Does Academic Buoyancy Protect Achievement against Minor Academic Adversities

David W. Putwain, Diahann Gallard, and Joanna Beaumont

School of Education, Liverpool John Moores University, UK.

Professor David W. Putwain, School of Education, Liverpool John Moores University, IM Marsh Campus, Mossley Hill Rd, Liverpool, L17 6BD. Phone: +44 (0)151 231 5270. Email: D.W.Putwain@ljmu.ac.uk.

Abstract

Academic buoyancy, the ability to respond adaptively to minor academic adversities, is positively related to achievement-related beliefs, emotions, and behaviours. No studies, however, have examined whether academic buoyancy moderates the relations between minor academic adversities and subsequent achievement. The objective of present study was to examine whether academic buoyancy protected achievement (end-of-year examination grades) against two types of minor adversities (non-attendance and behavioural misconduct) in a sample of 539 upper secondary (6th form) students. Having controlled for prior achievement, gender and age, Academic Buoyancy Scale scores moderated relations from non-attendance and behavioural misconduct to subsequent achievement. In the presence of adversity (non-attendance and behavioural misconduct) the achievement of high academically buoyant students was protected. The protective role of academic buoyancy diminished as adversity lessened. Since minor adversities will be experienced by many students, efforts to foster academic buoyancy would likely be beneficial for achievement outcomes.

Keywords: Academic buoyancy, academic achievement, attendance, absenteeism, misconduct

1. Introduction

The present study is concerned with how academic buoyancy, one's capacity to respond adaptively to minor academic adversities, can moderate relations between prior academic adversity and subsequent educational outcomes. Previous research has shown that academic buoyancy is directly related to myriad adaptive educational beliefs, emotions, and behaviours, (e.g., Martin, Colmar, Davey, & Marsh, 2010; Martin & Marsh, 2008). Studies have also shown academic buoyancy to positively predict achievement (e.g., Martin, 2014; Yun, Hiver, & Al-Hoorie, 2018). Few studies, however, have examined whether academic buoyancy can protect against prior adversity (for a notable exception see Martin & Marsh, 2019) and none, thus far, have examined how academic buoyancy could protect achievement outcomes from prior adversity. The objective of the present study was to address this knowledge gap and examine whether academic buoyancy can protect subsequent achievement, against low types of adversity, namely low attendance and high behavioural misconduct. We hypothesised that academic buoyancy would protect achievement when attendance was lower and misconduct was higher; the protective effect of academic buoyancy would gradually diminish at higher attendance and lower conduct.

1.1 Academic Buoyancy: What is it and What is it Not?

Academic buoyancy is defined as the perceived capacity to respond adaptively to the types of minor adversities that are typically experienced during the course of one's education and schooling (Martin & Marsh, 2008). The types of 'typical' adversities include, but are not limited to, temporary periods of low achievement for students, the stress and pressure associated with learning and testing, low confidence resulting from a poor grade, short-lived dips in motivation and engagement, and dealing with teachers when receiving poor feedback on a piece of work (Martin & Marsh, 2009). The academically buoyant student will proactively manage academic adversities of the type listed above in order to prevent such

adversities from developing into major adversities (as much as it is one's capacity to do so). As such, academic buoyancy can be conceptualised as a form of frontline protection against the need to employ attributes required to deal with major adversities. This brings us neatly to the related construct of resilience.

Resilience, in contrast to buoyancy, is defined as responses to major adversities (e.g., Garmezy, 1985; Masten, Morison, Pellegrini, & Tellegen, 1990). In an educational context these could include learning disabilities, chronic underachievement, poverty, and exposure to gang violence. Unlike buoyancy, referring to the responses to the everyday types of adversities experienced by the majority, far fewer students experience major adversities (at least in modern post-industrial societies). Conceptually, resilience as a 'backline' form of retroactive defence, would have greater relevance to extreme pressures, clinical anxiety and depression, bullying, school refusal, and chronic school alienation (Martin & Marsh, 2009). Empirically, the distinction between academic buoyancy and resilience has been shown by Martin (2013a) in a sample of secondary school students. Academic buoyancy was more strongly negatively related to low-level impediments to academic engagement (in the form of academic anxiety, failure avoidance, and uncertain control) whereas academic resilience was strongly negatively related to high-level maladaptive engagement (in the form of academic self-handicapping and disengagement).

Academic buoyancy has not only been differentiated from academic resilience but also from cognate constructs including grit (persistency of effort and consistency of interest; Duckworth, Peterson, Matthews, & Kelly, 2007), future time perspective (the perceived connection between present activities and future goals; Lens & Seginer, 2015), and coping (efforts to regulate emotion and behaviour under stressful conditions; Skinner & Saxon, 2019). Using a principal components analysis, Fong and Kim (2019) showed that academic buoyancy, grit, and future time perspective, items loaded onto their target factors with no

cross-loading items (λs > .35). In relation to coping, academic buoyancy has been shown small to negligible correlations (rs = -.13 to .08) with adaptive forms of coping, such as task-focus and seeking help, and maladaptive forms of coping, such as avoidance (Putwain, Connors, Symes, & Douglas-Osborn, 2012; Putwain et al., 2016). Importantly then, in light of jingle-jangle fallacies (see Kelley, 1927), academic buoyancy is not simply resilience, grit, future time perspective, or coping, masquerading under a different name.

1.2 Academic Buoyancy Protects Against Maladaptive Academic Behaviours, Cognitions, and Affect

A body of evidence shows that academic buoyancy is negatively related to maladaptive academic behaviours, cognitions, and affect. Using samples of secondary school students, academic buoyancy has been shown to be related to higher adaptive cognitions (e.g., self-efficacy and valuing of school) and behaviours (e.g., effort and planning), and lower maladaptive cognitions (e.g., uncertain control and failure avoidance), emotions (academic and test anxiety), and behaviours (self-handicapping) in cross-sectional designs (Malmberg, Hall, & Martin, 2013; Martin & Marsh, 2006; Putwain et al., 2012). In more sophisticated longitudinal designs, also with secondary school students, academic buoyancy has been shown to predict subsequent lower academic and test anxiety and other unpleasant academic emotions (boredom, hopeless, and shame), school stress, uncertain control, emotional instability, and neuroticism, and higher subsequent pleasant academic emotions (enjoyment, hope and pride), self-efficacy, planning, and persistence (Hirvonen, Yli-Kivistö, Putwain, Ahonen, & Kiuru, 2019; Hirvonen, Putwain, Määttä, Ahonen, & Kiuru, 2019; Martin et al., 2010; Martin, Ginns, Brackett, & Malmberg, 2013; Putwain et al., 2016).

The findings from these studies are consistent with the conceptualisation of academic buoyancy as a direct adaptive response to academic setbacks. However, there is another possible way that academic buoyancy might show as an adaptive response, that is to

moderate the relations from adversity to subsequent outcomes (Martin & Marsh, 2019); the negative effects of adversity on subsequent outcomes would be partially or wholly mitigated in highly buoyant students. Few studies, thus far, have investigated the moderating role of academic buoyancy. Two studies with secondary school students showed the negative relation between test anxiety and task-focus (Putwain, Chamberlain, Daly, Sadreddini, 2015) and between teacher fear messages and threat appraisal (Symes, Putwain, & Remedios, 2015) by students were reduced by high academic buoyancy. Furthermore, the relation between prior and subsequent adversities (academic failure, school suspension, relationship problems with teachers or peers, and so on) twelve months apart showed a trend ($p = .10$) towards being reduced (Martin & Marsh, 2019). In short, the nascent evidence suggests that buoyancy can play a moderating as well as direct role in adaptive responses to academic setback.

1. 3 Academic Buoyancy and Academic Achievement

An adaptive response to academic adversity would also be expected to show in achievement outcomes. There is, however, mixed evidence linking academic buoyancy to achievement. Higher academic buoyancy is related to better examinations marks in English, science and mathematics, secondary school exit exams (Putwain et al., 2016) and in secondary school numeracy and literacy tests (Martin, 2014). Furthermore, higher academic buoyancy in second language learning (L2) predicted performance on an end-of-course L2 exam in undergraduate students (Yun et al., 2018). Other studies, however, have shown no relation between buoyancy and achievement in secondary school students after controlling for competence beliefs (Collie, Martin, Malmberg, Hall, & Ginns, 2015; Putwain & Aveyard, 2018) which is a likely effect mediating relations between academic buoyancy and subsequent achievement (see Colmar, Liem, Connor, & Martin, 2019). Thus, in the absence of the mediating role of competence beliefs academic buoyancy does seem to predict achievement.

1.4 Academic Buoyancy Protects Achievement Against Minor Adversity

Following the rationale for the aforementioned 'buffering' role of academic buoyancy (Martin & Marsh, 2019), it would be expected that the negative effects of adversity on achievement would be partially or wholly mitigated in highly buoyant students. No studies, to date, have examined the buffering role of academic buoyancy in relation to achievement outcomes. One related study did, however, show that the indirect negative relation between test anxiety and achievement (mediated by lower use of task focus) was reduced in highly buoyant students (Putwain et al., 2015). In the present study we address the paucity of research into the buffering role of academic buoyancy by examining whether relations between two types of minor adversity (low attendance and behaviour misconduct) and achievement are moderated by academic buoyancy. All things being equal, higher attendance (e.g., OECD, 2018), and lower misconduct (e.g., Wang & Degol, 2015), are related to better achievement outcomes. Thus, high academic buoyancy might be expected to protect achievement from lower attendance and higher misconduct.

Attendance is represented on a continuum ranging from attending under duress, to periodic absences, to a complete absence from school for a period of time (Kearney, 2008). Whereas attendance under duress to periodic absences could be considered as a minor academic adversity, repeated absences or a complete absence would be more appropriately considered a major academic adversity. The reasons for attending under duress to minor absences are numerous. Common causes include illness or injury (e.g., Borrego, César, Leiria-Pinto, Rosado-Pinto, 2005), and a loss of interest or motivation in one's studies (e.g., Green, Liem, Martin, Colmar, Marsh, & McInerney, 2012).

Like attendance, student misconduct is represented on a continuum ranging from the minor, such as tardiness towards teachers, through to the major, such as wilful acts of theft or vandalism (Crawshaw, 2015). Relatively infrequent instances of minor misconduct would

constitute a minor adversity whereas frequent instances of minor misconduct, or infrequent instances of more serious misconduct, would constitute a major adversity. Also, like attendance, the causes of minor forms of student misconduct are numerous including boredom, peer pressure, and difficulties resulting from students' out-of-school/ college lives (Fredricks, 2014).

Conceptually a distinction can be made between *academic adversity* (i.e., minor absences or misconduct) and the *reasons* for that adversity. Although some reasons (e.g., illness) could be accurately described as adversities in themselves they are not necessarily the proximal cause of lower achievement (e.g., missing important curriculum coverage). Nonetheless the potential reasons for non-attendance are exactly the types of minor adversity that academic buoyancy is theorised to help with. We might expect, therefore, that highly buoyant students who missed lessons due to illness or injury were more likely to catch up with their missed work; students experiencing a temporary dip in their motivation were able regulate their motivation in such a way to find new reasons to attend college or improve their interest and make additional effort to make up for missed work. In these ways the efforts to catch up missed work by highly buoyant students meant that achievement did not suffer despite missing lessons.

If a student was pressured by peers to disengage and mess around in lessons rather than focus on their work, resulting in a recorded instance of behavioural misconduct by the class teacher, a high academically buoyant student would be able to respond adaptively to instances of misconduct by taking steps to manage behaviour more effectively in the future (e.g., withstand peer pressure) and hence maintain a greater focus on their learning (resulting in higher achievement than less buoyant students who were unable to regulate their behaviour so effectively). A high academically buoyant student would be able to regulate their emotions in such a way (e.g., focusing on the extrinsic benefits of learning, such as the value to future

university entry or career) to be enable them to maintain a focus on their learning (resulting in higher achievement than less buoyant students who were unable to regulate their emotions so effectively).

Aim of the Present Study

The aim of the present study was examine whether academic buoyancy moderates the relations between minor academic adversity (absenteeism and behavioural misconduct) and subsequent academic achievement. Prior research has shown academic buoyancy to be lower in female students, older students, and those from economically deprived backgrounds (Martin & Marsh, 2008, 2019; Martin et al., 2010). Accordingly, in the present study we checked for relations between the aforementioned socio-demographic factors and academic buoyancy, and included them in analytic moderating models as covariates where they were related. We also controlled for autoregressive relations with prior achievement. Thus, we offer a robust test of the moderating role of academic buoyancy over and above the variance accounted for by socio-demographics and prior achievement.

In the common with the majority of published literature, academic buoyancy in the present study was conceptualised and measured in a domain-general fashion (for notable exceptions see Malmberg et al., 2013; Yun et al., 2018). To ensure an appropriate degree of matching-specificity with academic achievement (see Swann, Chang-Schneider, & McClarty, 2007) we used mean examination grades, aggregated across different subjects studied/ examined.

Based on the theorised role of academic buoyancy as buffering against academic adversity, we tested the following two hypotheses:

H1: Academic buoyancy will protect achievement against lower attendance. When attendance is lower (i.e., the presence of adversity), higher achievement would be shown by

those with higher, compared to lower, academic buoyancy. When attendance is higher there will be little difference between higher and lower academic buoyancy.

H2: Academic buoyancy will protect achievement against higher misconduct. When misconduct is higher (i.e., the presence of adversity higher achievement) would be shown by those with higher, compared to lower, academic buoyancy. When misconduct is lower there will be little difference between higher and lower academic buoyancy.

2. Method

2.1 Participants

The participants in this study ($n = 539$) were drawn from a college located in the North West of England specialising in upper secondary education for those aged 16-19 years (colloquially referred to as a 6th form college). Between 2015 and 2017 (the year that participants in the present study left secondary education) 22% to 25% of students following upper secondary education attended a 6th form college and the remainder in a school (Department for Education, 2017a, 2017b, 2018a). This college was selected as they had approached the institution at which the authors are based with an interest in finding out more about the adaptive characteristics (or otherwise of their students).

All participants (217 males, 313 females, 5 not reported) were in their first year of study (Year 12) with a mean age of 16.7 years ($SD = .64$). All Year 12 participants in the college were invited to participate. There were 693 Year 12 students in total, meaning the response rate was high (77.8%). The ethnic heritage of the majority of participants was white Caucasian ($n = 512$) with a lower proportion from alternative backgrounds (Asian = 16, Black = 2, mixed = 5, other = 4, and 5 not reported). As a proxy measure for economic deprivation, 37 participants were eligible for free school meals (FSM). In England, 7.2% of 16-167 year olds were eligible for FSM in 2017-18 (Department for Education, 2018b), suggesting that the present sample were representative. There were a small proportion of

missing data (6.01%) that were handled in subsequent analyses using full information

maximum likelihood.

2.2 Measures

     2.2.1 Academic buoyancy. Academic buoyancy was measured using the four-item

Academic Buoyancy Scale (Martin & Marsh, 2008). Participants responded to items (e.g.,

'I'm good at dealing with setbacks at College, e.g. bad mark, negative feedback on my

work') on a five-point scale (1 = strongly disagree, 3 = neither 5= to strongly agree). In the

present study, the internal consistency was high (Cronbach's α = .80).

     2.2.2 Academic achievement. Prior achievement was taken from participants' mean

grade in national secondary school exit exams (General Certificate of Secondary Education;

GCSE). GCSE exams are taken at the end of Year 11 (this was the academic year prior to

students first year in college; the year that data for the present study were collected). GCSE

exams were graded on an eight-point letter scale that was converted to numerical value for

quantitative analyses (8 = highest grade, 1 = lowest grade). Subsequent end-of-year

achievement was taken from participants' mean grade in national General Certificate of

Education Advanced Subsidiary (AS) exams. AS exams were taken at the end of Year 12 and

graded on a five-point letter scale that was converted to numerical value for quantitative

analyses (5 = highest grade, 1 = lowest grade). GCSE and AS grades were retrieved from

official college records.

     GCSE and AS exams were set, and marked, by an external government approved

awarding body not by teachers at college. Marking procedures were highly regulated with

standardised mark schemes, examiner training, and examiner moderation (Office of

Qualifications and Examination Regulation, 2014). Research undertaken by the examination

regulator (Bramley & Dhawan, 2010; Dhawan & Bramley, 2012) has shown a high level of

accuracy among GCSE and AS examiners (rs = .89 – .91 between a definitive mark and examiners' marks) and high levels of internal consistency (Cronbach's αs = .74 – .91).

    2.2.3 Attendance. Student attendance at all lessons was recorded by teachers electronically on a central database. Student attendance for the spring term (January to March) was retrieved from college records and expressed as a % of the total attendance.

    2.2.4 Misconduct. Misconduct was defined in accordance with the code of conduct that students sign on enrollment. Minor forms of misconduct included smoking on college premises other than in the designated area, using rude language to staff or other students, and being persistently late for lessons. All instances of minor misconduct were recorded by teachers (or other college staff) electronically on a central database. The minimum number of recorded misconduct incidents was zero. Although there was no upper limit, a student with repeated misconduct would be escalated through a disciplinary process that could eventually lead to a temporary or permanent exclusion from the college. Hence, in practical terms the frequency of misconduct would not continue to accumulate endlessly. Student misconduct for the spring term was retrieved from college records. Gross forms of misconduct, such as the use of alcohol or drugs, fighting, and theft, were not included as these were recorded separately resulting in an immediate escalation of the disciplinary process.

2.3 Procedure

    Data were collected as part of an ongoing project into how adaptive psychological attributes influence achievement-related behaviour, cognition, and emotion. Students' academic buoyancy was measured in March of the school year (near the end of the spring term). Questionnaires were administered by teachers following a standardised script in a period of the college timetable used for administrative purposes. Attendance and misconduct data were taken from college records for the period covering the spring term (twelve weeks). Although academic buoyancy was measured near the of the spring term (week nine) items

were phrased in a general rather than temporal specific manner. Since attendance and

misconduct were cumulative, students' academic buoyancy responses would be expected to

cover the period over which attendance and misconduct data were collected. Institutional

permission to collect college data was provided by the college principal and individual

consent was provided by participants. In order to maintain anonymity of participants, a

college enrolment number (a 6 digit number printed on students' college identification card)

was used to link self-report data with college records. This project was approved by an

institutional research ethics committee.

3. Results

3.1 Descriptive Statistics and Bivariate Correlations

Descriptive statistics are reported in Table 1.Academic buoyancy, GCSE grade, and

AS grade, were normally distributed. Mean attendance was high and showed a negatively

skewed leptokurtic distribution. Misconduct was low and showed a positively skewed

leptokurtic distribution. Bivariate correlations were estimated in M*plus* version 8.3 (Muthén

& Muthén, 2017) using the MLR estimator to account for the aforementioned distributions of

attendance and misconduct. Academic buoyancy was modelled as a latent variable with four

indicators (each corresponding to the four measurement items). GCSE and AS grades were

modelled as single item latent variables on the basis that the assessment of examination

scripts, although highly standardised, is likely to inevitably incur a degree of measurement

error.

The factor loading for each indicator was set to $\lambda = 1$, and the corresponding residual

variance (σ_{ε}) calculated by multiplying the indicator variance (GCSE Grade $\sigma = .52$; AS

Grade $\sigma = 1.39$) by 1-ρ, where ρ is a reliability estimate (Brown, 2006, Little, 2013). We

assumed the lower value of $\rho = .74$ from those reported by Bramley and Dhawan (2010) and

Dhawan and Bramley (2012) as a conservative estimate (GCSE Grade $\sigma_{\varepsilon} = .19$; AS Grade σ_{ε}

= .26). Socio-demographic covariates, namely Gender (0 = male, 1 = female), age, and

eligibility for free school meals (FSM; 0 = not eligible, 1 = eligible), as a proxy for low

income, were added as manifest variables.

The fit of this latent model, and all subsequent models estimated using M*plus*, was

guided using the Root Mean Square Error of Approximation (RMSEA), Standardized Root

Means Square Residual (SRMR), Comparative Fit Index (CFI), and the Tucker-Lewis index

(TLI). A good model fit is indicated by RMSEA ≤ .08, SRMR ≤ .06, and CFI/ TLI indices ≥

.95 (Hu & Bentler, 1999), although such estimates derived from simulation studies may be

overly strict for complex naturalistic data (Heene, Hilbert, Draxler, Ziegler, & Bühner, 2011).

The model fit was relatively good, $\chi^2(23) = 50.09$, $p < .001$, RMSEA = .051, SRMR = .036,

CFI = .974, and TLI = .932. Bivariate correlations are reported in Table 2. Academic

buoyancy, GCSE and AS grades, were positively correlated with attendance. GCSE and AS

grades, were negatively correlated with misconduct. Academic buoyancy was not correlated

with GCSE or AS grades. Gender was related to all variables, age was associated with

attendance, but FSM was unrelated to all other variables.

3.2 Latent Interaction Structural Equation Modelling

The role of academic buoyancy in moderating relations between attendance/

misconduct and subsequent achievement was examined using the latent moderated structural

equation modeling (LMS) approach (Klein & Moosbrugger, 2000). As the LMS approach

uses numerical integration, absolute model fit indices are not estimated. Accordingly we

followed the two-step approach advocated by Maslowsky, Jager, and Hemken (2015). Step

one was to estimate a measurement model without the interaction term in order to judge

absolute model fit (i.e., RMSEA, SRMR, CFI, and TLI, indices). These absolute model fit

indices will remain the same for the model that includes the interaction as no mean, variance,

or covariance with other parameters, are estimated for the interaction term in the LMS

approach.

Step two involved estimating the model including an interaction term and assessing

the advantage over the model with the interaction using the following relative fit indices:

Akaike Information Criterion (AIC), sample-size adjusted Bayesian information (ᵃBIC),

change in the proportion of variance (ΔR^2) explained in the outcome variable, and the

likelihood ratio test (*D*). Smaller AIC and ᵃBIC (Hix-Small, Duncan, Duncan, & Okut, 2004),

and larger ΔR^2, values would indicate a relatively better fitting model. A statistically

significant *D* would indicate a relatively worse fit for the model without the interaction term.

Due to the computational power required to estimate latent interactions, 5,000 Monte Carlo

Integration points were used. Prior achievement (GCSE grade), gender, and age, were entered

as covariates. FSM was omitted as no statistically significant correlations were shown in

Table 2.

The model for that did not include the interaction term showed a good fit to the data:

$\chi^2(19) = 61.90$, $p < .001$, RMSEA = .052, SRMR = .041, CFI = .977, and TLI = .959. The

addition of academic buoyancy × attendance, and academic buoyancy × attendance,

interactions term improved model fit, ΔAIC = -.8.42, ΔaBIC = -.6.12, $D(2) = 8.86$, $p = .01$,

and explained a greater proportion of variance in subsequent achievement ($\Delta R^2 = .030$).

Coefficients are reported in Table 3 (Pearson's *r*s between academic buoyancy, achievement,

and misconduct, .03 to .26). Misconduct was a negative ($\beta = -.17$, $p = .001$), and attendance

($\beta = .19$, $p < .001$), GCSE grade ($\beta = .75$, $p < .001$), and age ($\beta = .17$, $p = .005$) positive,

predictors of AS exam performance. Gender ($\beta = .02$, $p = .79$) was unrelated to AS exam

performance. Academic buoyancy, furthermore, interacted with attendance ($\beta = .11$, $p = .03$)

and misconduct ($\beta = .12$, $p = .006$).

Interactions were probed using simple slopes at ±1SD. The academic buoyancy ×

attendance interaction is graphed in Figure 1. At -1SD academic buoyancy, a positive relation

was shown between attendance and subsequent attainment (B = .077, SE = .025, p = .002)

which became weaker at mean academic buoyancy (B = .039, SE = .010, p < .001) and +1SD

academic buoyancy (B = .004, SE = .024, p = .92). The academic buoyancy × misconduct

interaction is graphed in Figure 2. At -1SD academic buoyancy, a negative relation was

shown between misconduct and subsequent attainment (B = -.286, SE = .064, p < .001) which

became weaker at mean academic buoyancy (B = -.178, SE = .036, p < .001) and +1SD

academic buoyancy (B = -.070, SE = .06, p = .29).

4.0 Discussion

The aim of the present study was to examine whether academic buoyancy moderated

relations between prior adversity (low attendance and high behavioural misconduct) and

subsequent academic achievement. Having controlled for gender, age, and prior academic

achievement, an analytic model including the moderating role of buoyancy showed improved

fit and statistically significant interaction terms. Academic buoyancy protected subsequent

achievement against lower attendance and higher behavioural misconduct. When attendance

was higher and behavioural misconduct lower, academic buoyancy offered no advantage for

achievement. Thus, the hypothesised role of academic buoyancy in protecting against minor

adversity was supported. In the absence of adversity, academic buoyancy offered no benefit

for achievement.

Previous research has shown academic buoyancy to be related to advantageous

educational beliefs, emotions, and behaviours, such as control, enjoyment, and persistence

(e.g., Hirvonen et al., 2019; Martin et al., 2010; Martin & Marsh, 2008), and to academic

achievement (e.g., Martin, 2014; Putwain et al., 2016) in cross-sectional and longitudinal

designs. While such studies confirm the adaptive nature of academic buoyancy they do not

examine the central conceptual claim of the construct that it is to provide an adaptive response to minor *adversity*. In order to examine responses to minor *adversity* it is necessary to examine relations between previous minor adversities and subsequent academic outcomes for students who differ in their academic buoyancy. Methodologically and analytically this involves testing for interactions between academic buoyancy and the adversities in question and regressing the educational outcome(s) onto the adversity, academic buoyancy, and their interaction.

Evidence for the claim that academic buoyancy is an adaptive response would come in the form that buoyancy protected, or mitigated, the educational outcome(s) partially or fully, against the prior adversity. That is, when the adversity is present, we would expect better educational outcome(s) for those high in academic buoyancy. When adversity is not present there would be no difference expected between those who were high or low in academic buoyancy. Only three studies, thus far have tested this claim (Martin & Marsh, 2019; Putwain et al., 2015; Symes et al., 2015) none of which examined achievement as a potential outcome. Findings of the present study make a noteworthy contribution by showing how academic buoyancy protected achievement against low attendance (supporting *H1*) and high misconduct (supporting *H2*). Methodologically the evidence is robust; prior achievement and socio-demographic covariates were controlled for, and unlike Martin and Marsh (2019) who used self-reported adversities, we made use of official school records adding a greater degree of objectivity.

Both attendance and misconduct are represented on a continuum. Periodic absences would constitute a minor adversity that high academically buoyant students could recover from. Repeated absences or chronic non-attendance, however, would constitute more of a major adversity. It is notable in the present study that mean college attendance was very high (92.8%), making the type of non-attendance a minor rather than major adversity. There could

be many reasons for non-attendance such as illness, injury, and a loss of motivation (e.g., Borrego et al., 2005; Green et al., 2012). It is likely that highly buoyant students are able to catch up with their missed lessons by making additional effort or finding new reasons to motivate themselves hence the reason why subsequent achievement was not adversely affected. Repeated absences or chronic non-attendance that may result from serious forms of physical or mental illness, bullying, or a more profound alienation from school or college, represent major, rather than minor adversities. In these circumstances, we would expect academic resilience, rather than buoyancy, to be the attribute required to successfully overcome these challenges.

Similarly, low instances of misconduct such as causing disruption in class, smoking on college premises outsides of the designated area, and being rude to staff or peers, are the types of minor adversity that high academically buoyant students could respond adaptively to. The mean frequency of recorded student misconduct was very low (a mean of one instance per student) indicating that adaptive responses were appropriate to examine using academic buoyancy rather than academic resilience (which would have been more appropriate to more frequent instances of misconduct). It is likely that high academically buoyant students are able to regulate their behaviour and emotions in such a way as to minimise consequences for achievement such as making an effort to repair relationships with staff and peers, resisting peer pressure to disrupt lessons, and not ruminating on the misconduct or the circumstances surrounding it. What is clear from our interpretation of findings is reasons for non-attendance and misconduct are potentially numerous and it is likely that academic buoyancy, although having an overall adaptive result, may have multiple paths and routes by which the adaptive outcome is maintained.

One of the other notable findings from our study was that academic buoyancy was exerting a moderating influence in the absence of a statistically significant direct relation with

achievement; bivariate correlations and first-order regression coefficients with GCSE and AS grades were all non-significant. This is not entirely unexpected as previous studies have shown equivocal findings (e.g., Collie et al., 2015; Colmar et al., 2019; Martin, 2014). It is not necessary for a variable to be significantly related to an outcome in order to show a moderating effect on the relations between a predictor and outcome (and indeed colinearity between a predictor and moderator can be analytically problematic). Nonetheless, one might be tempted to conclude that in the absence of statistically significant relations between academic buoyancy and achievement, that academic buoyancy was of little substantive importance in predicting achievement. The findings of the present study show that such conclusions would be misplaced; even if the absence of direct relations between academic buoyancy and achievement, academic buoyancy can still play an important role in ensuring protection against those adversities (e.g., low attendance and high misconduct) likely to be damaging to achievement.

4.1 Limitations and Directions for Future Research

The findings of this study have shown that buoyancy can protect achievement from minor non-attendance and misconduct. As we note above, there are potentially multiple reasons for minor adversities arising from non-attendance and misconduct, and multiple pathways that academic buoyancy can protect achievement. We did not, however, measure reasons for non-attendance and misconduct, or include possible mediators of relations between academic buoyancy and subsequent achievement. The first limitation of our study to highlight is that we cannot establish if academic buoyancy is more effective at protecting achievement when adversities arise for some reasons (e.g., misconduct arising from boredom) than others (e.g., misconduct arising from peer pressure). The second limitation is that we cannot establish the mechanisms (e.g., greater effort or self-regulation) by which buoyancy could be protecting achievement. Future research could further the understanding of the

protective role of academic buoyancy by including reasons for minor adversities and mediators of the relations between academic buoyancy and subsequent achievement.

A third limitation is that we only investigated two of potentially many academic adversities. Other minor adversities likely to be experienced by the majority of students include finding subject material difficult, receiving lower than expected grades or marks, academic pressures to achieve, and difficulty with teacher or peer relationships (see Martin, 2013a). Another fruitful avenue for future research to explore is whether academic buoyancy can also moderate relations between these adversities and subsequent achievement in such a fashion as to protect achievement.

4.2 Educational Implications

Since minor adversities are, by definition, experienced by the majority of students at some point, fostering an adaptive response is likely to be a highly beneficial attribute. It is a point of controversy in the literature whether it is actually necessary to experience adversity in order to facilitate an adaptive response ('what doesn't kill me makes me stronger' vs. 'what doesn't kill me makes me weaker'; see Martin & Marsh, 2019). However, if one works on the principle that minor adversities will have been experienced, one could intervene in the expectation that students will relate to the relevance of responding adaptively. Academic buoyancy is fortunately an attribute that can be fostered and developed (Martin, 2013b; Putwain, Gallard, & Beaumont, 2019). The 5Cs that underpin academic buoyancy (namely confidence, coordination, commitment, control, and composure; see Martin et al., 2010) are all amenable to relatively straightforward interventions (e.g., see McInerney, McInerney, & Marsh, 1997; O'Mara, Marsh, Craven & Debus, 2006). Thus, interventions designed to boost these variables that underpin academic buoyancy would also be anticipated to boost buoyancy too. Furthermore, as we note above, if academic buoyancy exerts adaptive

influence through more effective regulation strategy, this also would also be another suitable focus for intervention.

4.3 Conclusion

Even though academic buoyancy was not directly related to achievement in the present study, it still exerted an important influence by moderating the relations between minor academic adversity (low attendance and high behavioural misconduct) and subsequent achievement. After controlling for prior achievement and socio-demographic covariates (gender and age), the academic achievement of high academically buoyant students was protected in the presence of minor adversity compared to their low academically buoyant counterparts. The protective role of academic buoyancy diminished as adversities reduced; in the absence of academic adversity there was no achievement protective role of academic buoyancy.

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Table 1

Descriptive Statistics for Academic Buoyancy, GCSE and AS Grades, Attendance, and Misconduct.

	Range	Mean	SD	Skewness	Kurtosis
Academic Buoyancy	1-5	3.33	0.80	-0.29	-0.24
GCSE Grade	1-8	5.53	0.72	0.33	0.18
AS Grade	1-6	2.35	1.18	0.17	-0.58
Attendance	0-100	92.77	8.27	-1.96	5.51
Misconduct	0-∞	1.00	2.04	3.80	9.27

Table 2

Bivariate Correlations Between Academic Buoyancy, GCSE and AS Grades, Attendance, Misconduct, and Socio-Demographic Correlates.

	1.	2.	3.	4.	5.	6.	7.	8.
1. Academic Buoyancy	—	.04	.03	.22**	-.01	-.44***	-.01	.06
2. GCSE Grade		—	.79***	.26***	-.33***	.21**	-.11	.01
3. AS Grade			—	.30***	-.49***	.16**	.07	.01
4. Attendance				—	-.48***	.13**	-.23***	.10
5. Misconduct					—	-.17**	.09	.03
6. Gender						—	-.03	.01
7. Age							—	.06
8. FSM								—

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

Table 3

Unstandardised and Standardised Coefficients for the Moderating Role of Academic Buoyancy on the Relations Between Attendance, Misconduct, and Achievement.

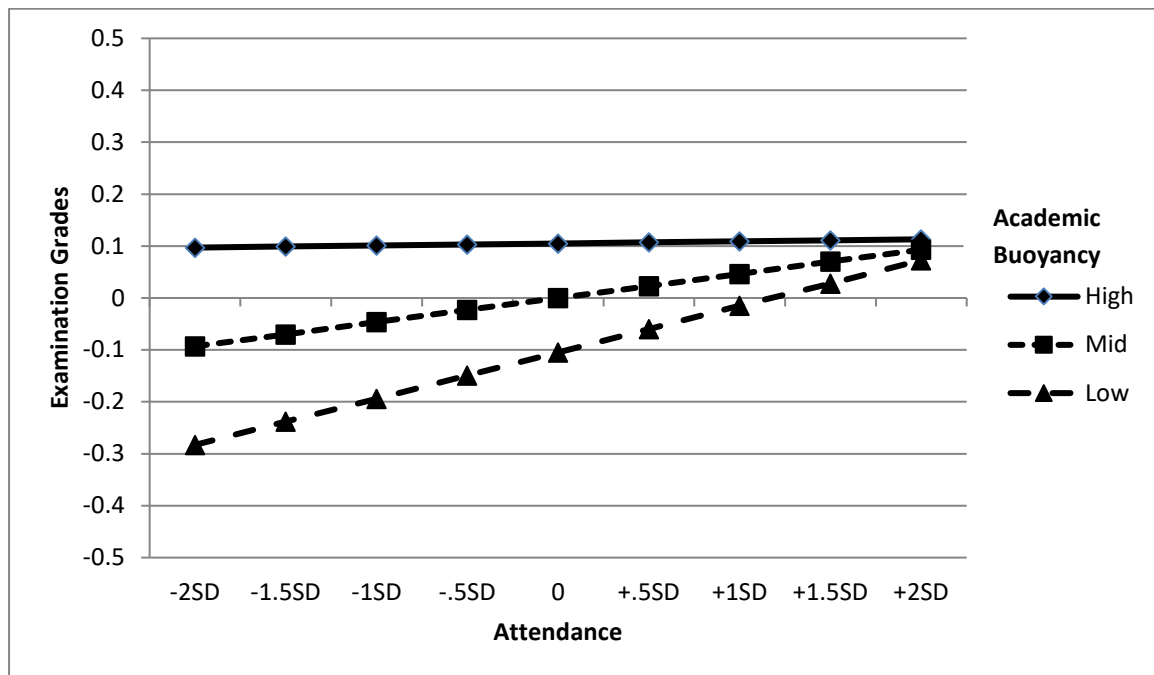|	Unstandardised Coefficients		Standardised Coefficients	
	B	*SE*	β	*SE*
Attendance:				
Academic Buoyancy (B)	0.109	.093	.065	.055
Attendance (A)	0.039***	.010	.187***	.058
Misconduct (M)	-0.114**	.036	-.171***	.053
B×A	0.031*	.015	.113*	.054
B×M	0.128**	.048	.118**	.043
GCSE Grade	1.345***	.131	.749***	.054
Gender	0.031	.114	.015	.055
Age	0.274***	.095	.169**	.060

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

Figure 1. The model-implied academic buoyancy × attendance interaction on subsequent examination grades.
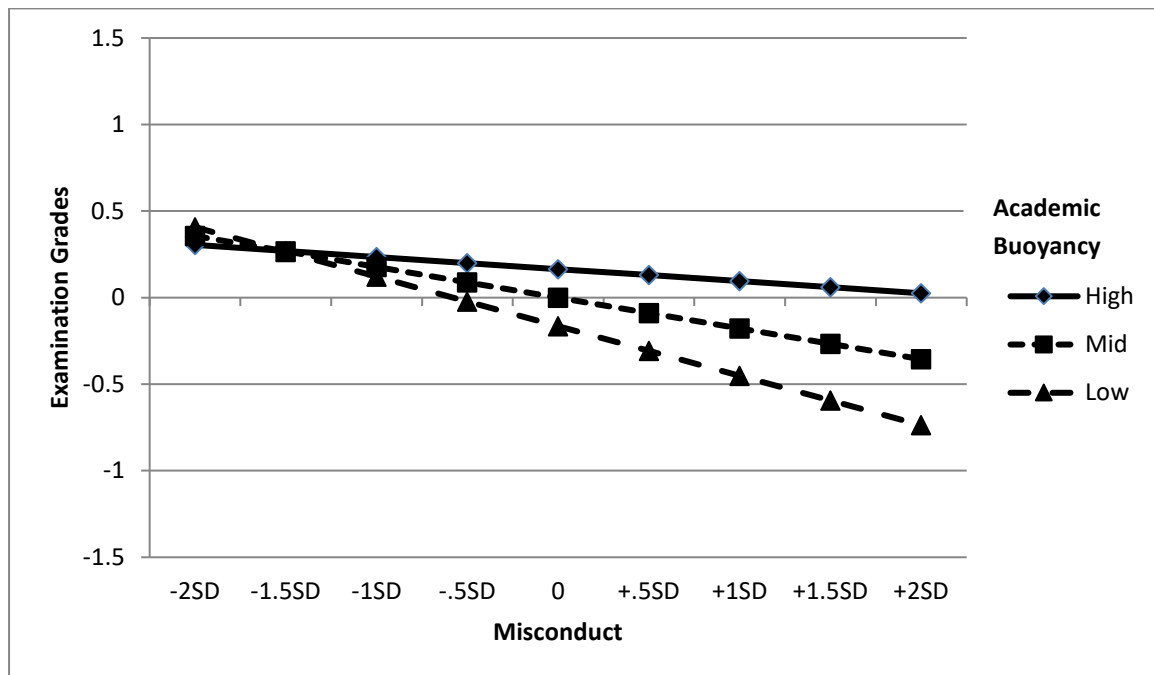
Figure 2. The model-implied academic buoyancy × misconduct interaction on subsequent examination grades.