Teacher Well-Being: An Examination of the Antecedents, Processes, and Outcomes of Teachers' Psychological Functioning Through the Lens of Job Demands-Resources Theory

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Teacher Well-Being: An Examination of the Antecedents, Processes, and Outcomes of Teachers' Psychological Functioning Through the Lens of Job Demands-Resources Theory

Helena Granziera

A thesis in fulfillment of the requirements for the degree of Doctor of Philosophy

School of Education
Faculty of Arts, Design, and Architecture

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Better than a thousand days of diligent study is one day with a great teacher.

- *Japanese Proverb*

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ABSTRACT

Teachers and the provision of quality education are widely recognised as being key foundations for a successful society (Schleicher, 2019). However, teaching is an inherently challenging occupation (Heffernan et al., 2019; Hung et al., 2007) and teachers are leaving the profession at disproportionately high rates (Organisation for Economic Cooperation and Development [OECD], 2021). Early efforts to understand and address this have broadly focused on the reasons for teachers' negative experiences of the workplace – such as the factors leading to burnout, disengagement, and turnover (Chang, 2009; Ryan et al., 2017). More recent approaches have highlighted the need to understand how teachers can be supported to thrive in the workplace and the positive workplace and personal factors implicated in this (Collie & Perry, 2019). To date, research attending to these positive factors and teachers' thriving is comparatively limited. The present investigation sought to expand the evidence base in relation to both positive and negative factors in a multi-method analysis of the psychological and workplace functioning of Australian teachers. This investigation harnessed Job Demands-Resources theory (Demerouti et al., 2001), which proposes that employee outcomes can be understood by examining two organisational aspects of work: job demands and job resources (Hakanen et al., 2008). Alongside personal resources, these aspects of work are associated with employees' functioning via several key processes. These processes formed the basis of the three studies in the present work.

Data were collected from 486 primary school teachers from 39 schools in New South Wales, Australia. In the first phase of analysis (Study 1), a variable-centred approach using structural equation modelling was adopted to examine the ways in which job demands (role conflict), job resources (useful collaboration, useful professional development), and personal resources (adaptability, self-efficacy) were associated with well-being factors (behavioural engagement, emotional exhaustion) and, in turn, retention-related outcomes (organisational

commitment, turnover intentions), while controlling for background characteristics (experience, gender, personality). In addition, moderation and mediation effects involving these variables were considered. In the second phase of analysis (Study 2), a person-centred approach using latent profile analysis was adopted to identify profiles of teachers according to their experiences of demands and resources. In turn, analyses explored the associations between these profiles and teachers' well-being and retention-related outcomes, and the extent to which the profiles were predicted by background factors. Finally, Studies 1 and 2 were augmented by a multilevel modelling analysis (Study 3) of the associations between school-level measures of teachers' well-being (behavioural engagement and emotional exhaustion) and school-level academic achievement among students.

Each of the three studies yielded distinct information and provided unique insights into the factors, processes, and outcomes associated with teachers' psychological functioning in the workplace. The variable-centred findings in Study 1 revealed that adaptability and useful professional development were associated with optimal workplace functioning, and highlighted the deleterious association that role conflict has in relation to teachers' psychological functioning. The person-centred findings in Study 2 identified four unique profiles comprising a qualitatively distinct mix of demands and resources. Notably, the profile characterised by high levels of the job and personal resources, and low levels of the job demand, was associated with the most positive well-being and retention-related outcomes. Finally, the multilevel analyses in Study 3 revealed that school-level emotional exhaustion was negatively associated with school-level academic achievement. Taken together, the findings underscore the centrality of teachers' work-related experiences for understanding broader teacher, school, and student-level outcomes and highlight the importance of addressing such matters in both research and school-based practice.

Chapter 1

INTRODUCTION AND SUMMARY OF THE PRESENT INVESTIGATION

Teaching is a complex profession (Heffernan et al., 2019; Hung et al., 2007). Teachers must possess knowledge of the curriculum, knowledge of strategies to teach the content, and an understanding of the unique learners in their classrooms (Schleicher, 2019). Each day, teachers are required to negotiate a constellation of challenges, including marking, preparation, and differentiation to meet the diverse needs of students, alongside interpersonal and individual demands such as interactions with many colleagues and parents and striving to attain work-life balance (Collie et al., 2018; De Carlo et al., 2019). Although teachers and the provision of quality education are widely recognised as being the foundation of a successful society (Schleicher, 2019), teachers are leaving the profession at an alarming rate (Jennings & Greenberg, 2009). In light of these challenges, teacher well-being has emerged as an area of increasing interest and priority. Early attempts to understand this phenomenon broadly focused on the reasons for teachers' negative experiences of the workplace—such as the factors leading to burnout, disengagement, and turnover intentions (Chang, 2009; Ryan et al., 2017). More recent approaches have highlighted the need to understand how teachers can be supported to thrive in the workplace and the positive workplace and personal factors implicated in this (Collie & Perry, 2019). However, research attending to these positive factors and teachers' thriving is comparatively limited. The present investigation sought to expand the evidence base in relation to both positive and negative factors in a multi-method analysis of the psychological and workplace functioning of Australian teachers. This investigation harnessed Job Demands-Resources (JD-R) theory (Demerouti et al., 2001), which suggests that an employee's experiences at work can be explained and understood by examining the characteristics of their work environments—job demands and job resources—and the personal resources that operate alongside these job-related factors to evince either an

adaptive motivational process, or a maladaptive health impairment process (Xanthopoulou et al., 2007).

1.1 Job Demands-Resources Theory: An Introduction

As noted above, JD-R theory highlights the role of demands and resources in relation to employees' workplace experiences and performance (Bakker & Demerouti, 2017). Job demands are the physical, social, psychological, and organisational aspects of work requiring protracted physical and/or psychological effort. Job demands result in the depletion of energy and involve considerable physical and/or psychological costs (Demerouti et al., 2001; Schaufeli & Taris, 2014). Conversely, job resources refer to the social, physical, psychological, and organisational resources that are functional in achieving work goals, enable employees to manage job demands, and the associated physical and psychological costs, and facilitate personal growth and development (Demerouti et al., 2001; Hakanen et al., 2008). In addition to job demands and resources, later iterations of the JD-R model have acknowledged the central role that personal resources play in shaping employees' workplace experiences (Xanthopoulou et al., 2007). These are considered to be self-evaluations linked to an individual's resilience, and sense of their ability to exercise control within their environment (Hobfoll et al., 2003).

Schaufeli and Bakker (2004) identified two independent, but related processes catalysed by job demands, job resources, and in later examinations of the model, personal resources. The motivational process assumes that resources (both job and personal) have motivational potential and are thus associated with increased engagement and enhanced task performance (Demerouti et al., 2001; Lewig et al., 2007; Schaufeli et al., 2009). Comparatively, the health impairment, or energetic process refers to work conditions in which job demands are high, resulting in burnout and deleterious psychological and physical

outcomes—including depression, anxiety, and cardiovascular disease (Schaufeli & Taris, 2014).

The present investigation focused on a range of demands, resources, and well-being and retention-related outcomes that have been associated with teachers' broader experiences of work (e.g., Collie et al., 2018; Heffernan et al., 2019; B. Johnson, 2003; Skaalvik & Skaalvik, 2018). Job demands were examined by way of role conflict. Job resources were examined by way of useful collaboration and useful professional development. Personal resources were examined via adaptability and self-efficacy. The extent to which these five demands and resources were associated with two well-being outcomes (behavioural engagement, emotional exhaustion), and two retention-related outcomes (organisational commitment, turnover intentions) guided the development of the three phases of analysis (operationalised via three studies) that comprised the investigation.

1.2 The Present Investigation

By and large, prior studies examining demands and resources in teachers' work have employed variable-centred analysis (e.g., structural equation modelling), which rests on the assumption of sample homogeneity and thus generally reveals associations among variables at a sample-wide level. Variable-centred analyses focus on what factors are associated with other factors—such as, in the case of this investigation, what job demands and resources may predict workplace outcomes. More recently, researchers have considered how different teachers may present with different mean-level patterns on the target variables—such as, in the case of this investigation, different patterns in terms of low, medium, and high mean-levels of job demands and resources (e.g., Collie, Malmberg, et al., 2020). This alternate approach involves person-centred analysis (e.g., latent profile analysis), which is predicated on the idea that there may be underlying population heterogeneity that reflects different combinations of factors, and thus allows for the identification of different subpopulations or

profiles. Importantly, both variable- and person-centred approaches can yield unique information and so are considered complementary approaches (Morin et al., 2017). Indeed, it is possible to obtain information from one approach not apparent in the other approach. For example, it is possible to ascertain how variables are associated at a broad sample-wide level in variable-centred approaches, whereas it is possible to ascertain how subpopulations of teachers differ in the antecedents and outcomes of their demand-resource profiles in person-centred approaches (Collie, Malmberg, et al., 2020).

Together, variable- and person-centred approaches provide a more holistic picture of teachers' workplace experiences, which can then guide the development of broader intervention efforts for teachers, along with more nuanced efforts targeted to specific subpopulations of teachers. Despite the strengths of complementary approaches, no prior research appears to have adopted this method to examine teachers' experiences of demands and resources at work—prior research has conducted variable- or person-centred analyses, but not both. A complementary approach has the potential to yield important insights into how specific demands and resources are associated with teachers' experiences and outcomes, and how specific combinations of demands and resources may be differentially associated with workplace experiences and outcomes. One of the methodological aims of the present study, therefore, was to conduct a complementary variable- and person-centred investigation of demands and resources among teachers. Respectively, these represent Studies 1 and 2 of the present investigation. Then, in a third augmenting study, some of the key issues were explored from a multilevel (teachers nested within schools) perspective.

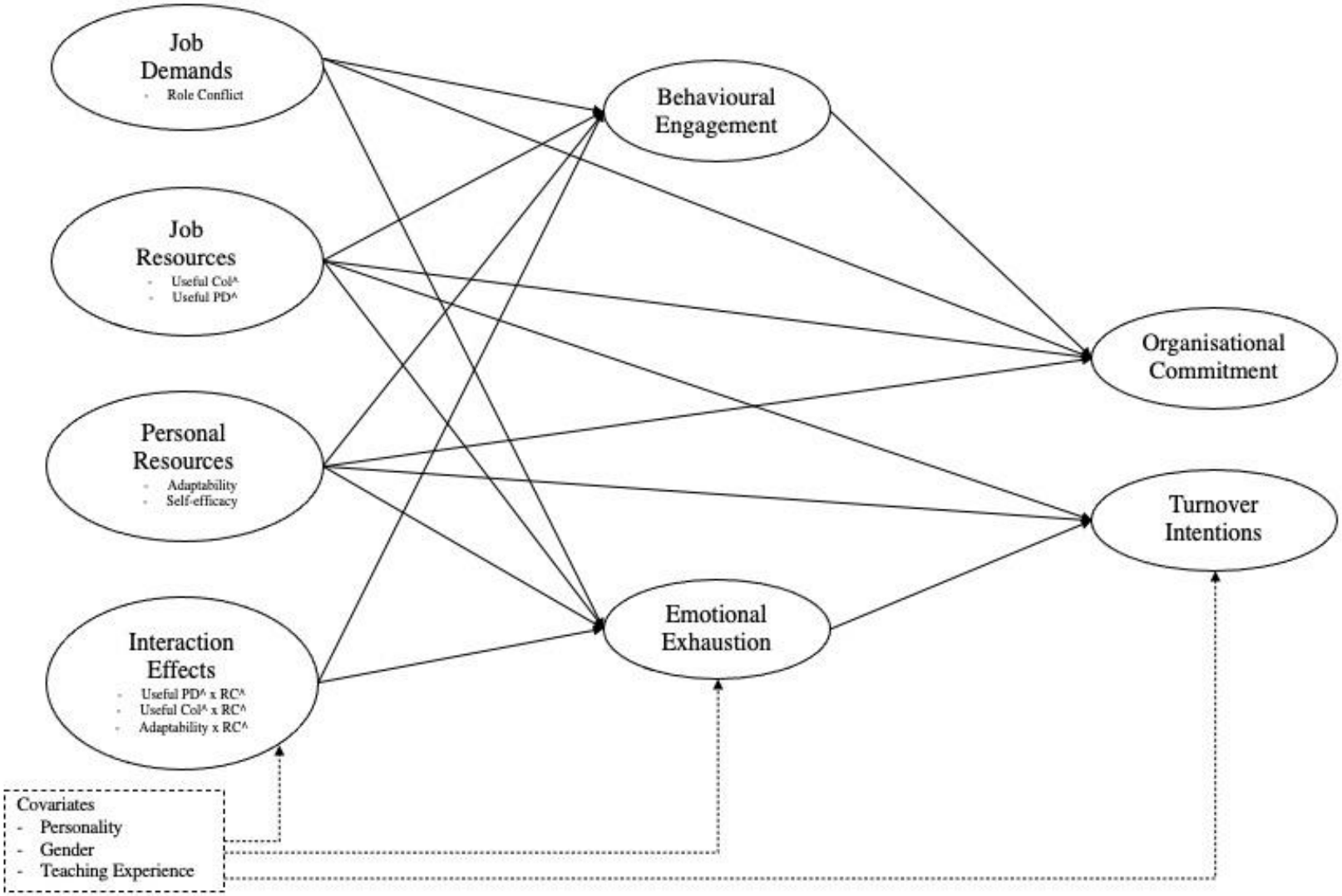
1.2.1 Study 1

In the first phase of analysis (Study 1), a variable-centred approach was adopted to examine the ways in which job demands, job resources, and personal resources were associated with the two well-being factors and, in turn, two retention-related outcomes (while

controlling for background characteristics). The extent to which the job demand (i.e., role conflict) moderated the association between the resources (i.e., useful collaboration, useful professional development, adaptability, self-efficacy) and behavioural engagement, and whether the resources moderated the association between the demand and emotional exhaustion were also examined. This is shown in Figure 1.1 and will be explained more fully in the detailed review of literature to follow.

Figure 1.1

Hypothesised variable-centred model



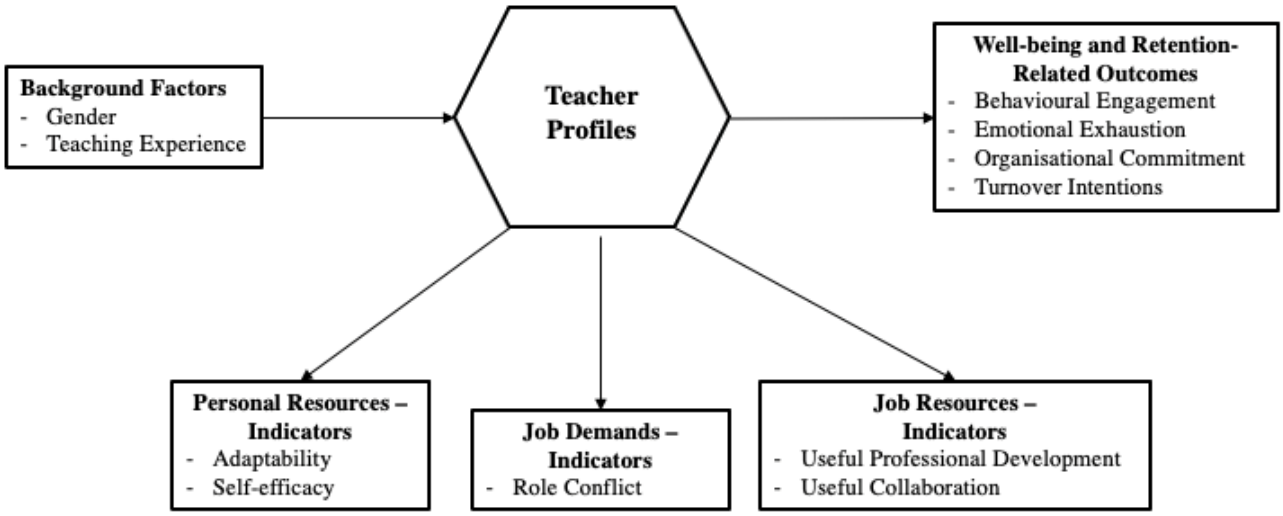
^ - PD = Professional Development; Col = Collaboration; RC = Role Conflict

1.2.2 Study 2

In the second phase of analysis, a person-centred approach was adopted to identify profiles of teachers according to their experiences of demands and resources. Specifically, latent profile analysis was adopted to identify distinct profiles. The associations between these profiles and the well-being- and retention-related factors, as well as the extent to which the profiles were predicted by two background factors—gender and teaching experience—were then examined. This second study was conducted to reveal more nuanced insights into the combinations of factors implicated in teachers' well-being. The hypothesised model guiding Study 2 is shown in Figure 1.2 and is explained in further detail in the review of literature below.

Figure 1.2

Hypothesised person-centred model

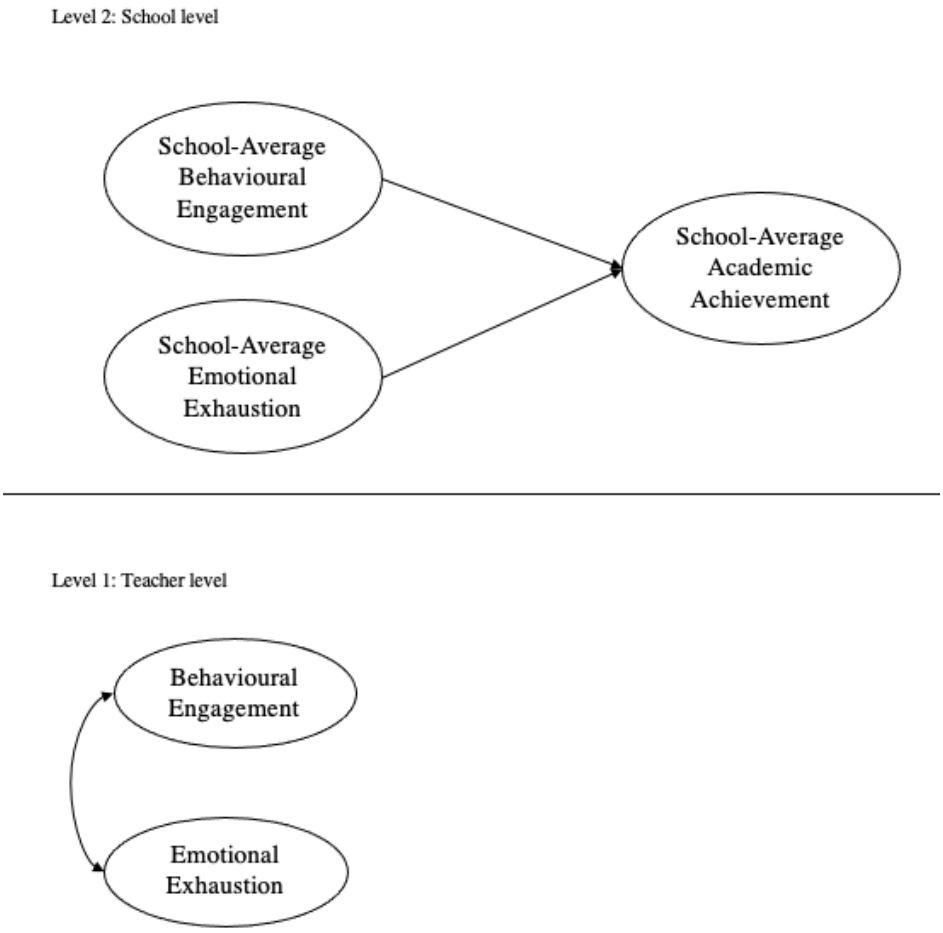


1.2.3 Study 3

To augment the variable- and person-centred analyses, the present investigation also employed multilevel modelling (MLM). MLM enables the analysis of hierarchically clustered data, so that differences associated with group membership (e.g., belonging to a specific school) can be identified (Hox, 2013; Rabe-Hesketh et al., 2007). Hence, using MLM, the potential associations between school-level measures of teachers' well-being and school-level academic achievement among students were examined. More precisely, in Study 3, multilevel modelling was employed to examine the associations between school-average behavioural engagement and emotional exhaustion with school-average academic achievement. The hypothesised model for Study 3 is shown in Figure 1.3.

Figure 1.3

Hypothesised multilevel model



1.3 Envisaged Yields

The present dissertation aims to expand understanding of the unique individual and organisational factors involved in the well-being of primary (elementary) school teachers. This research provides an opportunity to examine teachers' experiences within the framework of JD-R theory and to consider the extent to which the proposed processes bear relevance in further understanding the experiences and outcomes of teachers, students, and schools alike. Accordingly, this investigation is considered an opportunity to:

- Identify the resources (both job and personal) that are associated with teachers' positive psychological functioning.
- Identify the demands that may inhibit the development of well-being among teachers.
- Examine how specific pairs or combinations of demands and resources interact to facilitate relevant outcomes.
- Identify profiles of teachers in terms of the demands and resources they possess, and in turn how such profiles are associated with well-being outcomes.
- Explore the extent to which school-level measures of teachers' well-being are associated with school-level student achievement.
- Augment current understanding of the applicability of JD-R theory to teaching populations.
- Examine the utility of adopting a complementary analytic approach to advance understanding of teachers' demands and resources and how they manifest in the workplace.
- Identify future directions for conceptual work pertaining to teachers' well-being and JD-R theory, and also methodological work examining this theory and related processes.

- Suggest potential strategies for enhancing teachers' well-being at both an individual and organisational level.

1.4 Summary

This dissertation seeks to further understand the antecedents, processes, and outcomes involved in teachers' well-being, as conceptualised through the lens of JD-R theory (Demerouti et al., 2001). Specifically, through the adoption of three unique but complementary methodologies (variable-centred, person-centred, and multilevel analyses), the dissertation aims to unearth more nuanced understanding of teachers' psychological functioning at work. Such analyses have the potential to advance knowledge of the pertinent demands and resources for teachers, and thereby offer a more complete picture of teachers' experiences and outcomes at work. Taken together, this dissertation holds theoretical and conceptual implications for the way in which teachers' well-being is conceptualised, measured, and fostered.

Chapter 2

LITERATURE REVIEW

This chapter reviews the literature that is relevant to the theoretical framework and core constructs adopted in the present work. The chapter begins by examining the nature of teaching and the teaching profession, and then introduces the Job Demands-Resources (JD-R) framework. Following this, the core constructs under examination (role conflict, useful collaboration, useful professional development, adaptability, self-efficacy, behavioural engagement, emotional exhaustion, organisational commitment, and turnover intentions) are defined and hypothesised associations between these factors, as relevant to teachers' workplace experiences, are discussed. This is followed by an analysis of the three methodological approaches adopted in this study: variable-centred methods (structural equation modelling; Study 1), person-centred methods (latent profile analysis; Study 2), and multilevel methods (multilevel structural equation modelling; Study 3). Following that, a broad discussion of the ways in which these approaches have been adopted to advance understanding of teachers' experiences at work is presented. The chapter concludes with a discussion of the background characteristics (gender, teaching experience, personality traits) that are included in the investigation. Taken together, this chapter aims to establish the theoretical underpinnings of the present work and to present the empirical rationale for the inclusion of the substantive constructs.

2.1 Teachers and Teaching

Teaching is an inherently difficult profession. In addition to mastering core pedagogical work, teachers must also navigate diverse challenges such as constantly changing organisational and structural requirements, increased pressure for their students to perform in standardised tests, and an increasingly diverse student population (L. Daniels et al., 2017; Heffernan et al., 2019; Ryan et al., 2017). It is therefore unsurprising that teachers

report the highest rates of occupational stress (Milburn, 2011) and account for the greatest proportion of work-related stress claims in Australia (Guthrie, 2005). As a result, teacher attrition has emerged as a phenomenon of increasing concern across a range of developed countries (Weldon, 2018). Estimates suggest that up to 35% of Australian teachers will leave the profession within five years of employment (Mason & Poyatos-Matas, 2015; Weldon, 2018). In the U.K. also, 32% of teachers leave the profession in the first five years (Fullard & Zuccollo, 2021), while in Canada, attrition rates among teachers in the first five years of their career have risen by 60% (Kutsyuruba et al., 2014). These levels of attrition have major ramifications for students, schools, and broader society (Sorensen & Ladd, 2020). Schools may struggle to replace qualified teachers, and students may experience a decline in academic achievement as a result of new and potentially inexperienced teachers (Kearney, 2014; Sorensen & Ladd, 2020). On a broader level, significant investments must be made to recruit and train new teachers (Watlington et al., 2010). Although statistics relevant to Australia are difficult to come by, an investigation of teacher attrition in the United States revealed that the estimated national cost of recruiting, hiring, and training teachers to address the rates of turnover was 7 billion dollars (National Commission on Teaching, 2007). There is thus clear social and economic impetus to address teacher turnover and attrition.

Early attempts to understand these phenomena focused primarily on teachers' negative experiences of the workplace—such as burnout, disengagement, and turnover intentions (e.g., Chang, 2009). More recent work has also concentrated on the positive correlates of teachers' workplace well-being as a focus for intervention. Accordingly, several models have sought to conceptualise the processes of teachers' satisfaction and well-being at work. One of the more salient and influential of these is the JD-R model, which suggests that the characteristics of work environments—job demands and job resources—can act to facilitate either a motivational process, or a health impairment process (Xanthopoulou et al.,

2007). Although the JD-R model has been examined in samples of teachers (Collie & Martin, 2017; Lorente-Prieto et al., 2008; Vera et al., 2012), a considerable gap remains in our understanding of the most salient factors associated with, and the relevant processes underlying a range of occupational and personal outcomes, particularly among Australian teachers. Hence, the present investigation harnesses the JD-R framework to consider job demands, job resources, and personal resources identified as salient to Australian teachers, and examines their unique and moderated roles in facilitating well-being and retention-related outcomes in Studies 1 and 2, as well as student outcomes via achievement in Study 3.

2.2 Conceptual Framework – Job Demands-Resources Theory

JD-R theory has emerged as a major conceptual lens for examining and explaining employees' experiences at work (Bakker & Demerouti, 2017; Schaufeli & Taris, 2014). The theory has been applied to a broad range of occupations (e.g., dentists, nurses, teachers; Collie et al., 2018; Demerouti et al., 2001; Hakanen et al., 2008) and across a range of cultural contexts (e.g., Australia, China, Germany; Collie et al., 2018; Dicke et al., 2018; Hu et al., 2011). Key to the theory is the proposition that employee outcomes can be understood, explained, and predicted by examining two organisational aspects of work and the workplace: demands and resources (Hakanen et al., 2008).

2.2.1 Job Demands, Job Resources, and Personal Resources

Job demands are aspects of work requiring protracted physical and/or psychological effort, resulting in the depletion of energy, and considerable physical and/or psychological costs (Demerouti et al., 2001; Schaufeli & Taris, 2014). Examples of job demands include work overload, conflict with colleagues, student misbehaviour, and a lack of administrative support (Betoret & Artiga, 2010; Fernet et al., 2012; Skaalvik & Skaalvik, 2018). As described above, job resources enable employees to achieve work goals, manage job demands, and facilitate personal growth and development (Demerouti et al., 2001; Hakanen

et al., 2008). These resources may be social, physical, psychological, or organisational in nature. Examples of job resources relevant to teachers include autonomy support from school leadership, assistance from colleagues, and supervisory support (Collie & Martin, 2017; Skaalvik & Skaalvik, 2017b).

Recent work into JD-R theory has also acknowledged the role that personal resources play in predicting work-related outcomes. Personal resources broadly refer to self-evaluations linked to an individual's resilience, and sense of their ability to control and impact their environment (Hobfoll et al., 2003). Examples include adaptability, self-efficacy, and cognitive reappraisal (Collie et al., 2018; Dicke et al., 2018; Yin et al., 2018).

The strengths of adopting JD-R theory to guide research into employee well-being include its universality and flexibility as a conceptual framework. For example, because the theory encompasses a diversity of job resources and job demands, it can, and has been, harnessed to investigate many different types of occupations across a range of contexts (Bakker, Boyd, et al., 2010; Brough et al., 2013). This broad applicability is especially pertinent to the present study as it allows for the examination of diverse job demands, job resources, and personal resources to ascertain their unique associations with teachers' outcomes (see Figure 1.1). In turn, findings of research harnessing JD-R theory provide a means to guide interventions pertaining to employee well-being and performance (Bakker et al., 2014).

2.2.2 Processes in Job Demands-Resources Theory: The Motivational and Health Impairment Processes

Within JD-R theory are two independent, but related processes that occur by way of job demands, job resources, and personal resources. The *health impairment process* refers to work conditions in which job demands are high, resulting in burnout and deleterious psychological and physical outcomes—including depression, anxiety, and cardiovascular

disease (Bakker & Demerouti, 2017). This occurs because job demands require the exertion of energy and consume physical and psychological resources (Bakker & Demerouti, 2017). For example, job demands such as time pressure, student misbehaviour, role stress, and poor student motivation have been linked to impaired well-being (e.g., higher emotional exhaustion, greater stress) and lower retention-related outcomes (e.g., lower organisational commitment, higher motivation to quit the profession; Bermejo-Toro et al., 2016; Dicke et al., 2018; Evers et al., 2016; Lee, 2017; Leung & Lee, 2006; Skaalvik & Skaalvik, 2018; Tonder & Fourie, 2015).

Comparatively, the *motivational process* assumes that job and personal resources have motivational potential, and are thus associated with increased engagement, enhanced task performance, and greater job satisfaction (Bakker & Demerouti, 2017). These resources satisfy employees' basic psychological needs for autonomy, competence, and relatedness and thus promote optimal functioning (Bakker & Demerouti, 2017). For instance, researchers have found job resources such as social support, autonomy, organisational climate, and participation in decision-making, along with personal resources such as adaptability and self-efficacy, to be associated with greater subjective well-being, higher engagement, and greater organisational commitment (Collie et al., 2018; De Carlo et al., 2019; Dicke et al., 2018; Hakanen et al., 2006; Skaalvik & Skaalvik, 2018).

A number of studies have examined the motivational and health impairment processes in samples of teachers. In one of the first studies to apply JD-R theory to a teaching population, Hakanen et al. (2006) examined these dual processes in a sample of Finnish teachers. Three job demands were examined (pupil misbehaviour, work overload, and physical work environment), alongside five job resources: job control, supervisor support, information, social climate, and innovative climate. The researchers found that the job demands predicted ill-health via burnout, while the job resources positively predicted

engagement and subsequent organisational commitment. The researchers also demonstrated that a lack of job resources to meet job demands may be associated with burnout, thus providing evidence for the way the processes may be intertwined—that is, via interaction effects, which are discussed more below.

Skaalvik and Skaalvik (2018) similarly applied JD-R theory to examine these processes in a sample of elementary and middle school teachers in Norway. Specifically, they considered job resources by way of supportive colleagues, positive leadership, value consonance, and a collective school culture, and job demands by way of time pressure, discipline problems, and low student motivation. All the job demands, and particularly time pressure, were found to significantly predict poor well-being. Conversely, value consonance and positive colleagues were associated with greater well-being, higher engagement, and less inclination to quit the profession.

Likewise, Dicke et al. (2018) tested the assumptions of JD-R theory in a sample of German beginning teachers. They examined the longitudinal associations between self-efficacy (a personal resource), classroom disturbances (a job demand), and emotional exhaustion and engagement. Per JD-R theory, self-efficacy was positively associated with engagement, while classroom disturbances were associated with greater emotional exhaustion. These studies therefore provide support for the adoption of JD-R theory in the present work for examining teachers' well-being and retention-related outcomes.

2.2.3 Interaction Processes in Job Demands-Resources Theory: The Buffering and Boosting Processes

Alongside the direct processes described above, JD-R theory also proposes two interaction processes that involve moderation among demands and resources, such that job resources can moderate the association between job demands and workplace processes and

outcomes (Bakker & Demerouti, 2017). The key interactions posited in JD-R theory are referred to as the buffering process and the boosting process.

2.2.3.1 The Buffering Process

The *buffering process* refers to instances in which job resources buffer or decrease the deleterious association between job demands and workplace well-being (Bakker et al., 2005). Specifically, a buffer is a variable that alters the strength of an association between two other variables (Tremblay & Messervey, 2011). Thus, job resources can reduce the likelihood that specific (adverse or maladaptive) organisational aspects will be perceived as sources of stress (Demerouti & Bakker, 2011). The buffering hypothesis within JD-R theory represents a conceptual development based on the tenets of the job demands-control model (Karasek, 1979). This model suggests that job strain is the product of a combination of high job demands and low job control. Because job resources enable employees to experience job control, they may be better positioned to mobilise these resources to enact efficient coping strategies (Bakker et al., 2005).

A number of studies have found evidence of the buffering process among teaching populations. For instance, in a study of Finnish teachers, Bakker et al. (2007) found that the job resources of supervisor support (i.e., teachers feel their supervisor provides help and support), innovation (i.e., teachers make regular improvements to their work), appreciation (i.e., colleagues appreciate a teacher's work), and positive organisational climate (i.e., the organisation encourages and supports new ideas) buffered (or reduced) the negative relationship between student misbehaviour and work engagement. Thus, teachers were better able to cope with student misbehaviour when they had access to those job resources. In another examination of the buffering process involving job resources, De Carlo et al. (2019) found that support from a supervisor and participation in decision-making were particularly

significant in reducing the negative association between work-family conflict and work engagement.

Turning to studies of the buffering process involving personal resources, Dicke et al. (2018) found that when beginning teachers reported high or positive ratings of self-efficacy, a weaker link between classroom disturbances and emotional exhaustion existed. Additional evidence for the role of personal resources in the buffering process was found by Mérida-López et al. (2019) in a sample of Spanish early childhood, primary, and secondary teachers. The researchers examined the extent to which emotional intelligence (a personal resource) buffered the effects of self-appraised stress (a job demand) on teachers' work engagement. Across all levels of teachers, emotional intelligence was found to buffer this association, such that teachers higher in emotional intelligence were less likely to experience poor work engagement as a result of self-appraised stress. Resources (be they job-related or personal) thus appear to provide teachers with strategies to better manage demanding situations.

2.2.3.2 The Boosting Process

The *boosting process* refers to the way in which job or personal resources become particularly important for employees—or "boost" their positive outcomes—when job demands are high. According to Hobfoll (2002), individuals actively seek to cultivate and protect social, personal, or material resources. These resources become particularly salient under periods of resource loss, as individuals mobilise such resources to protect further depletion. Thus, in the context of JD-R theory, job and personal resources are most useful in the face or threat of resource loss (i.e., by way of high job demands). Bakker et al. (2007) were the first to identify this process in samples of teachers. In the aforementioned study of Finnish teachers, the job resources of supervisor support, innovation, appreciation, and organisational climate were more strongly associated with greater work engagement when pupil misbehaviour was high. Dicke et al. (2018) noted a similar association in their study of

German beginning teachers; when classroom disturbances were high, self-efficacy had an even stronger connection with teachers' engagement.

2.2.4 Moderated Mediation

In addition to direct buffering and boosting effects on workplace outcomes, there may also be indirect associations involving the interactions and their relationships to outcomes via mediating factors (Figure 1.1). A small body of work (e.g., Mérida-López et al., 2019) has theorised that teachers' experiences of the health impairment and motivational processes may differ as a function of the personal and organisational resources they possess. To test this hypothesis, moderated mediation models have been used, which allow for evaluations of whether an indirect association is moderated by another variable (Edwards & Konold, 2020). For instance, Mérida-López et al. (2019) applied a moderated mediation model in a sample of Spanish teachers to consider whether teachers' emotional intelligence (a personal resource) moderated the strength of the indirect relationship between teachers' emotional demands and work engagement (via self-appraised stress). Though no significant association was revealed among these variables, it is possible that moderated mediation models may shed further light on some of the more complex processes within JD-R theory when considering other variables—such as those under examination in the present research.

2.2.5 Recent Methodological Advances Extending Job Demands-Resources Theory

As indicated above, JD-R theory involves direct and interaction processes that are well-suited to examination using variable-centred approaches such as structural equation modelling. Indeed, the vast bulk of research using JD-R theory has involved variable-centred examination at the teacher-level—including all studies described above. However, this is not to say that JD-R theory is not relevant to other methodological approaches. Indeed, recent research using JD-R theory is using it to inform both person-centred approaches and multilevel models.

For instance, researchers are now considering how teachers simultaneously fare across a range of demands and resources, and whether there are groups of teachers that fare similarly in the combinations of demands and resources they experience (e.g., Collie, Malmberg, et al., 2020). This alternate approach involves person-centred analysis (e.g., latent profile analysis), which is described in more detail below. Person-centred approaches are ideally suited to examining interaction effects, such as the buffering and boosting processes, in more complex ways than can be achieved via variable-centred approaches. Notably, person-centred approaches are yielding novel insights into JD-R theory (discussed below). Similarly, multilevel analyses have also emerged as a methodological approach that can both extend understanding of teachers' workplace experiences and advance JD-R theory more broadly. Indeed, Bakker and Demerouti (2018) have highlighted the need for a greater body of empirical evidence examining how individual well-being is associated with factors at the team or organisational level. To the extent that school-level (organisation-level) factors are associated with individual teachers' well-being, this may provide an avenue for specific interventions. There thus appears to be considerable utility in examining teachers' well-being from a multilevel perspective. Importantly, both person-centred and multilevel approaches have the potential to extend theoretical and empirical understanding of teachers' workplace experiences, and represent an important and needed extension of the largely variable-centred and single-level approaches that have been conducted to date.

2.2.6 Summary

JD-R theory informs four processes that are key to the present research: the motivational, health impairment, buffering, and boosting processes. Prior research has provided some empirical support for these processes; however, several avenues for further research remain. For instance, although prior research has applied JD-R theory to Australian teaching populations (e.g., Collie, 2021; Collie et al., 2018), there is a need to extend this

work to consider a broader range of demands and resources, particularly those at organisational and systemic levels (Collie, 2021). Identifying these factors may provide more nuanced directions to guide potential well-being interventions.

Likewise, although prior work has identified a range of job and personal resources that may act as buffers or boosters, there is a need to extend these findings to determine whether other resources may be involved in these processes. To the extent that other job and personal resources are identified as buffers or boosters, this may provide direction for professional development and interventions. Extending research through this avenue is particularly important given that different resources appear to affect different demands in unique ways (Bakker et al., 2007). That is, particular resources are important for addressing particular demands—for example, support from supervisors may buffer or decrease the strength of the association between workload and strain, as supervisors are able to lessen the load, or put workload into perspective (Bakker et al., 2007). Thus, there may be "pairs" of demands and resources that are particularly salient in teachers' lives and the present investigation seeks to determine the extent to which this is so. Moreover, although these processes reflect variable-centred understanding, recent research has highlighted the need for person-centred approaches to consider the interacting roles of demands and resources and also multilevel considerations that may be relevant. For instance, person-centred analyses have the potential to yield understanding about the joint effects of demands and resources; that is, how specific combinations of demands and resources may be differentially associated with relevant outcomes. Indeed, while such combinations may not be apparent in variable-centred approaches, person-centred approaches provide more nuanced insights into combinations involving more than two demands and resources. For instance, it may be that while a specific job resource does not appear to be particularly salient in variable-centred analyses, person-centred analyses may demonstrate that this resource is important to support

or bolster other resources to achieve optimal outcomes. Accordingly, such analyses also enable investigation of the joint outcomes of these demand-resource combinations. However, a relatively limited body of work has considered demand-resource profiles among teachers, particularly in primary school settings. There is a need for further work which considers a broader range of demands and resources relevant to teachers, their joint effects, and joint outcomes. Examining this range of demands and resources in concert may both advance knowledge of the individual variables that are important for teachers, and also the specific combinations of variables that may be associated with optimal functioning for teachers.

From a multilevel perspective, while prior work has examined differences in some measures of teachers' well-being as a function of school membership (e.g., Yin et al., 2018), there is a need to consider other salient measures of teachers' well-being—such as behavioural engagement and emotional exhaustion—which have shown to be significant determinants of teachers' occupational functioning (Skaalvik & Skaalvik, 2017a), yet remain underexplored. Moreover, although some prior work has considered the associations between teachers' emotional exhaustion and student achievement, there is a need to broaden this work to consider how such associations operate in other national contexts and age groups. Further work employing both variable- and person-centred analyses (augmented by multilevel analyses) is important for revealing nuances in patterns or profiles of demands and resources, and to advance theoretical understanding of the benefits of adopting multi-pronged analyses in the context of JD-R theory.

2.3 Methodological Approaches to Studying Teachers' Workplace Experiences

Contemporary developments in research methods have led to more advanced and nuanced study of the psychological processes relevant to the broader field of educational psychology (Hodis & Hancock, 2016). This has enabled the examination of increasingly complex processes, such as those involved in teachers' well-being. In the following section,

the three methodological approaches adopted in the present study (variable-centred, person-centred, and multilevel analyses) are described. Following this, the potential yields of this methodological synergy are discussed.

2.3.1 Variable-Centred Methodological Approaches

Prior research harnessing JD-R theory to investigate teaching samples has tended to adopt a (single-level) variable-centred approach to examine the associations between demands, resources, and workplace experiences and outcomes (e.g., Collie et al., 2018; De Carlo et al., 2019; Skaalvik & Skaalvik, 2018). Variable-centred approaches, such as structural equation modelling, represent the traditional and dominant approach to understanding phenomena in social science research (Howard & Hoffman, 2018). Such approaches typically examine the association between one variable and another (e.g., the relation between self-efficacy and engagement; Dicke et al., 2018) and summarise a specific population using a single set of parameters (Howard & Hoffman, 2018). This prior work has yielded important insights into the demands and resources that are salient in predicting teachers' work-related experiences and outcomes. For example, structural equation modelling has been used to test the appropriateness of applying JD-R theory to understand the motivational and health impairment processes among teachers (e.g., Collie et al., 2018; Rajendran et al., 2020; Xanthopoulou et al., 2007), revealing the ways that demands and resources such as school climate, self-efficacy, autonomy-supportive leadership, and student misbehaviour are associated with teachers' engagement, burnout, and subsequent occupation outcomes.

In addition, (single-level) variable-centred approaches have been applied to examine interaction effects, such as the buffering and boosting processes and how these play out among teachers (e.g., Dicke et al., 2018). For instance, De Carlo et al. (2019) employed regression analyses and simple slopes tests to explore the extent to which job resources

buffered the relationship between demands and strain in a sample of Italian secondary school teachers. Using these methodological approaches, the researchers found that the job resources of social support and participation in decision-making buffered the negative role of workload in relation to work-family conflict. Variable-centred approaches have thus yielded significant and important insights into the nature of teachers' work and have advanced understanding of the complexities faced in the workplace.

Nonetheless, there is considerable scope for further research using such (single-level) variable-centred approaches. More research is needed that examines novel demands and resources, alongside previously examined demands and resources, in order to understand how the variables are uniquely associated with important outcomes. For instance, though a significant body of research has highlighted the salience of self-efficacy as a personal resource to teachers, there is a need to examine self-efficacy alongside other personal resources—such as adaptability—to understand the relative strength of each resource, and potential differences in their associations with relevant outcomes. If a particular resource is found to be particularly salient in buffering the effects of a specific job demand, this may indicate that there are further nuances in this interaction process, Further, examining a broader range of resources, which reflect the contemporary context in which teaching occurs, may also shed light on the extent to which they moderate associations via the buffering and boosting processes. One aim of the present study, therefore, was to examine demands and resources in relation to important well-being factors and retention-related outcomes, including main and moderated associations.

At the same time, there are limitations to examining the buffering and boosting processes using variable-centred approaches. Although variable-centred analysis readily allows consideration of how two factors interact via moderation, it becomes difficult to interpret interactions between three or more factors in a meaningful way. This is where

person-centred analyses provide an ideal way to consider more complex interactions, as well as how these interactions may vary for different subpopulations (Howard & Hoffman, 2018).

2.3.2 Person-Centred Methodological Approaches

Whereas variable-centred approaches assume that individuals within a sample are drawn from a single population, person-centred approaches consider that there may be multiple subpopulations characterised by unique sets of parameters (Howard & Hoffman, 2018; Morin et al., 2018). Specifically, such approaches take into account intra-individual variation between a set of variables (Marsh et al., 2009), allowing for the acknowledgment that variables combine differently for different individuals. Thus, person-centred approaches identify different subpopulations (or profiles) of individuals who are characterised by similar experiences—such as their combination of demands and resources.

Latent profile analysis (LPA) is a widely adopted person-centred approach, in which profiles of individuals who share similar patterns of variables are developed. Group membership is specified by values on one or more latent variables (e.g., self-efficacy), and each profile is characterised by qualitative and quantitative differences from each of the other groups (Marsh et al., 2009). Unlike other person-centred approaches (e.g., cluster analysis), LPA is model-based and prototypical; that is, individuals are assigned to profiles derived from a theoretical model and with a certain probability (Morin et al., 2018). Employing person-centred analyses enables researchers to develop a more nuanced understanding of psychological phenomena and to identify underlying patterns of attitudes and behaviours (Morin et al., 2018; Williams & Kibowski, 2016).

Researchers have begun to identify demand-resource profiles among teachers. For instance, Collie, Malmberg, et al. (2020) drew on data from the Teaching and Learning International Survey (TALIS) to conduct LPA. Using JD-R theory, the authors identified five unique profiles of Australian and English teachers. Two of their profiles had low-to-average

demands and high resources (the *Low-Demand-Flourisher*, the *Mixed-Demand-Flourisher*), two had mixed demands and resources (*Job-Resourced-Average*, *Balanced-Average*), and one had high demands and low resources (the *Struggler*). Results further revealed that the profiles were differentially related to measures of job satisfaction and occupation commitment; the *Mixed-Demand-Flourisher* and the *Low-Demand-Flourisher* evinced the highest levels of the two outcomes, while the *Struggler* displayed the lowest outcomes on these variables. Comparatively, in a sample of Italian teachers, Simbula et al. (2012) identified three demand-resource profiles that could be broadly categorised as high demands-high resources, high demands-low resources, and low resources-high demands. Across both studies, the profiles characterised by high resources and low demands tended to fare best in terms of workplace outcomes, while the reverse was true for profiles characterised by low resources and high demands.

Notably, these prior studies have unearthed information that variable-centred analyses would not readily reveal—thus extending both theoretical and practical understanding of the JD-R model. For example, in Collie, Malmberg, et al. (2020), disruptive student behaviour (a job demand) and teacher input (a job resource) were found to be negatively associated in bivariate correlations (i.e., a variable-centred approach). However, using latent profile analysis (a person-centred approach), one of the identified profiles was characterised by teachers who displayed high levels of both variables—a finding that provides understanding about a subpopulation of teachers for whom these two variables occur at similar levels, despite their negative association at a sample-wide level.

Thus, it is clear that person-centred approaches have the capacity to yield insights into the complexity of psychological phenomena. However, only a handful of studies have utilised person-centred approaches to examine factors relevant to JD-R theory. Thus, more work is needed to ascertain the common demand-resource profiles among teachers. Notably,

it is important to recognise that variable-centred and person-centred approaches should not be considered as competing methodologies; rather, using these approaches in concert can enable a complementary and even more comprehensive examination of psychological phenomena (Hofmans et al., 2020). Indeed, the present investigation adopted both approaches to gain a more comprehensive insight into teachers' workplace well-being.

2.3.3 Complementary Variable- and Person-Centred Analytic Approaches

In the broader literature, an emerging body of research is now adopting a complementary analytic approach, in which both variable- and person-centred methods are used in tandem. This approach allows for a more nuanced understanding of psychological functioning at work, as it enables for the identification of the key processes and variables relevant to teachers' psychological functioning, as well as how teachers may vary in terms of different typologies (e.g., Collie et al., 2019; Gillet et al., 2018, 2019). However, most of this prior work has focused on identifying profiles of psychological functioning, such as motivation profiles or profiles of teaching styles. In the case of Collie, Malmberg, et al. (2020), whose study did examine demand-resource profiles, the only variable-centred results provided were bivariate correlations, which lack the additional strengths of multivariate research (e.g., controls for shared variance to enable unique associations to be identified). There is thus a practical and theoretical need to determine whether a complementary analytic approach can shed new light on demands and resources, and whether conducting these analyses simultaneously may offer a more complete picture of teachers' experiences and outcomes at work. The present research thus employs both variable- and person-centred methodological approaches to understand the processes and factors involved in teachers' psychological functioning. In two of this dissertation's three studies, these approaches are operationalised by structural equation modelling (SEM; for single-level variable-centred analysis) and latent profile analysis (LPA; for person-centred analysis).

2.3.4 Augmenting Complementary Analyses with Multilevel Modelling

In addition to the SEM and LPA conducted in two studies of this investigation, a third study adopts a multilevel modelling (MLM) approach. In adopting this approach, the present research extends the methodological and empirical work in the field by suggesting that multilevel analyses may further augment complementary (single-level) variable- and person-centred methodological approaches to provide information on teachers' well-being as a function of group membership (schools, in this case).

MLM has emerged as a valuable further avenue for examining the tenets of JD-R theory (Bakker & Demerouti, 2018). Like SEM, MLM is a variable-centred approach. However, compared to conventional SEM, which assumes independence across units, MLM enables the analysis of hierarchically clustered data, such that differences attributable to group can be identified (Hox, 2013; Rabe-Hesketh et al., 2007). In doing so, issues such as aggregation bias and the misestimation of standard errors can be avoided (Raudenbush & Bryk, 2002).

For instance, MLM allows for examination of how measures of teacher well-being may vary between different schools. The extent to which school-level factors are implicated in teachers' well-being is an important empirical question given the potential differences between schools that may shape the school environment. As described above, a range of organisational factors may shape the experiences of teachers within certain schools. For instance, schools may significantly vary in terms of academic focus, staff relations, morale, school values, trust, and disciplinary climate (Maxwell et al., 2017; Yin et al., 2018).

A growing number of studies have employed MLM to examine teacher well-being. For instance, Yin et al. (2018) harnessed JD-R theory to examine the associations between school-level job demands and resources (the emotional job demands of teaching and trust in colleagues) in a sample of teachers in Hong Kong. The analyses revealed that school-level

emotional demands were associated with greater levels of anxiety and depression, while school-level trust in colleagues was associated with contentment and enthusiasm. Notably, these school-level variables explained between 23% and 55% of the between-group variance.

A similar multilevel examination of teachers' well-being was conducted by Lopes and Oliveira (2020). In a large-scale study of Portuguese teachers in 1318 schools, the authors found significant between-school variation in teachers' job satisfaction. However, they noted that only 7% of the explained variance was attributable to school-level factors, with 93% of the variability considered to be between teachers. This suggests that in some teaching populations, proximal, rather than distal variables may be more significant determinants of teachers' well-being outcomes.

Taken together, these emerging studies indicate that significant differences between schools exist in terms of school-level variables and their links to teachers' well-being. However, few—if any—studies appear to have considered school-level associations between teachers' behavioural engagement and emotional exhaustion, and students' academic achievement. The present investigation attends to this research gap.

2.4 Key Factors Examined in the Present Research

Having introduced JD-R theory and the key analytic approaches guiding the present investigation, it is now appropriate to introduce the specific factors that will be examined. In the sections below, the target factors are defined, along with details about their relevance in teachers' work. As part of this, key processes and hypotheses relating to all three analytic approaches (i.e., the three studies) are proposed.

2.4.1 Demands and Resources

As described above, JD-R theory is predicated on the notion that every workplace presents unique demands and resources which shape the personal and organisational experiences of employees (Demerouti et al., 2001). Having introduced the core processes

within the theory, the following sections further explore the nature of the demands and resources to be examined in the three studies, and they also consider prior work relevant to these factors. Specifically, as discussed, job demands are examined by way of role conflict, job resources are examined by way of useful collaboration and useful professional development, and personal resources are examined via adaptability and self-efficacy. Taken together, these factors are relevant to different aspects of teachers' psychological functioning and have the potential to yield important information about teachers' workplace experiences and how to optimise them (Collie et al., 2018; Tiplic et al., 2015).

2.4.1.1 Job Demands

As described above, job demands are the aspects of work that require sustained effort to navigate (Demerouti et al., 2001), and which may precipitate a health impairment process that leads to negative psychological and physical outcomes for employees (Hakanen et al., 2006). Consistent with Hockey's (1997) model of compensatory control, the JD-R theory assumes that when job demands are high, additional physical and psychological effort must be exerted, thus resulting in physical and psychological costs. Over time, if a worker does not adequately recuperate, such costs will result in burnout and a range of negative health and organisational outcomes (see Figure 1.1).

Teaching is a profession characterised by considerable stress (Hakanen et al., 2006). Teachers must contend with growing workloads, pressures from conflicting sources (e.g., principals, parents, and students), conflicting responsibilities, and an increasingly diverse range of student needs (L. Daniels et al., 2017; Skaalvik & Skaalvik, 2015). While a considerable body of research has examined how factors such as workload and time pressure are associated with teachers' well-being (e.g., Fernet et al., 2012; Skaalvik & Skaalvik, 2018), fewer studies have considered how conflicting sources of pressure (i.e., role conflict) may relate to teachers' well-being. In addition, although emerging research is considering the

role of job demands in person-centred research, more research is needed involving job demands which reflect the contemporary challenges faced by teachers. To address these gaps, the present investigation sought to examine role conflict as a job demand relevant to teachers' work.

2.4.1.1.1 Role Conflict. Teaching has been increasingly recognised as a challenging and multifaceted profession (Heffernan et al., 2019). In addition to teaching the formal curriculum, teachers are expected to play a significant role in influencing students' mental health, social behaviours, and social values (Heffernan et al., 2019). At the same time, teachers must also contend with pressures from parents, expectations placed upon them by schools, and government and departmental mandates (Stapleton et al., 2020). In light of these numerous sources of influence, teachers may report the existence of role conflict (Tiplic et al., 2015). *Role conflict* alludes to instances in which individuals with whom the teacher interacts (i.e., parents, students, principals, colleagues, and family) hold conflicting expectations about a teacher's expected behaviour (Mitchell & Larson, 1987). Role conflict may also occur when teachers face two or more conflicting requirements, or if they are expected to behave in a way that violates their personal values (Papastylianou et al., 2009). Diverse role pressures may mean that complying with one pressure may create difficulty in complying with another (Rizzo et al., 1970). For example, teachers may experience role conflict when tasked with addressing the behavioural issues of a student they know to be experiencing distress at home. Though the teacher may not feel that punitive measures are appropriate, the school welfare policy and the teacher's supervisor may require a certain form of discipline be enacted, leading to the teacher feeling conflicted. Similarly, teachers may face role conflict when schools implement a whole-school learning program (e.g., a particular reading program). Though the teacher may not believe this program is appropriate for their

students, they are obligated to implement it in their own classroom, which may lead to feelings of role conflict.

Despite the acknowledgment that teachers face pressure from various sources (Weldon, 2018), only a limited and arguably dated evidence base has examined role conflict in studies of teachers' well-being and retention-related outcomes; notably, no prior work has apparently been conducted in the context of Australian teachers and none has used person-centred approaches to examine role conflict. In one of the few studies to consider role conflict in a teaching population, Papastylianou et al. (2009) employed regression analysis to examine the associations between role conflict, role ambiguity, and burnout in a sample of Greek primary school teachers. Results revealed a strong positive correlation between role conflict and emotional exhaustion, suggesting that handling pressures from multiple sources can lead to the depletion of emotional energy.

Tiplic et al. (2015) similarly considered role conflict as an antecedent of turnover intentions among Norwegian beginning teachers. As hypothesised, role conflict was found to be significantly and positively associated with turnover intentions, such that higher levels of role conflict led to stronger attitudes and plans in relation to leaving the profession. It is possible that when faced with role conflict, teachers may view the investment of energy to manage the conflict as being disproportionate to the perceived rewards from doing so; hence, leaving the job becomes the most "cost-effective" measure.

There are a number of gaps in the role conflict research base that necessitate further research. As well as research conducted in more contemporary contexts, studies examining teachers within unique teaching contexts (i.e., studies of different nationalities) is needed. Papastylianou et al. (2009) noted that a particular limitation of their own investigation was that its focus on the Greek education system (with its unique structure, frequently changing educational reforms, and bureaucracy) means the findings have limited cross-national

generalisability. Moreover, prior work has focused on direct associations between role conflict and the outcomes, when it is possible under JD-R theory that there may be mediated (indirect) associations with retention-related outcomes (via the health impairment process). Specifically, because managing role conflict involves the investment of psychological and physical energy (Piko, 2006), teachers may experience greater emotional exhaustion, which in turn may lead to maladaptive occupational outcomes. Further, to the extent that role conflict is a salient job demand for teachers, it is important to understand organisational and personal supports (i.e., job and personal resources) that may help teachers to manage such demands; i.e., those which may 'buffer' or 'boost' the effects of role conflict on well-being and organisational outcomes.

From a person-centred perspective, no prior research has considered role conflict as a profile indicator for teachers. Considering role conflict from a person-centred perspective enables the examination of the joint effects and the subsequent joint outcomes of demands and resources (Van den Broeck et al., 2012). That is, it is possible that some teachers may experience role conflict to a differing extent as a function of their levels of resources; for instance, more adaptable teachers may be better positioned to adjust their practices in the face of role conflict (a joint effect) and may experience lower levels of this demand and subsequent emotional exhaustion (a joint outcome). Advancing understanding of the co-occurrence of role conflict with other resources advances both theoretical understanding of the interactions between demands and resources and can also provide direction for future interventions. Given these considerable gaps in the present empirical base, there is a clear imperative to further investigate the salience of role conflict for teachers.

2.4.1.2 Job Resources

Per JD-R theory, job resources are considered to possess motivational properties and to be one of the most important predictors of employee work engagement (Bakker et al.,

2014; Christian et al., 2011). Job resources have been directly and indirectly associated with engagement and measures of occupational functioning (Schaufeli & Bakker, 2004), such as organisational commitment and job satisfaction (Collie et al., 2018; Dicke et al., 2018) in samples of teachers. Although a number of resources (e.g., perceived autonomy support, input in decision-making; Collie, 2021; Collie et al., 2018) have been identified as salient for teachers, there is a need to extend current knowledge of other resources that may be important for teachers' well-being. In addition, it is important to consider the co-occurrence of job resources alongside personal resources and job demands to further understand potential joint effects and joint outcomes (i.e., via person-centred approaches). Accordingly, the present study aimed to address these gaps by examining job resources by way of useful collaboration and useful professional development.

2.4.1.2.1 Usefulness of Collaboration. *Collaboration* refers to the extent to which a teacher can obtain assistance, advice, or encouragement from colleagues (B. Johnson et al., 2007; Rentoul & Fraser, 1983). Teacher collaboration can be broadly categorised as active—that is, where teachers learn from each other in some capacity—or passive, in which teachers share resources or address administrative issues collectively (Australian Institute for Teaching and School Leadership [AITSL], 2018). Active collaboration can take a number of forms, such as formal or informal consultation, co-planning of units of work or individual lessons, peer coaching, or co-teaching (Mofield, 2020). In recent years, collaboration has been labelled a hallmark of effective classroom practice in schools (NSW DET, 2021). Indeed, Gonski et al. (2018) identified professional collaboration as a core component of practice to enhance teacher quality and improve student achievement in Australian schools. Accordingly, this has led to a recent rise in collaborative practices among teachers (Kelly et al., 2019). Much of the research examining teacher collaboration has focused on the benefits for students' achievement. For instance, variable-centred studies of American (Reeves et al.,

2017), Australian (Bentley & Cazaly, 2015), and German (Mora-Ruano et al., 2019) teachers and students have established a positive association between levels of collaboration and student achievement.

However, a comparatively smaller body of research has examined the benefits for teachers, particularly in relation to teachers' well-being and retention-related outcomes. One of the few large-scale quantitative surveys examining the associations between teacher collaboration and teachers' well-being outcomes was the Teaching and Learning International Survey (TALIS), conducted by the Organisation for Economic Cooperation and Development (OECD) in 2013. Results of the survey indicated that across virtually all OECD countries, there was a strong and positive association between collaboration and job satisfaction. It is possible that collaboration reduces social isolation and may contribute to teachers' satisfaction with organisational structures, which in turn may lead to more positive perceptions of their work (Reeves et al., 2017).

Other smaller scale variable-centred studies have identified benefits of collaboration such as a sense of decreased workload (Egodawatte et al., 2011), greater collegiality (Main & Bryer, 2005), and greater collective efficacy (Moolenaar et al., 2011). However, despite these seemingly positive findings, some research suggests that collaboration can be a source of frustration, conflict, and dissatisfaction among teachers (Hargreaves, 2019). For example, in a study of Australian teachers, B. Johnson (2003) found that some teachers believed collaboration increased their workloads, diminished their professional autonomy, and led to an unhelpful culture of competition.

Based on these conflicting results, the present investigation sought to disentangle this association and focus specifically on the role that *useful* collaboration plays in influencing teachers' well-being and retention-related outcomes. Indeed, prior work does not appear to have acknowledged the "double-edged sword" that collaboration may present for teachers.

That is, while collaboration may be proposed as a resource for teachers, the extent to which teachers appraise this resource as being helpful or instead, a hindrance, may ultimately be more important than the characteristics of the resource itself (C. Liu & Li, 2018; Martin et al., 2021). Although the work of C. Liu and Li (2018) established that employees' subjective evaluations of a stressor were associated with the extent to which this stressor was correlated with motivation, little work appears to have investigated the role of resource appraisals as relevant to motivational processes. Examining teachers' perceptions of the usefulness of collaboration thus represents a theoretical and empirical advancement on prior work, as it enables exploration of the extent to which teachers' appraisals of collaboration may be associated with their broader motivation at work. Moreover, considering this job resource via a person-centred approach is also needed to ascertain the manner in which it co-occurs with other job resources for different subpopulations, which will advance knowledge of how its role varies for different teachers.

2.4.1.2.2 Useful Professional Development and Learning. Teachers' professional development and learning (TPDL) is a complex process, in which teachers engage in both formal and informal learning opportunities that extend professional competence, knowledge, beliefs, and motivation (L. Daniels et al., 2020; Durksen et al., 2017; Richter et al., 2011). Effective TPDL involves structured learning opportunities and is characterised by visible changes to teachers' practices (Darling-Hammond et al., 2015). Though requirements vary by state, teachers in New South Wales (this investigation's state educational jurisdiction) are required to undertake a minimum of 100 hours of professional development over a course of five (for full-time teachers) or seven (for part-time or casual teachers) years (New South Wales Education Standards Authority [NESA], 2020). Thus, professional development plays a significant role in teachers' working lives.

There is an overwhelming body of literature that examines the types of professional development that are considered most effective for students' outcomes (e.g., Fischer et al., 2018; Jacob et al., 2017). However, the associations between TPDL and teachers' outcomes have been comparatively underexplored. Though some studies (e.g., Antoniou & Kyriakides, 2013; Rutherford et al., 2017) have examined how TPDL is associated with teachers' pedagogical behaviours, limited research appears to have considered how TPDL may be associated with teachers' well-being and retention-related outcomes. Some variable-centred studies have reported positive associations with measures of teachers' social and affective outcomes. For instance, Gore and colleagues (2017) examined the outcomes of a professional development program in which teachers participated as part of a professional learning community. The study, consisting of teachers in Australia, found this form of professional development to be associated with greater teacher morale and a greater sense of recognition among colleagues. Others have established links with intra-psychic constructs. Chen (2019), for example, considered how participation in continuing professional development was associated with Chinese teachers' self-efficacy. As hypothesised, participation in this professional development was linked with greater levels of self-efficacy, suggesting that developing teachers' professional knowledge and skills enabled them to feel more capable of addressing the challenges faced in teaching.

Knowledge of the associations between TPDL and organisational outcomes, however, is limited. In one of the few variable-centred studies to consider the associations between TPDL and turnover intentions, Coldwell (2017) found that 57% of science teachers who participated in higher levels of TPDL believed the TPDL had contributed to their desire to remain in the profession. However, due to study design it was not possible to determine the direction of this association; that is, whether teachers who already had positive attitudes towards the profession viewed professional development as motivating, or whether

participation in such TPDL predicted this commitment. Thus, broader examinations of teaching populations are required to establish the associations with teachers' well-being and retention-related outcomes.

A further limitation in the existing empirical base relates to teachers' perceptions of the quality and content of the TPDL they engage in. The majority of research has sought to establish associations between teachers' professional development and outcomes, without interrogating the extent to which the professional development provided actually meets their professional needs. This is surprising given the findings of the 2009 TALIS survey (OECD, 2009), which reported that of the Australian lower secondary teachers who wanted more professional development, 40% did not have access to professional development that was suitable to their learning needs. It is thus possible that in not establishing whether the professional development undertaken by teachers was actually useful to them, prior research has not been able to represent the breadth or magnitude of the associations between TPDL and teachers' outcomes. As described above, given that teachers' appraisals of stressors may be associated with the extent to which collaboration is associated with motivation, examining teachers' perceptions of resources—such as professional development—may be more informative than examining the characteristics of the resource itself (C. Liu & Li, 2018; Martin et al., 2021). Accordingly, the present study thus focused on *useful professional development*. In narrowing this focus, it was possible to unearth the associations between forms of TPDL that were perceived as valid and useful for teachers, and retention-related outcomes.

Turning to person-centred examinations of TPDL, only one study to date appears to shed light on this job resource. Namely, Collie, Malmberg, et al. (2020) examined barriers to professional learning alongside other job demands, job resources, and personal resources. Although this TPDL-related variable was examined as a job demand given its nature, it does

provide some understanding relevant to the present investigation. Collie, Malmberg, et al. (2020) identified five profiles, in which barriers to professional learning played a salient role. In particular, profiles high in barriers to professional learning were associated with poorer teacher well-being outcomes. The reverse was true for profiles lower in barriers to professional learning. The extent to which similar associations are found when considering useful professional development and learning is an open empirical question.

2.4.1.3 Personal Resources

As described above, more recent applications of JD-R theory have considered teachers' personal resources as salient to their well-being and retention related outcomes. Like job resources, personal resources assist employees to achieve work goals and facilitate personal growth. Personal resources have been integrated into the JD-R model as both mediators and moderators of the relation between job characteristics and well-being (e.g., Van den Broeck et al., 2011), as well as factors that are considered antecedents to well-being (Xanthopoulou et al., 2009). A number of prior variable-centred applications of JD-R theory to teachers (e.g., Bermejo-Toro et al., 2016; Dicke et al., 2018) have considered personal resources as antecedents to factors such as emotional exhaustion and engagement. In addition, several person-centred studies have identified profiles involving personal resources among teachers (Perera et al., 2018; Simbula et al., 2012). These studies have largely drawn on the theory proposed by Judge et al. (1997), which suggests that personal resources influence the way individuals understand and react to their environments. Accordingly, personal resources were positioned alongside job resources and job demands as antecedents to well-being and retention-related outcomes in the present investigation (see Figure 1.1 for positioning in the variable-centred approach, and Figure 1.2 for their positioning in the person-centred approach). In the present study, personal resources were examined by way of

adaptability and self-efficacy. These variables, and their theoretical and empirical relevance, are now discussed.

2.4.1.3.1 Adaptability. Given the constantly changing nature of teaching, adaptability is a crucial attribute for teachers (Collie et al., 2018; Collie & Martin, 2016). *Adaptability* describes an individual's capacity to respond effectively to change, and to adjust their thoughts, emotions, and behaviour in response to unfamiliar or changing situations (Martin et al., 2012). As adaptability contributes to an individual's capacity to change and control their environment (Collie & Martin, 2017; Martin et al., 2021), it is considered a personal resource within JD-R theory. Notably, though related to cognate constructs such as resilience, adaptability is distinct in that it focuses on an individual's capacity to respond to change, novelty, and uncertainty, rather than adversity (Martin et al., 2012).

In the present study, the tripartite model of adaptability was employed (Martin et al., 2012). The tripartite model posits three dimensions of adaptability; a cognitive, a behavioural, and an emotional dimension. Cognitive adaptability involves thinking about a challenging or novel situation in different ways or changing one's thoughts about the situation or circumstance. Behavioural adaptability involves adjusting one's actions in order to manage the novel situation or circumstance. Emotional adaptability involves adjusting one's emotions to reduce less helpful emotions (e.g., anxiety) or increase positive emotions (e.g., hope) in the face of novelty, change, or uncertainty. For example, in the case of a science teacher embarking upon teaching a new strand of science, cognitive adaptability may involve thinking about the situation in a new or revised way such as drawing on prior knowledge and making new connections between previous learning and the novel material, behavioural adaptability may involve seeking out and mobilising new resources such as professional learning and experienced colleagues, and emotional adaptability may involve

regulating anxiety (e.g., fear, frustration) about the new teaching area in order to find effective solutions.

A growing body of literature has highlighted the importance of adaptability in aspects of teachers' well-being and retention-related outcomes. For instance, in a study of Australian mathematics teachers, Collie and Martin (2017) examined adaptability as a component of the JD-R framework. Using structural equation modelling, it was found that teachers who were more adaptable also reported higher organisational commitment and subjective well-being, thus providing evidence of the role of adaptability in the motivational process per JD-R theory. Further support for the relevance of adaptability to teacher well-being was reported by Collie et al. (2018), who in a variable-centred study of secondary school teachers, found adaptability to be inversely associated with disengagement. This represents a particularly interesting finding, as it demonstrates that adaptability is not only salient in the motivational process, but also plays a role in the health impairment process given its association with lower disengagement (a maladaptive aspect of well-being). A more recent study of Australian secondary school teachers (Collie, Guay, et al., 2020) found adaptability to be a positive predictor of both organisational commitment and extra-role behaviour. The authors suggested that adaptability may be more relevant in the motivational process, and specifically, more relevant in relation to positive outcomes. The aforementioned study is of particular relevance as it represents one of the first examinations of adaptability alongside another personal resource (buoyancy). Further research, in which adaptability is examined alongside other potentially salient personal resources (e.g., self-efficacy), is needed to determine the unique role adaptability may play in shaping teachers' well-being and retention-related outcomes, beyond shared variance.

In addition, research has yet to consider adaptability by way of person-centred research. As such, the extent to which it co-occurs at varying levels with other demands and

resources for different subpopulations of teachers remains unknown. This is important because person-centred analyses may reveal particular combinations of adaptability with other demands and resources that are most strongly associated with beneficial outcomes. Conversely, person-centred analysis may also reveal combinations when adaptability is less helpful or salient. From a theoretical perspective, examining adaptability from a person-centred perspective may shed light on the extent to which personal resources can be salient in both the health impairment and motivational processes.

It is also important to note that the bulk of prior research has considered adaptability as relevant to secondary school teachers, but not primary (elementary) school teachers. There are considerable differences between the roles of primary and secondary school teachers; while secondary school teachers focus on a particular subject area and teach different cohorts of students each day, primary school teachers have one class, teach across all subject areas, and are also considered more singularly responsible (than secondary school teachers who typically just interact with a student in their subject area) for fostering students' social and emotional competence (OECD, 2019). Thus, primary school teachers' experiences of adaptability, and the associations between adaptability and other outcomes may differ from that of prior studies of secondary school teachers.

2.4.1.3.2 Teacher Self-Efficacy. *Self-efficacy* refers to an individual's perception of their ability to meet task-specific demands (Bandura, 1997; Chen et al., 2001). Self-efficacious individuals believe they are able to execute a specific course of action to achieve a specific goal (Brouwers & Tomic, 2000). More recent work (e.g., Tschannen-Moran & Woolfolk Hoy, 2001) has focused on measuring a form of self-efficacy that is characterised by the specific behaviours that teachers need to engage in to be effective in the classroom (Chesnut & Burley, 2015). Accordingly, as relevant to teachers, self-efficacy refers to a belief that they can perform specific teaching tasks in a specified teaching situation (Dellinger et al.,

2008). A number of studies (e.g., Dicke et al., 2018; Vera et al., 2012) have argued that self-efficacy is one of the most important personal resources for teachers because of its associations with positive personal and organisational outcomes. Self-efficacious teachers tend to possess higher levels of effort and persistence, which minimises work-related anxiety and enables them to effectively address problems in the workplace (Durksen et al., 2017; Tschannen-Moran & Woolfolk Hoy, 2001). This capacity also influences the choice of tasks engaged in, and the amount of time, persistence, and effort invested in such tasks (Vera et al., 2012). Unsurprisingly, self-efficacy is one of the most commonly examined personal resources within the context of JD-R theory.

In terms of its associations with positive individual and organisational outcomes in variable-centred research, self-efficacy is particularly important for teachers, as it appears to be strongly linked to engagement and commitment (Durksen et al., 2017; Klassen & Chiu, 2010; Kozikoğlu, 2016; Lauermann et al., 2017). For instance, in a large-scale study, Skaalvik and Skaalvik (2017a) applied the JD-R theory to a sample of Norwegian teachers. Results of structural equation modelling revealed self-efficacy to be positively associated with teachers' engagement. Notably, it had stronger associations with engagement than two other job resources that were examined in the model: supportive colleagues and supervisory support. Further support for the importance of self-efficacy as a personal resource positively influencing engagement has been found in samples of German beginning teachers (Dicke et al., 2018), Dutch teachers (Xanthopoulou et al., 2007), and Spanish teachers (Mérida-López et al., 2020). Conversely, self-efficacy has also been inversely associated with emotional exhaustion: Aloe et al. (2014) adopted a meta-analytic approach to examine associations between self-efficacy in classroom management and burnout. High levels of self-efficacy in classroom management were associated with lower emotional exhaustion.

Teacher self-efficacy is also important for teachers' commitment to the profession. In a meta-analysis of 33 studies of teachers from North America, Europe, Asia, and Australia, Chesnut and Burley (2015) reported a moderate effect size of the relation between self-efficacy beliefs and commitment to the teaching profession. The authors highlighted the differences in correlations between self-efficacy and commitment by country; these associations were strongest in magnitude in Europe, and smaller in magnitude in North America, Asia, and Australia. Closer analysis of the studies revealed that only two were set in an Australian context. Of these, one study surveyed pre-service teachers (Watt & Richardson, 2007), while the other was conducted in 1990 (Punch & Tuettemann, 1990). There is thus little contemporary research considering this association among in-service teachers.

More recent work has examined self-efficacy as a resource relevant to the buffering and boosting processes using variable-centred approaches. Specifically, Dicke et al. (2018) examined the interactions between self-efficacy, classroom disturbances, and emotional exhaustion. Self-efficacy was found to buffer (or weaken) the association between classroom disturbances and emotional exhaustion, such that classroom disturbances did not affect emotional exhaustion as deleteriously as they would have in the absence of self-efficacy, providing support for the buffering process. Further, the association between self-efficacy and engagement was stronger in cases of high classroom disturbances, providing evidence of the boosting process. Though promising, the authors acknowledged that examinations of moderation effects within the context of the JD-R model have tended to be examined in isolation. Approaches that integrate analysis of a range of moderation effects simultaneously is thus needed.

Alongside variable-centred approaches, teachers' self-efficacy has also been examined from a person-centred perspective. For instance, Herman et al. (2018) employed latent profile analysis to develop profiles of teachers' adjustment. In a sample of U.S.

elementary school teachers, self-efficacy was considered as a profile indicator alongside stress, coping, and burnout. The authors identified four profiles; *stressed/low coping, stressed/moderate coping, stressed/high coping*, and *well-adjusted*. The least adaptive profile—*stressed/low coping*—displayed the lowest levels of self-efficacy, while the most adaptive profile—*well-adjusted*—displayed the highest levels of self-efficacy. Moreover, the *well-adjusted* profile was found to be associated with the highest levels of students' math achievement. Other person-centred analyses involving teachers' self-efficacy (e.g., Perera et al., 2019; Rodríguez et al., 2014) have involved the development of profiles consisting of different domains of self-efficacy (e.g., self-efficacy for classroom management, self-efficacy for instructional strategies), and the associations between these profiles and students' outcomes. Taken together, there is a notable absence of person-centred work examining teachers' self-efficacy alongside other relevant resources, and of work considering how such profiles are associated with teachers' broader individual and occupational outcomes.

Taken together, when considering teachers' self-efficacy from a JD-R perspective, there is a notable lack of research among Australian teachers. Given the salience of self-efficacy in predicting teachers' positive workplace functioning, this absence is of particular concern. Additionally, prior studies using JD-R theory (e.g., Dicke et al., 2018) have examined self-efficacy in isolation, rather than alongside other personal resources. Further, though self-efficacy is clearly central to teachers' psychological functioning, Xanthopoulou et al. (2007) have highlighted the need to consider personal resources that not only operate at an affective-cognitive level (such as self-efficacy), but also those which operate at a behavioural-practical level (such as adaptability), which may be important for the management of certain job demands and the prevention of emotional exhaustion. The present study thus provides the opportunity to examine the relative salience of self-efficacy as a personal resource, compare the relative role that it plays (an affective-cognitive personal

resource) in comparison with adaptability (a behavioural-practical personal resource), and to examine these personal resources in an Australian context. From a person-centred perspective, the present work provided the opportunity to consider how self-efficacy functions when considered alongside other resources in profiles of teachers' demands and resources. Moreover, while previous work has considered how profiles involving self-efficacy are associated with students' outcomes, few have considered the associations with measures of teachers' well-being.

2.4.1.4 Summary

The five demands and resources (role conflict, useful collaboration, useful professional development, adaptability, self-efficacy) reflect factors that are relevant to teachers' work because they shape teachers' perceptions of their occupational environment, and they help (or hinder) teachers' capacity to engage in their work effectively (Collie, Malmberg, et al., 2020; Han et al., 2020; Zhang et al., 2020). More precisely, teachers who perceive their collaborations with colleagues and their professional development to be useful are more likely to be engaged and committed at work (Veeriah et al., 2017). Similarly, teachers who are confident in their abilities at work and who are able to be adaptable in the face of novel or changing situations are more likely to be committed to their work (e.g., Collie, Malmberg, et al., 2020) and less emotionally exhausted (Skaalvik & Skaalvik, 2017a). In terms of demands, teachers who deal with conflicting pressures and expectations likely experience greater levels of emotional exhaustion (Lorente-Prieto et al., 2008). From a person-centred perspective, profiles comprising combinations of higher job and personal resources tend to fare better across a range of occupational outcomes (e.g., Collie, Malmberg, et al., 2020; Simbula et al., 2012).

At the same time, there are several gaps in knowledge. For example, prior research examining collaboration and professional development has often conflated the two resources,

despite the fact that they are conceptually distinct (Vangrieken et al., 2015). Examining the constructs as distinct variables will provide nuanced understanding of the components of these processes that are actually beneficial to teachers. Furthermore, prior research on these concepts has typically focused on the frequency with which teachers engage in these activities (e.g., OECD, 2009), rather than the extent to which the activities are useful to teachers. Given that collaboration and professional development may vary in the extent to which they are helpful or not, the present study seeks to unearth further knowledge about these job resources as relevant to teacher well-being. As another example, prior studies using JD-R theory (e.g., Collie et al., 2018; Dicke et al., 2018) have tended to focus on either adaptability or self-efficacy as the sole personal resource under examination. In examining adaptability and self-efficacy simultaneously, the present study will be able to ascertain their unique roles in relation to the target well-being factors and outcomes—and also to ascertain the manner in which they co-occur for different profiles of teachers. Moreover, prior research has not yet considered the buffering and boosting processes in relation to adaptability and self-efficacy, nor the extent to which those two interaction processes may play out in more complex ways among subpopulations of teachers using person-centred approaches. More precisely, when considered from a person-centred perspective, there may be combinations of these demands and resources that a variable-centred approach alone may not reveal (discussed in further detail below).

Advancing understandings of the role and significance of these resources and demands is important for both theory and practice. From a theoretical perspective, there is a need to expand understandings of the types of resources and demands that may operate within the JD-R model. To the extent that specific combinations of resources and demands combine to shape employee outcomes, this may represent a theoretical advancement in the way pairs of demands and resources are positioned in the broader model. From a practical

perspective, there is significant utility in understanding factors that may be implicated in teachers' well-being, as such knowledge may provide direction for the development of teacher-specific interventions.

2.4.2 Well-being Factors: Behavioural Engagement and Emotional Exhaustion

In the present research, two well-being factors central to JD-R theory (Bakker & Demerouti, 2017) are examined: behavioural engagement and emotional exhaustion. The factors are contended to be directly associated with employee outcomes and also to mediate the relations between demands/resources and employee outcomes (see Figure 1.1; Study 1). The factors are also considered to be outcomes of demand-resource profiles (see Figure 1.2; Study 2) and to play a role in predicting student achievement at the school-level (see Figure 1.3; Study 3).

2.4.2.1 Behavioural Engagement

In the present investigation, behavioural engagement, considered to be a dimension of broader work engagement, was examined. Work engagement is an umbrella engagement construct that refers to the extent to which teachers are actively involved in their work and their workplace (Guglielmi et al., 2016). Recent approaches (e.g., Klassen et al., 2013; Schaufeli et al., 2002) have acknowledged the multidimensionality of work engagement. For example, Schaufeli et al. (2002) conceptualise engagement as consisting of three components: vigour (the investment of physical energy), dedication (the extent to which an individual is enthusiastic about what they do), and absorption (the extent to which individuals are immersed in their work). Klassen et al. (2013) proposed a model of engagement consisting of four dimensions: cognitive engagement, which refers to investment of attention, and absorption in teaching; emotional engagement, which refers to teachers' positive emotional responses to teaching; and social engagement with colleagues and social

engagement with students, which refer to the investment of energy to build positive connections with colleagues and students respectively.

However, few studies applying JD-R theory have considered whether demands and resources relate differentially to dimensions of engagement. For instance, studies of self-efficacy and engagement in teachers have tended to examine engagement as a global construct, rather than focusing on a specific dimension of engagement that may be associated with teachers' self-efficacy (e.g., Dicke et al., 2018). To address this gap, the present research focused on examining the associations between demands and resources and behavioural engagement. *Behavioural engagement* at work, as distinct from cognitive and emotional forms and domain global engagement, refers to those proactive, innovative, and adaptive behaviours that are focused on achieving organisational objectives (Macey & Schneider, 2008). In this respect, behavioural engagement is considered to be a form of work engagement (Stumpf et al., 2013). In the case of teachers, this could include the extent to which teachers immerse themselves in resource creation for lessons with the aim of helping children to understand a difficult topic. Because this form of engagement is considered to be action-facilitating, it is the form of engagement most closely aligned to teachers' future occupational behaviours (e.g., commitment and turnover intentions; Bedarkar & Pandita, 2014; Macey & Schneider, 2008), thus rendering it particularly relevant for addressing broader issues of attrition and retention in the present investigation.

Little research employing JD-R theory has examined the antecedents or outcomes of behavioural engagement for teachers. Instead, prior research has examined antecedents and outcomes of more global engagement (e.g., conflating different forms of engagement, such as cognitive, behavioural, etc.). For example, Timms et al. (2012) measured global engagement using the Utrecht Work Engagement Scale (UWES; Schaufeli & Bakker, 2003) in an application of JD-R theory to teachers in Queensland. The job resources of value congruency

and the provision of rewards were found to be positively associated with engagement. Likewise, in a study of German beginning teachers, Dicke et al. (2018) employed the UWES to examine the motivational process within JD-R theory. Findings revealed that self-efficacy positively predicted this measure of engagement, and this in turn predicted teachers' commitment. Though there are clearly associations between a range of individual and organisational factors and teachers' broad engagement, a more nuanced approach, in which the dimensionality of engagement is recognised, is required to capture the depth and complexity of this concept. Because of its unique associations with future occupational behaviours such as organisational commitment and turnover intentions (Bedarkar & Pandita, 2014; Macey & Schneider, 2008), the present work focused on behaviourally-oriented work engagement and its antecedents and outcomes (see Figure 1.1).

Turning to person-centred research, of relevance to the present investigation is the work of Simbula et al. (2012), which examined how demand-resource profiles were associated with engagement. As hypothesised, teachers within the *stressed* profile (characterised by high levels of two job demands) reported lower levels of work engagement. Interestingly, no significant differences were found between the *Wealthy* (characterised by high resources and low demands) and *Resourceful* profiles (characterised by high resources and high demands) and engagement. While other person-centred analyses of teachers have considered associations between individual and motivational characteristics and engagement (e.g., teachers' motivational dimensions, Van de Wal et al., 2014; personality traits, Perera et al., 2018), few have employed JD-R theory to do so. Hence, the present work sought to address this gap (see Figure 1.2).

Finally, in terms of multilevel analyses, very few studies have considered school-level engagement. One notable exception is the work of Klusmann et al. (2012), which examined within- and between-school variance in teachers' engagement. Analyses revealed that 7% of

variance could be attributed to between-school differences. The present investigation sought to build on this work and address the relative lack of literature in the area by examining the extent to which school-average behavioural engagement is associated with students' academic achievement (see Figure 1.3).

2.4.2.2 Emotional Exhaustion

Emotional exhaustion is the key component of burnout (Chang, 2009; Maslach et al., 2001; Taris et al., 2005), and is among the most widely researched phenomena in the area of teacher well-being. Emotional exhaustion describes the chronic depletion of emotional resources in response to continued exposure to excessive job demands and continuous levels of occupational stress (Skaalvik & Skaalvik, 2011; Wright & Cropanzano, 1998). It leaves individuals emotionally drained, experiencing low energy, and reporting high levels of fatigue (Maslach et al., 2001). Emotional exhaustion can lead to a range of deleterious outcomes for both individuals and organisations, including job withdrawal, diminished productivity, decreased commitment, and poor physical and psychological health (Maslach & Leiter, 2016). Some studies have suggested that burnout may even be "contagious" in that it may be perpetuated by social interactions in the workplace (González-Morales et al., 2012).

As described above, emotional exhaustion is a component of burnout. It is considered to be conceptually distinct from the other two dimensions of burnout: cynicism, which describes a loss of idealism and withdrawal from work; and inefficacy, which describes reduced productivity and low morale (Maslach & Leiter, 2016). In the present study, emotional exhaustion was the focus given that teaching is a particularly emotionally taxing profession (Chang, 2009; Collie et al., 2018). Teachers must expend considerable energy regulating their own emotions and in negotiating complex and unpredictable stimuli (Collie et al., 2018). Emotional exhaustion was further selected as the focus for the health impairment process as it has been consistently linked with employees' turnover intentions

(Rajendran et al., 2020; Skaalvik & Skaalvik, 2017b). Given the high rates of attrition among teachers (Weldon, 2018), understanding emotional exhaustion as a potential antecedent to teachers' retention-related outcomes may shed light on why teachers leave, and what can be done to support them to stay.

There is a considerable body of literature suggesting that Australian teachers experience significant levels of emotional exhaustion. Rajendran et al. (2020) applied the JD-R theory to examine the demands and resources associated with teachers' emotional exhaustion and turnover intentions. The authors used the 7-point Maslach Burnout Inventory (MBI) to measure emotional exhaustion, and found above average levels of emotional exhaustion among primary teachers. Moreover, a mediation model, in which work-family conflict, workload, and student misbehaviour predicted turnover intentions via emotional exhaustion explained approximately 40% of the total variance in emotional exhaustion, and 25% of variance in turnover intent among primary school teachers. In another study of Australian teachers, Collie et al. (2018) similarly reported moderate levels of emotional exhaustion and found significant and negative associations between emotional exhaustion and organisational commitment, such that teachers who were more exhausted were also less committed to their organisation.

Turning to person-centred work, although no prior work has considered associations between demand-resource profiles and emotional exhaustion, other person-centred work involving teachers may shed light on potential associations. For example, Ferradás et al. (2019) examined profiles of teachers' psychological capital, conceptualised as teachers' efficacy, hope, optimism, and resilience, variables which have been classified as personal resources per JD-R theory (e.g., Xanthopoulou et al., 2007). The authors found that teachers with a profile of low psychological capital (i.e., low levels of all four psychological capital indicators), experienced the highest levels of burnout. The opposite was true for teachers who

fell within the profile characterised by high psychological capital. Given the absence of prior work examining the associations between teachers' demand-resource profiles and emotional exhaustion, this was a central empirical question in the present investigation (see Figure 1.2).

From a multilevel perspective, emotional exhaustion has been examined at the organisational level. For instance, Klusmann et al. (2008) considered how teachers' levels of emotional exhaustion varied between and within schools. Interestingly, only 1% of variance in teachers' emotional exhaustion was found to be attributable to between-school variance; instead, a greater percentage of variance was attributable to teacher-level factors. Van Droogenbroeck et al. (2021) similarly found only a small proportion of variance at the between-school level. Arens and Morin (2016) extended work in this area by examining teachers' emotional exhaustion at the classroom-level and how this was associated with differences in students' academic achievement. Analyses revealed that classes taught by teachers reporting greater emotional exhaustion also presented lower levels of academic achievement (as measured by standardised assessments). However, whether this association is generalisable across national contexts remains an open empirical question. The present research thus sought to extend this work to the Australian context by examining the associations between school-level emotional exhaustion and students' academic achievement (see Figure 1.3). Together, prior studies suggest that emotional exhaustion is indeed a significant issue for Australian teachers.

2.4.2.3 Summary

Behavioural engagement and emotional exhaustion are associated with teachers' retention-related outcomes. They are also associated with school and student success; for example, teachers who are more behaviourally engaged go above and beyond what is expected of them, are more devoted to students' success, and are particularly instrumental in helping schools to achieve their goals (Abd Razak et al., 2009; Han & Yin, 2016).

Comparatively, teachers reporting higher levels of emotional exhaustion have lower levels of organisational commitment and are more likely to leave the profession prematurely (Akdemir, 2019; Hakanen et al., 2006; Lee, 2017; Wullur & Werang, 2020). Accordingly, behavioural engagement and emotional exhaustion are positioned as mediators in the hypothesised variable-centred model (shown in Figure 1.1; Study 1), and as outcomes of demand-resource profiles in the person-centred model (shown in Figure 1.2; Study 2). In the multilevel model (Figure 1.3; Study 3), these factors are positioned as school-level predictors of students' academic achievement.

2.4.3 Associations Between Demands, Resources, Behavioural Engagement, and Emotional Exhaustion

2.4.3.1 Overview

The previous sections of this literature review introduced the demands (role conflict) and resources (useful collaboration, useful professional development, adaptability, self-efficacy) that are of central interest to the present body of work, in addition to two measures of well-being (behavioural engagement and emotional exhaustion). The following section examines prior research that has investigated the links between the demands and resources and the measures of well-being. A plethora of studies have examined the associations between job demands, job resources, and personal resources with work engagement (though not necessarily behavioural engagement specifically) and emotional exhaustion via variable-centred approaches, with emerging research also using person-centred approaches. This section begins with a broad discussion of studies examining teachers' job demands, job resources, and personal resources in relation to work engagement and emotional exhaustion, then proceeds to focus on the specific demands and resources examined in the present investigation.

Beginning with variable-centred studies, Hakanen et al.'s (2006) seminal study of Finnish teachers applied JD-R theory to test the core tenets of the model. Job demands were examined by three indicators: disruptive pupil behaviour, work overload, and a poor physical work environment. Job resources were considered by way of five indicators: job control (the ability to influence one's own work), supervisor support, information (pertinent issues are communicated with staff), innovative school climate (characterised by a school's desire to continually improve), and social climate. Results of the study provided strong empirical support for the health impairment and motivational process posited by JD-R theory: job demands were associated with greater ill-health via burnout, and job resources were related to greater organisational commitment via engagement. In another large-scale study, Skaalvik and Skaalvik (2018) examined the associations between job demands, job resources, and teacher well-being, engagement, and turnover intentions in a sample of Norwegian teachers. They included three job demands: time pressure, discipline problems, and low student motivation. The researchers also included four job resources: positive relations with colleagues, supervisory support, a collective school culture, and value consonance. Time pressure was found to be the strongest predictor of poor well-being, while only value consonance was found to be directly related to engagement.

Turning to the Australian context, a growing body of research has applied JD-R theory to understand the experiences of Australian teachers. Rajendran et al. (2020) applied JD-R theory to understand burnout and turnover intent in a sample of primary and secondary school teachers. Workload and student misbehaviour (job demands) and work-family conflict (a personal demand) were all positively associated with emotional exhaustion, and indirectly related to turnover intentions via emotional exhaustion. Notably, no differences were found in results as a function of gender or teaching level. In one of the only studies to have applied JD-R theory to consider the positive occupational outcomes of Australian teachers, Collie et

al. (2018) investigated the salience of perceived autonomy support (a job resource) and adaptability (a personal resource) as relevant to emotional exhaustion, disengagement, and organisational commitment. Perceived autonomy support was negatively associated with exhaustion and disengagement, and positively associated with organisational commitment, while adaptability was found to be negatively associated with disengagement. These findings provide broad support for the application of JD-R theory to Australian teaching populations and illuminate avenues for further investigation.

Turning to studies using person-centred approaches, as noted above, far fewer investigations have been conducted. Indeed, to the best of the author's knowledge, only three studies have examined profiles of teachers' demands and resources from the JD-R perspective. Simbula et al. (2012) considered profiles comprised of two job demands (inequity and role ambiguity) and two job resources (professional development and colleague support). The authors found that the profile highest in job resources and lowest in job demands was associated with lower perceptions of pupil misbehaviour and perceived responsibility, while the profile lowest in resources and highest in demands was associated with lower engagement, satisfaction, and organisational identification. Interestingly, another unique profile was identified—the resourceful profile—characterised by high demands and high resources, which suggests that there are unique differences in the way teachers experience demands and resources. Although this study provided understanding in relation to teachers' engagement, associations with emotional exhaustion remain relatively unknown.

The other notable person-centred studies of teachers' demands and resources were conducted by Collie, Malmberg, et al. (2020, 2021). The authors examined samples of Australian and English teachers and identified five profiles of teachers based on JD-R theory in the 2020 study (and replicated these profiles in the 2021 study, along with the addition of one new profile). Focusing on the 2020 study, two profiles had low-to-average demands and

high resources, two had mixed demands and resources, and one had high demands and low resources. This prior research is particularly noteworthy as it considered both job and personal resources, thus advancing understanding of joint effects of these resources. While the authors did not examine emotional exhaustion or engagement, they did examine two conceptually similar well-being factors: job satisfaction and organisational commitment. The profiles characterised by the highest levels of demands and low-to-mixed levels of resources displayed the greatest levels of satisfaction and commitment, while the profile high in demands and low in resources reported the lowest levels of these outcomes. While these are important occupational outcomes, there is both a theoretical and empirical need to consider associations with factors such as behavioural engagement and emotional exhaustion, which are important in their own right and also because of their links with broader organisational outcomes.

2.4.3.2 Associations with Behavioural Engagement

The present research anticipates links between demands and resources and teachers' behavioural engagement. It is important to note that, because of the lack of studies examining behavioural engagement, the following section reviews literature which examined engagement (or work engagement) more broadly for teachers.

2.4.3.2.1 Job Demands. Starting with job demands, little prior work has considered the associations between role conflict and engagement in teaching populations using variable- or person-centred approaches. In one of the few relevant variable-centred studies, Mérida-López et al. (2017) investigated the links between role stress (comprising both role ambiguity and role conflict) and domain-general work engagement (comprising three dimensions: vigour, dedication, and absorption). Role stress was found to account for 25% of variance in overall engagement. However, it is important to note that role ambiguity accounted for the largest proportion of variance, and when analysed in isolation, role conflict

was not significantly associated with general engagement, or any of its three dimensions. This underscores the need for more focused examinations of role conflict, because although related, role conflict and role ambiguity are conceptually distinct constructs (Bowling et al., 2017). The prior findings also highlight the importance of examining whether role conflict is salient in relation to specific (rather than global) measures of engagement—such as behavioural engagement in the present investigation.

Further still, no research appears to have specifically considered role conflict using person-centred approaches among teachers, highlighting that this is an important area to consider—particularly given sample-wide associations in variable-centred approaches may mask unique associations among subpopulations. Indeed, there is very little person-centred research on role conflict and work stress more broadly. The work of Van den Broeck et al. (2012) is the notable exception; their examination of profiles involving role conflict among Flemish community employees revealed that profiles higher in this demand were more likely to experience higher levels of burnout and lower levels of work engagement. Conversely, employees within profiles characterised by lower levels of this demand evinced the highest levels of work engagement. The extent to which similar patterns may be present in teaching populations is an open empirical question.

2.4.3.2.2 Job Resources. Variable-centred research provides support for the links between the job resources and engagement. Starting with professional learning, research has demonstrated associations between professional development and adaptive outcomes such as job satisfaction (e.g., OECD, 2014). However, there is a notable absence of literature considering other measures of teachers' well-being, such as engagement and, more specifically, useful professional learning as was the focus in the present investigation. Prior studies of collaboration suggest that professional learning may be positively associated with forms of engagement. In a multilevel study of Dutch teachers, Thoonen et al. (2011) found

collaboration to positively predict teachers' engagement in reflection, experimenting, and decision-making. Though significant, it is important to note that these forms of engagement do not necessarily reflect broader conceptualisations of work engagement (e.g., Schaufeli et al., 2002).

Turning to person-centred studies, Simbula et al. (2012) included professional development in an application of JD-R theory to a sample of Italian teachers. Using cluster analysis, the authors revealed that the two profiles with high levels of professional development also had a higher mean score on measures of work engagement. While no person-centred research has examined the associations between profiles consisting of collaboration and engagement, the work of Collie, Malmberg, et al. (2020) may be informative. The authors reported that profiles higher in teacher collaboration were more likely to be associated with job satisfaction and organisational commitment, suggesting that collaboration may play a positive role in teachers' well-being outcomes. Nonetheless, the absence of research examining potential associations between profiles involving collaboration and teachers' engagement underscores the need for further work in this area.

2.4.3.2.3 Personal Resources. Turning to the personal resources, as described above, a considerable body of literature has found self-efficacy to be associated with engagement in variable-centred research. For example, Skaalvik and Skaalvik (2014) employed structural equation modelling to investigate the associations between self-efficacy, engagement, emotional exhaustion, and job satisfaction. Self-efficacy positively predicted engagement, providing support for the notion that self-efficacy may be a motivating mechanism through which individuals are able to direct their efforts to engage in given tasks (Vera et al., 2014). Despite this body of research, no prior research has considered self-efficacy in relation to teachers' behavioural engagement in either variable- or person-centred research, leaving this an open empirical question.

In terms of adaptability, prior variable-centred work has established associations with negative forms of engagement. As described above, in a study of secondary school teachers, Collie et al. (2018) reported adaptability to be negatively associated with disengagement, such that more adaptable teachers were less likely to report being disengaged at work. Though no other studies appear to have examined the indirect or direct links between adaptability, emotional exhaustion, and engagement, a handful of studies have examined related constructs. For instance, Collie and Martin (2017) examined adaptability as a predictor of subjective well-being. Adaptability was found to predict general well-being and it was thus suggested that this capacity helps teachers to manage their demands at work. Similarly, Martin et al. (2019) explored adaptability as a correlate of workplace enjoyment, participation, self-concept, and general motivation among teacher assistants working in classrooms where students with a disability were present. Teachers who were more adaptable reported significantly higher levels of all the aforementioned outcomes and it was thus suggested that adaptability is a critical element of workplace well-being for teacher assistants. While promising, further investigations using specific measures of well-being—such as behavioural engagement (and emotional exhaustion)—are needed to further investigate the role of adaptability in teachers' psychological functioning. Similarly, and as noted earlier, there is a need to consider adaptability from a person-centred perspective, to determine how it functions alongside other personal and job resources, as well as whether different combinations of adaptability alongside other resources yield more positive outcomes.

2.4.3.3 Associations with Emotional Exhaustion

The present research further anticipates links between demands and resources and teachers' emotional exhaustion. The associations between job demands and emotional exhaustion have been the subject of considerable research (e.g., Lorente-Prieto et al., 2008; Skaalvik & Skaalvik, 2018); however, comparatively less work has examined the

associations involving job and personal resources. The present investigation thus addresses this gap by considering the associations that the demand and the two forms of resources have with emotional exhaustion, as well as how demand-resource profiles are associated with emotional exhaustion.

2.4.3.3.1 Job Demands. Beginning with the job demands, role conflict has been previously associated with emotional exhaustion in variable-centred research. In a study of Greek primary school teachers, Papastylianou et al. (2009) found role conflict to positively predict emotional exhaustion, and to be a source of considerable stress for primary school teachers. Role conflict has also been associated with emotional exhaustion in samples of special education co-teachers (Moss, 2015). In a smaller study of assistant teachers and specialist teachers of students with special needs, Moss (2015) used regression analyses to examine the predictive power of role conflict on burnout, finding that role conflict accounted for approximately 28% of variance in emotional exhaustion.

Although no prior person-centred research of teachers has considered profiles involving role conflict, Van den Broeck et al. (2012) did consider role conflict among community employees. Profiles characterised by higher levels of role conflict, alongside cognitive demands, emotional demands, and workload (other job demands) were associated with higher levels of emotional exhaustion. The present study thus provides an opportunity to consider the extent to which such patterns are similarly reflected in profiles of teachers.

2.4.3.3.2 Job Resources. While studies of collaboration and teachers' emotional exhaustion are relatively scarce, variable-centred evidence does suggest (somewhat counter-intuitively) that collaboration may facilitate negative emotionality for educators. For example, in a study of Australian teachers, B. Johnson (2003) found that collaboration with colleagues led to work intensification, interpersonal conflict, loss of autonomy, and factionalism, leaving teachers cynical and professionally dissatisfied. Hargreaves (2000)

similarly noted that contrived forms of collegiality could actually be counterproductive for teachers.

To better understand these findings, there may be utility in considering teachers' appraisals of such resources (C. Liu & Li, 2018; Martin et al., 2021). That is, rather than focusing on the characteristics of job resources, it may be more informative to consider whether teachers perceive such resources to be helpful or a hindrance (Martin et al., 2021) and accordingly, whether this contributes to experiences of emotional exhaustion. Considering teachers' appraisals may shed light on these surprising and somewhat contradictory associations, which in turn may advance understanding of how and why such factors are associated with teachers' well-being. In addition, considering profiles involving useful collaboration may reveal the circumstances (i.e., low demand vs high demand) under which useful collaboration may help (i.e., lead to greater engagement) or hinder (i.e., lead to greater exhaustion) teachers.

2.4.3.3.3 Personal Resources. Finally, with respect to personal resources, Skaalvik and Skaalvik (2017a) examined the associations between self-efficacy and emotional exhaustion in a sample of Norwegian teachers. They found that lower levels of self-efficacy were associated with higher levels of emotional exhaustion. Consistent with social-cognitive theory (Bandura, 2006), the authors suggested that individuals with low self-efficacy may be more likely to negatively appraise a situation. In doing so, they will tend to focus on the negatives, thus perpetuating a cycle of negative emotionality. Although no person-centred research has considered how profiles involving self-efficacy are associated with emotional exhaustion among teachers, Herman et al. (2018) examined profiles in which levels of self-efficacy were profile indicators alongside burnout, stress, and coping. The authors found that across all profiles, self-efficacy and burnout did not co-occur positively but did vary between

profiles, which provides further support for the need to consider these variables using person-centred methods.

2.4.3.4 Interaction Processes for Both Behavioural Engagement and Emotional Exhaustion

In addition to the direct associations between the demands and resources and well-being outcomes, prior work involving JD-R theory suggests the presence of interaction effects, such as the buffering and boosting processes described above. Turning to the work that has examined these interactions, prior work suggests that job and personal resources may buffer the association between demands and emotional exhaustion and engagement. For instance, in their study of Finnish teachers, Bakker et al. (2007) found that when teachers reported high or positive ratings of supervisor support, organisational climate, and innovation, their perceptions of pupil misbehaviour had less of a harmful association with their work engagement. Dicke et al. (2018) reported similar results in their study of German pre-service teachers. Self-efficacy (a personal resource) was found to buffer or reduce the negative association between classroom disturbances and emotional exhaustion. Both of the aforementioned studies also found evidence of the boosting effect. Bakker et al. (2007) reported when pupil misbehaviour was high, the job resources had an even stronger connection with teachers' engagement (Bakker et al., 2007). Dicke et al. (2018) likewise reported that self-efficacy was found to "boost" engagement when disturbances were high.

Person-centred studies are particularly well suited to examining the buffering and boosting processes as they readily allow for examination of multiple interacting factors at any given time (Collie et al., 2021). Accordingly, they have enabled more complex examinations of the buffering and boosting effects in teaching populations. Though no prior person-centred work appears to have examined the buffering and boosting effects in relation to behavioural engagement or emotional exhaustion among teachers, the work of Collie, Malmberg, et al.

(2020) is revealing. The profile associated with the highest levels of individual and work-related outcomes (the *Mixed-Demand-Flourisher*) did not possess the lowest levels of job demands. Specifically, the authors suggested that the *Mixed-Demand-Flourisher* may have displayed more positive outcomes than a comparable profile with low demands (*Low-Demand-Flourisher*) because the marginally higher levels of job demands made the job resources more important for their well-being. The present study provides the opportunity to consider whether such interaction effects are present among a different range of demands and resources, and if they are associated with behavioural engagement and emotional exhaustion.

2.4.3.5 Summary

Although prior work has advanced our understanding about the associations between teachers' demands and resources and a range of well-being outcomes, a number of empirical questions remain. For example, prior studies have tended to focus on global work engagement (i.e., a single overarching work engagement factor that comprises cognitive, affective, and behavioural components; Gillet et al., 2019), rather than considering more focused constructs such as behavioural (work) engagement. As noted above, behavioural engagement is considered particularly salient to teachers' outcomes at work and so more detailed attention to this construct is important. Moreover, researchers have yet to consider the association between either adaptability or self-efficacy and behavioural engagement among teachers. Further, although prior work (e.g., Van den Broeck et al., 2017) suggests role conflict to be the most significant determinant of emotional exhaustion in the health care industry and public sector, limited research appears to have explored this association with teachers. Such knowledge may be important for future interventions. Finally, while variable-centred approaches have established associations between various demands and resources and emotional exhaustion and engagement, there is within-person variation in demands and resources that few studies have examined (Van den Broeck et al., 2014). For instance, it is

possible that there are subpopulations of employees who, despite experiencing high levels of demands, also experience high levels of resources and thus report higher levels of engagement (e.g., Van den Broeck et al., 2012). Similarly, it may be that specific combinations of resources create joint effects (Van den Broeck et al., 2012), which lead to more optimal outcomes (e.g., greater behavioural engagement and higher organisational commitment).

To address these gaps, the present study sought to examine the predictive pathways between a range of demands and resources, and engagement and emotional exhaustion from both a variable- and person-centred perspective. Based on prior research (e.g., Collie et al., 2016; Dicke et al., 2018; Van den Broeck et al., 2017), it was anticipated that role conflict would positively predict emotional exhaustion and negatively predict behavioural engagement, and that the job and personal resources would positively predict behavioural engagement and negatively predict emotional exhaustion. From a person-centred perspective, based on the work of Collie, Malmberg, et al. (2020) and Simbula et al. (2012), it was anticipated that profiles higher in demands and lower in resources would exist and have stronger associations with emotional exhaustion, while it was also anticipated that profiles higher in resources would exist and generally be higher in behavioural engagement. The relative salience of each of the demands and resources in each profile may advance understanding about the unique and interactive roles these factors play.

2.4.4 Retention-Related Outcomes: Turnover Intentions and Organisational Commitment

Having reviewed the demands and resources and well-being outcomes under focus in this investigation, the discussion now turns to the final outcomes in the hypothesised variable- and person-centred models: turnover intentions and organisational commitment. Turnover intentions are primarily considered to be an outcome of the health impairment

process, whereas organisational commitment is primarily considered to be an outcome of the motivational process. In the variable-centred study (Study 1), the job and personal resources and behavioural engagement are examined as direct and/or indirect predictors of organisational commitment and turnover intentions. Turning to the person-centred analyses (Study 2), based on prior work (e.g., Collie, Malmberg, et al., 2020; Simbula et al., 2012), turnover intentions and organisational commitment are examined as outcomes of the profiles. The following section begins by defining and describing these outcomes and then proceeds to review prior work examining the factors associated with these outcomes.

2.4.4.1 Turnover Intentions

Turnover intentions refer to teachers' attitudes, thoughts, plans, or behaviours which have them inclined or predisposed to leaving their current position (Tiplic et al., 2015). These intentions may be to leave the teaching profession entirely, or to leave the organisation in which they currently work (McInerney et al., 2015). Though "movers" and "leavers" (Kukla-Acevedo, 2009) differ in their career-related behaviour, they may share similar motivations and ultimately, their departure from their organisation yields the same negative consequences, including lower levels of student achievement, organisational instability, and significant costs to schools (Carver-Thomas & Darling-Hammond, 2019; Tiplic et al., 2015). Examining turnover intentions is of particular value as these intentions are considered to be proximal antecedents to actual attrition (McInerney et al., 2015). Specifically, turnover intentions are considered to be the single strongest predictor of actual turnover in employees and are considered the most appropriate measure when longitudinal data reporting actual mobility cannot be obtained (S. Liu & Onwuegbuzie, 2012).

Reports suggest that between 10% and 30% of teachers will leave the career within the first five years (Weldon, 2018). This pattern of attrition presents a significant issue for students, the education system, and the broader economy, all of which must bear the

financial, structural, and social burdens of the loss of knowledge and educational expertise (Buchanan et al., 2013; Darling-Hammond, 2010). Although this phenomenon has been the subject of considerable variable-centred work (e.g., Räsänen et al., 2020; Tiplic et al., 2015), no prior person-centred work appears to have considered how different profiles may be associated with turnover intentions.

2.4.4.2 Organisational Commitment

The second outcome, *organisational commitment*, is a psychological state related to an employee's attachment and willingness to continue as part of the organisation with which they are affiliated (Meyer & Allen, 1991). Importantly, organisational commitment differs from occupational commitment, which refers to the profession in which one is involved, rather than a specific organisation (McInerney et al., 2015).

Prior studies (e.g., McInerney et al., 2015) suggest that particularly strong organisational commitment is associated with reduced turnover intentions among teachers, thus highlighting the importance of this construct in efforts to address issues of teacher attrition. Moreover, teachers who are committed to their organisation are more likely to put extra effort into their work, go beyond the expectations of their role, and care more about their subject matter, all of which may contribute to greater student achievement (Berkovich & Bogler, 2021). Importantly, turnover intentions and organisational commitment are not considered to be opposite ends of the same spectrum—they are negatively correlated, but still tap into distinct constructs (Oh, 2019; Stanley et al., 2013). More precisely, organisational commitment is more than just low intentions to quit—it actually reflects active commitment, in which an employee exerts effort on the organisation's behalf and internalises an organisation's core values and ideals (Meyer & Allen, 1997). Comparatively, turnover intentions are largely cognitive responses, which represent the final of a series of withdrawal cognitions (Ahmad & Chin, 2018; Tett & Meyer, 1993). Though research related to teachers'

organisational commitment is prolific in nature, very little work appears to have been conducted in an Australian context. Moreover, with the exception of the examination of occupational commitment conducted by Collie, Malmberg, et al. (2020), few studies have considered how demand-resource profiles may be associated with organisational commitment.

2.4.5 Direct and Indirect Associations to the Retention-Related Outcomes

2.4.5.1 Overview

Having introduced the core retention-related outcomes, this part of the literature review turns to the direct and indirect associations that the demands, resources, and well-being factors have with the retention-related measures. Per JD-R theory, it is posited that the demands and resources and the well-being factors will be directly associated with organisational commitment and turnover intentions, and that the demands and resources will also be indirectly associated with these outcomes via the well-being factors. The theoretical and empirical rationales for these suppositions are further discussed.

2.4.5.2 Potential Predictors of Turnover Intentions

Teachers' turnover intentions have been the subject of considerable research, given the high rates of teacher attrition across a range of developed countries (Weldon, 2018). Studies of turnover intentions have considered the phenomenon as the product of both personal and school climate factors (Skaalvik & Skaalvik, 2011), with factors such as high workload, dissatisfaction with pay, conflict with colleagues, job security, work-life balance, and professional work conditions cited as reasons for leaving the profession (Gallant & Riley, 2014; Grant et al., 2019; Mason & Poyatos-Matas, 2015). In terms of the JD-R theory, and the variables under examination in the present study, a range of factors have been identified in relation to turnover intentions.

2.4.5.2.1 Job Demands. Beginning with job demands, role conflict has been directly associated with turnover intentions in samples of Norwegian and Swedish teachers (Tiplic et al., 2015, 2016). Notably, the magnitude and direction of the association between the two variables was similar across the two samples despite the contextual differences. It may be that role conflict depletes teachers of physical and emotional resources, and they may not feel they have the time to meet the conflicting demands. To cope with this conflict, teachers may consider leaving the profession (Tiplic et al., 2016; Wen et al., 2020). Though some evidence of direct associations between role conflict and turnover intentions among teachers has been reported (e.g., Tiplic et al., 2015), it is also possible that role conflict may be indirectly associated with turnover intentions by way of emotional exhaustion. These indirect pathways are described more fully below. Though no prior work involving teachers has considered profiles comprising role conflict and associations with turnover intentions, a latent profile analysis conducted by Radey and Wilke (2021) may shed light on potential associations. The authors examined the positive analogue of role conflict—role compatibility—in a study of child welfare workers. Results revealed that workers who were members of profiles characterised by high role compatibility, alongside other job and personal resources, displayed lower levels of turnover intentions than those profiles low in role compatibility.

2.4.5.2.2 Job Resources. Turning to job resources, though no prior work has considered useful collaboration or useful professional development per se, other studies of similar variables can shed light on possible associations using variable-centred approaches. For instance, in a study of Kenyan secondary school teachers, Ekabu (2020) examined the direct associations between professional development opportunities and turnover intentions. Correlation analyses revealed a negative association, suggesting that a lack of professional development opportunities leads to lower motivation and higher turnover intentions. Though

theoretically informative, there is a need for multivariate research to better reflect the complex ecology of schooling contexts.

There is also a small body of literature that suggests that teacher collaboration may be negatively associated with turnover intentions. According to Yada et al. (2018), engaging in collaboration may heighten teachers' awareness of the impact of their collective efforts on students. In doing so, teachers may experience a sense of meaningfulness which energises them in their work, thus reducing their turnover intentions. In their study of Japanese elementary and secondary school teachers, Yada et al. (2018) found evidence for this, suggesting that collaboration generates a sense of prosocial impact that is inherently motivational.

Turning to person-centred approaches, the vast majority of prior work involving profiles of job resources has examined associations with positive outcomes (e.g., job satisfaction and organisational commitment in Collie, Malmberg, et al., 2020; civic virtue, organisational identification in Simbula et al., 2012). Though no prior work has considered turnover intentions as an outcome of demand-resource profiles, based on JD-R theory and the aforementioned work which points to the positive outcomes of job resources, it is theorised that profiles higher in job resources will be associated with more adaptive outcomes. Importantly, the present work provides the opportunity to examine specific combinations of resources which may be more important in preventing the development of turnover intentions.

2.4.5.2.3 Personal Resources. With respect to personal resources, self-efficacy has been found to negatively predict turnover intentions in variable-centred research. In a study of Belgian beginning teachers, De Neve and Devos (2017) examined the direct associations between self-efficacy and teachers' intentions to leave the profession, finding that self-efficacy was negatively and significantly associated with turnover intentions. The authors

suggested that because these teachers believe they could manage the classroom and be effective with their students, they would perceive their working environment more positively, thus reducing their intentions to leave.

While little prior work appears to have considered adaptability in relation to teachers' turnover intentions, it is possible that like self-efficacy, adaptability may negatively predict turnover intentions. Teachers who are more adaptable may perceive themselves as more capable of managing change in the school environment. By adapting their thoughts, feelings, and behaviours they may also be more invested and engaged in their work (Collie, Guay, et al., 2020). Through these processes, teachers may make more positive appraisals of their work, thus reducing their intentions or behaviours to leave the profession.

In terms of person-centred approaches, though no prior work has considered the associations between profiles comprising personal resources and turnover intentions, it is likely that teachers who fall within profiles higher in adaptability and self-efficacy will experience a greater sense of their ability to control their working environment, and thus display lower turnover intentions.

2.4.5.2.4 Well-being Factors. Studies of teachers in the U.S., Australia, Hong Kong, and Finland (Goddard & Goddard, 2001; Lee, 2017; Leung & Lee, 2006; Rajendran et al., 2020; Skaalvik & Skaalvik, 2017b) have consistently shown that teachers reporting higher levels of emotional exhaustion are more likely to report intentions to leave the profession in variable-centred research. According to Skaalvik and Skaalvik (2018), there are a number of possible reasons for this association. First, teachers may associate emotional exhaustion with the school environment, and thus be more motivated to change their environment (changing schools or professions entirely) to reduce their exhaustion. Second, emotional exhaustion and low mood may result in decreased engagement; as a result, educators may not see any reason to continue teaching. On this point, work engagement more

generally has been associated with lower turnover intentions. For instance, in a sample of Chinese teachers, Fu et al. (2020) reported a negative correlation between work engagement and turnover intentions. The authors suggest that because work engagement is a state in which employees invest energy in their work, when teachers experience low work engagement, they may distance themselves from their work, strengthening their intention of leaving.

2.4.5.2.5 Indirect Predictive Paths. In addition to the direct associations between the variables described above and turnover intentions, a number of studies have found evidence of indirect associations via the health impairment and motivational processes, as posited by JD-R theory. Importantly, indirect paths are examined via variable-centred approaches (not person-centred approaches). In their study of Australian teachers, Rajendran et al. (2020) found that three demands—workload, student misbehaviour, and work-family conflict—were each indirectly related to turnover intentions by way of emotional exhaustion. In a similar study of Norwegian teachers, Skaalvik and Skaalvik (2016) identified an indirect association between time pressure and turnover intentions, which was mediated by emotional stress and exhaustion. Notably, they also identified an association between lower self-efficacy and higher turnover intentions, mediated by lower engagement.

Finally, in a study of workers across a broad range of occupations, Albrecht and Marty (2017) explored the extent to which job resources were indirectly associated with turnover intentions via engagement. Job resources were modelled as a higher-order construct, comprising five indicators: job autonomy, job feedback, skill utilisation, opportunities for feedback, and opportunity for professional development. Results revealed a significant and negative indirect effect of job resources on turnover intentions, via engagement. Though this provides support for the motivational process, and sheds some light on the role of professional development as a job resource that is indirectly associated with turnover

intentions, the aggregation of the five job resource factors makes it difficult to determine the unique variance attributable to professional development (which is a focus of the present investigation).

2.4.5.2.6 Summary. Taken together, there are clearly a range of individual and organisational factors that are associated with teachers' turnover intentions. As described above, there is also an ample body of research that justifies the inclusion of the factors selected for analysis in the present study. Based on this prior work, a number of direct and indirect associations were anticipated, as were links between demand-resource profiles and teachers' turnover intentions (described below).

2.4.5.3 Potential Predictors of Organisational Commitment

As outlined above, organisational commitment is considered to be an important capacity for teachers and organisations alike (Hulpia et al., 2011). Prior work harnessing JD-R theory has begun to consider the types of demands and resources and subsequent processes associated with this outcome (e.g., Collie et al., 2018). However, work in this area remains in its infancy. Accordingly, the present investigation sought to expand this understanding by examining the associations that a range of novel demands and resources, and demand-resource profiles, have with organisational commitment.

2.4.5.3.1 Job Demands. A number of individual and school climate variables have been identified as antecedents of organisational commitment. Relatively limited work has considered the associations between role conflict (a job demand) and organisational commitment; instead, most work has focused on role stress more broadly (e.g., Conley & Woosley, 2000). Of the available work into role conflict, H. Liu and Y. Liu (2017) found no association between role conflict and organisational commitment in a study of beginning teachers in China. Nouriska et al. (2019) similarly reported no association in a small sample of Malaysian teachers.

From a person-centred perspective, the work of Peeters et al. (2021) may provide some insights. In their study of Dutch bankers, the authors found that employees who were members of profiles characterised by less role conflict tended to display higher levels of work performance. Though conceptually distinct from organisational commitment, work performance has been frequently cited as an outcome of organisational commitment (Meyer et al., 1989; Riketta, 2002). Thus, it is possible that teachers within profiles comprising lower role conflict may report greater organisational commitment.

2.4.5.3.2 Job Resources. With respect to collaboration, Collie et al. (2011) examined the associations between collaboration and organisational commitment in a sample of Canadian teachers. The authors found that teachers who collaborated more often were more committed to their work. To explain this, they suggested that teachers who engaged in greater levels of collaboration may experience more positive and subsequently satisfying social interactions with colleagues, and perceive greater levels of support in relation to classroom management. In a study of Malaysian teachers, Veeriah et al. (2017) found that teacher collaboration predicted three dimensions of organisational commitment: affective, continuance, and normative commitment. However, not all research is consistent with these findings. For example, Tschannen-Moran (2001) notes that isolating, or working alone, may be necessary for teachers to maintain their autonomy, which is an important determinant of their organisational commitment (Gagné et al., 2008). B. Johnson (2003) also suggests that collaboration may lead to increased workload, which may leave teachers disillusioned with their organisation. The evidence, thus, is mixed. In addition, prior research has not considered useful collaboration and whether its role is more consistent.

In terms of person-centred work, Collie, Malmberg, et al. (2020) considered levels of teacher collaboration as a profile indicator in an examination of Australian and English teachers. The two profiles highest in collaboration (*Low-Demand-Flourisher* and *Mixed-*

Demand-Flourisher) were also the profiles associated with the greatest levels of organisational commitment. Interestingly, of the two profiles, the *Mixed-Demand-Flourisher* (i.e., the profile that displayed higher levels of demands than the *Low-Demand-Flourisher*) was found to evince the highest levels of organisational commitment. Collie, Malmberg, et al. (2020) thus suggest that average levels of demands may not be a hindrance, and in fact may lead to greater utilisation of existing resources.

Though no specific studies of teachers appear to have addressed the direct association between professional development and organisational commitment, other related work suggests there may be a positive correlation between these two variables. For example, in the aforementioned person-centred study of Italian teachers, Simbula et al. (2012) reported that teachers within the *Wealthy* and *Resourceful* profiles (both characterised by high levels of professional development) possessed greater levels of organisational identification. Though conceptually distinct, organisational identification appears aligned with organisational commitment (Van Knippenberg & Sleebos, 2006), and so positive professional development effects may be inferred in the present study. In their person-centred study, Collie, Malmberg, et al. (2020) examined barriers to professional development as a demand. The profile associated with the poorest levels of organisational commitment (the *Struggler* profile) was characterised by the highest levels of barriers to professional development, while the two profiles associated with the highest levels of organisational commitment were characterised by the lowest levels of barriers to professional development.

2.4.5.3.3 Personal Resources. With respect to personal resources, there is a well-established association between self-efficacy and commitment to the teaching profession in variable-centred research. Indeed, in a meta-analysis of 33 studies and 16,122 pre-service and in-service teachers, Chesnut and Burley (2015) reported an effect size of 0.32 (considered to be a moderate effect size; Cohen, 1988) of self-efficacy on commitment to the teaching

profession, reporting that self-efficacy can explain up to 10% of variance in teachers' decisions to leave or stay in the profession. Studies of Dominican, Israeli, Pakistani, and Turkish teachers have also identified direct and significant associations between self-efficacy and organisational commitment (Barouch Gilbert et al., 2014; Bogler & Somech, 2004; Demir, 2020; Kozikoğlu, 2016). When teachers perceive themselves as being capable of performing behaviours required to attain a specific outcome at their school, they may feel more committed to this school as they have seen that is a context in which they can be successful (Bogler & Somech, 2004). Moreover, the experiences of success may lead to positive appraisals of the organisation (Demir, 2020). However, a conceptual issue in the analysis of this association is the use of inaccurate and overgeneralised instruments to measure self-efficacy (Chesnut & Burley, 2015). Use of validated and domain-specific (e.g., work-related) instruments is thus required to advance understanding of this association. The present study addresses this.

Adaptability, another personal resource, has likewise been shown to be positively associated with organisational commitment in variable-centred research. In a recent study of Australian secondary school teachers, Collie, Guay, et al. (2020) found that adaptability uniquely predicted teachers' organisational commitment. It was suggested that because adaptable teachers actively engage in adjusting their thoughts, feelings, and behaviours in their workplace, they are able to see how such adjustments lead to positive change in this workplace, thus increasing their attachment to it.

As described above, the person-centred analysis conducted by Collie, Malmberg, et al. (2020) considered self-efficacy (a personal resource) as a profile indicator in an identification of demand-resource profiles and their associations with job satisfaction and organisational commitment. The two profiles associated with the greatest levels of organisational commitment were those characterised by high levels of self-efficacy, alongside

the other two job resources. Demand-resource profiles involving adaptability have yet to be conducted; however, given its role as a personal resource, it is possible that profiles higher in adaptability are linked with greater organisational commitment.

2.4.5.3.4 Well-being Factors. Prior work suggests that teachers reporting higher levels of emotional exhaustion may possess lower organisational commitment (Akdemir, 2019; Bogler & Nir, 2015; Collie et al., 2018). When teachers are emotionally exhausted, they are less capable of experiencing positive emotionality, which may inhibit the development of a positive connection to work (Collie et al., 2018). Conversely, and in line with the tenets of JD-R theory, teachers who are more energised in their work are more likely to be committed to their organisation as they are able to access resources that help them to achieve their work goals and grow as a professional (Hakanen et al., 2006). This association has been reported in studies of both Finnish and Turkish teachers (Hakanen et al., 2006; San & Tok, 2017).

2.4.5.3.5 Indirect Predictive Paths. In terms of indirect associations between demands and resources and organisational commitment, job resources appear to also predict organisational commitment via engagement. Once again, indirect paths are only examined using variable-centred approaches, which thus form the focus here. In a sample of Finnish teachers, Hakanen et al. (2006) found that teachers who drew on job resources such as job control, supervisory support, and innovation displayed greater engagement, and subsequently displayed greater levels of commitment to their organisation. Dicke et al. (2018) reported similar results with regards to personal resources. In their study of German beginning teachers, the authors reported an indirect association between self-efficacy and organisational commitment, mediated by engagement.

2.4.5.4 Interaction Processes for Both Turnover Intentions and Organisational Commitment

Turning to the interaction effects, while a number of studies (e.g., Bakker et al., 2007; Dicke et al., 2018) have considered the buffering and boosting processes in relation to measures of engagement and exhaustion, far fewer studies have considered associations with turnover intentions and organisational commitment. From a variable-centred perspective, no prior work involving teachers has extended the buffering or boosting processes to consider associations with these outcomes. However, there is some evidence in the broader literature to suggest that job resources may buffer the effect of demands on employees' leaving intentions. For instance, in a study of Finnish physicians, Heponiemi et al. (2008) reported that higher job control (a job resource) buffered the effect of distress on physicians' intentions to change the profession. Similarly, in a sample of Dutch employees in nursing houses, Proost et al. (2015) found that organisational justice (a job resource) buffered the effect of job demands on turnover intentions.

The person-centred work of Collie, Malmberg, et al. (2020) appears to be one of the only studies to have considered how the buffering and boosting processes are associated with teachers' retention-related outcomes. As described above, the authors identified profiles in which a range of job demands and job and personal resources interacted simultaneously. The *Mixed-Demand-Flourisher* profile was found to evince the highest levels of occupational commitment, which was significant given that this profile was not characterised by the lowest levels of demands. Instead, the authors suggested these optimal outcomes were attributable to the presence of the boosting effect, whereby resources become particularly important for well-being in the presence of demands. Taken together, further work is needed to clarify the extent to which interaction effects are associated with retention-related outcomes. Examining

such effects from both a variable- and person-centred perspective may nuance these understandings and thus provide a more focused course of intervention.

2.4.5.5 Summary

Despite the sizeable body of prior research examining turnover intentions and organisational commitment, a number of empirical questions remain. In terms of variable-centred research, prior work has only considered frequency of collaboration and professional development, not teachers' appraisals of their usefulness, in relation to the two outcomes. Moreover, research has yet to disentangle the unique roles of adaptability and self-efficacy with regard to these important outcomes. Further, very little prior research has been conducted in an Australian context. Finally, although prior work has considered how demand-resource profiles among teachers are differentially associated with teachers' commitment to the profession, it remains unknown whether any such demand-resource profiles are associated with commitment to their job (i.e., organisational commitment) and turnover intentions—two retention-related outcomes that hold specific relevance to individual schools (not just the profession more broadly).

The present investigation thus provides an opportunity to test the full JD-R model by examining how key demands and resources predict organisational commitment and turnover intentions, both directly and indirectly via behavioural engagement and emotional exhaustion. Based on prior research, it is expected that role conflict (the job demand) will be negatively associated with organisational commitment and positively associated with turnover intentions (Rajendran et al., 2020). Conversely, the job and personal resources are anticipated to be positively associated with organisational commitment and negatively associated with turnover intentions (Collie et al., 2018; Russell et al., 2020). It is also anticipated that job and personal resources will be indirectly associated with organisational commitment via behavioural engagement. Because these resources stimulate personal

growth, enable employees to manage challenges, and assist them to achieve their goals (Bakker, 2011; Collie et al., 2018), higher levels of behavioural engagement and subsequently, higher organisational commitment are anticipated. Conversely, because role conflict depletes individuals of psychological and physical energy (Parayitam et al., 2020), it is expected that this job demand will be positively associated with turnover intentions via emotional exhaustion. In terms of the interaction effects, it is expected that role conflict will moderate (boost) the positive association between the resources and behavioural engagement, while the job resources (useful collaboration, useful professional development) and personal resources (adaptability, self-efficacy) will moderate (buffer) the negative association between the job demand and emotional exhaustion. Figure 1.1 shows all these contended paths that were investigated in the variable-centred approach.

Turning to the person-centred analyses, it is proposed that between three and five profiles will be identified, which will be broadly classified as either adaptive and maladaptive: for example, low demands, high resources; average demands and resources; high demands, low resources; and a profile that may be mixed in terms of job and personal resources. It is expected that profiles higher in resources and lower in demands will exist and be positively associated with organisational commitment. Conversely, because of the taxing nature of demands on physical and psychological energy (Bakker & Demerouti, 2007), profiles higher in demands and lower in resources are expected to exist and be positively associated with turnover intentions. Figure 1.2 shows the overarching nature of the person-centred approach adopted in the present investigation.

When variable- and person-centred methodologies are conducted simultaneously, this is known as a complementary approach. As noted earlier, in addition to the unique insights provided by the variable- and person-centred approaches, it is anticipated that several complementary findings will emerge. For instance, based on the work of Collie, Malmberg,

et al. (2020), it is possible that factors found to be negatively associated in variable-centred analyses may be found to be positively associated for some profiles in the person-centred approach. Moreover, while variable-centred approaches can reveal the presence of direct associations and interaction effects as separate associations, person-centred approaches enable examination of how these two effects combine to produce joint outcomes (Van den Broeck et al., 2012). In doing so, person-centred methodologies extend variable-centred work by examining associations among people, rather than among variables. This enables the development of targeted interventions, which may be more appropriate in addressing teachers' motivation and performance at work.

2.5 Teacher Well-being and Student Achievement

A growing body of research has sought to examine the extent to which measures of teachers' well-being are associated with students' academic outcomes (Arens & Morin, 2016; Chang, 2009; Collie & Martin, 2017). From a theoretical standpoint, teachers experiencing high levels of well-being and socioemotional functioning may be more effective in instruction and managing classroom behaviours, which in turn is positively associated with student outcomes (Frenzel et al., 2021; Jennings & Greenberg, 2009). Conversely, burnout, and specifically emotional exhaustion, may lead to lower involvement and effort in lesson planning and more negative attitudes towards students (Frenzel et al., 2021; Grayson & Alvarez, 2008; Maslach & Leiter, 1999). Emotional exhaustion may also lead teachers to withdraw from the classroom, and ultimately higher rates of absenteeism (Taris, 2006), which in turn is negatively associated with students' achievement (Miller et al., 2007).

A small number of studies have sought to test these theorised links. For example, using MLM, Arens and Morin (2016) investigated the associations between teachers' emotional exhaustion (a core component of burnout, and considered to be a measure of well-being within JD-R theory; Demerouti et al., 2001) and class-level academic achievement in a

sample of teachers and students in Germany. Results revealed that teachers with higher levels of emotional exhaustion tended to have classrooms that attained lower levels of academic achievement. This was particularly pronounced for standardised achievement test scores. The authors posited that these teachers may lack the psychological and social resources required of their position.

Turning to the Australian context, Collie and Martin (2017) applied the JD-R model to examine the associations between teachers' well-being (measured by positive indicators of well-being) and students' achievement in a standardised literacy test. This study is particularly notable as it is one of the few to focus on a positive measure of teachers' well-being and employ JD-R to guide the investigation. Employing MLM, the authors revealed a significant positive association between secondary school mathematics teachers' well-being and class-average numeracy achievement.

Although there is a growing body of research indicating associations between teachers' well-being and students' academic achievement, a number of knowledge gaps remain. For example, more research in the primary (elementary) school sector is necessary, given that primary teachers have far greater face-to-face contact with students than secondary teachers (Madigan & Kim, 2021). This greater teacher-student exposure may strengthen the magnitude of the aforementioned associations. Likewise, there is a need to extend research in an Australian context to consider school-level measures of standardised achievement, given that such measures appear to be differentially related to measures of teacher well-being (Arens & Morin, 2016). Further still, prior research has largely examined associations at the classroom-level. Ascertaining the extent to which teachers' well-being is linked with school-average academic achievement is important for extending knowledge of the full scope of teacher well-being and its associations—and will be important to determining whether

school-wide efforts are incorporated into teacher well-being intervention in addition to the individual efforts typically under focus (Falecki & Mann, 2020).

In sum, then, in terms of a multilevel perspective, given evidence of school-level variance in workplace processes and outcomes (Maxwell et al., 2017), there is a need to identify the links between school-level workplace factors and school-average student achievement. Augmenting the teacher-level SEM and LPA approaches with teacher- and school-level approaches under MLM provides an important opportunity to disentangle teacher and school effects. To the extent there are significant links with student achievement at the school-level, this has implications for school-level policy and practice, beyond policy and practice aimed at supporting individual teachers. Complementary SEM, LPA, and MLM approaches are essential for shedding light on and informing these important educational issues.

2.6 Background Factors Important to Consider

Teachers' background attributes are inextricably linked with their perceptions of the working environment and how they manage workplace demands (OECD, 2013). The present study includes three background factors along these lines: gender, teaching experience, and personality. It is important to take such factors into consideration to ensure that the variation attributable to substantive factors (e.g., self-efficacy, adaptability, etc.) is above and beyond that which may be the product of background attributes. That is, these background factors are vital to include in variable-centred modelling in order to establish unique variance attributable to the substantive (JD-R) factors of interest. Moreover, including them as covariate predictors in modelling also allows for insight into the relationship between them and the substantive factors. Turning to person-centred approaches, examining the background factors as predictors of identified profiles can reveal the extent to which the background factors predict profile membership. Each background factor is now introduced in detail.

2.6.1 Gender

Gender has been shown to differentially predict teachers' perceptions of work and work-related outcomes—and thus is included as a key background factor in modelling for both Study 1 and 2. Starting with job resources, research tends to report that females engage in collaboration more than males (e.g., Killion, 2015; Mora-Ruano et al., 2018). Gender does not appear to be associated with teachers' perceptions of professional development; neither males nor females display significantly different attitudes towards such practices (Torff & Sessions, 2008). Such findings were confirmed in a cross-national examination of professional development conducted by the OECD (Barrera-Pedemonte, 2016).

Turning to personal resources, prior work suggests that females may have lower levels of self-efficacy than males. For instance, Klassen and Chiu (2010) found that female teachers possessed lower levels of self-efficacy for classroom management compared to their male counterparts. However, in other studies (e.g., Lazarides et al., 2018; Simbula et al., 2011), the association between gender and self-efficacy was non-significant. In terms of adaptability, studies of Australian teachers conducted by Collie et al. (2018) and Collie and Martin (2017) found no differences in adaptability due to gender.

In terms of job demands, and in a person-centred examination of teachers, Collie, Malmberg, et al. (2020) found males were more likely to be members of profiles characterised by lower levels of job resources (specifically, the *Job-Resourced-Average*, *Balanced-Average*, or *Struggler* profiles) than in profiles that experienced more positive work-related outcomes. The authors found that overall, males reported weaker perceptions of job resources compared to females, which may shed light on their perceptions of job demands.

Moving to well-being outcomes, in a study of Alaskan teachers, Schweitzer (2014) reported that female teachers were more engaged in the workplace than their male

counterparts. In a study of Australian teaching personnel, Martin (2009) likewise found that women were significantly lower in disengagement than men. Similarly, in a more recent study of U.S. teachers, Topchyan and Woehler (2020) found males to be significantly less engaged than their female colleagues. Comparatively, Klassen and colleagues (2012) conducted a cross-national examination of engagement among teachers in five countries (Australia, Canada, China [Hong Kong], Indonesia, and Oman). Their results broadly found no significant association between gender and engagement, except in the Omani sample, in which females were significantly more engaged than males. In terms of negative well-being, emotional exhaustion appears to be more common in females than in males (e.g., Antoniou et al., 2006; Olson et al., 2019). For example, in a study of Norwegian secondary school teachers, Skaalvik and Skaalvik (2016) found females to report higher levels of emotional stress and emotional exhaustion. Similarly, in a study of U.S. teachers, Chang (2013) reported higher levels of emotional exhaustion in females.

With regards to retention-related outcomes, studies of teachers across a range of developed countries have yielded conflicting results. For instance, in a longitudinal study of Finnish teachers, Räsänen et al. (2020) reported that males had stronger turnover intentions than females. However, in a recent study of Australian primary and secondary school teachers, Rajendran et al. (2020) reported no significant differences between male and female teachers' turnover intentions. Similarly, in a study of Hong Kong teachers, McInerney et al. (2015) reported no significant differences in turnover intentions as a function of gender. In terms of organisational commitment, mixed results have also been reported. For instance, although a number of studies have found that female teachers are generally higher than males in commitment (Choi & Tang, 2011; Karakuş & Aslan, 2009; Nagar, 2012), others suggest males may in fact be higher than females (e.g., Aydin et al., 2011) or that there are no significant associations between gender and organisational commitment (Collie et al., 2018).

2.6.2 Teaching Experience

Teaching experience is also included as a covariate given prior research has established its association with a number of the key constructs under examination in the present investigation. Beginning with job demands, whereas Kaur and Kaishta (2020) found no significant difference in role conflict as a function of teaching experience, in a sample of Indian female teachers, Lathakumar (2000) reported a negative association between years of experience and role conflict. Specifically, in their study teachers' role conflict declined as their years of teaching experience increased. Notably, early studies (e.g., Grace, 1972) found higher levels of role conflict in more experienced teachers.

With regards to job resources, no prior studies have considered the associations between teaching experience and useful collaboration and useful professional development. However, R. Li et al. (2019) suggested that more experienced teachers may be less likely to participate in professional development compared to their less experienced colleagues, due to lower levels of motivation and a belief that such experiences will yield limited rewards (Richter et al., 2011). Moreover, in their person-centred study, Collie, Malmberg, et al. (2020) demonstrated that teachers with greater experience were more likely to be in profiles higher in collaboration. The present work provided an opportunity to shed light on these associations looking specifically at useful collaboration.

In terms of personal resources, investigations of the associations between teaching experience and self-efficacy have delivered mixed results. For instance, although a number of studies suggest that more experienced teachers report stronger self-efficacy beliefs than less experienced teachers (Lazarides et al., 2018; OECD, 2013; Wang et al., 2015), other studies (e.g., Klassen & Chiu, 2010) suggest that levels of self-efficacy rise during early career, remain steady during mid-career, and then drop towards the later stages of career. From a person-centred perspective, Collie, Malmberg, et al. (2020) reported that more experienced

teachers tended to be in profiles higher in self-efficacy. Turning to adaptability, although most prior studies have reported non-significant associations between years of teaching experience and adaptability (e.g., Collie et al., 2018; Collie & Martin, 2017), a recent comparative study of Australian and British teachers (Collie, Malmberg, et al., 2020) revealed that schools with less experienced teachers demonstrated higher school-average adaptability. Perhaps this is because, in recent years, there has been an increased emphasis placed on providing practical experiences in pre-service teacher education courses (Ledger et al., 2020). Through these practical experiences, pre-service teachers are provided with opportunities to develop adaptability as they are required to teach across a diverse range of contexts.

In terms of well-being- and retention-related outcomes, a study of Australian secondary school teachers conducted by Collie et al. (2018) found that teachers with more experience reported lower levels of emotional exhaustion and higher levels of organisational commitment. It may be that teachers with more experience are able to mobilise a broader range of resources to manage challenges, thus resulting in lower levels of energy depletion (Collie et al., 2018). In terms of organisational commitment, this positive association may reflect the growth of commitment over time, which is considered to increase as a function of years in the organisation (Gao-Urhahn et al., 2016).

Studies of the associations between teaching experience and engagement have yielded conflicting results. Some studies (e.g., Collie et al., 2018; Topchyan & Woehler, 2020) have found no significant differences in work engagement as a function of years of teaching, while others (e.g., Schweitzer, 2014) have found that more experienced teachers have higher levels of engagement. Conversely, some studies (e.g., Kong, 2009) reported that teachers with zero to five years of experience were the most engaged, and those with 16 to 20 years of experience were the least engaged. In relation to turnover intentions, in a longitudinal study

of Finnish teachers, Räsänen et al. (2020) found that teachers with between six and 20 years experience most frequently reported turnover intentions, compared to teachers with five years of experience or less, or 21 years of experience or more. In contrast, Ajayi and Olatunji (2017) found higher turnover intentions in teachers with 21 years of experience or more.

2.6.3 Personality

Personality traits have been consistently associated with teachers' work-related attitudes (Collie, 2021; Perera et al., 2018). Personality refers to the unique patterns of thoughts, feelings, and behaviours that distinguish individuals from one another (Roberts & Mroczek, 2008). There are typically five dimensions of personality in major theoretical frameworks and measurement approaches (the so-called Big 5): agreeableness, conscientiousness, extraversion, neuroticism, and openness to experience (Costa & McCrae, 1999).

2.6.3.1 The Big 5

Agreeableness is characterised by a high degree of amicability, trust, and compliance (Costa et al., 2001). Agreeable individuals are more likely to be trusting, cooperative, and amiable (Sur & Ng, 2014). *Conscientiousness* refers to an individual's achievement orientation and the degree to which an individual is reliable and rule-abiding (Barrick et al., 2001). Bruk-Lee et al. (2009) suggest that individuals high in conscientiousness apply themselves to their jobs and derive a greater level of satisfaction from their core work tasks. Conscientious individuals may be more engaged in their work and perceive themselves as making consistent and positive progress in relation to their work goals. *Extraversion* is characterised by talkative, social, gregarious, and assertive behaviour (Barrick et al., 2001; Zhai et al., 2013). Extroverts have a higher number of friends, report higher levels of positive affect, and generally display positive reappraisal coping styles (Watson & Hubbard, 1996; Zhai et al., 2013). *Neuroticism* is characterised by the presence of negative affect, anxiety,

instability, and depression (Judge et al., 1999). Neurotic individuals are more likely to find themselves in unfavourable situations, and appear to handle stress using passive, emotion-focused forms of coping (Zhai et al., 2013). Individuals high in neuroticism are more reactive to challenging and negative situations (Rusting & Larsen, 1997). *Openness to experience* relates to intellectual nonconformity (Sur & Ng, 2014), and the degree to which one is likely to be imaginative, interested in novel ideas, and open-minded (Zhai et al., 2013).

2.6.3.2 Teachers' Personality and the JD-R Model

Prior work has established the role personality plays in influencing teachers' work-related experiences. For instance, in a variable-centred study of Australian academics, Bakker, Boyd, et al. (2010) found neuroticism to directly predict health impairment (viz., burnout), and extraversion to directly and positively predict commitment. The authors also found that individuals higher in neuroticism reported higher levels of job demands, while individuals higher in extraversion reported higher levels of job resources.

Teachers high in conscientiousness tend to report greater levels of self-efficacy and engagement, compared to teachers high in neuroticism, who tend to report lower levels of self-efficacy and satisfaction (Perera et al., 2018). It may be that conscientious teachers are better prepared and display a higher degree of self-discipline, which may lead to positive appraisals of their capacity to engage students and deliver instruction (Perera et al., 2018). Conversely, because neurotic individuals are prone to negative affect, they may negatively appraise their abilities and the characteristics of their work situation (Perera et al., 2018).

Interestingly, individuals higher in agreeableness and conscientiousness have also been shown to be more prone to burnout (Collie, 2021; Kokkinos, 2007). It may be that conscientious and agreeable individuals strive to be thoughtful and dependable, which in turn may give rise to greater levels of stress and exhaustion (Collie, 2021). Although less research

has considered openness to experience in teaching populations, there appears to be a tentative link between openness and general well-being (Aftab et al., 2017).

Turning to retention-related outcomes, prior work has established positive associations between extraversion, agreeableness, and conscientiousness and organisational commitment, and negative associations between neuroticism and openness to experience and commitment among school teachers and university educators (Farrukh et al., 2017; Ziapour et al., 2017). Moreover, in studies of university educators, extraversion and agreeableness have been negatively associated with turnover intentions (Jeswani & Dave, 2012).

Importantly, the studies described above are all variable-centred in nature, and the present investigation extended that prior work by examining the five personality factors as covariates in Study 1. The personality traits were not examined in Study 2 (person-centred), however, as the focus in this study was on identifying background characteristics (i.e., gender, teaching experience) that are readily observable and thus may guide targeted interventions. Specifically, the background characteristics examined in Study 2 were those that were readily identifiable, as opposed to personality traits which are not so readily discernible (Neal et al., 2012). Thus, the two background characteristics could arguably help to direct intervention efforts if they were found to be significant predictors of group membership.

2.6.4 Summary

Taken together, gender, teaching experience, and personality are included in the present study in order to control for variance attributable to them, and accordingly, to better identify the unique associations involving demands and resources beyond background factors. Furthermore, their inclusion allowed for a more complete theoretical and empirical understanding of their roles in predicting different aspects of the hypothesised models. In the variable-centred SEM (Study 1), they are included as predictors of all substantive factors (see

Figure 1.1). In the person-centred LPA (Study 2), gender and teaching experience are included as predictors of profile membership (see Figure 1.2).

2.7 Summary of Review of Literature

The present chapter sought to contextualise the broader investigation within the framework of the relevant theory and prior empirical work. Specifically, the chapter began by examining the work of teachers and considering the importance of the present investigation in light of the growing rates of teacher attrition across developed countries. Following this, JD-R theory was introduced as the overarching conceptual framework for the study. A discussion of the key methodological approaches—structural equation modelling, latent profile analysis, and multilevel modelling—proceeded. Next, the core constructs (role conflict, useful collaboration, useful professional development, adaptability, self-efficacy, behavioural engagement, emotional exhaustion, organisational commitment, and turnover intentions) were defined, followed by an exploration of prior work involving these variables, from which the hypothesised models (see Figures 1.1, 1.2, and 1.3) were developed. The latter part of the chapter explored the association between teacher well-being and students' achievement, especially school-average achievement. The chapter concluded with a discussion of the background factors relevant to the present investigation (gender, teaching experience, and personality). In the following chapter, the research questions and hypotheses for Study 1 (see Figure 1.1), Study 2 (see Figure 1.2), and Study 3 (see Figure 1.3) are presented.

Chapter 3

HYPOTHESES

3.1 Introduction

The aim of the current study was to extend knowledge on teachers' workplace experiences by applying Job Demands-Resources theory. To do so, three studies were conducted. In Study 1 (variable-centred), structural equation modelling was adopted to examine the ways in which job demands, job resources, and personal resources were directly and indirectly associated with measures of teachers' behavioural engagement, emotional exhaustion, organisational commitment, and turnover intentions. Interactions between demands and resources were also examined. Figure 1.1 depicts the hypothesised variable-centred model. In Study 2 (person-centred), profiles of teachers' demands and resources were developed. Next, the extent to which these profiles were predicted by teachers' background factors was examined, as well as the extent to which these profiles were associated with different levels of behavioural engagement, emotional exhaustion, organisational commitment, and turnover intentions. Figure 1.2 shows this hypothesised model. In Study 3, multilevel modelling was used to examine the associations between the school-level aggregates of the two well-being outcomes (viz. behavioural engagement and emotional exhaustion) and school-average academic achievement. Figure 1.3 depicts this hypothesised model. Following the review of theory and research, numerous hypotheses are proposed, as follows.

3.2 Study 1 Hypotheses

H1a. Direct Associations Involving the Job Demand: Job demand (role conflict) will be positively associated with emotional exhaustion and turnover intentions and negatively associated with behavioural engagement and organisational commitment.

H1b. Indirect Associations Involving the Job Demand: Job demand (role conflict) will be positively associated with turnover intentions via emotional exhaustion.

H1c. Direct Associations Involving the Resources: Job resources (useful collaboration, useful professional development) and personal resources (adaptability, self-efficacy) will be positively associated with behavioural engagement and organisational commitment and negatively associated with emotional exhaustion and turnover intentions.

H1d. Indirect Associations Involving the Resources: Job resources (useful collaboration, useful professional development) and personal resources (adaptability, self-efficacy) will be positively associated with organisational commitment via behavioural engagement.

H1e. Moderated (Boosting) Role of Job Demand: Job demand (role conflict) will moderate (boost) the positive association between the resources and behavioural engagement.

H1f. Moderated (Buffering) Role of Resources: Job resources (useful collaboration, useful professional development) and personal resources (adaptability, self-efficacy) will moderate (buffer) the negative association between the job demand and emotional exhaustion.

H1g. Direct Associations Involving Behavioural Engagement: Behavioural engagement will be positively associated with organisational commitment and negatively associated with turnover intentions.

H1h. Direct Associations Involving Emotional Exhaustion: Emotional exhaustion will be positively associated with turnover intentions and negatively associated with organisational commitment.

To note is that analyses to test Hypotheses *H1a* to *H1h* control for variance attributable to covariate factors—for example, modelling the role of job resources beyond the effects of gender, years teaching, and personality. In addition, preliminary analyses also provided the opportunity to examine the equivalence of measurement properties and model paths across different subgroups of the background factors (gender and teaching experience). No hypotheses were established for these analyses involving the background factors and personality. Finally, a plausible alternative model was also examined to provide a further test of support for the theoretically derived associations in the hypothesized model (see Figure 1.1).

3.3 Study 2 Hypotheses

H2a. Between three and five profiles (as suggested in the review of literature) of teachers will be identified via latent profile analysis. These are hypothesised to include adaptive and maladaptive profiles of demands and resources; e.g., low demands, high resources; average demands and resources; high demands, low resources; and a profile that may be mixed in terms of job and personal resources.

H2b. Profiles higher in resources and lower in demands will be positively associated with behavioural engagement and organisational commitment.

H2c. Profiles higher in demands and lower in resources will be positively associated with emotional exhaustion and turnover intentions.

No hypotheses were established regarding the role of the two background factors (gender and teaching experience). Instead, the extent to which these factors were associated with profile membership was an open empirical question.

3.4 Study 3 Hypotheses

H3a. Higher school-average behavioural engagement will be associated with higher school-average academic achievement.

H3b. Higher school-average emotional exhaustion will be associated with lower school-average academic achievement.

3.5 Summary

Taken together, support for the above hypotheses has the potential to yield considerable insights into the variables, processes, and outcomes associated with teachers' well-being, which in turn may hold implications for teachers, schools, and students alike. From a variable-centred perspective, support for these hypotheses may extend understanding of the job and personal resources that can be fostered to optimise teachers' positive workplace functioning, and conversely, the job demands and dimensions of burnout that need to be reduced or managed. From a person-centred perspective, understanding the profiles associated with the most adaptive outcomes has the potential to provide useful direction for interventions that can target specific and identifiable groups (profiles) of teachers. Finally, from a multilevel perspective, establishing whether there are school-level differences in teachers' behavioural engagement and emotional exhaustion, and if the differences are related to students' academic achievement, will be helpful to inform school-level interventions targeting these factors. Although no firm hypotheses are advanced for the complementary findings across the studies, as noted earlier, it is anticipated that there will be unique insights revealed when the findings from all three studies are combined. For example, it is expected that findings will provide more nuanced knowledge of the broad associations between factors across the whole sample, as well as knowledge of specific associations for subpopulations. As another example, it is anticipated that the complementary approach will reveal those resources most salient in predicting teachers' positive outcomes, as well as the specific combinations of resources that not only predict the most optimal outcomes, but also help teachers to manage demands.

Chapter 4

METHODOLOGY FOR STUDY 1

Study 1 adopted a variable-centred approach to examine the workplace experiences of primary (Kindergarten to Grade 6; K-6) teachers in New South Wales (Australia's most populous state). Specifically, the cross-sectional study tested the core tenets of Job Demands-Resources theory by considering the associations between a range of demands and resources, behavioural engagement and emotional exhaustion, and two retention-related outcomes (organisational commitment and turnover intentions), in addition to testing the buffering and boosting processes hypothesised in JD-R theory. The proposed model depicting the associations under examination is shown in Figure 4.1. The hypotheses guiding this study can be found on p. 103. This chapter first discusses the characteristics of the Study 1 sample and proceeds to provide an overview of the relevant procedure, measurement, instrumentation, and analysis undertaken to address the central research questions posed in Study 1. In subsequent chapters, the methodologies for Studies 2 and 3 will be described.

4.1 Sample

In total, 486 teachers from 39 schools participated in Study 1. Of the sample, 414 (85.2%) were female and 72 (14.8%) were male. This is comparable to the NSW population parameters where 82.2% of primary school teachers are female and 17.8% are male (New South Wales Department of Education [NSW DET], 2020). Teachers' ages ranged from 21 to 72 years, with an average age of 40 years (*SD* = 12). In terms of experience, teachers reported between one and 52 years of teaching, with an average of 15 years (*SD* = 11). The vast majority of teachers (95.3%) reported teaching both boys and girls, while 12 teachers (2.5%) reported teaching all girls, and 11 teachers (1.6%) only taught boys. Of the sample, 82.7% taught in government schools, while 17.3% taught in non-government (independent) schools. Regarding qualifications, over half of the teachers (58.4%) held a minimum of a Bachelor's

degree, while over a third (35.4%) held a postgraduate qualification. Six percent (6%) held a diploma. Socioeconomic status was analysed by way of the school's Index of Community Socio-Educational Advantage (ICSEA) value. The value on the index corresponds to the average level of educational advantage of the school's student population relative to those of other schools (Australian Curriculum, Assessment and Reporting Authority [ACARA], 2015), with 1000 considered to be the national average value (*SD* = 100). In the present study, school ICSEA values ranged between 872 and 1183. The mean ICSEA value in the present sample was 1076 (*SD* = 104.6), which is slightly above the national average (i.e., *M* = 1000, *SD* = 100). Turning to the language backgrounds of teachers, in addition to English, which was spoken by 95.2% of the sample, a small proportion of teachers (4.8%) also spoke Arabic, Cantonese, Greek, Italian, Macedonian, or Vietnamese.

4.2 Procedure

The research project received ethics approval from the University of New South Wales Human Research Ethics committee (see Appendix A). As a number of the schools to be invited were NSW Government Schools, approval from the NSW DET State Education Research Applications Process (SERAP) was also sought (see Appendix B). Once this approval was provided, schools were invited to participate in the study. For independent schools, each principal was approached individually and permission to conduct the study was sought.

Data were collected between late 2018 and early 2019 with an average response rate of 54% at each school. To ensure a large cross-section of schools participated, schools from across NSW were contacted. Some schools were invited as a result of professional connections with the researcher, while others were approached through a convenience and snowballing approach. All schools were assured that their decision to participate would neither advantage nor disadvantage the school's relationship with the University or its

researchers. School principals were first contacted by either phone or email with an overview of the study and how they could be involved. If the principal provided consent for their school to participate, further arrangements were made to collect the data at that school. Principals returned copies of the consent form via email (see copy of the Principal Information statement in Appendix C). The survey was in an online format, and was delivered either via a weblink sent by the principal to staff, or through the link provided by the researcher during a staff meeting where the study was introduced. Of these methods, 52% of the sample completed the survey after receiving the link directly from the principal, 37% completed the survey after the researcher attended a staff meeting to explain the study, and 11% completed the survey while the researcher was in attendance at the staff meeting. A digital copy of the participant information statement was presented on the first page of the survey (see Appendix D). Participants were required to provide their consent by indicating their agreement to participate on the first page of the survey.

4.3 Instrumentation

The instrumentation used in this study was included in a single survey (see Appendix E for all instruments used). All substantive factors were scored on a scale from 1 (strongly disagree) to 7 (strongly agree). Scale reliability was calculated using M*plus* and evaluated by way of McDonald's omega coefficient. Omega coefficients provide a better approximation of scale reliability and make fewer and more realistic assumptions compared to alpha coefficients (Dunn et al., 2014; Peters, 2014; see Methods for more details on this measure of reliability). Omega coefficients which exceed .65 are considered adequate (Catalán, 2019).

The constructs under examination were:

1. Job demands: Role conflict.
2. Job resources: Useful collaboration and useful professional development.
3. Personal resources: Adaptability and teacher self-efficacy.

4. Behavioural engagement (Indicative of the Motivational Process).
5. Emotional exhaustion (Indicative of the Health Impairment Process).
6. Retention-related outcomes: Organisational commitment and turnover intentions.
7. Covariates: Gender, teaching experience, and personality traits (agreeableness, conscientiousness, extraversion, neuroticism, openness to experience).

4.3.1 Job Demands

4.3.1.1 Role Conflict

The measure to assess role conflict was based on four items used by Starnaman and Miller (1992). The scale was originally intended for American teachers in the early 1990s and so particular terms and phrases were adapted to render the scale more appropriate to a contemporary Australian schooling context. For example, instead of "I have to buck a rule or policy", the present study reworded the item to "I often have to bypass or ignore a rule or policy". Additionally, the term "administrative head" was replaced with "supervisor". Items included: "I receive conflicting demands from two or more people at school"; and "There is a difference between the way my supervisor thinks things should be done and the way I think they should be done". Starnaman and Miller (1992) performed confirmatory factor analysis on the original scale to assess the reliability of the items in a sample of American teachers, reporting an internal consistency alpha coefficient of .78. In the current investigation, the adapted scale was tested, and a coefficient omega (ω) of .76 was found.

4.3.2 Job Resources

4.3.2.1 Useful Collaboration

Useful collaboration was assessed via six items adapted from the School Level Environment Questionnaire – Revised (B. Johnson et al., 2007). Items were adapted by adding "it is useful" or "…are generally helpful" or "I find it helpful" to the items developed

by B. Johnson et al. (2007). Items included: “It is useful when I collaborate with other teachers at my school to discuss classroom instruction”; and “The opportunities I have to work with other teachers at my school are generally helpful for my teaching.” In their examination of the original scale in a sample of American teachers, B. Johnson et al. (2007) reported internal consistency reliability alpha estimates of .82 for the collaboration items. The current investigation provided the opportunity to test the adapted scale. Accordingly, a coefficient omega (ω) of .93 was found in this study.

4.3.2.2 Useful Professional Development

Useful professional development was assessed via six items developed specifically for this study. Although previous TALIS surveys (OECD, 2014) have examined participation in professional development, such investigations have not examined teachers’ perceptions of the *usefulness* of professional development to their own practice. This study thus sought to disentangle the usefulness of professional development as distinct from participation. Based on observations of schools and discussions with teachers, a six-item measure was developed. The items were as follows: “The professional development at my school is...:” “helpful to my work as a teacher”, “enhances my teaching”, “allows me to do a better job in the classroom”, “helps me meet the needs of my students”, “allows me to improve my content knowledge”, and “helps me to implement the curriculum effectively”. The current investigation provided the opportunity to test the robustness and validity of the items, including through measurement invariance tests. A coefficient omega (ω) of .96 was recorded for this scale in the present investigation.

4.3.3 Personal Resources

4.3.3.1 Adaptability

Adaptability was measured using the long form of the Adaptability Scale—Domain Specific (Martin et al., 2015). The scale consisted of 9 items which measured behavioural,

cognitive, and emotional adaptability at work. Sample items included: “I am able to adjust my thinking or expectations at work to assist me in a new situation if necessary” (cognitive); “At work, I am able to reduce negative emotions (e.g., fear) to help me deal with uncertain situations” (emotional); and “To assist me in a new situation at work, I am able to change the way I do things if necessary” (behavioural). As per prior measurement work (Martin et al., 2012, 2013), an overarching adaptability factor was employed and estimated by way of the three mean scale scores reported for cognitive, behavioural, and emotional adaptability. The Adaptability Scale has previously been used in a number of studies of Australian teachers (e.g., Collie et al., 2018; Collie & Martin, 2017), in which Cronbach’s alphas of between .76 and .91 were recorded. The coefficient omega (ω) was .89 in the present study.

4.3.3.2 Self-efficacy

Self-efficacy was measured using the Teacher Self Efficacy Scale (TSES; Tschannen-Moran & Woolfolk Hoy, 2001). The twelve-item scale assessed self-efficacy in relation to instructional strategies, student engagement, and classroom management. Sample items included: “I am confident that I can control disruptive behaviour in the class” (classroom management); “I am confident that I can use a variety of assessment strategies” (instructional strategies); and “I am confident that I can motivate students who show low interest in school work” (student engagement). The TSES has demonstrated adequate reliability and validity across a range of teaching populations (Klassen et al., 2009). It has been used across samples of Australian, Korean, Singaporean, Canadian, Cypriot, and American teachers, with reliability alpha coefficients ranging between .67 and .85 for instructional strategies, .74 and .88 for student engagement, and .85 and .90 for classroom management (Klassen et al., 2009; O’Neill & Stephenson, 2012). In the present study, an overarching self-efficacy factor was employed and measured by way of the three scale mean scores for each core dimension (classroom management, instructional strategies, and student engagement) to avoid

multicollinearity given relatively strong intercorrelations. In the present study, the coefficient omega (ω) was .96.

4.3.4 Health Impairment Process

4.3.4.1 Emotional Exhaustion

Emotional exhaustion was examined using four items from the Maslach Burnout Inventory (MBI; Maslach & Jackson, 1981). Items included: “I feel emotionally drained from my work”; and “I feel used up at the end of the workday”. The MBI has been used across a range of countries and occupations and has demonstrated robust psychometric properties when applied in samples of teachers (e.g., $\alpha = .87$ in Keller et al., 2014; $\alpha = .90$ in Richards et al., 2016). In the present study, the coefficient omega (ω) was .91.

4.3.5 Motivational Process

4.3.5.1 Behavioural Engagement

Behavioural engagement was assessed using four items developed by Klassen et al. (2013). Items included: “While teaching I pay a lot of attention to my work”; “While teaching, I really throw myself into my work”; “While teaching, I work with intensity”; and “I try my hardest to perform well while teaching”. These items fall under the “Cognitive Engagement” factor in the original scale, but were selected to assess behavioural engagement because they map well onto the operationalisation in the present investigation. Namely, behavioural engagement was defined as the action-facilitating behaviours that are focused on achieving organisational objectives (Macey & Schneider, 2008), which these items capture (e.g., “I try my hardest to perform well while teaching”). Notably, when developing these items, Klassen et al. (2013) reported that the cognitive and physical dimensions of engagement shared similarities and were thus difficult to separate. Hence, the present investigation considered behavioural engagement to comprise both physical and cognitive components of engagement in that both cognitive and physical effort (as per the scale’s item

wording) were required in concert to facilitate behavioural engagement. Prior applications of these items have demonstrated sound psychometric properties in samples of Canadian and Australian teachers (α = .84 in Klassen et al., 2013; α = .84 in Perera et al., 2018). In the present investigation, a coefficient omega (ω) of .80 was derived for this scale.

4.3.6 Retention-Related Outcomes

4.3.6.1 Organisational Commitment

This study assessed organisational commitment using Collie et al.'s (2016) adaptation of Vandenberghe and Bentein's (2009) Organisational Commitment Scale. The scale consisted of four items and has demonstrated reliability and validity in previous studies of teachers (e.g., α = .87 in Collie et al., 2016). Sample items included: "I really feel a sense of belonging to my organisation"; and "I am proud to belong to this organisation". In the current study, the coefficient omega (ω) for this scale was .81.

4.3.6.2 Turnover Intentions

Three items developed by Vandenberghe and Bentein (2009) were used to assess the turnover intentions of teachers. Sample items included: "I often think about quitting this organisation"; and "I intend to search for a position with another employer within the next year". Alpha coefficient reliabilities of between .80 and .84 have been reported in previous research using this instrument (Vandenberghe & Bentein, 2009). In the present research, a coefficient omega (ω) of .88 was found for this scale.

4.3.7 Covariates

To ascertain the predictive role of the variables selected for the present research, and to more confidently attribute variation to the selected substantive variables (distinct from variation attributable to background attributes), two background and demographic characteristics were taken into consideration. In addition to controlling for their variance in the model, the inclusion of these covariates also yielded information regarding their role in

predicting the substantive factors in the model. These factors were gender (coded 1 = female, 2 = male) and years of teaching experience.

A further aim of the present study was to determine the extent to which the substantive factors accounted for variance above and beyond existing personality traits. As personality was not a central factor under examination, a brief personality scale was used (Gosling et al., 2003), consisting of a single item measure for each personality trait. Participants were thus asked to indicate how much they disagreed/agreed with a series of statements which encapsulated the core of each of the "Big 5" personality traits (agreeableness, conscientiousness, extraversion, neuroticism, and openness to experience; Donnellan et al., 2006), as follows: "I see myself as"… "sympathetic, warm" (for agreeableness), "dependable, self-disciplined" (for conscientiousness), "extraverted, enthusiastic" (for extraversion), "anxious, easily upset" (for neuroticism), "open to new experiences, complex" (for openness to experience). In their validation of the inventory, Gosling et al. (2003) reported adequate levels of convergent and discriminant validity, test-retest reliability, and convergence between self- and observer-ratings.

4.4 Statistical Analyses

Data analysis in Study 1 consisted of seven stages: descriptive statistics (stage 1), confirmatory factor analysis (CFA; stage 2), measurement invariance tests using multigroup CFA (stage 3), structural equation modelling (SEM) (stage 4), model invariance using multigroup SEM (stage 5), tests of indirect associations (stage 6), and testing alternative models (stage 7). Analysis of descriptive statistics was performed using SPSS v.25, and reliability analyses, CFA, SEM, and supplementary analyses were performed using M*plus* v.8.4 (Muthén & Muthén, 2018).

4.4.1 Stage 1: Descriptive Statistics, Reliability, Distributions, Standard Deviations, Skewness and Kurtosis, and Missing Data

Initial analysis of the data involved calculating and reporting descriptive statistics (means, standard deviations, skewness, and kurtosis), and reliability estimates of all substantive variables. Given that the statistical analysis was parametric, it was important that the substantive scales demonstrated sound psychometric properties. Distributional properties were examined by way of skewness and kurtosis to ascertain the extent to which measures reflected approximately normal distribution. Skewness values that exceeded the absolute value of 3, and kurtosis values that exceeded the absolute value of 10 were considered to reflect poor distribution (Kline, 2011). Scale reliability was calculated using standardised factor loadings and residuals from CFA in M*plus* and was evaluated by way of McDonald's omega coefficient (McNeish, 2018). The omega coefficient is interpreted in the same way as an alpha coefficient (Deng & Chan, 2017) and is considered a more appropriate and consistent measure of scale reliability in the psychological sciences (Dunn et al., 2014).

As personality was measured using single items, it was necessary to account for measurement error. This was achieved by calculating an error-adjusted mean score from the data obtained from a sample of Australian teachers in a study conducted by Perera et al. (2018). Variances and alpha coefficients for each substantive factor were used to generate residual variances that were then used to calculate composite scores. The following equation was used: $\sigma^2 * (1- \omega)$, where σ is the estimated variance of a variable and ω is the reliability estimate of the same variable (Brown, 2006). In so doing, unreliability was accounted for in the model, as would be the case if latent modelling were conducted.

Teachers were clustered within schools using the cluster command ("type = complex") in M*plus* to appropriately adjust for standard errors as a result of nesting within schools. Missing data (7.4%) were handled with full information maximum likelihood

(FIML) procedures. FIML generates model fit estimations based on all available information, and has been shown to produce unbiased estimates and standard errors (Cham et al., 2017). Additionally, as the study was not exploratory in nature, and the parameters to be estimated were clear, FIML was considered superior to alternative approaches such as multiple imputation (Dong & Peng, 2013). Finally, FIML has been shown to be effective when used in conjunction with the robust maximum likelihood estimation, even in cases of high missing data, under conditions of missing-at-random (MAR), and notably in cases when not all of the MAR assumptions have been met (Enders, 2001; Shin et al., 2009).

4.4.2 Stage 2: Confirmatory Factor Analysis (CFA) of Scales

The factor structure for all scales was assessed using CFA, which determined the degree to which scale items loaded appropriately on their target factor (e.g., whether the items purporting to measure teacher self-efficacy actually functioned together as one latent factor). CFA was conducted via the variance/covariance matrix. The aim was to determine whether the theoretical factor structure was reflected in the data. In total, the CFA comprised nine substantive factors and seven background factors and personality traits—thus, a 16-factor structure in all. Model fit was assessed by way of CFI and RMSEA. Excellent fit was indicated by CFI values greater than .95 and RMSEA values lower than .06 and adequate fit was indicated by CFI values greater than .90 and RMSEA values less than .08 (Hu & Bentler, 1999; Schreiber et al., 2006).

Interaction effects were not included in the measurement model as such terms do not have means, variance, or covariances with other parameters, and thus should not affect the fit of the measurement model (Muthén, 2012). Taken together, the CFA provided information on the overall factor structure, as well as the factor loadings, factor variances/covariances (viz, a correlation matrix), and error terms for each variable and latent factor.

4.4.3 Stage 3: Testing Measurement Invariance with Multigroup Confirmatory Factor Analysis

Prior to conducting SEM, it was necessary to test measurement invariance among key subgroups within the study. Establishing measurement invariance provides a justification for pooling the data for SEM, rather than conducting SEM as a function of group membership. Establishing invariance also increases the likelihood that the conclusions drawn from the central analyses are primarily due to differences in substantive variables, rather than as a function of subgroup membership and differences in underlying measurement properties for these subgroups. Measurement invariance tests also provide additional evidence of validity for the scores of the newly developed scales examined in the project.

Multigroup CFA was used to test measurement invariance based on years of teaching experience. The parameters for these subgroups were established by conducting a median split on the data set according to years of teaching experience, such that two groups were formed: early career (less than or equal to 12 years) and later career (more than 12 years of teaching experience). It was initially envisaged that invariance tests would also be conducted as a function of gender; however, invariance as a function of gender could not be established due to the disproportionate number of females to males (89% female, 11% male)—which reflects the typical gender composition of primary schools, but is not appropriate in modelling.

For the teaching experience measurement invariance test, significant variation in factor structure and measurement between subgroups would indicate that the sample should not be analysed as a whole, but instead by subgroup. For this study, three models were tested. Model 1 (baseline model; configural) allowed all parameters to be free across the two subgroups (early career vs. later career). Model 2 (metric) constrained factor loadings across the two subgroups. Model 3 (scalar) constrained factor loadings and intercepts across the two

subgroups. Each model was analysed for changes in the CFI and RMSEA. If the changes between each model were equal to or less than a CFI value of -.01 (Cheung & Rensvold, 2002), and changes in the RMSEA value were no greater than .015 (Chen, 2007), this was taken to indicate measurement invariance across the subgroups.

4.4.4 Stage 4: Structural Equation Modelling (SEM)

To the extent that the CFA and factor structure invariance demonstrated measurement support, SEM was used to explore "directional" associations between covariates (gender, teaching experience, and the five personality traits), predictors (e.g., job resources, interaction terms), well-being factors (e.g., engagement, burnout), and retention-related outcomes (e.g., well-being) in the hypothesised model (see Figure 4.1). Specific factors at each stage of the model were also correlated for their shared variance. More precisely, all covariates were correlated; job resources, job demands, personal resources, and interaction effects were correlated; behavioural engagement and emotional exhaustion were correlated; and the retention-related outcomes were correlated. Having correlated these factors, SEM was used to determine the predictive associations between the covariates, the job demand, job resources, personal resources, behavioural engagement, emotional exhaustion, and the retention-related outcomes. The hypothesised model was tested and evaluated based on its model-fit statistics. As in the CFA, the MLR was used to estimate this model, teachers were clustered within schools, and both CFI and RMSEA were used as the criteria to assess fit with the same cut-offs as listed above.

Interaction terms were calculated in SPSS by multiplying the standardised values of the job demand with the various job and personal resources, resulting in the creation of four two-way interaction terms (adaptability x role conflict; useful collaboration x role conflict; useful professional development x role conflict; self-efficacy x role conflict). Per JD-R theory, interactions were only computed between the personal resources and the job demand,

and the job resources and the job demand, as demands and resources are considered to have opposing effects on well-being outcomes (Schaufeli, 2017). This approach to calculating interaction terms was used given that initial attempts to model interactions as latent factors resulted in non-convergence due to the complexity of the model. Accordingly, interaction effects were modelled as non-latent factors. As the interactions were comprised of the job demand, job resources, and personal resources, they were correlated alongside these five variables (viz. role conflict, useful collaboration, useful professional development, adaptability, and self-efficacy).

Following this initial modelling, a number of iterations in modelling were run to determine the most parsimonious and conceptually appropriate solution. In the initial model, all four interactions (adaptability x role conflict; useful collaboration x role conflict; useful professional development x role conflict; self-efficacy x role conflict) were included as predictors of behavioural engagement, emotional exhaustion, organisational commitment, and turnover intentions. Based on the initial model results, interaction effects that had non-significant associations with the four outcomes were removed one at a time beginning with the smallest standardised beta estimate. Following this, the model was re-estimated using only those interactions that were significant at a *p*-value of $< .05$. The resulting significant interaction effects were interpreted using simple slopes tests.

4.4.5 Stage 5: Testing Model Invariance with Multigroup Structural Equation Modelling

Following estimation of the structural model, the next stage of analyses involved multigroup SEM to test for invariance in predictive parameters across the two subgroups based on years of teaching experience (again, there were too many females to justify testing invariance as a function of gender). Achieving invariance across sub-groups was important to provide support for the model's generalisability. The model invariance testing process

involved examining the extent to which subgroup membership moderated the structural paths under examination. This involved two stages. The first stage sought to establish broad model invariance. This involved comparing two models: Model 1, in which all parameters in the SEM (i.e., loadings, intercepts, correlations, residuals) were unconstrained; and Model 2, which constrained the standardised β paths. Again, RMSEA and CFI were monitored for changes not exceeding .015 and -.01, respectively (Chen, 2007; Cheung & Rensvold, 2002). In the second stage, path-level invariance was determined by comparing beta estimates across the SEMs. Paths were considered to be non-invariant if they met two criteria: (a) the path was significant in one group but not the other, and (b) the Wald test of difference (using a Bonferroni correction given the number of comparisons) in M*plus* indicated two paths were significantly different in strength from each other. Considering invariance both broadly and at a path-level provided stronger evidence for the model's generalisability compared to adopting either test in isolation.

4.4.6 Stage 6: Indirect Associations

The next stage of data analysis involved tests of indirect associations between the predictors (including the interaction terms), process factors, and outcomes. Testing of indirect associations enables further understanding of the mechanism by which a mediator (e.g., emotional exhaustion) plays a role in the associations between an independent variable (e.g., adaptability) and an outcome (e.g., organisational commitment). Indirect associations provide a more nuanced understanding of psychological processes and may inform interventions (Gunzler et al., 2013). This stage of analyses considered, for example, indirect associations such as adaptability on turnover intentions via emotional exhaustion (i.e., adaptability → emotional exhaustion → turnover intentions), and the indirect effect of role conflict on organisational commitment via emotional exhaustion (i.e., role conflict → emotional exhaustion → organisational commitment). In addition to indirect associations involving the

substantive variables, indirect associations involving the interaction terms (e.g., useful professional development x role conflict) were also considered. Such analyses enable the examination of the extent to which an indirect effect is moderated by another variable (e.g., the extent to which useful professional development moderates the indirect association between role conflict and turnover intentions via turnover intentions). Such analyses are indicative of moderated mediation (Edwards & Konold, 2020). All indirect associations were examined using a non-parametric bootstrapping approach (1000 draws; Shrout & Bolger, 2002). Confidence intervals were calculated to determine the significance of the indirect associations (Martin, 2007).

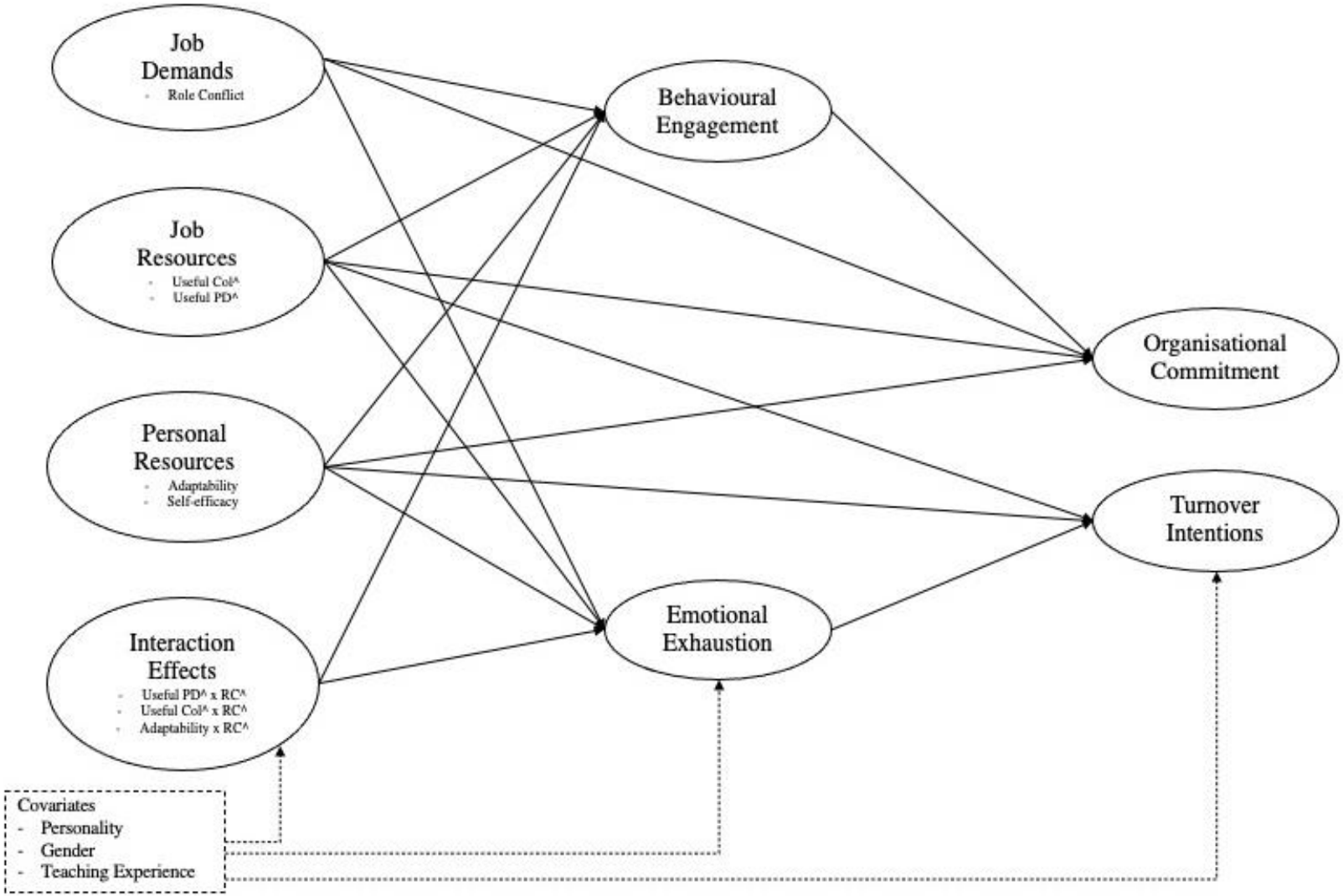
4.4.7 Stage 7: Alternative Model

The final stage of data analysis involved testing the viability of an alternative model. This analysis was performed in light of the issues of cyclical associations present within JD-R theory. Prior research suggests that resources and the motivational process (viz., engagement) may mutually influence each other in a cyclical fashion (Schaufeli et al., 2009; Xanthopoulou et al., 2008). There is thus a need to consider the dynamic relations between variables in the model (Schaufeli & Taris, 2014), and specifically, the cyclical relations between resources and engagement. One alternative model was tested in which behavioural engagement and emotional exhaustion were associated with job resources, personal resources, job demands, and the interactions, which in turn was associated the retention-related outcomes. This conceptualisation is consistent with prior studies (e.g., Schaufeli et al., 2009; Xanthopoulou et al., 2008), which have found cyclical associations between resources and engagement. To test the alternative model, an initial model involving all main and interaction effects was run. Then, only significant associations involving the interaction effects were retained (as described above in Stage 4). With this more parsimonious model, indirect associations were tested (using a non-parametric bootstrapping approach with 1000

draws; Shrout & Bolger, 2002). Confidence intervals were calculated to determine the significance of the indirect associations (Martin, 2007).

Figure 4.1

Hypothesised variable-centred model



Note. The interaction effects refer to interaction terms that were examined between all job demands and resources (both job and personal).

Chapter 5

RESULTS FOR STUDY 1

This chapter reports the findings of the seven phases of data analysis employed in Study 1: reliability and descriptive statistics, confirmatory factor analysis (CFA), multigroup CFA, structural equation modelling (SEM), multigroup SEM, indirect associations testing, and alternative model testing.

5.1 Reliabilities and Descriptive Statistics

The first stage of analysis involved assessing the descriptive statistics and reliability of each factor under examination in the study. The scale means and standard deviations for each substantive factor are presented in Table 5.1. The distributional properties (skewness and kurtosis values) are also presented in Table 5.1. These values demonstrate that the scales were approximately normally distributed, as all fall within the acceptable ranges for skewness and kurtosis (Kline, 2011). Table 5.1 displays McDonald's omega coefficient for each substantive factor. As is evident, reliability for each psychometric scale was sound, with all coefficients higher than the .65 that is considered desirable (Catalán, 2019). Taken together, the reliability and distributional data provided strong support for proceeding with confirmatory factor analysis.

5.2 Confirmatory Factor Analysis and Latent Correlations

In Stage 2 of the data analysis, confirmatory factor analysis (CFA) was performed to evaluate the psychometric properties of scale items and to ensure each item loaded appropriately onto each target construct. The CFA also enabled identification of the latent correlations between factors. The hypothesised factor structure yielded adequate fit: χ^2 (817) = 1659.18, $p < .001$; RMSEA = .046; CFI = .92. Standardised factor loading means and ranges are presented in Table 5.1.

Table 5.1

Descriptive, Reliability, and CFA Statistics for Substantive Factors for Study 1

	Mean	*SD*	Skewness	Kurtosis	ω – Omega coefficient	Factor loading mean (range)
Job Demands						
Role conflict	4.01	1.22	-0.10	-0.49	.76	.58 (.45-.67)
Job Resources						
Useful collaboration	6.17	0.77	-1.24	2.08	.93	.78 (.73-.87)
Useful professional development	5.39	1.11	-1.17	1.91	.96	.89 (.80-.94)
Personal Resources						
Adaptability	5.57	0.66	-0.65	0.65	.89	.78 (.73-.81)
Self-efficacy	6.05	0.58	-0.89	2.40	.96	.81 (.80-.84)
Health Impairment Process						
Emotional exhaustion	4.86	1.42	-0.60	-0.32	.91	.81 (.76-.87)
Motivational Process						
Behavioural engagement	6.19	0.62	-0.63	0.35	.80	.67 (.53-.79)
Retention-Related Outcomes						
Organisational commitment	5.32	1.16	-0.72	0.20	.81	.67 (.46-.83)
Turnover intentions	3.09	1.61	0.44	-0.76	.88	.78 (.59-.92)

Table 5.2 shows the correlations among the substantive variables. Although the substantive variables and covariates were examined simultaneously, they are presented in two separate tables for clarity. Correlations between the substantive variables are discussed first. In terms of job resources, collaboration was significantly and positively associated with professional development (r = .46, p < .001), adaptability (r = .49, p < .001), self-efficacy (r = .27, p < .001), behavioural engagement (r = .23, p < .001), and organisational commitment (r = .45, p < .001). Collaboration was negatively correlated with role conflict (r = -.36, p < .001), emotional exhaustion (r = -.19, p < .001), and turnover intentions (r = -.34, p < .001). Professional development was positively and significantly correlated with adaptability (r = .46, p < .001), self-efficacy (r = .28, p < .001), behavioural engagement (r = .18, p < .001), and organisational commitment (r = .54, p < .001); it was negatively correlated with role conflict (r = -.45, p < .001), emotional exhaustion (r = -.28, p < .001) and turnover intentions (r = -.43, p < .001). Role conflict was significantly and positively associated with emotional exhaustion (r = .58, p < .001) and turnover intentions (r = .66, p < .001), and negatively associated with adaptability (r = -.39, p < .001) and organisational commitment (r = -.51, p < .001).

Turning to the personal resources, adaptability had significant and positive associations with self-efficacy (r = .62, p < .001), behavioural engagement (r = .43, p < .001), and organisational commitment (r = .54, p < .001). Adaptability had negative associations with emotional exhaustion (r = -.50, p < .001) and turnover intentions (r = -.47, p < .001). Self-efficacy displayed significant and positive associations with behavioural engagement (r = .60, p < .001) and organisational commitment (r = .27, p < .001), while negative associations were found between self-efficacy and emotional exhaustion (r = -.15, p < .01) and turnover intentions (r = -.18, p < .001). Emotional exhaustion was significantly and positively associated with turnover intentions (r = .65, p < .001) and negatively

associated with organisational commitment (r = -.39, p < .001). Behavioural engagement was positively associated with organisational commitment (r = .22, p < .001).

Correlations between covariates (e.g., gender, teaching experience, five personality traits) and all substantive factors are shown in Table 5.3. Collaboration was positively and significantly correlated with extraversion (r = .32, p <.001), agreeableness (r = .22, p <.01), conscientiousness (r = .23, p <.01), and openness to experience (r = .33, p < .001); it was significantly and negatively associated with gender (r = -.15, p < .05). Comparatively, professional development was only significantly correlated with extraversion (r = .18, p <.001), agreeableness (r = .17, p <.01), and openness to experience (r = .22, p < .001). In terms of job demands, role conflict was significantly and positively correlated with neuroticism (r = .24, p < .001) and negatively associated with extraversion (r = -.21, p < .01).

Both adaptability and self-efficacy were positively and significantly correlated with: teaching experience *(r* = .19; and r = .32, p < .001 for adaptability and self-efficacy respectively), extraversion (r = .51; r = .43, p < .001), agreeableness (r = .32; r = .39, p < .001), openness to experience (r = .50; r = .43, p < .001), and conscientiousness (r = .37; r = .48, p < .001), and negatively correlated with neuroticism (r = -.50; r = -.29, p < .001). Emotional exhaustion was significantly and positively associated with neuroticism (r = .51, p < .001) and negatively correlated with extraversion (r = -.23, p < .001). Teaching experience (r = .19, p < .001), extraversion (r = .29, p < .001), agreeableness (r = .46, p < .001), openness to experience (r = .53, p < .001), and conscientiousness (r = .62, p < .001) were all significantly and positively correlated with behavioural engagement. Turning to the retention-related outcomes, organisational commitment was significantly and positively associated with extraversion (r = .35, p < .001), agreeableness (r = .24, p < .001), conscientiousness (r = .19, p < .001), and openness to experience (r = .14, p < .05); organisational commitment

was significantly and negatively associated with neuroticism (r = -.20, p < .01). Turnover intentions were significantly and positively correlated with neuroticism (r = .30, p < .001) and significantly and negatively associated with extraversion (r = -.24, p < .001).

Table 5.2

Latent Correlations among Substantive Factors for Study 1

	Useful collaboration	Useful professional development	Role conflict	Adaptability	Self-efficacy	Emotional exhaustion	Behavioural engagement	Organisational commitment
Job Resources								
Useful collaboration	-							
Useful professional development	.46***	-						
Job Demands								
Role conflict	-.36***	-.45***	-					
Personal Resources								
Adaptability	.49***	.46***	-.39***	-				
Self-efficacy	.27***	.28***	-.05	.62***	-			
Health Impairment Process								
Emotional exhaustion	-.19***	-.28***	.58***	-.50***	-.15**	-		
Motivational Process								
Behavioural engagement	.23***	.18***	.08	.43***	.60***	.03	-	
Retention-Related Outcomes								
Organisational commitment	.45***	.54***	-.51***	.54***	.27***	-.39***	.22***	-
Turnover intentions	-.34***	-.43***	.66***	-.47***	-.18***	.65***	-.05	-.66***

*$p < .05$, **$p < .01$, ***$p < .001$

Table 5.3

Latent Correlations between Covariates, Personality Traits, and Substantive Factors for Study 1

	Gender (F/M)	Teaching experience	Extraversion	Neuroticism	Agreeableness	Openness to experience	Conscientiousness
Job Resources							
Useful collaboration	-.15**	-.06	.32***	-.12*	.22**	.33***	.23**
Useful professional development	-.01	-.01	.18***	-.10	.17**	.22***	.15*
Job Demands							
Role conflict	.04	.10	-.21**	.24***	-.08	.01	-.01
Personal Resources							
Adaptability	.04	.19***	.51***	-.50***	.32***	.50***	.37***
Self-efficacy	-.03	.32***	.43***	-.29***	.39***	.43***	.48***
Health Impairment Process							
Emotional exhaustion	-.03	-.07	-.23***	.51***	-.01	-.06	-.02
Motivational Process							
Behavioural engagement	-.11	.19***	.29***	-.03	.46***	.53***	.62***
Retention-Related Outcomes							
Organisational commitment	.01	-.06	.35***	-.20**	.24***	.14*	.19***
Turnover intentions	-.05	.11	-.24***	.30***	-.05	-.07	-.06

*$p < .05$, **$p < .01$, ***$p < .001$

5.3 Measurement Invariance Across Key Subgroups

Measurement invariance was conducted to determine that the measurement properties of the instrumentation used in developing the hypothesised model were broadly consistent across teaching experience subgroups in the sample. Measurement invariance was established via multigroup CFA. Through a series of three tests, loadings and intercepts were progressively constrained to determine the extent to which they were invariant across the subgroups. The key subgroups were early career (less than or equal to 12 years) and later career (more than 12 years of teaching experience).

Measurement invariance as a function of teaching experience was confirmed across all three tests (configural: CFI = .90; RMSEA = .055; metric: CFI = .90; RMSEA = .058; scalar CFI = .90; RMSEA = .058). As elements of the factor structure were progressively constrained across these subgroups, the CFI and RMSEA did not change beyond acceptable parameters (i.e., ΔCFI $\leq$ -.01; Cheung & Rensvold, 2002; ΔRMSEA $\leq$ .015; Chen, 2007). Taken together, these results indicated that the loadings and intercepts were invariant across teachers with different levels of teaching experience. On this basis, SEM was conducted with a pooled sample.

5.4 Structural Equation Modelling

The SEM examined the extent to which job demands, both types of resources, and the interaction terms were significant predictors of emotional exhaustion, behavioural engagement, and the retention-related outcomes (further detail on the hypotheses under examination can be found on p. 103). With respect to the interaction effects, consistent with JD-R theory, the associations between the interaction effects and behavioural engagement, emotional exhaustion, organisational commitment, and turnover intentions were modelled. This model also involved estimating the predictive pathways between covariates (gender, years of teaching experience, personality traits) and substantive factors. As noted in Data

Analysis, all main associations were retained in this model, along with the significant interaction terms (non-significant interaction terms were removed as predictors for reasons of parsimony). This model yielded an adequate fit to the data, χ^2 (817) = 1659.17, $p < .001$, RMSEA = .046; CFI = .92. Results are shown in Figure 5.1. Reported below are the significant predictive paths shown in Figure 5.1. For clarity in Figure 5.1, only paths of significance are shown. All predictive parameters, both significant and non-significant, are shown in Table 5.4.

5.4.1 Main Effects in the Motivational and Health Impairment Processes

Moving through the model (beginning with job demands), role conflict significantly and positively predicted both emotional exhaustion (β = .36, $p < .01$) and turnover intentions (β = .34, $p < .01$), such that teachers higher in role conflict experienced greater levels of emotional exhaustion and a stronger desire to leave the profession. Turning to job resources, collaboration did not significantly predict behavioural engagement (β = -.07, *ns*) or organisational commitment (β = .11, *ns*) but did significantly and positively predict greater emotional exhaustion (β = .17, $p < .05$). Professional development was not found to significantly predict behavioural engagement (β = .07, *ns*); however, it was found to significantly and positively predict organisational commitment (β = .27, $p < .001$), such that teachers who found professional development to be useful had greater organisational commitment. Self-efficacy was a significant and positive predictor of behavioural engagement (β = .24, $p < .01$), but did not significantly predict emotional exhaustion (β = .11, *ns*), suggesting that teachers higher in self-efficacy are more likely to be behaviourally engaged in their work but not notably lower in emotional exhaustion. Adaptability did not predict behavioural engagement (β = .08, *ns*), but significantly and negatively predicted emotional exhaustion (β = -.48, $p < .001$) and positively predicted organisational commitment (β = .28, $p < .01$), such that teachers higher in adaptability were more likely to

be committed to their organisation, and less likely to experience emotional exhaustion. In terms of the motivational process, behavioural engagement was not significantly related to either organisational commitment (β = .11, *ns*) or turnover intentions (β = -.08, *ns*). In terms of the health impairment process, emotional exhaustion significantly and positively predicted turnover intentions (β = .38, $p < .001$), suggesting that teachers higher in emotional exhaustion are more likely to report intentions to leave the profession.

5.4.2 Interaction Effects

In total, eight associations between the four interaction terms (adaptability x role conflict; useful collaboration x role conflict; useful professional development x role conflict; self-efficacy x role conflict) and behavioural engagement and emotional exhaustion were tested. Initial tests of the model indicated the presence of four significant effects. Of these effects, adaptability x role conflict was found to be positively associated with emotional exhaustion (β =.13, $p < .05$), collaboration x role conflict was found to be negatively associated with emotional exhaustion (β = -.13, $p < .05$), and professional development x role conflict was associated with behavioural engagement (negatively; β = -.14, $p < .05$) and emotional exhaustion (positively; β =.17, $p < .01$). In order to interpret these interaction effects, simple slopes tests were conducted using the unstandardised regression coefficients for the predictors and the interaction term. Specifically, graphs were constructed to determine whether the slopes were significantly different from zero at different levels of the resources. Three levels of the resources were explored: low (one standard deviation below the mean), medium (mean), and high (one standard above the mean). These results are shown in Table 5.5.

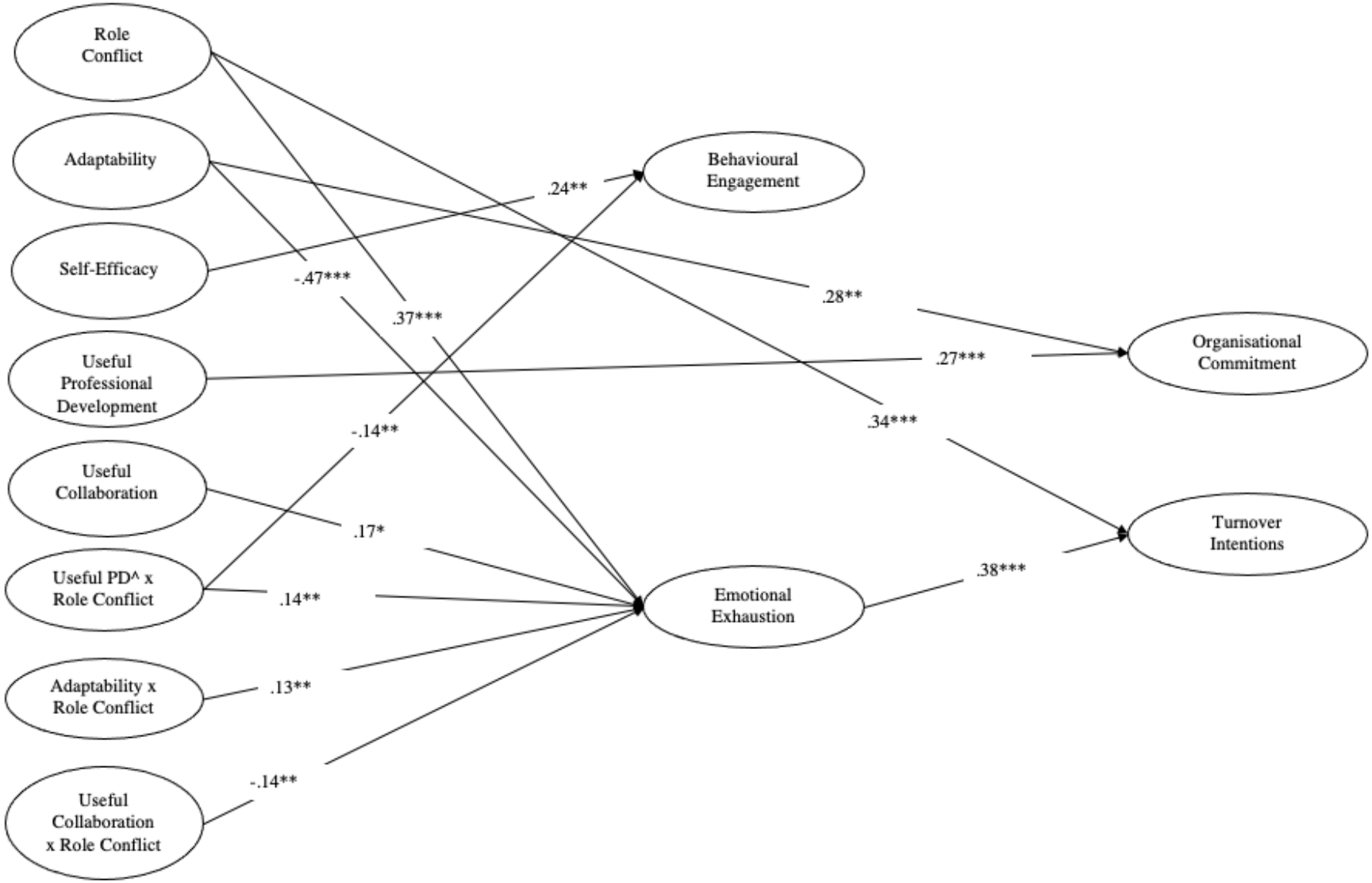
Starting with the interaction between adaptability and role conflict (Figure 5.2), for teachers experiencing low (b = -1.50, $p < .001$), medium (b = -1.31, $p < .001$), or high (b =-1.14, $p < .001$) role conflict, greater adaptability was associated with lower exhaustion. This

suggests that at all levels of role conflict, greater adaptability is associated with lower emotional exhaustion in teachers, thus providing support for the buffering hypothesis posited within JD-R theory. Turning to the interactions between useful collaboration and role conflict (Figure 5.3), simple slopes analysis revealed that for teachers experiencing low ($b = 0.61$, $p < .01$) or medium ($b = 0.41$, $p < .05$) role conflict, greater collaboration was associated with higher levels of emotional exhaustion. Teachers who reported high levels of role conflict ($b = 0.21$, *ns*) were not found to differ in emotional exhaustion as collaboration increased. These findings did not support the buffering hypothesis.

In terms of the interactions between useful professional development and role conflict, for teachers experiencing low role conflict ($b = -0.30$, $p < .05$), higher levels of useful professional development were associated with lower emotional exhaustion (Shown in Figure 5.4). Comparatively, for teachers with medium ($b = -0.18$, *ns*) and high ($b = 0.07$, *ns*) role conflict, there was no difference in the outcome as professional development usefulness increased. These findings provided partial support for the buffering effect, however only under conditions of low job demands. The interaction effect between useful professional development and role conflict was the only interaction found to be also associated with behavioural engagement (Shown in Figure 5.5). Analysis of this graph revealed that for teachers experiencing low role conflict ($b = 0.08$, $p < .01$), higher usefulness of professional development was associated with greater behavioural engagement. However, for teachers reporting medium ($b = 0.03$, *ns*) and high ($b = -0.03$, *ns*), role conflict, there was no difference in behavioural engagement as levels of useful professional development increased. Support for the boosting process was thus not found in these analyses.

Figure 5.1

Study 1 Final Structural Model



Note. Findings are controlled for the influence of covariates at all stages of the model; Only significant paths shown. See Table 5.4 for all covariate effects and non-significant paths. *$p < .05$, **$p < .01$, ***$p < .001$; ^ PD = Professional Development

Table 5.4

SEM Findings: Beta Coefficients for the Final Structural Model

	Role conflict	Useful collaboration	Useful professional development	Adaptability	Self-efficacy	Behavioral engagement	Emotional exhaustion	Organisational commitment	Turnover intentions
Covariates									
Gender (F/M)	.08	-.10	.02	.07	.06	.03	.05	.04	-.05
Tch experience	.15*	-.08	-.02	.12**	.28***	.06	-.02	-.09	.16*
Personality Traits									
Agreeableness	-.14	.06	.08	.10	.06	.03	.04	.06	.04
Conscientiousness	.08	.11	.06	.14	.31***	.42***	.08	.05	-.01
Extraversion	-.11	.21**	.11	.31***	.35***	.13	.04	.11	.04
Neuroticism	.29***	-.02	-.03	-.29***	-.02	.26***	.28***	.02	-.01
Openness to experience	.12	.20**	.14	.26***	.20**	.24**	.12	-.18	.09
Job Demands									
Role conflict						.07	.36***	-.19	.34***
Job Resources									
Useful collaboration						-.07	.17*	.11	-.05
Useful professional development						.07	-.10	.27***	-.10
Personal Resources									
Adaptability						.08	-.48***	.28**	-.11
Self-efficacy						.24**	.11	-.07	-.08
Interaction Effects									
ADxRC							.13**		
COLxRC							-.13**		
PDxRC						-.14**	.17***		
Well-being-Related Outcomes									
Behavioral engagement								.11	-.08
Emotional exhaustion								-.06	.38***

*$p < .05$, **$p < .01$, ***$p < .001$; ADxRC = adaptability x role conflict; COLxRC = useful collaboration x role conflict; PDxRC = useful professional development x role conflict.

Table 5.5

Simple Slopes Results

Interaction	Outcome Variable	Level	*B*	Significance
Adaptability x Role Conflict	Emotional Exhaustion	Low	-1.50	<.001
		Medium	-1.31	<.001
		High	-1.14	.001
Useful Collaboration x Role Conflict	Emotional Exhaustion	Low	0.61	.004
		Medium	0.41	.043
		High	0.21	.327
Useful Professional Development x Role Conflict	Behavioural Engagement	Low	0.08	.010
		Medium	0.03	.190
		High	-0.03	.203
	Emotional Exhaustion	Low	-0.30	.032
		Medium	-0.18	.208
		High	0.07	.350

Figure 5.2

Adaptability x Role Conflict on Emotional Exhaustion

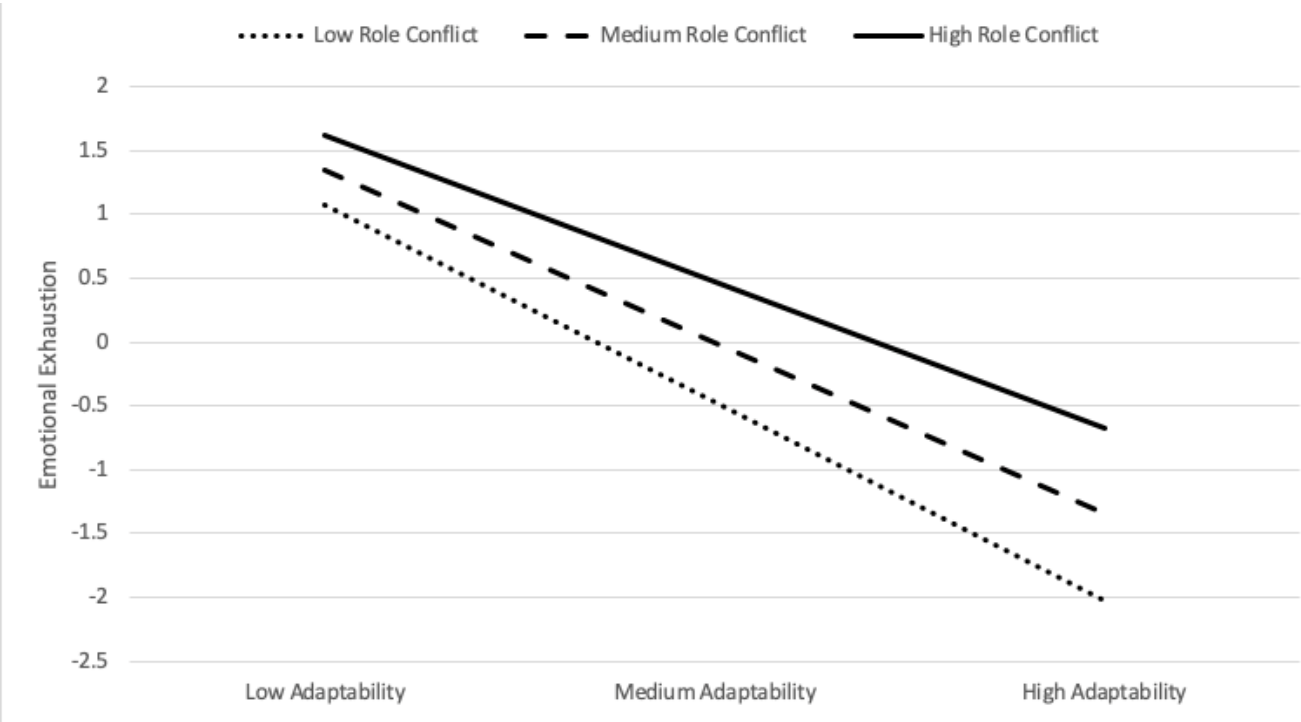


Figure 5.3

Useful Collaboration x Role Conflict on Emotional Exhaustion

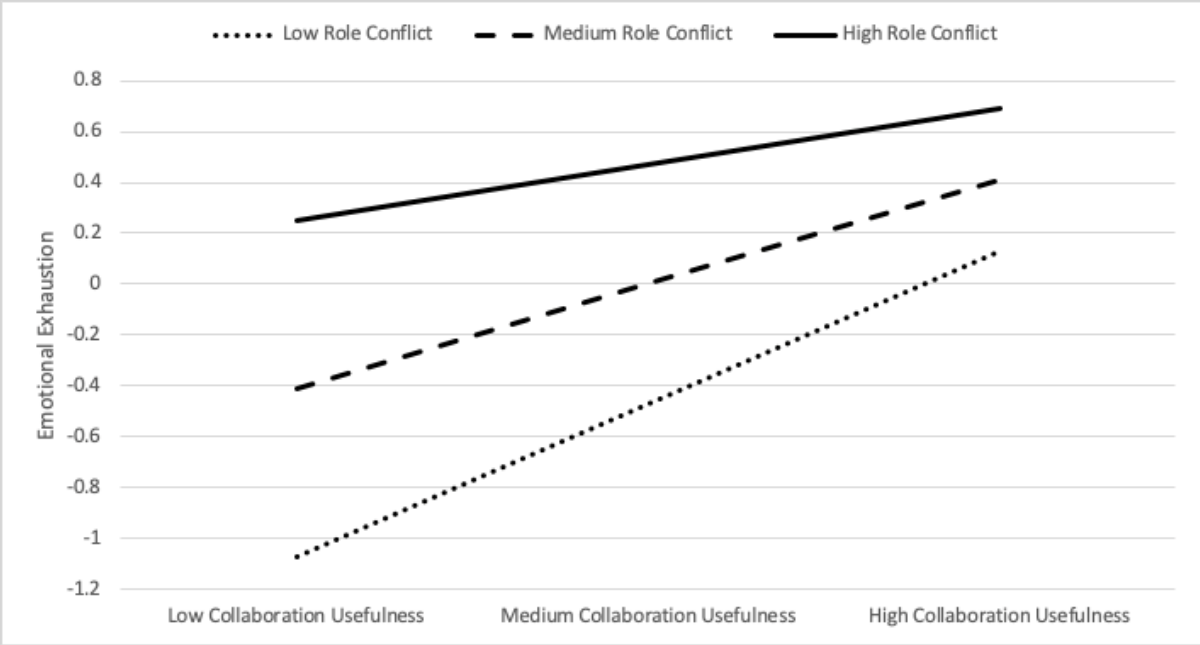


Figure 5.4

Useful Professional Development x Role Conflict on Emotional Exhaustion

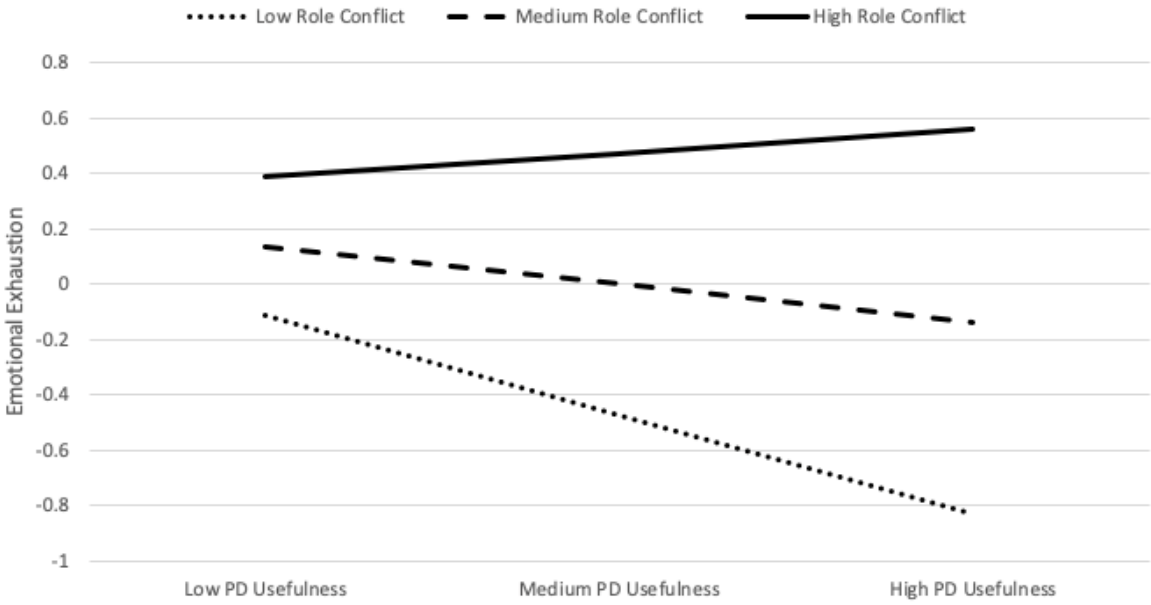
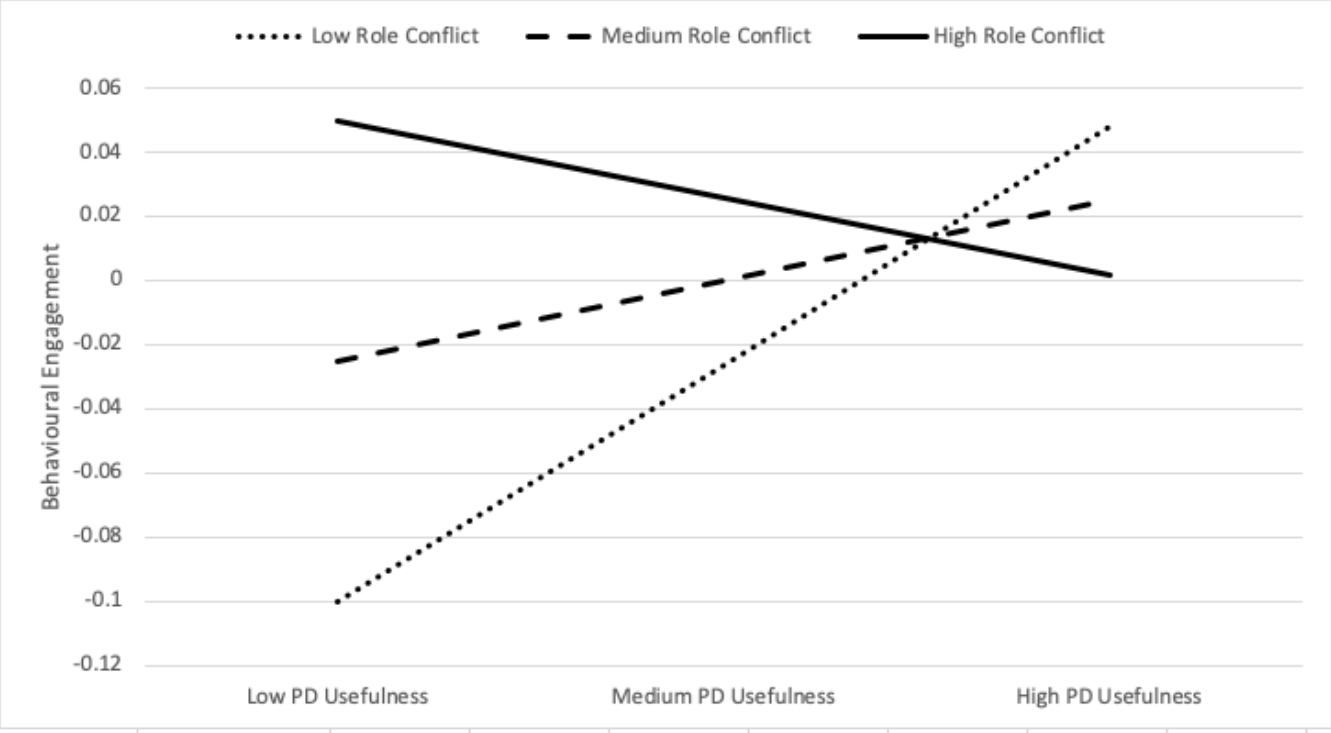


Figure 5.5

Useful Professional Development x Role Conflict on Behavioural Engagement



5.4.3 Associations with Covariates

A number of covariates also predicted substantive constructs. For the sake of brevity, only those covariates significant at $p < .001$ are reported here; all other significant parameters (at $p < .05$ and $p < .01$) are shown in Table 5.4. Teaching experience was related to self-efficacy (β = .28), such that teachers with greater teaching experience reported higher levels of self-efficacy. Conscientiousness significantly predicted both self-efficacy (β = .31) and behavioural engagement (β = .42), suggesting that conscientious teachers felt a greater sense of self-efficacy and were more likely to be behaviourally engaged in their work. Extraversion was also significantly related to adaptability (β = .31) and self-efficacy (β = .35), such that teachers higher in extraversion also reported greater levels of both adaptability and self-efficacy. Neuroticism was significantly related to a number of substantiative constructs, including role conflict (β = .29), behavioural engagement (β = .26), emotional exhaustion (β

= .28), and adaptability (β= -.29), indicating that teachers higher in neuroticism also reported higher levels of role conflict, behavioural engagement (explored further in Discussion), and emotional exhaustion, and lower levels of adaptability. Finally, openness to experience was significantly related to adaptability (β = .26), such that individuals higher in openness also reported higher levels of adaptability.

5.5 Multigroup Structural Equation Modelling

The next stage of Time 1 data analysis involved multigroup SEM invariance testing. Invariance testing was conducted to determine whether participant subgroups were moderators in the associations between key variables—that is, the extent to which beta paths may significantly vary as a function of group membership. The same subgroups were used in SEM invariance testing as those used in CFA invariance testing: early career (less than or equal to 12 years teaching experience) and later career teachers (More than 12 years teaching experience). Two models were run: a model in which all elements were unconstrained (Model 1, unconstrained), and a model that constrained the beta paths (Model 2, betas fixed). These analyses revealed that changes in CFI and RMSEA values remained smaller than -.01 (Cheung & Rensvold, 2002) and .015 (Chen, 2007) between the unconstrained model (RMSEA = .055; CFI = .90) and the fixed beta model (RMSEA = .055; CFI = .90) for both subgroups. These findings provided evidence for broad model-level invariance, suggesting that the predictive paths were generalisable across the two subgroups of teaching experience.

To obtain path-level evidence for SEM invariance, a second approach was adopted that involved examination of specific path-level differences by comparing beta estimates across the SEMs. Paths were considered to be non-invariant if they met two criteria: (a) the path was significant in one group but not the other, and (b) the Wald test of difference (using a Bonferroni correction given the number of comparisons) in M*plus* indicated two paths were significantly different in strength from each other. Based on these criteria, none of the

significant paths derived from the multivariate model were found to vary as a function of subgroup membership (viz. years of teaching experience). Thus, support for the model's invariance was further established.

5.6 Indirect Associations

The next step of Study 1 data analysis was to examine indirect associations. Bootstrapping techniques were used to determine the extent to which factors centrally located in the hypothesised model (i.e., emotional exhaustion and behavioural engagement) mediated the link between antecedent variables (i.e., job demands, job resources, and personal resources) and retention-related outcomes (i.e., organisational commitment and turnover intentions). As behavioural engagement was not found to be a significant predictor of retention-related outcomes in the model, only those associations involving emotional exhaustion were tested. Four significant indirect associations were found. Table 5.6 displays the results. The first was role conflict → emotional exhaustion → turnover intentions (β = .14, SE = .03, $p < .05$). This effect suggests that individuals higher in role conflict are likely to report higher emotional exhaustion, and subsequently report higher intentions to leave the profession. A further indirect association was reported from adaptability → emotional exhaustion → turnover intentions (β = -.18, SE = .09 $p < .05$). This indirect effect suggests that teachers higher in adaptability are likely to report lower emotional exhaustion, which in turn is associated with lower intentions to leave the career. It thus appears that adaptability and role conflict play a role in determining the extent to which emotional exhaustion predicts teachers' retention-related outcomes.

Turning to the interaction effects, two significant indirect associations were reported. These interaction effects were indicative of moderated mediation, whereby an indirect effect is influenced by a moderating variable (Edwards & Konold, 2020). An indirect effect was found from useful collaboration x role conflict → emotional exhaustion → turnover

intentions (β = -.05, *SE* = .02, *p* < .05), such that useful collaboration moderated the extent to which role conflict was indirectly associated with turnover intentions via emotional exhaustion. Finally, an association was found from useful professional development x role conflict → emotional exhaustion → turnover intentions (β = .06, *SE* = .03, *p* < .05), suggesting that useful professional development likewise moderated the extent to which role conflict was indirectly associated with turnover intentions via emotional exhaustion.

Table 5.6

Results of Indirect Effect Testing

Pathway	Standardised Beta Coefficient	*SE*	95% Confidence Interval
1. Role Conflict → Emotional Exhaustion → Turnover Intentions	.14*	.03	[.02, .25]
2. Adaptability → Emotional Exhaustion → Turnover Intentions	-.18*	.09	[-.36, -.01]
3. Useful Collaboration x Role Conflict → Emotional Exhaustion → Turnover Intentions	-.05*	.02	[-.10, -.01]
4. Useful Professional Development x Role Conflict → Emotional Exhaustion → Turnover Intentions	.06*	.03	[.01, .11]

*p < .05, **p < .01, ***p < .001

5.7 Alternative Model Testing

To confirm the suitability of the hypothesised model, an alternative model was estimated in which behavioural engagement and emotional exhaustion predicted job resources, personal resources, job demands, and the interactions, which in turn predicted the retention-related outcomes. This model also displayed adequate fit, χ^2 (901) = 1732.91, *p* < .001, RMSEA = .044; CFI = .92. However, tests of the indirect associations in this model revealed fewer significant paths (two significant indirect associations) and comparatively weaker regression coefficients than the hypothesised model (four significant indirect associations). The significant effects that were found were from emotional exhaustion →

collaboration → turnover intentions (β = .02, *SE* = .01, *p* < .05) and emotional exhaustion → useful professional development → organisational commitment (β = -.08, *SE* = .03, *p* < .05). In contrast, the hypothesised model (Figure 4.1) retained the core processes posited by JD-R theory and had a greater number of indirect associations, which were also greater in strength. The hypothesised model thus represented a model with a stronger theoretical and empirical rationale. Nonetheless, further longitudinal studies are required to determine whether there are cyclical associations between the job demands, job resources, and personal resources, and the health impairment and motivational processes.

5.8 Summary of Study 1 Findings

Consistent with the key propositions of JD-R theory, the major findings of the Study 1 analyses indicate that there are significant predictive paths from job demands, job resources, and personal resources to behavioural engagement and emotional exhaustion, and emotional exhaustion to turnover intentions. Contrary to prior hypotheses, no associations between behavioural engagement and the retention-related outcomes were found (there was a significant bivariate association in the correlations, but this was reduced to non-significance when controlling for other factors in the SEM). The results also highlighted the direct paths between the job demand, job resources, and personal resources and the retention-related outcomes, thus shedding further light on the role of these factors in shaping teachers' psychological functioning. Support for the buffering hypothesis was found when examining the interaction effects generated by adaptability x role conflict, indicating that as a personal resource, adaptability appears to buffer the negative association between role conflict and emotional exhaustion. Tests of indirect associations revealed a significant indirect effect between adaptability and turnover intentions (negatively, via emotional exhaustion) and another between role conflict and turnover intentions (positively, via emotional exhaustion). Evidence of moderated mediation was similarly found, whereby both useful collaboration

and useful professional development moderated the indirect association between role conflict and turnover intentions via emotional exhaustion. Notably also, paths were found to be invariant across two different career stages, providing support for the model's generalisability. Taken together, these results reveal the unique ways in which job demands, job resources, and personal resources are associated with engagement, emotional exhaustion, and the retention-related outcomes of teachers. These findings have the potential to yield important insights into interventions targeting teacher well-being.

Nonetheless, further research is required to extend the present findings, particularly given that population homogeneity was assumed (using sample-wide means) under the variable-centred analyses in Study 1. It is possible that there are homogenous subpopulations within the sample that collectively represent population heterogeneity (using subpopulation means). Person-centred analytic approaches are one avenue for examining population heterogeneity. Specifically, rather than examining the associations among variables, person-centred analyses enable examination of the associations among people (Morin et al., 2013). Adopting these approaches in concert may enable further understanding of the multidimensionality of the psychological constructs, which may yield implications for the nature of interventions. These person-centred analyses are the focus of Study 2 that follows.

Chapter 6

METHODOLOGY FOR STUDY 2

Study 2 complements the results derived from the variable-centred analysis undertaken in Study 1 by adopting a person-centred analytical approach. In Study 1, paths between the substantive variables (viz. job demands and resources, behavioural engagement, emotional exhaustion, organisational commitment, and turnover intentions) were estimated. Although structural equation modelling enables the analysis of sample-wide associations between variables, such analyses may mask the existence of subpopulations. Accordingly, person-centred approaches (e.g., latent profile analysis; LPA) enable the identification of groups that may vary in their levels of key variables. Understanding the shared experiences of groups of teachers facilitates a more detailed understanding of how such groups may fare in terms of retention-related outcomes (Collie et al., 2019). Although an emerging body of research (e.g., Collie, Malmberg, et al., 2020) has adopted a person-centred approach to identify profiles in terms of demands and resources reported by teachers, a considerable gap exists in understanding such combinations and their associations with important well-being and retention-related outcomes. Accordingly, in Study 2 LPA was used to identify profiles of teachers according to their levels of job demands, and job and personal resources. The extent to which background factors (i.e., gender and teaching experience) predict membership in the profiles was also examined. Following this, associations that the profiles have with well-being factors (behavioural engagement, emotional exhaustion) and retention-related outcomes (organisational commitment, turnover intentions) were then examined. These hypotheses are further detailed on p. 105. Taken together, the adoption of a person-centred approach complements the methodological approach of Study 1 and allows for a more nuanced understanding of individual differences among teachers.

6.1 Sample

The same 486 teachers from the 39 schools that participated in Study 1 comprised the sample for Study 2. To briefly recap, 414 (85.2%) were female and 72 (14.8%) were male. The average age was 40 years (*SD* = 12) and teachers taught in either government (82.7%; 402 teachers) or non-government schools (17.3%; 84 teachers). Further details on the demographics of the sample are provided in Study 1.

6.2 Procedure

As noted in Study 1, approval to conduct the study was obtained by both the University of New South Wales Human Research Ethics committee and the NSW DET State Education Research Applications Process. With the consent of principals, teachers willing to participate received a link to complete an online survey. Surveys were completed either during a staff meeting or during participants' own time. Further information on the procedure is provided in Study 1.

6.3 Measures

The instrumentation employed to measure the constructs under examination are briefly described below. All scales were identical to those used in Study 1 and all items were scored on a 7-point Likert scale (Strongly Disagree to Strongly Agree). Further information regarding items and properties of the scales are described in Study 1.

6.3.1 Measures Used to Generate Profiles

6.3.1.1 Job Demands and Resources

Role conflict was assessed with four items based on a scale by Starnaman and Miller (1992). The usefulness of collaboration to teachers was assessed using six items adapted from the School Level Environment Questionnaire – Revised (B. Johnson et al., 2007). The usefulness of professional development to teachers was assessed using six items developed

specifically for this project. These items were devised by consulting prior research and collecting anecdotal data from current teachers.

6.3.1.2 Personal Resources

Adaptability was measured using the long form of the Adaptability Scale—Domain Specific (Martin et al., 2015). Self-efficacy was measured using the Teacher Self Efficacy Scale (TSES; Tschannen-Moran & Woolfolk Hoy, 2001).

6.3.2 Outcomes Associated with Profile Membership

6.3.2.1 Well-being Factors

Emotional exhaustion was examined using four items from the Maslach Burnout Inventory (MBI; Maslach & Jackson, 1981). Behavioural engagement, as an indicator of the motivational process, was assessed using four items developed by Klassen et al. (2013).

6.3.2.2 Retention-Related Outcomes

Organisational commitment was assessed using Collie et al.'s (2016) adaptation of Vandenberghe and Bentein's (2009) Organisational Commitment Scale. Turnover intentions were assessed with three items developed by Vandenberghe and Bentein (2009).

6.3.3 Predictors Associated with Profile Membership

Teacher gender and teaching experience were examined as predictors of profile membership. Gender was coded as a dichotomous variable (1 = female, 2 = male) and years of teaching experience was examined as a continuous variable.

6.4 Data Analysis

All analyses were conducted using M*plus* 8.4 (Muthén & Muthén, 2018). Teachers were clustered within schools and thus the cluster command ("type=complex") in M*plus* was implemented to adjust standard errors due to the nesting of teachers within schools. Although nesting has been shown to not influence decisions regarding the numbers of classes in an LPA (Chen et al., 2010), failing to control for nesting may disproportionately influence

standard errors and classification accuracy (Morin et al., 2016). Hence, all parameter estimates in the present study controlled for teachers nested within schools. The robust maximum likelihood (MLR) estimator was used in all models to appropriately accommodate any non-normal data (although, descriptive statistics reported below suggested skew and kurtosis were not an issue). Missing data (7.4%) were handled with full information maximum likelihood (FIML) procedures.

6.4.1 Preliminary Analyses

Factor scores from a measurement model were used as profile indicator variables in the latent profile analyses (LPA). This is considered to be best practice when estimating mixture models as it enables the underlying measurement structure to be preserved. Greater weight is given to items displaying lower levels of measurement error, rendering them a superior alternative to scale scores (Morin et al., 2016). Factor scores were derived from a confirmatory factor analysis (CFA) that involved the profile indicator variables estimated as latent factors. The profile indicator variables were the job demand (role conflict), the two job resources (useful collaboration and useful professional development), and the two personal resources (adaptability and self-efficacy). The latent factors for the profile indicator variables were determined from the items indicated in Measures. Demographic characteristics (gender, teaching experience) and mean scores of the well-being factors (behavioural engagement, emotional exhaustion) and retention-related outcomes (organisational commitment, turnover intentions) were included as auxiliary variables in the CFA for use in subsequent analyses.

6.4.2 Profile Identification

For the LPA, a range of solutions consisting of 1 through 8 profiles were tested. A profile-varying approach was employed, whereby means and variances were allowed to differ across indicator variables and profiles (Masyn, 2013). A profile-varying approach can result in parameters that are less biased (Peugh & Fan, 2013) and enables profile structure to vary

qualitatively (Collins & Lanza, 2010). It also facilitates the generation of a model that reflects a more accurate and nuanced conceptualisation of the differing nature of individual experiences (Morin et al., 2011). Although less constrained models can lead to convergence issues, in the present study the parameters to be estimated were such that constraints did not need to be applied.

Each model was estimated using at least 15,000 random start values with 100 iterations, and 100 final stage optimisations to avoid converging on a local solution (McLachlan & Peel, 2000). A local solution describes the instance in which estimations in an LPA converge on a different maximum depending on the number of starting values (Magidson & Vermunt, 2004). If a different log-likelihood is recorded when a model is run with a different range of start values, the original solution is considered to be local (Berlin et al., 2014). To ensure that a global (i.e., a replicable) solution is achieved, it is important to use a range of possible start values and to compare the log-likelihood generated by each iteration. Accordingly, each model was tested to ensure that the best log-likelihood was replicated at least once (Berlin et al., 2014).

Based on the recommendations of Muthén (2003) and Nylund-Gibson and Choi (2018), several different fit indices were used to evaluate the fit of the different models. Smaller values in the Akaike Information Criteria (AIC), Consistent Akaike Information Criteria (CAIC), Bayesian Information Criteria (BIC), and sample-size-adjusted BIC (SSA-BIC) reflect superior model fit (Nylund-Gibson & Choi, 2018). The adjusted Lo-Mendell-Rubin Likelihood Ratio Test (*p*LMR) was also used to compare a *k*-profile model with a $k - 1$ profile model, where *k* is the number of profiles and where a non-significant *p*-value indicates that a *k* profile model does not provide significantly better fit over the $k - 1$ model. As profile enumeration is sensitive to sample size, the addition of profiles may mean that no minimum fit is achieved (Morin et al., 2011). Thus, elbow plots should be used to determine the point at

which the slope noticeably flattens as an indicator of an appropriate profile solution (Morin et al., 2016). Accordingly, elbow plots of the AIC, CAIC, BIC, and SSA-BIC were constructed to graph the slope of these indices. Measures of entropy were also recorded, where values closer to 1 reflect superior profile separation. A further consideration when generating a final solution is class size; according to Nylund-Gibson and Choi (2018), any given class should include at least 1% of the sample.

When determining the number of classes in LPA, the statistical adequacy of a solution is alone insufficient in determining the suitability of a proposed model (Morin et al., 2016). Statistical measures should thus be considered alongside other criteria, such as the substantive meaning and theoretical conformity of the profiles, and the utility of a solution in addressing the research aims (Bauer & Curran, 2004; Marsh et al., 2009; Nylund-Gibson et al., 2019). Thus, in addition to fit indices and class size, other factors influencing the final solution were the degree to which the solution was consistent with the tenets of JD-R theory, and whether the classes proposed by the solution were interpretable in this theoretical context. The final solution was also influenced by the parsimony principle, with, all other considerations equal, models consisting of fewer parameters deemed to be superior (Morin et al., 2016). Moreover, for additional profiles to be considered, they needed to differ qualitatively (i.e., in terms of shape) not just quantitatively, compared to a more parsimonious solution (Morin & Marsh, 2014; Morin et al., 2011).

6.4.3 Profile Membership and Links with Predictors and Outcomes

Under specific conditions, the addition of background factors and outcomes to an LPA may lead to methodological issues, whereby background factors and outcomes cause shifts in profile membership (Nylund-Gibson et al., 2019). To overcome this issue, the manual three-step process (as described by Asparouhov & Muthén, 2014 and Vermunt, 2010) was employed in M*plus* (Muthén & Muthén, 2018). This approach is superior to a one-step

approach as it builds classification error into a distal outcome model and allows for class formation independent of the influence of background factors and outcomes (Asparouhov & Muthén, 2014; Nylund-Gibson et al., 2019). Adopting this approach also enables the estimation of the role of background factors and distal outcomes simultaneously (Nylund-Gibson et al., 2019). In Step 1, the LPA was estimated and the posterior probabilities and modal class assignments were saved as a new data file. In Step 2, the logits generated as part of the output in Step 1 were saved and used as indicators of the estimated average classification errors for the modal class assignment (with the new data file). In the third step, the estimated average classification errors for the class assignment were translated into fixed parameter values, which were then used as a single nominal indicator of the latent class variable in subsequent analyses with predictors and outcomes (described next).

6.4.3.1 Predictors of Profile Membership

To ascertain the extent to which profile membership was associated with the demographic characteristics (gender and teaching experience), multinomial logistic regression was used (Nylund-Gibson & Choi, 2018). This was built from the final step of the manual three-step process outlined above. More precisely, gender and teaching experience were added as predictors of the latent profile variable in the final step. Unstandardised beta coefficients and odds ratios are reported from this analysis, with one latent profile used as a reference group. Odds ratios that are greater than 1 indicate the increased likelihood of membership in a specific profile compared with the reference profile. The reverse is the case for odds ratios lower than 1.

6.4.3.2 Profile Membership and Outcomes

The next phase of data analysis involved determining the extent to which each profile was associated with the outcomes under examination: behavioural engagement, emotional exhaustion, organisational commitment, and turnover intentions. This analysis was conducted

by building from the final step of the manual three-step process outlined above. In this step, a new analytic model is specified, whereby outcomes were included as additional indicators of the latent class variable. The M*plus* "model constraint" option was employed to conduct pairwise comparisons of class-specific intercepts across the profiles (Morin et al., 2015). Because the background characteristics were included in the model, these pairwise comparisons involved controls for gender and teaching experience (Nylund-Gibson et al., 2019).

Chapter 7

RESULTS FOR STUDY 2

7.1 Preliminary Analyses

Descriptive statistics (means, standard deviations, skewness, and kurtosis) for Study 2 can be found in Table 7.1. These statistics are the same as those in Study 1. As previously reported, the distributional properties met the criteria for normal distribution (Kline, 2011), and all scale score reliabilities were deemed sound (Catalán, 2019).

7.2 Profile Enumeration and Interpretation

Table 7.1 shows the fit statistics for the models with 1 through 8 profiles for the sample. As can be seen in Figure 7.1, the log-likelihood, AIC, CAIC, BIC, and SSA-BIC all decreased as additional profiles were added to the solutions. The *p*LMR value suggested a 5-profile solution provided significantly better fit than a 4-profile solution. Non-significant values recorded for the 6-, 7-, and 8-profile solutions indicated that they did not provide superior fit over the 5-profile solution. An elbow plot of these values was constructed (see Figure 7.1) and shows a flattening of the slope from the 6-profile solution. Together, the fit statistics did not indicate the clear superiority of a particular profile. Therefore, parsimony and conceptual relevance were considered to determine the best solution.

When examining the 6- and 7-profile solutions it became clear that in both, two or more profiles were qualitatively similar and varied only in the levels of the means. The addition of profiles in this instance only resulted in the division of profiles into smaller profiles with a similar shape. When evaluating the inclusion of additional classes, Morin et al. (2017) emphasise the importance of ensuring the shapes, rather than the mean levels of profiles are substantively different, so that each profile adds conceptually meaningful information to a solution. Additionally, the inclusion of these extra classes only accounted for 11% of the population in the 6-profile solution, and 13% in the 7-profile. Nylund-Gibson and

Choi (2018) recommend that each class within an LPA should be larger than approximately 8% to ensure such profiles can be reproduced in smaller samples. Accordingly, these solutions were deemed inappropriate for reasons of parsimony and conceptual significance.

Both the 4- and 5-profile solutions were conceptually feasible; however, comparison of the two solutions revealed that two of the classes in the 5-profile solution varied only in the mean levels and not in shape, and thus did not contribute qualitatively novel information to the solution. Taken together, conceptual reasons, parsimony, and fit statistics pointed to the suitability of a 4-profile solution.

Table 7.2 shows the mean of the indicator variables for the four profiles, in addition to the profile sizes and hypothesised names for each profile. Figure 7.2 displays a graphical representation of this information. Teachers within profile 1 (n = 87; 18%) displayed the highest levels of collaboration (M = 0.98), professional development (M = 0.85), self-efficacy (M = 0.81), and adaptability (M = 1.04), and the lowest levels of role conflict (M = -0.83). This profile was termed *adaptive* due to the comparatively high levels of personal and job resources. In contrast, teachers within profile 4 (n = 57; 12%) exhibited the lowest levels of collaboration (M = -1.11), professional development (M = -1.23), self-efficacy (M = -0.64), and adaptability (-1.11), and the highest level of role conflict (M = 0.97). The high level of the job demand and the low levels of both personal and job resources reflected a *maladaptive* profile. Profile 3 comprised the largest number of teachers (n = 237; 49%). Teachers in this profile exhibited average levels of useful collaboration (M = 0.04), professional development (M = 0.04), role conflict (M = -0.03), self-efficacy (M = -0.08), and adaptability (M = -0.03). This profile was termed *average functioning.* Profile 2 comprised 101 teachers (21%). Teachers within this profile displayed a slightly higher level of useful collaboration (M = 0.14), a slightly lower level of role conflict (M = -0.17), near average self-efficacy (M = 0.03), and high levels of both useful professional development (M = 0.54) and adaptability

Table 7.1

Fit Statistics and Entropy for Profiles

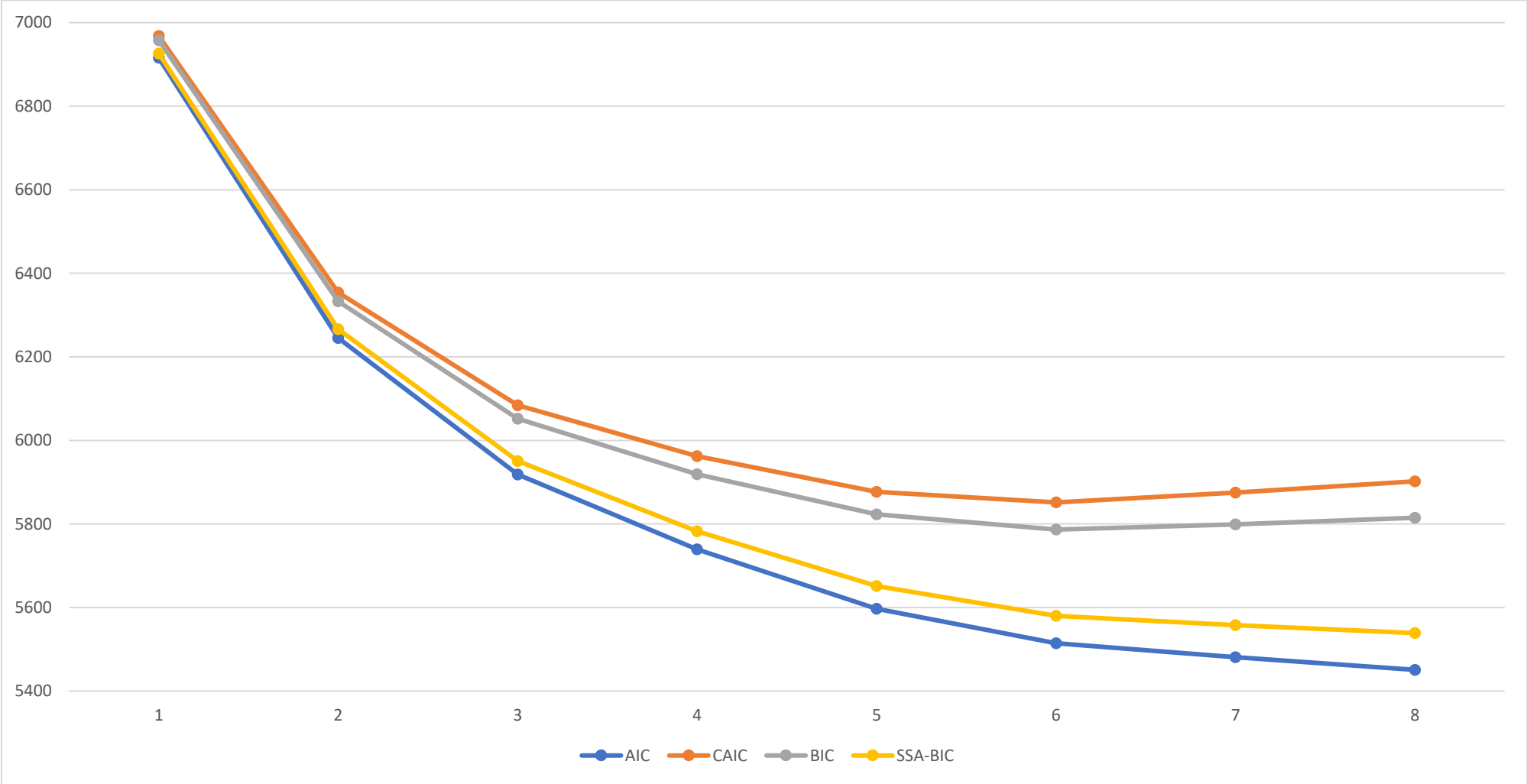
	Log-likelihood	Free parameters	AIC	CAIC	BIC	SSA-BIC	Entropy	*p*LMR
1 profile	-3448.021	10	6916.041	6967.903	6957.903	6926.164	—	—
2 profiles	-3101.404	21	6244.808	6353.718	6332.718	6266.065	.78	<.001
3 profiles	-2927.073	32	5918.147	6084.105	6052.105	5950.539	.84	<.001
4 profiles	-2826.566	43	5739.131	5962.138	5919.138	5782.659	.84	.002
5 profiles	-2744.409	54	5596.818	5876.873	5822.873	5651.480	.84	.007
6 profiles	-2692.180	65	5514.360	5851.464	5786.464	5580.157	.86	*ns*
7 profiles	-2666.455	76	5480.910	5875.062	5799.062	5557.842	.88	*ns*
8 profiles	-2638.344	87	5450.688	5901.888	5814.888	5538.755	.85	*ns*

Note. *ns* = non-significant.

Note. AIC: Akaike Information Criteria; CAIC: Consistent Akaike Information Criteria; BIC: Bayesian Information Criteria (BIC); SSA-BIC: sample-size-adjusted Bayesian Information Criteria; *p*LMR: Lo-Mendell-Rubin Likelihood Ratio Test.

Figure 7.1

Elbow Plot Showing Comparative Fit Indices



(M = 0.26). These teachers displayed high levels on one job resource (useful professional development) and one personal resource (adaptability); hence, this profile was termed *mixed-resourced*.

7.3 Profile Membership and Demographic Characteristics

As can be seen in Table 7.3, no significant associations were found between the demographic characteristics (gender, teaching experience) and the four profiles. Examination of the unstandardised beta coefficients and odds ratios revealed no significant differences when each of the four profiles were compared to each other, with one group as a reference group. This indicates that neither gender nor teaching experience played a significant role in predicting profile membership.

7.4 Profile Membership and Outcomes

Table 7.4 displays the outcome means for each of the profiles. The majority of mean comparisons were statistically significant, with some exceptions. The associations between the profiles and outcomes are reported below in relation to two phases posited in the JD-R model: the well-being phase, in which job demands, job resources, and personal resources are associated with behavioural engagement and emotional exhaustion (referred to as well-being outcomes henceforth), and the outcomes phase, in which the aforementioned demands and resources are associated with organisational commitment and turnover intentions (referred to as retention-related outcomes henceforth).

7.4.1 Well-being Factors

Starting with behavioural engagement, the *adaptive* profile displayed the highest mean on this outcome (M = 6.60), followed by the *average* profile (M = 6.09), the *mixed-resourced* profile (M = 6.15), and the *maladaptive* profile (M = 5.97). The means for behavioural engagement displayed in the *average*, *mixed-resourced*, and *maladaptive* profiles

Table 7.2

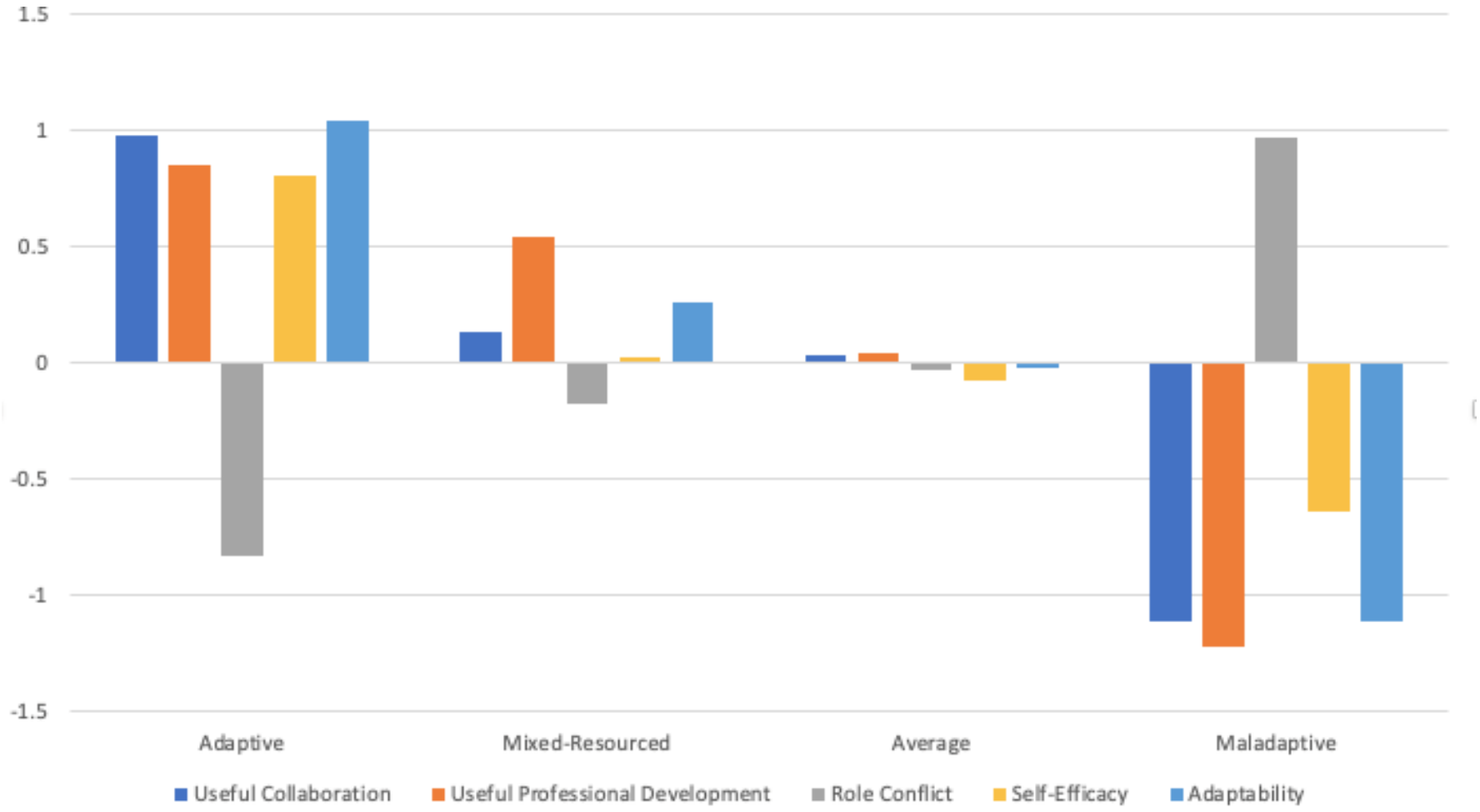
Latent Profile Analysis Solution Significant Mean Differences in Latent Profile Indicators

	Profile indicator variables										Profile size	Hypothesised profile name
(*N* = 486)	Useful collaboration		Useful professional development		Role conflict		Self-efficacy		Adaptability			
	M (95% CI)	Variance (95% CI)	*M* (95% CI)	Variance (95% CI)	*M* (95% CI)	Variance (95% CI)	*M* (95% CI)	Variance (95% CI)	*M* (95% CI)	Variance (95% CI)		
Profile 1	0.98 (0.90, 1.05)	0.03 (0.01, 0.05)	0.85 (0.67, 1.03)	0.37 (0.13, 0.62)	-0.83 (-1.05, -0.61)	0.80 (0.56, 1.04)	0.81 (0.57, 1.04)	0.50 (0.32, 0.68)	1.04 (0.83, 1.24)	0.35 (0.24, 0.45)	87 (18%)	Adaptive
Profile 2	0.14 (-0.02, 0.29)	0.19 (0.13, 0.26)	0.54 (0.53, 0.54)	0.01 (0.01, 0.01)	-0.17 (-0.43, 0.08)	0.49 (0.35, 0.63)	0.03 (-0.23, 0.29)	0.30 (0.01, 0.60)	0.26 (0.07, 0.45)	0.17 (0.06, 0.28)	101 (21%)	Mixed-Resourced
Profile 3	0.04 (-0.09, 0.16)	0.34 (0.27, 0.41)	0.04 (-0.10, 0.18)	0.37 (0.27, 0.48)	-0.03 (-0.19, 0.14)	0.68 (0.27, 0.47)	-0.08 (-0.25, 0.10)	0.58 (0.42, 0.74)	-0.03 (-0.19, 0.14)	0.45 (0.32, 0.59)	237 (49%)	Average
Profile 4	-1.11 (-1.43, -0.80)	1.67 (1.16, 2.18)	-1.23 (-1.51, -0.94)	1.17 (0.83, 1.50)	0.97 (0.77, 1.18)	0.55 (0.38, 0.72)	-0.64 (-0.98, -0.31)	1.74 (1.09, 2.39)	-1.11 (-1.39, -0.83)	0.98 (0.64, 1.32)	57 (12%)	Maladaptive

Note. 95% CI = 95% Confidence Interval.

Figure 7.2

Graphical Representation of the 4-Profile Solution - Standardised



were not statistically different from one another. The *maladaptive* profile displayed the highest levels of emotional exhaustion (M = 6.25), followed by the *adaptive* profile (M = 4.20), the *mixed-resourced* profile (M = 5.20), and the *average* profile (M = 5.44). There was no significant difference in the means for emotional exhaustion between the *average* and *mixed-resourced* profiles.

7.4.2 Retention-Related Outcomes

Turning to the associations between the profiles and the retention-related outcomes, the *adaptive* profile displayed the highest levels of organisational commitment (M = 6.18), followed by the *mixed-resourced* profile (M = 5.39), the *average* profile (M = 5.31), and the *maladaptive* profile (M = 4.03). Both the *mixed-resourced* profile and the *average* profile displayed higher levels of organisational commitment than those teachers within the *maladaptive* profile; however, there was no significant difference in organisational commitment between the *mixed-resourced* and *average* profiles. In terms of turnover intentions, the *maladaptive* profile displayed the highest levels on this outcome (M = 4.91), followed by the *mixed-resourced* (M = 3.25), *average* (M = 3.38), and *adaptive* (M = 1.82) profiles. There was no significant difference in the turnover intention means between the *average* and *mixed-resourced* profiles. Figure 7.3 provides a graphical representation of these findings.

Table 7.3

The Role of Teacher Background Factors in Predicting Profile Membership

	B	*SE*	*OR*	*B*	*SE*	*OR*
	Adaptive vs Mixed-Resourced			*Adaptive vs Average*		
Gender (F/M)	-0.98	0.52	0.38	-0.35	0.47	0.70
Teaching experience	-0.01	0.02	0.99	-0.01	0.02	1.01
	Adaptive vs Maladaptive			*Mixed-Resourced vs Average*		
Gender (F/M)	-0.85	0.45	0.43	0.62	0.32	1.87
Teaching experience	0.02	0.01	1.02	0.02	0.01	1.02
	Mixed-Resourced vs Maladaptive			*Average vs Maladaptive*		
Gender (F/M)	0.13	0.43	1.14	-0.50	0.40	0.61
Teaching experience	0.03	0.01	1.03	0.01	0.02	1.01

Note. * $p < .05$; ** $p < .01$; *** $p < .001$; *B* = multinomial logistic regression coefficient; SE = standard error of the coefficient; OR = odds ratio; For gender, females were coded 1 and males were coded 2.

Table 7.4

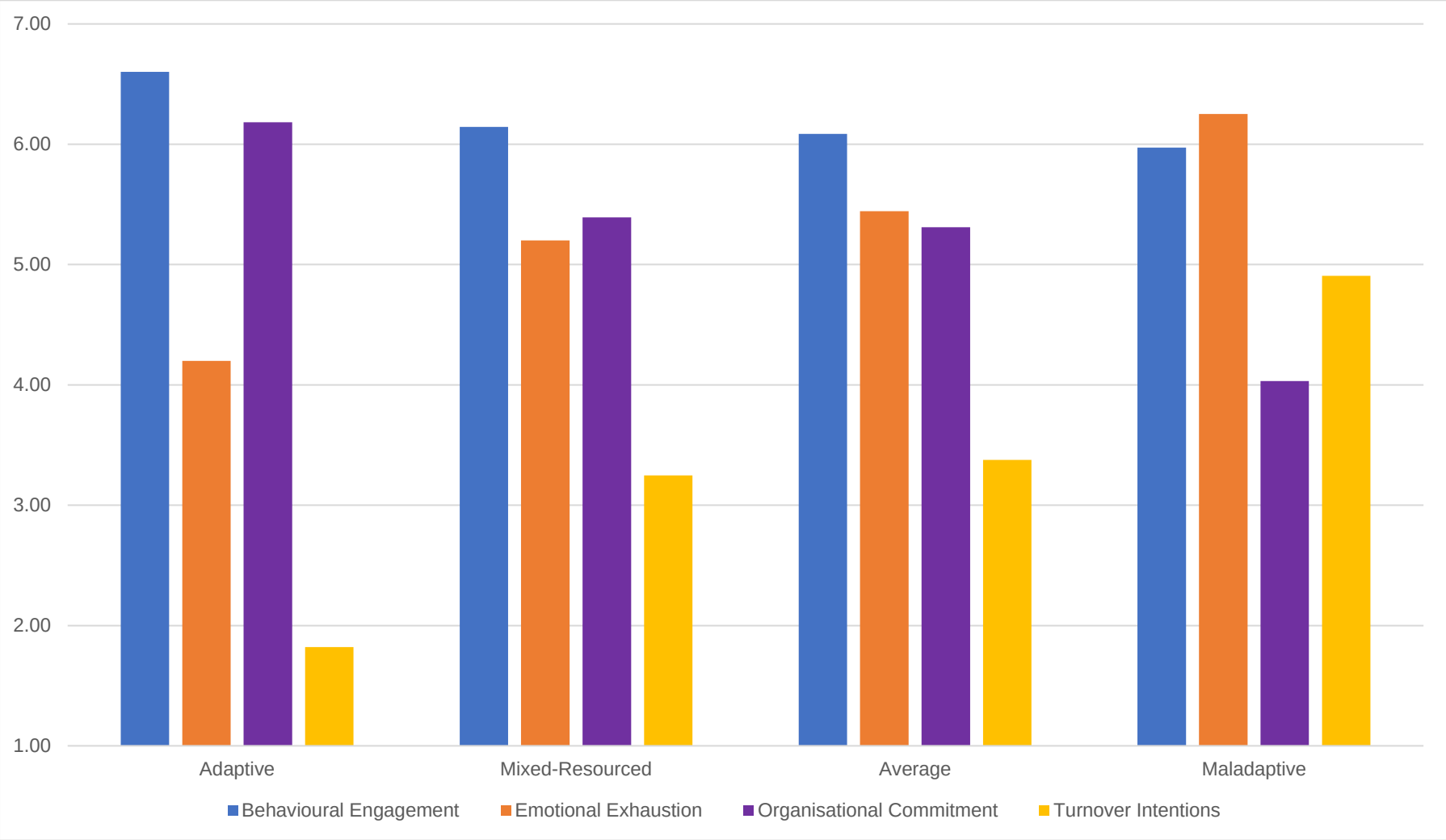
Outcome Means for the Four Profiles

	Well-being Outcomes		Retention-Related Outcomes	
	Behavioural engagement	Emotional exhaustion	Organisational commitment	Turnover intentions
Adaptive	6.60[a]	4.20[c]	6.18[a]	1.82[c]
Mixed-Resourced	6.15[b]	5.20[b]	5.39[b]	3.25[b]
Average	6.09[b]	5.44[b]	5.31[b]	3.38[b]
Maladaptive	5.97[b]	6.25[a]	4.03[c]	4.91[a]

Note. Different superscript values in a column indicate statistically significant differences (at $p < .05$) in the outcome means.

Figure 7.3

Outcome Means for the Four Profiles



7.5 Summary of Study 2 Findings

The present person-centred study represents a complementary approach to interpreting the data reported in Study 1. Specifically, rather than focusing on the associations between variables at a sample-wide level, Study 2 sought to examine the associations among individuals by identifying homogenous subpopulations (Morin et al., 2017). Analyses revealed the existence of four unique profiles: the *adaptive* profile, the *mixed-resourced* profile, the *average* profile, and the *maladaptive* profile. Although there were no associations between gender and years of experience, and membership in any of the profiles, there were unique differences between the four profiles and their associations with the four outcomes: behavioural engagement, emotional exhaustion, organisational commitment, and turnover intentions. Specifically, members of the *adaptive* profile evinced the highest levels of behavioural engagement and organisational commitment, and the lowest levels of emotional exhaustion and turnover intentions. Comparatively, teachers within the *maladaptive* profile displayed the highest levels of emotional exhaustion and turnover intentions, and the lowest levels of both organisational commitment and behavioural engagement. Interestingly, although profile enumeration revealed substantive differences in the levels of demands and resources in the *mixed-resourced* and the *average* profiles, there were few significant differences in outcomes between these profiles (further discussed in Discussion below). In sum, the present study highlights the utility of adopting a person-centred approach to reveal nuances in the levels and types of demands, resources, and outcomes reported in populations of teachers.

Taking Study 1 and Study 2 together, complementary knowledge about teachers' experiences at work was revealed. In Study 1, a variable-centred approach (structural equation modelling; SEM) was adopted to test the core tenets of JD-R theory. Study 1 revealed the most salient demands and resources for teachers, and how these variables were

associated with engagement, burnout, and measures of occupational functioning. Teachers within Study 1 were considered as a whole population, and subpopulations were not considered. Study 2 sought to address this gap by adopting a person-centred approach to understanding the different types of profiles of job demands and job and personal resources existed within teaching populations, and how these profiles were associated with measures of well-being and retention-related outcomes. However, neither of these studies considered the associations between school membership or school-average levels and teacher well-being on outcomes. In Study 3, it was thus important to extend these findings by aggregating data to examine the extent to which differences in outcomes as a function of school membership existed.

Chapter 8

METHODOLOGY FOR STUDY 3

Study 3 extended the findings of Studies 1 and 2 by considering the associations between the school-level measures of well-being examined in Studies 1 and 2 (viz, behavioural engagement and emotional exhaustion) and students' academic achievement. Behavioural engagement and emotional exhaustion were selected as variables to be examined at the school-level as these reflect the pathways through which job demands and job resources are associated with retention-related outcomes. Specifically, it is through these two factors that the two core processes conceptualised within JD-R theory that are considered to be associated with measures of occupational functioning, such as commitment, poor health, organisational commitment, and job performance (Bakker & Demerouti, 2018; Bakker et al., 2004; Collie et al., 2018; Skaalvik & Skaalvik, 2018) are actualised. Having examined the first stage of the model (i.e., by way of the processes involving job demands and job and personal resources) in Study 1, this study sought to investigate the processes that occur in the latter stages of the model. To date, limited research has considered how the motivational and health impairment processes are associated with student achievement. Moreover, little research has conceptualised these processes at both a teacher- and school-level simultaneously. Study 3 thus provided an opportunity to address these empirical questions. Student academic achievement was chosen as a school-level outcome given the growing body of research suggesting an association between teachers' psychological functioning and student achievement (e.g., Arens & Morin, 2016). Specifically, Study 3 sought to disaggregate the variation in student achievement as a function of individual differences versus school membership. Further detail on the hypotheses guiding Study 3 can be found on p. 105. To the extent that differences in school-level measures of well-being are associated with school-level academic achievement, this may be an important avenue for interventions.

Academic achievement was measured by way of school results in the National Assessment Program – Literacy and Numeracy (NAPLAN), an annual standardised assessment for all Australian students in Years 3, 5, 7 and 9.

Accordingly, the present study used multilevel structural equation modelling (ML-SEM) to assess the extent to which behavioural engagement and emotional exhaustion predicted school achievement. A two-level model was estimated with teachers at level 1 (L1) and schools at level 2 (L2). At L1, correlations among teacher-level behavioural engagement and emotional exhaustion were modelled. At L2, data were aggregated to form school-level measures of behavioural engagement and emotional exhaustion. Academic achievement was already a school-level variable. The associations between school-level measures of behavioural engagement, emotional exhaustion, and academic achievement were of central interest in Study 3.

8.1 Sample

The sample for Study 3 comprised teachers (the same sample as Studies 1 and 2), along with data from the schools at which the teachers worked. More precisely, the sample comprised 486 primary school teachers from 39 schools in New South Wales, Australia. A summary of the teacher characteristics can be found in Study 1. In terms of school characteristics, the average school size was 697 students (*SD* = 381.3), and 29% of schools were classified as rural. The average percentage of students from a non-English speaking background was 34.8% (*SD* = 29.3). Socioeconomic status was analysed by way of the school's Index of Community Socio-Educational Advantage (ICSEA) value. The value on the index reflects the average level of educational advantage of the school's student population relative to those of other schools (ACARA, 2015). In the present study, school ICSEA values ranged between 872 and 1183. The mean ICSEA value in the present sample

was 1076 (*SD* = 104.6), which is slightly above the national average (i.e., *M* = 1000, *SD* = 100).

8.2 Procedure

Approval to conduct the study was obtained by both the University of New South Wales Human Research Ethics committee and the NSW DET State Education Research Applications Process. With the consent of principals, teachers willing to participate received a link to complete an online survey. Surveys were completed either during a staff meeting or during participants' own time. Further information on the procedure is provided in Study 1. Data at the school-level was obtained through the MySchools website (https://www.myschool.edu.au). From this website, details were obtained for each school via government-reported data. Specifically, school characteristics (i.e., percentage of non-English speaking students, rural/urban classification, school size, and school socioeconomic status) were obtained, alongside school-average achievement results from NAPLAN in the areas of reading, writing, spelling, grammar, and numeracy.

8.3 Measures

8.3.1 Behavioural Engagement

Behavioural engagement was assessed using the same four items developed by Klassen et al. (2013) that were used in Studies 1 and 2. Items included: "While teaching I pay a lot of attention to my work"; "While teaching, I really throw myself into my work". In the present investigation, coefficient omegas (ω) of .80 at the teacher-level and .84 at the school-level were derived for this scale and an ICC of .01 was recorded (see Data Analysis below for details on how ICC was calculated). The ICC reflects the percentage of variance for the variable that is explained at the school-level (Byrne, 2012). Although modest, this variable was nonetheless examined at the school-level alongside the other variables as Bliese et al. (2018) recommend multilevel analyses when organisational phenomena (e.g., workplace

engagement) are under examination; however, it is acknowledged that there is limited school-level variance to examine, meaning limited power to find significant associations.

8.3.2 Emotional Exhaustion

Emotional exhaustion was examined using the same four items used in Studies 1 and 2 (e.g., "I feel emotionally drained from my work," "I feel used up at the end of the workday"). The coefficient omega (ω) for this factor was .91 at the teacher-level and .98 at the school-level. The intraclass correlation (ICC) was .06 (in this case, 6% of the total variance is explained at the school-level).

8.3.3 Academic Achievement

Academic achievement was assessed by way of the five areas of assessment in the National Assessment Program—Literacy and Numeracy (NAPLAN) tests. The tests are administered annually to all students in Years 3, 5, 7, and 9. In the present study, the tests for Years 3 and 5 were relevant given the focus on primary school teachers. Five domains are examined in NAPLAN: reading, writing, spelling, grammar and punctuation, and numeracy. In the tests of reading, spelling, grammar and punctuation, and numeracy, there is a mix of multiple-choice and constructed-response items. The reading test involves students reading a booklet and then answering reading comprehension questions relating to literacy, literature, and language. The test consists of multiple-choice items and constructed-response items. The spelling and grammar and punctuation tests assess students' editing, punctuation, sentence-level grammar, knowledge of text cohesion, vocabulary, word-level grammar, and spelling. The NAPLAN numeracy test examines students' proficiency in number and algebra, measurement and geometry, and statistics and probability. For writing, students are given a prompt from which they are required to compose either a persuasive, informative, or imaginative text.

NAPLAN data for each school were collected to coincide with the year in which teacher data from that school were collected. For example, where teacher survey data were collected from schools in 2018, NAPLAN data for 2018 were also collected for that school. Where teacher survey data were collected from schools in 2019, NAPLAN data for 2019 were also collected for that school. In 2018 and 2019, NAPLAN was delivered by way of both paper-based tests and an online multistage adaptive test.

For Year 3, in both 2018 and 2019, there were between 25 and 37 items for reading, spelling, grammar and punctuation, and numeracy. For Year 5, in both 2018 and 2019, there were between 25 and 42 items for reading, spelling, grammar and punctuation, and numeracy. All students in Years 3 and 5 responded to a writing prompt to compose a persuasive text. This text was scored out of 48. Students who sat the online NAPLAN test initially completed a year-level testlet. Based on performance on the initial testlet, each student was assigned a second testlet that was targeted to their ability. Each testlet was constructed from a pool of items. For Year 3, in 2018 items for reading, spelling, grammar and punctuation, and numeracy ranged between 87 and 130, and in 2019 ranged between 42 and 208. In 2019, the items for reading, spelling, grammar and punctuation, and numeracy for Year 5 ranged between 87 and 140, and in 2019 ranged between 100 and 208. Further details can be found in Appendix G.

NAPLAN tests have been subject to extensive evaluation for robustness and validity since their introduction in 2008. Items within the tests have been assessed by way of Rasch analysis and Differential Item Functioning (DIF) to examine the influence of gender, background, and jurisdiction. The tests have consistently demonstrated excellent reliability and discriminant validity (ACARA, 2019). The alpha coefficients for the 2018 and 2019 items for Years 3 and 5 are shown in Table 8.1 and Table 8.2, as reported by ACARA (ACARA, 2018, 2019). In 2018, alpha coefficients for the online test were not available.

Table 8.1

Alpha Coefficients for 2018 NAPLAN tests

Area	Year 3 alpha coefficient	Year 5 alpha coefficient
Reading	.80	.78
Spelling	.91	.91
Grammar and Punctuation	.70	.68
Numeracy	.89	.90
Writing	.96	.96

Table 8.2

Alpha Coefficients for 2019 NAPLAN tests

2019 Alpha coefficients for written tests		
Area	Year 3 alpha coefficient	Year 5 alpha coefficient
Reading	.82	.84
Spelling	.90	.89
Grammar and Punctuation	.75	.70
Numeracy	.87	.90
Writing	.94	.94
2019 Alpha coefficients for online tests		
Area	Year 3 alpha coefficient	Year 5 alpha coefficient
Reading	.89	.88
Spelling	.93	.92
Grammar and Punctuation	.61-.79^	.62-.75^
Numeracy	.90	.92
Writing	.95	.95

^ For grammar and punctuation, multiple alpha coefficients were recorded as the tests were calibrated by four testlets – testlet C, testlet E1&E2, testlet E3, and testlet F (ACARA, 2019)

School-level achievement scores were calculated by obtaining the school average score in each of the five domains (reading, writing, spelling, grammar and punctuation, and numeracy) for both Year 3 and Year 5. Literacy scores were calculated by adding together the average score for Year 3 across all four literacy areas and the average score for Year 5 across all four areas. For instance, the score for one school was calculated as follows: 490 (Year 3 reading average) + 467 (Year 3 writing average) + 531 (Year 3 grammar average) + 490 (Year 3 spelling average) = 1978. Following this, the total (1978) was divided by four

(the number of literacy domains) to return an average score of 494.5. Therefore, the average Year 3 literacy score for this school was 494.5. The school-average Year 3 literacy score was then standardised across all schools. The same procedure was followed for calculating the school-average Year 5 literacy achievement score. The two standardised values were then combined to form the school-average overall literacy score, which was also standardised across all schools.

For school average numeracy scores, the process was simpler because there was only one numeracy score for each student. The school-average Year 3 numeracy score was standardised and combined with the standardised school-average Year 5 numeracy score. This final numeracy score was also standardised across schools. The standardised school-average overall numeracy and literacy scores were then combined together to form a final achievement variable which represented the school's average level of academic achievement.

8.4 Data Analysis

The present study used multilevel modelling (MLM) to assess the extent to which behavioural engagement and emotional exhaustion predicted school achievement. The data were conceptualised as a two-level model, with teachers at the first level (L1) and schools at the second level (L2). MLM is appropriate for such data as it takes into account the nested structure of the data (i.e., teachers are nested within schools; Marsh et al., 2009). MLM also enables examination of associations among teacher-level variables and associations among school-level variables simultaneously. Data analysis comprised three stages: preliminary analyses, multilevel confirmatory factor analysis, and multilevel structural equation modelling. All analyses were conducted using M*plus* 8.4 (Muthén & Muthén, 2018).

8.4.1 Preliminary Analyses

In the preliminary analyses, means, standard deviations, and measures of skewness and kurtosis were calculated for all substantive factors. Omega coefficients were also

calculated for both behavioural engagement and emotional exhaustion, using factor loadings obtained from the multi-factor multilevel CFA. The next step involved calculating the intraclass correlation coefficients (ICCs), which were obtained to evaluate the extent to which teachers within the same school shared similar experiences of behavioural engagement. More precisely, the ICCs were estimated as the proportion of total variance attributable to school-level differences (Bliese et al., 2018; Lüdtke et al., 2006). Although it is suggested that ICC values should be close to or exceed .10 (Marsh et al., 2012), Bliese et al. (2018) suggests that even marginal ICCs warrant examination, as they can provide insights into multilevel phenomena.

8.4.2 Multilevel Confirmatory Factor Analysis

Multilevel confirmatory factor analysis (ML-CFA) was used to assess the factor structure and bivariate correlations of the hypothesised model. A doubly latent approach to modelling was used, which yields a number of statistical advantages. First, in doubly latent modelling, multiple indicators are used to reflect the underlying unobserved construct that may be a source of covariance among the indicators (e.g., emotional exhaustion as measured by four burnout items; Marsh et al., 2012). This allows for the control of measurement error compared to the use of a single measure which is assumed to have no error. Additionally, ML-CFA and ML-SEM enable the control of sampling errors, as they use responses from multiple respondents to control for sampling error (Marsh et al., 2012). The capacity to control for both measurement and sampling error simultaneously is one of the significant strengths of adopting a doubly latent approach (Morin et al., 2021).

In this phase of analysis, all substantive factors (behavioural engagement, emotional exhaustion, and academic achievement) were included within one model. At both Level 1 (L1) and Level 2 (L2), behavioural engagement and emotional exhaustion were specified as latent factors (i.e., doubly latent). These factors were inferred on the basis of teachers'

responses to multiple indicators. Items at the L2 school-level were based on the latent aggregation of these responses. Factor loadings were constrained to be invariant across L1 and L2 to ensure constructs were measured in relation to the same metric (Marsh et al., 2012). L2 residuals were constrained to be more than zero to avoid convergence issues (Jia & Konold, 2021). Academic achievement was specified only at L2 (because it was a school-level variable). Teachers were clustered within schools (N = 39). To reduce nonessential multicollinearity, all variables in the model were standardised (M = 0.00, SD = 1.00; Morin & Marsh, 2014). This model was run using the maximum likelihood with robustness to non-normality (MLR) estimator (Chou & Bentler, 1995). Missing data at the item level (behavioural engagement = 4.5%; emotional exhaustion = 4.5%) were handled using full information maximum likelihood (FIML; Enders, 2001). Model fit was assessed via the comparative fit index (CFI), and the root mean square error of approximation (RMSEA). Excellent fit was indicated by CFI values greater than .95 and RMSEA values lower than .06 and adequate fit was indicated by CFI values greater than .90 and RMSEA values less than .08 (Hu & Bentler, 1999; Schreiber et al., 2006).

8.4.3 Multilevel Structural Equation Modelling

As can be seen in Figures 8.1a and 8.1b, core hypotheses were tested using doubly latent multilevel structural equation modelling (ML-SEM; Marsh et al., 2009). The same constraints as outlined above were used (i.e., factor loadings constrained at L1 and L2; L2 residuals ≥ 0; all factors standardised). In addition, the MLR estimator, FIML, and the same cut-offs for fit indices were applied. In this approach, all factors were modelled the same as in the ML-CFA. At L1, behavioural engagement and emotional exhaustion were correlated to control for shared variance. Structural paths were then estimated at L2 using two separate models. This approach was adopted given the comparatively small sample size relative to L2 parameters to be estimated (39 schools at L2). In these models, behavioural engagement and

emotional exhaustion were correlated at L1 and entered separately as predictors of academic achievement at L2. This is shown in Figure 8.1a and Figure 8.1b below.

Figure 8.1a

Hypothesised Multilevel Model: *Behavioural Engagement*

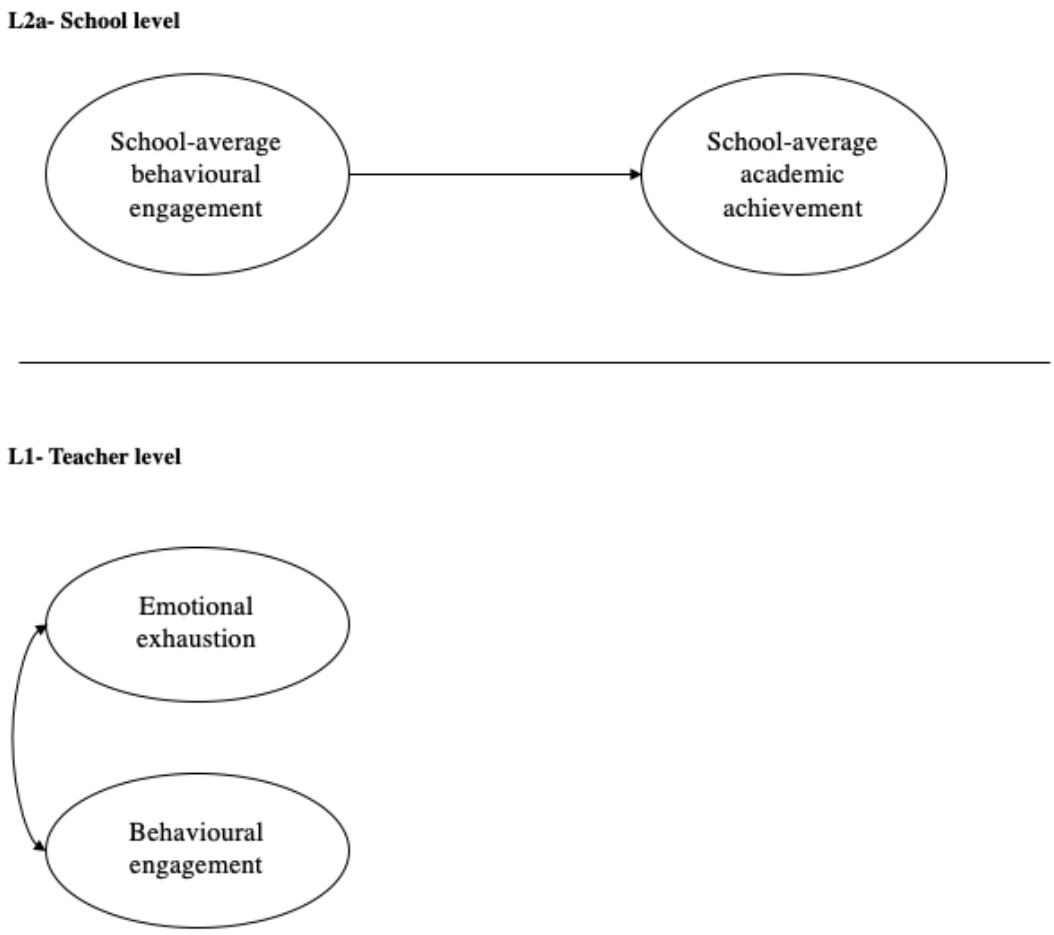
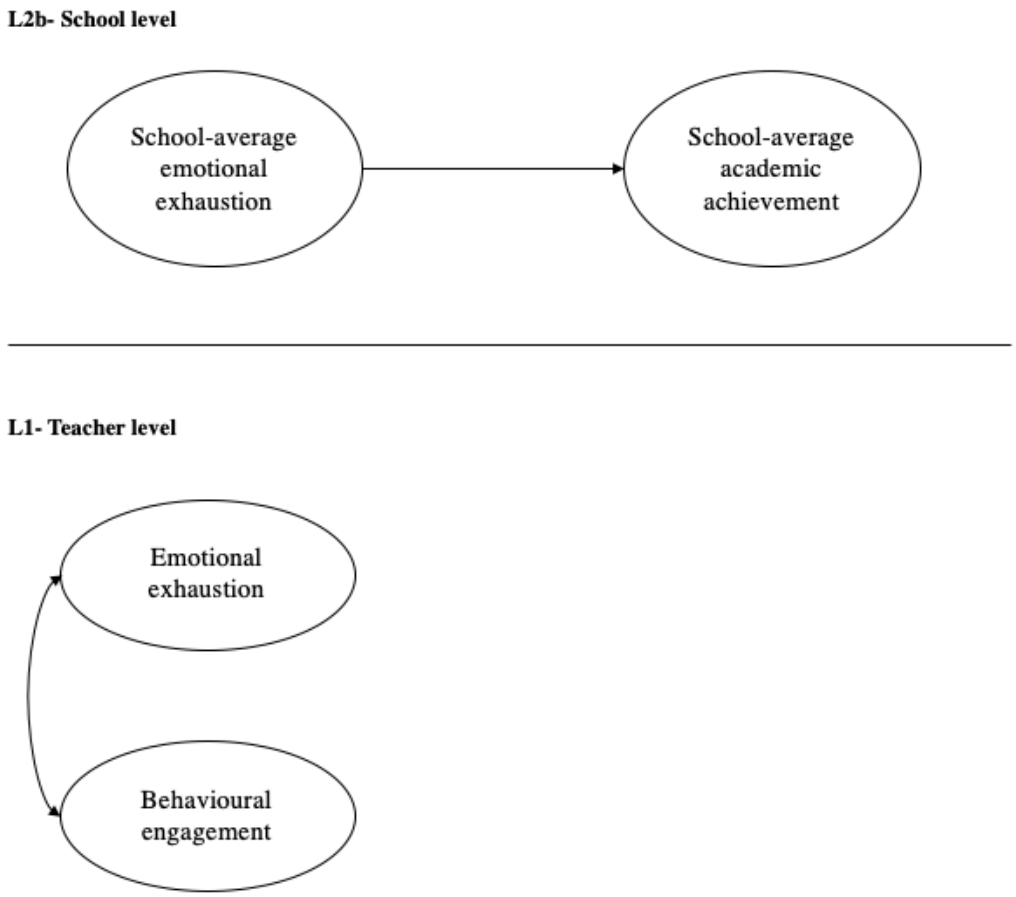


Figure 8.1b

Hypothesised Multilevel Model: Emotional Exhaustion



Chapter 9

RESULTS FOR STUDY 3

Table 9.1 presents the descriptive statistics (skewness, kurtosis, and standard deviations), the intraclass correlation (ICC) coefficients, and the bivariate correlation coefficients recorded in Study 3.

9.1 Reliability and Tests of Normality

As can be seen in Table 9.1, behavioural engagement, emotional exhaustion, and academic achievement were found to be normally distributed. Although the ICC values were modest, they warranted the use of mixed-effects modelling given that organisational phenomena were under examination (Bliese et al., 2018).

9.2 Multilevel Confirmatory Factor Analysis

Multilevel confirmatory factor analysis (ML-CFA) was used to test the latent structure of the scales used to represent behavioural engagement and emotional exhaustion at Level 1 (L1) and Level 2 (L2), and academic achievement at Level 2. These analyses yielded satisfactory fit: χ^2 (57) = 169.44, $p < .001$; RMSEA = .064; CFI = .95. The substantive predictors (behavioural engagement, emotional exhaustion) demonstrated adequate factor loadings, as shown in Table 9.1. Although one of the items measuring behavioural engagement was low compared to other items, it was retained as it was part of the original scale, and model fit was adequate despite the low factor loading. At L1, there was a non-significant correlation between behavioural engagement and emotional exhaustion ($r = .04$, *ns*). At L2, the correlation between school-level behavioural engagement and school-level achievement was non-significant ($r = .41$, *ns*). The correlation between school-level emotional exhaustion and school-level achievement was significant and negative ($r = -.59$, $p < .01$). A non-significant correlation was reported between behavioural engagement and emotional exhaustion ($r = -.77$, *ns*), but given the large size of the correlation, the non-

significance likely speaks to the modest power at L2 (only 39 schools). A positive and non-significant correlation was found between behavioural engagement and achievement at L2 (r = .41, *ns*).

9.3 Multilevel Structural Equation Modelling

Multilevel structural equation modelling (ML-SEM) was adopted to examine the central hypotheses of Study 3 (detailed on p. 105). Of specific interest were the relations between behavioural engagement and emotional exhaustion and academic achievement at L2. Thus, at L1 in the ML-SEM behavioural engagement and emotional exhaustion were correlated, but no structural paths were specified at L1 because the two factors are considered parallel in JD-R—thus, no directional ordering. Additionally, there was no student data available at L1, so specification of this path was not possible. At L2, structural paths were entered. Due to the relatively strong correlation between the two predictors at L2 and given the small sample size at L2, behavioural engagement and emotional exhaustion were entered as predictors of school-level achievement in two separate models. In both models, behavioural engagement and emotional exhaustion were correlated at L1. This enabled variance at L1 to be controlled for, thus allowing the identification of the association between the predictor (i.e., behavioural engagement in one model, emotional exhaustion in the other model) and achievement at L2 beyond that which is present at L1.

In Model 1 (Figure 9.1a), school-level behavioural engagement was entered as a predictor of school-level academic achievement. The model provided satisfactory fit: χ^2 (74) = 658.36, $p < .001$; RMSEA = .065; CFI = .91. The association between school-average behavioural engagement and achievement was non-significant (β = .58, *ns, SE* = .70), but given the size of the beta estimate, this non-significance likely speaks to the modest power at L2 and the fact that only 1% of the variance in behavioural engagement was at the school-level. In Model 2 (Figure 9.1b), school-level emotional exhaustion was entered as a predictor

of school-level academic achievement. Model 2 also yielded satisfactory fit: χ^2 (74) = 635.06, $p < .001$; RMSEA = .063; CFI = .91. In this model, a significant and negative association was found between school-level emotional exhaustion and school-level academic achievement (β = -.61, $p <.01$, $SE = .22$), such that greater levels of school-average emotional exhaustion negatively predicted school-average academic achievement. The final structural model is shown in Figures 9.1a and 9.1b.

9.4 Summary of Study 3 Findings

Study 3 builds on the findings of the structural equation modelling conducted in Study 1 and the person-centred analyses conducted in Study 2 by exploring key constructs at the school level, including school-level student achievement. Specifically, measures of teacher well-being were aggregated at a school-level and the associations between these measures and student achievement were examined. Results revealed a significant negative association between school-level emotional exhaustion and school-level academic achievement, such that schools with higher levels of emotional exhaustion were associated with lower levels of achievement in NAPLAN. Behavioural engagement was not significantly associated with student achievement; however, the effect size was large highlighting the need for additional research with greater power at L2 to examine this further (see Limitations in Discussion below). These findings yield important implications for the way in which emotional exhaustion is addressed at a school level and extends prior knowledge about the role teachers play in students' academic achievement.

Table 9.1

Descriptive, Reliability, and CFA Statistics for Substantive Factors for Study 3

	Mean	*SD*	Skewness	Kurtosis	ω - Omega Coefficient	L1 Loading mean (range)	L2 Loading mean (range)^	Intraclass Correlation Coefficient
Motivational Process								
Behavioural engagement	6.19	0.62	-0.63	0.35	0.80	.66 (.47-.87)	.82 (.66 – 1.0)	.01
Health Impairment Process								
Emotional exhaustion	4.86	1.42	-0.60	-0.32	0.91	.81 (.77-.88)	.93 (.87 – 1.0)	.06
Academic Achievement								
School literacy achievement	-0.16	0.99	.088	-1.46				
School numeracy achievement	-0.17	1.03	.054	-1.44				
Overall achievement	-0.17	1.01	.081	-1.48				

^ One item for each construct was fixed at 1 for factor variance

Figure 9.1a

Final Structural Model: Behavioural Engagement as a Predictor

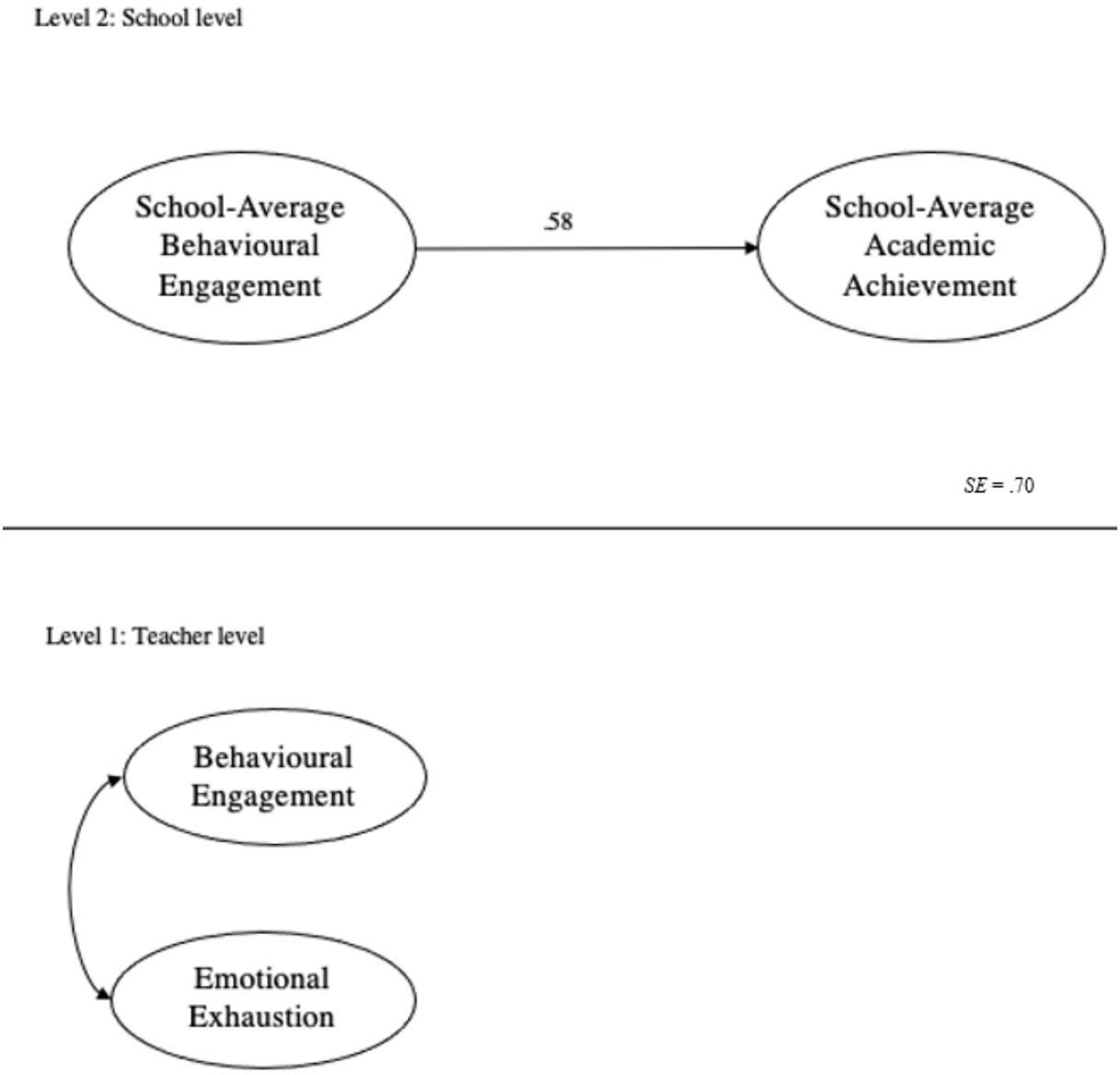
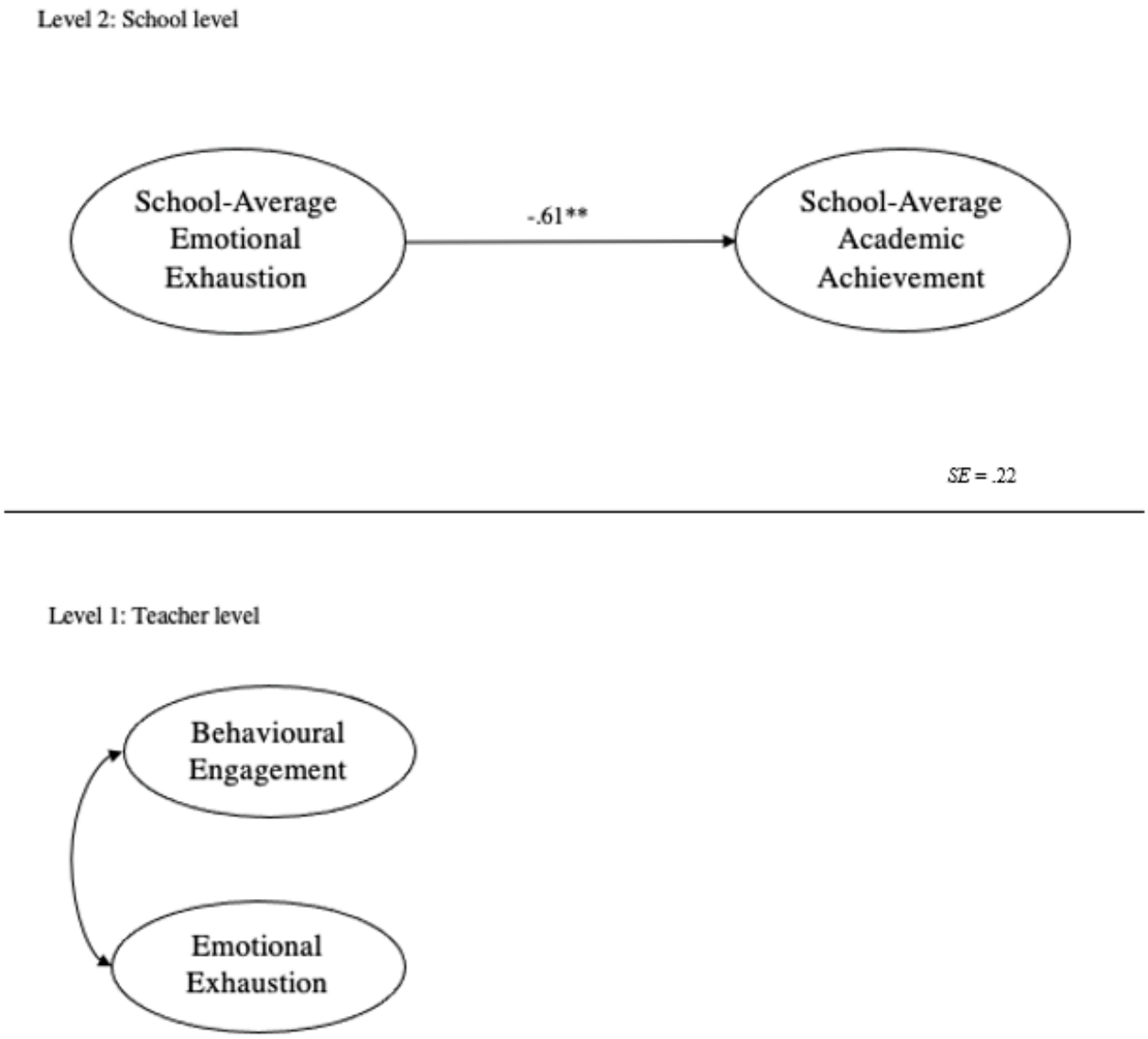


Figure 9.1b

Final Structural Model: Emotional Exhaustion as a Predictor



Chapter 10

DISCUSSION

Teaching is an inherently complex profession. Each day, teachers encounter a range of intellectual, interpersonal, and structural demands. Ultimately, the extent to which teachers are able to mobilise personal and job resources to help manage their demands is a key determinant of their psychosocial experiences of work. In turn, these experiences have significant implications for schools, students, and the education system more broadly in terms of student achievement, school effectiveness, and the wider educational, social, and economic impacts of teacher mobility. Although prior work has identified the factors associated with teachers' negative experiences in the workplace (e.g., the factors leading to burnout, disengagement, and turnover intentions; Chang, 2009; Ryan et al., 2017), comparatively less research has examined the factors associated with teachers' positive psychological functioning. This is particularly true of teachers within the Australian context, and notably among teachers in the primary school (ages 5-12) sector. Moreover, the bulk of previous quantitative research examining teachers' experiences at work has tended to adopt analytical approaches from one particular methodological standpoint (e.g., variable- or person-centred approaches), whereas there is increasing recognition of the utility of adopting complementary variable- *and* person-centred approaches (Morin et al., 2017) to reveal nuances in the way certain variables operate in concert. The current investigation sought to address these gaps and limits to glean greater insights into the workplace experiences of Australian teachers.

Using Job Demands-Resources (JD-R) theory, the present work aimed to test core hypotheses through three phases of analyses. In phase one (Study 1) of analyses (variable-centred), structural equation modelling was employed to examine the ways in which job demands (role conflict), job resources (useful collaboration, useful professional development), and personal resources (adaptability, self-efficacy) were associated with two

well-being factors (behavioural engagement, emotional exhaustion) and, in turn, two retention-related outcomes (organisational commitment, turnover intentions). Consistent with the propositions of JD-R theory, the interactions among the demands and resources were also examined to see if there was evidence of a moderating (boosting/buffering) role of the resources/demands. Phase two (Study 2; person-centred) sought to identify profiles of demands and resources among teachers, and examined the extent to which these profiles were predicted by demographic variables and associated with well-being (behavioural engagement, emotional exhaustion) and retention-related outcomes (organisational commitment, turnover intentions). In phase three (Study 3), measures of teachers' behavioural engagement and emotional exhaustion were aggregated at a school-level and examined in relation to school-level academic achievement.

The present chapter will begin with a summary of the key findings from the three phases of analysis. Following this, the chapter will discuss findings of note and consider the theoretical and empirical significance of the present work. Finally, the chapter will summarise the limitations of the investigation, provide avenues for future research, and discuss the implications of the findings for theory, research, and practice.

10.1 Summary of Findings

10.1.1 Study 1

The results from variable-centred Study 1 (p. 125) were largely consistent with hypotheses and the core propositions of JD-R theory (further below, each hypothesis is discussed with reference to the findings). Role conflict (a job demand) was associated with higher emotional exhaustion, that in turn predicted higher turnover intentions (role conflict was also directly associated with turnover intentions). This provides some support for the health impairment process—a key explanatory process under JD-R theory—which holds that chronic job demands will lead to the depletion of physical and emotional resources, resulting

in greater levels of burnout and poorer occupational outcomes (Bakker, Veldhoven, et al., 2010). Conversely, job and personal resources were significantly associated—both directly and indirectly—with the well-being factors (behavioural engagement and emotional exhaustion) and retention-related outcomes (organisational commitment and turnover intentions). This provides support for the motivational process among teaching populations—another key explanatory process under JD-R—which holds that job resources are inherently motivational and foster engagement and subsequent positive occupational outcomes (Collie, Malmberg, et al., 2020; Rajendran et al., 2020). There was also evidence that resources played a role in relation to emotional exhaustion, which extends beyond the main processes posited by JD-R, but that has been supported in prior work (e.g., Collie et al., 2018). In addition to the main associations, numerous moderation effects were found. Of specific note was the interaction between adaptability and role conflict, which provided support for the buffering process proposed by JD-R theory. Taken together, the findings provide broad support for JD-R theory and shed light on some of the key processes involved in teachers' well-being.

10.1.2 Study 2

The findings from Study 2 (p. 154) yield further insight into the nature of teachers' workplace experiences through the identification of person-centred profiles of demands and resources. Latent profile analysis (LPA) revealed four unique profiles: the *adaptive* profile, the *mixed-resourced* profile, the *average* profile, and the *maladaptive* profile. While no differences were found as a function of background attributes (gender, teaching experience), notable differences were found between the four profiles in terms of their component indicators and in terms of their associations with workplace outcomes: behavioural engagement, emotional exhaustion, organisational commitment, and turnover intentions. Specifically, members of the *adaptive* profile evinced the highest levels of behavioural

engagement and organisational commitment, and the lowest levels of emotional exhaustion and turnover intentions, while teachers within the *maladaptive* profile displayed the highest levels of emotional exhaustion and turnover intentions, and the lowest levels of both organisational commitment and behavioural engagement. Interestingly, few significant differences were found in terms of outcomes between the *mixed-resourced* and the *average* profiles. These findings provided complementary knowledge about teachers' experiences at work. Whereas in Study 1, teachers were considered as a whole population, the methodological approach adopted in Study 2 allowed for the identification of different sub-populations and subsequently, a more nuanced understanding of individual differences among teachers.

10.1.3 Study 3

Building on the findings of Studies 1 and 2, Study 3 employed multilevel structural equation modelling to examine the associations between school-level measures of well-being (viz, behavioural engagement and emotional exhaustion) and students' academic achievement (as measured by the five areas of assessment in the National Assessment Program—Literacy and Numeracy [NAPLAN] tests; p. 179). A significant and negative association was found between school-level emotional exhaustion and school-level academic achievement, such that schools with higher levels of emotional exhaustion were associated with lower levels of achievement in NAPLAN. These findings highlight the importance of addressing teachers' emotional exhaustion at the school-level, and contribute to the growing body of literature that suggests an association between teacher well-being and students' academic achievement.

10.2 Findings of Note

10.2.1 Study 1 – Variable Centred Findings

The variable-centred findings yielded a number of significant insights into the direct associations between the substantive factors examined in the present study. In addition, several significant indirect associations and interaction effects were revealed in these analyses. In the following section, the major findings to emerge from Study 1 (variable-centred) are discussed in relation to both prior work and JD-R theory.

10.2.1.1 Findings Involving Job Demands

The significant associations between role conflict and both emotional exhaustion and turnover intentions shed light on the comparatively understudied associations between role conflict and teachers' well-being- and retention-related outcomes (Tiplic et al., 2015). The reported findings were largely consistent with *Hypothesis 1a* (*H1a)*; role conflict positively predicted both emotional exhaustion and turnover intentions.

10.2.1.1.1 Role Conflict and Emotional Exhaustion. As noted, role conflict was found to be a significant predictor of emotional exhaustion. This is largely consistent with the findings of Papastylianou et al. (2009), who reported strong associations between these variables in a sample of Greek teachers. This finding also extends the literature in a number of ways. For instance, the results provide support for the salience of role conflict as a job demand relevant to understanding teachers' workplace experiences. This is significant as only limited prior work (e.g., Papastylianou et al., 2009; Tiplic et al., 2015) has examined this variable in relation to teachers' well-being and retention-related outcomes. These findings likewise align with JD-R theory, providing support for the presence of the health impairment process and its relevance in understanding teachers' experiences at work. Specifically, as JD-R theory suggests, role conflict is a job demand which appears to erode teachers' emotional and physical resources, resulting in higher emotional exhaustion. Further, to the best of the

author's knowledge, the findings of Study 1 represent one of the first examinations of role conflict in a sample of Australian teachers. From these findings, it is evident that role conflict is a salient issue for Australian teachers, and is indeed associated with poor psychological functioning. It may be that teachers find managing incompatible expectations psychologically uncomfortable, which generates a sense of being emotionally drained (Jawahar et al., 2007). Protracted exposure to role conflict may subsequently result in higher emotional exhaustion (Van Woerkom et al., 2016).

10.2.1.1.2 Role Conflict and Turnover Intentions. Role conflict was also found to be directly associated with turnover intentions, such that teachers higher in role conflict expressed stronger intentions to leave their position. When teachers experience role conflict, they may understandably attempt to manage this tension by removing themselves from the source of discomfort (Jackson & Schuler, 1985). Prior work has found evidence of this association among samples of Norwegian and Swedish beginning teachers (e.g., Tiplic et al., 2015, 2016). The present work thus affirms prior research. It also extends the nascent literature by indicating that role conflict is associated with turnover intentions for teachers at various stages of their career, not just for beginning teachers. It may be that although teachers at different stages in their career experience different sources of role conflict, these sources ultimately result in the same outcome, which is negative emotionality and the desire to remove oneself from the precipitating context. For example, beginning teachers may experience role conflict when trying to balance curriculum requirements with the new administrative requirements imposed by a school, while more experienced teachers may face role conflict when attempting to balance leadership demands with the demands of classroom teaching.

10.2.1.2 Findings Involving Job Resources

Partial support was provided for *H1c* (that job resources would positively predict behavioural engagement and organisational commitment) in that useful professional development was found to predict organisational commitment. However, neither useful collaboration nor useful professional development were found to predict behavioural engagement. Moreover, useful collaboration did not predict organisational commitment, and was in fact found to predict emotional exhaustion. In explaining these findings, it is important to recognise that a novel aspect of this study was its focus on teachers' appraisals of resources. While the vast bulk of prior work has focused on the characteristics of resources, emerging research (Martin et al., 2021) has highlighted the utility of focusing on individuals' appraisals or perceptions of resources, which may be a more salient (or additional) determinant of the motivational aspects of a resource rather than the properties of the resource itself. In the present investigation this was achieved by focusing on teachers' perceptions of the usefulness of two job resources: useful collaboration and useful professional development. The focus on the usefulness of the resources yielded a number of unexpected findings. These findings, alongside potential explanations, are now discussed.

10.2.1.2.1 Useful Collaboration. Contrary to hypotheses, useful collaboration was not associated with positive forms of well-being or retention-related outcomes. Instead, useful collaboration was found to be positively associated with emotional exhaustion, such that teachers who found collaboration to be more useful also reported higher levels of emotional exhaustion. Interestingly, this finding aligns with prior work (Achinstein, 2002; Hargreaves, 2000; B. Johnson, 2003) suggesting that collaboration can be a source of contention for teachers**.**

The time associated with collaborative activities may explain why collaboration was associated with emotional exhaustion in the present study. Collaboration can be a particularly

time consuming task for teachers (Bovbjerg, 2006). Often, collaborative activities are undertaken outside of school hours, during holidays, or at break times such as recess or lunch (Datnow, 2018). Thus, while the actual collaboration may be useful to teachers, it still consumes time, which is considered to be an important resource to teachers (Datnow, 2018). As a result, teachers may not feel they have sufficient time to address other aspects of their work or personal lives, which may lead to job strain, poor recovery, and the ultimate erosion of personal and job resources (Bakker & de Vries, 2021). Ironically, the most exhausted teachers, or those struggling the most may need collaboration more than others to cope (Berry et al., 2009). While this collaboration may be useful, it may serve to perpetuate the experience of emotional exhaustion. Thus, it is likely that the process involving useful collaboration and emotional exhaustion is cyclical, which may also help to explain this finding.

The association between useful collaboration and emotional exhaustion may also be explained within the context of self-determination theory (Deci & Ryan, 2000). In light of falling levels of student performance in international assessments, schools have faced growing pressure to increase teachers' collaborative activities as they have been recognised as important factors in promoting instructional change (Datnow, 2018). This has led to schools mandating and highly regulating teachers' collaboration, which may undermine the sense of collective autonomy and efficacy that organic forms of collaboration may facilitate (Datnow, 2018). Though the content of these collaborative activities may be useful to teachers, the imposition of collaboration may frustrate teachers' professional autonomy (Vangrieken et al., 2015), which has been associated with heightened emotional exhaustion in previous studies of teachers (e.g., Collie, 2021).

At a classroom level, engagement in collaboration may result in teachers having less face-to-face teaching time with their students. Some forms of collaboration—e.g., teacher

observations—may require a teacher to leave their class to observe another educator (Vangrieken et al., 2015). This can be a source of stress, as teachers may not feel they can meet the needs of their students when they must direct their attention to other classrooms (B. Johnson, 2003). Additionally, such activities may involve teachers being observed themselves (O'Leary & Savage, 2019), which may be an additional source of stress or anxiety. To manage these challenges, teachers may try to compensate by investing additional physical and psychological resources, which may lead to emotional exhaustion (Bakker & de Vries, 2021).

10.2.1.2.2 Useful Professional Development. The present investigation sought to advance understanding of the associations between professional development and teachers' well-being and retention-related outcomes by focusing specifically on useful forms of professional development. As described above, by focusing on the concept of usefulness, the present investigation was able to consider teachers' appraisals of resources, which have been argued to be as important as the characteristics of the resource itself (Martin et al., 2021). This yielded a number of interesting and important findings and extends prior work on teachers' professional development, which has predominantly focused on its association with student outcomes (e.g., Ingvarson et al., 2005).

10.2.1.2.2.1 Useful Professional Development and Organisational Commitment.

A strong and positive association was found between useful professional development and organisational commitment, indicating that teachers who perceived professional development to be particularly useful were more committed to their school. While this association partially aligns with the work of Simbula et al. (2012), this is a novel finding, as prior work has not established a direct association between these two variables. Moreover, few studies have considered professional development as a job resource relevant to teachers' well-being and retention-related outcomes, or within the framework of JD-R theory.

It may be that when a school provides professional development opportunities that are relevant and useful to teachers, teachers perceive the school as supporting or nurturing their professional growth and development, and meeting their professional needs (Bogler & Somech, 2004). As the professional development is unique and helpful to the teacher's professional growth, the teacher may perceive a sense of alignment between the school's professional goals and values and their own, thus promoting organisational identification (Somech & Bogler, 2002). Moreover, the provision of professional development they consider to be useful may imbue teachers with a greater sense of autonomy (Henkin & Holliman, 2009) and thus a greater sense of satisfaction with their workplace.

10.2.1.2.2.2 Useful Professional Development and Behavioural Engagement.

Though the findings involving organisational commitment broadly align with the core propositions of JD-R theory, it was interesting that there was no direct association between useful professional development and behavioural engagement, which was contrary to the motivational process proposed by JD-R theory. It is possible this finding occurred because unlike other job resources, provisions for professional development are generally made directly by the organisation. It may be that because teachers can see that this resource comes directly from their school, this facilitates greater affective commitment as teachers appreciate the care demonstrated by the school (Mercurio, 2015). Therefore, teachers may not need to experience engagement as a necessary precondition for commitment, as the teachers' values and the school's values are already aligned (Meyer & Herscovitch, 2001) through the provision of this resource.

10.2.1.2.2.3 Yields for JD-R Theory. In examining useful professional development, as distinct from professional development more generally, the present investigation advances understanding of the more complex role of resources within JD-R theory. Specifically, by focusing on the usefulness of the resource, this body of work was

able to glean information about teachers' appraisals of job resources. This builds on the work of C. Liu and Li (2018), which focused on the extent to which teachers' appraisals of stressors are associated with their experience of emotional exhaustion. In contrast, the present investigation focused on teachers' appraisals of factors relevant to positive motivational experiences (organisational commitment). In this instance, it may be that when teachers appraise their professional development as being useful to their practice, they are more likely to be committed to their organisation. Thus, organisations may benefit from designing professional development that draws on teachers' perceptions of what may be useful, in addition to focusing on the characteristics of the professional development program and what is mandated by policy.

10.2.1.3 Findings Involving Personal Resources

Similar to the findings reported with respect to job resources, partial support was found for *H1c,* which hypothesised that job resources (useful collaboration, useful professional development) and personal resources (adaptability, self-efficacy) would positively predict behavioural engagement and organisational commitment and negatively predict emotional exhaustion and turnover intentions. Specifically, adaptability was found to predict organisational commitment and self-efficacy was associated with behavioural engagement. Contrary to *H1c*, self-efficacy was not associated with organisational commitment and adaptability was not associated with behavioural engagement; however, a novel finding was that adaptability was (negatively) associated with emotional exhaustion.

10.2.1.3.1 Adaptability. The analyses involving adaptability revealed a number of interesting findings, which extend existing work relating to adaptability and offer new insights into the role of personal resources within JD-R theory. Specifically, adaptability was a positive predictor of organisational commitment, and a negative predictor of emotional exhaustion, highlighting the dual role that this personal resource can serve for teachers.

In terms of the associations with emotional exhaustion, adaptable teachers are more capable of adjusting their thoughts, actions, and behaviours to respond positively and proactively to the presence of novelty or uncertainty in the workplace (Collie et al., 2018). Because their adaptability may be something they can activate more readily in the everyday course of their working life, they may not need to invest so much energy regulating their emotions or behaviours, and thus may be less prone to experiencing emotional exhaustion (Jeung et al., 2018). Additionally, as adaptable teachers may perceive themselves as being more capable of mobilising adaptive self-regulation strategies in the face of stressors (Bakker & de Vries, 2021), they may view stressful situations as being less demanding (Mayerl et al., 2017).

In terms of organisational commitment, given that adaptable teachers are able to respond more positively to novelty and uncertainty—two phenomena that are highly characteristic of a teacher's occupation (Collie et al., 2019)—they may perceive themselves as being more capable of performing their teaching duties and thus identify more deeply with their teaching role (Richardson & Watt, 2018). Moreover, adaptable teachers tend to spend greater time experimenting with different thoughts, feelings, and behaviours in response to the challenges they face at school (Collie et al., 2019). They are thus investing greater energy in their organisation, which is a core component of organisational commitment (Collie, Guay, et al., 2020). On a broader level, adaptable teachers may be higher in organisational commitment as they perceive themselves as being more capable of influencing and contributing to their work environment (Contreras et al., 2020).

These two adaptability findings, then, inform JD-R theory and extend prior research (e.g., Collie et al., 2018; Xanthopoulou et al., 2007) by demonstrating that adaptability is not only salient in the motivational process (boosting organisational commitment), but also in the health impairment process (guarding against emotional exhaustion). Indeed, the connection

between adaptability and emotional exhaustion was of additional significance in that emotional exhaustion significantly mediated the relationship between adaptability and turnover intentions (via a significant indirect association), but adaptability did not directly predict turnover intentions. Adaptability was thus connected to major workplace outcomes in direct and indirect ways, suggestive of the need to address this personal resource in teachers' personal and professional development (Granziera et al., 2016).

10.2.1.3.2 Self-Efficacy. The findings involving self-efficacy yielded interesting results. Consistent with prior research (e.g., Dicke et al., 2018; Skaalvik & Skaalvik, 2017a), self-efficacy was found to positively predict behavioural engagement. This finding provides support for the motivational process, as proposed in JD-R theory, and extends current work focusing on teachers' self-efficacy to demonstrate specific associations with behavioural forms of engagement. Consistent with JD-R theory, it may be that self-efficacy satisfies the basic psychological need for competence, thus fostering greater motivation and engagement (Schaufeli & Bakker, 2004). That is, when teachers believe they are capable of performing their teaching duties, these feelings of competency may enable teachers to be more energetic and actively involved in their work.

Contrary to hypotheses, self-efficacy was not found to be associated with any other substantive factors. Though surprising, analysis of the broader structural model may provide some reasons for this. For instance, the present study controlled for personality traits as covariates. A number of these traits (e.g., conscientiousness, neuroticism, and openness to experience) were positively associated with well-being and retention-related outcomes. It may be that after controlling for these core traits, self-efficacy explains comparatively less variance in these outcomes. Another potential reason for this association is because unlike prior work (e.g., Dicke et al., 2018), self-efficacy was considered alongside another personal resource (adaptability). Doing so enabled examination of the unique associations between

these resources and the substantive outcomes and revealed that compared to self-efficacy, adaptability played a proportionately larger role in the direct, indirect, and moderated processes in the model. Perhaps this is because while self-efficacy is an affective-cognitive resource which represents an individual's broader beliefs in what they can do, adaptability comprises affective, behavioural, and cognitive components, which may result in a more practical course of action (Xanthopoulou et al., 2007). As a practical resource, adaptability may have greater utility in helping teachers manage specific job demands and in addressing the real-time in-situ challenges faced by teachers.

The absence of an association between self-efficacy and organisational commitment was surprising given the considerable body of research attesting to the link between self-efficacy and commitment more broadly. However, it is important to note that while much of the prior work (e.g., Chesnut & Burley, 2015; Klassen & Chiu, 2010) has focused on the professional or occupational commitment of teachers, the present study focused specifically on teachers' commitment to their organisation, or specific school. While some teachers may feel efficacious in their ability to teach, organisational factors such as poor relationships with school leaders and structural barriers may thwart the development of an association between self-efficacy and commitment to the specific organisation (Ford et al., 2019). Therefore, it is possible that for teachers in this study, while self-efficacy did not increase their commitment to their specific school, it may still be important for their commitment to the profession more broadly. Further studies which investigate self-efficacy in relation to these forms of commitment simultaneously may shed additional light on this unexpected finding.

10.2.1.4 Findings Involving Emotional Exhaustion

As one of the aims of the present study was to examine the full range of processes proposed in JD-R theory, examining the association between emotional exhaustion and turnover intentions was of particular interest. According to both JD-R theory and the broader

burnout literature, higher levels of emotional exhaustion led to deleterious individual and organisational outcomes (Houkes et al., 2003; Schaufeli & Taris, 2014). Indeed, the point at which burnout leads to physical, psychological, and organisational consequences such as depression, absenteeism, and poor performance, is considered to be the final phase of the health impairment process. The findings from Study 1 revealed a strong and positive association between emotional exhaustion and turnover intentions among the teachers in this sample, which was consistent with *H1h*. This finding aligns with prior studies of Australian teachers (e.g., Rajendran et al., 2020) and provides further support for the application of JD-R theory, and specifically the health impairment process, as a framework for understanding teachers' work-related experiences. There are a number of theoretical explanations for these phenomena. Consistent with prior work (e.g., Schaufeli & Bakker, 2004; Skaalvik & Skaalvik, 2018), teachers experiencing high levels of emotional exhaustion may withdraw and disengage from their work to reduce the psychological costs associated with emotional exhaustion. Alternatively, this association may be explained by social exchange theory (Cropanzano & Mitchell, 2005); when an individual perceives an imbalance between the effort invested and the returns made by an organisation, they may withdraw as a result of frustration or resentment. The nature of the research design did not allow for further interrogation of the reasons for this association; thus, further research may seek to disentangle the mechanisms underpinning this finding.

10.2.1.5 Findings Involving Behavioural Engagement

In addition to the health impairment process described above, Study 1 sought to examine the motivational process. According to JD-R theory, the motivational process operates when employees possess an abundance of resources. This in turn stimulates work engagement, which fosters positive organisational outcomes. As described in the literature review, although considerable work has investigated teachers' global (i.e., non-domain-

specific) engagement, limited work has focused on the associations between resources and the various dimensions of engagement. To address this gap and advance understanding of the more nuanced processes involved in engagement, the present work focused on behavioural engagement in the motivational process.

Contrary to *H1g*, behavioural engagement was not found to be associated with either organisational commitment or turnover intentions. Although unexpected, this may reflect the triple-match principle, as described by De Jonge and Dormann (2006). The triple-match principle suggests that the strongest relationships between job demands, job resources, and job-related outcomes is observed when these elements share qualitatively identical dimensions (Van de Ven & Vlerick, 2013). As described by the matching hypothesis (De Jonge & Dormann, 2006), job demands and resources can be categorised as cognitive stressors or resources, emotional stressors or resources, and physical stressors or resources. When the type of resource matches the type of demand experienced by the employee, the connections are expected to be higher. For instance, a teacher experiencing frustration with students (an emotional stressor) is hypothesised to find the provision of an emotional resource, such as support from colleagues, to be the most effective resource at managing this stressor, as both the stressor and the resource reflect the emotional dimension. In turn this association is likely to be related to emotion-related outcomes—e.g., enjoyment at work or emotional exhaustion—depending on the strength of the associations. This association may be generalised to understand the associations between behavioural engagement and organisational commitment; whereas behavioural engagement is a factor reflecting a primarily behavioural dimension, organisational commitment in the present study reflected a primarily affective dimension (consistent with the definition established by Meyer & Allen, 1997). Therefore, behavioural engagement may be more closely associated with

behaviourally-oriented outcomes, such as organisational citizenship behaviour, rather than emotion-focused outcomes such as organisational commitment.

Of further relevance in interpreting this finding is consideration of the motivational mechanisms driving an individual's behavioural engagement. Many teachers report a sense of being overworked (Hester et al., 2020); hence, they may also endorse high levels of behavioural engagement. Specifically, behavioural engagement shares its core features (working hard and high work involvement) with being overworked (Wojdylo et al., 2014). This may lead to a null effect of behavioural engagement on the outcomes, as behavioural engagement reflects both those who are genuinely behaviourally engaged and those that are behaviourally engaged because they are over-worked. This mix of teachers may also explain why no significant association was found between behavioural engagement and turnover intentions.

In sum, although the findings involving behavioural engagement and the retention-related outcomes were unexpected, they shed light on the unique aspects of this form of engagement. Specifically, given the mixed findings, future work may seek to focus on the dimensions of engagement as separate and distinct constructs, which may provide more detail on how each dimension is implicated in retention- and organisation-related outcomes.

10.2.1.6 Interaction Effects: The Buffering and Boosting Processes

The inclusion of demands and resources in the present investigation enabled the examination of the buffering and boosting processes, two moderation or interaction effects posited by JD-R theory (Xanthopoulou et al., 2007). The buffering process proposes that job resources buffer or decrease the deleterious association between job demands and workplace well-being (Bakker et al., 2007), while the boosting process posits that job or personal resources become particularly useful for employees—or "boost" their engagement—when job demands are high. Contrary to prior work, which has identified self-efficacy as a salient

resource involved in the buffering and boosting processes (e.g., Dicke et al., 2018; Xanthopoulou et al., 2007), the present investigation found adaptability, useful collaboration, and useful professional development to be the resources involved in these interactions. The findings revealed the presence of the buffering process, thus providing some support for *H1f*; however, contrary to hypothesis *H1e*, no support for the boosting effect was found. These findings and their implications are now discussed.

10.2.1.6.1 Adaptability x Role Conflict. One of the most significant interaction effects reported in the variable-centred analysis was that between adaptability and role conflict. Specifically, support was found for the buffering process, as adaptability was shown to offset the negative association between role conflict and emotional exhaustion on teachers. That is, teachers who were higher in adaptability were better able to manage the potentially adverse consequences of role conflict and were thus less likely to experience emotional exhaustion. Importantly, this effect was present at all levels of role conflict (low, medium, and high), which demonstrates that, irrespective of the degree to which a teacher experiences role conflict, it appears that adaptability can "protect" a teacher from role conflict leading to greater emotional exhaustion. Because adaptability involves effectively navigating novelty and uncertainty (Martin et al., 2012), this may enable teachers to better handle the uncertainty that arises when competing demands or expectations are placed upon them (i.e., role conflict). This finding is supported by theoretical models of role conflict (e.g., Tidd & Friedman, 2002), which suggest that it is the presence of uncertainty that links role conflict with stress. Specifically, Tidd and Friedman (2002) suggest that role conflict leads to stress when an individual is unsure of how to execute a task, which task should be performed, and when. However, the authors also suggest that when an individual employs an active approach to adapting to or managing these conflicting sources of pressure, they are significantly less likely to report high levels of stress (Tidd & Friedman, 2002).

This finding is similarly consistent with Conservation of Resources (COR; Hobfoll, 2001) theory, which suggests that certain learned traits and skills may enable people to regulate their behavioural, cognitive, and emotional responses more effectively in the face of stressors. Highly adaptable individuals may be able to prevent the resource loss associated with role conflict (Jawahar et al., 2007) by adapting their behaviours to mobilise resources such as supervisor support to address role conflict, or they may be able to adapt their cognitions and emotions to reduce the perception of potential role stressors.

Importantly, the findings involving adaptability also inform JD-R theory by locating this moderating dynamic in the context of the hypothesised buffering process, which is a core proposition of contemporary iterations of the framework (Bakker et al., 2005). Thus, including this personal resource (adaptability) has revealed an important means by which buffering mechanisms can operate in the workplace in schools. Encouragingly, because adaptability is a modifiable capacity (Martin et al., 2012), there are opportunities to cultivate it via personal and professional development both in schools and in pre-service teacher education contexts. These are discussed further below.

10.2.1.6.2 Useful Collaboration x Role Conflict. The interactions involving useful collaboration yielded unexpected findings (unexpected in the sense that this factor was hypothesised to be a resource for teachers). The findings of simple slopes tests revealed that for teachers experiencing low or medium levels of role conflict, greater collaboration with colleagues was associated with higher emotional exhaustion (there was no change in collaboration for teachers with high role conflict). This was surprising, as JD-R theory suggests that employees with greater resources are better able to manage daily job demands (Xanthopoulou et al., 2007). Specifically, social resources such as collaboration are hypothesised to act as resources that facilitate the preservation of resources in the face of stress (Hobfoll, 2002; Jawahar et al., 2007).

While this finding requires further investigation, there are some possible explanations. As described above, this finding may reflect teachers' appraisals of helpful collaboration as a being useful, but also time- or energy-intensive. It could also be speculated that while teachers may find collaboration useful, teachers who have greater role clarity (low/medium role conflict) may perceive it as a form of unnecessary administrative control (Hargreaves, 2019). Indeed, both Hargreaves (2019) and B. Johnson (2003) have reported that some teachers view collaboration as an attempt by the school administration to achieve conformity in the attitudes and approaches of teaching staff. This form of contrived collegiality may be a source of frustration, a negative emotion that may lead to the development of emotional exhaustion. Alternatively, it may be that teachers low in role conflict simply do not require support or collaboration; hence, even if the collaboration is useful, its unnecessary nature renders it emotionally exhausting.

Another possible explanation for this finding may be the incongruence between forms of collaboration and teachers' autonomy. Tschannen-Moran (2001) notes that isolation may be a necessary condition for teachers to maintain their sense of autonomy, particularly under conditions in which teachers report feeling burnout. However, collaboration may be seen as work that threatens an individual's independence, which teachers may conflate with their autonomy (B. Johnson, 2003; Vangrieken et al., 2015). This potential feeling of a lack of autonomy may undermine the positive effects of collaboration for teachers who are low/medium in role conflict. It may also be that collaboration can be somewhat of a double-edged sword; while collaboration with some teachers may be empowering, collaboration with others may lead to role conflict by way of greater interpersonal demands (Achinstein, 2002). That is, the inherently complex task of working with people (Bowen, 2013) adds yet another pressure, thus increasing potentially adverse effects of role conflict.

10.2.1.6.3 Useful Professional Development x Role Conflict. There were also two significant interactions involving professional development and role conflict. For the first interaction, under conditions of low role conflict, higher levels of useful professional development were associated with lower emotional exhaustion (there was no change in emotional exhaustion for teachers with medium or high role conflict). This suggests that when teachers perceive professional development to be useful, role conflict is less likely to be associated with emotional exhaustion, thus providing partial support for the buffering process within JD-R theory. Interestingly, this effect was only present under conditions of low role conflict, which may be indicative of the potency of role conflict as a demand.

The second interaction effect between useful professional development and role conflict was the only interaction found to be also associated with behavioural engagement. Results revealed that for teachers experiencing low role conflict, higher usefulness of professional development was associated with greater behavioural engagement. However, for teachers reporting medium and high role conflict, there was no difference in behavioural engagement as levels of useful professional development increased. This finding did not provide support for the boosting hypothesis.

Taken together, the two interactions suggest that professional development usefulness was important in supporting more positive well-being outcomes, but only when role conflict was low. Thus, it appears that after a certain level, role conflict becomes insurmountable in relation to teachers' well-being outcomes. Put differently, perhaps as role conflict rises, the usefulness of professional development is no longer strong enough to offset the detrimental association between role conflict and the well-being outcomes. While further research will be required to determine why the motivational properties of this job resource changed as job demands increased, these findings nonetheless suggest that useful

professional development may be a means through which schools can help teachers to manage the presence of role conflict.

10.2.1.7 Indirect Associations

In addition to the aforementioned interaction effects, a number of indirect associations, involving both the substantive factors and the interaction effects, were identified: role conflict to turnover intentions via emotional exhaustion; adaptability to turnover intentions via emotional exhaustion; useful collaboration x role conflict to turnover intentions via emotional exhaustion; and, useful professional development x role conflict to turnover intentions via emotional exhaustion. Accordingly, support was found for *H1b* (that role conflict would be positively associated with turnover intentions via emotional exhaustion), but not for *H1d* (that the job resources and personal resources would be positively associated with organisational commitment via behavioural engagement). The following section examines these associations and discusses their theoretical and practical significance.

10.2.1.7.1 Role Conflict to Turnover Intentions via Emotional Exhaustion.

Consistent with the health impairment process posited by JD-R theory, teachers reporting higher levels of role conflict also reported higher levels of emotional exhaustion, which in turn led to greater levels of turnover intentions. Specifically, when role conflict is high for teachers, it appears to deplete their physical and psychological resources. This depletion leads to greater emotional exhaustion, which may result in an elevated desire to leave the profession. Though prior work has examined the associations between role conflict and emotional exhaustion (Papastylianou et al., 2009) and role conflict and turnover intentions (e.g., Tiplic et al., 2015), the findings of the present investigation appear to be the first which examine how role conflict is indirectly associated with teachers' broader retention-related outcomes. In addition to providing support for the extended health

impairment process within JD-R theory (that is, between a demand, burnout, and an occupational outcome; Schaufeli & Taris, 2014), this finding highlights the salience of role conflict as a demand for teachers, and suggests that part of the reason that role conflict may result in greater turnover intentions for teachers is because of the increased levels of emotional exhaustion. These findings thus hold important information for interventions, and suggest there may be merit in reducing both role conflict and emotional exhaustion—discussed in more detail below.

10.2.1.7.2 Adaptability to Turnover Intentions via Emotional Exhaustion.

Contrary to *H1d* (that the personal resources would be positively associated with organisational commitment via behavioural engagement), adaptability (a personal resource) was in fact found to be negatively associated with turnover intentions by way of emotional exhaustion. Specifically, teachers who reported greater adaptability also reported lower emotional exhaustion, which in turn was associated with lower intentions to leave the organisation. This finding is particularly significant given that adaptability was not directly associated with turnover intentions in the final structural model. Moreover, this finding both complements and builds on the aforementioned interaction effect, which similarly found adaptability to act as a "protective" mechanism for teachers.

Though adaptability has been associated with positive outcomes for teachers, such as greater organisational commitment, greater subjective well-being (Collie & Martin, 2017), and higher levels of extra-role behaviour (Collie, Guay, et al., 2020), only one study has examined this resource in relation to emotional exhaustion (Collie et al., 2018) and no prior work has considered this resource in relation to turnover intentions. Given the growing concern with teacher burnout and attrition (Weldon, 2018), these findings are both theoretically and practically significant. From a theoretical perspective, this association builds on Collie et al.'s (2018) research, which demonstrated that adaptability is significant in

the motivational process, to show it is also important in the health impairment process. Teachers who are more adaptable may be more capable of adjusting their affective, behavioural, and cognitive responses to potential stressors (Collie et al., 2018). As a result, they may be less likely to experience emotional exhaustion and the ensuing negative outcomes. From a practical perspective, this finding points to the potential value of cultivating adaptability as a resource for teachers, discussed in detail below.

10.2.1.8 Moderated Mediation Effects

A novel finding to emerge from the analysis of indirect associations was that two of the interaction effects (useful collaboration x role conflict; useful professional development x role conflict) were found to be indirectly associated with turnover intentions via emotional exhaustion. Hence, useful collaboration and useful professional development (respectively) moderated the mediated association between role conflict and turnover intentions via emotional exhaustion. This extends prior work involving teachers and JD-R theory (e.g., Mérida-López et al., 2019) by highlighting the utility of examining demand-resource interactions in relation to the mediated health impairment and motivational processes posited by JD-R theory. Specifically, these effects suggest that the strength of the indirect association between a demand, an outcome, and a mediator may be influenced by the levels of resources possessed by a teacher. This represents a more nuanced process and points to the importance of building resources as a means to counteract the deleterious effects of demands on outcomes, rather than simply addressing or reducing the demand itself. The presence of these significant indirect associations involving these interactions appears to provide some support for the notion of synergistic and additive joint effects within JD-R theory (Hu et al., 2011), which suggest that the combined risk of high demands and low resources is greater than the separate risks of high demands and low resources alone. Future research, in which interactions between specific pairs of demands and resources are examined (i.e., demands and

resources that target specific domains of psychological functioning; K. Daniels & De Jonge, 2010) may clarify the nature of this association and shed further light on how and why moderation of the mediation effect may occur.

10.2.1.9 Findings Involving Covariates

10.2.1.9.1 Gender. No associations were found between gender and any of the substantive factors. Though this is in contrast to some prior work (e.g., Collie, Malmberg, et al., 2020; Klassen & Chiu, 2010), it is important to note that only 15% of participants were male. While this is comparable to the average proportion of males in NSW primary schools (NSW DET, 2020) and beyond (Ingersoll et al., 2018), future research employing larger sample sizes is important to further understand potential associations. Nonetheless, this finding may indicate that for primary school teachers, other personal and organisational factors play a more significant role in determining their well-being and retention-related outcomes than gender.

10.2.1.9.2 Teaching Experience. Analyses of the associations between teaching experience and the substantive factors revealed four significant associations. In contrast to prior work (e.g., Collie, Malmberg, et al., 2020; Collie & Martin, 2017), teaching experience was positively associated with adaptability, such that more experienced teachers reported a greater perception of their ability to adjust their thoughts, feelings, and behaviours to novelty and uncertainty at work. It may be that experienced teachers have spent more time adjusting their classes to respond to students' social, emotional, and academic needs (Arendale & Hanes, 2016; Louws et al., 2017) and are more capable of employing these adaptive behaviours again, and across different work contexts. Interestingly, these findings contrast with those reported by Collie, Malmberg, et al. (2020), who reported that less experienced teachers had higher levels of adaptability. This may be a function of teaching level; while the teachers under examination in Collie, Malmberg, et al. (2020) taught at a secondary school

level, the teachers in the present study all taught at the primary school level. As primary school teachers teach across a range of subject areas, perhaps prior experience in teaching across these areas develops their ability to adapt their emotional, behavioural, and cognitive responses to novelty. Comparatively, teachers in the earlier stage of their careers may lack prior mastery experience, which is a core determinant of an individual's belief in their capacity to pursue a specific course of action, such as adapting to new phenomena (Bandura, 1997).

Teaching experience was also found to be significantly associated with self-efficacy; teachers with more experience reported greater levels of self-efficacy than those with less experience. This finding broadly aligns with previous work (e.g., Lazarides et al., 2018; Schleicher & OECD, 2015), and can be understood within the theoretical framework of social-cognitive theory (Bandura, 1997). More experienced teachers are likely to have had the opportunity to develop greater teaching mastery that underpins their perceived competence (Bandura, 1997). The extra years of experience to accrue these mastery experiences are particularly important given that mastery experiences are considered to have the strongest effect on self-efficacy development (Pfitzner-Eden, 2016). Moreover, through collaboration and mentoring, more experienced teachers may have also been able to observe and work with accomplished colleagues or mentors. Through these vicarious experiences, teachers may have developed stronger beliefs in their ability to engage students, manage a classroom, and deliver instruction.

A small but significant association was also found between teaching experience and role conflict, such that more experienced teachers reported higher levels of role conflict. This finding is a novel contribution to an otherwise underdeveloped area of the literature. Teachers with greater experience are often allocated duties in addition to their teaching, such as mentoring, providing support for early career teachers, designing professional development,

and providing instructional support (Rowan et al., 2009). Typically, such duties are conducted in addition to normal teaching duties. Partaking in such activities may add additional sources of pressure and expectations to teachers (Rowan et al., 2009), thus increasing their perceptions of role conflict.

Finally, teaching experience was found to predict turnover intentions, such that more experienced teachers reported stronger intentions to leave their organisation. There are several possible explanations for this finding. Prior work has established that more experienced teachers may be closer to retirement age (Guarino et al., 2006). Hence, this finding may reflect a teacher's natural career progression. For other teachers, personal factors such as health and family or carer priorities become more important with age (Borman & Dowling, 2008; Day & Gu, 2010), leading to a premature departure from their role. Other studies (e.g., Buchanan et al., 2013; Räsänen et al., 2020) indicate that for a small proportion of experienced teachers, the changing nature of the profession has led them to leave the career earlier than anticipated. To further understand the reasons for this association, future research may seek to focus on the turnover intentions of more experienced teachers in order to better understand their underlying motivations.

10.2.1.9.3 Personality. In addition to gender and teaching experience, the study controlled for personality by including measures of agreeableness, conscientiousness, extraversion, neuroticism, and openness to experience (Judge et al., 1997). As can be seen in Table 5.3, numerous significant associations were found. Specifically, neuroticism was found to be a strong and positive predictor of role conflict, behavioural engagement, and emotional exhaustion, and a negative predictor of adaptability. The findings involving role conflict, emotional exhaustion, and adaptability were consistent with prior empirical work. That is, individuals high in neuroticism have a tendency towards negative emotionality, and will thus tend to appraise workplace situations as being greater sources of stress (Bono et al., 2002; Rai

& Kumar, 2012). Because neuroticism is often characterised by patterns of inflexibility (Paulus et al., 2016), neurotic individuals are less likely to adapt their responses to novel phenomena (Kashdan & Rottenberg, 2010; Martin et al., 2013). In contrast to these findings, the positive association between neuroticism and behavioural engagement was surprising. It may be that there is an element of stress arousal and self-critical perfectionism in neuroticism (Smith et al., 2016) that also drives workplace behaviours (Ozbilir et al., 2015). In line with this contention, it is revealing to note that behavioural engagement was also positively predicted by high levels of conscientiousness, which may speak to aspects of over-striving and perfectionistic behaviour in the workplace (Stricker et al., 2019). Further research is required to better understand this.

Both extraversion and openness to experience were found to predict useful collaboration, adaptability, and self-efficacy. Teachers high in extraversion and/or openness may find collaboration more useful as they are naturally sociable and derive satisfaction from the opportunity to explore new ideas and innovative practices with colleagues (Araujo-Cabrera et al., 2017; Schilpzand et al., 2011). Similarly, such individuals may perceive higher levels of personal accomplishment (Kokkinos, 2007) and have more flexible attitudes and thought processes (Paulus et al., 2016), thus leading to greater self-efficacy and adaptability. Interestingly, of extraversion and openness to experience, only openness to experience was found to predict behavioural engagement. This was consistent with prior work (e.g., Vanam, 2009), which found that the association between extraversion and engagement became non-significant when job resources were taken into consideration.

As anticipated, conscientiousness was a strong and positive predictor of self-efficacy and behavioural engagement. Conscientious individuals tend to be more goal-oriented and self-disciplined (Bakker et al., 2011). This translates into greater engagement and potentially higher levels of performance (Bakker et al., 2011). Similarly, as conscientious teachers have

a propensity towards being organised and self-disciplined, they may be better prepared to engage and instruct students, which in turn may enhance their perceptions of their capacities (Perera et al., 2018). Interestingly, no associations were found between agreeableness or any of the substantive outcomes. Although this is consistent with the findings of numerous meta-analyses (e.g., Kell, 2019; Kim et al., 2019), further research is required to understand the psychological mechanisms underpinning this finding.

Also noteworthy is the fact that including measures of personality in the present study allowed trait-based variance to be controlled for, enabling the identification of significant and unique JD-R associations beyond variance attributable to personality. Therefore, the significant relationships among the core substantive variables demonstrate the salience of work characteristics and state-like attributes—beyond individual trait-like differences (such as personality)—in predicting teachers' workplace outcomes. This is encouraging as it suggests that workplace interventions (Bakker, Veldhoven, et al., 2010) focusing on modifiable factors such as reducing role conflict, building adaptability, and providing opportunities for useful professional development, are likely to evince change beyond any relatively fixed traits of teachers. Strategies to target these modifiable factors are discussed further below.

10.2.2 Study 2 – Person-Centred Findings

Study 2 extended the variable-centred findings of Study 1 by examining the data from a person-centred perspective. Whereas variable-centred analyses allow for examination of the associations between different variables, person-centred analyses allow for an examination of how collections of different patterns of scores on these variables may occur between different individuals, thus acknowledging population heterogeneity. Accordingly, Study 2 examined patterns in teachers' levels of job demands, job resources, and personal resources, to ascertain the extent to which different identifiable patterns ("profiles") may exist among teachers.

Whereas Study 1 was about identifying variables that can be targeted in practice, Study 2 was about identifying teacher profiles and subpopulations of teachers to target. This section of the discussion will consider the profiles, the extent to which they were predicted by demographic variables, and their associations with well-being and retention-related outcomes.

10.2.2.1 Profile Indicators

In the first phase of analysis, profiles of the demands and resources were generated. Consistent with *H2a* (between three and five profiles of teachers will be identified via latent profile analysis), four empirically and substantively distinct profiles of demands and resources were identified through LPA: the *adaptive, maladaptive, mixed-resourced,* and *average* profiles. This was broadly consistent with the prior work conducted by Simbula et al. (2012) and Collie, Malmberg, et al. (2020), in which three and five profiles were identified respectively.

Teachers within the *adaptive* profile displayed the most positive mix of job and personal resources. This profile was characterised by high levels of adaptability, self-efficacy, useful professional development, and useful collaboration, and low levels of role conflict. A positive finding was that the *adaptive* profile comprised approximately 18% of the sample. Therefore, about one in five teachers reported high levels of both job and personal resources, and low levels of job demands. Although the group size was not as large as that found by Collie et al. (2021), it nonetheless suggests that a significant proportion of teachers report medium to high levels of resources, alongside low levels of demands.

In contrast, the *maladaptive* profile was characterised by low levels of adaptability, self-efficacy, useful professional development, and useful collaboration, and high levels of role conflict. While this was the least adaptive profile of those identified, a positive finding was that a smaller proportion of the sample (12%) fell into this profile. This was a

considerably smaller proportion of teachers compared to those that fell into the similarly maladaptive profiles identified by Collie, Malmberg, et al. (2020) and Simbula et al. (2012).

Largely consistent with Collie, Malmberg, et al. (2020), the majority (49%) of teachers were members of the *average* profile, characterised by average levels of all four resources and the job demand. While it is positive that this group did not experience raised levels of role conflict (job demand), the sample's average levels of resources suggest this is an area that could be enhanced to help them better manage their work.

Analyses revealed the existence of a fourth profile, which comprised approximately 21% of the sample. This *mixed-resourced* profile was characterised by slightly higher levels of useful collaboration, slightly lower levels of role conflict, near average self-efficacy, and high levels of both useful professional development and adaptability. This profile was quantitatively and qualitatively different from the *average* profile; the *mixed-resourced* profile was significantly higher in both useful professional development and adaptability, while the *average* profile was characterised by average levels on all indicators.

Each of these profiles revealed nuances that shed light on the potential synergistic nature of demands and resources. The *adaptive* profile, for example, was interesting. Specifically, although the high levels of adaptability were consistent with the variable-centred findings, the fact that useful collaboration (which had in fact been associated with maladaptive outcomes in Study 1) was the second highest resource was surprising. It may be that useful collaboration complements or supports the other resources in ways that were not discernible in the variable-centred analyses (Banerjee et al., 2017).

It was likewise interesting to note that while the *average* profile was characterised by levels of demands and resources close to zero, members within this profile were slightly higher (and above zero) on both job resources, yet slightly lower (and below zero) on the personal resources. Notably, they also displayed role conflict levels that were slightly below

zero. Perhaps for these teachers, job resources are particularly important. Indeed, it may be that while these teachers report near average levels of role conflict, this demand is not associated with significantly poorer outcomes compared to the *mixed-resourced* profile because they possess similar or slightly higher levels of job resources. This suggestion aligns with the boosting hypothesis in JD-R theory (Bakker & Demerouti, 2017) and it is partly consistent with the findings of Collie, Malmberg, et al. (2020), who suggest that as long as resources outweigh demands, teachers can still experience well-being to a certain extent. Nonetheless, it will be important for future research to consider why the job resources appeared to be higher than personal resources for these teachers.

Turning to the maladaptive profile, the very low levels of useful professional development in this profile are illuminating and provide avenues for targeted interventions. Namely, interventions for teachers within this profile should place a particular focus on identifying teachers' unique professional learning needs and providing opportunities to develop these interests and capacities.

Unearthing the *mixed-resourced* profile is a novel and important finding for several reasons. First, it departs from the generally linear groupings of the other three profiles—that is, whereas the other three profiles tend to be characterised in terms of low, medium, and high on the set of indicators, the *mixed-resourced* profile is quite distinct from this linear trend and underscores the yield of person-centred analysis. Second, this *mixed-resourced* profile highlights the reality that although personal and job resources may be positively correlated at a whole-sample level, there are distinct sub-samples that do not conform to these overarching correlational patterns—indeed, one in five teachers in the current sample. Third, following from this, there are clearly unique combinations arising from person-centred analyses that could not have been revealed using variable-centred analyses, thus highlighting the utility of adopting these approaches in concert.

The identification of these four profiles advances the literature with respect to both teachers' psychological functioning and JD-R theory. For instance, no prior work involving teachers has considered role conflict from a person-centred perspective. The analysis of role conflict alongside the resources enabled examination of the extent to which individuals experience this job demand as a function of their job resources. For instance, role conflict was lowest in the *adaptive* profile, in which the four resources were highest compared to all profiles; however, although the *mixed-resourced* profile was high in two resources, the level of role conflict was not as low as that in the *adaptive* profile, suggesting that different resources play a qualitatively different, but equally important role in managing job demands. Moreover, this examination drew on teachers' appraisals of two job resources (useful collaboration and useful professional development), which have yet to be examined from a person-centred perspective. In focusing on teachers' appraisals of the job resource as distinct from its provision as a resource, the profiles were able to unearth nuances in the patterns of teachers' perceptions of resources. For example, while teachers within the *adaptive* profile identified both collaboration and professional development to be useful, teachers within the *mixed-resourced* profile found only professional development, and not collaboration to be useful.

10.2.2.2 Predictors of Profile Membership

Multinomial logistic regression revealed that neither of the demographic variables included in the LPA—gender and teaching experience—were associated with profile membership. Although this was surprising for teaching experience, given this characteristic was associated with adaptability, role conflict, and self-efficacy in the variable-centred analyses, it is important to recognise that LPA investigates qualitatively different phenomena. Compared to variable-centred approaches, which consider associations between specific demographic variables and specific substantive variables, LPA examines multiple factors

simultaneously and reflects the more complex interactions in the environment in which teaching takes place. Indeed, the fact that no associations between the demographic variables and profiles were found may indicate that interventions targeting profiles need not focus on a specific gender or teaching experience group given that they are equally likely to be members of specific profiles. These findings underscore the utility of adopting a complementary analytic approach in yielding unique insights into how and why teachers' experiences of work differ (discussed further below).

Interestingly, the above finding is consistent with the work of Simbula et al. (2012), who similarly reported no significant associations between hypothesised predictors and profile membership. On a broader level, these findings reflect the largely ambiguous body of research around the role of these demographic variables in predicting teachers' well-being and retention-related outcomes. Further work across large, multi-nation samples is thus required to shed light on whether these findings are generalisable.

10.2.2.3 Associations with Well-Being and Retention-Related Outcomes

Turning to the well-being and retention-related outcomes, a number of unique and significant associations were found involving the four profiles. The *adaptive* profile was found to evince the highest levels of positive well-being and commitment-related outcomes (behavioural engagement and organisational commitment), and the lowest levels of negative well-being and retention-related outcomes (emotional exhaustion and turnover intentions). These findings were thus consistent with the work of Collie, Malmberg, et al. (2020) and Simbula et al. (2012), both of whom reported that the profiles highest in resources were associated with the most positive outcomes. In considering the four resources, which have not been examined in prior work, the findings of this study extend understanding of the combinations of resources associated with the greatest levels of teachers' positive psychological functioning. It was also interesting to note that while only self-efficacy was

associated with greater levels of behavioural engagement in the variable-centred findings, in the LPA the *adaptive* profile displayed significantly higher levels of behavioural engagement than the other profiles. This may suggest a possible joint effect of the four resources on behavioural engagement.

In contrast, the *maladaptive* profile displayed the poorest outcomes across all the profiles; specifically, the *maladaptive* profile was significantly higher in measures of emotional exhaustion and turnover intentions, and lower in levels of behavioural engagement and organisational commitment. These findings were therefore consistent with hypotheses *H2b* (that profiles higher in resources and lower in demands would be positively associated with behavioural engagement and organisational commitment) and *H2c* (that profiles higher in demands and lower in resources would be positively associated with emotional exhaustion and turnover intentions) and were largely similar to those reported in prior person-centred examinations of teachers' demands and resources (e.g., Collie, Malmberg, et al., 2020; Simbula et al., 2012). This finding was additionally noteworthy given that no prior research has considered role conflict from a person-centred perspective and in relation to turnover intentions. Indeed, to the best of the author's knowledge, the only person-centred study to consider an aspect of role-stress theory was conducted by Radey and Wilke (2021), in which a positive analogue of role conflict (role compatibility) was considered in a study of child welfare workers. Thus, in addition to shedding light on the role played by role conflict in teachers' demand-resource profiles and the subsequent outcomes, this finding has implications for the literature pertaining to employees' role stress more broadly. That is, profiles characterised by higher levels of role conflict tend to be associated with poorer levels of organisational outcomes.

An interesting finding to emerge was that the level of behavioural engagement in the *maladaptive* profile was not significantly lower than the *average* and *mixed-resourced*

profiles. This aligns with the findings of the variable-centred study; it may be that these teachers are exerting extra energy to compensate for the high job demands and low job resources (operationalised via modest levels of behavioural engagement). Research will be needed to identify if this maladaptive driver of behavioural engagement is counterproductive in other respects.

In terms of the *mixed-resourced* and *average* profiles, it was interesting to note that the means of this outcome were largely similar between the two profiles. Moreover, no significant differences in well-being or retention-related outcomes were found between these two profiles, despite the higher levels of useful professional development and adaptability inherent in the *mixed-resourced* profile. This was a surprising finding; however, it aligns with the notion of joint effects explored in prior work (e.g., Van den Broeck et al., 2012). That is, when considering how and why profiles are associated with outcomes, it is important to examine specific combinations of demands and resources. For instance, although the *mixed-resourced* profile was higher in adaptability and useful professional development compared to the *average* profile, this combination of resources was apparently insufficient in eliciting more positive outcomes. The absence of discernible differences in outcomes between these two profiles was also significant given that unlike the *mixed-resourced* profile, the *average* profile did not display moderate or high levels of resources. As Collie, Malmberg, et al. (2020) proposed, this may be explained by the boosting process posited in JD-R theory. More precisely, although the *average* profile had lower resources than the *mixed-resourced* profile, it had largely balanced levels of demand and resources. The balancing of these factors (including the relatively higher levels of the demand compared with the *mixed-resourced* profile) may have meant that the demand boosted the role of the resources in the *average* profile—resulting in similar outcomes to the *mixed-resourced* profile.

Ultimately, however, the levels of resources within the *mixed-resourced* and *average* profiles were not high enough to elicit outcomes that were as positive as those of the *adaptive* profile. Indeed, the fact that the *adaptive* profile, which consisted of high levels of all four resources, was associated with optimal outcomes speaks to joint additive effect of resources (Van den Broeck et al., 2012). Finally, this finding highlights the capacity for person-centred methodologies to unearth unique patterns not evident in variable-centred approaches.

10.2.2.4 Yields for JD-R Theory

Taken together, the findings provide person-centred evidence that largely affirms the core tenets of JD-R theory (Schaufeli, 2017) and extends prior research by demonstrating that demands and resources combine in different ways for different subpopulations of teachers, resulting in unique teacher profiles. The *adaptive* profile, for instance, suggests that optimal outcomes for teachers can be achieved when high levels of job resources and personal resources come together. This combination of resources appears to guard or protect teachers from experiencing role conflict, and from experiencing the negative effects of role conflict on retention-related outcomes. Comparatively, although the *mixed-resourced* profile is characterised by high levels of one personal resource and one job resource, it does not yield the same positive outcomes as the *adaptive* profile, nor does it yield significantly more positive outcomes than those in the *average* profile. It may be that while teachers high in adaptability and professional development (i.e., the *mixed-resourced* profile) are able to adjust their thoughts, feelings, and behaviours, and derive purpose and satisfaction from their professional development, it is ultimately the combined effects of these factors alongside collaborative interactions with colleagues and a belief in one's ability to teach that are required to achieve optimal outcomes. Thus, as suggested by Van den Broeck et al. (2012), it appears that the specific combination of resources matters.

The associations between the *average* and *mixed-resourced* profiles and the outcomes also yielded some illuminating findings. Although initial profile enumeration revealed significant differences between these profiles (described above); there were no significant differences between these profiles in terms of their associations with well-being- and retention-related outcomes. This was surprising given the comparatively higher levels of resources demonstrated in the *mixed-resourced* profile. As noted above, it is possible that the *average* profile thus displayed some evidence of the boosting effect. That is, job resources are more strongly associated with positive outcomes when job demands are high (Bakker & Demerouti, 2017). Perhaps the *average* profile did not display lower levels of the outcomes (despite being characterised by a generally less positive combination of factors) because with relatively higher levels of role conflict, their resources played a stronger role in boosting their outcomes. In contrast, the *mixed-resourced* profile had lower levels of role conflict and thus comparatively may have not experienced a boost on the outcomes. Further research is needed to understand this profile parity more, but at this time it is important to recognise that profile membership is an important end in itself (not just a means to important ends)—that is, belonging to a more positive profile (e.g., low and high levels of demands and resources respectively) is a desirable end in itself. Moreover, although analyses did not reveal significant differences in terms of the specific outcomes examined, the *mixed-resourced* profile may fare better in terms of other workplace outcomes (e.g., job satisfaction, organisational citizenship behaviour)—again, suggesting the need for further research to better understand these associations.

10.2.3 Study 3 – Multilevel Modelling Findings

An emerging body of work (e.g., Lopes & Oliveira, 2020; Yin et al., 2018) has highlighted the utility of adopting multilevel modelling as a methodological approach to broaden understandings of teachers' well-being at an organisational level. Of particular

interest has been the examination of the associations between teachers' well-being and student outcomes, such as their socioemotional well-being and academic achievement. Though a burgeoning body of research has reported a negative association between teachers' emotional exhaustion and students' academic achievement, limited work has been conducted in an Australian context and limited research has been conducted at the school-level. Study 3 sought to address these gaps by examining the associations between school-level measures of behavioural engagement and emotional exhaustion and students' academic achievement (as measured by school-average NAPLAN scores—a nation-wide standardised test in Australia). In doing so, Study 3 disaggregated the variation in student achievement as a function of individual differences versus school membership. Behavioural engagement and emotional exhaustion were chosen as variables of interest given that they represent the two pathways through which job demands and job resources are associated with outcomes (Bakker & Demerouti, 2018). Specifically, having examined in depth the demands and resources experienced by teachers in Studies 1 and 2, Study 3 sought to examine the final stage of the JD-R model, whereby behavioural engagement and emotional exhaustion (considered to be the product of demands and resources) are associated with salient outcomes. While a considerable body of research has examined these processes with respect to teachers' outcomes (e.g., Collie et al., 2018; Dicke et al., 2018; Sokal et al., 2020), fewer studies have examined how these processes may be related to student outcomes. In the following section, the key findings of the multilevel investigation and their significance to both theory and practice will be discussed. The discussion begins with reference to the findings involving emotional exhaustion, which were of particular significance.

10.2.3.1 Associations Between School-Level Emotional Exhaustion and Student Achievement

Results of the multilevel analyses involving school-level emotional exhaustion revealed that students attending schools in which teachers reported higher average levels of emotional exhaustion achieved lower scores in a standardised measure of achievement. This finding was consistent with *H3b* (that higher school-average emotional exhaustion would be associated with lower school-average academic achievement) and aligns with the work of Arens and Morin (2016), which found that classes taught by teachers higher in emotional exhaustion achieved lower scores in tests of standardised achievement. This finding provides further support for the notion that teachers' maladaptive psychosocial functioning at work not only has negative ramifications for their own well-being, but also for the academic functioning of their students.

Teachers who are emotionally exhausted may lack the psychological and physical resources to address students' academic needs by way of their lesson preparation, classroom practices, and interpersonal interactions (Frenzel et al., 2021; Madigan & Kim, 2021). Specifically, because they are emotionally exhausted, teachers may have fewer resources to invest in planning lessons, preparing materials, and delivering lessons (which are key determinants of students' academic achievement; Arens & Morin, 2016; Hattie, 2012; Madigan & Kim, 2021; Taris, 2006). Accordingly, such teachers may be unable to adequately prepare students to address the content measured by standardised achievement tests (Arens & Morin, 2016). Teachers who are emotionally exhausted may also struggle to maintain and cultivate positive teacher-student relationships (Frenzel et al., 2021; Madigan & Kim, 2021), which may be associated with student achievement (Wubbels et al., 2016). Emotionally exhausted teachers may be more critical and less likely to provide encouragement to their students, which may lead to a loss of motivation, academic disengagement (Martin & Collie,

2019), and subsequently lower levels of academic achievement (Madigan & Kim, 2021). Such suggestions are supported by Hattie's (2012) work, which identified high quality teacher-student relationships as being one of the top determinants of student achievement in a meta-analysis of strategies that maximise students' learning.

Importantly, this finding extends existing knowledge relevant to an Australian context. Specifically, this study represents one of the first multilevel investigations to examine the association between measures of teachers' well-being and students' academic achievement among Australian teachers, and thus contributes to contemporary discussions surrounding those factors involved in addressing concerns around student achievement. This finding broadly aligns with that of Collie and Martin (2017), who reported a positive association between class-average well-being among secondary school mathematics teachers and class-average numeracy achievement. It further complements the aforementioned work by demonstrating how a negative dimension of well-being (emotional exhaustion) may also play a role in students' academic achievement, and by linking this dimension to a nationally employed standardised test (NAPLAN).

10.2.3.2 Associations Between School-Level Behavioural Engagement and Student Achievement

Contrary to *H3a* (that higher school-average behavioural engagement will be associated with higher school-average academic achievement), no significant association was found between school-level behavioural engagement and students' academic achievement. Though surprising, it is important to note that initial calculations of intraclass correlations (ICCs, which report the percentage of variance attributable to group membership, as opposed to individual variance; Maas & Hox, 2005) revealed that only 1% of variance in behavioural engagement was at the school-level. This may suggest that behavioural engagement is associated with factors at an individual- or classroom-level more than at a school-level, and

hence is unlikely to yield significant results when modelled at the school-level. It is also worth noting that while non-significant, the beta estimate was sizable (β = .58, *ns*) suggesting part of the non-significance at school-level was due to statistical power issues.

Methodological considerations aside, it is possible that the association between behavioural engagement and students' academic achievement could be better explained by the inclusion of a mediating variable. For instance, teachers who are behaviourally engaged are more likely to implement innovative teaching practices, adjust instruction to suit the needs of their students, spend additional time preparing lessons, and hold higher expectations for students (Bardach & Klassen, 2021; Basikin, 2007; Cardwell, 2011; Marzano, 2007). Such behaviours may lead to greater levels of student engagement (Cardwell, 2011; Fredricks et al., 2004), which in turn may lead to higher levels of academic achievement (Lei et al., 2018). Examining other potential mediators, such as students' need satisfaction, students' self-efficacy, or teachers' instructional effectiveness (Bardach & Klassen, 2021; Kim et al., 2018; Marshik, 2010; Olivier et al., 2019) may yield further insights into the role of teachers' behavioural engagement in students' academic achievement.

10.2.3.3 Multilevel Findings and Yields for JD-R Theory

Study 3 makes an important contribution to the extant literature on JD-R theory by examining multilevel association in an educational setting (Bakker & Demerouti, 2018). This is significant given that multilevel research has been identified as an area for further exploration within JD-R theory (Bakker & Demerouti, 2018). Indeed, multilevel associations are considered to be an unresolved area in JD-R theory (Yin et al., 2018) given the scarcity of systematic research examining how associations at the individual and organisational levels may manifest (Bakker & Demerouti, 2018). Bakker and Demerouti (2018) specifically highlight the need for more informed arguments explaining how and why factors at higher levels, such as at the school-level, are relevant to understanding processes at lower levels.

Such approaches are important not only for advancing theoretical arguments about how and why organisational level factors are associated with employee outcomes, but because they have the potential to inform intervention efforts.

In employing a multilevel approach, this study sheds light on the way that psychological phenomena operate at an organisational level (Bakker & Demerouti, 2018), and specifically, how schools differ in terms of behavioural engagement and emotional exhaustion. In turn, the study further considers the outcomes of these differences by exploring students' academic achievement. This advances both JD-R theory and practice in a number of ways. Specifically, the findings of Study 3 contribute to the relatively scant body of work examining multilevel associations from a JD-R perspective, and demonstrate that factors at the organisational level are associated with organisational-level employee outcomes. Further, much of the prior multilevel work harnessing JD-R theory (e.g., Yin et al., 2018) has focused on outcomes for schools and teachers. The present investigation extends this work to link reports of teachers' behavioural engagement and emotional exhaustion to a student outcome—academic achievement—at an organisational level.

From a practical perspective, the findings of Study 3 reaffirm prior work (e.g., Arens & Morin, 2016; Madigan & Kim, 2021) suggesting that teachers' emotional exhaustion is associated with students' academic achievement—and extend prior work that has focused primarily on the classroom-level to show that these associations also occur at a school-level. The present investigation built on this work by also considering the associations involving a positive dimension of teachers' well-being—behavioural engagement. It was thus significant to note that the association involving the health impairment process (i.e., between emotional exhaustion and students' academic achievement) was more salient than that involving the motivational process, suggesting that perhaps it is not necessarily the presence of engagement that is important for students' academic achievement, but the absence of emotional

exhaustion. Further work, involving larger samples, is important to further investigate this finding.

10.2.3.4 Summary

The findings of Study 3, involving multilevel modelling, yielded novel and theoretically and empirically significant information which builds on the findings of Study 1 and Study 2. Notably, Study 3 revealed differences in teachers' reported levels of behavioural engagement and emotional exhaustion as a function of school membership, and extended this knowledge to identify associations with a salient outcome: students' academic achievement. Thus, while Study 1 identified the antecedents and outcomes of behavioural engagement and emotional exhaustion in the sample, and Study 2 identified the differences in these outcomes as a function of profile membership, Study 3 revealed further nuances in these associations by demonstrating how these variables differed based on the school at which teachers taught and how teachers' well-being may be implicated in students' outcomes. This contributes to the growing body of literature examining JD-R theory from a multilevel perspective.

10.2.4 Summary of Study 1-3 Noteworthy Findings

In concert, each of the three studies revealed novel information about the nature, processes, and outcomes of teachers' well-being and retention-related outcomes. Moreover, each study examined the data from a different methodological perspective, such that data could be understood and interpreted in different ways and the findings of each study compared and contrasted. As further discussed below, this research extended the existing empirical work, which has tended to adopt only a single methodological approach to analyse data related to teacher well-being. Notably, the vast majority of prior work has employed variable-centred structural equation modelling to analyse the associations between variables of interest. Although such approaches are highly informative (Tomarken & Waller, 2005), they do not necessarily allow for examination of more complex subpopulation profiles that

often typify workplaces—such as person-centred approaches (e.g., Bakker & Demerouti, 2018). From a methodological perspective, the present investigation advanced prior work by examining the data from variable-centred, person-centred, and multilevel perspectives. From a theoretical perspective, the present investigation provided broad support for the core propositions of JD-R theory. It advanced existing work by highlighting the role of individuals' appraisals of job resources and by revealing the dual motivational and protective roles that certain resources (e.g., adaptability) may play. Furthermore, in examining teachers' demand-resource profiles, the present work contributes to the growing body of research (e.g., Collie, 2021; Collie, Malmberg, et al., 2020) adopting person-centred methodologies to reveal more complex interactions between numerous demands and resources.

In relation to the analysis of demands and resources, the adoption of complementary variable- and person-centred analytic approaches yielded several insights which may not have emerged had only one of these approaches been adopted. Specifically, although variable-centred analyses (in Study 1) revealed only small significant associations between useful collaboration and well-being and retention-related outcomes, this variable formed a core component of the empirically derived profiles in Study 2 that in part was responsible for explaining significant outcomes. For example, in the *adaptive* profile, mean levels of useful collaboration were higher than both useful professional development and self-efficacy, suggesting that it is an important component of effective teachers' behaviour. Conversely, the *maladaptive* profile was characterised by very low levels of useful collaboration. This suggests that useful collaboration does play a key role in both the motivational and health impairment processes; however, it may be tapping into a psychological dynamic that was not examined, and which might be included in future variable-centred research. For instance, it is possible that useful collaboration satisfies the basic psychological need of relatedness (Deci & Ryan, 2000), which has been shown to be an important component of teachers'

psychological flourishing (Hobson & Maxwell, 2017). Testing a broader range of indicators and outcomes may shed light on this finding (discussed below).

The identification of the *mixed-resourced* and *adaptive* profiles in Study 2 provided a more nuanced picture (than was possible in variable-centred analyses of Study 1) of how adaptability and professional development were experienced by participants. Specifically, the *adaptive* profile demonstrated that some teachers who experience high levels of useful professional development and adaptability also report higher levels of useful collaboration and self-efficacy, and lower levels of role conflict. These teachers demonstrated higher well-being- and retention-related outcomes. In contrast, although teachers in the *mixed-resourced* profile also reported higher levels of useful professional development and adaptability, these teachers did not fare as well on the aforementioned outcomes as the *adaptive* group.

Notwithstanding these distinct contributions by variable- and person-centred analyses, there was also notable overlap important to recognise moving forward. Both variable- and person-centred analyses highlighted the significant and negative associations between role conflict and teachers' well-being- and retention-related outcomes, and the significant and positive associations between adaptability and teachers' well-being- and retention-related outcomes. This was particularly significant given that these results were largely consistent across teachers, independent of teacher gender and teaching experience. Taken together, these complementary analyses and convergent findings make a strong case for the need to reduce role conflict and to foster the development of adaptability among teachers (suggestions for practice are described below).

In addition to examining the associations between key variables among teachers, and profiles of teachers based on their demands and resources, the present work further considered the associations between school-level measures of teacher well-being and students' academic achievement (Study 3). The inclusion of multilevel analyses augmented

the complementary analytic approach and extended prior work by considering teachers' well-being in the broader schooling context. Specifically, teachers' emotional exhaustion was found to be directly and negatively associated with students' achievement in NAPLAN, such that schools with teachers experiencing greater levels of emotional exhaustion reported lower average scores in this test. Although further work involving larger samples is required, this is a noteworthy finding. Considered alongside the findings of Study 1, these results underscore the deleterious role of emotional exhaustion on a range of individual and organisational outcomes. It would appear that teachers' well-being is not only associated with their own personal outcomes (e.g., their turnover intentions and organisational commitment), but may also be associated with the academic outcomes of their students. Taken together, these findings reveal significant information regarding the factors involved in teachers' well-being, the different types of demand-resource profiles that exist among teachers, and how school-average measures of well-being may be associated with the broader school environment. These have significant implications for the way teachers' well-being is conceptualised, understood, and addressed at both a personal and organisational level.

10.3 Implications for Practice

The findings of the present study have implications for the advancement of practice relating to teachers' well-being. This section discusses how the findings can inform practice and provides practical advice as to how teacher well-being can be supported at both an individual and organisational level.

10.3.1 The Significance of Adaptability as a Resource

Across both the variable- and person-centred studies, adaptability was significantly and positively associated with a number of positive well-being and retention-related outcomes, such as greater organisational commitment and lower emotional exhaustion. It was also shown to be a resource that could buffer, or counteract, the adverse association between

role conflict and emotional exhaustion, thus pointing to its importance in both the motivational and health impairment processes. Given the centrality of adaptability as a capacity for teachers, reported both in this study and in the broader literature (e.g., Collie et al., 2018), there is a clear imperative to focus on developing this personal capacity.

In terms of pre-service teachers, teacher education programs may be optimal settings through which adaptability can be refined, as they are designed to provide future educators with the knowledge and skills to be effective in their teaching (Granziera et al., 2016). Strategies such as scenario-based learning or role plays can provide pre-service teachers with a "safe" context in which to experiment with their responses to unfamiliar or novel teaching situations without the pressure of students in front of them (Errington, 2010). Scenario-based learning involves pre-service teachers working with an instructor to discuss appropriate responses to teaching situations based on real-life scenarios. For instance, pre-service teachers may discuss how to adapt their thoughts, emotions, and behaviours to respond to a situation in which they are required to use a new form of technology. Role plays build on this practice by encouraging pre-service teachers to enact these adaptations in simulated scenarios. An important feature of both of these approaches is that each is followed by critical reflection, in which participants evaluate their cognitive, emotional, and behavioural responses to the scenario and consider what worked and modifications that could improve such responses in the future. Clarke and Hollingsworth (2002) suggest that critical reflection is vital as it builds new knowledge and facilitates self-awareness.

Turning to in-service teachers, Martin et al. (2015) suggest that professional development focusing on the cultivation and practice of adaptability may be useful. This may involve professional development in which teachers are encouraged to identify situations of novelty and uncertainty, and to brainstorm the adjustments that could be made to their behaviours, cognitions, and emotions in such situations. For instance, teachers may be given

a scenario in which they are required to teach a novel concept or aspect of subject matter. In this scenario, adaptability may involve adjusting thoughts (i.e., by thinking about different ways to teach the concept), modifying behaviours (i.e., by obtaining new materials to teach the concept or by consulting colleagues), and regulating emotions (i.e., by drawing on positive emotions such as enjoyment to minimise negative emotions such as anxiety). Collie and Martin (2016) also suggest that self-assessment involving critical reflection may be an avenue for promoting adaptability. This could involve reflecting on prior situations in which teachers had to adjust their thoughts, behaviours, and emotions, evaluating the extent to which they were successful, and considering how they may be more effective in the future (Collie & Martin, 2016).

10.3.2 Building Self-Efficacy

Given that self-efficacy was found to be a strong and significant determinant of behavioural engagement in the present study and has been shown to be an important determinant of other salient well-being outcomes for teachers (e.g., job satisfaction; Perera et al., 2018), promoting this capacity may be of value. Drawing on Bandura (1997), this may be achieved by focusing on key sources of self-efficacy: mastery experiences and vicarious experience.

Mastery experiences are one of the strongest predictors of future self-efficacy for teachers (Clark & Newberry, 2019). Accordingly, in-service professional development should focus on providing teachers with adequate opportunities to master novel teaching strategies and content (Bray-Clark & Bates, 2003). Experiencing success in this endeavour may foster future mastery experiences (Bandura, 2006). Moreover, some teachers may benefit from working with a more experienced mentor teacher (Elliott et al., 2010). Observing, learning from, and modelling the behaviours of a more experienced educator may be a valuable source of vicarious experience (D. Johnson, 2010). Indeed, prior work suggests

that vicarious experiences are particularly important for pre-service teachers (Clark & Newberry, 2019).

10.3.3 Reducing Role Conflict

Given the negative outcomes associated with role conflict, concerted efforts should be made to reduce this job demand. School leaders can reduce the role conflict teachers may experience by setting clear and consistent role expectations and by ensuring that transparent reporting structures are in place so that teachers know to whom they must report (Safework New South Wales, 2020). Creating a culture of psychological safety, in which open communication lines are established so that teachers can raise issues or discuss potential role conflict may also be helpful (Rahim, 2010; Safework New South Wales, 2020). Detailed induction programs, in which the expectations of the teacher and reporting structures are established prior to commencing work may also provide a context in which role clarity can be established (Ellis et al., 2015; Safework New South Wales, 2020). Induction programs also have a role to play; such programs should be of a protracted length and should make explicit the duties and responsibilities of the employee from commencement of employment. Such sessions should also be complemented by longer term monitoring, in which the employee's duties are consistently evaluated and communication between the employer and employee occurs (Backlund, 2017).

Consistent with JD-R theory, building teachers' resources may better equip them to cope with the demands that may lead to a sense of role conflict (Atterwall & Engqvist, 2016). Building personal resources such as resilience, or as demonstrated in the present study, adaptability, may imbue teachers with the ability to reframe their perception of a potential stressor (Atterwall & Engqvist, 2016; Safework New South Wales, 2020). For instance, in a situation where a teacher has been asked to teach using a reading program that is at odds with their personal philosophy, the adaptable teacher may be able to modify their cognitive

response and reframe this conflict as a professional challenge. By adjusting their response, individuals may be able to prevent this source of potential role conflict from devolving into emotional exhaustion or stress (Atterwall & Engqvist, 2016).

Finally, to further understand the findings involving role conflict and to design organisational interventions that can minimise this demand, it will be important for future work to examine what may precipitate or amplify role conflict for teachers. For example, examination of the associations with factors such as task overload or value incongruence (Papastylianou et al., 2009) may shed light on the reasons for the relatively high levels of role conflict among teachers.

10.3.4 Addressing Emotional Exhaustion

The present investigation revealed the considerable negative associations between teachers' emotional exhaustion and teachers' retention-related outcomes and students' achievement. Accordingly, there is a clear imperative to reduce emotional exhaustion in teachers. Importantly, this should not solely consist of addressing the symptoms of emotional exhaustion, but should also incorporate proactive strategies which promote healthy work environments (Otto et al., 2019).

In terms of addressing the symptoms of emotional exhaustion, in a meta-analysis of interventions aimed at reducing teacher burnout, Iancu et al. (2018) identified two interventions that were found to significantly reduce symptoms of emotional exhaustion: cognitive behavioural therapy (CBT) and mindfulness/meditation interventions. Cognitive behavioural interventions aim to help employees cope with stressors efficiently through cognitive restructuring (identifying cognitions leading to stress and changing them; Maricuţoiu et al., 2016) and through behavioural activation (e.g., by monitoring activities and associated moods; Kanter et al., 2010). Such interventions are predicated on the assumption that effective coping behaviours and problem-solving skills can be taught, thus resulting in an

enhanced capacity to cope with stressors that may lead to emotional exhaustion (Ebert et al., 2014). These interventions have displayed promising results in reducing emotional exhaustion in samples of teachers (e.g., Ansley et al., 2021; Ebert et al., 2014). Comparatively, mindfulness is considered to be a state in which an individual is attentive to and aware of the present moment, free from judgment (Brown & Ryan, 2003; Kabat-Zinn, 1994). Mindfulness and meditation-based approaches involve strategies that require the individual to focus their attention, act with awareness, and observe non-judgmentally and with nonreactivity (Huberty et al., 2019). Although the mechanisms underlying such approaches are unclear (Huberty et al., 2019), it would appear that mindfulness meditation promotes attention regulation, emotion regulation, positive affect, and changes in self-perspective (Hölzel et al., 2011). Such approaches have been associated with reductions in stress and significant increases in well-being among samples of teachers (e.g., Beshai et al., 2016; Emerson et al., 2017). Importantly, mindfulness-based approaches have been associated with a reduction in the symptoms of burnout in teaching populations (e.g., Flook et al., 2013).

10.3.5 Designing and Implementing Useful Professional Development

Both variable- and person-centred approaches highlighted the positive role of useful professional development in teachers' well-being- and retention-related outcomes. As the focus was on "useful" professional development, it may be beneficial for school leaders and teachers to work together to establish individualised professional learning plans that provide teachers with targeted and relevant professional development opportunities.

On a more general level, the most effective forms of professional development appear to focus on active teaching, reflection, and assessment (Darling-Hammond & Richardson, 2009) and do not occur in isolation (Matherson & Windle, 2017). They provide teachers with new and innovative ways to deliver content and with strategies to make learning relevant and

engaging for their students (Matherson & Windle, 2017; Wei et al., 2010). An important element of professional development, which may be associated with how useful teachers perceive it to be to their practice, is the extent to which such programs are teacher-driven and promote teachers' agency (Gurney & Liyanage, 2016). Thus, teachers should be actively involved in negotiating professional development initiatives, because based on the findings of this study, when teachers feel as though their professional development needs are being met, they are more likely to be committed to their organisation.

10.3.6 Considered Collaboration

The findings involving collaboration revealed the complex relations between such activities and teachers' well-being outcomes. Specifically, while useful forms of collaboration do appear to be a source of emotional exhaustion for teachers, when considered alongside other resources, they appear to support more adaptive outcomes. Accordingly, the design and implementation of collaborative activities should be carefully considered (Hargreaves, 2019). The most useful and effective forms of collaboration between teachers appear to be those which place schools' and teachers' goals at the forefront and actively involve teachers in the decision-making process (Hargreaves, 2019; Hargreaves & Goodson, 2006). Accordingly, school administrators should work with teachers to establish the forms of collaboration that are useful to their practice, and to set goals around the intended outcomes of this collaboration. Effective collaboration also requires careful scaffolding to guide professional conversations (Hargreaves & O'Connor, 2018). These structures will enable the improvement of practice without compromising existing professional relationships (Hargreaves & O'Connor, 2018). In sum, for collaboration to be useful, it must be carefully considered, thoughtfully scaffolded, and involve consultation with teachers.

10.3.7 Building Cognitive Skills and Strategies

On a broader level, cognitive approaches, such as cognitive reappraisal and positive thinking may also play a role in supporting teachers' psychological functioning. Cognitive reappraisal is an emotion regulation strategy in which an individual cognitively changes their thoughts and behaviours before an emotion fully develops (McRae et al., 2012). By reinterpreting situations which generate high emotion, the meaning and subsequent emotional impact can be altered (Gross & John, 2003) so that an individual can avoid activation of a debilitating emotional response (Cutuli, 2014). Cognitive reappraisal has been associated with a range of positive outcomes, including greater positive emotion, greater psychological well-being, higher self-esteem, and lower levels of perceived work stress (Cutuli, 2014; Gross & John, 2003; Yeung & Wong, 2020). Cognitive reappraisal may be applied to numerous factors and processes central to the present investigation. For instance, cognitive reappraisal has been shown to reduce subjective distress (Wolgast et al., 2011), which has been hypothesised to be both an antecedent and outcome of role conflict (Pomaki et al., 2007). Similarly, cognitive reappraisal may assist individuals in managing physiological and emotional arousal (Wolgast et al., 2011), factors which are associated with self-efficacy.

Cognitive reappraisal can be cultivated through explicit reappraisal training (Denny & Ochsner, 2014). Such training involves teaching participants to distance themselves from a situation—that is, where an individual changes their perception of a situation by decreasing their psychological distance—or reinterpreting the situation, which involves mentally changing the meaning of a behaviour or outcome (Denny & Ochsner, 2014). Such training may be implemented at an organisation-level—e.g., through staff professional development—or by an individual—e.g., by using online tools or apps such ReApp (DynaMORE, 2021) or WellPATH (Kiosses et al., 2018).

10.3.8 Intervention Efforts Informed by Interaction Effects

The findings involving the interaction effects provide a more specific focus for addressing role conflict as a job demand faced by teachers. Specifically, the results suggest that adaptability may be a particularly salient resource which can buffer the potentially adverse associations between role conflict and emotional exhaustion, irrespective of the level of role conflict that the teacher experiences. Efforts to boost adaptability in teachers for whom role conflict is of particular concern may thus be of benefit (described above). The other interactions likewise provide direction for interventions involving teachers experiencing role conflict at differing levels. For teachers who report low levels of role conflict, engagement in useful professional development may buffer the effect of role conflict on emotional exhaustion. Hence, such teachers should be encouraged to pursue professional learning that is relevant and meaningful to their practice. Though further research is required to clarify this association, results also suggest that regulating collaborative activities may be important for these teachers. That is, teachers experiencing low role conflict should not be subjected to high levels of collaboration, given that it was shown to strengthen the negative effect of role conflict on emotional exhaustion.

10.3.9 Targeting Teachers within Different Profiles

The identification of the four unique profiles bears implications for the nature of intervention efforts. Specifically, interventions should be directed towards addressing the differing needs of each profile. For instance, in the case of the *maladaptive* profile, efforts should be directed towards boosting all four resources and reducing role conflict. Teachers within this profile may require additional support or a more intensive intervention program than teachers in other profiles, given the low levels reported on each of the four resources. Teachers within the *average* profile may benefit from a similar intervention; although they did not display significant deficits in any of the resources or significantly elevated levels of

role conflict, analyses revealed that the most positive outcomes occurred when all four resources were higher and the job demand was low. Hence, focusing on building the levels of all four resources and reducing the job demand would be appropriate. This may also be helpful in enabling teachers to mobilise resources under periods of high role conflict, which in turn may lead to evidence of a "boosting" effect. Comparatively, sustaining high levels of resources may be an appropriate focus for teachers within the *adaptive* profile, given that resources are known to fluctuate (Simbula, 2010). Job crafting interventions, in which individuals learn how to innovatively adapt their work environment to continue to build resources and experience greater engagement and meaning (Demerouti et al., 2019) may be a means through which this can be achieved. For the *mixed-resourced* profile (which displayed higher levels of useful professional development and adaptability) there may be utility in focusing on building self-efficacy and useful collaboration in particular, given that it was a combination of higher levels of all four resources that appeared to evince the most optimal outcomes.

10.3.10 Reducing School-Level Emotional Exhaustion

In terms of addressing emotional exhaustion at the school-level, schools would do well to adopt proactive strategies focused on primary prevention of burnout. Primary prevention of burnout refers to the management of structural conditions that may lead to burnout (Brown & Quick, 2013), such as time pressures, student misbehaviour, and the absence of support systems, and has been proposed as a more effective strategy than tertiary interventions (i.e., those which treat burnout that has already developed; Madigan & Kim, 2021). Primary prevention strategies may include organisational restructuring (e.g., by reducing or redistributing workload), establishing role clarity, and providing teachers with ample resources (e.g., social or supervisory support; Madigan & Kim, 2021). Similarly, school-level interventions that focus on building a positive school climate (e.g., Grayson &

Alvarez, 2008) may be an important focus for school-level interventions. Such interventions may focus on fostering positive communication between all members of the school community, building resilience, and fostering respect. From a JD-R theory perspective, building other job and personal resources through organisation-level interventions (e.g., adaptability, self-efficacy, optimism; Collie et al., 2018; Dicke et al., 2018; Xanthopoulou et al., 2007) may also be of importance. Interventions should target both those factors known to be antecedents to burnout (e.g., a lack of self-efficacy, poor social and emotional competence; Arens & Morin, 2016) as well as those resources that may better equip teachers to manage the stressors associated with emotional exhaustion (e.g., cognitive reappraisal, proactive coping).

10.4 Limitations and Future Directions

Although the present investigation yielded considerable insights into the nature of teachers' well-being from variable-centred, person-centred, and multilevel perspectives, it is important to acknowledge some limitations when interpreting the findings of the current investigation. Such limitations also provide directions for future research.

10.4.1 Cross-sectional Data

Although the ordering of variables in the present investigation was in line with established theory, it is important to recognise that the data were cross-sectional and thus potential causal or temporal ordering could not be determined. Although the adoption of complementary analytic processes (i.e., in considering the data from variable-centred, person-centred, and multilevel perspectives) enabled a rich and multifaceted analysis of the data, future research employing longitudinal designs will be important for extending understanding about how demands and resources may operate and change (or not) over time and for ensuring there is sufficient statistical power to support conducting these complex analyses. In addition, consistent with the proposition in JD-R theory that resources and engagement may

be cyclically associated (Xanthopoulou et al., 2009), longitudinal research may enable exploration of the potential cyclical associations between personal resources, job resources, and behavioural engagement. Longitudinal research may also enable examination of the extent to which profile membership changes over time and the factors associated with such changes, which may yield insights for intervention efforts.

10.4.2 Self-report Data

The bulk of data collected in the present investigation relied on self-report. Although self-report data are considered to be an appropriate approach for measuring intrapsychic constructs such as those in the present investigation (Collie, 2021), there are some limitations of this approach that need to be acknowledged. First, social desirability bias may undermine construct validity as respondents seek to conform to desired social norms (Chan, 2008). However, it is worth noting that given the relatively low stakes involved in the investigation (i.e., data were de-identified and were not used towards higher stakes outcomes such as personnel selection), self-report biases are less likely to influence construct validity (Chan, 2004). Second, given the length of the survey, there may be some risk of acquiescent responding (Paulhus & Vazire, 2007). To ameliorate potential confounding effects as a result of acquiescent responding, items were randomised and both negative wording and reverse scoring were used on some items. Finally, self-report measures may be limited by a respondent's capacity to interpret, contextualise, and respond to questionnaire items (Chan, 2008). Hence, ensuring instructions were clear and accompanied by appropriate examples to illustrate the nature of the questions were key considerations when designing the questionnaire. Future research might look to also include objective measures (e.g., supervisor reports of teachers, school records of absenteeism, etc.) or physiological measures (e.g., sleep disturbances, deficiencies in memory and attention, cortisol levels; Grossi et al., 2015) to extend the present findings.

10.4.3 Correlational Nature of the Investigation

While the present investigation employed complementary methodological approaches to examine the data in a more nuanced and differentiated fashion, it is important to acknowledge the correlational nature of the data. Although correlational data enable analysis of associations, it is difficult to establish evidence of causality (Queirós et al., 2017; Simon & Goes, 2013). As noted above, longitudinal research will be important to validate the strength and direction of the empirical links reported in the present investigation. For instance, although student achievement was positioned as an outcome of teachers' well-being in Study 3, it may also be a source of self-efficacy or personal accomplishment (Bardach & Klassen, 2021), and as such a resource salient to teachers' well-being. Future research may provide insights into the directionality of associations involving these factors. Research involving potential interventions will also be an important avenue for further research; such research will allow for the examination of how modifying specific demands and resources (e.g., by implementing an intervention focused on boosting adaptability) may lead to changes in teachers' well-being and retention-related outcomes, thus providing experimental support for the findings of the present investigation.

10.4.4 Generalisability of Data and Findings

Although teachers' experiences of demands and resources appear to be largely similar across developed nations (Collie, Malmberg, et al., 2020; Skaalvik & Skaalvik, 2018), it is important to test whether the specific associations and profiles identified in the present study are generalisable both across primary and secondary school, and across other nations, particularly those with different education systems that may place unique demands on teachers. For instance, in the United States, systemic inequities in school finance have led to significant disparities in resources and wages (Darling-Hammond, 2010). Hence, these issues may be of greater concern than the role conflict described by Australian teachers. Similarly,

although useful forms of professional development were particularly salient predictors of teachers' well-being in the present sample, in countries with lower rates of participation in professional development (e.g., Belgium, Slovenia, and Malta; OECD, 2009), this resource may be less relevant.

10.4.5 Nested Structure of the Data

By including such an extensive range of demands, resources, well-being outcomes, and occupational outcomes, the structural equation model presented in Study 1 enabled examination of the complex environment in which teaching takes place. However, the number of variables under examination led to a large number of parameters, which meant that the multi-level structure of the data (i.e., teachers within schools) could not be taken into account due to convergence issues. Although Study 3 acknowledged the nested structure of the data, it will be important to conduct future research among larger samples so that modelling can account for the multiple levels of data under examination.

10.4.6 Inclusion of Additional Workplace Outcomes

The present investigation examined organisational commitment and turnover intentions as workplace outcomes relevant to teachers. While these factors are well-established workplace outcomes (Bogler & Somech, 2004; Somech & Bogler, 2002), there is now a need to consider other outcomes that may be relevant to both individual and organisational functioning to identify the generalisability of the derived predictors and teacher profiles. For example, although the present investigation examined organisational commitment, other work (e.g., Collie, 2021) has highlighted the utility of considering occupational commitment, which may allow researchers to identify whether certain associations occur when a teacher references a specific organisation, or the teaching profession as a broader entity. Similarly, other models of teachers' well-being (e.g., Klusmann's model of teachers' occupational well-being) have highlighted the importance of

considering job satisfaction and teachers' instructional performance. Examining a broader range of outcomes may also reveal new associations; for instance, although behavioural engagement was not found to be associated with either of the outcomes under examination, given the action-facilitating component of the construct, it may be associated with behavioural outcomes such as extra-role behaviour (Runhaar et al., 2013).

10.4.7 Extending the Person-Centred Findings

Future research should also seek to further understand the potential nuances in teacher profiles by focusing solely on teachers' personal characteristics as profile indicators. In the present study, profiles were developed based on demands and resources, and thus comprised a mix of personal and organisational characteristics. However, as described in Person-Environment Fit theory (Edwards et al., 1998), there may be particular 'types' of teachers who are better suited to particular environments. It will also be important to broaden the range of personal characteristics examined. For instance, Klussmann et al. (2008) highlighted the important of examining patterns of teachers' self-regulatory behaviours. Examining these profiles, alongside profiles of organisations, may provide even further insight into the types of teachers and organisational environments that are associated with the most adaptive outcomes.

10.4.8 Extending the Multilevel Findings

While the findings of Study 3 (multilevel modelling) yielded novel insights into potential associations between school-level teacher well-being and student achievement, further work is required to address some limitations. For instance, although the number of clusters (39 schools) exceeded the recommended minimum number of clusters considered acceptable to warrant use of multilevel modelling (Dedrick et al., 2009), it was not possible to model both behavioural engagement and emotional exhaustion at both L1 and L2 due to non-convergence. Thus, future research with a larger number of clusters is needed to extend

the findings of the present study. Moreover, future work may seek to unearth the psychological mechanisms underpinning school-level differences. For instance, prior work (e.g., Bakker & Schaufeli, 2000; Frenzel et al., 2021; Madigan & Kim, 2021) has identified the existence of a "contagion" effect with regards to emotional exhaustion, whereby one teacher's experience of emotional exhaustion spreads to other teachers and potentially to students. To further understand whether school-average burnout may be associated with interactions among colleagues, future studies may employ instruments measuring perception of burnout among colleagues (e.g., Bakker & Schaufeli, 2000).

10.5 Summary

The present investigation sought to extend knowledge of the processes and outcomes involved in teachers' well-being and broader psychological functioning at work. Harnessing JD-R theory, the present work adopted a multimethodological approach, comprising variable-centred, person-centred, and multilevel analyses.

The variable-centred analyses (Study 1) involved an application of the full JD-R model, in which demands were expected to predict exhaustion and subsequent maladaptive work outcomes and conversely, job and personal resources were expected to predict engagement and adaptive individual and organisational outcomes. Notwithstanding some exceptions, support was broadly found for the model. Of particular note were the associations involving adaptability and role conflict. In studying adaptability alongside self-efficacy, the present investigation advanced prior work by demonstrating that other personal resources appear to be of significant benefit for teachers. Specifically, adaptability played a comparatively larger role in predicting positive measures of workplace well-being (i.e., organisational commitment), and in managing negative aspects of workplace well-being (i.e., in negatively predicting emotional exhaustion and by moderating the effects of job demands on emotional exhaustion). As adaptability is a malleable capacity (Martin et al., 2012), this

provides promising direction for future interventions. Some indicative practical suggestions were described above.

In terms of role conflict, although prior work (e.g., Tiplic et al., 2015) has highlighted the potentially harmful effects of this variable, research in the Australian context has neglected the study of this role stressor. The present investigation shed light on both the prevalence and potentially negative associations with important well-being and retention-related outcomes. In Study 1, teachers reporting greater role conflict tended to report higher emotional exhaustion and turnover intention. Importantly, investigation of the interaction effects revealed that even with the presence of job resources, role conflict continued to be associated with poorer psychological functioning. Of further significance is the fact that Study 1 controlled for personality traits. In controlling for these, the study was able to examine variance in work-related and state-like variables beyond that which could be explained by individual trait-like differences.

The person-centred analyses (Study 2) built on the variable-centred findings by applying JD-R theory to consider the demand-resource profiles among teachers within the sample. While the focus in Study 1 was on the associations between variables, Study 2 focused on identifying distinct groups (profiles) of teachers that were similar in terms of the levels of demands and resources they possessed. Latent profile analysis revealed four unique profiles: the *adaptive* profile, the *mixed-resourced* profile, the *average* profile, and the *maladaptive* profile, which varied in terms of their component indicators and associations with the well-being and retention-related outcomes. The *adaptive* profile was found to evince the highest levels of the positive well-being and commitment-related outcomes (behavioural engagement and organisational commitment), and the lowest levels of the negative well-being and retention-related outcomes (emotional exhaustion and turnover intentions). Conversely, the *maladaptive* profile displayed the poorest outcomes across all the profiles. A

unique finding to emerge was the identification of the *mixed-resourced* profile, which departed from the generally linear groupings of the other three profiles, Specifically, while the other three profiles were broadly characterised in terms of low, medium, and high on the set of indicators, the *mixed-resourced* profile was quite distinct from this linear trend and underscores the yield of person-centred analysis. The identification of this profile was thus a novel contribution. Considered alongside the findings of Study 1—which highlighted the associations among salient factors, including both demands and resources—Study 2 enabled a more nuanced analysis of how different teachers experience different levels of demands and resources.

The multilevel analysis that comprised Study 3 built further still on the findings of Studies 1 and 2 by applying aspects of JD-R theory at a school-level. Study 3 examined—at a school-level—the outcomes of the health impairment and motivational processes in relation to students' academic achievement. These analyses revealed that teachers' experiences of the health impairment processes were negatively associated with school-average student achievement. Thus, while Study 1 identified teacher-level associations and Study 2 identified demand-resource profiles among teachers, Study 3 elevated these understandings even further by considering how measures of teacher well-being function at a school-level, and how such associations relate to an important measure of school success: academic achievement. These findings highlight the utility of JD-R theory in unearthing multilevel associations and provide further support for the premise that demands and resources differ as a function of context (Bakker & Demerouti, 2018). On a practical level, these findings underscore the need to identify and address emotional exhaustion at a whole-school level.

The three studies combined thus present three uniquely contributing perspectives on the factors, processes, and outcomes associated with teachers' psychological functioning in the workplace. They also yield important implications for future research, theory, and

practice. For future research, the findings of the investigation provided support for the examination of adaptability as a particularly salient resource for teachers. Longitudinal work, including work examining cyclical associations and different occupational outcomes, will be important to further augment these findings. Moreover, the findings involving teachers' well-being and students' academic achievement underscore the need for further work involving larger Australian-wide teaching samples. To the extent that similar findings are reported in future work, this may inform broader teacher and school interventions.

In terms of theory, the present work highlights the dual role that job and personal resources can play in employees' experiences of the motivational and health impairment processes. Moreover, in finding evidence of moderated mediation, the investigation suggests a need for further empirical work harnessing JD-R theory to examine these potential effects. The unique and complementary information provided by the three methodological approaches further highlights the empirical utility of multi-method investigations.

Turning to the implications for practice, the findings of this investigation point to the need to address the factors implicated in teachers' psychological functioning at both an individual and at a school-level. On an individual level, teachers may benefit from developing or consolidating a range of cognitive skills and strategies, such as cognitive reappraisal. There may also be utility in focusing on building personal resources such as adaptability and self-efficacy. Such efforts may be complemented at the school-level through in-servicing, a focus on individualised professional learning, and systematic training in social and emotional competencies. Moreover, a concerted effort should be made to reduce emotional exhaustion in teachers and across schools, both directly and by addressing demands such as role conflict.

Chapter 11

CONCLUSION

The present investigation sought to advance knowledge in the area of teacher well-being by harnessing Job Demands-Resources theory and applying this in an investigation among a large sample of primary school teachers using variable- and person-centred analytic approaches. In addition to the specific findings described in Results and unpacked in Discussion (above), a broader perspective on central findings revealed five major insights which are considered an appropriate note on which to conclude this investigation. These insights also bear particular significance for the way in which teachers' psychological functioning is theoretically, empirically, and practically understood.

11.1 The Role of Adaptability

This investigation provided considerable empirical support for the salience of adaptability as a resource relevant to teachers' psychological and workplace functioning. While self-efficacy has been widely examined as a personal resource important for teachers' well-being (e.g., Dicke et al., 2018; Vera et al., 2012), in the present investigation adaptability went above and beyond the variance attributable to self-efficacy, and explained comparatively greater variance in the substantive outcomes (e.g., organisational commitment). Moreover, in addition to being a resource central to the positive motivational experiences of teachers, adaptability also appeared important in protecting teachers from experiencing maladaptive outcomes such as emotional exhaustion and turnover intentions. Notably this occurred both directly and by way of interaction effects, suggesting that adaptability not only has a direct positive association with maladaptive outcomes, but also moderates the extent to which job demands are associated with such outcomes. These variable-centred findings were bolstered by the person-centred findings, which revealed that adaptability was a key feature of the profile associated with the most positive well-being and retention-related outcomes (i.e., the

adaptive profile). Together, these findings build on prior work highlighting adaptability as a resource important to teachers (e.g., Collie et al., 2018; Collie & Martin, 2017) and extends this work to consider its salience among primary school teachers. This provides considerable impetus to focus on cultivating this personal resource among educators.

11.2 The Significance of Interaction Effects

A distinguishing feature of JD-R theory is the hypothesised buffering and booster effects that may be derived through testing interactions between demands and resources (Bakker & Demerouti, 2007). This, for example, tests the extent to which a resource may moderate or buffer the negative effects of a demand. Notably, such a buffering effect was found in the present study. Specifically, adaptability was shown to buffer the negative effect of role conflict on emotional exhaustion. From a practical perspective, the presence of significant buffering effects has implications for interventions addressing teachers' well-being. It appears that the association between job demands and emotional exhaustion can be tempered by the presence of sufficient resources. Thus, while some job demands may not be readily modifiable, if teachers possess ample resources, they may be able to manage these job demands more effectively. Under circumstances where job demands are not easily changeable, schools or organisations may instead focus on building job resources and fostering teachers' personal resources.

11.3 Combinations of Variables Matter

The unique findings that arose from the complementary variable- and person-centred studies highlight the importance of not only considering the variables central to teachers' psychological and workplace functioning, but also the combinations of such variables. For instance, while the variable-centred study revealed useful professional development to be an important determinant of organisational commitment, the person-centred approach found this variable to be particularly associated with positive outcomes when it was accompanied by

high levels of the other job and personal resources. This suggests that interventions for boosting teachers' resources would do well to focus on cultivating more than one specific resource; that is, they should attend to the levels of different demands and resources that are present in teachers' professional lives. When examining teachers' psychological functioning, it is thus important to adopt a multidimensional perspective and to focus both on the levels of the variables possessed by the individual and the presence and absence of specific indicators.

Prior work has overwhelmingly favoured variable-centred approaches to examine processes posited in JD-R theory (e.g., Dicke et al., 2018). In the present investigation, person-centred analyses enabled the examination of multiple job and personal resources and the job demand, thus shedding light not only on the individual variables implicated in JD-R processes, but also how specific combinations of variables operate in concert. For instance, although the variable-centred analyses did not reveal the presence of a boosting effect, person-centred analyses found some evidence of this effect in that teachers within the *average* profile did not report significantly poorer outcomes compared to the *mixed-resourced* profile. Future work seeking to examine main and interaction effects proposed by JD-R theory may seek to employ person-centred or complementary variable- and person-centred research designs to allow for a more nuanced examination of organisational phenomena.

11.4 The Significance of Appraisals

Another notable contribution was the inclusion of individuals' appraisals of resources. Prior work employing JD-R theory has tended to assess the characteristics of resources (e.g., autonomy, feedback, social support; Bermejo-Toro et al., 2016; De Neve et al., 2015) more than the extent to which a particular resource is considered by teachers to be useful (or not). By focusing on the usefulness of resources, the present investigation advanced the work of C. Liu and Li (2018) and Martin et al. (2021) by demonstrating that appraisals of resources are arguably just as (or more) informative and relevant as considering the characteristics of the

resource itself. This represents a significant theoretical contribution, given that much prior work considering appraisals within JD-R theory has focused on appraisals with respect to job demands (e.g., R. Li et al., 2019; Van den Broeck et al., 2010). This approach also allows for greater recognition of individual differences; in line with propositions of Van den Broeck et al. (2010), while some teachers may consider certain resources to be motivational in nature, others may perceive them to be sources of stress.

In considering appraisals in relation to job resources, the present investigation was able to gain a more nuanced understanding of the relevance of these resources for teachers; for instance, the findings of the variable-centred study revealed that when teachers perceived professional development to be particularly useful, they experienced greater organisational commitment. There thus appears to be utility in focusing on appraisals or perceptions of resources, rather than (or in addition to) the characteristics of the resources themselves. Indeed, the associations between resources and outcomes may be better understood if there is a focus on individuals' perceptions or appraisals of these resources. This has significant practical implications in that it may be particularly helpful for designing more targeted interventions that focus on factors that make a difference to teachers' psychological functioning (e.g., appraisals of demands and resources). Importantly, prior work in the field of cognitive reappraisal (e.g., Cutuli, 2014) has demonstrated that appraisals may be relatively modifiable. By focusing on the extent to which teachers recognise and appraise resources available to them, this may help teachers to access these resources more effectively.

11.5 Primary School as a Context for Examining Teacher Well-Being

Although considerable work has examined the psychological functioning of secondary school teachers (e.g., Collie et al., 2018; Virtanen et al., 2019), far fewer studies have examined well-being within the primary school setting. Research examining secondary school teachers has identified some of the key demands encountered in this setting, citing factors

such as disciplinary problems, low student motivation, a disproportionate focus on high stakes testing, and challenging relationships with (adolescent) students as being particular sources of stress for teachers (Aldrup et al., 2018; Aloe et al., 2014; Harmsen et al., 2018; Simbula et al., 2012). However, primary schools differ in numerous ways to secondary schools and these differences may be sources of stress that are relatively unique for primary school teachers. For example, in primary schools, teachers have near-complete responsibility for the academic, physical, and social-emotional well-being of the whole classroom of students for the entire year (Lester & Cross, 2015)—whereas secondary school teachers typically have responsibility for narrower aspects of their students' development and share these responsibilities with several other teachers. Relatedly, primary school teachers are responsible for teaching all areas of the academic curriculum (Lester & Cross, 2015)—whereas secondary school teachers tend to focus on one or two curriculum areas. For reasons such as these, there is direct relevance for an investigation exploring psychological functioning in primary school settings. The present investigation thus contributes to the literature by considering primary school as a unique context in which teachers' psychological functioning occurs. For example, the findings involving role conflict suggest that primary school teachers do face significant job demands that have implications not only for their own well-being but also for broader school functioning and students' academic achievement as demonstrated in the multilevel study. Further research focusing on the demands faced by teachers in the primary school setting will thus be important for developing relevant and effective interventions going forward.

11.6 Summing Up

Teachers play a fundamental role in shaping the lives of students and in establishing the foundations from which an educated, civilised, and humane society can develop (Harris & Jones, 2019). However, teaching is a complex, dynamic, and multifaceted profession, characterised by a diverse range of demands. To address issues of disaffection in the

workforce and to promote retention and workplace efficacy, understanding teachers' experiences of work and how to optimise their well-being are key. The present set of studies has contributed numerous insights into the demands and resources that are implicated in teachers' workplace well-being and provided direction for future efforts to optimise teachers' experiences at work—as well as the student and school outcomes that follow from this.

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Appendix A

Ethics Approval

03-May-2018

Dear Dr Rebecca Collie,

Project Title	The work satisfaction and wellbeing of Australian teachers: An application of the Job Demands Resources model.
HC No	HC180184
Re	HC180184 Notification of Ethics Approval
Approval Period	03-May-2018 - 02-May-2023

Thank you for submitting the above research project to the **HREAP B: Arts, Humanities & Law** for ethical review. This project was considered by the **HREAP B: Arts, Humanities & Law** at its meeting on **02-May-2018**.

I am pleased to advise you that the **HREAP B: Arts, Humanities & Law** has granted ethical approval of this research project. The following condition(s) must be met before data collection commences:

Conditions of Approval:
N/A

Conditions of Approval - All Projects:

- The Chief Investigator will immediately report anything that might warrant review of ethical approval of the project.
- The Chief Investigator will seek approval from the **HREAP B: Arts, Humanities & Law** for any modifications to the protocol or other project documents.
- The Chief Investigator will notify the **HREAP B: Arts, Humanities & Law** immediately of any protocol deviation or adverse events or safety events related to the project.
- The Chief Investigator will report to the **HREAP B: Arts, Humanities & Law** annually in the specified format and notify the **HREAP B: Arts, Humanities & Law** when the project is completed at all sites.
- The Chief Investigator will notify the **HREAP B: Arts, Humanities & Law** if the project is discontinued before the expected completion date, with reasons provided.
- The Chief Investigator will notify the **HREAP B: Arts, Humanities & Law** of his or her inability to continue as Coordinating Chief Investigator including the name of and contact information for a replacement.

The **HREAP B: Arts, Humanities & Law** Terms of Reference, Standard Operating Procedures, membership and standard forms are available from https://research.unsw.edu.au/research-ethics-and-compliance-support-recs.

If you would like any assistance, or further information, please contact the ethics office on:

P: +61 2 9385 6222, + 61 2 9385 7257 or + 61 2 9385 7007
E: humanethics@unsw.edu.au

Kind Regards,

A/Prof Iva Strnadová

Convenor HREA Panel B: Arts, Humanities and Law

This HREC is constituted and operates in accordance with the National Health and Medical Research Council's (NHMRC) *National Statement on Ethical Conduct in Human Research (2007)*. The processes used by this HREC to review multi-centre research proposals have been certified by the National Health and Medical Research Council.

Appendix B

SERAP Approval

Education
Public Schools

Miss Helena Granziera

DOC18/1009365
SERAP 2018225

Dear Miss Granziera

I refer to your application to conduct a research project in NSW government schools entitled *Teacher Wellbeing: A job demands-resources approach*. I am pleased to inform you that your application has been approved.

You may contact principals of the nominated schools to seek their participation. **You should include a copy of this letter with the documents you send to principals.**

This approval will remain valid until 13-Sep-2019.

The following researchers or research assistants have fulfilled the Working with Children screening requirements to interact with or observe children for the purposes of this research for the period indicated:

Researcher name	WWCC	WWCC expires
Helena Granziera		09-Aug-2018
Andrew Martin		31-Mar-2019
Rebecca Jane Collie		19-Jun-2019
Helena Granziera		09-Aug-2023

I draw your attention to the following requirements for all researchers in NSW government schools:

- The privacy of participants is to be protected as per the NSW Privacy and Personal Information Protection Act 1998.
- School principals have the right to withdraw the school from the study at any time. The approval of the principal for the specific method of gathering information must also be sought.
- The privacy of the school and the students is to be protected.
- The participation of teachers and students must be voluntary and must be at the school's convenience.
- Any proposal to publish the outcomes of the study should be discussed with the research approvals officer before publication proceeds.
- All conditions attached to the approval must be complied with.

When your study is completed please email your report to: serap@det.nsw.edu.au
You may also be asked to present on the findings of your research.

I wish you every success with your research.

Yours sincerely

Elsa Lat
R/Director, School Policy and Information Management
18 September 2018

School Policy and Information Management
NSW Department of Education
Level 1, 1 Oxford Street, Darlinghurst NSW 2010 – Locked Bag 53, Darlinghurst NSW 1300
Telephone: 02 9244 5060 – Email: serap@det.nsw.edu.au

Appendix C

Principal Information Statement

School of Education	UNSW SYDNEY

PRINCIPAL INFORMATION STATEMENT

The work satisfaction and wellbeing of Australian teachers: An application of the Job Demands-Resources model

The research study is being carried out by the following researchers:		
Role	**Name**	**Organisation**
Chief Investigator	Dr Rebecca Collie	UNSW
Co-Investigator/s	Professor Andrew Martin	UNSW
PhD Student	Ms Helena Granziera	UNSW

Researchers at UNSW Sydney (The University of New South Wales) are seeking volunteer research participants to learn about the workplace experiences of teachers in New South Wales. We would like to combine all the answers together in order to get a broad picture of how teachers perceive their work, in order to understand what factors promote and inhibit wellbeing, and how teacher wellbeing shapes the broader school climate.

As the Principal we would like to approach you regarding your willingness to allow the teachers at your school to participate in the study

1. **What is the research study about?**
   The research study aims to examine the demands of the teaching profession, the resources available to teachers to manage these demands, and how these factors influence teacher and school level outcomes. We would like to combine all the answers together in order to get a broad picture of how teachers perceive their work, in order to understand what factors affect wellbeing, and how teacher wellbeing shapes the broader school climate. The survey will be given to teachers at the beginning of the school year and once again at the conclusion of the school year.

2. **Do I have to take part in this research study?**
   This Principal Participant Information Statement and Consent Form tells you about the research study. It explains the research tasks involved. Knowing what is involved will help you decide if you want your school to take part in the research. If you decide you want to take part in the research study, you will be asked to:
   - Sign the consent form;
   - Keep a copy of this Principal Information Statement;

   Participation in this research study is voluntary. Your decision to take part or not, will not affect your relationship with The University of New South Wales or your school.

3. **What does participation in this research require, and are there any risks involved?**

   If you decide to take part in the research study, a researcher will attend your school for approximately 30 minutes to speak to teachers of grades K-6. During this time, they will explain the premise of the study, and provide the link to the online questionnaire. The

questionnaire asks questions about the attitudes, behaviours towards, and beliefs about work, and how teachers perceive themselves as educators. It should take approximately 15-20 minutes to complete. Approximately 5 months later, a researcher will attend your school and run the same survey again.

We don't expect this questionnaire to cause any harm or discomfort, however if any participant experiences feelings of distress as a result of participation in this study, they can let the research team know and they will provide appropriate assistance.

4. **What are the possible benefits to participation?**
   We hope to use information we get from this research study to assist in the development of strategies and guidelines to promote teacher wellbeing and to prevent burnout and job dissatisfaction. We cannot and do not guarantee or promise that you will receive any benefits from the study.

5. **What will happen to information about me?**
   By signing the consent form, you consent to the research team collecting and using information about your teachers for the research study. The research team will be the only people who have access to all confidential project files and data. These files will be securely stored at UNSW Kensington and only accessible with a password. Any information from this study and information related to your teachers will remain private. We will keep this data for 7 years. Their information will only be used for the purpose of this research study and it will only be disclosed with your permission. If you give us your permission by signing this document, we plan to discuss/publish the results in journals, chapters, conference proceedings, and other publications such as newsletters and they may also be published as part of a PhD (or other research degree). In any publication, information will be provided in such a way that you, your school, and staff cannot be identified.

6. **How and when will I find out what the results of the research study are?**
   The research team intend to publish and/ report the results of the research study in a variety of ways. All information published will be done in a way that will not identify your school.

   At the completion of the study, a general report (of patterns and group results) will be provided to you. To ensure anonymity of participants, this report will take one of two forms. If there are 20 or more participants from your school, we will be able to provide you with a report that focuses on findings from your school (with group results from teachers who participated). If there are less than 20 participants from your school, we will provide you with a report on the results from the study overall (including teachers from your school and other schools). No result will be traced to any of the study's participants. You can share the aggregate anonymised findings in the best way you determine.

7. **What if I want to withdraw my school from the research study?**

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PRINCIPAL INFORMATION STATEMENT

The work satisfaction and wellbeing of Australian teachers: An application of the Job Demands-Resources model

If you decide you no longer want your school to take part in the research study, you are free to withdraw from the study at any time. If you do withdraw, you will be asked to complete and sign the 'Withdrawal of Consent Form' which is provided at the end of this document.

8. **What should I do if I have further questions about my involvement in the research study?**
The person you may need to contact will depend on the nature of your query. If you require further information regarding this study or if you have any problems which may be related to your involvement in the study, you can contact the following member/s of the research team:

Research Team Contact

Name	*Helena Granziera*
Position	*PhD candidate*
Email	*h.granziera@student.unsw.edu.au*

Appendix D

Participant Information Statement

School of Education	UNSW SYDNEY

ONLINE PARTICIPANT INFORMATION STATEMENT

The work satisfaction and wellbeing of Australian teachers: An application of the Job Demands-Resources Model

Helena Granziera (PhD Candidate).

1. **What is the research study about?**
   You are invited to take part in this research study. The research study aims to examine the demands of the teaching profession, the resources available to teachers to manage these demands, and how these factors influence teacher and school level outcomes. We would like to combine all the answers together in order to get a broad picture of how teachers perceive their work, in order to understand what factors promote and inhibit wellbeing, and how teacher wellbeing shapes the broader school climate. The survey will be given to teachers at the beginning of the school year and once again at the conclusion of the school year.

   You have been invited because you are a teacher in a New South Wales primary school.

2. **Who is conducting this research?**
   The study is being carried out by the following researchers: Miss. Helena Granziera (PhD candidate) under the supervision of Dr. Rebecca Collie and Scientia Professor Andrew Martin.

3. **Inclusion/Exclusion Criteria**
   Before you decide to participate in this research study, we need to ensure that it is ok for you to take part. The research study is looking recruit people who meet the following criterion:
   - *K-6 Teachers in NSW primary schools*

4. **Do I have to take part in this research study?**
   Participation in any research study is voluntary. If you do not want to take part, you do not have to.

If you decide you want to take part in the research study, you will be asked to:
- Read the information carefully (ask questions if necessary);
- Complete the online questionnaire.

5. **What does participation in this research require, and are there any risks involved?**

   If you decide to take part in the research study, we will ask you to complete an online questionnaire. The questionnaire will ask you questions about your attitudes, behaviours towards, and beliefs about your work, and how you perceive yourself as an individual and as an educator. It should take approximately 20 minutes to complete. In approximately June, 2019, we will return to your school and ask you to complete a follow up survey.

   We don't expect this questionnaire to cause any harm or discomfort, however if you experience feelings of distress as a result of participation in this study you can let the research team know and they will provide you with assistance.

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ONLINE PARTICIPANT INFORMATION STATEMENT

The work satisfaction and wellbeing of Australian teachers: An application of the Job Demands-Resources Model

Helena Granziera (PhD Candidate).

6. What are the possible benefits to participation?

We hope to use information we get from this research study to assist in the development of strategies and guidelines to promote teacher wellbeing and to prevent burnout and job dissatisfaction.

7. What will happen to information about me?

Submission of the online questionnaire is an indication of your consent. By clicking the 'I agree to participate' button you are providing your permission for the research team to collect and use information about you for the research study. Your data will be kept for a period of 7 years after the project's completion. We will store information about you in a non-identifiable format in the UNSW Education building. We will not ask for your name. Instead, we ask that you supply partial information from your first name, surname, month of birth and school name. In this way, we are able to keep each survey anonymous and yet are able to match the survey you do at the end of the year with the one you do at the beginning. All aspects of the study, including results, will be strictly confidential, so your answers will not be shown to anyone. Reports from the study may be submitted for publication, but individual participants will not be identifiable in reports.

8. How and when will I find out what the results of the research study are?

The research team intend to publish and report the results of the research study in a variety of ways. All information published will be done in a way that will not identify you.

If you would like to receive a copy of the results you can request a copy from the researchers via email - *h.granziera@student.unsw.edu.au*

9. What if I want to withdraw from the research study?

If you do consent to participate, you may withdraw at any time. You can do this by closing the questionnaire. If you withdraw from the research we will destroy any information that has already been collected. Once you have submitted the questionnaire however, we will not be able to withdraw your responses as the questionnaire is anonymous.

10. What should I do if I have further questions about my involvement in the research study?

The person you may need to contact will depend on the nature of your query. If you require further information regarding this study or if you have any problems which may be related to your involvement in the study, you can contact the following member/s of the research team:

Research Team Contact

HC Number: HC180184

Version dated: April 17, 2018

Online Participant Group:

School of Education	UNSW SYDNEY

ONLINE PARTICIPANT INFORMATION STATEMENT

The work satisfaction and wellbeing of Australian teachers: An application of the Job Demands-Resources Model

Helena Granziera (PhD Candidate).

Name	*Helena Granziera*
Position	*PhD candidate*
Email	*h.granziera@student.unsw.edu.au*

What if I have a complaint or any concerns about the research study?
If you have a complaint regarding any aspect of the study or the way it is being conducted, please contact the UNSW Human Ethics Coordinator:

Complaints Contact

Position	Human Research Ethics Coordinator
Telephone	+ 61 2 9385 6222
Email	humanethics@unsw.edu.au
Reference Number	HC180184

School of Education	UNSW SYDNEY

ONLINE PARTICIPANT INFORMATION STATEMENT

The work satisfaction and wellbeing of Australian teachers: An application of the Job Demands-Resources Model

Helena Granziera (PhD Candidate).

Consent Form – Participant providing own consent

Declaration by the participant

- I understand I am being asked to provide consent to participate in this research study;
- I have read the Participant Information Sheet or it has been provided to me in a language that I understand;
- I provide my consent for the information collected about me to be used for the purpose of this research study only.
- I understand that if necessary I can ask questions and the research team will respond to my questions.
- I freely agree to participate in this research study as described and understand that I am free to withdraw at any time during the study and withdrawal will not affect my relationship with any of the named organisations and/or research team members;

I agree, start questionnaire

Appendix E

Instrumentation

Job Demands

Role Conflict

Role Conflict Scale (Items adapted from Starnanam & Miller, 1992)

1. I receive conflicting demands from two or more people at school.
2. I often have to bypass or ignore a rule or policy to carry out my work.
3. I am given school-related duties without adequate resources and materials to carry them out.
4. There is a difference between the way my supervisor thinks things should be done and the way I think they should be done.

Job Resources

Useful Collaboration

Items adapted from School Level Environment Questionnaire - Revised (Johnson et al., 2007).

1.
2.
3.
4.
5.
6.

Items available upon request.

Useful Professional Development

Scale developed for this study.

1.
2.
3.
4.
5.
6.

Items available upon request.

Personal Resources

Adaptability

Adaptability Scale—Work (Martin et al., 2013)

1.
2.
3.
4.
5.
6.
7.
8.
9.

Please note that this scale has been omitted due to copyright reasons.

The reader is referred to sections 4.3.1 – 4.3.7 for information on original authors and publishers.

Self-Efficacy

Teacher Self-Efficacy Scale (Tschannen-Moran & Woolfolk Hay, 2001)

1. I am confident that I can control disruptive behaviour in the classroom.
2. I am confident that I can motivate students who show low interest in school work.
3. I am confident that I can calm a student who is disruptive or noisy.
4. I am confident that I can help my students to value learning.
5. I am confident that I can craft good questions for my students.
6. I am confident that I can get my students to follow classroom rules.
7. I am confident that I can help my students believe they can do well in schoolwork.
8. I am confident that I can establish a classroom management system with each group of students I teach.
9. I am confident that I can use a variety of assessment strategies.
10. I am confident that I can provide an alternative explanation or example when students are confused.
11. I am confident that I can assist families in helping their children do well in school.
12. I am confident that I can implement alternative teaching strategies in my classroom.

Behavioural Engagement

Items from Klassen et al. (2013).

1. I try my hardest to perform well while teaching.
2. While teaching, I really “throw” myself into my work.

3. While teaching I pay a lot of attention to my work.
4. I work with intensity.

Emotional Exhaustion

Items from the Emotional Exhaustion subscale of the Maslach Burnout Inventory (Maslach & Jackson, 1981).

1.
2.
3.
4.

Please note that this scale has been omitted due to copyright reasons.

The reader is referred to sections 4.3.1 – 4.3.7 for information on original authors and publishers.

Organisational Commitment

Items from Collie et al.'s (2016) adaptation of Vandenberghe and Bentein's (2009) Organisational Commitment Scale.

1. This organisation has a great deal of personal meaning for me.
2. I really feel a sense of 'belonging' to my organisation.
3. I really feel as if my organisation's problems are my own.
4. I do not feel like 'part of the family' at my organisation (Reverse Scored).

Turnover Intentions

Employee Turnover Intention Scale (Vandenberghe & Bentein, 2009)

1. I intend to search for a position with another employer within the next year.
2. I often think about quitting this organisation.
3. I intend to quit my organisation in the near future.

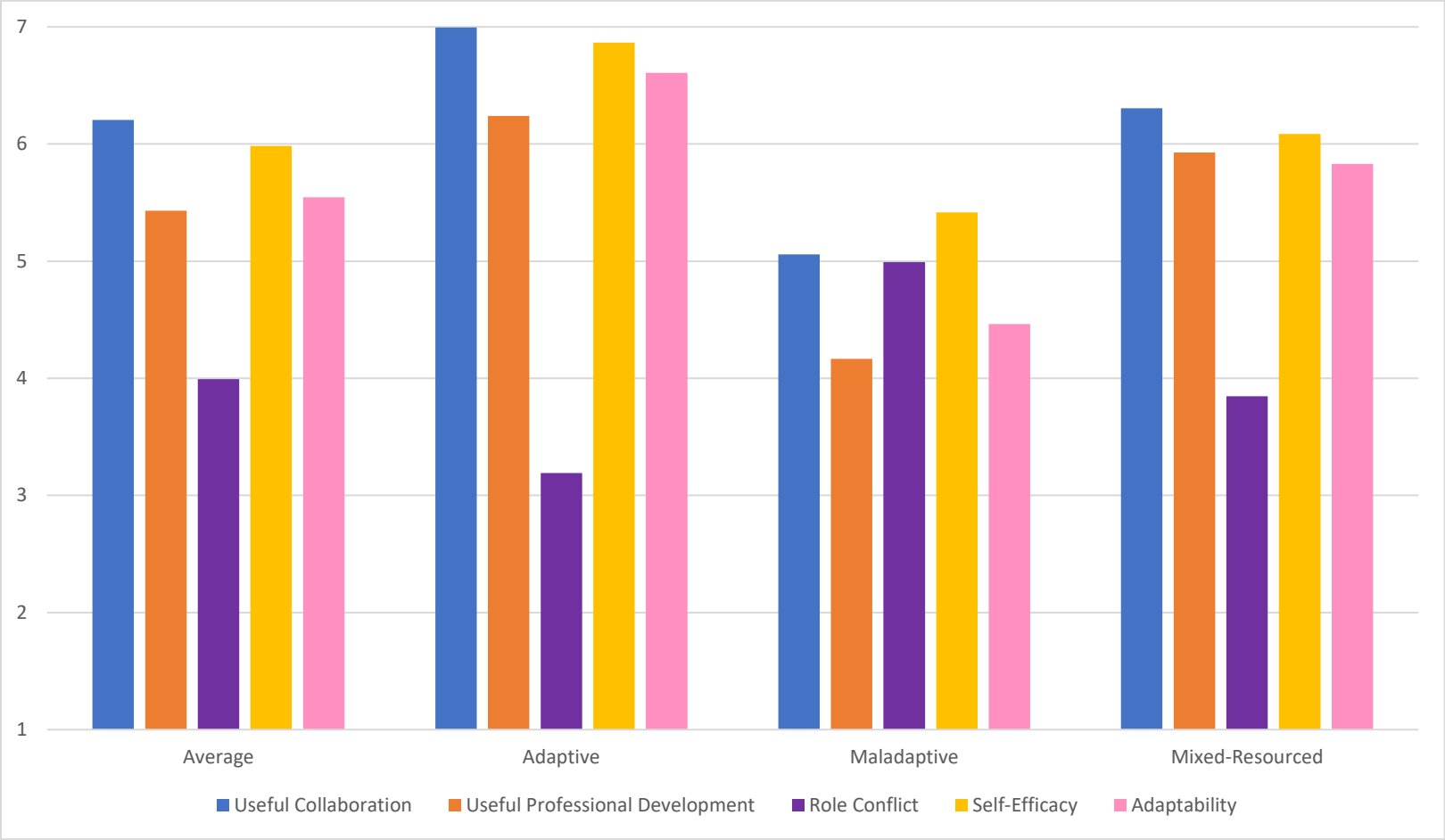
Personality

Five-Item Personality Inventory (FIPI) (Gosling et al., 2003).

1. I see myself as extraverted, enthusiastic.
2. I see myself as sympathetic, warm.
3. I see myself as dependable, self-disciplined.
4. I see myself as anxious, easily upset.
5. I see myself as open to new experiences, complex.

Appendix F

Figure A1: Graphical Representation of the 4-Profile Solution – Unstandardised



Appendix G

NAPLAN Technical Data

The number of items examined using the paper form of the NAPLAN test are displayed in the table below. These are for both Years 3 and 5 in 2018 and 2019.

Table F1 – Number of Items for Year 3 Test in 2018 and 2019 – Paper Test

Year 3 2018	
Domain	Number of Items
Reading	37
Spelling	25
Grammar and Punctuation	25
Numeracy	36
Year 3 2019	
Domain	Number of Items
Reading	37
Spelling	25
Grammar and Punctuation	25
Numeracy	36

Table F2 – Number of Items for Year 5 Test in 2018 and 2019 – Paper Test

Year 5 2018	
Domain	Number of Items
Reading	40
Spelling	25
Grammar and Punctuation	25
Numeracy	42
Year 5 2019	
Domain	Number of Items
Reading	39
Spelling	25
Grammar and Punctuation	25
Numeracy	42

All students in Years 3 and 5 responded to a writing prompt to compose a persuasive text. This text was scored out of 48. Students who sat the online NAPLAN test initially completed a Year level testlet. Based on performance on the initial testlet, each student was assigned a second testlet that was targeted to their ability. Each testlet was constructed from a pool of items. The number of items in each test domain is shown in the table below.

Table F3 – Number of Pool Items for Year 3 Test in 2018 and 2019 – Online Test

Year 3 2018	
Domain	Number of Items in Pool
Reading	130
Spelling	87
Grammar and Punctuation	92
Numeracy	119
Year 3 2019	
Domain	Number of Items in Pool
Reading	208
Spelling	118
Grammar and Punctuation	175
Numeracy	42

Table F4 – Number of Pool Items for Year 5 Test in 2018 and 2019 – Online Test

Year 5 2018	
Domain	Number of Items in Pool
Reading	130
Spelling	88
Grammar and Punctuation	87
Numeracy	140
Year 5 2019	
Domain	Number of Items in Pool
Reading	208
Spelling	100
Grammar and Punctuation	175
Numeracy	140

Appendix H

Figure A2: Scatterplot of Behavioural Engagement, Emotional Exhaustion, and Average School Achievement