July 2017	Ph.D. student, Department of Educational Research, Leibniz Institute for Science and Mathematics Education at Kiel University, Germany
September 2014	Diploma Psychology (M.A.), Kiel University, Germany
October 2010 – September 2014	Studies in Psychology, Kiel University, Germany

### **Professional Development**

Since November 2014	Research Scientist, Department of Educational Research, Leibniz Institute for Science and Mathematics Education at Kiel University, Germany
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Kiel, December 2017