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Publisher Routledge

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Oxford Review of Education

Publication details, including instructions for authors and subscription information:

<http://www.informaworld.com/smpp/title~content=t713440173>

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To cite this Article Martin, Andrew J. and Marsh, Herbert W.(2009) 'Academic resilience and academic buoyancy: multidimensional and hierarchical conceptual framing of causes, correlates and cognate constructs', Oxford Review of Education, 35: 3, 353 – 370

To link to this Article: DOI: 10.1080/03054980902934639

URL: <http://dx.doi.org/10.1080/03054980902934639>

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Academic resilience and academic buoyancy: multidimensional and hierarchical conceptual framing of causes, correlates and cognate constructs

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‘Academic resilience’ refers to a student’s capacity to overcome acute or chronic adversities that are seen as major assaults on educational processes. Although intersecting with highly vulnerable and important populations, academic resilience does not map onto the many students who are faced with setbacks, challenges and pressures that are part of more regular academic life. This, it is argued, reflects ‘academic buoyancy’ that maps onto the many students who must negotiate the ups and downs of everyday academic life as distinct from acute and chronic adversities relevant to more traditional constructions of academic resilience. Inherent in this argument, then, is a proposed hierarchical framework in which academic buoyancy is a necessary but not sufficient condition for academic resilience. Such a hierarchical framework, therefore, has the potential to speak to all students and so represents an encompassing framework that can more fully explain the nature and extent of adversities and challenges that are part of academic life. We further contend that academic resilience and academic buoyancy require multidimensional approaches to their conceptualising and measurement in order to most effectively differentiate the factors that are (and are not) components, causes, correlates and cognate to them. We conclude by proposing a number of conceptual and empirical approaches to a next generation of research into academic resilience and academic buoyancy, develop the notion of ‘leading’ and ‘lagging’ indicators of buoyancy and resilience, and identify the implications of our framework for intervention and policy in the academic domain and beyond.

Introduction

Although the issue of *life* resilience has received a great deal of attention (e.g., Garmezy, 1981; Rutter, 1987; Werner, 2000; Masten, 2001; Luthar, 2003; Coleman

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& Hagell, 2007), Martin and Marsh (2006, 2008a, b) point out that there are challenging questions requiring attention in the *academic* context. Schools and other educational domains are sites in which academic challenge, setback and pressure are a constant reality of everyday life—and empirical data clearly support this (e.g., Finn & Rock, 1997; Gonzalez & Padilla, 1997; Catterall, 1998; Overstreet & Braun, 1999; Martin & Marsh, 2006, 2008b). Given that most young people in the UK (and many Western nations) up to the ages of 16–18 are in some form of education, there is a clear need to better understand their academic adversities and the ways they deal with them. We suggest an important part of the picture lies in a student's capacity to be resilient and buoyant in the face of academic risk and challenge. Although there are many students who perform poorly and continue to perform poorly (Dauber *et al.*, 1996), there is a significant number of other students who manage to turn around their academic fortunes by overcoming initial problems and disadvantage (Jimerson *et al.*, 1999). It is proposed that we can learn much from these students.

The individual and societal price to pay for problematic academic pathways is substantial. Disaffection and disengagement from school reduce educational achievement and increase the chances of social exclusion (MacDonald, 2007). 'Failing students' from 'failing schools' (MacDonald, 2007) have little or no access to the 'structure of opportunities' (Roberts, 1995) available to other students. As a result, they are systematically disconnected from adaptive school and post-school pathways and this disconnection is reflected in persistent truancy (Pavis & Cunningham-Burley, 1999), increased substance use and abuse, employment and crime (Roberts, 1995; MacDonald, 2007). In less dramatic circumstances, a generally low-level inability to cope academically limits one's personal potential (Martin, 2006). In this article, we propose academic buoyancy and academic resilience as two important factors that underpin students' positive connections to school and academic life and their ability to 'bounce back' when they face minor and major academic adversity.

Inherent in our approach to academic resilience and academic buoyancy is an asset-oriented or strengths-based approach to students' responses to academic adversity. In line with recent theorising and research into positive psychology, well-being and mental health, we propose that students can learn to be more academically resilient and buoyant through the development of positive cognitive, affective and behavioural orientations to school and academic life. For example, recent work has moved beyond the more defensive 'risk' and 'protective' factors to also encompass 'enabling' factors (Bandura, 2006). Similarly, positive psychologists advancing the 'broaden-and-build' theory of positive emotion (Fredrickson, 2001; see also Martin, 2004) propose that enhancing positive emotions and narrowing negative ones broadens individuals' psychological and behavioural repertoire to facilitate adaptability and resilience under stress. Moreover, from a mental health perspective, there is emerging theory and research proposing that mental health is not simply the absence of mental illness but also the capacity to 'flourish' (Keyes, 2007)—a theme consistent with the present interest in an asset-oriented and aspirational approach to resilience and buoyancy.

Taken together, the ideas we develop here seek to answer some vital questions relevant to academic buoyancy and academic resilience, including, *inter alia*: What is the

difference between buoyancy and resilience? What does differentiating these two add to existing research and practice? Do existing accounts of academic resilience sufficiently recognise positive dimensions of students' academic lives? Are academic buoyancy and resilience more than *ex post facto* phenomena such that we can propose models that hold predictive and explanatory power? Do students need to experience academic adversity in order to develop academic buoyancy and resilience? How can we develop interventions that break vicious circles such that the initial inability to cope constructively with disadvantage and stressful circumstances does not mushroom over time? What implications do the answers to these types of questions hold for educational policy?

Defining academic resilience and academic buoyancy

Resilience has been defined as the process of, capacity for, or outcome of successful adaptation despite challenging or threatening circumstances (Howard & Johnson, 2000). These circumstances are not usually minor or insubstantial. Rather, they tend to be characterised in terms of 'acute' and 'chronic' adversities that are seen as 'major assaults' on developmental processes (e.g., see Garmezy, 1981; Luthar & Cicchetti, 2000; Werner, 2000; Lindstroem, 2001; Masten, 2001). Although there has been substantial focus on resilience in terms of broader life events such as being raised in a disadvantaged background, receiving poor parenting, or divorce (Luthar & Cicchetti, 2000; Lindstroem, 2001; Masten, 2001), there has been relatively less research focusing on academic resilience. In the academic context, 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). Similarly, academically resilient students are those 'who sustain high levels of achievement motivation and performance despite the presence of stressful events and conditions that place them at risk of doing poorly in school and ultimately dropping out of school' (Alva, 1991, p.19).

Because resilience typically refers to major adversities impeding developmental processes (Garmezy, 1981; Luthar & Cicchetti, 2000; Werner, 2000; Lindstroem, 2001; Masten, 2001), it has limited applicability to challenges and adversities that are typical of daily academic life and which are relevant to a majority of students. Thus, for example, studies dealing with resilience in the academic context tend to focus on ethnic groups situated in extremely adverse conditions (e.g., poverty—Overstreet & Braun, 1999; gang violence—Catterall, 1998), chronic underachievers (e.g., Finn & Rock, 1997), and specific underachieving cohorts (e.g., Gonzalez & Padilla, 1997). Other research touches on the issue of resilience in the academic setting and 'clinical' groups such as students with learning disabilities (e.g., Miller, 2002; Meltzer, 2004). Hence, traditional constructions and operationalisations of resilience refer to a relatively small number of students (whom it is vital to assist) experiencing rather extreme adversity. These constructions and operationalisations tend not to refer to a relatively large number of students experiencing 'everyday' adversities (whom it is also vital to assist).

Differentiating academic resilience and academic buoyancy

A critical dimension to our conceptualising and proposed measurement of academic resilience and buoyancy is that the two are distinct in some important ways. In seeking to better understand academic resilience and buoyancy, we have previously proposed the two differ in definitional terms, in terms of the samples to which they relate, in terms of operational aspects, on methodological bases, and in terms of the interventions that are relevant to them (Martin & Marsh, 2008b). We concluded that the traditional resilience concept does not map onto the many individuals who are faced with setbacks, challenges, and pressures that are part of the ordinary course of life. This, we contended, reflects buoyancy that maps onto the many individuals who must negotiate the ups and downs of everyday life as distinct from acute and chronic adversities relevant to traditional constructions of resilience. By proposing the concept of academic buoyancy, we (Martin & Marsh, 2008a, b) sought to bridge the gap between traditional treatments of academic resilience of acute, chronic, intense and sustained adversity experienced by the relative few (e.g., Garmezy, 1981; Luthar & Cicchetti, 2000; Werner, 2000; Lindstroem, 2001; Masten, 2001) and everyday adversities experienced by the many.

We have also previously contended that buoyancy and resilience can be demarcated in terms of differences of degree (Martin & Marsh, 2008a, b). We argued that:

- Whereas academic resilience comes into play when dealing with chronic underachievement, academic buoyancy comes into play when dealing with isolated poor grades and patches of poor performance;
- Whereas academic resilience comes into play when dealing with overwhelming feelings of anxiety that are incapacitating, academic buoyancy comes into play when dealing with more typical stress levels and daily pressures;
- Whereas academic resilience comes into play when dealing with debilitation in the face of chronic failure or anxiety, academic buoyancy comes into play when dealing with threats to confidence as a result of a poor grade;
- Whereas academic resilience comes into play when dealing with clinical types of affect such as anxiety and depression, academic buoyancy comes into play when dealing with low-level stress and confidence;
- Whereas academic resilience comes into play when dealing with truancy and disaffection from school, academic buoyancy comes into play when dealing with dips in motivation and engagement;
- Whereas academic resilience comes into play when dealing with comprehensive and consistent alienation or opposition to teachers, academic buoyancy comes into play when dealing with minor interactions such as negative feedback on schoolwork (Martin & Marsh, 2008a, b).

If we recognise differences of degree between the two, then it might also be feasible to consider that academic buoyancy may be a necessary but not sufficient condition for academic resilience (Martin & Marsh, 2008a, b). We might therefore ask to what

extent academically resilient students are also academically buoyant. To the extent that it is the case, it might imply something of a hierarchical or directional ordering—and a further point of differentiation.

Proactive approaches to academic adversity

We also seek to extend the narrative of academic adversity from one that is often defensively oriented to one that is proactive and asset-oriented. Resilience is often defined in terms of one's capacity to manage, offset, diminish or eliminate risk. In a sense, this implies that resilience occurs when risk strikes or when risk threatens. Accordingly, 'risk' and 'protective' factors have been developed as two central constructs or concepts in research and theorising about resilience. Ideally, however, it would seem important to be managing one's academic life in such a fashion that resilience is rarely needed or not needed at all. This would suggest a need for a certain level of buoyancy in one's academic life—to stay on top of things in the ordinary course of academic life, dealing with adversity whilst it is relatively minor before it becomes relatively major (although we recognise that some adversities are not of an individual's choosing or making).

Thus, a more encompassing view on students' capacity to deal with academic adversity might comprise a consistently proactive approach as the 'frontline' of one's academic development and a robust defence system as the 'backline' when more acute and/or chronic adversity arises. It might also be hypothesised that the frontline approach reflects academic buoyancy and the backline defence reflects academic resilience. Thus, academic buoyancy might be seen as the ongoing proactive frontline response to academic adversity and academic resilience is the defensive backline that is invoked as necessary, if at all.

This proactively-oriented buoyancy concept also aligns with recent developments in positive psychology hypothesising about the scope for adaptive dimensions of individuals' lives to address aspects of their lives that are not so adaptive. A positive focus along these lines has the capacity to not only reflect a healthy end-state but also is a means of achieving psychological growth and improved well-being over time (see Fredrickson, 2001). Positive psychologists refer to this as the broaden and build theory of positive emotions (Fredrickson, 2001). The broaden and build theory proposes that positive emotions and processes provide the potential to broaden individuals' momentary thought-action repertoires and also increase individuals' capacity to enhance their personal resources. Hence, a focus on key principles underpinning academic buoyancy might encompass building on strengths and emphasising proactive rather than reactive approaches to setback and challenge. It might also emphasise key catalysts to enhanced educational outcomes that include healthy school environments, adaptive intrapersonal factors, positive motivation and engagement, and constructive interests and attitudes.

A more proactive approach and narrative for academic adversity may also be developed in terms of the factors that are proposed to resolve such adversity. Recent theorising about resilience has extended its scope from the more defensive risk and

protective factors, to also encompass enabling factors (Bandura, 2006). Theorising around enabling factors explicitly promotes responses to academic adversity in terms of successful and positive adaptations whereby ‘individuals play a proactive role in their adaptation rather than simply undergo happenings in which environments act upon their personal endowments’ (Bandura, 2006, p. 28). It is noteworthy that the Scottish review by Newman and Blackburn (2002, p. 1) argued that ‘resilient children are better equipped to resist stress and adversity, cope with change and uncertainty, and to recover faster and more completely from traumatic events or episodes,’ but concluded that insufficient attention has been given to enabling factors such as positive school experiences, a sense of mastery, a belief that one’s own efforts can make a difference, and effective approaches to learning in school.

This proactive approach might also extend research from that which typically considers resilience in terms of cumulative risk factors to that which considers cumulative protective (Coleman & Hagell, 2007) and cumulative enabling factors. There has been a good deal of research looking at how risk factors multiply and aggregate to reduce young people’s life outcomes (Masten & Powell, 2003). The emphasis on risk factors has emerged from the medical model and epidemiological research seeking to identify risk factors for physical disease (e.g., heart disease). Consequently, Olsson and colleagues (2003) have suggested that this might not be the most appropriate lens through which to understand resilience—with Coleman and Hagell (2007) suggesting the value of cumulative protective factors for better fostering resilience.

Excessive focus on risk factors may also unduly influence interventions aimed at developing students’ academic buoyancy and academic resilience. For example, researchers are not sure if resilience is developed through exposing individuals to adversity in the same way that exposing individuals to a low level dose of a virus inoculates against future infection (Olsson *et al.*, 2003; Coleman & Hagell, 2007). Indeed, the opposite may be the case: increasing individuals’ exposure to protective and enabling factors may be a more effective means of developing their resilience. Proactive and positively-oriented perspectives on adversity, then, are ideally placed to account for such possibilities.

Approaches to studying academic resilience and buoyancy

According to Masten (2001), there are predominantly two approaches to the study of resilience. The first is the variable-focused approach that tests linkages among measures of degree of risk/adversity and qualities that may protect the person from negative consequences and outcomes. The second is the person-focused approach that compares people with different profiles to ascertain what differentiates resilient individuals from non-resilient individuals. Contextualising these approaches in terms of risk and resilience, we might also consider variable-focused approaches to primarily encompass risk factors and person-focused approaches to primarily encompass at-risk individuals (Coleman & Hagell, 2007). We consider it important to conceptualise and assess academic buoyancy and academic resilience from both perspectives. It is,

however, important to emphasise that we see variable-oriented and person-oriented approaches as complementary (e.g., Marsh *et al.*, in press).

Variable-focused approaches to academic buoyancy and academic resilience

Masten (2001) reports that the variable-focused approach has the advantage of statistical power and is suited to searching for specific and differential links between predictors and outcomes that can have implications for intervention. This also allows researchers to test aspects of the validity of academic buoyancy and resilience in relation to correlates rather than leave this assumption untested. Additionally, because it can be assumed that the relevant constructs vary as a function of a combination of student-level and environmental factors, it is possible to consider changes over time and what factors are related to these changes.

Perhaps the most direct and operationally straightforward means of assessing academic buoyancy and academic resilience is that conducted using *global* measures. For example, in relation to academic buoyancy, Martin and Marsh (2008a, b) have developed the Academic Buoyancy Scale that directly asks students how they deal with academic adversities that are typical of the ordinary course of academic life (e.g., study pressure and deadlines, occasional poor grades etc.). A global measure of academic resilience might ask students about the presence of more acute and/or chronic academic adversities and how they deal with these. These more acute or chronic difficulties might include ongoing detention or suspension from school, alienation in the academic context (e.g., bullying), chronic poor performance, consistent difficulties with teachers/authority, excessive and overwhelming pressure/stress, and ongoing inability to understand or complete schoolwork.

Following from this, if researchers were to assess global buoyancy and resilience and also collect data on particular academic adversities, this would enable tests of *moderation*. For example, a moderating operationalisation would examine the interaction of global academic resilience and academic adversity with particular interest in the extent to which academic resilience moderates the effects of academic adversity—with higher levels of resilience hypothesised to moderate the negative effects of academic adversity. This is consistent with recent research that recognises the need to consider resilience a dynamic process reflecting the interaction of context/situation and the individual (see Evans & Pinnock, 2007 for a review).

Researchers might also assess academic buoyancy and resilience through a *hierarchical* lens. As discussed above, we propose that academic buoyancy is a necessary but not sufficient condition for academic resilience. That is, resilient students are likely to also be buoyant. This implies something of a hierarchy and so researchers might also examine this, not only in terms of hierarchical structural equation models (e.g., see Muthén & Muthén, 2006; Marsh *et al.*, in press) but also from an item-response theory (IRT; Rasch, 1966) perspective. Indeed, an IRT perspective would also be useful to most effectively develop the global buoyancy and resilience measures described above—ensuring that individual items in each scale are appropriately

ordered in terms of item difficulty, with academic resilience items more 'difficult' than academic buoyancy items.

Also worth investigating is the extent to which global academic buoyancy and resilience are overarching constructs subsumed by more differentiated factors—suggesting the need for a *multidimensional* approach. Thus, global academic buoyancy and resilience might reside at the apex of their respective frameworks (e.g., see Marsh & Shavelson, 1985) each underpinned, for example, by specific cognitive, affective and behavioural components. Our related work into mental toughness amongst elite athletes also emphasised the need for multidimensional approaches to mental toughness in the sporting domain (Middleton *et al.*, 2004). A multidimensional approach to buoyancy and resilience would not only capture the potential complexity of the constructs but also provide points for more targeted intervention that is known to benefit from tailored and specific (not global) psycho-educational practice (Martin, 2005, 2008a; O'Mara *et al.*, 2006).

Another variable-focused approach to the study of academic buoyancy and academic resilience is that which examines *predictors* of these constructs. Research investigating predictors of academic resilience has identified a broad array of factors that contribute to students' capacity to deal effectively with academic adversity and setback. This research focuses on distal and proximal factors. Because the proximal factors are generally considered to be more manipulable and amenable to intervention (Cappella & Weinstein, 2001), these have been the focus of our own work on academic buoyancy (Martin & Marsh, 2006, 2008a, b). Broadly, these proximal factors can be grouped into (a) psychological factors, (b) school and engagement factors, and (c) family and peer factors. Psychological factors include self-efficacy, control, sense of purpose and motivation (Finn & Rock, 1997; Waxman *et al.*, 1997; Masten & Coatsworth, 1998; Wayman, 2002). School and engagement factors include class participation, educational aspirations, enjoyment of school, relationship with teachers, teacher responsiveness, effective teacher feedback, attendance, value placed on school, extra-curricular activity, and challenging curriculum (Alva, 1991; Finn & Rock, 1997; Waxman *et al.*, 1997; Catterall, 1998; Masten & Coatsworth, 1998). Family and peer factors include family support, positive bonds with pro-social adults, informal network of friends, peer commitment to education, authoritative and caring parenting, and connections to pro-social organisations (Alva, 1991; Gonzalez & Padilla, 1997; Catterall, 1998; Masten & Coatsworth, 1998; Wayman, 2002). Family factors ought also to encompass genetic and physiological factors relevant to academic buoyancy and resilience—and, for example, the interaction of these factors with the psychological and school factors described above (Rutter, 2006).

Buoyancy and resilience also necessitate some level of adversity that is resolved to a satisfactory end (Masten, 2001), implying a longitudinal process in which an individual wrestles with adversity to then functionally emerge at some later point. This might imply an inoculation model in which it is beneficial to successfully cope with small, manageable amounts of adversity in order to more effectively cope with subsequent more demanding amounts of adversity—as with successful coping with medical adversity (see above). There is, then, a need for researchers to collect data

that are able to shed light on passages that are successful and those that are not. This brings into consideration the need to collect longitudinal data. Importantly, longitudinal data provide opportunities to move beyond the study of predictors to the study of *causes*. Causation is a critical issue in academic buoyancy and resilience research and holds important implications for pedagogy and psychological practice. Marsh (see Marsh, 2007) developed new applications of structural equation modelling to assess causal ordering issues of this nature. For example, in relation to the area of self-concept, there now exists strong support for a model demonstrating that prior achievement motivation leads to improvements in subsequent academic achievement beyond what can be explained in terms of previous achievement (Marsh, 2007). Similarly, by assessing in the one model the effects of (a) Time 1 buoyancy and resilience on Time 2 academic outcomes after controlling for Time 1 academic outcomes, and (b) the effects of Time 1 academic outcomes on Time 2 academic buoyancy and resilience after controlling for Time 1 buoyancy and resilience, it is possible to get a sense of the 'causal' ordering of factors at one time point over factors at a later time point (e.g., see Martin & Marsh, 2008a).

To the extent that predictors and causes are important conduits for better understanding academic buoyancy and academic resilience, so too are the potential *consequences* of buoyancy and resilience. Indeed, connecting predictor and consequence models by way of academic buoyancy and resilience is also a means of testing a *mediation* model that seeks to determine the indirect effects of hypothesised predictors via buoyancy and resilience (see Baron & Kenny, 1986). There is a host of noteworthy educational and psychological constructs that may be deemed logical consequences of academic buoyancy and resilience. Martin and Marsh (2006) proposed educational (e.g., enjoyment of school, class participation) and psychological (e.g., general self-esteem) outcome measures that were to be predicted by academic buoyancy. These were suggested to represent a breadth of students' experience at school and were found to follow from students' capacity to effectively deal with challenge, adversity and setback in the school setting. They were also aimed at reflecting the breadth of the self-system in terms of their behavioural, cognitive and affective bases. Thus, demarcating outcomes in cognitive, affective and behavioural terms might be one way to fully scope the consequences of academic buoyancy and academic resilience. Another encompassing approach to assessing their consequences is by way of 'process' and 'product' outcomes (Green *et al.*, 2007). This differentiation expands the range of possible consequences against which academic buoyancy and resilience can be mapped. Process outcomes include factors such as effort, engagement, skill development, participation, attendance, work completion and enjoyment. Product outcomes include factors such as achievement, performance, rankings, scores, GPA and marks. Green and colleagues (2007) have demonstrated the yields of conceptualising and operationalising psycho-educational outcomes along these diverse and encompassing lines.

Finally, to better understand the nature of academic buoyancy and academic resilience, it is important to gain an understanding of what they are not. There are numerous *cognate* constructs that intersect academic buoyancy and resilience but

which in the final analysis are distinct from them. Understanding these cognate constructs and the amount of variance they share with academic buoyancy and resilience provides further information on the parameters of buoyancy and resilience. Indeed, assessing convergent and discriminant validity in these ways is good construct validity practice and has been effectively used to empirically scope buoyancy (Martin & Marsh, 2008b). Cognate constructs that are clearly relevant to assess include academic coping and academic hardiness (e.g., see Lazarus & Folkman, 1984; Speirs & Martin, 1999), adjustment (e.g., Bettoli-Vaughan *et al.*, 1998), academic hassles (e.g., Kohn *et al.*, 1991; Zeidner, 1994) and academic adaptability (e.g., Aspinwall & Taylor, 1992; Helgeson, 2003). Although Martin and Marsh (2006) presented some detail on how academic buoyancy was distinct from academic coping and academic hassles, a fuller analysis comprising academic resilience and a greater diversity of cognate constructs is needed to more comprehensively understand academic buoyancy and resilience.

Person-focused approaches to academic buoyancy and academic resilience

In terms of the person-focused approach, we position academic buoyancy and resilience in terms of groups of students deemed as buoyant and resilient with a view to identifying factors that determine group membership. This has the advantage of purposefully researching the very groups in which one is interested and mapping explanatory factors onto these focal and relevant groups. It also offers researchers a better opportunity to study patterns of academic buoyancy and resilience occurring 'naturally' (Masten & Powell, 2003) and provides opportunities for in-depth case study research. It further enables a more targeted approach to follow-up research that might, for example, seek to track buoyant and resilient students across time to determine stability and change in group membership and the factors that might influence this (see also Buckner *et al.*, 2003; Keller *et al.*, 2005). Indeed, recently developed latent profile models and growth mixture models (e.g., Muthén & Muthén, 2006; Marsh *et al.*, in press) suggest the possibility of defining buoyancy and resilience in terms of groups showing differential trajectories over time in relation to appropriate criterion variables (for related work see Stoolmiller *et al.*, 2005).

Because academic buoyancy and academic resilience require effective responses to academic adversity, it is important to map them against such adversity and show that they discriminate between students who do and do not respond effectively. There is, then, a need to collect data to shed light on *critical events* in which academic buoyancy and resilience are required and the students experiencing these events. As discussed above, the Academic Buoyancy Scale (Martin & Marsh, 2008a, b) can identify students who do and do not effectively deal with academic adversities that are typical of the ordinary course of academic life (e.g., study pressure and deadlines, occasional poor grades etc.). An academic resilience measure might ask students about the presence of more acute and/or chronic academic adversities (e.g., ongoing detention or suspension from school, chronic poor performance) and how they deal with these.

Having identified these students, researchers can then explore potential explanatory factors such as the predictors detailed above.

Another person-focused approach might entail a longitudinal naturalistic measurement of upward and downward academic *trajectories* hypothesised to reflect academic buoyancy and resilience (or lack of). Assessing academic trajectories along these lines might also be an interesting means of differentiating enabling, protective and risk factors. To our knowledge, no academic resilience research has been conducted that empirically differentiates enabling from protective factors. Might it be the case that: (a) enabling factors are associated with upward academic trajectories in the face of academic adversity, (b) protective factors are associated with unimpaired academic trajectories in the face of academic adversity, and (c) risk factors are associated with downward academic trajectories in the face of academic adversity? Alongside these questions might also be questions about the relative roles of enabling, protective and risk factors in students' academic buoyancy compared with their academic resilience.

To complement large-scale retrospective research is research that generates *real-time* information from a relatively small number of students. Technological advances have opened up exciting opportunities to collect contemporaneous quantitative and qualitative data from school students. For example, Malmberg *et al.* (2008) have piloted Personal Digital Assistants (PDAs) as a means of collecting real-time data on learning and instruction from students. They demonstrated PDAs to be a reliable and valid method of real-time data collection. Although their research focused on micro-longitudinal data (see Walls & Scafer, 2006) that is very useful in understanding the specific processes involved in dealing with academic adversity, PDAs also have tremendous scope for important qualitative insights. For example, as a voice-recording device they can capture students' open-ended comments at various points in the process; as a camera or video unit they can capture samples of students' work; and, as an e-mail or internet facility students can in real-time send and receive questions, answers and information to researchers. PDAs, then, serve two important purposes in the one design. First, the real-time nature of the data augments the retrospective self-report data collected in most other buoyancy and resilience research. Second, they assess in real time students' academic adversities and the unfolding ways in which students do or do not resolve them. Answers here not only provide greater guidance for researchers seeking to assist students during times of difficulty, but also for methodologists seeking new and valid ways to capture real-time buoyancy and resilience data.

Finally, person-focused perspectives are also very well geared to more detailed *case study* approaches. For example, the longitudinal measurement required for the trajectory approach described above provides very rich and detailed data about individual students who have evinced significant changes in their academic development. Whilst a good deal of information is gained through large-scale approaches, there remains a need for understanding in substantial depth the precise nature of the circumstances and factors that have contributed to these shifts. Students can be selected on the basis of their upward or downward shifts on key academic measures (e.g., see Martin *et al.*, 2003). These students can then be tracked, monitored, interviewed and observed on

the basis of key factors discussed thus far (e.g., global buoyancy and resilience, how these interact with critical events in their academic and non-academic lives, key predictors, cognate constructs). Complemented by a larger quantitative trajectory study, this person-focused case study approach offers the opportunity for powerful and authentic insights into the lived experience of students' academic buoyancy and academic resilience (e.g., see Creswell, 2003).

Leading and lagging indicators of academic buoyancy and academic resilience

It is evident in our discussion—and that of most other research into resilience—that individuals who achieve success (however defined) despite significant disadvantages are said to be 'resilient'. Individuals who experience success despite relatively minor disadvantages are said to be 'buoyant'. One danger here is that these *ex post facto* labels carry little or no explanatory power. Simply defining buoyancy and resilience in terms of outcomes, we do not know what characteristics of the individual or the circumstances allowed them to succeed. Hence, one might reasonably ask whether buoyancy and resilience are predominantly 'epi-phenomena' with no real existence other than an *ex post facto* label. To address this issue, we draw on the notion of 'leading' and 'lagging' indicators as a means of more clearly demarcating *a priori* and *ex post facto* elements of our academic buoyancy and academic resilience framework.

In the field of economics, a leading indicator is an economic indicator that changes prior to the economy changing. Leading indicators include factors such as building permits, money supply and stock prices. Indeed, government treasuries analyse these indicators to assist their decision making about fiscal intervention. A lagging indicator is an economic indicator that changes after the economy has changed. Lagging indicators include factors such as employment and inventory book value. Extending this analogy to academic buoyancy and academic resilience, it may be that aspects of our framework reflect leading indicators of buoyancy and resilience whilst others reflect lagging indicators.

The question, then, is what aspects of our proposed framework reflect leading and lagging indicators. Here, variable- and person-focused approaches to buoyancy and resilience are again helpful. In terms of variable-focused approaches, leading indicators might comprise predictive/causal factors and lagging indicators might include consequence factors (or to some extent, mediating factors). Interestingly, the person-focused approach might suggest a slightly different operation—with lagging indicators being considered first, followed by a study of leading indicators. For example, students in a research investigation evincing upward or downward trajectories (lagging indicators) are selected for closer quantitative or qualitative study and the key factors that are related to those trajectories (leading indicators) identified.

We propose that considering buoyancy and resilience in terms of leading and lagging indicators moves the issue from a potentially problematic *ex post facto* epi-phenomenon to one that provides researchers and practitioners with greater explanatory power. We

recognise others have sought to inject explanatory power in their models of resilience through differentiating resilience as a process and resilience as an outcome (Olsson *et al.*, 2003). We suggest, however, that the notion of leading indicators unambiguously sharpens the focus on what factors are relevant to address when seeking to enhance students' ability to deal with academic adversity. This leads us to the issues of educational intervention and policy development.

Intervention and policy implications

Examining academic buoyancy and academic resilience from a leading and lagging indicator perspective also provides direction for intervention—with leading indicators the key means by which to effect change in students' lives and lagging indicators the key means of assessing the effectiveness of these efforts. For example, in terms of leading indicators, our own research has identified the '5Cs' of academic buoyancy—control, confidence (high self-efficacy), coordination (high planning), composure (low anxiety) and commitment (high persistence)—as potentially useful points of intervention (Martin & Marsh, 2006). In longitudinal research we have also identified the need to foster good teacher–student relationships and involvement in the school as factors important to consider when developing students' academic buoyancy (Marsh & Kleitman, 2002; Martin & Marsh, 2008a).

It is not unreasonable to suggest that policy development can also stem from closer consideration of leading and lagging indicators—indeed, entire nations' economies are shaped around such indicators. The integration of findings arising from variable- and person-focused analyses provide clear direction as to what factors are truly leading indicators of students' academic buoyancy and academic resilience. Moreover, the integration of findings from these analyses also shows which lagging indicators are most valid and reliable in demonstrating when buoyancy and resilience have and have not been achieved. Following from this, policy can better direct appropriate types and amounts of resources to which leading indicators make a real difference and assess the effectiveness of these efforts on the lagging indicators that are known to reflect buoyancy and resilience in reliable and valid ways.

Indeed, the ideas we have presented throughout hold other policy-related implications. Our suggested proactive approach underscores the importance of primary prevention before the onset of more serious disadvantage (Schoon & Bynner, 2003). This might point to the need for a greater focus on connecting young people to their community and society before the focus needs to be on addressing the problems of disaffected youth (O'Brien & Scott, 2007). It also appears that times of transition are seen as sensitive periods when individuals are at heightened risk and by implication might benefit most from high quality resources and intervention (Schoon & Bynner, 2003; O'Brien & Scott, 2007). Additionally, hierarchical and multidimensional approaches to understanding academic buoyancy and resilience point to the need for more holistic policies that are integrated with the realities of young people's academic and other adversities (see also Schoon & Bynner, 2003). Policy must also account for the fact that buoyancy and resilience interventions must break vicious circles such

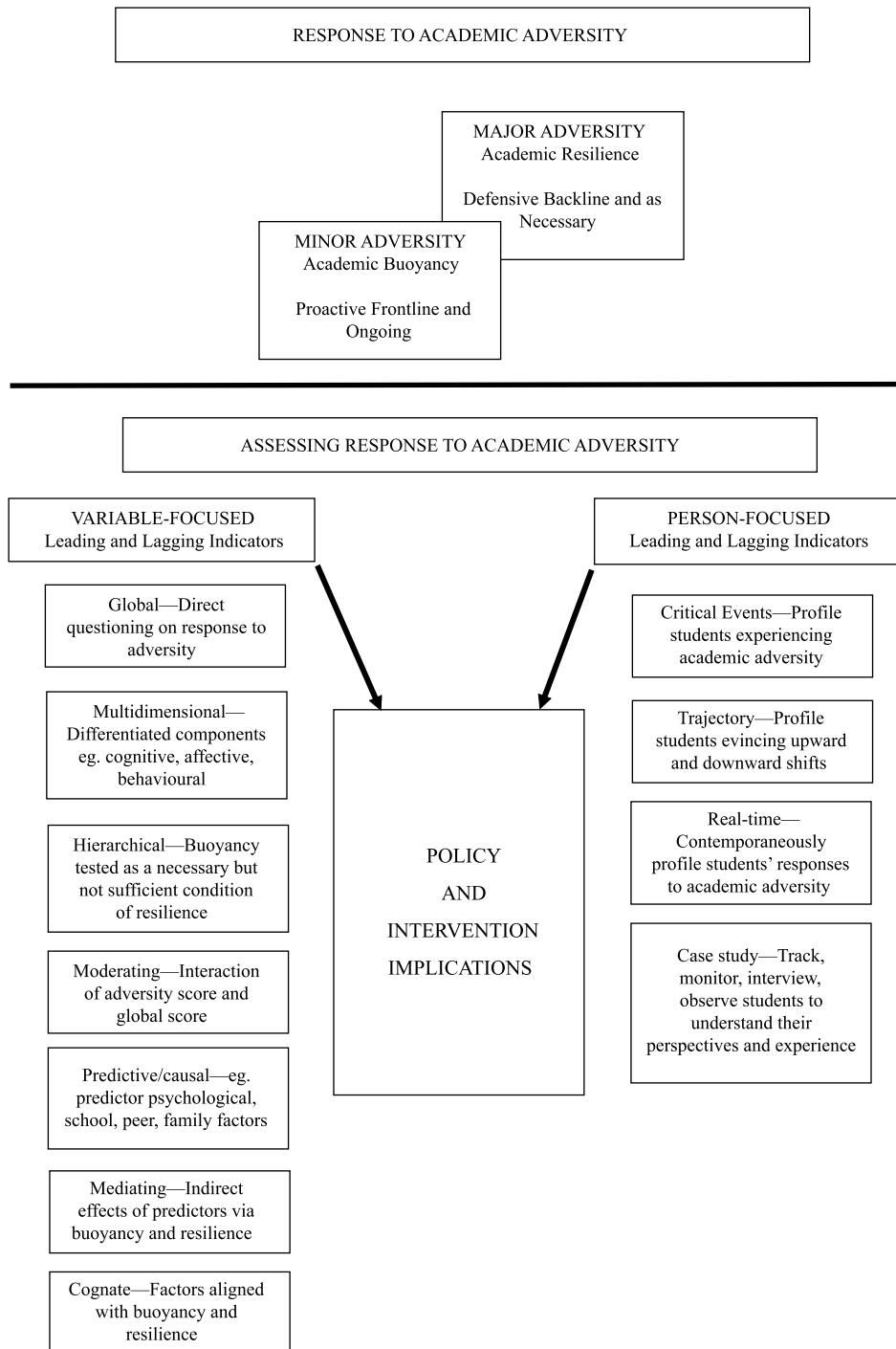


Figure 1. Proposed academic buoyancy and academic resilience framework

that the initial inability to cope constructively with disadvantage and stressful circumstances does not mushroom over time. Thus, the timing of intervention must be clearly articulated and policy directed in ways that maximally target critical times and turning points (Coleman & Hagell, 2007).

Conclusion

In the context of the large body of research and theorising around life or general resilience, there has been relatively little work into academic resilience—and much less into academic buoyancy. This article has sought to more fully scope the conceptual and operational terrain relevant to these two under-studied constructs. Figure 1 presents a schematic framing of this terrain. It has also been constructed in such a way that the concepts, principles and processes described in relation to the academic domain are relevant to other areas in which individuals experience adversity. Taken together, the ideas proposed here hold not only substantive and methodological implications for researchers studying academic buoyancy and academic resilience, but are also relevant to practitioners operating in contexts in which students are required to effectively deal with minor and major setback, adversity and challenge in their academic lives.

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