The assessment of stressors and resilience in secondary school physical education

The Assessment of Stressors and Resilience in Secondary School Physical Education

by

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Abstract

PE lessons are a unique context to address the declining levels of physical activity in the UK, offering the opportunity for students to achieve age appropriate physical activity recommendations. Therefore, it is imperative that researchers and practitioners understand variables that underpin students' motivational processes in PE lessons. Psychological resilience refers to the idea that some individuals are able to positively adapt to the stressors they encounter. Conceptual theorisers of resilience propose that the concept comprises three constructs: stressors, positive adaptation, and protective factors. The purpose of the thesis is to focus on the first construct of stressors: which may be major life events, or the minor and cumulative demands of everyday life. Specifically, the current thesis aims to develop a measure of stressors in the context of PE lessons within the wider framework of resilience.

The thesis is split into five chapters. The first chapter overviews the importance of facilitating motivation and engagement in PE lessons, and introduces the concept of resilience to stressors. Chapter two is split into three parts and comprises three reviews: the first provides an overview of the definitions, concepts, and theoretical models of academic resilience; the second is a systematic review of the approaches to measuring academic resilience and; the third presents a narrative review of daily stressors experienced by adolescents. Chapter three presents the first two studies of this programme of research. Study one is a qualitative exploration of the common stressors experienced by secondary school students during their PE lessons. Underpinned by the concept of resilience, study two explores the protective factors students utilise to facilitate their positive adaptation to these everyday stressors. Drawing on the reviews presented in chapter two, and the qualitative exploration of stressors in PE, chapter four presents a series of studies describing the development of the PE Stressors Scale (PESS). Specifically, study three explores the content validity of a pool of items designed to reflect common stressors in PE lessons. Study four examines the factorial structure of the PESS using exploratory factor analysis, and study five tests the factorial structure of the PESS using confirmatory factor analysis. Study six tests the factorial structure on an independent sample, examines whether it is invariant across gender, and tests the relationship between the PESS and related educational constructs. Overall, the current programme of research has advanced the field of educational psychology by providing greater understanding of the potential stressors experienced during PE lessons, and the dynamic processes by which students respond.

Publications Arising from this Thesis

Peer reviewed journal articles

Tudor, K., & Spray, C. M. (2017). Approaches to measuring academic resilience: A systematic review. *International Journal of Research Studies in Education, 7(4). 41-61.*

Tudor, K., Spray, C. M., & Sarkar, M. (in press). Exploring common stressors in Physical Education: A qualitative study. *European Physical Education Review.*

Tudor, K., & Spray, C. M. (in preparation). Resilience in PE lessons: An exploration of protective factors.

Tudor, K., & Spray, C. M. (in preparation). The experience and impact of everyday stressors in adolescence: A narrative review.

Conference proceedings

Tudor, K., & Spray, C. M. (2017). Exploring stressors affecting physical activity participation in secondary school Physical Education. *International Association for Physical Education in Higher Education's International Conference,* Gosier, Guadeloupe.

Tudor, K., & Spray, C. M. (2016). Resilience in Physical Education. *British Psychological Society's Division of Sport and Exercise Psychology Conference,* Cardiff, UK.

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Chapter I: General Introduction

The introduction to this thesis is split into four sections. The first section introduces the importance of students' active participation in PE lessons. Specifically, I overview the physical, social, affective, and cognitive benefits that active participation in PE lessons can have on adolescents' development. In the second section, I provide a brief introduction of stress and resilience, and how research into the academic resilience literature has helped to shape the programme of research presented in the thesis. In the third section I provide an account of my personal motivations for studying resilience to stressors in PE lessons. In the fourth and final section I outline the purpose of the current thesis and close with an overview of the structure of the thesis.

Why research resilience in Physical Education?

The Department of Health (2011, 2015) recommends children and young adults should engage in moderate to vigorous intensity physical activity for at least 60 minutes per day. This may be part of games, work, sport, physical education or planned physical exercise. However, research has shown that most children and adolescents do not meet these recommendations (Piercy et al., 2015), and that physical activity declines as children progress through their teens (Armstrong & Welsman, 2006; Wang & Biddle, 2001; Wang, Morin, Ryan, & Liu, 2016). A review by the British Heart Foundation reports that, in England, only 16% of girls and 21% of boys between the ages of five and 15 meet the recommended levels of physical activity (British Heart Foundation, 2015). Moreover, the proportion of both boys and girls meeting the recommendations fell between 2008 and 2012, with the largest declines in physical activity occurring between the ages of 13 and 15. This has been attributed to decreases in active transport to school (Mackett & Brown, 2011) and increase in sedentary behaviour (Broderick, 1998; Cliff et al., 2016).

PE lessons are a unique context to address the declining physical activity levels, offering a setting for students to achieve age appropriate physical activity recommendations (Castillo, Clark, Butler, & Racette, 2015). PE enables children to acquire the basic movement foundations that can be utilised in a wide range of physical activities across the lifespan (Jess & Collins, 2003; Rainer et al., 2012). Moreover, it provides the opportunity for young people to gain the appropriate knowledge and behavioural skills to be physically active outside of school, throughout and later in life (Fairclough & Stratton, 2005; Hagger et al.,

2003). PE has been recognised as a unique context in reaching all children and adolescents, regardless of ability, and providing a foundation for an active and healthy lifestyle beyond school (Hagger et al., 2003).

While PE's impact on physical health is clear, active participation in PE lessons is also associated with social, affective, and cognitive benefits (see, for a review, Bailey et al., 2009). Purposeful participation in PE lessons involves the acquisition of various personal social and moral skills which can enable children and adolescents behave successfully in a range of social scenarios (Bailey, 2005). During PE lessons there is a need for students to work collaboratively with their peers, which encourages the development of multiple skills including, trust (Priest, 1998), responsibility (Priest & Gass, 1997) and empathy (Townsend, Moore, & Mahoney, 2002). PE may be an opportunity for students to learn character building skills that may promote resilience to experiences outside of the school context (Hawkins, 2005). In terms of the psychological benefits of participation in PE lessons, there is consistent evidence linking physical activity and improved wellbeing in children and adolescents (Biddle & Asare, 2011; Eime, Young, Harvey, Charity, & Payne, 2013). Self-esteem is more likely reinforced when adolescents enjoy their lessons, which can lead to increased motivation to participate in sport outside of school (Williams & Gill, 1995). However, Bailey et al (2009) have highlighted that not all groups experience psychological benefit from being active, and there are differences in the affective benefit of engaging activity during National Curriculum PE lessons.

A number of authors have posited a positive effect of PE on students' cognition, suggesting a transfer effect of PE to academic subjects. Studies have found that academic performance was maintained, and sometimes improved, when time spent in PE lessons increased, despite the reduction in time spent in academic lessons (Shephard, 1997). Others have suggested that physical activity stimulates the development of generic cognitive learning skills (Barr & Lewin, 1994), improved cognitive performance and academic achievement. However, associations have been found to be small and inconsistent (Biddle & Asare, 2011). Although more well-designed research is needed to understand the specific benefits of PE for children and adolescents; it is clear that purposeful participation in lessons can have a significant impact on students' functioning. Given the important role PE can play in promoting public health, it is essential students are motivated to participate.

The role of PE in enhancing public health and wellbeing through physical activity promotion is limited if students are not engaged in their lessons. Unfortunately, it has been suggested that in many PE lessons students do not engage in sufficient moderate to vigorous physical activity (MVPA) to achieve health benefits (Lonsdale et al., 2013). My personal interest in this area of research stems from my own disengaged and unmotivated attitude towards PE during my secondary school years, in stark contrast to my attitude during primary school. Throughout my primary school years, I was highly motivated to participate in PE lessons to the best of my ability. Furthermore, I recall taking part in most after-school sports clubs and attended Saturday football club that took place at my primary school every weekend. Following transitioning to secondary school, consistent with the academic literate, my motivation, engagement, and participation in the subject took a downwards trajectory. However, there is not a defining moment in time, nor one specific event or experience which led to PE lessons becoming an inconvenient and unenjoyable aspect of school life.

Research data supports my own anecdotal experiences. In a report published by the Department of Health (2015), The Childhood Obesity National Support Team (CONST) expressed concern that, although schools are meeting the government target of two hours of PE per week, pupils are not sufficiently physically active during those two hours. Research investigating secondary school students' motivational profiles in PE lessons suggests that gender and age are associated with decreased motivation (Wang et al., 2016). Specifically, female students and older students were more likely to have undesirable motivational profiles, which predicted decreased intentions to engage in leisure time physical activity. These results support previous findings regarding adolescent students' motivational trajectories in PE (Barkoukis et al., 2010; Spray & Wang, 2001) as well as school in general (Otis, Grouzet, & Pelletier, 2005).

Applying resilience to the PE setting

These downwards motivational trajectories are concerning and require greater understanding if adolescents are to get the most out of their PE lessons. Psychological resilience, that is, an individuals' capacity to positively adapt to the stressors they encounter, is a burgeoning research area that may facilitate our understanding of students' motivation and engagement in PE lessons. Research investigating resilience has been applied in multiple contexts including, healthcare (Ablett, 2006; Carlos & Calvo, 2012), the workplace (Luthans, Youssef, & Avolio, 2007), the military (Palmer, 2008), sport (Fletcher & Sarkar, 2012) and education (Wang, Haertal, & Walberg, 1994). Chapter two introduces the concept of

academic resilience. In part one of chapter two, I provide an overview of the definitions, concepts, and theories of academic resilience. In part two of chapter two, I address measurement approaches to assessing academic resilience. In brief, research investigating students' positive adaptation to academic demands suggests that resilience predicts positive educational outcomes, including motivation, engagement, and achievement, amongst many more (Martin & Marsh, 2008a; Wang et al., 1994).

The programme of research presented in this thesis builds upon resilience research in the educational domain. Importantly, current research investigating academic resilience focusses on traditionally class-room based, 'academic' subjects. To my knowledge, no research to date has investigated the influence of student resilience on educational outcomes, such as motivation and engagement, during PE lessons. Important questions are yet to be answered. For example, are resilient students more engaged and motivated in their PE lessons? What makes one student more able to adapt to a stressor in PE compared to their counterparts? How is it that some students are able to deal with potentially negative experiences in PE, and remain motivated in these times, whereas other retreat and disengage completely from the subject? The more that is known about the process of resilience in PE lessons, the more conceptually relevant interventions can be developed to promote the attitudes, behaviours, and environment that facilitate this process.

Before understanding the process of resilience in PE lessons, and its relationship with educational outcomes, it is necessary to develop a measure to adequately assess the concept. Scholars agree that the most psychometrically sound approach to measuring resilience is by measuring the three components that comprise the concept independently (Windle, Bennet, & Noyes, 2011). As will be reviewed in much greater detail in chapter two part one, the three components of resilience are: stressors (or adversity), positive adaptation (indicated by levels of motivation and engagement), and protective factors. In the context of PE, I made the decision to commit a strong focus on the first component – stressors in PE – which is reflected in chapter three (study one) and chapter four (study three – six) of this thesis. I believe that a detailed and comprehensive approach to exploring stressors in PE lessons, and developing a psychometric measure would be an impactful first step to developing a measure of resilience in PE. Investigating potential stressors in PE, and the individual differences in the way in which students respond to these stressors, may contribute to our understanding of engagement in PE.

‘Everyday’ stressors in PE lessons

As noted, the current programme of work takes a comprehensive approach to assessing stressors in PE lessons. Detailed in chapter two part three, the term stressor is distinguished from the term ‘stress’ in that they are events that impinge upon a person (Lazarus & Folkman, 1984) or the experiential circumstances that result in a stress response (Pearlin, 1989). Four different types of stressors have been detailed in the research literature: cataclysmic changes (affecting a large number of people), major changes (affecting one or a small number of people), chronic strains, and daily hassles (Evans, 2006; Lazarus & Cohen, 1977). Cataclysmic changes may include natural disasters, or man-made catastrophes such as war. Major changes (commonly referred to as ‘life events’) affecting an individual may include the death of a loved one, divorce, or illness. Chronic stressors refer to the harsh and ongoing physical or social conditions associated with disadvantage, for example, poverty or disability (Evans, 2006). Finally, daily stressors (often termed daily hassles) refer to the “experiences and conditions of daily living that have been appraised as salient and harmful or threatening to the endorser’s wellbeing (Lazarus, 1984, p. 376).

When thinking about my own experiences in PE, I can reflect on a number of experiences that are akin to Lazarus’ conceptualisation of daily stressors. That is, most, if not all, PE lessons constituted some kind of environmental demand that I appraised as irritating, frustrating, or embarrassing. I cannot say that any of these were life-changing, or led to significant psychological maladjustment or negative affect, which is why they could not be conceptualised as ‘major stressors’ of ‘life events’. However, I believe these experiences did impact upon my motivation to participate in lessons. To conclude this brief introduction of stressors and resilience in PE, I will draw upon memories of, not my own experiences in PE, but the experiences of two close friends. I believe this provides a good example of the subjective nature of the appraisal of stressors in PE. For the purposes of the anecdote, I will call these friends ‘Alex’ and ‘Beth’. Both friends were, academically, two of the highest achievers and hardest workers in our school year. Both achieved straight A*s at GCSE, however both were less able when it came to PE and sport. Following an unscheduled cross-country run (note: we were not told in advance when we would be completing the termly cross-country runs due the coincidental rise in forgotten kits when notice was given) both Alex and Beth completed the run in the slowest percentile of the class. This experience was very distressing for Alex, leading to a multitude of tearful emotions, including embarrassment and shame, as well as significantly effecting her confidence in PE. Alex stated, “I’d give up

being good at every other subject, just to be good at PE!" Following this, and other performance scenarios like this one, Alex became more disengaged and unmotivated in lessons. In contrast, Beth was little phased by her poor performance in cross country. Furthermore, she was just as motivated the next time we did cross country as the first time, and was enthusiastic in lessons despite experiences of poor performance.

What was it about Beth which made her perceive this experience as non-threatening, in comparison to Alex? Was Beth more extraverted or confident? Or was it because Alex placed much greater value in demonstrations of physical ability? Or to the contrary, did Beth maintain motivation following her setback because she valued improving in the subject? While this is just one memory from my adolescent experience, such distinguishable patterns of resilience to stressors are evident in both the academic and PE domain. Research investigating resilience to the everyday stressors experienced by the majority of school students has been ongoing for over a decade. However, no such investigation has been undertaken in the PE setting. Representing a significantly different context to classroom-based subjects, it is essential for researchers and practitioners to understand what makes students resilient to the everyday stressors they experience in PE lessons.

Purpose and structure of the thesis

The purpose of the thesis is as follows:

- To develop a sound knowledge of the approaches to measuring academic resilience to inform the development of a similar measure in the PE setting.
- To explore the types of stressors students' experience in their PE lessons.
- To explore protective factors that may contribute to students' resilience to stressors in PE.
- To develop a measure of stressors in PE.

The thesis comprises of the following chapters: (1) General Introduction; (2a) an overview of definitions, concepts, and theories of academic resilience; (2b) Review which explores psychometric issues associated with the current approach to measuring academic resilience. (2c) Review which provides an overview of everyday stressors in adolescence (3) Studies One and Two, which brings a focus to the PE context, and is a qualitative exploration of potential stressors and protective factors in PE lessons specifically (4) Studies Three-Six

which describe the development and validation of a measure of stressors in PE lessons (5) Summary, Discussion, and Conclusions.

My PhD process

As is evident from structure, at the outset of my PhD there was a strong focus on resilience, and I had initially planned to develop a measure of resilience in PE lessons. Therefore, the development of a measure of stressors only appears somewhat inconsistent with how the thesis begins, that is, with a strong focus on measurement of resilience. My PhD has been a huge learning process, and the decision to only develop a measure of stressors was not taken lightly. However, I had not fully anticipated the conceptual complexities that are evident in the field of resilience, and indeed stressors. Such complexities have an operational impact, and the development of a comprehensive and reliable measure of resilience seemed beyond the scope of the time I had left to work on my PhD. Thus I, with input from my supervisors, made the decision to focus on the first construct of resilience that is ‘stressors’.

Chapter II: Literature Review

Content

Part One: A review of the definitions, concepts and theories of academic resilience.

Part Two: Approaches to measuring academic resilience: A systematic review.

Part Three: A narrative review of everyday stressors in adolescence.

Publications and Conference Proceedings

Tudor, K., & Spray, C. M. (in preparation). The experience and impact of everyday hassles in adolescence: A narrative review.

Tudor, K., & Spray, C. M. (2017). Approaches to measuring academic resilience: A systematic review.

Tudor, K., & Spray, C. M. (2016). School-based resilience interventions. *Health and Wellbeing Research Conference.* Loughborough, UK.

In the previous chapter I provided an overview of why it is important that secondary school students are engaged and motivated in their PE lessons, and expressed my personal motivations for studying this area. I provided a very brief overview of stressors and the types of stressors students might experience during an everyday PE lesson. Moreover, I introduced the concept of resilience, and the question of whether resilience might be able to explain motivational and engagement trajectories in secondary school students. I proposed that, in order to develop a greater understanding of resilience, a reliable and valid measure needs to be developed to assess the concept in the PE setting. Finally, I stated the purpose and structure of the thesis that is presented herein.

Chapter two is split into three parts. When approaching the task of investigating students' resilience to stressors in PE lessons, I took a very systematic approaching to reviewing the appropriate literature that investigates the concept of resilience in the educational setting, which is reflected in part one of this chapter. In part one, I present a review of academic resilience, examining how it is defined, conceptualised, and current theories and models of resilience in the educational domain. Before embarking on the process of developing a measurement scale for the PE context, it was necessary to understand the psychometric issues relating to measurement of resilience and the most appropriate way to approach this task. Again, as the closest related field, I focussed on academic resilience to better my understanding of the psychometric approaches to assessment. Thus, part two synthesises this background knowledge in a systematic review of the approaches to measuring academic resilience.

The systematic review presented in part two concludes that the most appropriate way to develop a measure of resilience is to measure stressors, protective factors and positive adaptation independently. As the majority of my thesis is dedicated to the development of an independent scale for stressors, I believed it was important to have a just as strong of a conceptual understanding of stressors. Thus, part three provides an overview of: the types of 'minor' or everyday stressors that the majority of adolescents' experience, the impact of these stressors, and the approach scholars have taken to measure stressors.

Part One: A Review of Definitions, Concepts and Theories of Academic Resilience

What is psychological resilience?

The term resilience refers to findings that some individuals have relatively good psychological outcomes, despite exposure to acute or chronic stressors that are associated with negative outcomes (Rutter, 2006). Research on resilience has increased substantially over the past three decades, as psychologists have sought to understand why individuals differ in their response to risk or stressors. While early psychological research focussed on identifying risk factors associated with psychosocial issues, resilience research is characterised by the nurturing of personal strengths and identifying factors that allow individuals to thrive under difficult circumstances (Luthar, Cicchetti, & Becker, 2000).

A pioneering study of resilience was conducted by Werner and Smith (1992). The Kauai Longitudinal Study followed individuals from birth to adulthood, assessing the impact of a variety of biological and psychosocial risk factors, stressful life events, and protective factors. Werner observed that 72 out of the 200 children developed into well-functioning adults despite risk factors, and characterised the resilient qualities that helped children's development. It was found that personal characteristics, for example, being adaptable, tolerant, and achievement orientated contributed to children's competent development. Furthermore, environmental factors, such as a strong relationship with a caregiver both inside and outside of the family, also promoted healthy development. In parallel with the increased focus on the science of positive psychology (Seligman & Csikszentmihalyi, 2000), researchers continued to investigate factors that protected children from a range of life's adversities, including poverty (Nelson, 2014), parental mental illness (Sameroff, Seifer, Zax, & Garmezy, 1982), child maltreatment (Kaufman & Zigler, 1989) and parental divorce (Emery & Forehand, 1996). Examples of these factors (i.e. 'protective factors') have been identified as positive emotions, self-regulation and supportive parents (Eisenberg, Smith, & Spinrad, 2004), positive school climate (Rutter, 1985) and personality disposition (Garmezy, 1991), to name just a few.

Numerous definitions of resilience exist, and most derive from science, where resilience is defined as the ability of an object to regain its original shape after bending and stretching (Collins English Dictionary, 2014). Most definitions incorporate two pivotal

concepts: adversity and positive adaptation (Luthar, 2006; Luthar et al., 2000; Masten, 2001; Rutter, 1987; 2006). Adversity (often use interchangeably with the terms 'risk' or 'stressors') refers to negative life circumstances that are statistically associated with adjustment difficulties. Adversity may range from ongoing daily stressors, such as work or relationship pressures (Davis, Luecken, & Lemery-Chalfant, 2009) to highly impactful stressors, such as bereavement (Bonanno, 2004). Positive adaptation typically refers to "behaviourally manifested social competence" (Luthar & Cicchetti, 2000, p. 858) or the ability to meet age appropriate tasks. 'Competence' is often used interchangeably with positive adaptation (Luthar & Zigler, 1991). Luthar and colleagues posited that indicators of positive adaptation must be relative to the adversity examined (Luthar et al., 2000). Specifically, if an individual is exposed to a severe life adversity (e.g. child maltreatment) then near average functioning (i.e. the absence of psychological problems) would be appropriate to justify resilience (Afifi & MacMillan, 2011). If an individual experiences less severe, nonetheless demanding challenges (e.g. daily stressors in a working environment), then excellent functioning in the relevant domain would be necessary to demonstrate the existence of positive adaptation (Davis et al., 2009). Applying this idea that indicators used to define positive adaptation must be of high relevance to the adversity examined to an academic context; if a child is exposed to a serious life adversity that directly impacts the likelihood of academic success, then average academic functioning should be considered appropriate to justify the demonstration of positive adaptation.

Resilience in schools

Psychologists' investigation of human functioning under stressful conditions has gone beyond developmental psychology and has been examined across a variety of contexts, including healthcare (Ablett, 2006; Carlos & Calvo, 2012), the workplace (Luthans et al., 2007), the military (Palmer, 2008), professional sport (Fletcher & Sarkar, 2012), and education (Wang, Haertal, & Walberg, 1994). This thesis focusses on the latter application of psychological resilience, that is, to education. Researchers have begun to utilise the concept of resilience in schools to understand why some children achieve academically while others, who experience the same environmental conditions, do not. In the following section of this chapter, I present an overview of the definitions, concepts and theories of academic resilience. Moreover, the chapter will discuss how discrepancies in the way academic resilience is defined and conceptualised may impact how scholars evaluate such interventions. There is no shortage of this type of review in the general or traditional

psychological resilience literature (see for reviews, Fletcher & Sarkar, 2013; Windle, 2011); however no such review exists for academic resilience.

Defining academic resilience

How a particular construct is measured is intricately dependent on how it is defined and definitional variation results in inconsistent findings with regards to prevalence, antecedents and outcomes (Windle, 2011). Table 2.1 demonstrates definitions of academic resilience utilised within the literature. In the educational context, one of the most widely used definitions of academic resilience is "the heightened likelihood of success in school and other life accomplishments despite environmental adversities brought about by early traits, conditions and experiences" (Wang et al., 1994, p.46). Martin, Ginns, Brackett, Malmberg, and Hall (2013) similarly posit that academic resilience is defined as, "a student's capacity to overcome acute or chronic adversity that may be a major threat to educational development" (Martin et al., 2013, pp. 488).

Academic resilience sheds light about particular groups at risk of adversity, however, it provides limited information about how resilient the majority of students are when faced with the challenges associated everyday school life. The majority of students face less extreme, but nonetheless problematic academic challenges (Martin & Marsh, 2008b). To address this gap, Martin and Marsh (2008) introduced the concept of academic buoyancy (see Table 2.2.), which refers to students' ability to "successfully deal with academic setbacks and challenges that are typical of the ordinary course of school life" (Martin & Marsh, 2008, p.54). Martin and colleagues proposed detailed examples of how academic buoyancy and academic resilience may be operationally differentiated. For example, while resilience refers to responses to extreme adversities (e.g., chronic underachievement or poverty), buoyancy addresses everyday stressors, or hassles, at school (e.g., patches of poor performance or pressures of competing deadlines). Moreover, academic resilience may be relevant to disengagement from school and severe affective responses (e.g., depression and anxiety), whereas buoyancy relates to periods of decreased motivation and engagement and low level affective outcomes (Martin & Marsh, 2008b). Buoyancy therefore reflects an 'everyday resilience' that is more relevant for the majority of students who deal with the challenges of school life. However, I question whether the distinction between buoyancy and resilience is necessary given their operational similarities. This will be discussed in more detail later in the thesis.

Defining academic stressors

A central issue in the area of resilience research is the negative value-laden connotations associated with the term "adversity". Despite this, the majority of academic resilience research predominantly uses this term. Existing definitions of adversity in the academic resilience literature focus on established, statistically significant predictors of maladjustment (Capella & Weinstein, 2001; Martin & Marsh, 2006). Specifically, researchers define adversity as distal variables that are statistically associated with lower academic achievement (Cappella & Weinstein, 2001). Such distal risks include demographic variables for example, low socio-economic status (SES; Çelik, Çetin, & Tutkun, 2015), ethnic minority status (Braddock, Royster, Winfield, & Hawkins, 1991) or parent education (Fantuzzo, LeBoeuf, Rouse, & Chen, 2012).

There are some limitations in defining adversity in terms of membership of a particular group (Cappella & Weinstein, 2001), which will be discussed in greater detail in the part two of this chapter. Classifying children resilient based on overcoming group risk may fail to represent children who *do not* face distal risk (e.g. low SES) but experience significant academic difficulties. Conversely, students who face distal risks, statistically associated with poorer outcomes, may not experience academic difficultly. It is also notable here that the definitions of risk in academic resilience studies are not specific to the school environment, but are broad risks that are statistically associated with poor academic achievement. These risk factors have a longer history in the 'traditional' psychological resilience literature; with researchers assessing children's behaviourally manifested social competence in the face of such risks (Cicchetti, Rogosch, & Sturge-Apple, 2007). More recently, Martin (2013) defined adversity in the context of school, specifically, "the debilitation in the face of chronic failure… truancy and disaffection from school… and alienation from school or opposition to teachers" (pp. 489).

Another issue with using the term "adversity" is that positive life events, that are not typically associated with a higher probability of maladjustment, may also be relevant in defining resilience. An example within the academic context would be a student being promoted to a 'higher', more academically challenging class based on improvements in performance. Recognition of performance is not likely to be labelled an adversity, however would require resilience characteristics in positively adapting to the new demands of a different class and more challenging work. Moreover, when adversity is defined as an event that predicts maladjustment, it fails to reflect daily stressors, or daily hassles that,

cumulatively may require positive adaptation and resilience capacities. Indeed, there is a growing body of evidence that everyday environmental situations should be considered under the rubric of resilience (Davis et al., 2009; Neff & Broady, 2011).

As noted above, the concept of academic buoyancy (or "everyday resilience') was introduced to reflect an 'everyday academic resilience' which reflects the majority of students who are faced with setbacks, challenges and pressures that are part of the course or ordinary school life (Martin & Marsh, 2008b). In this context, Martin and colleagues define adversity in the context of academic buoyancy as, the experience of isolated poor grades, patches of poor performance, daily pressures, 'typical' stress levels or threats to confidence due to a poor grade. The view adopted in the current programme of work is that resilience to everyday stressors, should not be denoted as buoyancy, but everyday stressors should be included under the rubric of resilience.

To summarise, the current thesis utilises the term "stressor", opposed to "adversity", when defining academic resilience. A stressor has been defined as an experiential circumstance that results in a stress response (Pearlin, 1989) or, an event that impinges upon a person (Lazarus & Folkman, 1984). The decision to move away from a definition of resilience that moves away from positive adaptation to an "adversity" and towards positive adaptation to "stressors" is based on a number of factors. To begin, existing academic resilience literature defines adversity as variables that are statistically associated with maladjustment. Given the issues relating to focussing on distal variables (e.g. SES) associated with poor educational outcomes, it is proposed that the term "stressor" better reflects proximal environmental events that students experience at school. Secondly, the definition of stressors is more neutral, and therefore more appropriate in reflecting events that may not be statistically associated with negative outcomes, yet still considered under the rubric of resilience (e.g. a student being 'promoted' to a more challenging class). Finally, when adversity is defined as an event that predicts maladjustment, it prevents the inclusion of many ongoing, cumulative, daily experiences under the definition of resilience, despite the growing body of evidence that these experiences require the characteristics of resilience.

Defining positive adaptation

The second defining construct of academic resilience is positive adaptation. In the context of academic resilience, positive adaptation is most commonly reflected by academic

achievement alone (Waxman, Gray, & Padrón, 2003). For example, Borman & Rachuba (2001) reviewed longitudinal national data to identify characteristics that distinguished "academically successful or resilient" (p. 6) elementary school students from minority and low socioeconomic status backgrounds from their "less successful, or non-resilient counterparts" (p. 6). Similarly, Perez and colleagues (Perez, Espinoza, Ramos, Coronado, & Cortes, 2009) examined the academic resilience, or academic outcomes of undocumented immigrant Latino students. As noted above, Luthar and colleagues asserted in the 'traditional' psychological resilience literature that indicators used to define positive adaptation must be relevant to the stressor experienced, both in terms of the domains assessed and the stringency of criteria used (Luthar, 2006; Luthar et al., 2000). Thus, if a child is exposed to a serious life adversity that directly impacts the likelihood of academic success, then average academic functioning should be considered appropriate to justify the demonstration of positive adaptation. In contrast, if a child is exposed to the everyday stressors that are relevant for all students at school, then exceptional academic functioning would be considered appropriate to justify positive adaptation.

The importance of consistent definitions

As noted, the way in which a concept is defined has an impact on the way it is measured and how its relationship with other variables is understood. Thus, it is incredibly important that, a) researchers provide a guiding definition of a concept and b) definitions are used consistently across the academic literature. Table 2.1 demonstrates the resilience definitions used by researchers within this field of study. In two studies, authors do not provide a guiding definition (Park & Chung, 2014; Skinner, Pitzer & Steele, 2013). However, despite differences in wording, definitions are consistently based around the two concepts of adversity and positive adaptation; generally highlighting adversities as "major threats" (Martin, 2013, p. 488) to development. One study stated a number of existing definitions of resilience (Thornton, Collins, Daugherty, 2006), ranging from, "the capacity to bounce back from disappointments" (p. 5) to "positive response to stress and adversity" (p. 5) however authors did not confirm its own guiding definition.

Table 2.1. *Definitions of academic resilience*

Author/Year	**Definitions of academic resilience**
Burger et al. (2012)	Students' perceptions of their ability to successfully deal with life's stressors and adversity (p. 370)
Maier et al. (2012)	Process through which individuals achieve positive outcomes despite adversity (Luthar et al., 2000 p.104)
Martin & Marsh (2006)	"the heightened likelihood of success in school and other life accomplishments despite environmental adversities brought about by early traits, conditions and experiences" (Wang et al., 1994, p. 46.)
Martin et al. (2013)	A capacity to overcome acute and/ or chronic adversity that is seen as a major threat to a student's educational development (p. 488)
Park & Chung (2014)	No guiding definition provided.
Skinner et al. (2013)	No guiding definition provided.
Thornton et al. (2006)	The capacity to overcome personal weaknesses and negative environmental conditions (p. 7)

Table 2.2. *Definitions of academic buoyancy (i.e. 'everyday resilience')*

Author/ Year	**Definitions of academic buoyancy**
Collie et al. (2015)	The personal attribute relevant to navigating everyday adversity (p.114)
Liem et al. (2012)	The capacity to deal with stresses typical of everyday academic life that determines the extent to which they can successfully overcome these academic challenges. (p 224)
Malmberg et al. (2011)	The ability of students to successfully negotiate academic challenge, setback and adversity of everyday school life (p 262)
Martin & Jackson (2008)	Students' ability to deal with setback, challenge and adversity in a specific setting (p 144)
Martin (2009)	A factor relevant to students' ability to deal with academic setback in the ordinary course of academic life (p. 801)
Martin (2013)	A capacity to overcome setbacks, challenges, and difficulties that are part of everyday academic life (p. 488)
Martin & Marsh (2008a, b)	Individuals' ability to successfully deal with setbacks and challenges that are typical of everyday life – an "everyday resilience" (p168; p 53)
Martin et al. (2010)	Students' ability to successfully deal with setbacks and challenges that typical of academic life (p. 473)
Martin et al. (2012)	Students' ability to effectively deal with setback, challenge, adversity and pressure in the academic setting (p. 67)

Table 2.2 (Continued). *Definitions of academic buoyancy (i.e. 'everyday resilience')*

Author/ Year	**Definitions of Academic Buoyancy**
Martin et al. (2013a, 2014)	Student's capacity to successfully overcome setbacks and challenges that are typical of the ordinary course of everyday academic life (p. 129)
Martin et al. (2013b)	A factor relevant to students' capacity to deal with academic setback (p. 423)
Martin et al. (2015)	Students' capacity to successfully deal with academic setback and difficulty (p. 105)
Putwain et al. (2012)	Student's response to the academic setbacks, challenges, and pressures which are distinct from resilience (p. 350)
Putwain & Daly (2013)	One's capacity to withstand academic challenge and pressure (p. 157)
Putwain et al. (2015)	The capacity withstand the routine types of setbacks, challenges and pressures experienced by the majority of students during their education (p. 2)
Symes et al. (2015)	The ability to withstand and respond successfully to the types of challenges and setbacks associated with routine school life (p. 607)
Yu & Martin (2014).	Students' capacity to successfully overcome setbacks and challenges that are typical of the ordinary course everyday academic life (p.641)

Table 2.2 presents definitions of academic buoyancy, Martin's concept of 'everyday resilience' (Martin & Marsh, 2008a), which are also consistent in basing definitions around the two concepts of adversity and positive adaptation. With regards to the former, definitions of buoyancy were clear in stating 'lower level' adversities as "challenges typical of everyday life" (Martin & Marsh, 2008a), distinguishing buoyancy from the traditional resilience concept. With regards to positive adaptation, some authors stated that buoyancy is an individual's ability to "deal with" (Martin et al., 2008a) or "withstand" setbacks (Putwain, Daly & Chamberlain., 2015), while others stated that it as an individual's ability to "successfully overcome" setbacks (Yu & Martin, 2014). Despite only subtle differences in wording, authors appeared to conceptualise positive adaptation contrasting ways. To "withstand" suggests the endorser has not been damaged by the stressors and thus there is no negative experience to overcome. In contrast, "to successfully overcome" suggests the endorser has appraised an experience as damaging and is required to positively adapt to the said situation.

As I will discuss in the next section resilience is conceptualised in a number of ways across the literature. Most definitions of academic buoyancy implied that it is a 'process', emphasising an individual's "capacity" or "ability" to negotiate academic challenges. In contrast, one study (Collie et al., 2015) defined academic buoyancy as a "personal attribute" relevant to navigating everyday adversity. This definition implies buoyancy to be an inherent trait or personality characteristic as opposed to a process. This minor difference in the wording of definitions can have a significant impact on the way in which resilience is conceptualised.

Conceptualising academic resilience

A definition simply describes the meaning of given term. A concept, however, is an abstract idea which is formed from the combination of essential features of a particular term. The conceptual debates surrounding academic resilience concerns whether it should be conceptualised as a trait, process, or an outcome. The second is whether academic resilience can be viewed as distinct from conceptually similar terms within the educational literature, including 'academic hardiness', 'academic coping' and, as already introduced, 'academic buoyancy'.

Is academic resilience a trait, a process, or an outcome? This question has long been debated and highly documented in the psychological resilience literature (Fletcher & Sarkar, 2013; Windle, 2011). When resilience is conceptualised as a trait, it has been suggested it reflects the "positive role of individual differences in peoples' responses to stress" (Rutter, 1986). Moreover, Connor and Davidson (2003) propose that resilience represents characteristics that enable individuals to adapt to adverse circumstances. In an academic context, if resilience were conceived as a trait, a students' academic achievement despite environmental vulnerabilities would be a reflection of individual resources or personality characteristics. Some researchers in the field academic resilience favour this view of resilience as a trait. For example, Alva (1991) uses the term 'academic invulnerability' to describe students who sustain high levels of achievement, motivation, and performance, despite the experience of stressful environmental conditions that place them at risk of doing poorly in school.

In contrast to viewing resilience as a personality trait, some scholars have conceptualised it as an outcome. Outcome focussed research highlights the maintenance of patterns of competence and effective functioning in children exposed to adversity. Researchers have often defined resilience outcomes in terms good mental health, social competence, and behavioural capacities (Olsson, Bond, Burns, Vella-Brodrick, & Sawyer, 2003). However, it has been proposed that this is not the appropriate way to conceptualise academic resilience as the variation in the kinds of outcomes considered has led to confusion about the nature of the concept (Blum, 1998). Moreover, this conceptualisation would result in as many definitions of resilience as there are outcome indicators. In terms of academic resilience, using an outcome approach to conceptualisation would suggest that those who achieve academically are therefore resilient, which is a particularly crude way of assessing the concept. I will talk more about this issue in part two of this chapter.

In contrast to viewing resilience as a personality trait or as an outcome, some conceive the concept as a *process* that changes over time and context. Luthar et al. (2000) define resilience as a "dynamic process encompassing positive adaptation within the context of significant adversity" (p.543). This conceptualisation recognises the interaction between people and their environments, and that protective factors may be more effective in given contexts over others, as well as differ across the lifespan. In some academic resilience research the definitions utilised appear to suggest it is a process. For example, in their investigation of academic resilience, Borman and Rachuba (2001) posit that a student's

capacity for resilience may grow or decline over time, depending on protective factors within the person that might mitigate the negative impacts of an adversity. As demonstrated in the previous section, scholars use of academic buoyancy definitions are often unclear with regards to whether the concept is a trait, process, or outcome and it is important for the development of research to be consistent on this issue.

An important question is whether academic resilience is conceptually distinct from related psychological constructs. For example, the traditional concept of resilience has been closely aligned with coping (Fletcher & Sarkar, 2013), resulting in the constructs being used interchangeably. The same issue arises when applied to the academic domain. Increasing evidence is available for the role of coping in students' academic functioning (Skinner, Pitzer, & Steele, 2016) with adaptive (or productive) coping identified as an important predictor of academic performance (MacCann & Fogarty, 2011). Positive coping strategies have been found to mediate positive classroom affect (Kaplan & Midgley, 1999) and are implicated in fostering resilience (Boon, 2008; Howard, Dryden, & Johnson, 1999). Skinner et al. (2013) incorporate academic coping as part of a model of motivational resilience that "focuses on the dynamics among ongoing engagement, emotional reactivity, coping, and reengagement in the face of difficulties and setbacks". Thus, in this conceptual model, academic coping strategies are tested as mediators of the relationship between academic stressors and positive adaptation. Therefore, effective academic coping is proposed to be a protective factor that facilitates a students' academic resilience.

Another distinction between academic resilience and academic coping is that coping may include maladaptive strategies that may divert students from constructive re-engagement following a stressor. Maladaptive coping strategies include attempts to 'escape' (mentally or physically; Skinner et al., 2016), 'conceal' the stressor and therefore avoid help-seeking (Ryan, Patrick, & Shim, 2005), rumination (Broderick, 1998), or projecting the cause of the an adversity on others (Burish & Houston, 1979). Academic resilience on the other hand can influence how an event is appraised, whereas coping refers to the strategies employed after the stressor has happened. A resilient student would be one that has experienced academic difficulties and setbacks and interpreted them as an opportunity to learn and develop, consequently leading to improved academic success. A student with adaptive coping strategies would be one that suffered in response to academic difficulties, however sought help from their peers or teacher, which may result in subsequent academic success. Thus, academic resilience can be characterised by its influence on how a student appraises

academic setbacks before any coping strategies are implemented. Academic coping is characterised by its both positive and negative cognitive, affective or behavioural responses to a stressor.

Academic hardiness is another construct that has some conceptual overlap with academic resilience, resulting in its mistaken interchangeable use (Creed et al., 2013). Hardiness theory posits that cognitive appraisal processes (i.e. commitment, challenge, and control) protect individuals from the negative effects of stressful life situations. Kamtsios and Karagiannopoulou (2013) describe academic hardiness as a personality characteristic that may differentiate between students who seek out academic challenge and difficulty and those who avoid it. Academic hardiness has been identified as a predictor of student' self-efficacy (Golightly, 2007), motivation (Kinder, 2008), academic achievement (Sheard & Golby, 2007). Given hardiness is defined in the literature as a personality characteristic, it may be that it is another protective factor that contributes to a students' resilient processes.

The concept of thriving has many similarities with concept of resilience, and therefore the two terms are often used interchangeably. There are many definitions of thriving within the psychological literature, in part due to the domain-specific conceptualisation of the construct (Brown, Arnold, Fletcher, & Standage, 2017). Drawing upon the commonalities of thriving definitions, Brown et al. (2017) propose that thriving relates to development (i.e. progressive enhancements that are either physical, psychological, or social) and success (evidenced by temporally and contextually relevant outcomes). Specifically, thriving reflects the experience of development and success in tandem (Brown et al., 2017). Carver, (1998) notes that resilience is similar to thriving in that they both reflect a capacity for positive adaptation. In differentiating the concepts, Carver propose that resilience denotes the restoration to healthy levels of functioning, whereas thriving refers to the ability of individuals to function at a consistently higher level. Moreover, in contrast to resilience, thriving "does not depend on the occurrence of a discrete traumatic event or longer-term trauma" (p. 245). Moreover, thriving reflects individuals who actively seek to engage with challenging situations that present opportunities for them to improve their performance. Thus, in an academic context, resilience reflects students who are able to maintain relatively stable levels of 'functioning' (i.e. academic engagement, motivation, or achievement) following an adverse event, whereas thriving reflects students who achieve a consistently higher level of functioning that is not necessarily dependent on the occurrence potentially stressful events (cf. Carver, 1998**;** Sarkar & Fletcher, 2014).

Finally, it is important to note the potential conceptual distinctions between academic resilience and academic buoyancy. As noted above, academic buoyancy refers to students' ability to successful deal with academic setbacks and challenges that are typical of the ordinary course of everyday school life (Martin & Marsh, 2008a). Martin argues that this addresses the gap in the academic resilience literature, which focuses on students that face more extreme challenges. Moreover, it is proposed that academic buoyancy is conceptually distinct from academic resilience. Martin (2013) reports data suggesting that academic buoyancy and academic resilience are distinct constructs, sharing 35% of variance, with buoyancy salient in predicting 'low level' negative outcomes (anxiety, uncertain control) and resilience predicting high-level outcomes (self-handicapping, disengagement). Furthermore, academic buoyancy also predicted academic resilience, providing preliminary evidence for an ordering effect of buoyancy and resilience. That is, individuals high in academic buoyancy may be better equipped at dealing with more extreme adversities should they occur (Martin, 2013). However, it is well established in the psychological resilience literature that the concept is not solely relevant to individual adaptation to severe stressors. To the contrary, it is suggested that for the vast majority of individuals, the stressors experienced do not comprise "major calamities" but are the more moderate disturbances that occur in everyday life (Davis et al., 2009). Given this, and the limited evidence in the literature that academic resilience and buoyancy are indeed distinct, the stance taken in the current thesis is that resilience and buoyancy are not conceptually distinct constructs. Therefore, the remainder of the thesis will use the term resilience to describe positive adaptation to all potential stressors (ranging in severity) in the PE context.

Theoretical models of academic resilience

Luthar et al. (2000) highlight the importance for psychological resilience research to be theoretically driven. Various theoretical models of psychological resilience have been proposed (see, for a review, Fletcher & Sarkar, 2013) however theories of academic resilience are limited. One theoretical model of academic resilience, the 'resilience cycle', is presented by Morales and Trotman (2011). The resilience cycle highlights the major systematic steps in the process of academic achievement of at risk students, which focuses on the resilience *process*, rather than by simply identifying variables. The model involves a 'hub' and the following five 'spokes', or steps: (1) the student identifies major risk factors, (2) the student is able to manifest and seek protective factors, which have the potential to ameliorate the negative effects of perceived risk factors, (3) the protective factors work to

boost students towards high academic achievement, (4) the student recognises the value of these protective factors and therefore continues to utilise and refine these, and (5) the continued implementation of protective factors sustains academic achievement in the face of new academic challenges.

The resilience cycle addresses the minority of significantly 'at-risk' students. While understanding the minority of vulnerable students is an incredibly worthwhile endeavour, Martin (2002) developed a theoretical model for the application of academic resilience to the majority of students that experience difficulties, challenges, and setbacks at school. Martin proposed that motivation and academic resilience were complementary, but not necessarily overlapping constructs, and a combination of theories may underpin student educational outcomes. Thus, a model of motivation (see Figure 2.1) was developed that incorporates the concept of academic resilience. In this model, contributions from the academic motivation literature were combined to identify constructs that underpin academic resilience. For example, the constructs of 'failure avoidance', 'self-sabotage', 'anxiety', and 'low control' were identified in the needs achievement and self-worth models of motivation (Covington & Omelich, 1991; Martin, 2001) that may predict low levels of academic resilience. The final

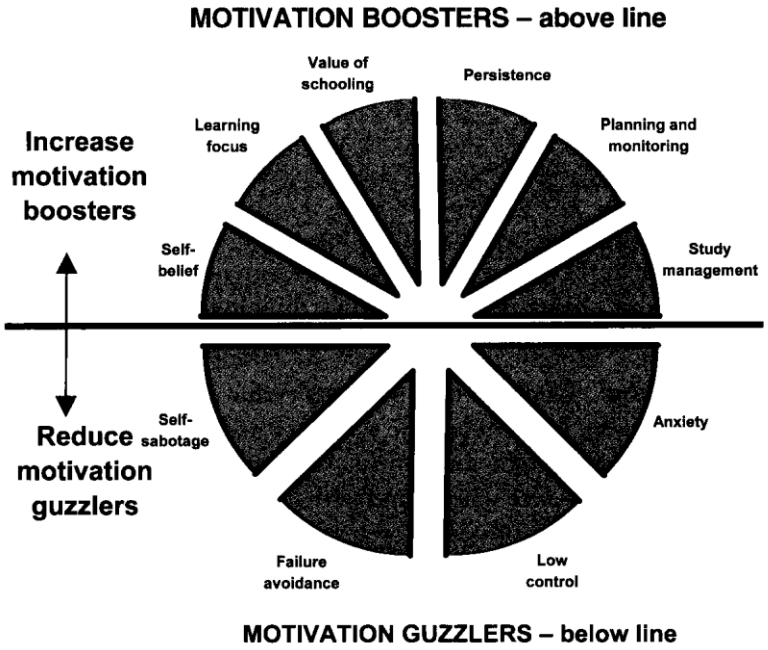

Figure 2.1. Martin's (2002) model of motivational resilience

model comprises a combination of motivational boosters (e.g. value of schooling, persistence, planning and monitoring) and motivational guzzlers (e.g. failure avoidance, low control).

Motivational guzzlers represent the protective factor component of academic resilience, and thus ameliorate the effect of academic stressors on positive adaptation. It was inferred that students high on 'boosters' and low on 'guzzlers' are resilient to academic setback, while those high on 'guzzlers' and low on 'boosters' do not respond well to academic setback, and this inference was confirmed on multiple subsequent studies (Martin & Marsh, 2006, 2008). A strength of a model such as this, was how easily it could be communicated by educators to students, and likewise, understandable by students.

More recently, Skinner and colleagues present a more complex model of motivational resilience applied to the academic domain (Skinner et al., 2013; Pitzer & Skinner, 2017). The proposed model consists of three components: academic engagement (versus disaffection), emotional reactivity, and reengagement in the face of academic problems or challenge. Academic engagement refers to a student's active participation in classroom activities (Skinner, Wellborn, & Connell, 1990; Skinner, Furrer, Marchand, & Kindermann, 2008). Specifically, engaged students pay attention, are curious and hard-working. Disaffected students on the other hand are passive and display behaviours exhibiting boredom and frustration. The second component is emotional reactivity, which refers to the severity of a student's immediate reaction to a negative academic event. Finally, Skinner and colleagues describe reengagement in the face of academic challenge as "the end-game in motivational resilience" (Skinner et al., 2013, pp. 10). Reengagement reflects increases in determination and mastery (Dweck, 2006) and is the opposite of giving up in the face of demanding work. Interestingly, Skinner et al. (2013) posit that the reengagement component of the motivational resilience model is synonymous with Martin & Marsh's (2008) concept of academic buoyancy, however do not use the Academic Buoyancy Scale (Martin & Marsh, 2008) to measure this component.

The model of motivational resilience (see Figure 2.2) view processes of engagement, coping, and persistence as complementary components of a dynamic motivational framework, that work together to promote students' learning, retention, and academic success (Pitzer & Skinner, 2016). Factors that promote academic resilience are incorporated into the model; specifically factors grounded in the self-determination theory (Deci & Ryan, 1985). Pitzer and Skinner (2016) tested the role of higher teacher support and more positive self-appraisals in predicting improvement in students' motivational resilience over the school year, in addition to: (a) whether SDT resources (self-perceptions of relatedness, competence, and autonomy, perceptions of teacher autonomy support) and emotional reactivity would

predict changes in motivational resilience over one year, (b) whether motivational resilience consequently predicted improvements in student academic achievement and 'fed back' to promote their personal and interpersonal SDT resources, and (c) whether teacher support promoted motivational patterns. Data analysis and structural modelling of primary school aged children supported the authors' hypothesised model, depicted in Figure 2.2.

Such a model supports the 'process' conceptualisation of academic resilience, indicating the dynamic relationships that exist among students' resilience, their own personal resources, social environment, emotional reactivity to stressors, and positive adaptation (in this case, indicated by 'learning and achievement'). Not only did the personal resources at the start of the school year predict student resilience capacities; levels of resilience (i.e. engagement coping, and reengagement) promoted feelings of relatedness, autonomy, and

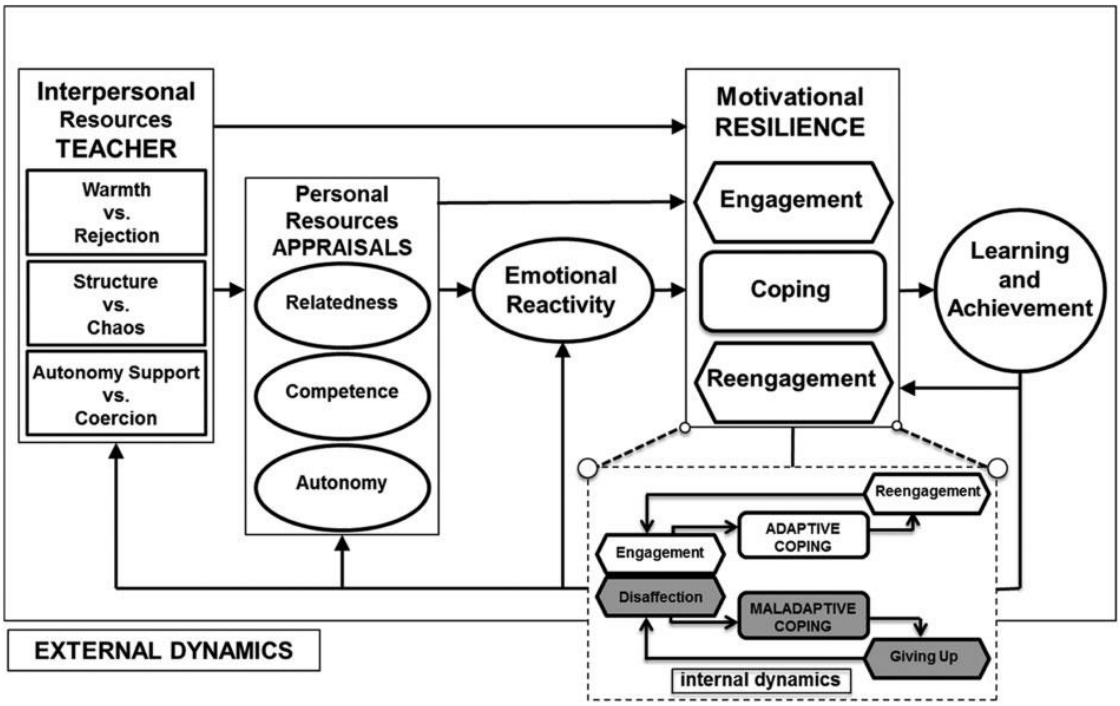

Figure 2.2. Skinner's (2017) model of motivational resilience

competence at the end of the school year. An important point to take from Pitzer and Skinner's (2016) model were findings that high levels of emotional reactivity do not necessarily signal motivational vulnerability, or students' capacities to positively adapt following failure. In contrast, emotional reactivity to academic setbacks can indicate the extent to which students care, and therefore may be present in the most academically engaged students. While more work is needed to understand the specific role of personal and

interpersonal components, Pitzer and Skinner's (2016) model is the first to integrate motivational theories to demonstrate the dynamic process of resilience to emotional reactions in the classroom. Given the class-room based context of the model, however, it may not be sufficiently applicable to the unique context of PE. These models may be useful to apply to the context of PE in the future, however the priority first is to comprehensively identify and measure the stressors that students experience during their PE lessons. This process should precede the development of complex models for how they respond to these stressors.

Summary

To summarise, the first part of the literature review chapter provides an overview of the definitions, concepts, and theoretical models of academic resilience. While there are a number of different definitions of academic resilience, all exhibit some degree of consistency with respect to incorporating the experience of adversity and positive adaptation. There are limited theoretical models of academic resilience, by comparison to the psychological resilience literature, however existing models attempt to incorporate both process and trait aspects of resilience. Part two of this chapter moves on to the psychometric issues related to the measurement of academic resilience.

Part Two:

Approaches to Measuring Academic Resilience: A Systematic Review

Academically resilient students have been described as those who achieve success in school despite experiencing stressful events that place them at risk of performing poorly (Wang, Haertal, & Walberg, 1994). Research into resilience has increased substantially over recent decades and the concept is receiving more interest from politicians and scholars, with an increase demand to introduce resilience building programmes as part of the national curriculum in the UK (Schofield & Bates, 2016) and globally (Hart & Heaver, 2015). Furthermore, under new government initiatives, trainee teachers will soon be taught how to build character and resilience, so that pupils are better equipped with the adversities they face (Schofield & Bates, 2016).

What is academic resilience?

In the academic context, academic resilience is defined as "the heightened likelihood of success in school and other life accomplishments despite environmental adversities brought about by early traits, conditions and experiences" (Wang et al., 1994, p.46). Investigated within the framework of risk and resilience, researchers seek to identify factors that enable at-risk students to 'overcome the odds' and achieve academic success. 'Risks' (stressors or adversities) have been defined as individual or social factors that are associated with a greater likelihood of poor development outcomes (Garmezy & Masten, 1986). For example, Overstreet and Braun (1999) focussed on students with a low socio-economic status (SES), while other studies have investigated children from minority ethnic groups (Cabrera & Padilla, 2004). 'Positive adaptation' refers to success at meeting stage salient tasks (Luthar et al., 2000) and, within academic resilience, refers to academic achievement relative to the risk posed. Much like the traditional resilience literature (see, for a review, Rutter, 1985; Sarkar & Fletcher, 2013). researchers aim to identify protective factors that moderate students' ability to respond to, and reduce the academic effects of a given risk. Individual protective factors of academically resilient students include high self-esteem, self-efficacy and autonomy (Wang et al., 1994), engagement in school (Finn, 1997) and value in school (Perez et al., 2009). Environmental factors have also been identified that serve to protect students from the impact of risk including, parent involvement (LaForett, Watt, Diaz, McCullough, & Barrueco, 2000), social ties at

school (Langenkamp, 2010) and, classroom environment (Samel, Sondergeld, Fischer, & Patterson, 2011).

In the traditional psychological resilience literature, resilience is conceptualised as positive adaptation to a range of stressors, from minor everyday stressors to severe life events (Davis et al., 2009). As demonstrated in part one of this chapter, this is not the case in the academic resilience literature. The concept of academic buoyancy was developed to address the majority of students who face less extreme, but nonetheless problematic academic challenges (Martin & Marsh, 2008b). Martin and colleagues suggest that academic buoyancy is likely to be influenced by multiple interconnecting factors. Martin & Marsh (2006) have suggested a number of motivational predictors of academic buoyancy, known as the 5Cs: Confidence (self-efficacy), Co-ordination (planning), Control (low uncertain control), Composure (low anxiety) and Commitment (persistence). The 5Cs have been found to predict academic buoyancy and to partially mediate between baseline and follow up academic buoyancy scores (Martin, Colmar, Davey, & Marsh, 2010). While empirical work has been began to test the distinct nature of buoyancy and resilience (Martin, 2013), methodological limitations surrounding the measurement scales utilised means that the suggestion the two concepts are distinct is unwarranted.

School-based resilience interventions

School-based approaches aimed at fostering resilience promote problem-solving skills, perseverance, and a positive emotional and behavioural attitude towards hard work in the face of failure. Interventions include targeting protective factors, including: individual assets (problem solving, sense of purpose, self-esteem); interpersonal factors (empathy, social competence); friends and family factors (family connectedness and positive peer relationships) and community factors (school / community connectedness). Hart and Heaver (2015) provide a comprehensive overview of school-based interventions for educational professionals to purchase and implement within their schools. It is disappointing that often, such costly interventions are implemented with little understanding of the concept, with various terminologies being used interchangeably. For example, some resilience approaches claim to be resilience based, however describe and target the more general concept of wellbeing (Hart & Heaver, 2013). Similarly, practitioners and politicians frequently use terms such as ‘resilience’, ‘grit’ and ‘persistence’ interchangeably. Not only do these concepts represent different characteristics, neither may be an appropriate label for what is being promoted in a given intervention (Smith, 2015).

Moreover, interventions lack a measurement strategy to evaluate their effectiveness in targeting and promoting resilience. For example, the UK's largest school-based intervention, the UK Resilience Programme, based on the Penn Resiliency Programme (Gillham et al., 2015) utilised outcome measures that were inconsistent with the concepts targeted in the intervention. The evaluation of such interventions and policies requires reliable and valid measures of academic resilience, as different approaches to measuring academic resilience across studies leads to inconsistencies when estimating prevalence. This makes it difficult to assess the effectiveness of resilience-based interventions, and even more difficult for professionals to make an informed decision regarding the purchase of such interventions. Establishing a reliable and valid approach to measuring academic resilience will have implications for both the development and evaluation of resilience-based interventions.

How do scholars measure academic resilience?

Currently, there is no 'gold standard' measure of academic resilience. The conceptual issues that characterise the traditional resilience research (e.g. trait versus process versus outcome) described in part one of this chapter, also apply in the academic context. Most researchers to date have not measured academic resilience directly; rather resilience is inferred based on the presence of an adversity or risk, with the demonstration of positive adaptation. Measuring academic resilience this way can be carried out through 'variable-focussed' or 'person-focussed' approaches.

In variable-focussed studies, researchers test for linkages between measures of risk, positive adaptation and the role of protective factors in mediating or moderating the impact of risk on subsequent outcomes (Masten, 2001). In such models, the main effects reflect the independent influence of a protective factor to the course of the outcome (positive adaptation). Furthermore, tests of mediated effects can be performed to determine whether altering the level of a protective factor (e.g. parental involvement in school) can contribute to positive outcomes. For example, Abel et al (2013) tested the mediating role of perceived discrimination of African American students at-risk of poor academic performance on their subsequent Grade Point Averages. Finally, variable focussed analyses can incorporate interaction models to test for protective factors that *moderate* the impact of an adversity on positive outcomes, that is, decrease the impact of the adversity on positive adaptation. As stated above, the definition of a protective factor is one that "ameliorates" or "alters" a person's response to an adversity. Therefore, it is essential that protective factors are tested for their mediating or moderating role in the relationship between risk and positive adaptation.

Person-focussed approaches to assessing academic resilience have involved the comparison of two groups of individuals, taken from the same high risk sample, who demonstrate adaptive or maladaptive outcomes (Masten, 2001). Statistical analysis, for example cluster analysis or discriminant function analysis, can then be employed to compare differences in the resilient (those who demonstrate positive adaptation) and non-resilient groups (Masten, 2001). For example, Finn (1997) compared resilient (school completers) and non-resilient (school 'drop-outs') students on measures of self-esteem and engagement. Whether researchers adopt a person-focussed or variable-focussed approach, it is important that the appropriate statistical analysis is used to understand relationships between adversity, positive adaptation and the role that protective factors can play.

A number of scales have been developed to assess *psychological* resilience in adult (Connor & Davidson, 2003) and adolescent (Ungar & Liebenberg, 2011) populations. The most psychometrically sound measures of the traditional concept of resilience (see, for a review, Windle et al., 2011) are those where the items reflect a collection of protective factors that facilitate resilience (e.g. Connor-Davidson Resilience Scale, Connor & Davidson, 2003; Child and Youth Resilience Measure; Ungar & Liebenberg, 2011). As academic resilience is characterised by the similar conceptual issues, academic researchers can use the lessons learnt from the psychological resilience literature. Currently, researchers utilise a variety of measurement scales to assess academic resilience, resulting in inconsistencies in terms of the prevalence of academic resilience, leading to the question of whether researchers are truly measuring the same concept. Moreover, evaluation of interventions designed to promote academic resilience require reliable measures to ensure the appropriate concepts are targeted. The aim of the current review was to provide some coherence to the academic resilience literature by:

- Providing an overview of methodologies employed to assess academic resilience. The review focuses on studies investigating academic resilience that should inform the development of school-based resilience interventions.
- Reviewing the indicators of risk and positive adaptation employed to infer academic resilience. Moreover, the statistical analysis utilised to determine the contributing role of protective factors will be reported.
- Reviewing the psychometric rigour of measurement scales utilised to assess academic resilience.

- Providing recommendations for the appropriate measure of academic resilience, in light of the psychometric lessons learned in the psychological resilience literature.

Method

Established guidelines were used to facilitate the undertaking of the systematic review. A systematic review is a review of a clearly formulated question that uses systematic methods to identify, select, and critically appraise relevant research through the collection and analysis of data of included studies (PRISMA Statement; (Moher et al., 2009). The PRISMA Statement recommends a checklist of items to include when reporting a systematic review (e.g. eligibility criteria, information sources, data collection process) and this checklist was adhered to when possible. Given that the PRISMA statement is developed to review outcome data of a selection of studies (primarily controlled trials) and the objective of the current review was to overview the methodologies employed in academic resilience research, not all of the checklist items were addressed (e.g. meta-analysis, risk of bias). The STROBE Statement was also utilised to inform the review process. The STROBE statement was developed to strengthen the reporting of observational studies (cross-sectional, cohort, case-control). Academic resilience studies to date are primarily cross-sectional and therefore the STROBE and PRISMA guidelines were used in combination to extract, analyse and report on data for the current review (von Elm et al., 2008).

Search strategy

In October 2016, a computerised literature search of Web of Science, PubMED, PsychINFO, ERIC and SportsDISCUS was conducted. Search strategies were built around four groups of key words: education (e.g. education*, academic*, adolescen*), resilience (e.g. resilien*, buoyan*) and measurement (e.g. scale, measure*, instrument and assess*). Asterisks were placed to account for more than one appropriate word (e.g. resilient and resilience). The search terms were also entered into Google Scholar and reference lists of previous reviews of the literature were hand searched. The search was limited to English language papers, specifically dealing with academic resilience, and or, buoyancy. Figure 2.1 depicts the literature retrieval process. The original search identified 2893 papers, commentaries and, reviews of the literature. The titles and abstracts of the identified papers were initially screened, and articles that did not address academic resilience or buoyancy were excluded. The full texts of the remaining articles were screened to identify articles that met the inclusion criteria.

Inclusion criteria

The focus of the search was to identify peer reviewed journal articles where academic

resilience was the key focus, where the authors had engaged with the resilience evidence-base in their rationale and investigated resilience in the academic context. Specifically, articles were included if an attempt was made to measure student resilience through: a) the independent assessment of a stressor or risk via. specified indicator (e.g. SES) and independent measure of positive adaptation via. a specified indicator (e.g. academic achievement) and b) assessment using a measurement scale. As the focus of the review was on academic resilience in school, studies of students in full-time education (aged 4- 19) were included.

Exclusion criteria

Papers not published in English were excluded from this paper if no translated version was available. Papers were excluded if only the title was available and the authors were unable to obtain a full version. Articles that addressed academic resilience in University populations were excluded. Studies that claimed to measure resilience, however did not complete adequate assessment (see inclusion criteria), were excluded.

Data extraction

Detailed information was extracted from each article including sample characteristics (sample size, age, gender, socio-economic status, ethnicity and 'risk status' if applicable), country of study, study design, resilience (and/ or buoyancy) measure, measure of positive adaptation, measure of protective factor(s) and the details of statistical analysis. Two reviewers discussed criteria for inclusion in the review, agreeing that articles should be included based on authors' attempts to measure resilience within an academic setting. Both reviewers have sound knowledge of the conceptualisation and theories of academic resilience. Specifically, broad screening (i.e. screening of titles and abstracts) was conducted by the first author. Working independently, the reviewers carried out narrow screening (i.e. screening of full texts) on approximately 10% of the included studies, and any ambiguity with inclusion and exclusion was discussed and resolved. Data extraction was carried out by the first author, corroborated by the second author following data extraction of a sample of articles.

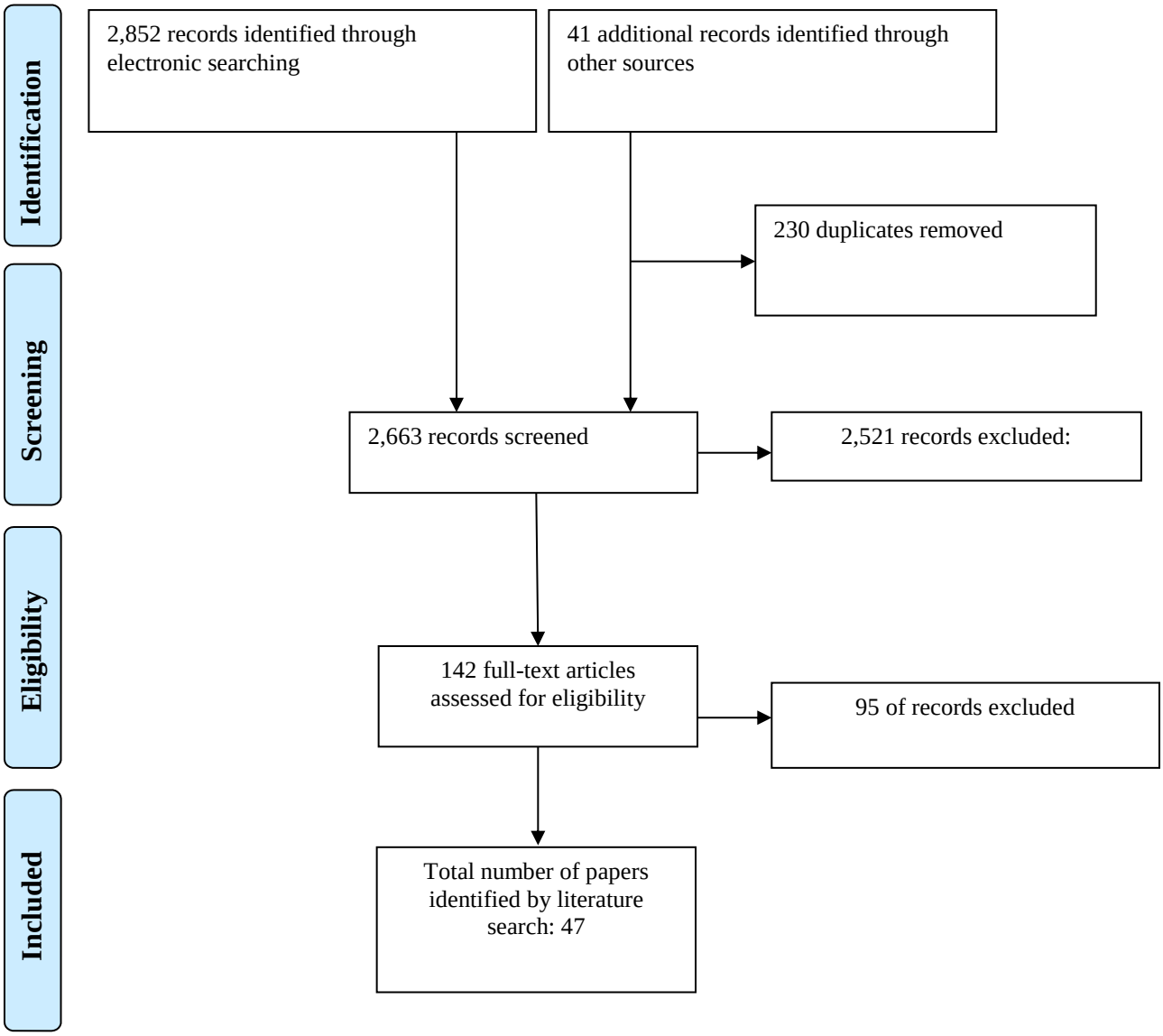

Figure 2.3. Presentation of literature search and study inclusion

Results

As demonstrated in Figure 2.3, 47 studies included in the current review assessed academic resilience by measuring student risk (or adversity), positive adaptation and one or more protective factors. Thirty-four studies utilised measurement scales to assess academic resilience (or academic buoyancy).

Measures of risk, positive adaptation and protective factors

Table 2.3 demonstrates the variability of measures used to assess risk. The majority of studies employed SES and/or ethnicity as a demonstration of risk or adversity. A wide variety of indexes were utilised to demonstrate the distal risk of low SES including: maternal

education, family composition, poverty status, and exposure to community violence. Academic factors were frequently employed as demonstration of risk, including dropping out of high school (Wayman, 2002), having low confidence in graduating (Catterall, 1998), low academic achievement at baseline (Langenkamp, 2010) and low school commitment (Li, Martin, Armstrong, & Walker, 2011).

The majority of researchers used some form of academic assessment as a demonstration of positive adaptation (e.g. Grade Point Average). In some cases, positive adaptation was indicated using academic achievement, however provided no more information regarding a specific test. In many cases, mathematics and reading scores were used as a measure of total academic achievement (Ladd, Valrie, & Walcott, 2014; Obradović et al., 2009). A minority of articles incorporated cognitive aspects of academic achievement, for example, 'self-efficacy in academic domains' (Plunkett, Henry, Houltberg, Sands, & Abarca-Mortensen, 2008) or academic aspirations (Braddock et al., 1991). Similarly, several studies utilised behavioural assessment of positive adaption by assessing attendance at school (Crosnoe & Elder, 2004), number of statistical analysis

Table 2.3. *Indicators of risk, positive adaptation and protective factors in academic resilience research*

First Author (Year)	Assessment of Risk	Assessment of Positive Adaptation	Assessment of Protective Factors	Statistical Analysis Employed
Abel (2013)	Ethnicity, Perceived discrimination.	Grade Point Average (GPA)	Trait emotional intelligence, demographic variables.	**Multiple regression (mediation analysis)**
Alfaro (2009)	Ethnicity, Perceived discrimination.	GPA	Academic motivation, English proficiency, Gender	**Structural equation modelling (mediation)**
Boon (2011)	Baseline academic achievement	Follow up academic achievement	Challenging behaviour, SES, Gender	**Path analysis (mediation)**
Borman (2004)	Low SES	Mathematics score (higher than predicted)	Ethnicity, Individual characteristics, Peer group, Effective school variables, School supportiveness.	**MANOVA**
Braddock (1991)	Ethnicity	Academic aspirations, Peer status, Academic investments	Athletic participation	**Multiple regression (mediation analysis)**
Cappella (2001)	Baseline academic achievement	Follow up academic achievement	Demographics variables, Psychological factors, Behavioural factors, School factors.	**Multiple regression (mediation analysis)**
Catterall (1998)	Low confidence in graduating	Academic test score	Family background, Family academic support, Engagement in extra-curricular activities, Teacher responsiveness, Student attitude towards motivation	**Multiple regression (mediation analysis)**
Coohey (2010)	Child maltreatment	Mathematics and reading test scores	Adaptive behaviour, School engagement, Behaviour problems, Relationship with peers.	**Multivariate longitudinal analysis**

Table 2.3. (Continued). *Indicators of risk, positive adaptation and protective factors in academic resilience research*

Connell (1994)	Gender, Low SES	GPA, Attendance, Suspensions (low)	Self-esteem, Perceived relatedness to self, Perceived relatedness to other students, Behavioural engagement	**Correlation**
Crosnoe (2004)	Parent-child emotional distance	Academic grades, Completed homework, Attendance	Parent involvement in education, Student academic orientation.	**Structural modelling (tested interactions)**
Elias (2008)	Ethnicity, Low SES	Reading and mathematics score	Perceived social support, Social-emotional competence	**Structural equation modelling (mediation)**
Fantuzzo (2012)	Cumulative risk score: Poverty, Child maltreatment, Mother education, Homelessness, Inadequate pre-natal care, Lead exposure	Reading and mathematics score	Academic engagement, Attendance	**Linear regression (mediation)**
Farmer (2005)	Ethnicity, Low SES	Academic, behavioural and social characteristics	Behavioural and emotional strengths	**t tests**
Ferrera (2015)	Bottom 1/4 of economic, social and cultural status	Mathematics score (top 1/4 nationally)	School variables (e.g. disruptions in class, class size), Individual variables (e.g. attention in mathematics)	**Logistic regression**
Finn (1997)	Ethnicity, Low SES	GPA, Standardised academic tests, Graduating on time	Self-esteem, Locus of control, Engagement	**MANOVA**
Geoke-Morey (2012)	Low SES	Expected academic attainment	Community, family, parenting variables	**Multiple regression (no mediation)**
Ghazarian (2010)	Inter-parental conflict	End of year grades	Youth perceived threat, Youth self-blame, Maternal acceptance and monitoring knowledge.	**Structural equation modelling (mediation and moderation)**

Table 2.3. (Continued). *Indicators of risk, positive adaptation and protective factors in academic resilience research*

Gonzalez (1997)	Ethnicity	Academic grades (mostly As = resilient, mostly Ds =not resilient)	Supportive academic environment, Sense of belonging in school, Cultural loyalty	**ANOVA, Stepwise regression & Discriminant analysis**
Gordon (1996)	Ethnicity, Low SES	GPA	Stress, Academic self-concept, Personality agency beliefs	**ANOVA**
Gutman (2002)	Ethnicity, Household factors (e.g. maternal education, depression)	GPA, Attendance, Mathematics score.	Family factors, Social support factors	**Hierarchical regression**
Hampton (2016)	Ethnicity, Gender	Academic grades	Self-respect, English proficiency, Goal setting ability, Self-motivation, Time-management, Consequence awareness	**Linear regression (no mediation analysis)**
Hawkins (1992, 2005)	Ethnicity, SES.	Educational aspirations, Peer status, Academic investment	Athletic participation	**Multiple regression (mediation analysis)**
Huang (1996)	Ethnicity, Low SES	Math achievement (top 25% = resilient, bottom 25% = not resilient)	Motivation, Involvement in class, Affiliation to others in class, Learning environment, Satisfaction, Parent involvement.	**ANOVA**
Irvin (2012)	Ethnicity, Low SES	Academic test score	Interpersonal competence, Behavioural engagement, Psychological engagement, Aggression.	**Cluster analysis**
Kanevsky (2008)	English learning student, Low SES	Academic test score	School related psychosocial variables	**ANOVA**
Kwok (2006)	Baseline academic achievement, Low SES	Follow up academic achievement	Ego resiliency, Agreeableness, Aggression and hyperactivity, Cognitive ability, IQ test, Higher SES	**Correlation**
Ladd (2014)	Sickle cell disease	Math and reading test score	Family functioning / environment	**Logistic regression (moderation)**

Table 2.3. (Continued). *Indicators of risk, positive adaptation and protective factors in academic resilience research*

La Foret (2000)	Ethnicity	Reading ability, Verbal ability, GPA	Family factor (e.g. parent involvement), School behaviour (e.g. engagement), Peer relations, Self-concept	**Correlation**
Langenkamp (2010)	Baseline math achievement (low)	Improved follow up math score	Social ties pre-transition to high school, Life disruptions between transitions, School district	**Logistic regression**
Li (2012)	Poor parental management, Low school commitment	GPA (Chinese, Mathematics, English)	Low truancy, low substance use, low antisocial behaviour	**Hierarchical regression (no mediation). MANOVA**
Obradovic (2009)	Homeless/ highly mobile, Poverty	Reading and mathematics score	Demographic and enrolment variables (e.g. sex, ethnicity)	**Linear Mixed Models**
Overstreet (1999)	Low SES, Exposure to community violence	GPA	Family environment, Emotional distress, Depression	**Regression analysis (moderation)**
Peck (2008)	Ethnicity, Gender, Low SES	Academic test scores	Self-theories (e.g. perceived academic ability), World theory (e.g. positive family environment), Activity involvement.	**Cluster analysis & logistic regression**
Perez (2009)	Ethnicity, Employment during high school, Parent education, Family size	GPA	Personal protective factors (e.g. valuing school, distress score), Environmental protective factors (e.g. family, peers valuing of school)	**Incremental regression analysis & cluster analysis**
Plunkett (2008)	Ethnicity	Self-efficacy beliefs for academic learning	Academic support from significant others	**MANOVA**
Raskaukas (2015)	Peer victimisation	GPA	Self-efficacy, Self-esteem	**Hierarchical regression (mediation and moderation)**

Table 2.3. (Continued). *Indicators of risk, positive adaptation and protective factors in academic resilience research*

Reynolds (1998)	Ethnicity, Low SES	Teacher rating of classroom adjustment, Reading and mathematics scores (above national average), Not repeating grade.	Previous academic achievement, Perceived competence, Parent academic participation, classroom adjustment.	**Logistic regression**
Samel (2011)	Low SES	Graduated on time	Classroom environment	**Not stated**
Schelbe (2010)	Maltreated children	Above average grades	Emotional dysregulation	**Linear regression (no mediation analysis)**
Sharkey (2008)	Low SES	Academic test scores	Inter-parental conflict, Youth self-blame, Youth perceived threat, Maternal acceptance, Maternal monitoring	**Structural equation modelling (mediation and moderation)**
Shumow (1999)	Low SES	GPA	Individual factors (e.g. social problem solving skills, academic self-competence), Family factors (e.g. emotional support, parent academic involvement)	**Stepwise regression (no mediation)**
Spencer (1993)	Ethnicity, Low SES	Academic achievement (national achievement percentile ranking)	Family support, Life dissatisfaction, Depression, Self-efficacy	**Multiple regression (no mediation)**
Von Secker (2004)	Ethnicity, Low SES, Gender	Science achievement (standardised test scores)	Parent education, Home environment (e.g. reading material) Attitude towards science	**Hierarchical linear modelling**
Waxman (1997)	Ethnicity, Low SES	Mathematics achievement (top 25% = resilient)	Achievement motivation, Academic self-concept, Classroom environment, Satisfaction in Maths, Parent academic involvement.	**Chi-square test & MANOVA**

Table 2.3. (Continued). *Indicators of risk, positive adaptation and protective factors in academic resilience research*

Wayman (2002)	High school drop out	Completed GED, Returned to high school	SES, Family and peer factors (support), School factors (e.g. extra-curricular activity), Age at dropout, Parent status	**Logistic regression**
Woolley (2007)	Threat to safety/ security, High risk peer affiliations, Social stressors	Academic success	Supportive / caring adults in the home	**Regression analysis (mediation)**

Table 2.4. *Measurement scales utilised in academic resilience research*

First Author (Year)	Risk Status	Measure of Resilience
Banatao (2011); Hanson (2013); Jowkar (2011)	Low SES	**Resilience and Youth Development Module (RYDM).** 58 items measuring internal student assets linked to positive developmental outcomes: a) school assets (caring relationships high expectations, meaningful participation) b) home assets (caring relationships, high expectations, participation at home) c) community assets (caring relationships, high expectations, meaningful participation) d) Peer assets (caring relationships, pro-social peers) Internal resilient assets (3 items each): co-operation, self-efficacy, empathy, problem solving, self-awareness.
Burger (2006)	Not stated	**Subscales of the Student-Orientation-to-School Questionnaire: External resilience,** 'perceived ability to cope and adapt successfully in the face of challenges': 11 items, e.g. "I pull through when things are difficult"). **Internal resilience**, 'perceived ability to resist anxiety and maintain internal emotional and mental balance': 4 items, e.g. "making mistakes bugs me". Responses on a 5 point scale (ranging from strongly agree to strongly disagree).
Martin (2006)	Not stated	**Academic Resilience** (6 items: "I believe I am mentally tough when it comes to exams"; "I don't let study stress get on top of me", "I'm good at bouncing back from a poor mark in my schoolwork", "I think I'm good at dealing with schoolwork pressures", "I don't let a bad mark affect my confidence", "I'm good at dealing with setbacks at school e.g. bad mark, negative feedback).
Martin (2008)	Not stated	**Academic Buoyancy Scale (ABS).** 4 items: "I'm good at dealing with setbacks (e.g. bad mark, negative feedback on my work", "I don't let study stress get on top of me" "I think I am good at dealing with schoolwork pressures", "I don't let a bad mark affect my confidence"

Table 2.4. (Continued). *Measurement scales utilised in academic resilience research*

Martin (2013)	Previous academic adversity	**Academic Risk and Resilience Scale (ARRS):** Students indicated 'yes' or 'no' to ten major academic adversity items (e.g. suspension, skipped a grade). Those who selected 'yes' to at least one academic adversity then asked to answer for items on a 7 point scale (1= strongly disagree, 7= strongly disagree): "I don't let these types of difficulties get on top of me", "I think I'm good at dealing with these types of pressures", "I don't let these types of difficulties affect my confidence", "I'm good at overcoming these types of setbacks".
Phan (2016)	Not stated	**Vigour (i.e. persistence and resilience), subscale of the Engagement scale (Scaufeli et al., 2002).** 6 items, 7-point scale, e.g. "As far as my studies in maths are concerned I always persevere, even when things do not go well"
Esteban (2104)	Immigrant status	**Resilience Scale** (Saavedra & Villalta, 2008), evaluates 12 resources that students may use.
Sarwar (2010)	Not stated	**Resilience Scale** developed for the study, 6 dimensions: 1. Personal competence 2. Social Competence 3. Family competence 4. Personal Structure 5. Social Support 6. Total Resilience
Skinner (2013)	Not stated	**Resilience Measure:** 3 components of resilience. 1. Engagement versus disaffection. A) Behavioural engagement (5 items); b) behavioural disaffection (5 items); emotional engagement (6 items); emotional disaffection (10 items). 2. Emotional Reactivity (extent to which student reacts negatively when they run into academic problems; 11 items). 3. Reengagement in face of academic challenge, tapping into mastery reactions (4 items) and giving up (5 items)
Thornton (2006)	Ethnicity	**Resiliency Belief System Instrument** (Jew et al., 1999): 50 items, 5 subscales: 1. The Active Optimism Subscale (17 items) 2. Passive Optimism Subscale (17 items) 3. Active Belief in Others Subscale (10 items) 4. Passive Belief in Others Subscale (6 items) 5. Total Scores.

Variable-focussed approaches

Most of the studies in the current review employed some form of mediation or moderation analysis to assess the influence of specific protective (or vulnerability) factors on the relationship between risk and positive adaptation. Table 2.3 demonstrates the form of statistical analyses used to examine the role of protective factors in the relationship between risk and adaptation. Many used multiple regression to test the mediating influence of specific protective factors on educational outcomes. For example, Braddock et al (1991) tested the role of athletic activity in mediating the relationship between ethnicity and academic aspirations. In some cases, correlation analysis was used to assess relationships. For example, LaForett et al (2000) investigated the role of family factors, self-concept and school behavior on academic achievement in at-risk students from an ethnic-minority background. Using correlation analysis fails to identify the specific impact of a protective factor on educational outcomes. Moreover, the majority of studies used a cross-sectional design with data collected at one-time point.

It is important for authors to distinguish between whether they are testing for moderating or mediating effects. Whether a protective factor is moderating or mediating the relationship between stressors and positive adaptation has implications for the conceptualisation of resilience. Using a potential protective factor of good student-teacher relationship; if relationship were a moderator, then stressors would have differential predictive effects based on the level (or the presence) of a good student-teacher relationship. If relationship were a mediator, then the level of stress predicts positive adaptation by altering the quality of the student-teacher relationship. The definition of protective factors are variables (individual or environmental) that ameliorate the impact of stressors on positive adaptation (Rutter, 2006) and therefore theories of resilience may incorporate either mediation or moderation analyses. However, the studies reported in the current review do not state a rationale for the analyses that are utilised, or whether it is consistent with their model of resilience (Ladd et al., 2014; Overstreet & Braun, 1999) It is essential in future, for researchers to clarify whether their conceptualization of resilience concerns moderation, mediation, or both.

Person-focussed approaches

Where a person-focussed approach was employed, participants were grouped as 'resilient' or 'not resilient' based on their positive adaptation at school. For example, in studies by Huang and Waxman, (1996) and Waxman, Huang, & Padrón (1997), participants in the top 25% for mathematics achievement were grouped as resilient, while the bottom 25% were grouped as not resilient. Similarly, Wayman (2002) grouped resilient and non-resilient as those who either

did or did not complete their Graduate Education Diploma (GED) following dropping out of high school. Many other studies employed statistical analysis which involved comparison of groups however did not state the 'cut off' point for a resilient or a non-resilient student. For studies employing a person-focussed approach, cluster analysis, or comparison of groups using analysis of variance was most frequently utilised. Differences in levels of a number of protective factors were then observed. For example, Irvin (2012) utilised cluster analysis, to determine whether psychological and behavioural engagement served as a protective factor in profiles of resilient and non-resilient students. Similarly, Peck, Roeser, Zarrett, & Eccles (2008) investigated the role of positive family environment and perceived academic ability in high achieving and low achieving students using logistic regression and cluster analysis.

Measurement scales

Table 2.4 demonstrates the measurement scales utilised to assess academic resilience. Most scales incorporated a variety of protective factors that are linked to positive adaptation, with each item indicating one protective factor. The Resilience and Youth Development Module (RYDM; Hanson & Kim, 2007) consists of 58 items measuring internal student assets linked to adaptive outcomes, including; school assets, home assets, community assets, peer assets and internal resilient assets. Similarly, the academic resilience scale developed for Sarwar, Inamullah, Khan, and Anwar (2010) study incorporates five subscales reflecting different assets: personal competence, social competence, family competence, personal structure and family support. Moreover, Skinner, Pitzer, & Steele, (2013) resilience measure includes three components of resilience; engagement, emotional reactivity and reengagement (described as similar to the concept of 'academic buoyancy'). Finally, Phan (2016) measured academic vigour (i.e. combination of persistence and resilience), using a subscale of the validated scale of Academic Engagement (Schaufeli, Salanova, Bakker, & González-Romá, 2002).

In contrast, a small number of scales measured academic resilience using a univariate scale assessing students' *responses* to academic adversities. For example, the Academic Resilience Scale (Martin & Marsh, 2006) consisted of six items reflecting students' cognitive response to setbacks at school (e.g. "I am mentally tough when it comes to exams"). This scale was subsequently amended, with the removal of two items ("I am mentally tough when it comes to exams" and "I'm good at bouncing back from a poor mark in my schoolwork", to form the Academic Buoyancy Scale (Martin & Marsh, 2008b). Both scales were developed to assess how students responded to more minor academic adversities. Finally, (Martin, 2013) developed the Academic Risk and Resilience Scale (ARRS; Martin, 2013) to assess how students respond

to more severe academic adversities. As described in Table 2.4, this scale requires participants to answer 'yes' or 'no' to ten significant academic adversities (e.g. suspension) then respond to an amended version of the ABS ("I don't let these types of difficulties get on top of me", "I think I'm good at dealing with these types of pressures").

Discussion

Recent years have seen an influx in government funding for the implementation of resilience programmes in schools (Schofield & Bates, 2016). Such interventions, however, have been implemented with little understanding of the desired outcome (i.e. resilience), and no specific outcome measures to evaluate such programmes. The aim of the current study therefore, was to provide an overview of methodologies employed to assess academic resilience. Specifically, we aimed to report the indicators of risk and positive adaptation used to infer students' academic resilience and the statistical analyses employed to determine the role of protective factors. Finally, we aimed to identify studies that employed measurement scales to assess academic resilience.

The review identified a number of scales utilised to measure academic resilience. Furthermore, there was heterogeneity in the indicators of risk and positive adaptation that were utilised to reflect academic resilience. This inconsistency reflects ongoing debate regarding the conceptualisation of academic resilience and the difficulties in developing an operational definition of the construct. Similar definitional and conceptual issues have been highlighted in the psychological resilience literature. The following discussion therefore uses the lessons learned from the traditional literature to make recommendations for the development of a valid and reliable measure of academic resilience.

Assessing risk

It has been proposed in the psychological resilience literature that measures should assess three defining components: risk, positive adaptation and protective factors (Sarkar & Fletcher, 2013). Turning first to risk, the current review highlights the heterogeneity of factors used to represent risk. Most frequently utilised to represent academic risk was socio-economic status, which was assessed in many different ways across studies (e.g. maternal education, exposure to community violence). While it is important and exciting to understand students from a variety of adverse circumstances, the diversity of risks presents a problem for comparing and interpreting results. Although the literature is very clear that socio-demographic factors predict negative academic outcomes, using a single indicator, for example ethnicity, makes the assumption that all students within this demographic are at equal risk of poor academic

outcomes. This approach therefore encompasses students from low SES backgrounds who are academically gifted, and similarly excludes students from high SES backgrounds who show significant trouble in the face of academic adversity. Thus, educational scholars should seek to use academic indicators of risk, for example, 'low confidence in graduating' or 'low baseline academic achievement'.

In empirical studies of psychological resilience, one approach to measuring risk, or adversity, is the use of checklists of negative life events (Luthar & Cushing, 1999). Measurement scales such as, the Life Events Checklist (Work, Cowen, Parker, & Wyman, 1990) and the Daily Hassles Scale (Kanner, Coyne, Schaefer, & Lazarus, 1981) have been used to measure major and minor life events to gain a complete picture of risk. The academic resilience literature would benefit from the development of a checklist of events that are associated with academic disengagement and substandard academic motivation. (Martin, 2013) has approached this method of assessment with the development of the Academic Risk and Resilience Scale (ARRS), which incorporates major academic events associated with disengagement from school (e.g. 'suspended from school', 'did not hand in most assignments', 'major illness affecting schoolwork'). This approach, paired with an appropriate measure of positive adaptation is a step in the right direction in assessing academic resilience. It is important, however, to be transparent regarding item generation, thus future development of a checklist for academic adversities should be generated from qualitative research with teachers, students and parents, exploring the chronic and acute events that impact students' academic outcomes.

One concern for researchers considering the option of developing a checklist for academic risk relates to the need to differentiate between chronic circumstances and acute events, as these are associated with different outcomes (Masten, Neemann, & Andenas, 1994). Academic resilience researchers therefore may take into account the recording of the frequency of events student's experience. Moreover, another consideration with this type of assessment is the potential for measurement confounds. For example, within the psychological resilience literature, Luthar & Cushing (1999) suggest that the inclusion of controllable adversities when measuring risk can inflate the relationship between risk and adaptation. Therefore, scales aiming to assess adversities that pose a risk to poor academic achievement should exclude those that are clearly controllable by the student (e.g. 'suspended from school'). For some cases there may be ambiguity, therefore the most rigorous approach would be to generate events through qualitative enquiry and request a panel of experts to rate the events in regards to their

controllability (Luthar & Cushing, 1999).

As noted, educational psychologists propose that academic resilience does not address the majority of students who face less extreme academic adversities associated with everyday school life (e.g. patches of poor performance, pressures of competing deadlines). Thus, academic buoyancy refers to students' ability to "successfully deal with academic setbacks and challenges that are typical of the ordinary course of school life" (Martin & Marsh, 2008, p.54). It is suggested that buoyancy reflects an 'everyday resilience' that is more relevant for the majority of students who deal with the challenges of school. Martin and colleagues use a measurement scale to assess students' responses to more minor adversities, which will be discussed in more detail below. However, I suggest assessing buoyancy using the same approach as resilience, specifically, measuring academic risk, positive adaptation and protective factors independently. Using this approach, scholars should strive to measure the everyday difficulties and challenges associated with everyday school life that may impact on students' educational outcomes.

Research within the stress exposure literature, which will be discussed in more detail in part three of this chapter, has suggested that everyday academic events (e.g. problems relating with teachers, being involved in too many extracurricular activities or being disrupted by peers) has an influence on the students wellbeing and academic performance (Escobar et al., 2013). As a result, Escobar and colleagues developed a measure of children's daily stressors (Torres, Mena, Fernandez-Baena, Espejo, & Montero, 2012), comprising three first-order factors related to family, health and school. School related items include, "I find schoolwork difficult", "the other children pick on me a lot at school". Thus, the academic buoyancy literature may benefit from the development of a scale depicting everyday academic events that students must be resilient against. Again, items should be identified through exploratory, qualitative methodologies, with transparent reporting of item development. Doing so would ensure content validity and that the items in the questionnaire truly represent the construct in the given population (Windle et al., 2011).

Assessing positive adaptation

Educational researchers should strive to measure positive adaptation, in conjunction with risk and protective factors, to gain a complete understanding of academic resilience. Positive adaptation refers to, success at meeting stage salient developmental tasks, or adaptation that is substantially better than that would be expected given the specific risk exposure. Luthar and Cushing (1999) state three approaches to measuring positive adaptation in psychological

resilience, one of which is the absence of serious psychopathology. This approach has been utilised in the academic resilience domain, with scholars using the 'absence of academic failure' as an indicator of positive adaptation. Most measured positive adaptation in terms of the single outcome of an academic test score or an average of test scores, most commonly in Mathematics and/ or Reading. In person-focussed approaches, scholars define resilient students as those who achieve academic scores within the top 25% of the national average and non-resilient as those who score in the bottom 25%. Assessing positive adaptation, and inferring resilient outcomes, in this way provides a limited view of what education is about. Focussing solely on test results overlooks students who may be naturally very intelligent however struggle when it comes to autonomous learning or problem solving (Pianta & Walsh, 1998). For example, a highly intelligent student may outperform all of his or her peers, yet disengage when they are eventually faced with difficulty. Likewise, a less intelligent student may perform poorly on academic test results, despite being very resilient in the face of such academic challenges. A more appropriate measure of positive adaptation may be students' level of academic engagement, motivation, or aspirations (Braddock et al., 1991).

Another broad approach to measuring positive adaptation in the psychological resilience literature is through the development of multi-item measures, scoring on a continuum between adjustment (i.e. competence) and maladjustment. Within the current review, no scholars took this approach to measuring positive adaptation. (Luthar & Cushing, 1999). Educational scholars may take this approach by utilising an existing measure of adjustment relevant to the academic context, for example a measure of academic engagement or motivation (e.g. Engagement and Disaffection Scale; Skinner & Wellborn, 1997). Academic engagement is distinguished from academic resilience in that engagement refers to students' enthusiastic and focussed participation in the classroom (i.e. pay attention, display interest and, work hard). If this approach were undertaken however, scholars should take some considerations into account. Firstly, that the indicator of positive adaptation is specific to the risk under scrutiny. This becomes relevant for school-based resilience interventions targeting students that are at-risk for psychological dysfunction, as opposed to academic risk. Such interventions should use psychological indicators of positive adaptation (not academic achievement), while interventions aimed at fostering academic resilience should use academic indicators of positive adaptation. Second, scholars should consider the seriousness of the risk under consideration. For example, if a student is exposed to a very serious academic risk (e.g. repeating a grade, learning difficulty) it would be sufficient to justify lower scores on a measurement of

competence (Luthar & Cushing, 1999). In contrast, if a student experiences less taxing academic risks, for example the daily hassles described in the buoyancy literature, a resilient student should demonstrate excellent scores on a measurement of competence.

Assessing protective factors

Protective factors refer to internal attributes or external resources that "modify, ameliorate, or alter a person's response to an environmental hazard" (Rutter, 1985, p.600). The results of the current review demonstrate the variability in the protective factors that have been investigated in academic resilience research. Factors protecting individuals from academic risk included demographic (e.g. SES), individual (e.g. emotional intelligence), family (e.g. parent involvement in education) and, other social factors (e.g. peer group / school supportiveness). With regards to academic buoyancy, the 5Cs (composure, control, commitment, confidence, and coordination) protected students from the everyday academic pressures they experienced at school. Within the buoyancy literature there is more consistency in the protective factors investigated, however within academic resilience, the heterogeneity of investigated factors makes the development of interventions very difficult.

A common concern in the traditional resilience research, also identified in the current review, is the blurred distinction between risk and protective factors. Here, authors should consider the psychometric issues relating to both variable-focused and person-focussed approaches to investigating resilience. In most cases, regression analyses or structural equation modelling were employed to test the mediating and/ or moderating role of protective factors. In some cases, however, linear regression was conducted to test the predictive value of each protective factor on a given academic outcome, with no mediation or moderation analyses. To illustrate, Li et al (2011) tested linkages between measures of risk (i.e. low school commitment) and protective factors (i.e. low truancy and antisocial behaviour), however did not test the mediating or moderating effect of such factors. This approach does not identify factors that "modify" or "ameliorate" the effect of the risk on positive adaptation. The choice of statistical analysis is important here, to ensure a protective factor is being tested within a model of academic resilience. That is, a protective factor is being tested for how it *impacts* the relationship between risk and positive outcomes, rather than its direct predictive utility on the outcome. If authors claim to be assessing academic resilience, the appropriate assessment of protective factors is recommended.

This concern was also present in some person-focussed investigations. Using this approach, researchers sought to identify groups of individuals, from the same high-risk sample, with good

versus poor academic outcomes, and test which factors accounted for the differences in outcomes. To illustrate, (Finn, 1997) identified academically resilient students from at-risk groups (i.e. low-SES and ethnic minority students) through the demonstration of grades and school completion. Differences between these resilient and non-resilient students were then identified by comparing groups using analysis of variance. Again, this approach does not identify specific protective factors that function to shield students from the negative effects of academic risk (Masten, 2001).

The majority of the variable-focussed studies in the current review were cross-sectional in design. A recommendation for future research is to examine how adversities and protective factors influence each other over time to predict academic outcomes. It may be that a risk factor, for example academic disengagement may predict the quality of teacher support over time, and also that teacher support predicts academic engagement over time, both contributing to increased academic success. To fully understand the transactional dynamics of individual students and their environment, and how this impacts on positive academic outcomes, scholars should attempt to employ longitudinal designs. Within the psychological resilience literature, Luthar et al (2000) proposes scholars should obtain measurements on three occasions, with an appropriate distance between time-points to enable the hypothesised protective factors to take effect. In the academic context, it may be appropriate to assess protective factors before, during and after a demanding period, for example an exam, to identify the changing relationship between academic risks and outcomes.

A final recommendation for research employing a person-focussed approach may be to consider the comparison of a third group: students with low risk, who have good academic outcomes. Doing so, researchers could better understand if high-risk, resilient students share any specific protective factors with their low-risk, academically competent peers (Masten, 2001). This method of comparing three groups has been used in the traditional resilience literature, which has found that maladaptive groups of children can be discriminated from the two adaptive groups (high and low-risk), however the two adaptive groups cannot not be discriminated from each other. Applying this method to academic resilience may uncover which factors define academic resilience in students.

Assessment using measurement scales

Over the past three decades, the approach of identifying protective factors has made a significant contribution to the development of a number of measures of psychological resilience (see for a review, Windle et al., 2011) The most conceptually sound measures are

those that comprise a number of items representing characteristics that enable individuals to positively adapt to the risks they face. Within the current review, ten measurement scales were used to measure academic resilience, however there were a number of psychometric issues relating to their use. The first problem relating to measurement scales is face validity. To illustrate, Phan et al. (2016) adapted a scale that was developed and validated to measure burnout in working adults and university students. Similarly, Esteban and Martí (2014) utilised a measure of resilience developed and validated in a non-academic sample of adults to assess academic resilience in students. When scholars make use of existing measures of resilience it is important they make a strong rationale for doing so, and provide details of the original measure development. Similarly, with regards to face validity, some scales may assess phenomenon that are related to resilience, however are conceptually distinct. For example, Phan (2016) measured 'vigour', defined as a combination of persistence and resilience, using the subscale of an engagement scale (Schaufeli et al., 2002) consisting of items such as, "as far as my studies in maths are concerned I always persevere, even when things are not going well". While resilience and persistence have some overlapping characteristics, and are often used interchangeably, they are in fact conceptually distinct. It is important that the development of a future academic resilience scale is distinguished from any related concepts to avoid confusion for practitioners incorporating resilience in an applied setting.

The second problem regarding measures used identified in the review relates to the limited evidence-base for item selection. For example, the ABS (Martin & Marsh, 2008b) was developed through the amendment of the ARS (Martin & Marsh, 2006), which involved the removal of two items. However little information is provided regarding the theoretical basis for the selection of the original six items, and the decision to remove two items to create the ABS. Moreover, the items that comprise resilience scales differ based on the authors' conceptualisation of the concept. This is illustrated by Martin and Marsh's (2006, 2008b) specific focus on 'bouncing back' from academic adversity (e.g. "I think I am good at dealing with schoolwork pressures").

Limitations

The current study undertook an extensive literature search to identify relevant articles; however, it only reports published studies in the English language. It is possible that there are relevant studies published in other languages which were not included in this review. In addition, there were some articles identified in the screening process that were unavailable to the authors. Although an attempt was made by the authors to gain a copy (through contacting

corresponding authors), some were not ascertained. Furthermore, the current review did not employ published quality assessment criteria to assess the psychometric rigour of each scale. This was due to the small number of scales identified that were developed and validated for the sole purpose of assessing academic resilience.

Summary and conclusions

Academic resilience is receiving more interest in terms of policy practice, however there is not yet a valid and reliable measure to assess the concept. The key recommendations that emerge from the discussion are fourfold. First, measures of academic resilience should incorporate three components: risk, positive adaptation, and protective factors separately. Second, when assessing risk, researchers should use academic indicators of risk, and consider the development of a scale of both everyday stressors relating to school. Third, researchers should consider alternative indicators of positive adaptation than academic achievement, for example emotional and behavioural engagement at school. Finally, when assessing protective factors, the appropriate statistical analysis should be used to examine how the factor moderates the effect of an academic risk on academic outcomes. Researchers should strive to utilise the lessons learned in psychological resilience literature to establish a reliable and valid measure, and gain a complete picture, of academic resilience.

In the third and final part of this literature review chapter, I introduce the concept of stress and stressors in more detail. The current review concludes that the most psychometrically rigorous method of assessing resilience is by independently measuring stressors, positive adaptation and protective. Therefore, before attempting to develop a measure of stressors in PE, I thought it essential to demonstrate a sound understanding of the stress literature and the types, frequency, and impact of stressors experienced by adolescents.

Part Three:

The reviews reported in the first two parts of the chapter highlight that the most psychometrically sound approach to measuring resilience is to measure stressors, positive adaptation, and protective factors independently. The literature I had studied up to this point (i.e. academic resilience) did not provide a comprehensive understadning of stressors as an idependent construct. Furthermore, as I began to research field of stress and stressors I realised that the concept is complex, with a wealth of conceptual and psychometric issues of its own. Given the time and scope of the PhD process, I realised that the development of a complete measure of resilience (i.e. a checklist of stressors, protective factors and postive adaptation) in PE was not feasibile. Therefore, following the completion of the qualitative studies, reported in the next chapter, I made the decision to focus on the development of the first part of the resilience measure, that is, a checklist of stressors in PE. As the decision was made to focus primarily on stressors, I wanted to gain a further understanding of the role of everyday stressors in secondary school-aged students, and the psychometric issues related to the development of checklists of inventories of stressors. Thus the following section reflects the review of the literature I undertook to facilitate my understanding of stress and stressors.

A Narrative Review of Everyday Stressors in Adolescence

For the following section of my thesis, I undertook a narrative review of everyday stressors in adolescence. The purpose is to synthesise what is known about: (a) the types of everyday stressors secondary school aged children experience, (b) the impact of these everyday stressors on a range of outcomes, and (c) the approaches to measuring everyday stressors in adolescence.

This decision to undertake a narrative review was made to allow for the extensive coverage of daily stressors adolescents' experience. A systematic review was not deemed appropriate due to the broad nature of the topic. A narrative approach is reflective of the current daily stress literature, and indeed the resilience literature, which has a number of published narrative reviews however no systematic reviews (Khanlou, Mustafa, Vazquez, Haque, & Yoshida, 2015; Windle et al., 2011). This is due to the wide range of potential daily stressors that can be investigated. Furthermore, the heterogeneity of measurement approaches

makes it difficult for systematic reviews to be undertaken. The strengths of systematic and narrative reviews were discussed in an editorial, whereby Collins & Fauser (2005) proposed that the prescribed methods of systematic reviews do not allow for the comprehensive range of particular topics, thus the wider scope of narrative reviews (with less explicit methodology) is a "trade-off for broader coverage" (Collins & Fauser, 2005, p. 104).

The current review focuses specifically on adolescents. Age is not a convenient way to define adolescence, however for clarity, the current review focuses on individuals transitioning to, or attending secondary school (i.e. ten to 18 years). There is existing literature on daily stressors experienced by children of primary school age (Byrne, Thomas, Burchell, Olive, & Mirabito, 2011; Fernandez-Baena, Trianes, Escobar, Blanca, & Munoz, 2014), which will not be addressed in the current review due to the far reaching developmental differences between these age groups (World Health Organisation, 2017).

Introduction

The term stress has been in use at least as early as the 14th century, and was utilised first in the physical sciences, by the influential physicist-biologist, Robert Hooke (Hinkle, 1973). Hooke examined how man-made structures could be designed to carry heavy loads and withstand the impact of natural forces. Here, stress was defined as the area over which the load (i.e. weight) impinged, and strain was defined as the deformation of the structure resulting from the load and stress. Models of stress have since been used in a number of disciplines, to describe the effects of stress (i.e. as an external load or demand on systems), in physiology, psychology and sociology.

Early research into psychological stress began following the discovery that stressful conditions did not produce dependable effects (Lazarus & Eriksen, 1952). For some individuals, the stress aroused by a particular environmental condition was great, while for others it was small. Until this point, stress was defined in one of two ways: as a stimulus (focussing on events within the environment), or a response (focussing on the state of stress; Lazarus & Launier, 1978; Lazarus & Folkman, 1984). Lazarus and colleagues however, recognised the individual differences in motivational and cognitive variables, which mediated the relationship between a stressor and the reaction (Lazarus & Eriksen, 1952). Initially, Lazarus and colleagues conceptualised stress as an interaction between an individual and their environment, such that, one's cognitive appraisal mediated the relationship that occurs between the environment (i.e. stressor) and stress response (Lazarus & Launier, 1978). Later,

the transactional model of stress (Lazarus & Folkman, 1984) was introduced which proposes that a transaction occurs between a person and their environment, and a stress response occurs when demands exceed and individual's perceived resources. The transactional model of stress differs from the earlier interaction model, whereby stress was seen as the interaction between the environment and an individual's perception of it. Moreover, interactional models of stress focus on the structural characteristics of the process (for example, which stressors result in specific outcomes in specific populations). In contrast, the transactional model focusses on the relationship that occurs between individuals and their environment, placing emphasis on the role of subjective perceptions of the environment and the influence of individual differences (Cox et al., 2000; Lazarus & Folkman, 1984). Based on the transactional model of stress (Lazarus & Folkman, 1984), psychological stress is defined as the relationship between the person and the environment that is appraised by the individual as taxing, or exceeding resources and endangering wellbeing (Cohen, Kessler, & Gordon, 1995; Lazarus & Folkman, 1984).

Psychological stress is viewed as a transactional phenomenon which involves an individual ascribing meaning to his or her interactions with the environment (Lazarus & Launier, 1978), neither residing in the environment or the person, but in the relationship between the two. Moreover, it is not viewed as one variable, but a "rubric consisting of many variables and processes" (Lazarus & Folkman, 1984, p.84)

In line with this conceptualisation, the stressors that arise within the environment are mediated by one's perception and appraisal, resulting in individual differences in responses to the same stimulus (Lazarus & Folkman, 1984). Lazarus and colleagues draw a distinction between three kinds of stress: harm (psychological damage that has already been done), threat (anticipation of imminent harm), and challenge (difficult demands one feels confident about overcoming). Primary appraisal refers to the evaluation of stress as either a harm, threat, or challenge, while secondary appraisal refers to an individuals' evaluation of his or her coping resources to effectively deal with the stressor (Lazarus, 1993; Lazarus & DeLongis, 1983; Lazarus & Folkman, 1984).

What are psychological stressors?

Despite the well documented acceptance that psychological stress encompasses both the environment and the individual's perception and appraisal, scholars have examined the two separately. Specifically, examining the sources in the environment (also known as 'stressors';

Seyle, 1956) and individual responses on the one hand, and the stress response on the other (Lazarus & Cohen, 1977). Stressors are most commonly thought of as events that impinge upon a person (Lazarus & Folkman, 1984), or as the experiential circumstances that result in a stress response (Pearlin, 1989). Lazarus and Cohen (1977) refer to three types of stressors that individuals experience, including: cataclysmic changes (affecting a large number of people), major changes (affecting one or a small number of people), and daily hassles. Cataclysmic changes affecting large numbers of people may include natural disasters, or man-made catastrophes such as war. Major changes affecting an individual (or small number of people) may include the death of a loved one, divorce, or illness. Later, an additional type of stressor of 'chronic strains' was identified and refers to the harsh and ongoing physical or social conditions associated with disadvantage, for example, poverty or disability (Evans, 2006).

Major changes or events occupied the most research attention in the early study of psychological stressors (Pearlin, 1989) due to their exceptional and traumatic nature, resulting in significant maladjustment. The life events approach proposed that the readjustment required by major life changes substantially increased the risk of physical illness and psychological maladjustment (Holmes & Rahe, 1967). However, Lazarus viewed this approach as limited and highlighted the low explanatory power of life events with regards to health outcomes (Lazarus, 1984). Subsequent findings suggested that the life events approach overemphasised the impact of change, demonstrated limited explanatory power on health outcomes (Rabkin & Struening, 1976), and failed to consider the individual and subjective significance of events (Lazarus, 1984). As a result of the conceptual, methodological, and empirical limitations of the life-events approach to stress, an increased interest in the impact of less exceptional stressful experiences (i.e. 'daily hassles') arose. This increased focus was also a result of from the recognition of the importance of one's 'psychological situation', that is, the environment which is appraised and reacted to, rather than the objective environment.

Daily hassles have been defined as the "irritating, frustrating, distressing demands that to some degree characterise everyday transactions with the environment" (Kanner, Coyne, Schaefer, & Lazarus, 1981) or "experiences and conditions of daily living that have been appraised as salient and harmful or threatening to the endorser's wellbeing (Lazarus, 1984). The latter definition is favoured in the current programme of research, given that it recognises the fact that not all individuals will perceive a specific event as "irritating", "frustrating", or

"distressing". Rather, some individuals appraise a condition of daily living as irritating, or harmful to wellbeing, whereas others will not. Lazarus' (1984) definition highlights the individual, psychological, and subjectively experienced situation, and views stressors as proximal rather than distal phenomena (Jessor, 1981). To illustrate, to one individual an occurrence of everyday life, for example, losing something, experiencing an interpersonal disagreement, or running late, are conditions that are managed with little stress or distress. To others, these occurrences are perceived as personal affronts that are held onto and recalled more readily. For a student in school, a performance situation, such as public speaking might be appraised by one individual as harmful or threatening, while another individual may appraise such an opportunity as exhilarating and exciting. Thus, the same environmental situation is subjectively appraised and responded to accordingly. The term daily hassles has been used interchangeably within the stress literature with "micro-stressors" (McLean, 1976), everyday hassles (Suarez-Morales & Lopez, 2009), and daily stressors (Escobar et al., 2013). The term 'hassle' holds negative connotations, and suggests that all individuals would appraise a given environmental stimulus as negative. Utilising the more neutral term of stressors acknowledges the individual and subjective experience of a specific environmental stimulus.

An individual's daily life is filled with these seemingly undramatic and mundane experiences that can be appraised as irritating and frustrating. For adults this may include practical things, for example getting stuck in traffic, arguments with one's spouse, financial concerns or the daily stress of caring for children or elderly parents (Kanner et al., 1981). For adolescents, daily hassles might include disagreements with friends or teachers, experiencing peer pressure, academic pressures or navigating romantic relationships (Kanner, Feldmen, Weinberger, & Ford, 1987). Daily stressors may symbolise greater ongoing issues, for example, they may be the daily manifestations of the stable features of an individual's life (e.g. social roles or personality traits). Moreover stressors may function as the mechanism by which major life events have manifested themselves within day-to-day life (Kanner, Feldmen, Weinberger, & Ford, 1987; Kanner et al., 1981; Lazarus, 1984).

Kanner and colleagues proposed the idea that the experience of these cumulative, minor, daily stressors could have a greater impact in health and wellbeing than the experience of major life events. During the early stages of the daily stressor research, Kanner et al. (1981 p.5) cited a poem by Charle's Bukowski (1980) that I believe demonstrates the impact of cumulative, minor demands quite aptly:

It is not the large things that

send a man to the madhouse….

No, it's the continuing series

of small tragedies that send

a man to the madhouse

Not the death of his love

but a shoelace that

snaps with no time left.

Charles Bukowski (1980)

Thus, Kanner proposes that individuals often demonstrate maladaptive psychological symptoms in response to the seemingly most trivial of events. In the late 1970s, researchers began to scientifically test this 'shoelace hypothesis' (Coyne, Kanner, & Hulley, 1979). In a series of studies that followed, Lazarus and colleagues gathered evidence for the immense adaptational significance of these relatively minor, yet cumulative daily hassles (DeLongis, Coyne, Dakof, Folkman, & Lazarus, 1982; Kanner, Feldmen, Weinberger, & Ford, 1987; Kanner et al., 1981). This work suggested that it was the day-to- day events, rather than the infrequent major life events, that have proximal significance for morale, psychological symptoms and somatic health outcomes. Specifically, Lazarus and colleagues found that the frequency and intensity of hassles, averaged over nine months, explained psychological and somatic health better than life events could. Moreover, hassles and life events were only modestly correlated, with hassles adding unique variance to the relationship where life events did not (Lazarus, 1984; Lazarus & Folkman, 1984).

The individual and subjective experience of daily stressors can be explained in part by primary and secondary cognitive appraisal processes. Primary appraisal is the discrimination between transactions in which there is some personal investment for an individual's wellbeing, versus those that are irrelevant (Lazarus, 1984; Lazarus & Folkman, 1984). An individuals' primary appraisal is dependent on whether something is at stake. For example,

public speaking will be more distressing when the audience, or potential outcome, is perceived as important. Similarly, a student finding a piece of academic work difficult is more distressing when getting the right answer is important or the student has a limited time to complete it, for example, in a test or examination situation.

Secondary appraisal refers to resources for coping with stressful demands. Lazarus and colleagues suggest that when facing an environmental demand, negative appraisals about resources for coping will enhance threat appraisals, whereas positive appraisals will inhibit them. Using the exam situation as an example, for some students, the difficult question will prompt efforts to recall any related information that might facilitate answering the question. This approach is known as problem-focussed coping and is an attempt to eliminate the 'threat' (Folkman & Lazarus, 1980; Lazarus & Folkman, 1984). If problem-focussed coping is unsuccessful, emotion-focussed coping can also inhibit the effects of the threat. For example, the student may reassure themselves that they will be able to answer the next question more successfully, or alternatively, depreciate the significance of the exam. The concept of primary and secondary appraisal suggests that daily stressors can be both antecedents of appraisal and consequences of appraisal; they are dependent on what is perceived as important and therefore threatening to an individual (Lazarus & Folkman, 1984).

The aim of the current review is to identify the type of daily stressors that are experienced by adolescent populations, the impact the experience has, and the approaches that have been taken by scholars to measures these stressors. In order to do this, a database search was undertaken, and all studies that examined "daily hassles", "everyday hassles, "daily stressors", or "everyday stressors" in adolescent populations were examined. The study titles and abstracts were screened to identify papers that were relevant to the research question. Subsequently, the full texts were read to identify what daily stressors, as defined by Lazarus (1984), adolescents report experiencing. In contrast to the systematic review undertaken in Part Two of this chapter, a systematic data extraction process was not undertaken, however detailed notes, relevant to the research question, were taken.

Daily stressors in adolescence

Investigating daily stressors in adolescence has become an important field of study due to their cumulative occurrence and the repercussions they have on social and emotional development (Escobar et al., 2013). Consistent with research of daily stressors in adults, correlations between major life events and psychological symptoms in adolescents are

significant, however very low in magnitude (Barrett & Heubeck, 2000; Kanner et al., 1987). Thus, researchers began to recognise that adolescents' main sources of stress were the more enduring, everyday problems that require continued adaptation. Furthermore, researchers demonstrated that the cumulative effect of these stressors are more taxing for adolescents than the effects of major life events (Byrne, Davenport, & Mazanov, 2007; Carter, Garber, Ciesla, & Cole, 2006; Lewis, Siegel, & Lewis, 1984; Pettit, Lewinsohn, Seeley, Roberts, & Yaroslavsky, 2010). Given these findings of the impact of daily stressors, it is important to explore the types of stressors that adolescents experience in their everyday lives.

What kind of daily stressors do adolescents experience?

I will begin by reviewing the literature that has used qualitative methods to explore the types of daily stressors students' experience. Most qualitative explorations of daily stressors precede the development of a measurement scale; thus, I will review the literature that has used quantitative methodologies to assess adolescent daily stressors experience. Following this I will review some of the individual differences in the frequency of daily stressor experience (referring to quantitative literature). Lewis et al. (1984) were the first to identify that the main sources of stress adolescents' experienced were the more enduring daily events, rather than major life events. In qualitative interviews (conducted to facilitate the development of 'The Feel Bad Scale'), Lewis and colleagues asked early adolescents (aged 10-11), "What happens that make you feel bad, nervous, or worry?" to identify sources of distress. Interviewers intentionally did not specify whether they wanted participants to recall life events or daily stressors, but simply what made them experience negative affect. Students recalled 22 events, with the majority of these constituting daily stressors. Daily stressors related to; family (e.g. 'fighting with your parents about house rules'), the 'self' (e.g. 'being smaller than others your age', 'being overweight or bigger than others your age'), health (e.g. 'feeling sick'), peers (e.g. being left out of group), and school (e.g. 'not getting along with teachers'). Similar qualitative methodologies were recruited by Compas and colleagues, who asked adolescents to list ten daily hassles that they had experienced in the last six months, which resulting in hundreds of examples, categorised into similar life domains (Compas et al., 1987).

In another qualitative study, early adolescents completed open ended questions regarding the types of daily events they experienced as stressful (Greene, 1988). Content analysis resulted in seven dimensions of daily stressors relating to: personal loss, school events, peers, the self, family, extra-curricular activities, and 'miscellaneous' (i.e. stressors

that were not easily captured in the other themes, for example attending church). Six of the most frequently cited stressors occurred within the school context (e.g. grades, exams), or a related context (e.g. completing homework). Moreover, students described some seemingly trivial stressors relating to school, for example, 'sitting still in class' and 'paying attention'.

A decade later, Heubeck and O'Sullivan, (1998) conducted qualitative brainstorming sessions with adolescent students, who were asked to answer what the word "hassle" meant to them, and to nominate all the hassles they had experienced in the last six months. The majority of students reported synonyms for the first question, describing hassles as, 'problems', 'things that bother you', and 'annoying things'. Findings for the second part of the brainstorming session revealed that interpersonal events in school were the most frequently endorsed hassles by adolescents, for example, 'teasing' (e.g. regarding size, haircut, race), 'being stopped from doing your work', 'being pushed around'). Stressors relating to school work were less often recalled, however some included, 'an overdose of work', 'home work' and 'being hassled by teachers' (Heubeck & O'Sullivan, 1998). More recently, Byrne and Mazanov (2002) and Byrne et al. (2007) conducted qualitative focus groups asking participants about the sorts of difficulties and challenges associated with the experience of adolescence. Again, the school domain dominated adolescent's responses, which ranged from performance stressors (e.g. 'having to study things you don't understand'), attendance (e.g. 'getting up early to go to school'), teacher interaction (e.g. 'abiding by petty rules') and, school/ leisure time conflicts (e.g. 'not enough time for fun').

The existing qualitative literature offers useful insight into the nature of adolescents' stressor experience. However, these qualitative explorations tend to be part of a larger measure development study, and thus the discussion of findings is often quite brief. Moreover, to my knowledge, there is limited qualitative exploration of adolescent stressors that has been published in the last ten years. This is perhaps due to the development of measurement scales, which is a more time and labour efficient approach to assessment of daily stressors. Given the changing environment in which adolescents are growing up in, it may be beneficial to update the qualitative literature in this field. This will be discussed in more detail later in this chapter.

Quantitative research has also provided valuable information regarding the types of daily stressors adolescents' experience, in addition to how frequently they occur and how 'intensely' they are perceived. Measurement scales of daily hassles, stressors, or events have

tended to require respondents to report the incidence, frequency, and intensity of a checklist of items. More detail regarding measurement approaches will be discussed below, however, each item (reflecting a daily stressor) is generally categorised into the following subscales: school, peers, family, and health. In the health domain, researchers have focussed on events such as occurrences of physical illness, medical procedures, and preoccupation with body-image. The family domain involves predominantly interpersonal stressors, including disagreements with parents or siblings, disagreements between parents, abiding by house rules, and parents not demonstrating trust in adolescents. Furthermore, the family domain involves stressors that do not involve interpersonal transactions, such as, a lack of parental supervision, or parents not doing things that they said they would do. Stressors relating to peer relationships include, being teased, a lack of acceptance, fighting, and peer pressure to do particular things (e.g. smoke). Relatedly, adolescents report everyday stressors involving romantic relations, including, being rejected by someone, not getting on with a boy/girlfriend, and breaking up with a boy/girlfriend.

In terms of frequency of stressors, consistent with the qualitative literature, the school domain composes a large portion of adolescents total stressor experience (Copeland & Gunning, 1997; Kohn & Milrose, 1993; Murberg & Bru, 2007). This is most likely due to the fact that adolescents spend the majority of their waking hours in school, and this arena can pose both social and academic challenges. With regards to the school domain, interaction with teachers, difficulties in terms of academic performance, exam performance, making mistakes in front of classmates, noise annoyances, poor school grades, and the pressure related to participating in extra-curricular activities, have all featured as potential school-related stressors in previous research. School-related daily stressors may also include interpersonal problems, including conflicts with friends, other classmates, or teachers. Spirito, Stark, Grace, and Stamoulis (1991) found that when asked to name the most upsetting incidents, young adolescents reported school events as the three most frequent problems. Moreover, findings specifically relating to the transition into secondary/ high school showed that daily school stressors included: complex time-tables, long hours, homework quantity and grading systems (Boekaerts, Seegers, & Van den Goor, 1993). Finally, in a longitudinal assessment of daily stressors in adolescents, Verma, Allen, Trinder, and Bei, (2017) suggested that students' reported more stressors during term time than vacation periods. This again supports the role of school as a prominent source of everyday stressors in adolescents.

Individual difference in adolescents' experience of stressors

Using quantitative methodologies (i.e. measurement scales) allows further understanding of the individual differences that influence adolescents' experience of everyday stressors. Evidence suggests a significant age difference with regards to the frequency and type of daily stressors that children and adolescents experience. To illustrate, older adolescents report increases in daily stressors from the age of 13 to 14, with stressor frequency plateauing at age 15 (Seiffge-Krenke, 2000). This is consistent with results from various studies demonstrating an increase of stress in early adolescence compared to younger ages and continuous high levels of daily stressors during adolescence (Compas, 1987; Escobar et al., 2013). Furthermore, research highlights that the types of stressors adolescents' experience changes with age. Early adolescents report higher levels of stressors related to health, school, and family. However, as children approach puberty, stressors related to physical changes, romantic attachments, academic demands, and the conflict between leisure and school time, take on greater relevance (Trianes et al., 2012).

There is also evidence supporting gender differences with regard to the type and frequency of daily stressors adolescents experience. Multiple research studies demonstrate the tendency for adolescent females to report a greater frequency of daily stressors in comparison to males (Greene, 1988; Verma, Allen, Trinder, & Bei, 2017). Furthermore, Kohn and Milrose's (1993) investigation of 'middle' adolescents (i.e. 14-16 years) indicated that girls outscored boys in areas of social alienation, excessive demands, romantic concerns, and loneliness. However, no gender differences were observed in relation to decisions about academic challenge or their future careers. Kohn speculatively concluded that, while girls were as concerned as boys regarding their achievement and future career, they remained more preoccupied with traditionally feminine stressors, such as romance and popularity (Kohn & Milrose, 1993). In contrast, some findings suggest that while there are no gender differences in the frequency of daily stressors experienced, females tend to report rate stressors as more impactful, and report being more affected by these occurrences (Heubeck & O'Sullivan, 1998; Kanner et al., 1987).

More recently, Escobar et al. (2013) investigated the individual differences that influenced the experience of school-based daily stressors in a sample of adolescents from across multiple regions of Spain. Four variables were examined for their contributing effect, including: 'student', (i.e. age, gender, and level of social adaptation'), 'class', 'type of school' (rural, urban, private school) and 'province'. Each variable was entered into a hierarchical

structural equation model to account for the similarities between individuals within the same context, whilst enabling unbiased estimates regarding the variation between different levels of the hierarchy. Results demonstrated that the type of school was associated with the experience of daily stressors. Specifically, students from rural schools experienced fewer daily stressors than those from urban and private schools. This again supports the important contribution school plays in the experience of stressor in adolescents.

Impact of daily stressors in adolescence

Over the last three decades, diverse studies have sought to advance knowledge regarding the experience of daily stressors and their relation to psychological, behavioural, cognitive, and physiological variables. As noted, early studies conducted on adult populations by Lazarus and colleagues demonstrated that daily stressors had a greater impact on psychological and physiological wellbeing than major life events (Coyne et al.,1979; Kanner et al, 1981; Lazarus & Folkman, 1984). Since this discovery, research has been conducted to assess whether the cumulative experience of daily stressors demonstrated the same results in adolescent populations. The following sections will overview the evidence pertaining to the psychological, psychosomatic, and educational effects of daily stressors in adolescents.

Psychological

The majority of research investigating the impact of daily stressors in adolescents has focussed on psychological outcomes, with results consistently demonstrating a positive association between stressor frequency and psychological maladjustment. Studies of this kind have repeatedly identified two major groups of consequences: internalising symptoms (e.g. anxiety, low self-esteem, depression) and externalising symptoms (e.g. aggression; conduct problems). Over the last three decades, a wealth of evidence has grown to support the effects of the experience of daily stressors on both internalising and externalising symptoms (Baucom et al., 2015; Byrne et al., 2007; Carter et al., 2006; Cole & Turner, 1993; DuBois, Felner, Meares, & Krier, 1994; Escobar et al., 2013; Greene, 1988; Kanner et al., 1987; Murberg & Bru, 2007; Santiago et al., 2017; Suarez-Morales & Lopez, 2009; Trianes et al., 2012; Zeiders, 2017). The following section provides an overview of the effects of daily stressors on adolescents' health and wellbeing.

To begin, in a recent longitudinal investigation of adolescents aged 15 to 18, Vaessen et al. (2017) found that stressful daily events predicted negative affect at a one year follow up from baseline measures. Specifically, findings suggested that adolescents' emotional

reactivity to the smallest stressors were related to follow up psychological symptoms. Similarly, Verma et al. (2017) examined longitudinal changes in negative mood (i.e. symptoms of depression and anxiety) and every day hassles over four time points during vacation and school term periods. Adolescents' experience of daily stressors predicted anxiety and depression symptoms at all of the time points, and less stressors (i.e. during vacation times) were related to fewer symptoms (Verma et al., 2017). Furthermore, studies investigating specifically school-based stressors have found a positive association with psychological symptoms. Barrett and Heubeck (2000) demonstrated that students' experience of minor stressors relating to school predicted anxiety and conduct problems (e.g. aggressive / delinquent behaviour). Moreover, interpersonal stressors with teachers and peers made a unique contribution to these psychological outcomes. Experience of school stressors have been shown to have a lasting impact, with evidence showing stressors to predict immediate negative affect, as well as negative affect on the same evening (Bai & Repetti, 2017).

In line with Lazarus' (1984) conceptualisation of the experience of daily stressors, illustrated above, researchers have attempted to further understand stressors as part of a complex process, rather than a linear predictor of psychological outcomes. For example, Carter et al. (2006) examined the relations between daily stressors across four years in adolescents who varied with regard to risk for psychopathology (i.e. adolescents with psychological symptoms as well as healthy adolescents). Carter aimed to test three models of the relation between stressors and emotional and behavioural symptoms: the stress exposure model (i.e. high levels of stressors will predict high levels of psychopathology), the stress generation model (i.e. individuals with existing psychopathology generate negative life events, that is, stress occurs due to their own behaviour), and the reciprocal effects model (i.e. daily stressors and symptoms mutually influence each other). Structural equation modelling found that the reciprocal model indicated the best fit to the data, which is supported by subsequent findings (Pettit et al., 2010). That is, adolescents' experience of daily stressors at one time-point predicted psychological outcomes at a later time point, and psychological symptoms also predicted the experience of later stressors. However, for internalising behaviours specifically, the stress exposure model provided the best fit to the data; that is higher levels of stress at one time-point significantly predicted internalising problems one year later. These findings highlight the complex experience of stressors experience and subsequent outcomes.

Psychosomatic

Adolescents' experience of daily stressors has also been associated with the manifestation of physiological symptoms, including: cortisol levels, sickness, headaches, and sleep efficiency. It has been proposed that adolescents' experience of daily stressors is associated with decreased cortisol levels, which mediates the effect of stressors on subsequent psychological and academic outcomes (Fernandez-Baena et al., 2007). In contrast to this proposition, a laboratory based study demonstrated that daily stressors only predicted negative psychological outcomes when cortisol levels were high, suggesting that physiological factors may influence the appraisal of environmental events in adolescents (Schechter, Brennan, Cunningham, Foster, & Whitmore, 2012). Further evidence in support of the psychosomatic effects of experiencing daily stressors has come from Hjern et al. (2007). Hjern asked Scandinavian students (aged 10 to 18 years) to answer questions related to eight indicators of school stress, two indicators of psychosomatic pain (headache, stomach ache), and four indicators of psychological complaints. Outcomes of a logistic regression analysis suggested that adolescents' experience of all school-based stressors were associated with headaches or stomach aches, and three of these stressors predicted psychosomatic complaints. Moreover, Vermeersch, T'Sjoen, Kaufman, Vincke, and Bracke (2010) investigated the interaction between the experience of daily hassles and reactivity to stress (via. cardiovascular reactivity) in explaining risk behaviour in a sample of Belgium adolescents. The study identified daily stressors as a predictor of risk taking behaviour when physiological reactivity to stress was high. This further supports the concept that physiological factors are part of the appraisal process in daily stress experience.

Additionally, studies of the effects of daily stressors on sleep behaviour in adolescence have demonstrated that high levels of stressors were associated with shorter sleep duration (Doane & Thurston, 2014). Sleep duration and sleep efficiency, however, also predicted experience of daily stressors the following day, suggesting that these two variables may interact with each other with detrimental effects. Finally, the impact of the frequency of daily stressors on cholesterol levels has also been investigated in adolescent populations (Coleman, Friedman, & Burright, 1998). Coleman et al. (1998) also measured the incidence of health behaviours (e.g. diet, physical activity and television viewing) and found that these factors mediated the relationship between the occurrence of daily hassles and cholesterol levels in secondary school students.

Educational

Research has also investigated the impact of daily stressors on performance at school. The impact of cumulative minor stressors on educational outcomes has received far less research attention in comparison to the effects of major life events or distal risks (e.g. SES, ethnicity) that were reported in parts one and two of this chapter, and their effects may be underestimated. For example, results from one research group in Spain has demonstrated that children with high daily stress levels (assessed using the IECI; Trianes et al., 2012) present lower scores on various cognitive performance battery tests. Specifically, adolescents show less capacity to sustain attention, and require more time to retrieve information from episodic and working memory in comparison to students with a lower frequency of daily stressors (Torres et al., 2012). These results corroborate separate findings that levels of daily stressors are negatively related with academic performance in early adolescence (Fernandez-Baena, 2007; Trianes et al., 2009). Suarez-Morales and Lopez (2009) also identified a positive relationship between the frequency of daily hassles and levels of concentration in Hispanic-American adolescents.

One specific daily stressors for school students that has received research attention is 'noise annoyance' and its effect on educational outcomes. In two studies, Boman and Enmarker (2004) investigated factors that mediated and moderated the effects of noise annoyance in Swedish secondary school students. Participants completed questionnaires measuring noise sensitivity, hearing status, disturbance, distraction due to noise, stress symptoms (i.e. irritation, headache, tension, tiredness, concentration problems), noise predictability, and sources of noise (i.e. ventilation, traffic noise, chatter, scraping of chairs, apparatus). Results of structural equation modelling demonstrated that self-reported noise annoyance predicted higher levels of stress symptoms, which was mediated by students' sensitivity and adaptation to noise. The most disturbing sounds, and most detrimental to stress symptoms, were those made from class mates (i.e. chatter in the classroom) and from nearby corridors. The noise annoyance was most detrimental to symptoms in maths lessons, perhaps due to the increased cognitive capabilities necessary in this subject. Similarly, Lundquist, Holmberg, and Landstrom (2000) identified chatter as the most disturbing noise in school, for students aged 13 to 15 years, and showed a negative relationship between perceived annoyance and the negative effects on schoolwork. Although one would not automatically associate noise as a daily stressor, students' perception of this environmental stimulus is consistent with the definition of daily stressors as "irritating, frustrating demands

that to some degree characterise everyday transactions within the environment" (Kanner et al., 1987, p. 3).

To summarise, evidence cultivated over the past thirty years supports the influential role that everyday stressor experience has on psychological, psychosomatic and educational outcomes in adolescents. It is important to note that the majority of studies assessing the effects of daily stressors on these outcomes are conducted on 'healthy' adolescent students, often within a school setting. Thus, the impact of daily stressors is not just relevant for adolescents who are clinically diagnosed with psychological maladjustment. Rather, daily stressors are relevant for all adolescents that experience the everyday transactions within the environment that pose a potential threat to wellbeing.

Approaches to measuring daily stressors in adolescence

As noted above, the most utilised method of assessing daily stressor experience in adolescents is with questionnaires or inventories. The selection of self-report format for the assessment of daily stress in school-age populations, as opposed to qualitative methods of assessment such as interviews, has the advantage of being easy to administer, and the ability of being complemented by other assessment instruments. Although these sorts of inventories lack the experiential and contextual detail of interviews, collecting data through the use of questionnaires has an advantage in that they can be administered collectively, allowing for assessment and intervention in large samples (Trianes et al., 2011).

Initial attempts by Lazarus and colleagues to measure daily stressors in adults were recognised as extremely challenging, given the transactional and subjective nature of individual experiences (Lazarus, 1984). Initial approaches utilised in-depth interviews reconstructing some of the most frequent, important and intense daily stressors, focussing on the phases of each experience, including: anticipation, confrontation, and outcomes, and the emotions experienced at each stage. The themes emerging from qualitative investigations were used to develop an inventory of daily events or experiences that have the potential to be appraised as salient and harmful or threatening to the endorser's wellbeing (Lazarus, 1984). Specifically, each item represents a potential stressor. Questionnaires that measure daily stressors have a marked distinction from the 'life events' questionnaires that previously dominated stress research, in that they measure both the objective experience (i.e. the frequency of occurrence) and the subjective experience (i.e. the perceived intensity).

Table 2.5 provides a description of existing measures of daily stressors that have been developed and validated for use in adolescent samples. While, Lewis et al's (1984) Feel Bad Measure incorporated both major life events and daily stressors, Bobo's Adolescent Hassles Inventory (Bobo, Gilchrist, Elmer, Snow, & Schinke, 1986b) was the first systematic attempt to develop a scale assessing solely daily stressors in early adolescents. The subsequent 30 years has seen a number of similar measures developed. Given the complex nature of the conceptualisation of stressors and stress responses, it is not surprising that scholars have debated the psychometric rigour of the existing measures presented in Table 2.5. Such psychometric issues pertaining to the measurement of stressors in adolescents include: content validity and temporal changes, confounding and contamination, and contextual issues.

Content validity

The first psychometric issue pertaining to the development of inventories for daily stress is content validity. While some of the scales reported in Table 2.5 come from findings from in depth qualitative studies (Barrett & Heubeck, 2000; Byrne et al., 2007), some adapt existing measures of daily stressors in adults by removing items deemed to be irrelevant for adolescent samples (Bobo et al 1986; Seidman et al., 1995). The approach of adapting existing scales developed for adults is flawed as it assumes that the stressors experienced in adult life are relevant for adolescents. Moreover, it omits potentially crucial areas of stressor exposure that adults do not experience (for example scholastic stressors and emerging adult responsibilities). Furthermore, in some research studies of daily stressors in adolescence, some authors have not used validated measurement scales. Alternatively, items are developed that are of particular interest to authors, without seeking methods to ensure content validity. For example, Hjern et al. (2008) were interested in the effects of school-based stressors on adolescents' psychosomatic symptoms (i.e. headache and stomach ache) and developed eight indicators to reflect these stressors. The items created (e.g. 'there are too many assessment, tests and presentations), may have reflected stressors that the authors believed may contribute to psychosomatic and disregarded those that have less effect (e.g. 'abiding by petty rules'). When using measurement scales, it is essential that its content reflects the true experiences of the population it aims to assess.

Another issue pertaining to content validity is temporal changes. Many of the measures of daily stressors were developed over a decade ago, therefore the content of each item, or stressor may not be relevant for adolescents today. Byrne et al. (2007) recognised

this issue when revising their original version of the Adolescent Stressor Questionnaire (Byrne & Mazanov, 2002). During focus groups, adolescents reported that some items of the original questionnaire did not have continued salience, or were not worded in ways which were appropriate for current adolescent language. The fact that questionnaires that were validated on adolescents in the 1980s have been used in recent years may lead to potential bias or misunderstanding by adolescent respondents.

Confounding and contamination

A long-debated issue concerning the measurement of stressors is the potential confounding nature of measurement items. Specifically, items are often confounded with indices of negative affect or psychopathology, that is, items reflect the cognitive appraisal of stressors rather than the stressors themselves. Such contamination leads to a bias in the relationships between what the scale intended to measure (i.e. stressor experience) and what they are used to predict (i.e. psychological, educational, or physiological outcomes). Kasl (1978) proposed that, "the measurement of the independent variable and the measurement of the dependent variable are sometimes so close operationally that they appear to be simply two similar measures of a single concept" (p.13). It is this issue of circularity that leads some to conclude such confounding items to be redundant when used to predict psychological, psychosomatic, or educational outcomes (Dohrenwend, Dohrenwend, Dodson, & Shrout, 1984; Dohrenwend & Shrout, 1985).

To illustrate, Bobo et al's (1986) Adolescent Hassles Inventory (AHI) includes items, such as, "feeling lonely" and "feeling embarrassed about the way I look". Using these items to predict psychological outcomes is flawed given the presence of subjectivity and cognitive appraisal within them. Sometimes item confounding is not as transparent, for example, 'being pressured to skip class or cheat', again taken from the AHI. However, it is argued that the feeling of 'being pressured' is one's appraisal of an event, rather than the event itself. Thus, a more appropriate, and less contaminated, way of wording this item would be, 'my classmates told me to skip class or cheat'. Here, the item does not imply cognitive appraisal and therefore can account for those respondents who were told to skip class, however did not feel pressured to do so. Since the ADI was published - and critiqued for item contamination - scholars have attempted to minimise this issue by only including items that reflect specific environmental occurrences (Heubeck & O'Sullivan, 1998; Torres et al., 2012). However, some recently published measures incorporate items that better reflect cognitive appraisals than daily stressors, for example in Keles' Hassles Battery: "I have been offended because of

my ethnic background". Future development of measurement scales assessing daily stressors should ensure items reflect only the environmental stimulus only (Keles, Friborg, Idsøe, Sirin, & Oppedal, 2015).

As noted above, the distinguishing feature of measurements of daily stressors is the incorporation of both a frequency and an intensity scale, to account for the theoretical importance of cognitive appraisal in mediating the influence of stressors on subsequent outcomes (see Table 2.5 for examples). Some scholars suggest, however, that the use of these ratings for severity evokes suspicion that the items are contaminated, even if they are 'clean' environmental situations (Kohn & Milrose, 1993). The use of such rating scales might be leading, particularly for young adolescents, to complete without implicit biases. Kohn and Milrose (1993) evaded this potential issue by only including items on the scale that were significantly and positively correlated with an independent measure of subjectively appraised stress. Furthermore, some authors have conducted validation analyses on three scores: the frequency, the frequency of bad hassles, and weighted score of frequency x intensity. Factor analyses demonstrated no differences in the models (Kanner et al., 1987), suggesting that the inclusion of an intensity/ appraisal scale may not be necessary in daily stressor measurement scales for adolescents.

Another leading issue is simply the use of the word 'hassle' within the name of measurement scale. The negative connotations of describing an environmental situation as a 'hassle' may lead respondents to provide biased responses. Although the term stressor is more neutral, as a stressor could be potentially a positive or negative experience, it still has negative connotations. Some scholars have attempted to overcome this by naming scales by using the terms 'event' or 'experiences', for example The Inventory of Adolescents Recent Life Experiences (Kohn & Milrose, 1993).

Contextual issues

Most measurement scales of daily stressors incorporate multiple domains (e.g. school, family, peers) which, in most cases, result in distinguishable subscales following the development and validation process. This broad and overly inclusive approach of measuring daily stressors across many contexts makes it difficult to assess the individual impact of stressors on outcomes. Some authors (e.g. Barrett & Heubeck, 2000) do report the unique contributions of each factor, however this is often not the case. To circumvent this issue, the development of specific measures may identify more meaningful relationships with potential

outcomes. Heubeck and O'Sullivan's (1998) Daily School Hassles Checklist is the only scale that is specific to the context of school, due to the evidence that this domain composes a large

Table 2.5. *Measurement scales developed to assess everyday stressors, or 'hassles' in adolescents.*

Author	Year	Scale	Validation sample	Description	Validation Methods
Lewis et al.	1984	The Feel Bad Scale	2400 10-11 year olds. USA. Majority Caucasian.	The FBS contained 20 items that emerged from qualitative studies about things that made adolescents feel bad. Internal Adolescents responded to the following stem: "The following is a list of things that some kids say make them feel bad, or nervous, or make them worry. For each, put an X showing how you would feel if this happened to you, or if this has happened to you, how you felt." Responses were given on a 5-point scale (1= not bad 5= terrible).	EFA. Content validity (qualitative data). Internal reliability. External validity (symptoms of anxiety).
Bobo et al.	1986	The Adolescent Hassles Inventory	246 11-13 year olds. USA. Majority (76%) Caucasian.	The AHI was adapted from the Adult Hassles Scale (Kanner et al., 1981) and developed in three stages. First, masters level and above psychologists, educators, and social workers deleted items from the Hassles Scale that were deemed inappropriate or irrelevant for 11-13 year olds. Next, conceptually relevant hassles were added to form a 68-items. Adolescents were required to read each item/ hassle and decide whether they had been hassled "like that within the past week". Participants circled zero if they had not experienced that hassle. Hassles that had been experienced were rated for relative severity on a 3-point scale (1= small hassle 3=large hassle).	EFA. Internal reliability. Invariance testing (gender). Subscale correlations. External reliability (measure of peer relations).

Table 2.5 (Continued). *Measurement scales developed to assess everyday stressors, or 'hassles' in adolescents.*

Kanner et al.	1987	The Children's Hassles Scale	232 11-12 year olds. USA. Majority (60%) Caucasian.	The CHS consists of 25 hassles covering the domains of family (e.g. your mother or father forgot to do something they said they would), school (e.g. your schoolwork was too hard"), friends (e.g. another kid could do something better than you could), and play (e.g. when the kids were picking teams you were the last to be picked). The items of this scale were generated from semi-structured interviews with early adolescents about the stress in their lives. Adolescents were required to: (a) check which stressors had occurred in the last month (b) state the number of times each stressor had occurred in the last month (i.e. frequency) and, (c) state whether the stressor made them bad on a four-point scale of didn't feel bad to felt very bad as a result (i.e. intensity). Three summary scores available: 1) Frequency of hassles (ranging from 0-25) 2) Frequency of bad hassles (ranging from 0-25) and 3) total intensity i.e. the sum of weights for each hassles endorsed (ranging from 0-100; frequency x intensity).	EFA. Internal reliability. External reliability (measures of anxiety, depression, and perceived competence).
Compas et al.	1987	The Adolescent Perceived Events Scale	12-20 year olds. USA. Sample contained less than 1% of ethnic minority group members.	The APES was developed by asking 658 12-20 year olds to list 10 daily hassles and as many major events that had happened to them in the past six months. From these items, three life events were checklists were created for: young (159 items), middle (200 items), and older adolescents (210 items). Major and daily life events were presented together in one scale as considerable variability was found between adolescents' classification of daily and life events. Each item included a cognitive appraisal scale for frequency (1= happened once in your life to 9= happened once a day) and intensity (1 = no impact at all 9 = extremely high impact). Older adolescents had additional cognitive appraisal scale of desirability (-4 = extremely bad 4= extremely good).	Test-retest and inter-rater reliability analyses supported reliability

Table 2.5 (Continued). *Measurement scales developed to assess everyday stressors, or 'hassles' in adolescents.*

Kohn and Milrose	1993	Inventory of High School Students Recent Life Experiences	176 14-16 year olds. Canada.	The IHSRLE consists of 41 comprising 8 factors: social alienation (e.g. disliking your studies), excessive demands (e.g. too many things to do at once), romantic concerns (e.g. dissatisfaction about romantic relationship), loneliness and unpopularity (e.g. being ignored), assorted annoyances and concerns (e.g. social disagreements over smoking), social mistreatment (e.g. being taken advantage of), and academic challenge (e.g. lower grades than you'd hoped for). Adolescents required to rate each itemised hassle on a 4-point scale of exposure over the past month (1= not at all part of my life 4 = very much part of my life)	EFA. Cross validation (sample split in two). Internal reliability. External validity using Perceived Stress Scale (Cohen et al., 1983).
Seidman et al.	1995	Daily Hassles Microsystem Scale	998 10-18 year olds. USA. Low SES populations.	DHMS consists of 28 items taken from the Daily Hassles Questionnaire (for adults; DHQ; Rowlison & Felner, 1988) and developed additional items to assess perceived neighbourhood hassles. For each item, adolescents' responses "yes" or "no" to whether the event has "happened this month" and if the hassles had occurred, how much of a hassle it was, on a 4-point scale (1 = not at all a hassle, 4 = a very big hassle). Scale comprised of five factors: school (e.g. trying to make good grades), family (e.g. increased number of arguments between parents), neighbourhood (e.g. being approached by a drug dealer in your neighbourhood), peers (e.g. problems with friends), and resources (e.g. not having your own room).	EFA. Invariance testing (gender, age, and ethnicity). Internal reliability. Test retest reliability. External validity.

Table 2.5 (Continued). *Measurement scales developed to assess everyday stressors, or 'hassles' in adolescents.*

Copeland & Gunning (1997)	1997	The Adolescent Perceived Events Scale -Revised	406 13-16 year olds. USA. Majority (68%) Caucasian.	Revised the middle adolescent version of the APES due to a) time consuming nature of existing APES and b) identification in the literate that adolescents are most affected by school, family and peer stressors. The APES-R consisted of 34 items that were selected by experts from the original scale based on their association with school, home, or peers.	Internal reliability. External validity (psychosomatic stress symptoms).
Heubeck & O'Sullivan	1998	Daily School Hassles Checklist	210 11-13 year olds. Australia.	The SCHC comprised 36 items that were based on qualitative brainstorming sessions and use of items from Kanner's (1981) Hassles Scale that were deemed appropriate. Hassles were comprised of four domains: peer (e.g. being left out, being hurt deliberately), home (parents give me too many jobs, parents are critical of homework), teacher (e.g. a teacher lectures me, a teacher shouts at me), and scholastic (e.g. sitting for a test, misplacing or losing things). Adolescents responded in terms of frequency (1= never 4 = often) and how much they were 'bothered' by the event (1= not at all 4= a lot).	Content validity (i.e. brainstorming). EFA. Internal reliability. External validity (using anxiety and depression measures).

Table 2.5 (Continued). *Measurement scales developed to assess everyday stressors, or 'hassles' in adolescents.*

Byrne et al.	2007	Adolescent Stressor Experience	1039 13-18 year olds. Australia	The ASE comprised 58 items drawn from focus groups with adolescents. Each item (stressor) was rated on a 5-point scale (1 = not at all stressful (or is irrelevant to me), 5 = very stressful). The scale is divided into 11 subscales: a) home life b) school performance c) school attendance d) romantic relationships e) peer pressure f) teacher interaction g) future h) school/leisure conflict i) financial pressure f) emerging responsibilities.	EFA. Content validity (i.e. focus groups). Internal reliability. Test retest reliability. External validity (i.e. anxiety, depressive symptoms).
Trianes et al.	2011	Children's Daily Stress Inventory. (Translated from Spanish; IECI).	1957 6-12 year olds. Spain.	The IECI presented 22 dichotomous items describing the occurrence of diverse events, problems, demands and setbacks that emerge from daily interaction with the environment that are susceptible to an emotional reaction. Comprises three domains pertaining to: health -related and psychosomatic problems, b) School (e.g. home work, interaction with teachers) and c) family (perceived loneliness, fights among siblings).	CFA. Test-retest. Internal reliability. External validity (e.g. using anxiety and depression measures).

Table 2.5 (Continued). *Measurement scales developed to assess everyday stressors, or 'hassles' in adolescents.*

Keles	2015	Youth, Culture and Competence Hassles Battery.	Adolescent refugees. Norway.	The YCCHB presented 33 items based on existing measures of various dimensions of daily stressors. Participants were asked to respond to frequency of hassles using a four-point scale (1= no, never 4= yes, very often). Daily hassles comprised four domains: economic hardship, worries, conflict related, and achievement related.	CFA. Internal reliability.

portion of adolescents' total stressor experience, and comprises both academic and social stressors. Moreover, Huebeck argued that the academic engagement and motivation profiles of some adolescents are often ascribed to home or family issues, which detracts from the role of daily stressors in school. Thus, the close scrutiny of one context may lead to greater understanding of relationships between stressor experience and outcomes.

Finally, another contextual issue pertains to the tendency for researchers to conduct investigation of adolescents' daily stressors within an academic context. Administering questionnaires within schools is the most efficient way of collecting information from large samples of adolescents. However, collecting data in schools may increase the risk of biased results in favour of academic or scholastic stressors, given they are the most proximal at the time of questionnaire completion. Thus, developing context specific measures, and administering them in the appropriate environment may evade the potential contextual biases that exist in current investigations.

Summary and conclusions

In summary, the current review highlights some of the everyday stressors, that is, the experiences of daily living that have been appraised as harmful to one's wellbeing (Lazarus, 1984). The everyday stressors adolescents' experience differs across age and gender, however generally relate to aspects of health, family, peer interactions, and school. Evidence suggests that school is the domain that composes the largest proportion of daily stressors for adolescents, given the extent of waking hours spent there, and the combination of academic and social demands. Thirty years of research suggests that the experience of everyday stressors has a greater impact on adolescents' psychological and physical health than the experience of major life events. Moreover, daily stressors have been shown to impact educational outcomes, including concertation, cognitive capacity, and academic achievement. Thus, scholars highlight the importance of identifying sources of potential daily stress, in order to develop appropriate interventions. The development of context specific measures of daily stressors may facilitate our understanding of the impact of environmental demands on subsequent outcomes in adolescence.

Chapter III: Qualitative Studies One and Two

Content

Study One: Exploring Common Stressors in Physical Education

Study Two: Exploring Protective Factors in Physical Education

Publications

Tudor, K., Spray, C. M., & Sarkar, M. (in press). Exploring common stressors in Physical Education: A qualitative study. *European Physical Education Review.*

Tudor, K., & Spray, C. M. (2016). Resilience in Physical Education. *British Psychological Society's Division of Sport and Exercise Psychology Conference,* Cardiff, UK.

In chapter two I provided an overview of the definitions, concepts, and theoretical models of academic resilience. Next, I presented a review of approaches to measuring academic resilience in schools. Following this, I provided a narrative review of school-based stressors. This review work provided a strong basis for how to approach the subsequent studies. The chapter presented herein details the first two studies of my thesis. Study one reports an exploration of everyday, or 'common' stressors in secondary school PE lessons. Study two explores the protective factors that students utilise to ameliorate the effects of stressors and facilitate resilience in PE lessons.

Exploring Common Stressors and Protective Factors in Physical Education

There is strong evidence that physical activity helps to prevent a number of chronic health conditions (O'Donovan et al., 2010) and inactivity is a major risk factor for premature mortality (Kohl et al., 2012). Evidence suggests that levels of physical activity, specifically moderate-to-vigorous intensity physical activity (MVPA), decline during adolescence (Armstrong and Welsman, 2006; Corder et al., 2015). School physical education (PE) provides a context for regular and stuctured physical activity particiption; however, evidence suggests that in many PE lessons, students do not engage in sufficient MVPA to achieve health benefits (Hollis et al., 2017; Lonsdale et al., 2013). Educational researchers have sought to understand why students are not engaging in sufficient levels of MVPA, identifying a combination of factors including: enjoyment or interest (Jaakkola et al., 2017), physical self-concept (Babic et al., 2014), perceived competence (Fairclough, 2003), teaching approach and environment (Gråstén, 2016), and self-determined motivation (Aelterman et al., 2012; Mitchell et al., 2013; Standage et al., 2005).

While the identification of predominantly cognitive factors has contributed to understanding of what promotes active participation in PE, previous findings do not explain the total variance of students' active participation in lessons. One concept that has been studied within educational psychology is how the incidence of everyday academic stressors (and how students respond to such stressors) can predict motivational and engagement outcomes (Martin, 2013; Martin and Marsh, 2008). There has been limited research on the incidence of everyday, or common, stressors associated with PE and students' ability to deal effectively with such stressors. Given the importance of cumulative, minor stressors on academic outcomes, identifying the stressors that students typically experience in their PE lessons may help explain patterns of motivation and engagement in the subject.

The experience and impact of daily stressors in adolescence

Early research defined the concept of psychological stress in one of two ways: as a stimulus (or 'stressor', focusing on events within the environment), or a response (focusing on the state of stress). However, it was soon established that individual differences mediated the relationship between stressors and one's response to these stressors (Lazarus and Eriksen, 1952; Lazarus and Launier, 1978; Lazarus and Folkman, 1984). Thus, psychological stress is viewed as a transactional process, and defined as the relationship between the person and the environment that is appraised by the individual as taxing, or exceeding resources and endangering wellbeing (Cohen, Kessler, and Gordon, 1995; Lazarus and Folkman, 1984).

Stressors are defined as the "experiences of daily living that have been appraised as salient and harmful or threatening to the endorser's wellbeing" (Lazarus and Folkman, 1984, p 376). Importantly, stressors are viewed as environmental stimuli, meaning that two individuals may have a different psychological response to the same stressor. The stressors that children experience can be categorized into: life events, chronic stressors, and daily stressors (or everyday hassles). Life events constitute those exceptional, traumatic circumstances that require significant adjustment, for example, the death of a family member or parental divorce (Williamson et al., 2003). Chronic stressors are the harsh and ongoing physical or social conditions associated with disadvantage, for example, poverty or disability (Evans, 2006; Serido et al., 2004). Finally, daily stressors, or everyday hassles, are the irritating demands that characterize frequent transactions between an individual and their environment (Kanner, Coyne, Schaefer, and Lazarus, 1981). These hassles may include practical problems (e.g. losing things) or fortuitous occurrences (e.g. arguments or disappointments; Kanner et al., 1981).

It has become increasingly evident that everyday environmental demands may form the primary cause of the stress experience in children (Byrne et al., 2011; Compas, 1987; Kearney et al., 1993; Kraag et al., 2006; McNamara, 2000). For children, everyday stressors relate to health, family, school and peers (Kanner, Feldmen, Weinberger, and Ford, 1987). In school, achievement demands (e.g. not attaining expected grades or giving public performances), interpersonal relationships (e.g. with teachers and peers),

and general school disrupters (e.g. class size) have been identified as sources of stress (Bauwens et al., 1989; Grannis, 1992; Kanner et al., 1987). More recently, research has found that most children reported multiple daily stressors at school, including interpersonal conflict and the demands of mastering new topics. Moreover, stressor experience in one area of school life impacted the stress response reported in other aspects of school on the same day (Sotardi, 2017).

Increasing evidence suggests that daily stressors have a significant impact on various outcomes, due to their cumulative and proximal nature. Adolescents' experience of daily stressors has been associated with anxiety (Carter et al., 2006; Kiang and Buchman, 2014), depression (Band and Weisz, 1990), low self-esteem (Escobar et al., 2013; Sandstrom et al., 2003), emotional wellbeing (Kiang and Buchman, 2014), antisocial behaviour (Sim, 2000), and negative interactions with parents (Lehman and Repetti, 2007). Moreover, daily stressors have been shown to be related to decreased attentional control (Liston et al., 2006), and cognitive performance (Rahdar and Galvan, 2014), which some scholars suggest may manifest as negative attitudes towards school and decreased academic achievement (Byrne et al., 2011; Torres et al., 2012).

Research exploring daily stressors in adolescence has focused primarily on academic demands, with little emphasis of the influence of potential stressors in PE (Barrett and Heubeck, 2000; Heubeck and O'Sullivan, 1998). However, researchers have begun to explore the perceived 'barriers' to students' participation in PE lessons. Elliott and Hoyle (2014) suggested that wearing a particular PE kit led to self-consciousness in female students, and O'Connor and Graber (2014) highlighted the increased tendency for bullying in PE, predominantly ignited by body image, attire, and physical ability. Furthermore, the public and competitive nature of PE compared to other classroom-based subjects may lead to greater concern with regards to ability and performance (Yli-Piipari et al., 2009). Ridgers, Fazey, and Fairclough (2007) reported that perceived physical competence was associated with the degree of apprehension students' experienced at the prospect of being negatively evaluated in PE.

Researchers have also highlighted the unique context that students are placed in during their PE lessons. PE represents one of the most significant contexts in which body

image and physical self-perceptions impact on student experience (Fox and Edmunds, 2000). Indeed, PE is an environment whereby "the body is explicitly used, displayed and talked about" (Paechter, 2003 p. 49) and research has identified body image issues as a psychological barrier to PE participation. Moreover, students' physical and social capital (i.e. material resources related to the body) are important components of PE lessons, as described by (Shilling, 2010, p. 155).

> "Bodies that are trim, presentable and skilled in the arts of impression management gain status and value within and between social fields, while the desirability and exchange value of those falling outside of these parameters are correspondingly lower."

Findings suggest students' concerns about the immediate social risks of being overweight or obese is particularly pertinent in PE lessons (Wiltshire et al., 2017). At present, however, there is no systematic knowledge regarding the range of daily, or common, stressors that the majority of students' experience in PE.

Daily stressors are distinct from many of the examples reported above, which are often termed by authors as 'barriers'. Barriers, by definition, are circumstances or obstacles that keep things apart or that prevent the advance of persons or things (New Oxford Dictionary of English, 2010). This definition assumes that all environmental situations have an equally obstructive impact on all students that experience them. Moreover, the term barrier is often used by authors to represent a cognitive appraisal of an environmental stimulus (i.e. a 'psychological barrier', such as self-consciousness). In contrast, stressors in PE are the environmental stimuli experienced by the majority of students that may or may not be appraised as salient or threatening. The term barrier is used inconsistently, and is not explicitly defined in existing literature (Elliott & Hoyle, 2014), and does not effectively encompass the range of environmental situations that are experienced by the majority of students. The current study therefore seeks to explore the common and potentially stressful events or situations that are experienced in secondary school PE lessons. The study utilized Lazarus' (1984) definition of daily stressors, that is, "experiences of daily living that have been appraised as salient and harmful or threatening to the endorser's wellbeing" (p 376). Thus, the focus was not to explore

students' emotional responses or appraisals, but specifically on exploring specific environmental stimuli that have the potential to be negatively appraised.

There are some studies within the physical education literature which have examined environmental conditions, however these have not been contextualised as stressors. For example, Achievement Goal Theory (Nicholls, 1989) represents a widely utilised framework in research concerning students' experiences in PE, which comprises elements that could be conceptualised as stressors. For example, within this framework, motivational climate relates to how psychological environment directs the goals in achievement situations in PE. In a task involving climate, students are rewarded for their effort, co-operation, and development. In an ego-involving climate, performance outcomes are encouraged, and students are rewarded for their performance outcomes and comparisons between students (Ames, 1992). Previous studies in PE have indicated that task-involving climates are associated with positive educational outcomes. Thus, within this research, the act of a teacher praising another student for superior performance could constitute a stressor, as it is an environmental stimulus that can be perceived as harmful to the endorser's (i.e. poorer performing student's) wellbeing. To date however, there is no comprehensive exploration of the range of stressors that students experience in PE, and the examination of these within the context of resilience.

Resilience to stressors

Resilience is characterized by the nurturing of personal strengths and identifying factors that allow individuals to thrive under difficult conditions (Luthar et al., 2000). Numerous definitions of resilience exist, however most incorporate three pivotal concepts: adversity, positive adaptation, and protective factors (Luthar, 2006; Luthar et al., 2000; Masten, 2001; Rutter, 1987, 2006). As noted above, for adolescents, adversity may range from ongoing daily stressors, such as academic difficulties to peer relationship pressure (Davis et al., 2009; Sotardi, 2017) to major life events (e.g. parental divorce, bereavement; Bonanno, 2004). Positive adaptation is defined as behaviourally manifested social competence (Cicchetti et al., 2007) and is relative, in severity and context, to the stressor(s) experienced. Finally, protective factors are defined as "influences that modify, ameliorate, or alter a person's response to some environmental hazard" (Rutter, 1985, p.

600). Garmezy (1993) identified three variables that operate as protective factors for adolescents at risk of poor academic outcomes including: psychological factors (e.g. perceived competence); family context (e.g. involved parenting); and external support (e.g. supportive teachers).

Further research into resilience to the everyday academic stressors that the majority of students face (i.e. academic buoyancy) has identified a number of protective factors that facilitate students' positive adaptation. Specifically, Martin and colleagues found that the 5Cs; control (low uncertain control), composure (low anxiety), co-ordination (planning), confidence (self-efficacy), and commitment (persistence) were all significantly related to positive adaptation to everyday school stressors. Investigation of protective factors facilitating resilience to everyday school stressors are limited to the academic (classroom-based context). Given the unique context that PE lessons place students in, students may utilise different protective factors to modify the effects of stressors. To our knowledge, no study has explored resilience to the everyday pressures associated with participation in PE lessons. The following two studies aim to explore two out of the three components of resilience in a PE setting; stressors and protective factors.

Study one: exploring common stressors in PE

The current study seeks to explore the common and potentially stressful events or situations that are experienced in secondary school PE lessons. The study utilised Lazarus' (1984) definition of daily stressors, that is, "experiences of daily living that have been appraised as salient and harmful or threatening to the endorser's wellbeing" (p 376). Thus, the focus was not to explore students' emotional responses or appraisals, but on exploring specific environmental stimuli that have the potential to be negatively appraised.

Method

Participants

Participants included 54 students (male= 21; female= 33) aged between 11 and 16 (M= 13.0, SD = 1.14), and six PE teachers (male: four; female: two), with a range of two to 12 years teaching experience (M=7.2, SD=3.70). Participants were recruited from five secondary schools in the Midlands of England. The five schools were all comprehensive

schools and all mixed gender. Schools consisted of a range of socio-economic status (i.e., four schools had below average number of students eligible for free school meals whilst one school had above average). All of the recruited schools had a majority of White British students. Pseudonyms are used within the text which enables the participants' identities to remain anonymous.

Design and procedure

After obtaining ethical clearance from the ethics committee of a British University, participants were recruited by writing to the head-teacher, explaining the study, and requesting to conduct focus groups with a sample of students, and interviews with PE teachers. If the head-teacher agreed and consent was granted, PE teachers were contacted by the lead researcher, explaining the details of the study. Focus groups were conducted with students and interviews were conducted with teachers. All of the interviews were recorded using a Dictaphone, and the head author recorded notes regarding the answers provided. The decision was made to interview both teachers and students to get more rich detail about the experience of stressors in PE. It was felt that teachers may provide another perspective of the experience of students in lessons that students may, or may not, discuss during focus groups. The approach to interviewing both students and teachers is an approach commonly utilised in educational research (Wellington, 2015).

Student focus groups

Teachers were instructed to select five or six students to form each focus group, who ranged in physical ability and engagement in PE. Each focus group consisted of students in the same class (therefore the same age and gender). A focus group approach was chosen for students in order to maximise data of students' experiences in PE and also to meet child-protection and ethical requirements. Focus groups were chosen as they are proposed to be appropriate for situations where research is aiming to draw upon participants' beliefs, attitudes, and feelings by exploiting group processes (Ennis & Chen, 2012). Moreover, the focus group approach was made in an attempt to reduce the adult/child power relationship that may be a disruptive element in one-to-one interviews.

Construction of focus groups with participants of the same age and gender was designed to facilitate an environment whereby students felt comfortable (Ennis & Chen, 2012).

An interview guide was constructed to ensure that questions were focussed on the topic under investigation, which was broadly focused on exploring student's experiences of stressors in PE. Interview guides were piloted on students to test question comprehension, particularly to identify child-friendly terms for the construct of daily stressors. Following piloting, the guides were altered to make questions more coherent for participants (specifically by altering the wording of questions). No changes were made to the interview guides for teachers. The interview guides consisted of a brief introduction on the concept of daily stressors, followed by open-ended probe questions. All focus groups were conducted during students' scheduled PE lessons by the first author. There are various interpretations, expectations, or quality assurances with regards to the concept of data saturation in qualitative research studies (see, for a discussion, O'Reilly and Parker, 2013). In the current study, due to logistical reasons (i.e. collecting data during scheduled PE lessons) the focus groups were limited to one hour each, and ranged from 35 to 55 minutes. Despite this, it was felt that each focus group was conducted to a point at which all questions were explored in detail and the experiences of all participants were captured (Morse, 2003; O'Reilly and Parker, 2013). Each focus group was audio-recorded and transcribed verbatim (producing 226 pages of single-spaces transcribed text). The analysis of each focus group prior to further data collection was conducted to ensure that all potential themes were thoroughly explored.

Teacher Interviews

Questions in the interview guide for teachers were similar in content to the interview guide for the focus groups; however, some wording was changed to meet differences in student and teacher comprehension levels. Interviews were conducted with PE teachers during their free time. Again, as sample size cannot be pre-determined given the need for a thorough exploration of an as yet unknown phenomenon (Morse, 2003); teacher interviews were held until saturation. Interviews were audio recorded and transcribed verbatim (producing 60 pages of transcribed single-spaced text).

Data analysis

A thematic analysis technique was employed through both inductive (i.e., derived from the data) and deductive (i.e., derived from the conceptual framework of the study) analysis. Following an introduction and definition of what stressors were, the interview and focus group guides included open-ended questions about what kind of stressors were experienced in PE lessons. Similarly, the interviewer had a discussion with students about what resilience was, provided a definition, and then included open ended questions about what facilitated one's positive adaption in the face of stressors. Thus, the guides were deductive as they were shaped by existing theory, while the analysis was inductive as patterns were discerned by myself (and colleagues) based on the data provided by participants.

The analysis followed a six-stage process: (1) familiarisation with the data through the manual transcription of interviews; (2) the generation of initial codes of salient features of the data; (3) identifying themes within the codes; (4) reviewing the themes; (5) defining the identified themes and (6) reporting the findings, extracting data that corresponds to the identified themes (Braun & Clarke, 2006; Clarke & Braun, 2013). A reflective diary, to note the researcher's initial thoughts during data collection, was utilised to guide the analysis.

Transcripts from student focus groups and teacher interviews were analysed simultaneously, that is, the data were combined. It was not recorded whether themes emerged from teachers, and not from students (or vice versa), as the objective was to obtain as broad a perspective of stressors as possible. Data were analysed an iterative process between data and theory, although it is important to acknowledge the active role of the researcher in identifying themes in thematic analysis and selecting those that are of interest. The researchers made decisions regarding the data, and themes did not passively emerge from the data, therefore the themes reported should be considered a result of on-going interpretation and reflection (Braun & Clarke, 2006).

Methodological rigour and trustworthiness

Methodological rigor refers to the intellectual precision, robustness, and appropriateness of methodologies (Smith & McGannon, 2017). To ensure the credibility

and trustworthiness of the data, discussions took place within the research team during the analysis to ensure alternative interpretations of the data were considered (Smith, 2007). The third author coded a sample of the data to stimulate alternate explanations of the data and discussion of the generated themes and the emerging categories were reviewed and refined so the findings could be considered credible and transferable (Lincoln & Guba, 1985). Doubts and disagreements were discussed until a consensus was reached.

To ensure the credibility and trustworthiness of the data, discussions took place within the research team during the analysis to ensure alternative interpretations of the data were considered (Smith, 2007). The primary researcher author coded 100% of the data. Discussion of the generated themes and the emerging categories were reviewed and refined so the findings could be considered credible and transferable (Lincoln and Guba, 1985). Some doubts and disagreements arose between myself and my supervisor (CS) with regard to some coding and categorization into themes and subthemes. Specifically, there was discussion regarding whether a given situation in PE reported by students should be considered an event or the appraisal of an event. Consequently, having reviewed the transcripts, and independent researcher (MS) was approached to address the disagreements between myself and CS. In the cases of doubt, a discussion took place between all three researchers until a majority consensus was reached (i.e. two were in agreement). The utilisation of inter-rater reliability, or investigator triangulation, is recommended by Smith and McGannon (2017), and enhances the methodological rigor of the analysis. The presented studies did not incorporate member checking. Member checking involves the participants of a project assessing the trustworthiness of research by validating the credibility of the data and results (Smith & McGannon, 2017). If the participant supports the accuracy of the data, then the findings are deemed more credible and valid as they control for the implicit or explicit subjective bias from the researchers (Lincoln & Guba, 1985).

Results and Discussion

The results derived from the thematic analysis procedures are a representation of participants' collated responses. Table 3.1 has been constructed to highlight higher order

themes that showed clear links to lower order themes. The interview data yielded raw-data quotes comprised of 17 lower order themes and seven higher order themes. The higher order themes formed three general dimensions of stressors in PE: the social environment, the physical and organisational environment, and the performance environment.

Social Environment

Social environment consisted of two first-order themes: peers and teachers (see Table 3.1). With regards to peers, situational demands in PE ranged from working outside their usual peer group, the existence of cliques related to ability, and negative interactions between peers. In terms of teachers, some students reported strict teachers, the enforcement of PE kit rules and teachers' 'choice' of activities to be demanding. The most frequently cited themes in the higher order theme of the social environment was negative interactions between peers.

Peers

Students recalled that being separated from their friends or being in a group with individuals they 'don't know' or 'don't get on with' as a hassle: 'you feel really uncomfortable when you're with no one that you really like or know… You're out of your comfort zone'. [Jess, year 10]. Relatedly, students recalled sporty classmates working together which sometimes created a 'cliquey' atmosphere in lessons, which was supported by teachers reporting that the social capital associated with physical ability was often reflected in cliques within PE lessons. These findings support previous research identifying PE as a context whereby physical abilities can contribute to students' social capital, resulting in the formation of hierarchical social groups (Hills, 2007; Wiltshire et al., 2017), thus, teaching practices may be modified to facilitate more inclusive peer interactions.

Participants recalled negative comments between peers, which were unique to the PE setting, most likely relating to a student's physical appearance or athletic ability. A group of year seven males discussed teasing in the changing rooms (see Table 3.1), openly discussing the negative impact of their own actions on other students. Similarly,

girls discussed some students not getting involved during PE lessons due to the potential negative comments from their peers, regarding physical appearance: ‘There’s some

Table 3.1. *Raw data themes representing stressors in PE*

Raw Data Quotes	First Order Themes	Second Order Themes	General Dimensions
Liam, year 8: Working in a team with people that I don't get on with tends to be quite hard. Well, erm… I would… in the past I've fallen out with some of my friends and then erm, we were put in a group together so I had to work with him and it was really awkward. So I struggled with that quite a bit. **Boys, year 7.** [when discussing body image] **Vinnie:** - some people might feel awkward. Sometimes like, when you're getting changed… you can be getting changed like, with the boys a-and if someone a bit overweight then people take the mick out of them, and then net time they try and... hide behind from the people who's takin the mickey out of them... and then they feel sad when they do PE which is... not good ... **Dillon:** - well we don't exactly take the mick out of them, but like... we won't say it to their faces.. no- no one's said it to their faces… but we do probably say it behind their back... **James, year 9:** Some people ain't got the right mindset with things, like, they just do what they want and like, stand at the back, like during football, just stand at the back talking to their mates, thinking it's a doss lesson. Bu they need to put the work in... **Mark, year 9:** Yeah we just let them get on with it. We're not gunna stoop to their level**.** **Mia, year 10:** When we got put into sets, when people said, 'What set are you in?' and you'd say, 'Set Three', they'd be like, 'well, you're not fit then, you should be in Set Two' or they'd brag about being in Set One and it'd get you down.	Working outside peer group Negative comments Differences in participation Boasting between peers	Peers	**Social Environment**
Year 10 boys. Louis: Another one is Mr A. You really can't have a joke with him. Like, he'll always take it so seriously. Mark: It's as if he's in the army, everything's like, military style and I think like, you have to enjoy it as well ain't you?	Teacher is strict	Teachers	

Table 3.1 (Continued). *Raw data themes representing stressors in PE*

Lucy, year 10: There's a few girls here that enjoy sport but they're very conscious of the kit that they wear and who's watching and if there's a boy group nearby. And it's a shame because I don't think they work as hard because they're too conscious about what they look like in their PE kit. **Sarah, year 10:** It's when you're trying your hardest, but then the teachers tell you to work harder and don't appreciate that that is your hardest.	Strict rules for PE kit Teachers telling you to work harder	Teachers	**Social Environment**
Kevin, teacher. Just getting changed it a massive issue for some of our pupils… I probably have about five or six boys that go into the staff changing rooms… we've had boys that, in terms of swimming that have got changed in a cubicle because of having one testicle or a concave chest or... just being obese.	Getting changed	Facilities	**Physical / Organisational Environment**
Charlotte: Some sports just aren't available for girls. Like football, rugby… Which, sometimes people may enjoy those sports more than the normal girl's ones like netball. **Andrea:** but then there's one's that boys can't access like gymnastics and stuff like that - **Mia:** I find that unfair because even with trampolining, the boys were doing front flips and back flips but we were just doing seat drops, and we asked the teacher if we could try, 'cause I've done it before at home, and she just said 'no'. **Claire, year 8:** Yeah 'cause we just do the same things with Miss E all the time. It's like netball and netball, hockey, netball, hockey, hockey, netball, and I just get bored.	Gender differences in activities Repetition	Availability of Activities	

Table 3.1 (Continued). *Raw data themes representing stressors in PE*

Will, year 9: In PE, I find difficult, long distance running… Just after a while, my legs… I just find it difficult… and, well on sports days I didn't sign up for anything so I had to do the 800m and I wasn't very good at it and I really didn't want to go. **Beth, year 8:** - cause when you can't do somethin' and they tell you to do it and you can't do it, it makes you angry. I: Yeah. And what kind of things? B: Once when I did hockey last year and they made me do it and I felt a bit down and that and Miss was like, 'keep trying, keep trying', but I couldn't do it. So it was making me angry and then I wasn't happy for the whole day 'cause it had made me feel down.	Facing challenges in an activity Taking time to grasp physical skills	Skill Acquisition	**Performance Environment**
Gemma, year 8: I think there's some people that are quite like, conscious about their appearance and I think that like affects them. Cause if sometimes people are bit bigger than sometimes you're a bit conscious and I feel like that kind of stops you from getting involved. And they think, 'oh what if they're saying stuff about me?' **Amy, year 7:** …if you do basketball and you're the shooter and it doesn't go in. It's hard then to like… get your confidence back to try again and you think the team's gunna think you're like… rubbish.	Exposing the body Demonstrating competences	Public Nature of PE	

people that are like, quite conscious about their appearance… and that kind of stops them from getting involved… They think, "oh, what are they saying about me?"' (Joanna, year 8). A less severe yet potentially negative interaction between peers was the tendency for higher ability students to gloat about their superior physical ability. Furthermore, some female students recalled situations where male students boasted about their superior athletic ability, which was more apparent in mixed gender classes. While some girls appraised this as a tool to spur them on, others found it detrimental to participation.

Students recalled situations whereby differences in PE participation were very apparent. Some students described not getting a chance to participate as a result of the higher ability students (for example, never being passed to). Previous research has highlighted the physical involvement and social acceptance that being passed to affords (Hills, 2007), and students in the current study stated that exclusion in this way resulted in the tendency to disengage from the game. In contrast, students with high perceived competence stated a tendency for lower ability students to 'just stand at the side' and let them do all the work. High ability students put their counterparts' lack of participation down to 'laziness' and 'not taking PE seriously', not considering that discrepancies in participation may stem from previous experiences of exclusion.

Many of the findings related to peer hassles support previous literature, for example the increased tendency of teasing underpinned by appearance and ability (O'Connor & Graber, 2014). The current study extends previous research by highlighting less 'severe', but nevertheless frustrating and irritating environmental demands, such as boasting and perceptions of classmates' effort levels.

Teachers

Other social environmental stressors included issues with teachers, however these were less frequently reported. Some students described situations where particularly strict teachers could take the fun out of the PE experience. Moreover, some students found that getting into trouble for forgetting their PE kit, or wearing the incorrect uniform, to be a hassle for them. A male student recalled being consistently reprimanded for wearing the incorrect socks for his PE lessons, and did not understand why a small detail should be

important. Female students also struggled to understand the importance of wearing a specific uniform, often expressing it was not warm enough in the winter months.

Organisational and physical environment

Organisational and physical environment was comprised of two higher-order themes: facilities and the availability and range of activities. The most frequently cited stressors within this dimension were those related to space and privacy within the changing rooms.

Changing room facilities

Some teachers and students suggested that the process of changing in school facilities to be a stressor, due to overcrowding during the changeover of PE lessons: 'The year 10s are all coming in when you're getting changed… and they try to put pressure on us and it really annoys us' [Emma, year 8]. Moreover, some teachers recognised that getting changed for some students was so anxiety provoking that they made arrangements for a small group to change in the staff changing rooms. These findings resonate with previous research identifying the changing room environment to be a negative experience for students (Flintoff & Scraton, 2001). They also demonstrate the distinction between events that constitute severe stress responses (i.e. fear of changing with classmates), and those less severe, but irritating frustrations relating to school life (e.g. being rushed to get changed), which has received less attention in the research literature.

Availability of activities

Female students of all age groups recalled the activities available to them within the curriculum to be a hassle in PE. They recalled a gender difference in PE activities, demonstrated here by year ten girls: 'Some sports just aren't available for girls… like football… rugby. People may enjoy those sports more than the normal girl's ones, like netball' (Sarah, year 10). Further, females reported being restricted in PE levels, demonstrated in Table 1, by participating in activities at a 'lower level' to their male counterparts (e.g. touch rugby).

Students also reported that units of work that were repeated frequently across the year were a cause of frustration. For example, students felt that some teachers favoured particular sports, which were therefore repeated in the curriculum, resulting in boredom

and a lack of interest from the students. Teachers countered this argument, stating that longer units of instruction support skill development and learning, an approach to the curricula which has been supported by previous literature (Ennis, 1999; Kirk, 2004). More recent however research has highlighted the positive effect of a non-traditional curricula, using longer units of instruction of the same content, has on student engagement over time (MacPhail, Gorely, Kirk, & Kinchin, 2008), which may be a consideration for PE practitioners.

Performance environment

Performance environment was comprised of two higher-order themes: skill acquisition and the public nature of performance activities. In terms of skill acquisition, students recalled that finding particular activities challenging or taking time to grasp a particular skill to be a hassle.

Skill acquisition

With regard to skill acquisition, students often recalled situations where they found a particularly activity difficult to grasp as frustrating, particularly when they continued to try, without success. Teachers similarly recognised that their students would become frustrated if they found a particular skill difficult: 'We started table tennis... literally the, some of the lads are relatively able, holding their rallies but he [a student] couldn't hit the ball back. And looking around, being in a social setting, he's getting really frustrated' (Joe, teacher). This teacher highlights the difficulty of grasping particular skills, paired with the social and performance environment of a PE lesson, as frustrating for some students.

Public nature of performance

Relatedly, PE teachers suggested that PE lessons could be differentiated from classroom-based lessons due to the frequency of public displays of physical skill. The social aspect of performance occurred frequently for students and most students recalled situations whereby their athletic performance was on public display as a stressor. Students reported that participating in activities that they felt less competent, or 'rubbish' at, as demanding for them. If not an issue for themselves, students recognised this may be a stressor for others in their class: 'In the bleep test… If a person's a different size, then

they compare themselves to someone else. And might feel uncomfortable or like, they might feel like they're not good enough.' Feelings of shame regarding physical competence were also demonstrated when ability was made apparent through ability grouping. A consistent feature (for boys and girls) was to recall being in the top set with pride and responsibility, whilst being in lower sets was associated with a sense of shame and embarrassment:

Philippa, year 10: When we were first here [your set] was a *big thing* – almost as much as like, Maths, Science and English, so people were like, 'so what set you in for PE?!' and I was like, "well I'm in set three… I don't wanna shout it out". It's nothing to brag about is it? You're in the lowest group.

On the other hand, top set students spoke about their placement with a sense of achievement, and also relief that they didn't have to participate with less competent students. These findings resonate with work showing the construction of physical capital relating to the capacity for successful displays of competence (Hills, 2007; Wiltshire et al., 2017). Poor performances in Wiltshire et al's (2017) study were perceived as shame-worthy, resulting in students' avoiding exposing themselves through sport to prevent embarrassment. Practitioners may consider approaches to creating a mastery climate during PE lessons, highlighting incremental improvements, and limiting performance-related goals.

Study two: exploring protective factors in PE

The second study seeks to explore the protective factors that students may utilise during their PE lessons when faced with the potential stressors reported in study one. The study was based on Rutter's definition of protective factors, that is, "influences that modify, ameliorate, or alter a person's response to some environmental hazard" (Rutter, 1985, p. 600).

Method

Participants, design, and procedure.

Data collected for study two were collected at the same time as study one. Thus, participants, design and procedure remain the same for study two as those reported previously. Following a discussion of stressors, the focus groups and interview guides introduced the concept of resilience. The topic began with an open question of what students thought the definition of resilience to be. Following a brief introduction, a definition and explanation was provided by the interviewer before a discussion about potential protective factors began.

Results and discussion

The results derived from the thematic analysis procedures are a representation of participants' collated responses. Table 3.2 has been constructed to highlight higher order themes that showed clear links to the most frequently reported lower order themes. The higher order dimensions are abstract, however they conceptualise the lower order themes beneath them. The interview data yielded raw-data quotes comprised of 17 first order themes and six higher order themes. In line with previous conceptualisations of protective factors (Garmezy, 1993; Rutter, 1985), the higher order themes formed two general dimensions of: individual assets and environmental resources.

Individual Assets

Individual assets were comprised of the second order themes of cognitive factors, behavioural factors, and personality traits. In terms of cognitive factors, the most frequently reported first order themes were: holding value in PE, perceived competence, and commitment. In terms of personality traits, extraversion and 'drive' were associated with increased levels of resilience in students. Finally, behavioural factors, including, attending extra-curricular activities and 'approaching challenges' ameliorated the effects of stressors in PE. All higher and lower order themes are reported in Table 3.2, with corresponding quotes.

Cognitive factors

Value. The most frequently reported individual assets that both students and teachers reported were cognitive factors. As demonstrated in Table 3.2, understanding the

value of PE, or a particular activity in PE, contributed to the ability to bounce back from stressors: “Say in circuit training, I don’t enjoy it necessarily but I know how to do it properly because I know it benefits me so I keep trying to do circuit training properly” (Hannah, year 10). Students reported that lacking value in PE, or a specific activity had contrasting effects in terms of resilience. On the one hand, students viewed placing little value in PE as a protective factor; not valuing a certain activity meant that performance stressors (e.g. not being able grasp a certain skill) were not appraised as harmful: “If the teacher said to me [in netball] ‘You’re not passing the ball properly’, I don’t really care because I’m never going to need to know how to pass a ball at any other time” (Hannah, year 10). The stressor of not performing a skill adequately is not appraised as stressful for students who do not value that skill, and therefore lacking value could be viewed as a protective factor.

On the other hand, some students saw this as the opposite of protective (i.e. a vulnerability factor), suggesting that when students did not value a certain activity it meant that they would not positively adapt to setbacks in PE. In Hannah’s (year 10) experience above, for example, she is not positively adapting to the performance setback she has experienced, due to her lack of value of that skill. These contrasting views highlight the subjective nature of the experience of stressors (particularly minor, everyday stressors). Participants reported environmental factors that influenced their value of PE, and subsequently how they responded to setbacks, which will be addressed later in this discussion.

Perceived competence. Perceived competence was another theme that participants reported facilitating resilience. Students who were already confident in their own physical abilities were described as being more able to ‘deal’ with the negative effects of setbacks in PE lessons:

Luke, year seven: “Some people are a bit negative, so they think, ‘oh I’m terrible at this, I’m just not good at it’ so they won’t be determined to get better at it. They think, ‘I’m terrible at this’ so I’m not going to persevere”

Previous research has investigated the role of perceived competence in the adoption of performance and mastery goals in PE lessons (Spray & Warburton, 2011), however it has not been studied within the framework of resilience. The idea of perceived competence in PE can relate to research that has investigated the role of implicit theories (i.e. an individual's view about the malleability and stability of their attributes; Dweck, 1999) in PE lessons. Implicit theories researchers state that 'incremental theorists' believe that their personal qualities can be developed through learning, while 'entity theorists' believe their personal attributes are fixed, stable qualities that cannot be developed with practice. This concept was reported frequently by both students and teachers, suggesting that students with an entity theory of physical ability were less resilient to performance stressors compared to incremental theorists. This idea was presented aptly by one year seven student:

Jenna, year seven: "Some people think about how they were at primary school and if they weren't good at something at primary school then they think, 'Oh because I wasn't good at it then then I'm never gunna be good' so they just give up instead of trying"

Early research into implicit theories was conducted in adolescents' theories of their intelligence (Dweck, 2006; Dweck & Leggett, 1988), however research has begun to investigate implicit theories of physical ability (Ommundsen, 2001; Warburton & Spray, 2013). Future research may investigate the role of implicit theories as a protective factor within the framework of resilience in PE lessons.

Commitment. Consistent with one of the protective factors that is tested in the academic resilience literature (Martin & Marsh, 2009), commitment and dedication was a cognitive factor recalled by students and teachers alike. Specifically, with regards to performance stressors, students who were committed to the self-improvement of physical

Table 3.2. *Raw data themes representing protective factors in PE*

Raw Data Quotes	First Order Themes	Second Order Themes	General Dimensions
Sarah, year 10: Say in circuit training, I don't enjoy it necessarily but I know how to do it properly because I know it benefits me so I keep trying to do circuit training properly But if the teacher said to me [in netball] 'You're not passing the ball properly', I don't really care because I'm never going to need to know how to pass a ball at any other time.	Value	Cognitive Factors	**Individual Assets**
Luke, year 7 Some people are a bit negative, so they think, 'oh I'm terrible at this, I'm just not good at it' so they won't be determined to get better at it. They think, 'I'm terrible at this' so I'm not going to persevere. **Jenna, year 7**: Some people think if they weren't good at something at primary school then they think, 'Oh because I wasn't good at it then then I'm never gunna be good' so they just give up instead of trying.	Perceived competence		
Tania, year 10: I think it's mostly about motivation and how committed you are to the particular type of sport **Penny, year 8:** [reaction to moving down sets in PE] Well I was kind of like shocked. I thought I was doing really, really well… But I was okay about it because I knew I would try. To try and get, get there again. When you get negative feedback, like when I got told I was moving down it like, abled me to make sure I'm hardworking.	Dedication / commitment		

Table 3.2 (Continued). *Raw data themes representing protective factors in PE*

Gemma, year 10: We weren't given a choice to drop out so you had to do it. Even if you ended up being like forty minutes or something, you're not allowed to not try.	Autonomy	Cognitive Factors	**Individual Assets**
Liam, year 8: Well, like let's say you're a really sporty person and you got told in PE that you're like, not doing as good then you'd -because you love sports anyway you'd just keep on trying.	Enjoyment		
Mark, teacher: The ones who are more resilient are the ones that would just like the attention anyway. So the one's that would be like 'Oh I did rubbish on that test, never mind', because they are confident people… they're not afraid to share that and almost show off the fact they've done badly, whereas as some students are so introverted it would be the most embarrassing thing ever.	Extraversion	Personality Traits	
Joe (year 8): A bit of aggression is good. Like you wanna be better than other people. You wanna be like.. wanna make youself stand out compared to other people. **Dave, teacher:** [Resilient students] just want to be the best. They want to be the best they can possibly be. And it's that drive, it's that inner drive that pulls them through.	Drive		
Lucy, year 10: I'm quite used to having regular feedback and contructive criticism about how I'm doing. Like really, tiny, specific things. It's like, you tend to just like, keep going. And really, it doesn't affect me that much, because I'm used to it and you just try it again really. **Alex year 8:** Boxing's like a tough sport, like you're always getting told bad stuff like, you gotta work on this..and you gotta work on that, like, so like when you come here you just take it as a doddle really. **Max, year 9:** Because like.. I don't really do that much sports outside or at home. But everyone else does, like tonnes… like I could keep trying. But there wouldn't really be a point.	Extra-curricular activity	Behavioural Factors	

Table 3.2 (Continued). *Raw data themes representing protective factors in PE*

Connor year 7: If they [non- resilient students] struggle, they'll have a go at it but if they fail at it then they'll just forget it. 'Cause they'll think, well I've tried once and I'm just gunna embarrass myself more. But if they try once and it works, but if it doesn't then they'll just leave it. **Adam, year 10:** So I've got like one pupil in my mind, who could be a real good GCSE PE student, and she's got really strong practical marks, but her kind of self-confidence is really low and she'd rather just not do it than fail.	Failure avoidance / appraching challenge	Behavioural Factors	**Individual Assets**
Claire, year 10: It depends on... how you feel about other people, how well you know them. If you think, 'well I know them, they're not gunna judge me' so you can be yourself around them but then there's other people in the group.. that you think, I don't wanna do anything in front of them because I feel like they'll probably think I'm weird.	Being with friends	Peers	**Environmental Resources**
Mark, teacher: I'd say the most resilient learners are the ones that have got the social status where they don't really care about other people's opinions because if they're already up and above in y'know the cool crew they think 'Yeah actually I've failed at this but I'll try again. I'm not affected by your opinion. A learner who is a bit more insecure about their social status in the group might take it more to heart if they've failed. **Hannah, year 10:** I think it's also like a social pressure as well, about whether you're gunna be able to take it and not think of it personally. So y'know like, if you're popular, you won't take things personally. You can just like brush it off, like, just come back with another remark about something. So you don't take [public failure] personally. (Hannah, year 10).	Perceived social status		

Table 3.2 (Continued). *Raw Data Themes representing protective factors in PE*

Emma, year 7: They [teachers] know what you can do and what you can't do so they just try to challenge you for what you can do and not like, try and expect you to do things that you can't do. **Adam, teacher:** [talking about SEN boy couldn't grasp skill] he just didn't wanna do it. So what we did, well what I did in the lesson was differentiated so differentiated the equipment, so he went to a sponge ball to start and he was just doing a co-ordination station around cones to build up his confidence. Then he went to a ralley with a bigger ball and all of a sudden he experienced success and y'know his confidence came back up.	Differentiation	Teachers	**Environmental Resources**
Mark, teacher: I guess a lot of it is like real simple things like positive reinforcements. **Vinnie, year 7:** There are some kids that are not so good at rugby, but then if they make a challenge [make a tackle] then the teacher will say "well done, keep doing that" and that encourages them to do it more.	Reinforcing resilient behaviour		
Amy, year 8: When teachers give you like, criticism, they always give like constructive criticism, and something that you should like work on to improve. **Ciaran, year 8:** Mr. S is one of those teachers that like, if you're struggling or something, he'll tell you what to do for it to be better, then you do it again, and he'll say 'no that's still not right' and tell you what to do, so then you'll keep persevere and keep trying to do better. And I've heard you get better grades with Mr. S, because they're like that.	Specific feedback		
Dave, teacher: It's instilling that from day one, even in year one, that things are difficult, things are hard and you've got to just keep going. (Dave, teacher) **Jessica, teacher:** We try to meet individual needs. So just try and build them up to be a better person, resilience is tried to be built up from grassroots as soon as they've come into the school.	Teaching resilience early		

Table 3.2 (continued). *Raw data themes representing protective factors in PE*

Alex year 8, "The teachers are like your mates and they help you out a lot. They're more of like, a lad, and it's more relaxed so you don't feel as bad [when experiencing a performance stressor].	Student-teacher relationship	Teachers	**Environmental Resources**
Jessica, teacher: [on parents' value of PE]so if they say, "oh it's PE go and have a little run around", whereas if they think, "I really wanna be in the first team or do well and get a good grade". And because we do grade them and give them reports, that does give them a bit of a, "oh, I wanna get a good grade, I wanna work hard" – **Max, year 9:** My dad just said to me when I was in year seven and eight, just like care about the subjects that you're gunna take for GCSE, and that it doesn't really matter how you do in the other ones.	Parents value of PE	Environment and value	
Hannah, year 10: 'cause with PE there's just not the same pressure as in other subjects. If you get something wrong in Maths then you might worry because you have the pressure that you might fail the exam, whereas in PE, we're not doing an exam in it… there's not that pressure to do it right – **Georgia, year 10:** it almost makes you more relaxed in PE… I almost look forward to PE 'cause I don't have that pressure to do well.	School culture		

skills were likely to bounce back well from the frustrations of making mistakes: "When we know we're not as good at something then we'll keep practising and practising at it and get better. We're more committed than some of the other girls (Caley, year 9). It is important to note however that it was the higher ability students, with high perceived competence, who reported being committed to self-improvement. This highlights the number of interconnecting factors that influence how students adapt to the physical challenges they experience in PE.

Autonomy. Autonomy was a cognitive factor that influenced adaptation to minor stressors in PE. However, surprisingly, it was a lack of autonomy that facilitated adaptation to minor stressors in PE. When questioned about how they overcame specific emotions resulting from performance stressors, such as feeling embarrassed or self-conscious, students simply stated that there was no other option than to just carry on: [talking about being resilient when doing cross-country] "we weren't given a choice to drop out so you had to do it. Even if you ended up being like forty minutes or something, you're not allowed to not try" (Gemma, year 10). Similarly, students reported working in groups with classmates who they had previously "fallen out" with, stating that there was no other choice so they had to "just get on with it" (Matthew, year 8).

This idea contrasts with research utilising the Self-Determination Theory (Deci & Ryan, 1985) to investigate motivation in PE lessons. Findings in this area demonstrate that low levels of autonomy (i.e. little or no choice) are related to lower participation in PE lessons (Lonsdale, Sabiston, Raedeke, Ha, & Sum, 2009) Therefore, while 'no choice' may result in immediate positive adaptation to minor stressors, for example by completing a fitness test, it is likely to have long term detrimental effects to motivation and engagement in PE.

Enjoyment. Finally, higher levels of enjoyment of a particular activity facilitated students' positive adaptation to minor stressors in those activities. Students recalled that if they experienced a performance stressor, for example making public mistakes or not being able to master skills, they were more likely to 'bounce back' if levels of enjoyment were high:

Connor, year 8. Well, like let's say you're a really sporty person and you got told in PE that you're like, not doing as good then you'd be like because you love sports anyway you'd just keep on trying.

This quote also highlights the role of perceived competence (i.e. 'really sporty person'), as mentioned above, suggesting that the combination of enjoyment and perceived competence facilitates one's ability to adapt to minor stressors in PE lessons. This supports quantitative investigation which suggests a strong relationship between perceived competence and enjoyment in PE lessons (Carroll & Loumidis, 2001)

Personality traits

Extraversion. As noted in the previous chapters, there is debate as to whether resilience should be conceptualised as a trait or a process. While the majority of the protective factors reported in this discussion support the latter conceptualisation, both teachers and students recalled personality traits that facilitated recovery from stressors in PE. Quotes reported in Table 3.2 demonstrate that participants believed those with a more extroverted personality were more able to overcome stressors associated with PE lessons:

Steve, PE teacher: "The ones who are more resilient are the ones that would just like the attention anyway. So the one's that would be like 'Oh I did rubbish on that test, never mind', because they are confident people… they're not afraid to share that and almost show off the fact they've done badly, whereas as some students are so introverted it would be the most embarrassing thing ever."

More specifically, extraversion influenced the way in which stressors were appraised, meaning that extroverted students do not interpret certain stimuli (e.g. demonstrating physical incompetence) as harmful to their wellbeing.

Drive. Participants also reported "drive" as a personality trait that facilitated resilient behaviours. This subtheme is closely related with the cognitive factor of commitment and determination, however it tended to be described as an innate feature of a student's personality, rather than a conscious process: "It's that inner drive that pulls them through" (Dave, teacher).

Behavioural factors

Extracurricular-activity. Students also reported behavioural factors that reinforced positive adaptation to stressors in PE. Participating in sports clubs after school and outside of school meant that students were more accustomed to experiencing performance stressors (e.g.

difficulties grasping skills) and therefore felt more able to overcome such stressors during their PE lessons:

Alex (year eight): Boxing's [club outside of school] like a tough sport, like you're always getting told bad stuff like, you gotta work on this and you gotta work on that, so like when you come here you just take it as like, a doddle really.

Other students reported similar feelings, proposing that attending activities outside of PE lessons allowed them to experience negative feedback and constructive criticism, which they understood would develop their skills in the long-term. As with some other overlapping subthemes in this discussion, the availability of extra-curricular activities could be classed as an environmental resource that facilitates resilience (opposed to an individual behavioural asset) given that students cannot attend extra-curricular clubs if they are not available to them. This became apparent when conducting focus groups with students from one school with a higher proportion of students eligible for free school meals (an indicator of lower socio-economic status). Teachers from this school highlighted the lack of opportunity meant they were less equipped with dealing with performance stressors in PE lessons.

Approaching challenge. A further behavioural protective factor reported by participants was 'approaching challenge'. More specifically, 'failure avoidance' was frequently reported as a behavioural factor that inhibited positive adaptation to performance stressors. Older female students recalled times where they did not attempt particular activities, especially when performing in front of the opposite sex: "When we were playing rounders with the boys I just hit the ball first time and was like, "oh, I'm out" even though I wasn't out" (Maya, year 10). Both male and female students described non-resilient students as those who walked the entirety of a cross country course or did not participate in fitness tests to ensure they would 'come last' on their own terms. This finding support previous research into academic buoyancy and resilience, which identified failure avoidance as negatively related with motivational and engagement outcomes in classroom-based subjects (Martin & Marsh, 2008a,b).

Environmental resources

Environmental resources were comprised of lower order themes of peers, teachers, and parental factors. In terms of peers, participants reported that social status facilitated

students' capacity to overcome stressors in PE. Parental factors were not directly recalled as facilitators of resilient behaviour, however teachers and students recalled how parental views impacted their own values and attitudes towards overcoming stressors in the subject. Students recalled the influence of their teachers most frequently.

Teachers

Differentiation. All teachers recalled their own technique for ameliorating the effects of performance stressors is to provide scaled options for students, to account for differences in ability within the same group:

Joe (teacher): When we were doing table tennis, some of the lads are very able, holding their rallies. But one pupil, David, he couldn't hit the ball back. And looking around, he's in a social setting and he's getting really frustrated and he just didn't want to do it. So what I did in the lesson was differentiated, so differentiated the equipment, so he went to a sponge ball to start and doing a co-ordination around some cones to get his confidence up. Then he went to a rally with a bigger ball and all of a sudden he experienced success.

Thus, teachers are providing greater opportunities for successful execution of a skills in response to failure to ensure that students are motivated to persevere. The concept of differentiation has not been addressed within the framework of academic resilience. As this theme was consistently reported as the most important facilitator of resilience in PE, future research may consider testing the impact of differentiation in an experimental study. This is by no means the first recognition of the positive effects of differentiation in PE lessons (Aelterman et al., 2016; Jagacinski & Nicholls, 1984), however it is yet to be tested whether differentiating tasks can mediate the influence of stressors and positive adaptation in PE lessons.

Reinforcing resilient behaviour. Another environmental resource that was recalled in the focus groups was teachers' positive reinforcement of resilient behaviours. For example, students recalled situations whereby classmates had stepped out of their comfort zone to perform a skill or activity that they had previously failed at. Reinforcement from their teachers encouraged students to continue to approach difficult challenges:

Dom (year seven): There are some kids that are not so good at rugby, but then if they make a challenge [make a tackle] then the teacher will say "well done, keep doing that" and that encourages them to do it more.

Moreover, some teachers suggested that the use of 'effort grades' as opposed to achievement grades in PE facilitated students' resilience, as it was a form of positive reinforcement for their persistence. This lower order theme of reinforcing resilient behaviours relates to the substantial work of social cognitive theories of achievement motivation (Ames, 1992a, 1992b; Nicholls, 1984) and motivational climate in PE lessons (Goudas & Biddle, 1994). Previous research supports the positive effects of teachers providing a 'mastery' climate, that is, providing high praise for effort regardless of actual achievement, as opposed to a 'performance climate' (i.e. praising superior ability or performance). Moreover, the importance of reinforcing resilient behaviours in PE is consistent with the TARGET framework, proposed by Ames (1992a, 1992b) and Epstein (1989). The TARGET framework is a means of understanding how PE teachers' behaviours can emphasise either mastery of goals. The 'R' of the TARGET acronym represents 'recognition' (i.e. the manner of distributing rewards such as praise'), and research demonstrates that endorsing these behaviours results in positive behavioural, affective, and cognitive outcomes in PE lessons (Braithwaite, Spray, & Warburton, 2011) Thus the facets, for example, 'recognition' may mediate the relationships between stressors and positive adaptation.

Teaching resilience early. Positive reinforcement is something that teachers agreed should be utilised as early as possible. A number of teachers proposed that specifically teaching resilience from "grass roots" and "instilling that from day one that things are difficult but you just keep going" (Dave, teacher). During the introduction to the focus groups, the researcher asked each group what they understood by the word "resilience". The majority of students could not give an adequate response. Teaching students the concept and value of resilience is not explored in the academic resilience or buoyancy literature, therefore it would useful to investigate whether teaching the meaning of resilience could impact positive adaption in lessons.

Specific feedback. Similarly, teachers providing specific feedback in response to failure facilitated students' positive adaptation to performance stressors. Providing clear and achievable direction for students promoted a student's tendency to try activities again:
Chris (year nine): Mr. S is one of those teachers that like, if you're struggling or something, he'll tell you what to do for it to be better, then you do it again, and he'll say 'no that's still

not right' and tell you what to do, so then you'll keep persevering and keep trying to do better. And I've heard you get better grades with Mr S, because they're like that.

Student-teacher relationship. Both teachers and students recalled that students who had a good relationship with their teachers were more likely to positively adapt to stressors in PE. However, a good relationship may be the 'side effect' of perceived competence, as students who described a strong bond with their PE teacher tended to be those who were already motivated in PE. That is, students who are already competent and motivated to improve further are more likely to communicate with their teachers and seek advice.

Peers

Social status. Peer dynamics were a resource that students and teachers suggested facilitated their positive adaptation to potential stressors in PE lessons. All teachers proposed that social status modified the effects of stressors (see Table 3.2):

Karl (teacher): I'd say the most resilient learners are the ones that have got the social status where they don't really care about other people's opinions because if they're already up and above in y'know the cool crew they think 'Yeah actually I've failed at this but I'll try again. I'm not affected by your opinion. A learner who is a bit more insecure about their social status in the group might take it more to heart if they've failed.

Peer dynamics worked in one of two ways. First, teachers suggested that students who were felt secure in their social status did not appraise particular situations as stressful, where other (less secure) students would. These students are unaffected by the potential social impact of their failure and will continue to persevere. Students reinforced the idea that 'popularity' protected some students from the negative impact of social stressors and performance stressors in PE (see Table 3.2).

Being with friends. Similarly, students who perceived themselves to be less 'popular' felt protected from the impact of stressors if they were in groups with their friends: You've always got one friend that you're happy to work and if you do something wrong [i.e. performance stressor] you just think, oh it doesn't matter, and you keep on trying at it (Emma, year 7).

School culture and parental influence

Earlier in this discussion, I reported that understanding the value of subjects modified students' positive adaptation to stressors in PE lessons. This cognitive variable was highly influenced by the school culture and parental influence which I felt worthy of noting as a subtheme of environmental resources. Specifically, teachers reported that when students had parents who reinforced the value of PE, they were more likely to positively adapt to setbacks in PE with the aim of developing their skills. Moreover, some students recalled their parents' views on PE as impacting their resilience to performance stressors in PE. The following quote came from a male student who self-reported as a non- resilient student in PE, tending to "give up" in response to initial failure in acquiring physical skills:

Max, year 9: "My dad just said to me when I was in year seven and year eight, just like care about the subjects that you're gunna take for GCSE, and that it doesn't really matter how you do in the other ones"

A similar theme of school culture also impacted students' responses to working at acquiring physical skills following setbacks. Many students recalled that their school prioritised core subjects, such as Maths, English and Science, over PE:

Hannah, year 10: 'cause with PE there's just not the same pressure as in other subjects. If you get something wrong in Maths then you might worry because you have the pressure that you might fail the exam, whereas in PE, we're not doing an exam in it… there's not that pressure to do it right –
Georgia, year 10: it almost makes you more relaxed in PE… I almost look forward to PE 'cause I don't have that pressure to do well.

This feeling that teachers prioritised academic subjects was repeated by many students, who suggested that PE lessons were a time to relax, with less focus on self-improvement. These environmental influences therefore may work in the opposite way to protective factors, inhibiting students' positive adaptation to performance stressors in PE.

General discussion

There is increasing evidence that daily stressors have a significant impact on academic outcomes, due to their cumulative and proximal nature. Adolescents' school-based stressors have been associated with academic performance, wellbeing and negative attitudes towards school (Byrne et al., 2011; Torres et al., 2012). To date, there has been limited exploration of the common stressors associated with students' participation in PE lessons. Study One identified a range of stressors relating to the social environment, the physical and organisational environment, and the performance environment.

The identification of more 'severe' stressors, including negative peer interactions, public performance, and body exposure, replicates previous findings (Elliott & Hoyle, 2014; O'Connor & Graber, 2014; Wiltshire et al., 2017; Yli-Piipari, Watt, Jaakkola, Liukkonen, & Nurmi, 2009). The current study extends previous findings however, by identifying the more minor, yet frustrating, environmental demands that may influence participation. For example, discrepancies between individuals' perceived effort levels and those of their peers, is a relatively mundane, yet frustrating experience for students. Furthermore, the public nature of participating in challenging activities, and the tendency of boasting about physical ability, are examples of the everyday hassles associated with PE that may impact engagement. The research presented here suggests that the stressors experienced in PE are unique from those in the classroom, and thus current findings related to the impact of daily stressors on educational outcomes may not be applicable to engagement in PE.

Recent research investigating students' positive adaptation to daily academic stressors has primarily focussed on cognitive factors, including low uncertain control, commitment and composure (Martin et al., 2010; Martin & Marsh, 2008, 2009). Study two extends current research by identifying unique cognitive factors that may facilitate resilience in the PE context. Furthermore, it explored environmental factors that may ameliorate the impact of stressors on positive adaptation.

A number of the protective factors explored in study two have conceptual overlap with existing theories of motivation, for example the Self-Determination Theory (Deci & Ryan, 1985) and Achievement Goal Theory (Ames, 1992a). For example, protective factors relating to teachers creating an environment that reinforces effort is likened to research that finding positive effects of creating a mastery climate in PE. Within the sport and exercise psychology literature, there has been an increased call for researchers to integrate

psychological theories (reference needed here). In a review of the application of SDT to sport and exercise, Hagger and Chatzisarantis (2008) suggested that future research should endeavour to combine SDT with other theories of motivation. Theoretical integration may provide an optimal explanation of behaviour and identify commonalities in motivational constructs across theories, reducing redundancy by restricting psychological predictors of outcome behaviours. More recently, Nicholls, Levy, Carson, Thompson, and Perry (2016) combined self-regulation theories from the health psychology literature to investigate wellbeing in sport performers. Study two highlights the opportunity to combine existing motivation theories within the framework of resilience, investigating motivational constructs (e.g. motivational climate, implicit theories) as mediators of stress and positive adaptation.

Strengths, limitations and future directions

The current study was the first to comprehensively explore everyday stressors in the context of PE. Moreover, it utilised the existing framework of resilience, applying the theory to PE for the first time. While the study had strengths there were a number of limitations. The current study requested PE teachers to select students from their class who reflected a range of ability levels, motivation and engagement in PE. While this may have been achieved, there is a possibility that the sample reflected students that were more likely to respond positively to questions about their experience in PE lessons. Future research may benefit from seeking a random selection of students and complement focus group and interview data with observations of PE lessons. Moreover, the participants in the current study were mainly White British, therefore future research may benefit from exploring the views of individuals from a range of ethnic backgrounds. Furthermore, the subthemes of protective factors that emerged were predominantly factors that would facilitate responses to performance stressors. Less attention was placed on protective factors for resilience to organisational and social stressors which may have identified more varied protective factors.

The current studies could have been more methodologically rigorous, and future research should utilise methods that are consistent with recent guidelines for developing trustworthiness in qualitative research (Smith & McGannon, 2017). For example, future qualitative work should incorporate the process of member checking, that is, allowing participants to validate the credibility of the data and the results. Furthermore, although inter-rater reliability (or inter-coder agreement) was utilised within the studies, a more formal process should be incorporated. For example guidelines suggest that two or more researchers should independently code data and come to an agreement over the codes to check that

coding is replicable (Lincoln & Guba, 1985). While discussion took place to ensure the credibility of the data, the two additional researchers involved did not formally code significant sections of the transcripts. Use of more rigorous methodologies prevents researchers using pre-existing theories and knowledge guide the analysis and results. It is possible that this occurred during the current analyses and therefore the trustworthiness of the results could be improved in future research.

The current study has begun to explore common stressors in PE. Future research may progress by investigating the cumulative impact of these experiences and investigating how, and why some students disengage in the face of stressors while other demonstrate resilience to the same environmental demands. Although recent years have seen an increased interest in exploring resilience to everyday stressors in school (Martin & Marsh, 2008; Skinner et al., 2013), these investigations refer to general academic challenges. By first identifying common stressors in PE, we can begin to investigate how different students appraise these stressors, and how these appraisals impact engagement and motivation in PE lessons.

Chapter IV: Empirical Research: Studies Three – Six

Content

In the previous chapter, I explored the existence of the everyday stressors that students commonly experience during their PE lessons. Drawing on the conceptualisation of daily stressors, the aim of chapter four is to describe the development and validation of the PE Stressors Scale (PESS). Chapter three reported study one and study two, a qualitative exploration of the everyday stressors reported by secondary school students and the protective factors utilised to ameliorate the effects of such stressors. Chapter four reports studies three to six, a series of related studies developing and validating the questionnaire. The aim of study three is to provide content validity of a pool of items designed to reflect everyday stressors in PE for secondary school students. The purpose of study four is to test the factorial structure of the PESS via exploratory factor analysis (EFA). The aim of study five is to test the factorial structure of the PESS via confirmatory factor analysis (CFA) and exploratory structural equation modelling (ESEM). Finally, study six aims to cross-validate study five findings with another independent sample.

The aim of studies three-six was not to replicate the higher order dimensions presented in the qualitative study one. Among the stressors identified in study one, of most interest were those that were relevant to further psychological enquiry and potential intervention. One higher order theme presented in study one was organisational stressors, such as the size of changing rooms and bad weather. At the outset of the measure development, it was felt that this higher order theme would be something that future psychological or pedagogical interventions could not address. Therefore, throughout the measurement development process, themes that related to teaching practices, peer dynamics and performance (which did arise in the qualitative studies) were of greatest interest. To produce a measure of stressors that could not lead to later intervention felt of little scientific use. The measure development process therefore was not directly modelled on the findings of the qualitative study. Rather, the aim was to examine how all of the themes could be parsimoniously reduced.

Academic resilience

Over the past three decades, there has been an increased research focus on the understanding of human functioning in demanding situations. The concept of resilience has been examined across many contexts, including the military, healthcare, sport performance and business organisations, however, most researchers agree that, for resilience to be demonstrated, both a stressor and positive adaptation should occur. Protective factors are those variables that ameliorate the impact of stressors of positive adaptation. Inconsistencies in the specific delineation of these two concepts have resulted in confusion about their meaning, and some researchers questioning the scientific value of resilience (Bodin & Winman, 2004). To be of scientific use, and to facilitate out understanding of resilience specific to the context of the school, it is necessary to identify risk factors, protective factors, and outcomes that are most pertinent in this context. Protective factors that have been identified as facilitators of positive adaptation in the context of sport performance and the military, for example, will not be pertinent in the school or PE context, and therefore specificity is required when examing the resilience process.

Within the academic context, indicators of risk have primarily included distal factors such as: low socio-economic status (e.g. Connell, Spencer, & Aber, 1994; Irvin, 2012) ethnicity (Gordon, 1996; Gutman, Arnold, & Jacquelynne, 2002), and inadequate parental care (Fantuzzo et al., 2012). More recent resarch has begun to identify proximal acadeimc stressors, which include: too much work, home work, disagreements with teachers, having to get up too early, school/leisure time conflicts, and studying things that are difficult to understand (Byrne and Mazanov, 2002; Byrne et al., 2007). In the academic context, positive adaptation has been represented primarily by academic achievement, indicated by test scores. However I propose in chapter two that motivation and engagement are appropriate indicators in the academic and PE context. In terms of protective factors, emotional intelligence (Abel, 2013), extra-curricular activity participation (Braddock, 1991), school variabels (e.g. class size, disruption; Ferrera, 2015), among many other variables (see chapter two, part two) have been identified as protective factors. The current chapter applies the concept of resilience to physical education. To be scientifically useful, researchers must examine resilience specific to the context that it being applied. Thus, the current chapter focuses on the first of the three constructs of resilience, that is, stressors.

Resilience to daily stressors

Everyday stressors, or daily hassles, have been defined as "experiences of daily living that have been appraised as salient and harmful or threatening to the endorser's wellbeing" (Lazarus, 1984, p. 376). Identifying everyday stressors of adolescents is important because the experience of cumulative, minor stressors has been found to be detrimental to adolescents' psychological wellbeing and school experience. Specifically, previous research indicates that everyday environmental demands may form the primary cause of stress experience in children and adolescents, causing adverse impact on psychological (Carter et al., 2006; Kiang & Buchman, 2014; Lehman & Repetti, 2007; Sim, 2000) and psychosomatic (Hjern et al., 2008) outcomes. Furthermore, everyday stressors are pertinent within the school context as the experience of daily stressors has been found to impact educational outcomes. To illustrate, adolescents who experience a higher frequency of daily stressors show less capacity to sustain attention, and require more time to retrieve information from episodic and working memory (Torres et al., 2012). Furthermore, minor stressors including noise annoyance have been shown to have detrimental effects on school work, particularly during lessons that require greater cognitive capacity (Lundquist, Holmberg, & Landstrom, 2000).

Research from the academic resilience literature also highlights the impact of the common stressors that are associated with everyday school life, and that are relevant for the majority of students (Martin & Marsh, 2006, 2008). Specifically, Martin and colleagues developed the concept of academic buoyancy, which refers to students' ability to "successfully deal with the academic setbacks and challenges that are typical of the ordinary course of school life" (Martin & Marsh, 2008a, p.54). Thus, buoyancy refers to an 'everyday resilience', and Martin and colleagues liken the setbacks and challenges associated with school life to Lazarus' concept of daily stressors (Lazarus, 1984). Examples of these daily stressors include; the pressure of competing deadlines, isolated poor grades, and dips in confidence with regards to academic work (Martin & Marsh, 2008). Evidence suggests that those who are well equipped at dealing with these everyday stressors are more engaged, motivated (Martin, 2013, 2014) and are less anxious about academic tests (Putwain & Daly, 2013; Putwain, Daly, Chamberlain, & Sadreddini, 2015).

Measuring resilience to daily stressors

Despite the consistent findings that resilience to daily academic stressors predicts positive outcomes, limitations in the approach to measuring the concept can be identified. As

discussed in chapter two part one of this thesis, the concept of buoyancy (i.e. resilience to 'everyday stressors') is assessed using a four-item scale, reflecting students' cognitive responses to minor stressors (e.g. "I am good at dealing with setbacks at school"; "I don't let these types of difficulties get on top of me"). This method of assessment reflects the conceptualisation of resilience as an *outcome*. In contrast, it is generally accepted among researchers in the field that resilience should be conceptualised as a *process*; an interaction between an individual and their environment, that may change over time and context (Luthar et al., 2000; Masten, 2001). Moreover, scholars suggest that the most reliable and valid way to measure the concept is through the independent assessment of: stressors, positive adaptation and protective factors (Windle et al., 2011). As Martin and colleagues conceptualise buoyancy as an 'everyday resilience', I propose that resilience to everyday academic stressors should utilise the same approach as the resilience literature (see chapter two part one).

There are limitations of existing resilience questionnaires applied to education. These include the use of distal factors, for example SES, gender, or ethnicity, as proxy measures of academic stressors or risk. Using a single indicator makes the assumption that all students within a particular demographic are at equal risk of poor academic outcomes. The measurement of resilience would therefore benefit from the development of a reliable and valid checklist of events that are associated with academic engagement and poor academic motivation. Relatedly, the majority of academic resilience research studies utilise a measure of academic achievement (i.e. grades, graduation status) as a proxy for positive adaptation (Tudor & Spray, 2017). This approach provides a limited view on what education is about; focussing solely on test results overlooks students who may be naturally very intelligent however struggle when it comes to autonomous learning or problem solving. The studies presented in this chapter will build upon the limitations of previous resilience measurements by a) develop a measure of daily school-based stressors that have the potential to be appraised as harmful by the endorser, and b) assess positive adaptation using a measure of academic engagement or motivation. Researchers should then seek to identify protective factors that mediate the relationship between stressors and positive adaptation.

Focussing on the first concept of stressors, as demonstrated in chapter two part three, a number of measurement scales have been developed to assess daily stressors relevant to adolescent populations (Byrne, Davenport, & Mazanov, 2007; Kanner, Feldmen, Weinberger, & Ford, 1987). Addressing this research literature can facilitate investigations into academic resilience in adolescents. The majority of existing measures of daily stressors comprise items

reflecting many domains including, school, peers, home, health, and emerging adult responsibilities. This broad and overly inclusive approach of measuring stressors across many contexts makes it difficult to assess the unique impact of stressors on outcomes. Very few measurement scales have focussed solely on adolescents' experience of school-based stressors, however, those that have may be utilised in the assessment of academic resilience (Heubeck & O'Sullivan, 1998).

Measurement scales that assess adolescents' experience of school-based stressors prioritise academic stressors and interpersonal transactions (Heubeck & O'Sullivan, 1998). To the best of my knowledge, no scales recognise the unique contribution of PE participation to the everyday stress experience in adolescence. Given students in the UK should have two hours of PE per week (Department for Education, 2013), such stressors may not constitute "daily", however, it is possible that the frequency and severity of common stressors experienced in PE may have detrimental outcomes in terms of motivation and engagement in the subject over time. Existing measures of daily stressors related to school or academic difficulties are not appropriate for use in PE, given the unique context of PE lessons. PE represents one of the most significant contexts in which body image and physical self-perceptions impact on students' experience (Fox & Edmunds, 2000). Moreover, PE represents a situation where the body is used, displayed and discussed, with evidence suggesting that body image issues act as a barrier to students' participation in PE lessons (Paechter, 2003).

The present studies

Drawing on the knowledge of stressors in PE, gleaned from the qualitative enquiry (see chapter three, study one) and a review of daily stressors in adolescents (see chapter two, part three), the aim of chapter four was to develop and validate a measure of common stressors that students encounter in their PE lessons and provide evidence for its validity. In chapter two, I discussed some psychometric issues pertaining to the development of measurement scales of daily stressors which provided a foundation for the studies reported herein. Firstly, a critique of existing measures is the tendency for items to be 'contaminated' or confounded with cognitive appraisal. Such contamination leads to a bias in the relationships between what the scale intended to measure (i.e. stressor experience) and what they are used to predict (i.e. educational outcomes; Dohrenwend et al., 1984; Dohrenwend & Shrout, 1985). Kohn & Milrose, 1993). Thus, the items developed for the current scale reflect

environmental occurrences, rather than the emotional or cognitive responses to such situations. Second, while most existing measurement scales for daily stressors include rating scales for intensity (i.e. 'how bad did this make you feel') for each item, the decision was made not to do so for the current scale. It has been suggested that the use of rating scales for perceived intensity of each item evokes the suspicion that the items are contaminated, and may be leading for respondents (Heubeck & O'Sullivan, 1998). Moreover, these rating scales may be complex for young adolescents to comprehend. Finally, existing scales have been critiqued for lacking content validity (Byrne, Davenport, & Mazanov, 2007), for example being developed from pre-existing scales that were created for adult populations. The items comprising the scale under development in the current study were based on qualitative focus groups with adolescents to ensure they reflect the nature of students' experiences in PE (see chapter three: part one).

The purpose of the studies presented here is to develop a checklist of contextually relevant stressors in PE that may inform further development of a measurement of resilience in PE. The purpose is not to measure the concept of resilience, rather, to establish the 'first step' to developing a complete measure of resilience in PE. Four studies were carried out to demonstrate initial evidence for the PE Stressors Scale (PESS). Study three aimed to provide content validity of an initial pool of items designed to reflect stressors students might experience in their PE lessons. The purpose of study four was to examine the factor structure of stressors using explanatory factor analysis. Study five aimed to test the factorial structure of the PESS using confirmatory factor analysis, and test whether the measurement model was invariant across male and female students. Study five additionally aimed to test the concurrent validity of the model by examining the relationship between the PESS and relevant educational outcomes (e.g. engagement, disaffection, buoyancy, and amotivation). Finally, the purpose of Study six was to cross validate the measurement model in an independent sample, using confirmatory factor analysis.

Study three

Among the stressors identified in study one, of most interest were those that were relevant to further psychological enquiry and potential intervention. One higher order theme presented in study one was organisational stressors, such as the size of changing rooms and bad weather. At the outset of the measure development, it was felt that this higher order theme would be something that future psychological or pedagogical interventions could not address. Therefore, throughout the measurement development process, themes that related to

teaching practices, peer dynamics and performance (which did arise in the qualitative studies) were of greatest interest. As noted earlier in this chapter, to produce a measure of stressors that could not lead to later intervention felt of little scientific use. The measure development process therefore was not directly modelled on the findings of the qualitative study, and produce a fourteen item, three factor measure. Rather, the aim was to examine how all of the themes could be parsimoniously reduced.

The aims of study three were to first create a pool of items that comprehensively captured common stressors that are experienced by secondary school students during PE lessons. As noted at the beginning of this chapter, the aim of the empirical studies was not to replicate the higher order dimensions presented in the qualitative study one. However, the lower order themes identified in study one were used to reflect the first item pool of 46 items. Specifically, each item reflected a raw data quote that made up the subthemes in study one. Second, study three aimed to assess the content validity of the items via an independent panel of experts. The expert panel procedure was informed by recommendations outlined by De-Vellis, (2012), and on procedures outlined in previous measure development research in sport and exercise psychology (Arnold, Fletcher, & Daniels, 2013; Bartholomew, Ntoumanis, & Thøgersen-Ntoumani, 2010). Content validity is an essential aspect of scale development, and refers to the degree to which a set of items reflect the domain they intend to measure (Clark & Watson, 1995). The most effective way of examining content validity is through expert panel opinion (Dunn, Bouffard, & Rogers, 1999).

Method

Participants

Ten individuals were recruited as part of the expert panel to evaluate the content validity of the items. This panel comprised of academics in PE, pedagogy, and sport and exercise psychology (PhD research students, lecturers, and professor) and PE teachers.

Measure

A multi-method approach was utilised to inform the development of the scale (Hagger & Chatzisarantis, 2009). The scale was underpinned by the definition of everyday stressors, “the experiences of daily living that have been appraised as salient and harmful or threatening to the endorser’s wellbeing” (Lazarus, 1984, p. 376), and developed from a large qualitative investigation of common stressors experienced by secondary school students during their PE

lessons (see, chapter three). Focus groups and interviews were conducted with over 60 students (aged 11 – 15) and teachers. An initial pool of 46 items was generated based on the themes that were extracted within this study. To facilitate item generation, additional items were added based on existing research investigating barriers to participation during PE lessons (e.g. Elliott & Hoyle, 2014; Fox & Edmunds, 2000; Ridgers et al., 2007). The result of this item generation process was a preliminary version of the scale containing 46 items.

Procedure

Institutional ethical approval was obtained for all of the studies reported in this chapter. Specialists in the area of PE, psychological stress, and measure development, were recruited, via email, to participate in the initial validation of the scale (see Appendix One). In Section A, experts were asked to rate the suitability of each item presented to them by marking "yes", "no", or "unsure", with respect to (a) relevance (i.e. "does this question potentially relate to the common stressors experienced by students in PE"), (b) clarity (i.e. "Is this question worded clearly for students aged 11-16?"), and (c) specificity ("does the question target a common hassle in PE"). A definition of everyday stressors was provided for experts (Kanner et al., 1981). These procedures were developed according to DeVellis' (2012) recommendations. Under each item, a comment section was included to provide experts with the opportunity to add any further thoughts associated with their rating of the item. In Section B, the proposed format of the scale, and the response scale, was presented. This was followed by the opportunity to give general feedback (via open ended questioning) regarding the presentation of the scale, or any additional information that experts felt might benefit the development of the scale. In the general feedback section, experts were invited to comment on the items' readability, comprehension and suitability for secondary school-aged students and also make any recommendations (i.e. additions, deletions, or modifications) for the scale.

Results and discussion

Of the 46 items that were reviewed by the expert panel, 22 received unanimous endorsement from the experts with regards to, relevance, clarity, and specificity. The primary outcome of the expert panel procedure was the identification of items that were contaminated by the presence of appraisal of the stressors within the item. Therefore, some items were reworded to remove this potential contamination. For example, 'I have felt frustrated when I have been working with students who are much worse at PE than I am" was amended to "I

have been working with students who are much worse at PE than I am". Similarly, "I have worried about classmates making negative comments towards me" was amended to "classmates have made negative comments about me". Thus, all items reflected a specific environmental demand, or stimuli, that may be perceived by students as frustrating or demanding. The outcome of the expert panel process resulted in a revised 34 item measurement scale, named the PE Stressors Scale (PESS). This name was chosen to reflect the least contamination of negative appraisal. The 34-item scale can be found in Appendix Two, and compared to the initial 46 item scale that underwent the expert panel review in Appendix One.

Study four

The purpose of study four was to examine the factor structure of the 34 items stressors scale, generated and content validated in study three, using exploratory factor analysis (EFA). Additionally, study four aimed to reduce the number of items to a level that is sufficient to examine stressors in PE lessons. EFA was conducted for a number of reasons. Firstly, the philosophical assumption of factor analysis is that a selection of observed variables are reflective of underlying latent variables (Tabachnick & Fidell, 2013). This contrasts with formative measurement models, whereby latent variables are caused by the observed variables (Kline, 2005). Factor analysis was deemed the most appropriate approach in the current, and subsequent, studies due to the assumption that everyday stressors in PE are likely being caused by underlying individual and environmental processes. Many of the influential theories of daily stress are based on the premise that the dynamic process between individuals and their environments manifest themselves as specific daily stressors (Kanner et al., 1981; Kanner et al., 1987; Lazarus & Folkman, 1984). Moreover, in the research of daily stressors to date, most measures have been developed using factor analytic methods (e.g., Byrne, Thomas, Burchell, & Mirabito, 2009; Martin & Marsh, 2006).

EFA is an appropriate form of analysis to begin with when the goal of the analysis is to determine the number of latent variables (i.e. factors), and therefore the observed variables (i.e. items) are free to associate with all latent variables (Stevens, 2002). This is the case in the current study. Moreover, EFA is advocated during the early stages of scale development to avoid misspecification of the number of factors and to maximise the convergent and discriminant validity of the items constituting each factor (Gerbing & Hamilton, 1996; Hurley et al., 1997). The aim is to retain items that comprise the best fitted model to the data.

Method

Participants

The sample comprised 271 students (N = 140 females, N=131 males) in school years seven to 11 (M =8.51, SD=1.05), recruited from four secondary schools in the Midlands. PE groups were selected to represent all ages and physical abilities. Therefore, PE teachers were requested to select classes based on a specific year group and physical ability level (high, average, or low ability). This approach was also chosen to facilitate the logistics of collecting data within a school setting whilst obtaining a representative sample.

Measures

The 34-item PESS represented a range of children's experiences in PE. The items of the questionnaire emerged from in-depth focus groups and interviews with secondary school children and PE teachers (chapter three, study one). Students responded on a four-point Likert scale ranging from 1 (*never)* to 5 (*always)*, rating the extent to which potential stressful situations occurred during their participation in PE over the preceding four weeks.

Procedure

Participants were recruited by writing to the head-teacher, explaining study aims and design. If the head-teacher agreed to participate and consent was granted, PE teachers were contacted explaining the details of the study. To facilitate the recruitment process, each of the four schools were allocated year and ability groups by the researcher resulting in a representative sample of students with regards to age, gender, and ability. Students from specific PE groups were provided with a parent letter, informing them of the purpose of the study and a parent opt-out sheet providing the opportunity for parents to refuse their child's participation in the study. Letters and opt-out sheets stated that the study would commence in two weeks' time and therefore parents should opt their children out within this time frame. The questionnaire was administered to students who did not return their opt-out sheet. The children were given verbal instruction concerning completion of the questionnaire and any questions were answered before students began to complete the questionnaire. Students signed a willingness to participate form prior to completing the questionnaire and were encouraged to ask questions throughout completion, for example, if they did not understand a particular question.

Results and discussion

Exploratory factor analysis

Only 0.7% of the possible data points were missing, and no item had >5% missing data therefore, data were assumed to be missing in a random fashion (Tabachnick & Fidell, 2013). Discrete values were applied to represent missing values prior to analyses (Field, 2009). Following imputation, the suitability of the data for EFA was determined via examination of the correlation matrix. Bartlett's test of sphericity suggested item interdependence (χ^2 =434.91, p <.001) and an acceptable Kaiser-Meyer-Olkin sampling adequacy statistic was observed (.81). Therefore, the stressors correlation matrix was deemed suitable for EFA.

An EFA was then conducted on the 34 items to identify underlying dimensions of stressors in PE, using the criteria and considerations communicated by (Tabachnick & Fidell, 2013) to guide decisions regarding the suitability of items. Principal components analysis was carried out with direct oblimin rotation, as it was hypothesised that the underlying dimensions of stressors in PE would be interrelated (Kanner et al., 1987; Tabachnick & Fidell, 2013). The average communalities of the items was <.61, highlighting the need to use multiple criteria for factor extraction (Field, 2009). Factor extraction was based on an eigenvalue of >1.0 and a confirmatory inspection of the scree plot. Solely adopting the criteria for eigenvalues has the potential of retaining factors with no practical significance (Stevens, 2002). Item loadings of .30 and above were considered satisfactory (Kline, 1994, 2005). Items with a primary factor loading of <.30 and all items with high cross loadings (or secondary loadings) of >.30 were deleted.

Following a sequence of factor analyses and adopting the aforementioned criteria, 20 items were removed. The final EFA solution contained 14 items that loaded on to four factors and accounted for 56.5% of the items variance (see Table 4.1 for means, standard deviations, factor loadings, factor correlations and internal consistency estimates). Analysis of the content of items suggested that that the items could be represented by four factors. Factor 1, labelled *Performance,* consisted of five items that reflected stressors associated with performing an activity in PE below one's expected standard. This factor is conceptually consistent with students' reports (demonstrated in study one) of situations relating to performance, particularly public displays of physical performance, that are perceived as psychologically demanding. Students' reported that being excluded as a result of their below-

average performance in PE to be a frustration, and related to disengagement during lessons. Moreover, it is consistent with the literature focussing on adolescent everyday stressors which consistently emphasises situations relating to school performance as a potential demand for students (Copeland & Gunning, 1997; Kohn & Milrose, 1993; Murberg & Bru, 2007).

Factor 2, labelled *Classmate Behaviour,* consisted of three items that reflected stressors relating to the behaviour with regards to their participation in PE lessons. These items reflect situations when students recognise that the type (i.e. the kind of activity or topic) and 'level' (i.e. better or worse) of participation is conflicted with their own. This reflects subthemes that were within the higher order themes of the social environment. It also incorporates the subtheme of 'availability of activities' in study one (i.e. the behaviour of other students in the context of what activities they able to partake in). Factor 3 was labelled *Ability Grouping* and consisted of four items that reflected the way students are grouped during PE lessons and the implications of such groupings (for example, the dominance of students with greater physical competence). This is consistent with previous findings of the impact of physical capital (i.e. forms of symbolic and material resources related to the body) on presentations of power and dominance during PE lessons (Wiltshire et al., 2017). Factor 4 was labelled *Gender Interaction* and consisted of two items that reflected interactions with the opposite sex during PE lessons. This factor is consistent with the PE literature that suggests unequal power relations during lessons (Fisette, 2013). These four factors are reflective of the underlying everyday stressors in physical education (see chapter three). The factor correlations were small to moderate, ranging from r=-.36 to r=.39.

Item analysis

Next, an item analysis was carried out to assess the homogeneity of the items representing each factor (DeVellis, 2012). To assess the internal reliability of each factor, the following criteria were employed: (a) an inter-item correlation between r =.20 and r =.70, (b) a minimum corrected item-total correlation of r = .30, and (c) an increase in the alpha estimate if an item were deleted (Kidder & Judd, 1986). The majority of items met all three criteria. One item ("other classes in the year are doing different activities than my class") did not meet the criteria for item reliability. It was decided that this may have occurred due to the wording of the question. Taken from the qualitative enquiry this item should reflect gender differences in PE activities, however this may not be represented in the phrasing of the item. Thus, it was decided that this item should be rephrased and undergo further analysis. The two *Gender*

Interaction items did not meet the first two criteria for internal reliability, and were not applicable for the final criterion (due to being a two item factor).

Finally, Cronbach alpha coefficients were calculated to assess the internal consistency of the factors. The composite reliability coefficients for *Performance* and *Ability Groupings* were acceptable (α=.71 for both). The *Behaviour of Classmates* and *Gender Interactions* factors displayed low internal reliability (α = .47 and .39 respectively) and did not meet internal reliability recommendations (Nunnally & Bernstein, 1994). Despite the low estimates of internal reliability, the extracted factors appeared to represent salient stressors in PE, and were considered to be important by students in qualitative explorations (see chapter three study one) and experts in the panel analysis. Conceptually, we therefore believed it would be premature to delete any extracted factors at this early stage. Existing measure development literature suggests it is empirically justified to add items following an initial EFA to increase the internal reliability estimates of a given factor (e.g. Bartholomew, Ntoumanis, & Thøgersen-Ntoumani, 2010). Following a review of the transcripts of the qualitative studies, and discussion within the supervisory team, the decision was made to add items that would strengthen the reliability estimates of the Classmate Behaviour factor. Specifically, three items were added: “some of my classmates mess about during the lesson”, “if we do PE with the boys, they take over the lesson”, and “some of my classmates boast if they are better at PE than others”. This resulted in a 17-item questionnaire, consisting of 14 existing items and three additional items.

Table 4.1. *Item Means, Standard Deviations, Factor Loadings, and Skewness and Kurtosis Values Following Exploratory Factor Analyses (Study 4)*

Subscale and Item	M	SD	F1	F2	F3	F4	Skewness	Kurtosis	Com.
Performance									
I have been physically hurt during an activity	1.82	.94	*.42*	.031	-.12	.25	1.32	1.69	.32
I have not performed as well as others in my class	2.13	.87	*.80*	-.13	.08	-.15	1.03	1.48	.60
I have been excluded by my classmates (e.g. not being passed to)	1.73	1.1	*.62*	-.06	-.26	-.03	1.48	1.21	.56
I have been given a bad grade for an activity	1.80	.73	*.76*	.18	.10	.09	1.36	2.39	.62
I finished near the bottom of the class for an activity	1.86	.87	*.59*	-.02	-.20	.04	1.47	3.00	.48
Classmate Behaviour									
Others classes in my year are doing different activities than my class	2.95	1.28	.08	*.53*	-.15	.06	.23	-1.03	.40
I have been put in a group with students who are much worse at PE than me	2.11	.99	-.13	*.77*	-.10	-.03	.84	.37	.60
Classmates in my group have not made as much effort as I do	2.24	.94	.04	*.83*	.17	-.02	.83	.53	.67
Ability Grouping									
The class was dominated by the 'sporty' students in the class	2.63	1.16	-.07	-.07	*-.85*	.02	.45	.65	.66
My teachers(s) have paid more attention to the students who are better at PE	2.26	1.25	.17	.16	*-.72*	.05	.86	-.23	.76
All the sporty students work together	2.91	1.27	.03	-.01	*-.80*	.14	.36	-1.05	.68
I had to work with classmates who are not in my friendship group	2.77	1.04	.07	.14	*-.47*	-.27	.47	-.48	.35
Gender Interaction									
I have been working in front of the opposite sex	1.85	.77	-.03	.10	.09	*.76*	.95	1.60	.59
Some boys have boasted about being better at PE than girls	2.77	1.28	.03	-.09	-.12	*.78*	.17	-1.12	.64

Factor Correlations and Internal Consistency	F1	F2	F3	F4
Performance	.71			
Classmate Behaviour	.14	.47		
Ability Grouping	-.36	-.20	.71	
Gender Interaction	.09	.04	-.07	.39

Note: F1= Performance, F2= Classmate Behaviour, F3= Ability Grouping, F4= Gender Interaction. Com= item communalities. Numbers in italics indicate primary loadings. Composite reliability coefficients are presented in the diagonal of the factor correlation matrix.

item aimed only at female students: “if we do PE with the boys, they take over the lesson”. These were based on a review of the qualitative findings in the previous chapter. These additional items would more appropriately reflect classmate behaviour and gender interactions in PE. This resulted in a 17-item questionnaire, consisting of 14 existing items and three additional items.

Study five

The purpose of study five was to use confirmatory factor analysis (CFA) and exploratory structural equation modelling (ESEM) to cross-validate the findings of the EFA and further refine the factor structure of the scale. Study five also examined whether the resultant PESS scores were invariant across gender. Finally, the current study examined the concurrent validity of the PESS by examining the relationship between the proposed factors and related outcomes, specifically: engagement, disaffection, amotivation, and buoyancy in PE lessons.

CFA is the preferred data analytical technique to evaluate the adequacy of a proposed factor structure (Hagger & Chatzisarantis, 2009). Further, CFA is particularly valid when there is a strong theoretical base for the hypothesised measurement model (Marsh, 2012; Russell, 2002). Thus, development and validation of theory-based multidimensional measurement scales have usually utilised this approach, testing a correlated first-order factor model via CFA (e.g., Appleton, Ntoumanis, Quested, Viladrich, & Duda, 2016). Recent scale development studies, however, have tested multiple approaches to modelling the factor structure of scales using ESEM (e.g., Appleton et al., 2016). ESEM combines the principles of EFA and the CFA/SEM framework, as items are permitted to cross-load onto non-intended factors and fit indices are used to assess model fit (Asparouhov, Muthén, & Muthén, 2016). Both approaches were used in the current study to identify the best approach to assessing the factor structure of the PESS.

Method

Participants

The sample comprised 293 secondary school students (N=164 males; N=129 females), recruited from three secondary schools in the English Midlands. Participants were aged between 11 and 15, in school years seven to 10 (M= 8.23; SD=1.08).

Measures (see Appendix Three and Four)

PE Stressors Scale (PESS). The scale consisting of 17 items representing four factors: Performance, Classmate Behaviour, Ability Grouping, and Gender Interactions (as described in study four) was administered.

Engagement and Disaffection Scale. Students completed the 20 item Engagement and Disaffection Scale (Skinner, Zimmer-Gembeck, & Connell, 1998; Skinner, Wellborn, & Connell, 1990; Wellborn, 1991), which was adapted for PE. Behavioural engagement was assessed using five items that reflected students' attention, effort and persistence in PE (e.g. "I try hard to do well in PE"; α = .81). Behavioural disaffection was assessed using five items reflecting students' lack of effort and withdrawal from PE (e.g. I do just enough in PE to get by"; α = .81). Emotional engagement was measured using five items that reflected motivated participation during PE (e.g., "PE is fun"; α = .88). Finally, emotional disaffection was measured using five items reflecting motivated withdrawal during PE (e.g., "When I'm in PE I feel bad"; α = .89). All responses were given on a four-point Likert scale (1=not at all true; 4= very true).

Buoyancy. Students' buoyancy in PE was assessed using four items adapted from the Academic Buoyancy Scale (Martin & Marsh, 2008). The items intended to measure the degree to which students are resilient to everyday stressors in PE (e.g. "I'm good at dealing with setbacks in PE"). Reponses were given on a 7-point Likert scale (1=strongly disagree; 7 = strongly agree). In the current study, the scale was internally consistent (α = .74).

Amotivation. Students' amotivation in PE was assessed using four items adapted from the Academic Motivation Scale (Vallerand et al., 1992). The scale intended to measure the degree to which students felt amotivated in their PE lessons (e.g. "I take part in this PE class but I don't really know why"). Reponses were given on a 7-point Likert scale (1=strongly disagree; 7 = strongly agree). In the current study, the scale was internally consistent (α = .83).

Procedure

The procedures were the same as those outlined in study three.

Data analysis

The 17 item PESS was analysed with CFA using Mplus 8.0 (Muthén & Muthén, 2017). One item from each factor was fixed to 1.0 for the purposes of identification and latent variable scaling. The adequacy of the model fit to the data was evaluated using multiple fit indices, including the chi-square ($\chi 2$) statistic, the comparative fit index (CFI; Hu & Bentler,

1998), the Tucker-Lewis index (TLI; Tucker & Lewis, 1973), the standardized root mean square residual (SRMR; Hu & Bentler, 1998), and the root mean square error of approximation (RMSEA; Steiger, 1990). There is debate in the literature regarding the values indicative of acceptable model fit (Marsh, Hau, & Wen, 2004), however it is generally accepted that values of approximately .08 and .06 for the SRMR and RMSEA respectively (Hu & Bentler, 1998). Furthermore, a value of ≥.90 for the CFI and TLI indicates adequate fit, and a value of ≥.95 reflects excellent fit (Hu & Bentler, 1998; Marsh et al., 2004; Schermelleh-Engel, Moosbrugger, & Müller, 2003). The $\chi 2$ statistic and fit indices are not immune to misspecification, and therefore previous studies have used these values as guides rather than absolute values (Marsh et al., 2004). Therefore, in the current study, the values for fit indices were not interpreted as golden rules (Heene, Hilbert, Draxler, Ziegler, & Bühner, 2011), rather the overall fit of the model was assessed by considering multiple fit indices (Williams, Vandemberg, & Edwards, 2009). Items that displayed a large standardised residual (>|2.00|) and, or factor loadings <.40 were considered for deletion.

Alternative models were tested using ESEM (Asparouhov et al., 2016). A number of models were tested using procedures outlined by Appleton et al. (2016) and Myers (2014). As noted, testing models in CFA requires fixing item loadings to their hypothesised factor, and factors are permitted to correlate. ESEM allows items to cross load on non-intended factors, while using fit indices to assess model fit. The alternative model was tested in Mplus Version 8.0 (Muthén & Muthén, 2017) based on the robust maximum likelihood (MLR) estimator. The MLR provides standard errors and fit indices that are robust to the Likert nature of the items.

Discriminant validity was also investigated through observation of the factor correlations. Further data analysis calculated the scale descriptives and internal reliability estimates. Finally, concurrent validity was ascertained through inspection of correlations between factors of the PESS and related educational outcomes.

Results and discussion

Preliminary analyses

0.8% of the possible data points were missing and no item on the PESS had >5% of missing data, therefore, any data not present were assumed to be missing at random.

Descriptive statistics

Item means and standard deviations are presented in Table 4.2. Potential stressors had an overall mean scores of 1.80, 2.38, and 2.58 (out of five), relating to *Performance, Classmate Behaviour*, and *Ability Groupings* respectively, suggesting participants experienced a low to moderate frequency of minor stressors. Frequency analyses demonstrated that participants employed the entire response range for all items.

Confirmatory factor analyses

Results of initial four factor CFA, that a poor fit of the data to the model: $\chi 2$ (84) =256.93, p <.001, RMSEA =.08, SRMR = .73, CFI =.80, TLI =.75. The *Gender Interaction* factor had strong correlations with *Classmate Behaviour* (r=.92) and *Ability Groupings* (r =.84). *Gender Interaction* was also the weakest factor (in terms of internal reliability) to result from the EFA in study four. Therefore, the decision was made to remove the *Gender Interaction* factor and subsequently test a three-factor model consisting of *Performance, Classmate Behaviour* and *Ability Groupings*. An initial three-factor CFA suggested that modifications were required: $\chi 2$ (87) = 239.59, p <.001, RMSEA=.077, SRMR = .08, CFI = .77, TLI =.73. Therefore, in a sequence of CFAs five problematic items were removed. Excluding these five items improved the fit of the model to the data $\chi 2(48) = 89.53$, $p < .001$, RMSEA =.05, SRMR = .04, CFI = .94, TLI =.92 (see Table 4.2 for item means, standard deviations, and standardised factor loadings). These values indicate that the model is a good fit to the data. Therefore, the chosen model, that is, the best fitting model to the data, was a 12-item model comprising three factors: *Performance, Classmate Behaviour, and Ability Grouping* (see Table 4.2).

All factor correlation values were below <.85, providing initial evidence for the discriminant validity of the factors (Kline, 2005) Most items had a standardised factor loading of >.40, suggesting adequate convergent validity (Hair, Black, Babin, Anderson & Tatham, 2006). In addition, the average variance extracted (AVE) was examined using Fornell and Larcker's (1981) technique to test convergent validity. An AVE of $\geq .5$ suggests adequate convergent validity (Hair et al., 2006). The *Ability Groupings* factor had an AVE of $\geq .5$ supporting discriminant validity, however the *Performance* and *Classmate Behaviour* factors had an AVE $< .5$, suggesting inadequate discriminant validity. Cronbach alpha coefficients were calculated to assess the internal consistency of the factors. The composite reliability coefficient for *Classmate Behaviour* and *Ability Groupings* were close to acceptable (α =.69 and .67 respectively). The composite reliability coefficients for

Performance displayed low internal reliability (α =.56) and did not meet internal reliability recommendations (Nunnally & Bernstein, 1994).

Testing alternative models

Additional alternative models of the CFA were tested to determine whether the first-order three factor, 12 item model demonstrated the best fit to the observed data (Jackson, Gillaspy, & Purc-Stephenson, 2009). Firstly, a hierarchical model was tested whereby the three first-order factors were represented by one higher order factor (i.e. stressors). The fit of the hierarchical measurement model was worse than the 12-item model. Additionally, an ESEM on the initial four factor model resulting from the EFA in study four to determine whether this produced a better fit to the model than a CFA (see Table 4.4). A four factor was ran to test whether the model established in the EFA (study four) could be established using ESEM. Results from a four-factor ESEM produced good fit indices, CFI = .94, however observation of the pattern co-efficients indicated poor loadings or some items (i.e. <.30) and cross loadings of items across two factors. Furthermore, the factor structure did not appear to be conceptually meaningful. Finally, a three-factor ESEM was conducted to determine whether it produced a better fit to the three factor CFA. Results from a three-factor ESEM produced an adequate fit to the data (CFI = .90) however the fit was worse than the 12 item, three-factor CFA. Following the testing of alternative models, the best fitting model to the data was a 12-item model comprising three factors: *Performance, Classmate Behaviour, and Ability Grouping* (see Table 4.2).

Concurrent validity

Table 4.3 shows the correlations between the PESS and related, important educational outcomes in PE. *Performance* stressor scores were significantly negatively correlated with buoyancy (r=-.32, p< .05), behavioural engagement (r=-.58, p<.01), and emotional engagement (r=-.72, p<.01), and positively associated with amotivation (r=.68, p<.01), behavioural disaffection (r=.66, p<.01) and emotional disaffection (r=.67, p<.01). Significant correlations in the expected directions supports the concurrent validity of the Performance factor. The *Ability Groupings* factor was significantly correlated with behavioural engagement (r=-.33, p<.01), behavioural disaffection (r=.28, p<.05), emotional engagement (r=-.34, p<.01), and emotional disaffection (r=.32, p<.05), however was not significantly correlated with amotivation or buoyancy in PE lessons. The *Classmate Behaviour* factor was

not significantly correlated with any of the additional variables (see Table 4.3), therefore not supporting the concurrent validity of the *Classmate Behaviour* factor.

Study six

The first purpose of study six was to use confirmatory factor analysis (CFA) to cross-validate the three-factor model supported in study five, using an independent sample. Second, this study examined if the components of the measurement model were invariant across gender. Thirdly, study six examined the concurrent validity of the PESS by examining the relationships between everyday stressors in PE and other relevant educational outcomes.

Method

Participants

The sample comprised (N= 189) comprised 99 males and 89 females, recruited from three secondary schools in the English Midlands. Participants were secondary school aged students (aged 11 – 15) in school years seven to ten (M= 8.13; SD=1.2).

Measures (See Appendix Three and Four)

PE Stressors Scale (PESS). The PESS, as described in study five, was administered. The scale consisted of 12 items representing three factors: *Performance, Behaviour of Classmates* and *Ability Groupings.*

Engagement and Disaffection Scale. Students completed the adapted scale, as described in study five (Skinner, Zimmer-Gembeck, et al., 1998; Skinner, Wellborn, et al., 1990; Wellborn, 1991).

Buoyancy. Students' buoyancy was assessed using an adapted version of the Academic Buoyancy Scale (Martin & Marsh, 2008), as described in study five.

Amotivation. Finally, students completed a four-item measure of amotivation in PE (Vallerand et al., 1992), as described in study five.

Procedure

The procedures were the same as those outlined in study five. The PESS and additional validation measures were completed by the full sample (N=189).

Data analysis

The 12-item PESS was analysed with CFA using Mplus version 8.0 (Muthén & Muthén, 2017). As in study five, one item from each of the three factors was fixed to 1.0 for

the purposes of identification and latent variable scaling. The adequacy of the model fit to the data was assessed using multiple fit indices, including, the chi-square ($\chi 2$) statistic, the comparative fit index (CFI; Bentler, 1990), the Tucker-Lewis index (TLI; Tucker & Lewis, 1973), the standardised root square residual (SRMR; Hu & Bentler, 1998), and the root mean square error of approximation (SRMSEA; Steiger, 1990). Values representing an acceptable model fit remain controversial (Marsh et al., 2004), however it is generally accepted that an excellent fit between the hypothesised model and the data is demonstrated if values are above .08 for the SRMR and .06 for the RMSEA (Hu & Bentler, 1998). For the CFI and TLI, values of ≥ .90 are considered acceptable, and values ≥ .95 are considered an excellent fit of the hypothesised model to the data. Again, these values were used as guides as opposed to 'golden rules' (Marsh et al., 2004).

Results and discussion

Preliminary analyses

0.8% of the possible data points were missing and no item on the PESS had >5% of missing data, therefore, any data not present were assumed to be missing at random (Field, 2009).

Descriptive statistics

Item means and standard deviations are presented in Table 4.5. Potential stressors had an overall mean scores of 1.71, 2.31, and 2.51 (out of five), relating to *Performance*, *Classmate Behaviour*, and *Ability Grouping* respectively, suggesting participants appeared to experience a low to moderate frequency of minor stressors. Frequency analyses demonstrated that participants employed the entire response range for all items.

Confirmatory Factor Analyses

The 12-item three factor model was analysed with CFA using Mplus 8.0 (Muthén & Muthén, 2017). The model displayed inadequate fit to the data: $\chi 2(48) = 101.23$, $p < .0000$, RMSEA =.08., SRMR =.07., CFI =.88, TLI =.83. All factor correlation values were below <.85, providing initial evidence for the discriminant validity of the factors (Kline, 2005). Most items had a standardised factor loading of >.40, suggesting adequate convergent validity (Hair et al., 2006). In addition, the average variance extracted (AVE) was examined using Fornell and Larcker's (1981) technique to test for convergent validity. An AVE of ≥ .5 suggests adequate convergent validity (Hair et al., 2006). All factors displayed an AVE <.50 (.20, .31, and .41 for *Performance*, *Classmate Behaviour*, and *Ability Groupings*

respectively), therefore suggesting inadequate convergent validity of the factors. Cronbach alpha coefficients were calculated to assess the internal consistency of the factors. The composite reliability coefficients for *Classmate Behaviour* and *Ability Groupings* were close to acceptable (α =.69 and α =. .67 respectively). The composite reliability coefficient for *Performance* displayed low internal reliability (α =.56) and did not meet internal reliability recommendations (Nunnally & Bernstein, 1994).

Table 4.2. *Item Means, Standard Deviations, Factor Loadings, and Skewness and Kurtosis Values Following Confirmatory Factor Analyses (Study 5).*

Subscale and Item	M	SD	Loading	Skewness	Kurtosis .
Performance					
I have not performed as well as my classmates	2.12	.82	0.34	.94	1.27
I have been excluded by my classmates	1.54	.92	0.60	2.03	3.85
I have been given a bad grade for an activity	1.82	.92	0.80	1.50	2.50
I finished near the bottom of the class for an activity	1.74	.77	0.47	1.36	3.10
Classmate Behaviour					
Others classes in my year are doing different activities than my class	2.11	1.26	0.40	1.02	-.03
I had to work with classmates who are not in my friendship group	2.70	1.03	0.47	.46	-.50
Some classmates have boasted about being better at PE	2.38	1.16	0.75	.78	-.03
Some of my class mates mess about or disrupt the lesson	2.72	1.04	0.58	.74	-.19
I have been put in a group with students who are much worse at PE than me	2.06	1.06	0.34	1.25	1.19
Ability Grouping					
The class was dominated by the 'sporty' students in the class	2.54	1.24	0.68	.60	-.61
My teachers(s) have paid more attention to the students who are better at PE	2.23	1.27	0.74	.89	-.28
All the sporty students work together	2.97	1.24	0.63	.24	-.94

Factor Correlations and Internal Consistency	F1	F2	F3
Performance	.56		
Classmate Behaviour	.45	.69	
Ability Grouping	.66	.80	.67

Note: F1= Performance, F2= Classmate Behaviour, F3= Ability Grouping

Table 4.3. *Correlations between PE Stressors, Buoyancy, Amotivation, Behavioural Engagement, Behavioural Disaffection, Emotional Engagement, and Emotional Disaffection (Study 5).*

	1	2	3	4	5	6	7	8	9
1. Performance	1	.13	.45**	-.32*	.68**	-.58**	.66**	-.72**	.67**
2. Classmate Behaviour		1	.61**	-.05	.08	-.08	.05	-.06	-.05
3. Ability Grouping			1	.06	.21	-.33**	.28*	-.34**	.32*
4. Buoyancy				1	-.26*	.16	-.23	.25	-.37**
5. Amotivation					1	-.54**	.67**	-.73**	.75**
6. Behavioural Engagement						1	-.78**	.80**	-.69**
7. Behavioural Disaffection							1	-.80**	.76**
8. Emotional Engagement								1	.82**
9. Emotional Disaffection									1

Note. ** Correlation is significant at the 0.01 level (2-tailed). * Correlation is significant at the .05 level (2-tailed).

Table 4.4. *Factor Models and the Stressors in PE Scale (Study 5).*

Model	*χ2 (df), p*	*Parameters*	*RMSEA*	*SRMR*	*CFI*	*TLI*
Model 1: m=4, CFA	256.93(84), p<.000	51	.08(.07, .09)	.07	.80	.76
Model 2: m=3 CFA	239.59(87), p<.000	48	.08(.06, .09)	.08	.78	.73
Model 3: m= 3, CFA	**89.53(48), <.001**	**42**	**.05(.04, .07)**	**.04**	**.94**	**0.92**
Model 4: m=4, ESEM	98.71(51), <.000	84	.06(.04, .07)	.03	.94	.89
Model 5: m=3, ESEM	116.88(42), <.000	62	.08(.06, .09)	.04	.90	.82

Note. m= factor number, CFA= Confirmatory Factor Analysis, ESEM = Exploratory Structural Equation Modelling. Final model in bold.

Concurrent Validity

Table 4.6 shows the correlations between the PESS and the other variables. *Performance* stressors were significantly correlated with buoyancy (r =-.37, p<.01), amotivation (r =.48, p<.01), behavioural engagement (r =-.50, p<.01), behavioural disaffection (r =.57, p<.01), emotional engagement (r =-.48, p<.01), and emotional disaffection (r =.51, p<.01). *Classmate Behaviour* stressors were significantly correlated with amotivation (r =.17, p<.01), behavioural engagement (r =-.2, p<.01), behavioural disaffection (r=.23, p<.01), emotional engagement (r =-.15, p<.05) and, emotional disaffection (r =.12, p<.01). *Ability Grouping* stressors were significantly correlated with buoyancy (r =.12, p<.05), amotivation (r =.3, p<.01), behavioural engagement (r =-.32, p<.01), behavioural disaffection (r =.34, p<.01), emotional engagement (r =-.36, p<.01), and emotional disaffection (r = .31, p<.01).

Table 4.5. *Item Means, Standard Deviations, Factor Loadings, and Skewness and Kurtosis Values Following Confirmatory Factor Analyses (Study 6).*

Subscale and Item	M	SD	Loading	Skewness	Kurtosis .
Performance					
I have not performed as well as my classmates	2.03	.88	0.41	1.31	2.36
I have been excluded by my classmates (e.g. have not been passed to)	1.44	.72	0.54	1.75	3.36
I have been given a bad grade for an activity	1.81	.95	0.60	1.40	2.48
I finished near the bottom of the class for an activity	1.66	.67	0.54	.86	.91
Classmate Behaviour					
Others classes in my year are doing different activities than my class	2.11	1.12	0.50	1.04	.23
I had to work with classmates who are not in my friendship group	2.60	1.04	0.39	.43	-.47
Some classmates have boasted about being better at PE	2.18	1.10	0.87	.80	-.03
Some of my class mates mess about or disrupt the lesson	2.61	1.12	0.52	.63	-.52
I have been put in a group with students who are much worse at PE than me	2.10	1.00	0.51	1.01	.64
Ability Grouping					
The class was dominated by the 'sporty' students in the class	2.54	1.24	0.57	.62	-.58
My teachers(s) have paid more attention to the students who are better at PE	2.17	1.25	0.70	.97	.03
All the sporty students work together	2.84	1.25	0.63	.30	-.91

Factor Correlations and Internal Consistency	F1	F2	F3
Performance	.56		
Classmate Behaviour	.45	.69	
Ability Grouping	.66	.80	.67

Note: F1= Performance, F2= Classmate Behaviour, F3= Ability Grouping. Composite reliability coefficients are presented in the diagonal of the factor correlation matrix.

Table 4.6. *Correlations between PE Stressors, Buoyancy, Amotivation, Behavioural Engagement, Behavioural Disaffection, Emotional Engagement, and Emotional Disaffection (Study 5).*

	1	2	3	4	5	6	7	8	9
1. Performance	1	.31**	.40**	-.37**	.48**	-50**	.57**	-.48**	.51
2. Classmate Behaviour		1	.47**	-.05	.17**	-.20**	-.23**	-.15*	.12**
3. Ability Grouping			1	-.12*	.30**	-.32**	.34**	-.36**	.31**
4. Buoyancy				1	-.28**	.29**	-.31**	.37**	-.36**
5. Amotivation					1	-.62**	.60**	-.65**	.56**
6. Behavioural Engagement						1	-.74**	.73**	-.48**
7. Behavioural Disaffection							1	-.65**	.60**
8. Emotional Engagement								1	-.64**
9. Emotional Disaffection									1

Note. * Correlation is significant at the .05 level (2-tailed) ** Correlation is significant at the 0.01 level (2-tailed).

General discussion

Understanding students' positive adaptation to stressors in the PE setting is important given recent findings regarding the potential cumulative impact of minor daily stressors on academic achievement and motivation, as well as health and wellbeing (Kanner et al., 1987; Martin & Marsh, 2008; Sotardi, 2017). To date, no measure has been developed to conceptualise and assess common stressors in the PE context. Chapter four sought to address this gap in the literature through the development and validation of the PESS via a series of four studies. The outcome was a 12-item scale that assessed stressors through three subscales: Performance Stressors, Classmate Behaviour and Ability Grouping. Analyses indicate inconsistent results, suggesting that the PESS requires further modifications before it can provide a reliable and valid measure of common stressors in PE lessons.

An initial EFA suggested that four factors represented the most parsimonious model of stressors in PE. Within this model, conceptually, stressors relating to *Gender Relations* could be represented by items in the *Classmate Behaviour* factor. For example, "Other classes in my year are doing different activities than me" intended to represent the frustration that students reported in qualitative investigations that there was a gender difference in the activities available in PE (see chapter three, study one). Given that the *Gender Interactions* factor had only two items (and it is generally recommended that subscales should consist of three or more items (Tabachnick & Fidell, 2013) and was very highly correlated with the *Classmate Behaviour* factor, the decision was made to remove this factor.

Initial CFA analyses demonstrated promising findings. The three factors emerging in study five represent parsimonious subscales of stressors in PE that are underpinned by previous qualitative research. The first-order, three-factor model tested in this study met Bentler's (1992) SRMR, RMSEA, and CFI guidelines (however not the revised CFI guidelines of $\geq$.95; Hu & Bentler, 1999). Moreover, inter-factor correlations supported discriminant validity of the measurement model. However, the factors appeared to have statistical deficiencies regarding internal consistency. Given the strong theoretical basis of the factorial structure and good fit indices, the decision was made to maintain a three factor, 12 item, scale and test this factor structure with an independent sample. The first-order, three-factor model tested in study six displayed an inadequate fit to the data, with CFI values falling just short of the .90 cut off value). Factor correlations suggested discriminant validity however analyses of average variance extracted (AVE) suggested inadequate convergent

validity. Moreover, factor loadings, variances, and covariances were not equivalent across gender.

Further analysis and additional modifications to the 12-item questionnaire (that are not reported in the results) in study five and six improved the fit of the data, establishing a good fit in the study six sample. Specifically, in study five, removing one item improved the CFI in study five to .95 and improved the internal reliability of all factors. Furthermore, when another item was removed, resulting in a 10-item three factor model, the CFI value ≥.95 and all items met the recommended cut off value of .40. Similar improved fit indices were found when modifying the model to an 11 or 10-item model. However, the decision was made to maintain a twelve item, three factor model with the clear need to conduct further empirical work. This decision was made due to the well-reported risk in measure development of 'over-fitting' measurement models to a particular set of data (Byrne, 2011; Tabachnick & Fidell, 2013). Amending or adding items for further analyses is recommended to develop a psychometrically sound measure.

In addition to examining a three-factor structure, a one-factor structure was also tested, which resulted in a very poor fit to the data. This suggests that the experience of stressors is multifaceted that is most reliably represented by a number of separate, yet related, factors. Furthermore, ESEM was conducted to test alternative models. Utilising ESEM produced some models with good fit indices; alternative model testing in Study 5 produced a four factor (14 item) factorial model with good fit indices (CFI ≥.95). However, there were instances of poor pattern loadings and cross-loadings of items across factors. Furthermore, factor structures of the models produced by ESEM were not conceptually sound and that the CFA model produced the most parsimonious representation of stressors in PE.

Both study five and the additional validation study six supported the concurrent validity of the PESS. The correlation analyses demonstrated mostly significant correlations between each factor and buoyancy (i.e. resilience to minor stressors) in PE, amotivation, behavioural engagement and disaffection, and emotional engagement and disaffection. These relationships were in the expected direction; students who reported a greater incidence of potential stressors indicated increased amotivation, behavioural disaffection and emotional disaffection in their PE lessons. Moreover, these students were more likely to indicate lower behavioural and emotional engagement in PE. These relationships are in accordance with the literature in educational psychology, which has indicated that everyday stressors are related to detrimental responses in academic performance (Rahdar & Galvan, 2014) decreased attentional control (Liston et al., 2006), and psychological wellbeing (Carter et al., 2006;

Escobar et al., 2013). However, in the majority of correlations across study five and study six, the three factors were unrelated to levels of buoyancy in PE lessons. This may be due to the measurement issues surrounding the scale used to assess buoyancy (Martin, 2013) that were discussed in chapter two of this thesis. Although the factor structure needs further empirical work, these findings highlight the potential impact that the experience of even minor stressors can have on motivation and engagement outcomes in PE lessons.

The majority of the item mean responses obtained across study four, five, and, six were between 2 and 3 on the 5-point scale, indicating that most students in the current studies experienced some minor stressors during their PE lessons. Moreover, frequency analyses revealed that students employed the entire response range for all items across all three of these studies, suggesting that some students experience these situations many times in their PE lessons. However, the appraisal of each minor stressor could not be determined in the current studies. Previous measurement scales investigating everyday stressors in adolescence have included an additional scale for each stressor, questioning "how bad" this experience made participants feel (Kanner et al., 1987). However, the inclusion of these supplementary appraisal items may have been misleading, and also potentially too complex for young adolescents to complete. Given the correlational findings regarding the experience of stressors and decreased motivation and increased disaffection, it is likely that negative appraisal may act as a mediator between stressor experience and motivational outcomes (Lazarus & Folkman, 1984; Mancini & Bonanno, 2009).

This research is the first attempt to develop and validate a measure of everyday stressors in secondary school PE lessons. Previous research has investigated the everyday school-based stressors, however only focus on academic stressors. Notwithstanding the strength of investigating stressors in the context of PE, there are some limitations that are necessary to note. Consistent with previous research developing scales to measure stressors, the current research relied solely on self-report data. Adolescents' reports of their experiences can provide insight to their experience of potential stressors, however the self-reports can be confounded by social constructions and coping responses (Arnold et al., 2013; Pekrun, 2016). To address this limitation, future research might consider adopting a triangulation strategy, that is, to incorporate mixed methods. For example, observation of PE lessons and the use of accelerometers to assess activity levels within lessons (as potential indicators of engagement and participation) may be a future consideration to attenuate the weaknesses of self-report data. Consistent with previous questionnaires developed for adolescents' self-reports of stressors, the PESS required students to recall events in PE lessons in the past four weeks. To

minimise memory bias, future research should attempt to validate the PESS using different temporal instruction (e.g., the past week) as retrospective reports may not be accurate. Another limitation of the current studies was the cross-sectional nature of the data collected. This method is appropriate and necessary for development of validation of new measures, however future research should seek to use longitudinal designs to better capture the nature of stressors in PE lessons and how these might change over time.

In summary, the four studies presented here report the initial development and validation of a scale to assess common stressors in secondary school PE lessons. The scale measures stressors via. three subscales (Performance, Classmate Behaviour, Ability Grouping) comprising 12 items. The scale needs further empirical work to refine the factor structure and ensure it is a psychometrically sound measure of stressors in PE.

Chapter V: Summary, Discussion, and Conclusion

The following chapter is split into three parts. To begin, I provide a summary of chapter two (reviews one to three), chapter three (study one and two) and four (studies three – six). Second, I will discuss the conceptual, theoretical, psychometric, and practical contributions of the thesis to the academic literature, the practical potential, strengths and limitations, and future research directions. Finally, I will present some concluding remarks on the research presented in my thesis.

Summary

In the section presented herein, I provide a brief summary of the systematic review, narrative review, qualitative studies one and two, and empirical studies three-six.

Review: part one

The first part of the literature review chapter provided an overview of the definitions, concepts, and theoretical models of academic resilience. A number of definitions of psychological resilience exist, and most incorporate three components: adversity, positive adaptation, and protective factors. Adversity, or stressors, may range from ongoing daily stressors to highly impactful stressors. Academic resilience has a number of definitions across the literature, however refers to the heightened likelihood of success in school despite environmental risk, brought about by early conditions and experiences (Wang et al., 1994). Traditional academic resilience research focussed solely on the minority of students who thrive academically in spite of significant, extreme stressors. Thus, the concept of academic buoyancy was developed to reflect an 'everyday academic resilience' that addresses the majority of students who experience the daily difficulties and challenges that are embedded in school life (Martin & Marsh, 2008). Martin suggests that buoyancy is conceptually distinct from academic resilience. However, I proposed that as the concept of resilience can apply to a whole spectrum of stressors (from minor to major), that it was premature to distinguish between academic resilience and buoyancy. The review did distinguish academic resilience from other related constructs, for example, academic hardiness and academic coping. Finally, the review presented in part one of chapter two presented two theoretical models of academic resilience that could be applied to the majority of students facing everyday academic stressors (Martin, 2002; Pitzer & Skinner, 2016). Both models brought together multiple theories of

motivation, identifying constructs that reflect protective factors in the process of academic resilience.

Review: part two

The systematic review presented in part two of chapter two provided a review of the measurement approaches in assessing academic resilience. It highlighted the increased demand to introduce resilience building programmes within schools, however a limited means of measuring the effectiveness of such interventions. I proposed that a reliable and valid measure of academic resilience should be established to address this issue. The review discussed the psychometric issues relating to academic resilience research, as well as recommendations for educational psychologists seeking to measure the construct. A systematic literature search identified 47 studies that assessed academic resilience. Results demonstrated large variability in the approaches to measuring the three components of resilience: adversity (or stressors), positive adaptation, and protective factors. The discussion provided recommendations for researchers planning to develop a measure of academic resilience. The key recommendations that emerged from the discussion were fourfold. First, measures of academic resilience should incorporate three components: risk (or stressors), positive adaptation, and protective factors separately. Second, when assessing risk, researchers should use academic indicators of risk, and consider the development of a scale of both stressors relating to school. Third, researchers should consider alternative indicators of positive adaptation than academic achievement, for example, emotional and behavioural engagement at school. Finally, when assessing protective factors, the appropriate statistical analysis should be used to examine how the factor moderates or mediates the effect of academic stressors on academic outcomes. Researchers should strive to utilise the lessons learned in psychological resilience literature to establish a reliable and valid measure, and gain a complete picture of academic resilience.

Review: part three

Part three of chapter two presented a narrative review of the everyday stressors experienced by adolescents. The review highlighted that the types and frequency of daily stressors that adolescents experience differ across age, but are generally characterised into domains of school, peer, family, and health. Evidence suggests that school is the domain that composes the largest proportion of daily stressors for adolescents, given (a) the extent of waking hours spent there and (b) the combination of academic and social demands (Barrett &

Heubeck, 2000; Heubeck & O'Sullivan, 1998). Moreover, the review highlighted research that has demonstrated the significant impact that experiencing daily stressors has on adolescents' psychological, psychosomatic, and educational outcomes. Indeed, it reviewed evidence that the frequency and cumulative nature of such stressors results in a greater impact on these outcomes than the experience of major life events. Thus, scholars emphasise the importance of identifying sources of potential stress in order to develop appropriate prevention or intervention strategies. Finally, the narrative review discussed the measurement approaches that have been utilised over the past three decades to appropriately assess the everyday stressors encountered by adolescents. A number of psychometric issues were highlighted, including content validity, confounding and contamination, and contextual factors.

Studies one and two

Study one sought to explore the common and potentially stressful events or situations that are experienced in secondary school PE lessons, using Lazarus' (1984) conceptual framework of stressors. The results from a thematic analysis (Clarke & Braun, 2013) yielded three general dimensions of stressors in PE lessons: the social environment (situations relating to peers and teachers); the physical and organisational environment (situations relating to the changing room facilities and availability of activities), and the performance environment (situations relating to skill acquisition and public demonstrations of competence). Study one extended current PE literature by identifying the more minor, yet frustrating, environmental demands that may influence participation in lessons.

Study two sought to explore the protective factors that students utilise during their PE lessons when faced with the potential stressors reported in study one. Consistent with Rutter's (2006) conceptualisation of protective factors, thematic analysis yielded two general dimensions: individual assets and environmental resources. Students reported individual assets including; value, perceived competence, commitment, autonomy, and specific personality traits as protective against the impact of stressors in PE lessons. Environmental resources were categorised into two higher order themes of teachers and peers. Teacher resources included; differentiating within lessons, providing specific feedback, and having good relationships. Peer related resources included; social status and being grouped with friends, suggesting that greater social status and working within a safe friendship group protected against the effects of stressors. Finally, students reported that the lack of value

given to PE lessons by both the school and their caregivers protected students from the negative effects of performance stressors.

Studies three-six

The series of studies in chapter four described the development and validation of the PE Experiences Questionnaire (PESS). In study three, an expert panel examined the content validity of an initial item pool, which resulted in the retention of 34 items. In study four, these items were analysed using exploratory factor analysis, resulting in a factorial structure of four factors and 14 items. However, the fourth (two item) factor indicated poor internal reliability. Using confirmatory factor analysis, study five found support for a 12-item factorial structure, comprising three factors: Performance, Classmate Behaviour, and Ability Grouping. Study five also provided evidence for the PESS's concurrent validity. Study six used confirmatory factor analysis to confirm the factor structure identified in study five on an independent sample of participants. Study six did not support previous findings, with a three-factor, 12-item structure providing an inadequate fit to the data.

Discussion

In the section presented herein, I will discuss the conceptual and theoretical contribution to the educational psychology literature, as well as the practical implications of this body of work. Moreover, I will discuss the psychometric contribution of this thesis with regard to its potential influence on the assessment of common stressors, and resilience to these stressors in secondary school students. Finally, I will discuss the strengths and limitations of the thesis, and potential future research directions.

Conceptual contributions

Contribution to academic resilience research

In terms of conceptual contribution, the first review which provided an overview of definitions, concepts and theoretical models of academic resilience, provided a foundation for a comprehensive and accurate measure of the concept. It reviewed both academic resilience (relevant for major, infrequent stressors, relevant to a minority of at-risk students) and academic buoyancy (relevant for minor, cumulative academic stressors that are experienced

by the majority of students). The review presented in chapter two part one is the first to propose that academic resilience and academic buoyancy should not be conceptually distinct. Rather, one concept (i.e. academic resilience) is relevant to both severe stressors that put a student at risk of poor achievement (e.g. maltreatment, poverty) and also those daily stressors, such as, academic difficulties associated with everyday school life. The academic resilience and buoyancy literature suffer from the 'jangle' fallacy here, a common concern in psychological research (Kelley, 1927), whereby different terms are used to describe the same underlying concepts. Both resilience and buoyancy address students' positive adaptation to the experience of stressors, and researchers attempt to identify protective factors that ameliorate the effect of such stressors on adaptation. Thus, both academic resilience and buoyancy are consistent with the conceptualisation of resilience that is outlined in the traditional psychological literature (Masten, 2001; Masten et al., 2000; Rutter, 2006). Furthermore, the evidence, put forward by Martin (2013) that supports the conceptually distinct nature of the two constructs, is limited given the methodological drawbacks of the measurement scale utilised for both constructs. Martin's findings suggest that academic resilience predicts more severe educational outcomes (e.g. disengagement and failure avoidance) and academic buoyancy predicts more minor educational outcomes (e.g. uncertain control, anxiety). However, Martin's measures of academic resilience and buoyancy are remarkably similar, and such a drawback means that to conclude that the two constructs are distinct is premature. To establish whether these two concepts are indeed distinct should be preceded by the development of appropriate measurements scales.

While the initial review provided evidence for the significant overlap of the constructs of academic resilience and academic buoyancy, it overviewed evidence that posits academic resilience is conceptually distinct from other related constructs. A practical issue within this field of research is the tendency for practitioners and politicians to use terms which represent different characteristics, such as 'resilience', 'grit', 'hardiness', and 'persistence' interchangeably (Smith, 2015). For example, researchers posit that academic hardiness is a personality characteristic that differentiates between students who seek out academic challenge and difficulty and those who avoid it (Kamtsios & Karagiannopoulou, 2013). Although hardiness theory suggests that such a characteristic protects individuals from the effects of negative situations, it does not account for the dynamic and transactional nature of resilience, which can change over time and context. Thus, academic hardiness should be viewed as a protective factor that some students may possess. However, this does not mean that those students who do not possess the characteristic of hardiness cannot be resilient,

rather, they may utilise other personal characteristics and environmental resources (e.g. help seeking behaviour, social support) to positively adapt to stressful academic situations. Such interchangeable use of contrasting concepts poses a problem when educational professionals purchase and implement resilience interventions which have little evidence base and do not address the one concept they are trying to promote (Hart & Heaver, 2015). Making this conceptual distinction is important when developing and implementing interventions and subsequently measuring the efficacy of such interventions.

The current programme of research makes a significant conceptual contribution with regard to approaches to measure academic resilience, which is necessary to measure the outcomes of resilience based interventions (Smith 2015). The systematic review presented in chapter two, part two, provides a strong foundation for researchers to develop a reliable and valid measure of the concept of academic resilience. In most research studies, the approach to the assessment of resilience is to measure (a) an indicator of risk, typically a combination of distal factors (e.g. socio-economic-status or parental education), and (b) an indicator of positive adaptation, commonly academic achievement. While the independent assessment of stressors and positive adaptation is a sound approach to the measurement of academic resilience, the indicators used to represent each construct are rudimentary. To illustrate, using academic achievement overlooks innately intelligent students who show no resilience in the face of academic adversity. Furthermore, using SES as an indicator of academic adversity makes the assumption that all students within this demographic are at equal risk for poor academic outcomes. Moreover, the diversity of SES risk factors presents a problem for comparing and interpreting results.

The systematic review of academic resilience measurement approaches also makes a conceptual contribution by highlighting the psychometric issues concerning the measurement scales that are utilised to assess academic resilience. For example, The Academic Buoyancy Scale (ABS; Martin & Marsh, 2008) comprises items that measure students' *responses* to academic stressors (e.g. 'I deal well with schoolwork pressures', 'I don't let a bad mark affect my confidence'). Scales that use an outcome approach to measuring academic resilience (or buoyancy as is here) diverts researchers' attention from examining the true nature of resilience. The concept of resilience is not directly measured, but is inferred based on the assessment of stressors and positive adaptation (Luthar et al., 2000). Examining the relationship between stressors and protective factors is an essential aspect of resilience research as it analyses the processes underpinning positive adaptation (Rutter, 2006; Windle et al, 2011). The systematic review makes a significant practical contribution to the field of

academic resilience measurement, making recommendations for the most psychometrically rigorous way to measure academic resilience. Drawing on lessons learnt in the traditional psychological resilience literature, academic resilience researchers should strive to: incorporate the three components of risk, positive adaptation, and protective factors independently; develop a measure of proximal stressors impacting positive educational outcomes; and consider alternative (i.e. not performance based) indicators of positive adaptation, such as motivation and engagement. Finally, making a longitudinal assessment of positive adaptation, and utilising the appropriate statistical analysis to understand the academic resilience process is essential. The appropriate statistical analyses should be undertaken to test the mediating effects of the proposed protective factors on the relationship between stressors and positive adaptation. Providing such recommendations of academic resilience measurement is necessary given the fact that recent academic resilience interventions, such as the UK Resilience Programme and the Penn Resilience Programme (Gillham et al., 2015), have been highly criticized for ineffective outcome measures. Specifically, these programmes were evaluated using outcome measures that were inconsistent with the concepts being targeted in the intervention (i.e. depression and anxiety). This results in commissioners having little knowledge of the efficacy of the intervention. Therefore, now is an essential time to develop a reliable and valid measurement of academic resilience to ensure the same mistakes are not repeated. The recommendations made in chapter two of this programme of research is an appropriate start for researchers to develop such a measure.

Contribution to the understanding of stressors and protective factors in PE

The current thesis makes a conceptual contribution with the first exploration of the concept of resilience in PE lessons. Study one and two (chapter three) reflect the first application of the concept of resilience in the field of PE. While research into students' resilient processes has been carried out for three decades, this has applied to academic, or 'class-room based' subjects. With regards to stressors, academic resilience research reflects students' responses to the cumulative stressors of 'getting a bad grade' or 'getting negative feedback on work (Martin & Marsh, 2008a) and therefore cannot be translated to the unique context of PE lessons. As noted throughout this thesis, the unique context of PE lessons requires an independent investigation of the existence of frequently occurring, minor stressors

that may be perceived as harmful to students' motivation, engagement, participation, or wellbeing in lessons.

Study one findings therefore add to the research literature by identifying such experiences of secondary school students during their PE lessons. The identification of more 'severe' stressors, such as negative peer interactions, public performance, and body exposure, support previous findings in PE research (Elliott & Hoyle, 2014; O'Connor & Graber, 2014; Wiltshire et al., 2017; Yli-Piipari et al., 2009). Study one extends these findings however, by identifying the more minor stressors that may be appraised as frustrating and irritating. For example, discrepancies between individuals' perceived effort levels and the effort of their classmates appears to be a relatively mundane, however was reported as a very frustrating experience for students during their lessons. Furthermore, the public nature of participating in challenging activities, and the tendency of boasting about physical ability, are examples of the everyday stressors associated with PE that may impact engagement.

The measure development studies provided further support for the fact that the majority of students do report experiencing minor, but frequently occurring, stressors during their PE lessons. Thus, studies four, five, and six make a conceptual contribution, representing the first empirical application of the concept of everyday stressors in the PE setting. The majority of the item mean responses obtained across studies four to six were between two and three of the 5-point scale, indicating that most students in these three studies experienced minor stressors either 'sometimes' or 'often' during their PE lessons. Moreover, frequency analyses revealed that students employed the entire response range for all items across all three of these studies, suggesting that some students 'always' experience these situations in their PE lessons. Furthermore, studies four-six also provide preliminary evidence for the negative impact of these stressors on educational outcomes. Specifically, students who reported a greater incidence of potential stressors indicated increased amotivation, behavioural disaffection, and emotional disaffection in their PE lessons. Moreover, these students were more likely to indicate lower behavioural and emotional engagement in PE. These relationships are in accordance with the literature in educational psychology, which has indicated that everyday stressors are related to detrimental responses in academic performance (Rahdar & Galvan, 2014), decreased attentional control (Liston et al., 2006), and psychological wellbeing (Carter et al., 2006; Escobar et al., 2013). While these findings are cross-sectional, and thus no causal inferences can be made, they suggest an important line of further investigation.

Study two adds to this conceptual contribution by providing initial evidence for the role of protective factors in fostering positive adaptation to stressors in PE. Specifically, students reported both individual assets (e.g. cognitive factors, personality traits) and environmental resources (e.g. peer, teacher support) that either ameliorated the negative appraisal of stressors or promoted positive adaptation to those stressors that were appraised negatively. Previous research investigating protective factors in academic resilience primarily focus on cognitive factors, for example uncertain control, value, and test anxiety (Martin & Marsh, 2008a; Putwain et al., 2014; Symes et al., 2015). Study two extends such findings by both highlighting unique cognitive protective factors (e.g. perceived autonomy) but also emphasising the significant role of environmental resources (e.g. teacher support, student-teacher relationship) which are often overlooked in academic resilience research.

Future conceptual investigations may empirically examine the role of protective factors in either mediating or moderating the relationship between stressors and positive adaptation in PE lessons. In the traditional psychological resilience literature, Rutter's (2006) moderation hypothesis proposes that protective factors moderate, or affect the strength of, the relationship between stressors and outcomes. Specifically, Rutter suggests that the impact of a protective factor will be more evident when the levels of protection is high compared to when protection is low. There is wealth of support in the psychological resilience literature that support this premise of protective factors moderating the relationship between stressors and positive adaptation (Baldry & Farringdon, 2005; Jessor, Van Den Bos, Vanderryn, Costa, & Turbin, 1995; Pinquart, 2009). Future research may explore whether this is the case in PE, using the protective factors identified in study two. Future research may test whether having greater levels of teacher support for example, moderates the impact of stressors on students' positive adaptation during PE lessons.

A mediation hypothesis of resilience, presented by Mancini and Bonnano (2009), suggests that cognitive appraisal processes are an important mechanism of resilience, playing a critical mediating role on the effect on positive adaptation. This is supported by findings showing that challenge appraisal (i.e. appraising a potentially stressful situation as a challenge) predicts higher positive adaptation, while threat appraisal predicts lower positive adaptation (Bonanno, 2012; Riolli, 2012). There is little empirical evidence of the role of appraisal in mediating the impact of academic stressors on positive adaptation within the academic resilience literature. However, sports psychology research has suggested that athletes who appraise the potential stress of a performance situation as challenging demonstrate resilient outcomes, whereas those that appraise the same situation as threatening

demonstrate vulnerability (Seery, 2011). Studies one and two provide preliminary evidence for the mediation hypothesis, that is, the mediating role of cognitive appraisal. For example, students who talked about performance stressors (e.g. taking time to grasp a skill, public performances) as challenging, and an opportunity to grow described positive outcomes. In contrast, students who discussed the same situations in the context of a threat to their self-esteem described negative educational outcomes. Empirical work needs to be undertaken to understand the complex processes that occur within lessons, and which protective factors have the greatest ameliorative effects.

Psychometric contributions

With regards to PE, the studies that comprise this volume of work are the first attempt to assess common stressors in PE. The scale developed in studies 3-6 provides a valuable contribution to the educational psychology literature, as it addresses the issues related to the assessment of stressors which were presented in part three of chapter two. For example, the PESS was derived from extensive qualitative exploration, demonstrated in chapter three, and empirical knowledge in key stressor related areas, demonstrated in chapter two. This ensured sufficient face validity of items. Furthermore, the approach to item development incorporated qualitative and quantitative methodologies, in line with Hagger and Chatzisarantis' (2009) recommendations.

This rigorous foundation to the development of a measure of everyday stressors in PE is in contrast to previous measures within the field, which have used a disputable evidence base for item selection. For example, some measures of stressors in adolescence adapt existing measures of daily stressors in adults by removing items deemed to be irrelevant for adolescent samples (Bobo et al., 1986a; Seidman et al., 1995). The approach of adapting existing scales developed for adults is flawed as it assumes that the stressors experienced in adult life are relevant for adolescents. Moreover, it omits potentially crucial areas of stressor exposure that adults do not experience (for example scholastic stressors and emerging adult responsibilities). Furthermore, in some research studies of school-based daily stressors, some authors have not used validated measurement scales (Hjern et al., 2008; Keles et al., 2015). Alternatively, items are developed that are of particular interest to authors, without seeking methods to ensure content validity (Hjern et al., 2008).

The PESS is not confounded with indices of negative affect, which addresses a common issue that is present in measures of everyday stressors. In many cases, the items that comprise a scale reflect cognitive appraisal of stressors, rather than the stressors themselves

(e.g. ‘being pressured to skip class’; Bobo et al., 1984; Keles et al. 2015). The items of the PESS reflect environmental situations only, that can be appraised as either harmful or not. Doing so avoids any bias in the relationship between what the scale intends to measure (i.e. stressors experienced in PE) and what they are used to predict (i.e. educational outcomes). Therefore, they are a true representation of the definition of daily stressors, that is, “experiences and conditions of daily living that have been appraised as salient and harmful or threatening to the endorser’s wellbeing” (Lazarus, 1984 p. 376).

The PESS requires more empirical work before it is in a psychometrically sound condition to be used by researchers and practitioners. While the initial CFA demonstrated promising findings, there were issues with the internal consistency of the factors. Subsequently, the CFA conducted on an independent sample demonstrated inadequate fit to the data with the CFI value falling just short of Bentler's (1990) .90 cut-off value. Further analyses were conducted that were not reported in study five or study six which found that the further removal of two items (with the lowest factor loadings) improved the CFI in studies five and six to an excellent and good fit to the data, respectively. Despite this, the decision was made not to ‘force’ a model upon the data, which is a common issue within measure development research (Byrne, 2011; Tabachnick & Fidell, 2013). Rather, it was suggested that amending or adding items for further analyses would be a more scientific approach to developing a psychometrically sound measure. Although the measurement scale needs additional work, this chapter makes a psychometric contribution through the use of both CFA and ESEM to determine the most appropriate factorial structure. ESEM is a novel methodological extension of the traditional approach to measure development, combining the strengths of both EFA and CFA (Asparouhov et al., 2016). It is recommended that educational researchers utilise this type of integrated approach, testing alternative models, in future development of measurement scales.

Practical contributions

In addition to conceptual and psychometric contributions, the current thesis provides distinct practical implications applicable to PE teachers. The most significant practical contribution comes from the qualitative explorations demonstrated in study one and study two. Study one demonstrates the kinds of stressors that students may appraise as frustrating, irritating, or physically and psychologically demanding during their lessons. While some of these may appear trivial, for example ‘not working in my friendship group’, the correlations

with engagement and motivation in PE (study five and six) suggest that they have a reliable link with educational outcomes.

It is not feasible for teachers to take a wholly preventative approach to eliminating all potential stressors in PE lessons. In fact, PE lessons are often viewed as an environment to promote such character building skills in the face of stressors (Doty, 2006; Sage, 1998). Indeed, former Education Secretary, Nicky Morgan stated that: "school sport and team games don't just help people stay healthy, they help build character, resilience and grit…" and further urges teachers to stop wrapping children up in "cotton wool" (Hope, 2016). The current research programme highlights some protective factors that teachers may target to facilitate students' resilient processes during their PE lessons. 'Differentiation' was the most frequently identified protective factor that ameliorates the relationship between stressors and positive adaptation. The differentiated instructional model (Tomlinson, 1999) encourages teachers to respond to the needs of all students, with specific attention given to each student's readiness, interest, and abilities. Tomlinson (1999) outlines a number of specific criteria which PE teachers may incorporate to facilitate students' positive adaptation to performance stressors in particular. For example, teachers may utilise a variety of instructional approaches aimed at modifying content (i.e. what students learn), 'support' (i.e. how students make sense of content), and the 'product' (i.e. how students demonstrate what they have been taught). More recent research in the field of PE highlights the benefits of graded competition (Hastie, Ward, & Brock, 2017), whereby leagues are arranged that match students of similar skill level against one another. Specifically, when lower-skilled students played in graded competition games during PE, they experienced increase physical success, ball engagement and efficiency during the game. However, previous research in PE has demonstrated that, while PE teachers recognise the value in differentiating in their lessons, they find it particularly challenging to meet the needs of all students (Whipp, 2004). Given the importance of differentiation in facilitating students' responses to performance stressors, demonstrated in study three, teachers may prioritise finding ways to use empowering and inclusive techniques that might reduce students' disengagement following poor performance.

Another protective factor that was emphasised more by students than by teachers was autonomy. Surprisingly, it was a lack of autonomy that facilitated adaptation to minor stressors in PE. Students described persevering during performance stressors (e.g. poor performance during a cross country race or fitness test) or social stressors (e.g. working with classmates they had fallen out with) simply because they had no choice in the matter. This finding however contrasts with previous findings relating to the Self-Determination Theory

which suggests that students strive to satisfy three fundamental psychological needs: autonomy, competence, and relatedness (Deci & Ryan, 2000). Specifically, a direct effect of psychological need satisfaction on positive outcomes in PE has been identified in cross-sectional investigations (Lonsdale, Sabiston, Raedeke, Ha, & Sum, 2009; Taylor et al., 2008). However, in a longitudinal study of the predictive utility of SDT variables on positive outcomes, competence and relatedness were of central importance, whereas autonomy did not predict the three positive outcomes (Taylor, Ntoumanis, Standage, & Spray, 2010). Despite the findings proposed in study three regarding the benefits of a somewhat controlling climate, it may be that while a controlling climate may lead to immediate positive outcomes (i.e. the student completes the task they do not enjoy), it may promote more long-term disengagement for activity outside of the PE context. Thus, more research in needed to determine 'how much' autonomy leads to the best outcomes during PE lessons.

Study three also highlighted the effects of different kinds of student-teacher relationships on students' positive adaptation to performance stressors. The exploratory findings suggested that those students who reported a strong and positive relationship with their teachers were more likely to positively adapt to the stressors that they experience. Those who suggested that they disengaged in response to a performance stressor did not report having a bad relationship with their PE teachers, but appeared indifferent with regards to their relationship. Moreover, findings from study one indicated that some of these students believed that teachers showed a greater focus on high ability students in comparison to low ability students. Previous research has explored how the PE teaching context can influence teachers' motivational strategies towards students, suggesting that PE teachers are influenced by their perception of students' motivation in PE. Specifically, teachers may develop stronger relationships with those that are self-determined and motivated in lessons (Pelletier, Séguin-Lévesque, & Legault, 2002). For example, Taylor, Ntoumanis, and Standage, (2008) reported a positive relationship between PE teachers' perception of students' motivation and how emotionally involved and structured their teaching environments were. While the development of these relationships is a naturally occurring process, the results of study three may encourage teachers to focus on an equal relationship with all students, regardless of motivation and behaviour.

A final practical implication of the current thesis is the development of a measure for PE teachers to gain a better understanding of their students' experiences in lessons. While the PESS needs further empirical work, a valid, reliable, and importantly short, measure of potential stressors can be a quick way to understand why levels of motivation and

engagement may be poor in some students. Moreover, it is an effective way of observing differential experiences across age and gender, as well as highlighting differences in teaching styles by comparing student experience across classes.

Strengths and limitations

Table 5.1 presents the strengths and limitations associated with each study reported in the thesis. A major strength of the study is the thorough and comprehensive approach to the development of a measure of the experiences of stressors in PE. Significant preliminary work went into developing a conceptually sound foundation for measure development, which is reflected in the lengthy literature review chapter. As a result of this, and the comprehensive qualitative investigation specific to the PE context, the programme of research has developed an instrument that, with further modifications, may be an effective tool for researchers and practitioners. Moreover, while the first two reviews (presented in chapter two parts one and two) did not have a direct impact on the studies conducted, they represent a significant contribution to the educational psychology literature.

With regards to limitations, as demonstrated in Table 5.1, an ongoing limitation was the lack of diverse samples. A significant effort was made to include schools that comprised students with a range of socio-economic backgrounds. This attempt was successful with one out of the four schools located in an area of high deprivation. However, the samples investigated in studies one to six consisted of a majority of White British students which may not reflect all students in the UK. For example, Elliott and Hoyle (2014) explored the barriers to PE participation in secondary school females of Muslim faith and identified a number of everyday stressors which were not reflected in the PESS. Another limitation is the cross-sectional, self-report nature of the data collected which inhibits causal inference. This design is considered appropriate in the current programme of research, whereby the development of a measure was the primary objective, however future research should aim to incorporate longitudinal designs in order to truly capture the nature of positive adaptation to stressors in PE.

An aspect of the current thesis which may be considered a limitation is the lack of frequency or intensity subscales developed to supplement the PESS. Previous scales developed for the purposes of measuring daily stressors in adolescents (e.g. Bobo et al., 1986; Kanner et al., 1987) have incorporated these subscales. Initially, this was incorporated into the PESS, however it was decided that such a design would be too complex for younger

adolescents (i.e. aged 11) to complete. Moreover, while weighted scales can indicate the total amount of stressors encountered and those that are deemed most important, weighted and unweighted indices result in almost identical relationships with outcomes (Kanner et al., 1987). Indeed, it has been suggested that: "the correlation between the sums of a weighted index and a simple count of the number of items checked is sufficiently high to render the two scoring systems equivalent" ((Lorimer, Justice, McBee, & Weinman, 1979, p.306). Therefore, such a design was adopted within the current programme of research. Future research may test the effect of supplementing the PESS with frequency and intensity subscales, in older students perhaps, to provide greater insights in their experiences of stressors in PE.

An additional limitation is the self-report data collected from students. Much like other measures in educational psychology, relying solely on self-reported data introduces the possibility of bias due to common method variance which may inflate the association between constructs (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). Moreover, researchers and practitioners show particular concern about self-report responses of adolescents, suggesting an increased tendency for inattention and random responding (i.e. response bias; (Wright & Ogbuehi, 2014). Furthermore, while all students were reassured that responses were anonymous, and teachers would not be exposed to their responses, there is a possibility

Table 5.1. *Thesis strengths and limitations*

Study	Strengths	Limitations
Systematic Review	• Provides the most extensive account of academic resilience measurement to date • Presents a comprehensive conceptualisation of academic resilience • Provides accurate and detailed recommendations for educational researchers seeking to measure academic resilience	• Reflects publication bias as only articles published in the English language are reported • Due to the small number of scales identified, and the nature of the review, quality assessment criteria were not employed
Narrative Review	• Provides the first narrative review of everyday stressors experienced by adolescents. • Presents psychometric issues relating to current measurement approaches to assessing everyday stressors	• Some scholars suggest that narrative reviews do not meet important criteria for mitigating biases as they lack explicit criteria for article selection

Table 5.1. *Thesis strengths and limitations*

Study	Strengths	Limitations
One and Two	• Presents the first exploration of stressors and protective factors in PE lessons • Qualitative exploration used both inductive and deductive methodologies • Sampled students from a range of socio-economic backgrounds • Included focus groups with both students and teachers to reflect more than one interpretation of stressors in PE lessons • Thematic analyses were based on existing theory of psychological resilience and employed both an inductive and deductive approach • Methodological rigour was ensured via investigator triangulation •	• The sample consisted of mainly Caucasian students and may not reflect the experiences of students from minority ethnic backgrounds • Some scholars suggest that one-to-one interviews are superior to focus groups with secondary school-aged students • PE teachers were requested to select students from their class who reflected a range of ability levels, motivation, and engagement in PE. It is possible that the sample may reflect students who were likely to respond more positively to questions regarding experiences in PE. • Qualitative analysis was limited to focus group and interview data and did not incorporate triangulation of data (e.g. observations).

Table 5.1. *Thesis strengths and limitations*

Study	Strengths	Limitations
Three to Six	• The PESS represents the first attempt to provide a reliable and valid measure of common stressors encountered by students in everyday PE lessons • The PESS is based on extensive qualitative exploration and reviews of the everyday stressors experienced by secondary school students • Provides initial evidence for the PESS's content, concurrent, convergent, discriminant, and factorial validity • PESS is based on well-established conceptualisation of stressors (i.e. everyday stressors), does not conflate stressors with related terms, and reflects an accurate representation of the concept • The sample size was in line with recommendations in the psychometric literature	• The sample consisted of mainly Caucasian students and may not reflect the experiences of students from minority ethnic backgrounds • Self-report data may be contaminated by bias • CFA on the independent validation sample failed to produce fit indices consistent with the initial CFA and therefore further psychometric development is required to establish a reliable and valid measure of stressors in PE lessons • The studies are cross-sectional in nature and therefore cause and effect between stressors and outcomes cannot be established • The PESS does not incorporate frequency, duration, or intensity subscales and therefore stressors' chronicity and appraisal cannot be established •

Table 5.1. *Thesis strengths and limitations*

Study	Strengths	Limitations
Three to Six continued.	• Participants were from a range of schools, reflecting students from a range of socio-economic backgrounds • The PESS minimises confounding influences as items reflect situation specific stressors and are not contaminated by subjective appraisal • Provides the first investigation of the effect of stressors on educational outcomes (motivation, engagement, buoyancy, and amotivation) • Provides a solid foundation to enable educational researchers and practitioners to measure students' experiences in PE lessons	• There were too few items in the initial PESS item pool which contributed to the poor factor loadings in the following studies.

that students' responses may be biased by social desirability. On the same note, significant attempts were made to ensure that the questionnaires were completed independently. In some cases, this was possible due to the arrangement for students to complete the questionnaire independently in a quiet classroom. However, when no classroom was available, students completed the questionnaires in the sports hall immediately before their lesson. Such an environment made it difficult to prevent student from conferring on their answers, despite significant attempts to stop this (e.g. spreading students out, encouraging students to complete the questionnaire in silence, etc.). Future investigations would benefit from making sure students complete the questionnaire in more controlled conditions to ensure that responses are a reflection of their own experiences in PE, rather than their peers.

Future directions

As noted above, future research should undertake further testing to understand the mediating and/ or moderating role of protective factors in the relationship between stressors and adaptation in PE. As demonstrated in the first review, resilience theorists highlight the importance of research to be theoretically driven. There are limited theoretical models derived from the academic resilience literature, however Pitzer and Skinner (2016) have recently put forth a model of motivational resilience relevant to the majority of students who experience challenges and setbacks at school. This model, (depicted in Figure 2.2 of chapter two) incorporates some of the protective factors that were identified in the current volume of work, such as competence and teacher resources (e.g. warmth vs rejection; structure vs chaos; autonomy support vs coercion). Pitzer and Skinner's model is a much more comprehensive representation of the processes by which students, (a) appraise, (b) react to, and (c) re-engage following the experience of a stressor at school. Moreover, this model has successfully identified a number of adaptive and maladaptive ways that students respond to school stressors and use these to predict educational outcomes, for example engagement. Future research might utilise this model - developed in the academic, or 'class-room' domain - to predict motivation and engagement outcomes in PE lessons.

Some studies of adolescents' resilience have used 'real-life' scenarios to assess students' adaptation to potential stressors. For example, Yeager, Trzesniewski, and Dweck (2013) were interested in adolescents' resilience to social exclusion, using a virtual game of catch (i.e. Cyberball; Williams & Jarvis, 2006), whereby participants believed they were

playing with two peers. The other two players were, in fact, controlled by the computer. When students were ostensibly excluded by their 'peers' during the game, they were given the opportunity to assign their classmates a chosen amount of hypothetical food that they did not like (i.e. uncomfortably spicy sauce) and leave their peer an anonymous note. 'Aggressive retaliation' was measured by how much hot sauce was assigned and the content of anonymous notes. The study found that students who had previously received an 'incremental theory of behaviour' intervention, (highlighting that individuals' behaviour was not fixed, but changeable) showed substantially less aggressive behaviour in response to virtual exclusion one-month post-intervention.

Given the impact of social relations in PE (highlighted by study one), the intervention utilised by Yeager et al. (2013) has the potential to be applied to a PE setting to further understand students' resilient behaviours during lessons. Instead of measuring 'aggressive retaliation', researchers might test engagement, or motivation to continue the virtual sports game. The 'stressor' could be social exclusion (as this was identified as a stressor in PE lessons), or poor performance (via. the game being contrived to result in poor performance by the participant). In Yeager et al.'s study, students received an intervention emphasising the malleability of their peers' personalities. A similar study to test resilient behaviours in PE may test the effects of interventions emphasising the incremental nature of physical abilities (e.g. sporting ability can be developed and improved upon) versus an intervention emphasising the entity nature of physical abilities (i.e. sporting ability is fixed and something one is born with). Moreover, an intervention may incorporate another protective factor identified in study two, for example 'commitment' or 'approaching challenge'. Such interventions promoting resilient behaviours via hypothetical PE scenarios may help researchers understand these processes and precede the development of 'real-life' interventions.

As noted above, further developments could be made to improve the factorial structure of the PESS. This approach of modifying existing and adding related items on theoretical grounds has been one method of obtaining a good model fit in previous measure development research (e.g. Bartholomew et al., 2010) and may be a possibility for future empirical work on the PESS. Furthermore, to ameliorate the effects of the potential bias produced by self-report measurements, future research may utilise triangulation strategies to understand students' responses to stressors. Triangulation incorporates multiple methods (e.g. self-report, teacher reports, observations, and physiological indicators) into the study design in order to attenuate the limitations of one method through the strengths of another.

Conclusion

To conclude, previous research has shown that adolescents experience everyday stressors, i.e. situations that have the potential to be appraised as harmful or threatening to the endorser's wellbeing (Lazarus, 1984). Everyday stressors have been shown to have detrimental effects on psychological, psychosomatic, and educational outcomes over and above the experience of major life events (Escobar et al., 2013; Vaessen et al., 2017). Consequently, psychologists have sought to identify stressors relating to educational outcomes, and understand the processes by which students are resilient to these experiences. However, no research to date has focussed on identifying daily, cumulative stressors that are apparent in the unique context of PE lessons. Thus, six studies (in addition to three comprehensive reviews of stressors and resilience in adolescence) were conducted to: (a) review research that identified the occurrence of everyday stressors in adolescents; explore the common stressors experienced by students during their PE lessons, (b) explore protective factors that facilitate students' resilient responses to stressors in PE, and (c) develop and validate a measure of common stressors in PE, testing the relationships between levels of stressors and educational outcomes. Qualitative findings demonstrated a number of common situations that were unique to the PE context (opposed to class-room based, academic context) that were perceived by some students as, irritating, frustrating, or demanding. Teachers and students highlighted a number of individual assets (e.g. cognitive and behavioural factors) and environmental resources (e.g. teacher support and peer interactions) that ameliorated the negative impact of these potentially stressful experiences. Empirical studies provide a foundation for the development of a reliable and valid measure of stressors in PE, however further data collection and modification of items are necessary to improve the factorial structure of this scale. The empirical studies did, however, indicate that the experience of potential stressors had negative consequences, with the extent of stressor experience being negatively associated with motivation and engagement in PE lessons.

PE lessons are a unique context to address the declining levels of physical activity in the UK, offering the opportunity for students to achieve age-appropriate physical activity recommendations (Castillo et al., 2015). It is therefore a high priority for researchers and practitioners to understand students' motivational processes, and develop strategies and interventions to promote levels of engagement and physical activity participation in lessons. The current programme of research has contributed to this goal by providing greater

understanding of the potential stressors experienced during PE lessons, and the dynamic processes by which students respond.

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Appendix One: Expert Panel (Study Two)

EXPERT PANEL VALIDATION

Section A

Part One: Pressures

This part consists of questions that describe possible pressures that students may have experienced in the past four weeks. For the purposes of the PERS, this part aims to measure hassles, which are defined as:

"The irritating, frustrating, distressing demands that to some degree characterise everyday transactions with the environment" (Kanner, 1981)

Below we have presented a sample of questions from part one. Please rate the suitability of each question by marking yes, no, or unsure in the "relevance", "clarity", and "specificity" columns. If you have any idea of how the questions can be improved, please detail these in the comments box (below each item).

Part One		RELEVANCE			CLARITY			SPECIFICITY		
In the past four weeks, during PE I have…		Does this question potentially relate to the pressures experienced by students in PE?			Is the question worded clearly for students aged 11-16?			Does the question target a specific hassle in PE?		
		Yes	No	Unsure	Yes	No	Unsure	Yes	No	Unsure
1.1	… Felt self-conscious about the way I look									
1.1 Comments:										
1.2	… Felt embarrassed									
1.2 Comments:										
1.3	… Found a certain sport or activity difficult									
1.3 Comments:										
1.4	… Felt like I was not very good at a sport or activity									

1.4 Comments:

Part One		RELEVANCE			CLARITY			SPECIFICITY		
In the past four weeks, during PE I have…		Does this question potentially relate to the pressures experienced by students in PE?			Is the question worded clearly for students aged 11-16?			Does the question target a specific hassle in PE?		
		Yes	No	Unsure	Yes	No	Unsure	Yes	No	Unsure
1.5	…felt frustrated when I've been working with students who are much worse at PE than me									
1.5 Comments:										
1.6	… Felt bad when I've been working with students who are much better at PE than me									
1.6 Comments:										
1.7	… Felt like I'm not as good at PE compared to other students in my class									
1.7 Comments:										
1.8	… Worried about letting my group down in PE (e.g. missing a goal/ shot)									
1.8 Comments:										
1.9	… Worried about not doing well in front of my classmates									
1.9 Comments:										
1.10	… Felt like I was not included in some activities (e.g. not being passed to / left out of activities)									
1.10 Comments:										

Part One		RELEVANCE			CLARITY			SPECIFICITY		
In the past four weeks, during PE I have…		Does this question potentially relate to the pressures experienced by students in PE?			Is the question worded clearly for students aged 11-16?			Does the question target a specific hassle in PE?		
		Yes	No	Unsure	Yes	No	Unsure	Yes	No	Unsure
1.11	… Felt self-conscious about what my classmates thought of me									
1.11 Comments:										
1.12	… Worried about classmates teasing me or making negative comments									
1.12 Comments:										
1.13	… Felt like I was making much more effort than others in my class									
1.13 Comments:										
1.14	… Had to work with classmates that are not in my friendship group									
1.14 Comments:										
1.15	… Felt like PE was dominated by the ‘popular’ students in the class									
1.15 Comments:										
1.16	… Not enjoyed a particular sport / activity									
1.16 Comments:										

Part One		RELEVANCE			CLARITY			SPECIFICITY		
In the past four weeks, during PE I have…		Does this question potentially relate to the pressures experienced by students in PE?			Is the question worded clearly for students aged 11-16?			Does the question target a specific hassle in PE?		
		Yes	No	Unsure	Yes	No	Unsure	Yes	No	Unsure
1.17	… Been physically hurt during a PE lesson									
1.17 Comments:										
1.18	… Found a particular activity boring									
1.18 Comments:										
1.19	… Had to do PE outside in bad weather conditions (e.g. cold/ rain)									
1.19 Comments:										
1.20	… Felt like there wasn't enough privacy in the changing rooms									
1.20 Comments:										
1.21	…Felt uncomfortable doing activities in front of the opposite sex									
1.21 Comments:										
1.22	… Felt like I had no confidence when doing certain activities									
1.22 Comments:										

Part One		RELEVANCE			CLARITY			SPECIFICITY		
In the past four weeks, during PE I have…		Does this question potentially relate to the pressures experienced by students in PE?			Is the question worded clearly for students aged 11-16?			Does the question target a specific hassle in PE?		
		Yes	No	Unsure	Yes	No	Unsure	Yes	No	Unsure
1.23	… Felt like my teacher does not think I am doing very well in PE									
Q1.23 Comments:										
1.24	… Been frustrated that my teacher pays more attention to the students that are better at PE									
Q1.24 Comments:										
1.25	… Been given a bad grade for an activity									
Q1.25 Comments:										
1.26	… Got a low fitness test result									
Q1.26 Comments:										
1.27	… Felt like PE classes are too ‘cliquey’ (e.g. ‘sporty’ students all work together)									
1.27 Comments:										
1.28	… Been frustrated because lessons are too short									
1.28 Comments:										

Part One		RELEVANCE			CLARITY			SPECIFICITY		
In the past four weeks, during PE I have…		Does this question potentially relate to the pressures experienced by students in PE?			Is the question worded clearly for students aged 11-16?			Does the question target a specific hassle in PE?		
		Yes	No	Unsure	Yes	No	Unsure	Yes	No	Unsure
1.29	… [Girls only] Felt frustrated because girls don't get to do some of the activities that the boys get to do (e.g. football or rugby)									
1.29 Comments:										
1.30	… [Boys only] Felt frustrated because boys don't get to do some of the activities that girls get to do (e.g. netball or rounders)									
1.30 Comments:										
1.31	… Had someone shout at me for doing something wrong during an activity									
1.31 Comments:										
1.32	… [Girls only] Felt frustrated because boys think they are much better at PE than girls are									
1.32 Comments:										
1.33	… Felt pressured to be one of the best in the group									
1.33 Comments:										
1.34	… Felt self-conscious getting changed in front of my classmates / teachers									
1.34 Comments:										

Part One		RELEVANCE			CLARITY			SPECIFICITY		
In the past four weeks, during PE I have…		Does this question potentially relate to the pressures experienced by students in PE?			Is the question worded clearly for students aged 11-16?			Does the question target a specific hassle in PE?		
		Yes	No	Unsure	Yes	No	Unsure	Yes	No	Unsure
1.35	… Been bored because we do the same activities over and over again									
1.35 Comments:										
1.36	… Been in trouble with my teacher for wearing the wrong PE kit									
1.36 Comments:										
1.37	… Been in trouble with my teacher for forgetting my PE kit									
1.37 Comments:										
1.38	… Felt like my teacher doesn't think I am putting in effort during lessons, even when I am									
1.38 Comments:										
1.39	… Felt bad about being put in lower ability groups in PE									
1.39 Comments:										
1.40	… Felt like my PE teacher was being too strict									
1.40 Comments:										

Part One		RELEVANCE			CLARITY			SPECIFICITY		
In the past four weeks, during PE I have…		Does this question potentially relate to the pressures experienced by students in PE?			Is the question worded clearly for students aged 11-16?			Does the question target a specific hassle in PE?		
		Yes	No	Unsure	Yes	No	Unsure	Yes	No	Unsure
1.41	… Felt like some students brag about being better at PE than other students									
1.41 Comments:										
1.42	… Found it difficult to grasp a particular skill									
1.42 Comments:										
1.43	… Lost a game									
1.43 Comments:										
1.44	… Finished near the bottom of the class in a certain activity									
1.44 Comments:										
1.45	… Felt as though my ability in PE affects how popular I am within the class									
1.45 Comments:										
1.46	… Felt like I was not fit enough to do some activities									
1.46 Comments:										

EXPERT PANEL VALIDATION

Section B

This section presents the proposed format of the PERS and the response scales used. It only includes the instructions and a sample of questions from the three parts of the scale. Following this, there are some questions regarding your general impression of the PERS format and response scales and whether you feel that any changes are required.

Instructions

The statements below refer to a number of different pressures that you might have to deal with in a PE lesson. For each of the statements you need to answer how often they have happened in the past four weeks.
For each statement, you will then be asked how bad this made you feel in the lesson.
Remember there is no right or wrong answer, so please be as honest as possible.

In the past four weeks, during PE I have…

1) Felt self-conscious about the way I look

1	2	3	4	5
Never	Sometimes	Often	Very often	Always

What effect does this have on you during the lesson? (If you answered 'never', circle "it didn't happen").

1	2	3	4
It didn't happen	Didn't feel bad	Felt sort of bad	Felt very bad

2) Been embarrassed

1	2	3	4	5
Never	Sometimes	Often	Very often	Always

What effect does this have on you during the lesson?

1	2	3	4
It didn't happen	Didn't feel bad	Felt sort of bad	Felt very bad

3) Found a certain sport or activity difficult

1	2	3	4	5
Never	Sometimes	Often	Very often	Always

What effect does this have on you during the lesson?

1	2	3	4
It didn't happen	Didn't feel bad	Felt sort of bad	Felt very bad

4) Felt like I was not very good at a sport or activity

1	2	3	4	5
Never	Sometimes	Often	Very often	Always

What effect does this have on you during the lesson?

1	2	3	4
It didn't happen	Didn't feel bad	Felt sort of bad	Felt very bad

General Feedback

Please use the space below to feedback any additional impressions of the scale, the title (PERS), potential issues or any recommendations you feel may benefit the scale.

Appendix Two: 34-Item SPE-Q (Study Three)

Challenges, Difficulties and Setbacks in Physical Education

1. What year of school are you in? Year: _____

2. What is your gender?

☐ Male ☐ Female

3. Have you chosen PE for GCSE? [Only answer if you are in year 10 or 11].

☐ Yes ☐ No

Please read the following situations that might have happened to you during your school PE lessons over the last four weeks. For each situation, please circle whether it has 'never happened', 'sometimes happened', 'often happened', 'very often happened' or 'always happened' in your PE lesson.

For example, if the particular situation **never** happened to you over the past four weeks, then circle the number '1'.

Remember there is no right or wrong answer so please be as honest as you can.

In the past four weeks, during PE…

1) …I have been doing an activity that I've found difficult

1	2	3	4	5
Never	Sometimes	Often	Very often	Always

2) …I have been put in a group with students who are much worse at PE than me

1	2	3	4	5
Never	Sometimes	Often	Very often	Always

3) …I have been put in a group with students who are much better at PE than me

1	2	3	4	5
Never	Sometimes	Often	Very often	Always

4) …I have not performed as well as others in my class

1	2	3	4	5
Never	Sometimes	Often	Very often	Always

5) …I let my group down in PE (for example, by missing a shot)

1	2	3	4	5
Never	Sometimes	Often	Very often	Always

6) …I performed an activity badly in front of my classmates

1	2	3	4	5
Never	Sometimes	Often	Very often	Always

7) …I was excluded by classmates during an activity (e.g. was not passed to)

1	2	3	4	5
Never	Sometimes	Often	Very often	Always

8) …a classmate(s) made negative comments towards me

1	2	3	4	5
Never	Sometimes	Often	Very often	Always

9) …classmates in my group have not made as much effort as I do

1	2	3	4	5
Never	Sometimes	Often	Very often	Always

10) …I had to work with classmates who are not in my friendship group

1	2	3	4	5
Never	Sometimes	Often	Very often	Always

11) …the class was dominated by the 'sporty' students in the class

1	2	3	4	5
Never	Sometimes	Often	Very often	Always

12) …I have been physically hurt during a particular activity

1	2	3	4	5
Never	Sometimes	Often	Very often	Always

13) …I had to do PE outside in bad weather conditions (e.g. cold/ rain)

1	2	3	4	5
Never	Sometimes	Often	Very often	Always

14) …I have not had enough privacy in the changing rooms

1	2	3	4	5
Never	Sometimes	Often	Very often	Always

15) …I have been working in front of the opposite sex

1	2	3	4	5
Never	Sometimes	Often	Very often	Always

16) …my teacher has told me I could be doing better in PE

1	2	3	4	5
Never	Sometimes	Often	Very often	Always

17) …my teacher(s) have paid more attention to the students who are better at PE

1	2	3	4	5
Never	Sometimes	Often	Very often	Always

18) …I have been given a bad grade for an activity

1	2	3	4	5
Never	Sometimes	Often	Very often	Always

19) …I got a low fitness test result

1	2	3	4	5
Never	Sometimes	Often	Very often	Always

20) …all the sporty students work together

1	2	3	4	5
Never	Sometimes	Often	Very often	Always

21) …other classes in the year are doing different activities than my class

1	2	3	4	5
Never	Sometimes	Often	Very often	Always

22) …a classmate or teacher shouted at me for doing something wrong

1	2	3	4	5
Never	Sometimes	Often	Very often	Always

23) …[girls only] some boys have boasted about being better at PE than girls

1	2	3	4	5
Never	Sometimes	Often	Very often	Always

24) …I have been doing activities that I've been doing lots of times before

1	2	3	4	5
Never	Sometimes	Often	Very often	Always

25) …I have been in trouble with my teacher for wearing the wrong PE kit

1	2	3	4	5
Never	Sometimes	Often	Very often	Always

26) …I have been in trouble with my teacher for forgetting my PE kit

1	2	3	4	5
Never	Sometimes	Often	Very often	Always

27) …my teacher has told me to put more effort in PE classes

1	2	3	4	5
Never	Sometimes	Often	Very often	Always

28) …I get put in lower ability groups / teams in PE

1	2	3	4	5
Never	Sometimes	Often	Very often	Always

29) …my PE teacher has been very strict

1	2	3	4	5
Never	Sometimes	Often	Very often	Always

30) …some students have bragged (or 'showed off') about being better at PE than me

1	2	3	4	5
Never	Sometimes	Often	Very often	Always

31) …I have taken a long time to master a particular skill

1	2	3	4	5
Never	Sometimes	Often	Very often	Always

32) …I have lost a game

1	2	3	4	5
Never	Sometimes	Often	Very often	Always

33) …I have finished near the bottom of the class in a certain activity

1	2	3	4	5
Never	Sometimes	Often	Very often	Always

34) …I did not want to do certain activities because I wasn't fit enough

1	2	3	4	5
Never	Sometimes	Often	Very often	Always

Appendix Three: 17-Item SPE-Q (Study Four & Five)

Challenges, Difficulties and Setbacks in Physical Education

1. What year of school are you in? Year: _____

2. What is your gender?

☐ Male ☐ Female

3. Have you chosen PE for GCSE? [Only answer if you are in year 10 or 11].

☐ Yes ☐ No

Please read the following situations that might have happened to you during your school PE lessons over the last four weeks. For each situation, please circle whether it has 'never happened', 'sometimes happened', 'often happened', 'very often happened' or 'always happened' in your PE lesson.

For example, if the particular situation **never** happened to you over the past four weeks, then circle the number '1'.

Remember there is no right or wrong answer so please be as honest as you can.

In the past four weeks, during PE…

…I have been put in a group with students who are much worse at PE than me

1	2	3	4	5
Never	Sometimes	Often	Very often	Always

…I have not performed as well as others in my class

1	2	3	4	5
Never	Sometimes	Often	Very often	Always

…I was excluded by classmates during an activity (e.g. was not passed to)

1	2	3	4	5
Never	Sometimes	Often	Very often	Always

…classmates in my group have not made as much effort as I do

1	2	3	4	5
Never	Sometimes	Often	Very often	Always

…I had to work with classmates who are not in my friendship group

1	2	3	4	5
Never	Sometimes	Often	Very often	Always

…the class was dominated by the ‘sporty’ students in the class

1	2	3	4	5
Never	Sometimes	Often	Very often	Always

…I have been physically hurt during a particular activity

1	2	3	4	5
Never	Sometimes	Often	Very often	Always

…I have been working in front of the opposite sex

1	2	3	4	5
Never	Sometimes	Often	Very often	Always

…my teacher(s) have paid more attention to the students who are better at PE

1	2	3	4	5
Never	Sometimes	Often	Very often	Always

…I have been given a bad grade for an activity

1	2	3	4	5
Never	Sometimes	Often	Very often	Always

…all the sporty students work together

1	2	3	4	5
Never	Sometimes	Often	Very often	Always

…[girls only] some boys have boasted about being better at PE than girls

1	2	3	4	5
Never	Sometimes	Often	Very often	Always

…I have finished near the bottom of the class in a certain activity

1	2	3	4	5
Never	Sometimes	Often	Very often	Always

… some of my classmates 'mess about' or disrupt the lesson

1	2	3	4	5
Never	Sometimes	Often	Very often	Always

… [boys only] Girls get to do activities that I would like to do (e.g. gymnastics / hockey)

1	2	3	4	5
Never	Sometimes	Often	Very often	Always

… [girls only] Boys get to do activities that I would like to do (e.g. football / basketball)

1	*2*	*3*	*4*	*5*
Never	*Sometimes*	*Often*	*Very often*	*Always*

…[girls only] if we have to do PE with boys they take over the lesson (e.g. don't pass to the girls)

1	2	3	4	5
Never	Sometimes	Often	Very often	Always

… some of my classmates boast if they are better at PE than others

1	2	3	4	5
Never	Sometimes	Often	Very often	Always

Appendix Four: Concurrent Validity Measures (Study Four & Five)

Academic Motivation Scale (Amotivation subscale)

If you strongly **disagree** with the sentence, circle number 1. If you strongly **agree**, circle number 7.

I take part in this PE class…
…but I don't really know why.

1	2	3	4	5	6	7
Strongly disagree			Neither agree or disagree			Strongly agree

…but I don't see why we should have PE.

1	2	3	4	5	6	7
Strongly disagree			Neither agree or disagree			Strongly agree

…but I really feel I'm wasting my time in PE.

1	2	3	4	5	6	7
Strongly disagree			Neither agree or disagree			Strongly agree

…but I can't see what I'm getting out of PE

1	2	3	4	5	6	7
Strongly disagree			Neither agree or disagree			Strongly agree

Academic Buoyancy Scale

Next, please read the four sentences below about how you deal with difficulties at school. If you strongly **disagree** with the sentence, circle number 1. If you strongly **agree**, circle number 7.

I'm good at dealing with setbacks in PE

1	2	3	4	5	6	7
Strongly disagree			Neither agree or disagree			Strongly agree

I don't let stress in PE get on top of me.

1	2	3	4	5	6	7
Strongly disagree			Neither agree or disagree			Strongly agree

I think I'm good at dealing with pressures in PE.

1	2	3	4	5	6	7
Strongly disagree			Neither agree or disagree			Strongly agree

I don't let a bad mark affect my confidence.

1	2	3	4	5	6	7
Strongly disagree			Neither agree or disagree			Strongly agree

Engagement and Disaffection Scale

I try hard to do well in PE

1	2	3	4
Not at all true	Not very true	Sort of true	Very true

In PE I work as hard as I can

1	2	3	4
Not at all true	Not very true	Sort of true	Very true

When I'm in PE, I participate in activities

1	2	3	4
Not at all true	Not very true	Sort of true	Very true

I pay attention in PE

1	2	3	4
Not at all true	Not very true	Sort of true	Very true

When I'm in PE, I listen very carefully

1	2	3	4
Not at all true	Not very true	Sort of true	Very true

When I’m in PE, I just act like I’m taking part

1	2	3	4
Not at all true	Not very true	Sort of true	Very true

I don’t try very hard in PE

1	2	3	4
Not at all true	Not very true	Sort of true	Very true

In PE, I do just enough to get by

1	2	3	4
Not at all true	Not very true	Sort of true	Very true

When I’m in PE, I think about other things

1	2	3	4
Not at all true	Not very true	Sort of true	Very true

When I’m in PE, my mind wanders

1	2	3	4
Not at all true	Not very true	Sort of true	Very true

When I’m in PE, I feel good

1	2	3	4
Not at all true	Not very true	Sort of true	Very true

When we work on something in PE, I feel interested

1	2	3	4
Not at all true	Not very true	Sort of true	Very true

PE is fun

1	2	3	4
Not at all true	Not very true	Sort of true	Very true

I enjoy learning new things in PE

1	2	3	4
Not at all true	Not very true	Sort of true	Very true

When we work on something in PE, I get involved

1	2	3	4
Not at all true	Not very true	Sort of true	Very true

When we work on something in PE, I feel bored

1	2	3	4
Not at all true	Not very true	Sort of true	Very true

When we start something new in PE, I feel nervous

1	2	3	4
Not at all true	Not very true	Sort of true	Very true

When we work on something in PE, I feel discouraged

1	2	3	4
Not at all true	Not very true	Sort of true	Very true

PE is not all that fun for me

1	2	3	4
Not at all true	Not very true	Sort of true	Very true

When I'm in PE, I feel bad

1	2	3	4
Not at all true	Not very true	Sort of true	Very true