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Workplace and Academic Buoyancy

Psychometric Assessment and Construct Validity Amongst School Personnel and Students

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Buoyancy is individuals' ability to successfully deal with setbacks and challenges that are typical of everyday life—an "everyday resilience." From a construct validity perspective, then, the present study conducts a psychometric scoping of buoyancy in the school setting. The study comprised 3,450 high school students and 637 school personnel administered the Buoyancy Scale, along with the Motivation and Engagement Scale and cognate measures. Confirmatory factor analysis supported the hypothesized factor structure of the Buoyancy Scale for personnel and students and invariance in factor loadings suggested similarity in constructs across samples. Reliability and distribution properties were also consistent across samples. Structural equation modeling showed males to be more buoyant in both samples, but opposite age effects were found with higher bouyancy amongst younger respondents in the student sample and older respondents in the workplace sample. Findings demonstrated broad congruency across samples in key relationships between buoyancy and hypothesized correlates.

Keywords: *buoyancy; construct validity; psychometric assessment; school personnel; school students*

Defining, Differentiating, and Assessing Buoyancy

Schools are sites in which challenges, setbacks, and pressure are features of everyday life. In terms of school personnel, previous research has identified stress, disengagement, heavy workloads, little support, and high turnover in this challenging setting (Fry & Martin, 1994; Mayer, 2006; McCormack, Gore, & Thomas, 2006; Richardson & Watt, 2006; Smithers & Robinson, 2003). In terms of students, evidence clearly demonstrates the pressures and adversities ever present in the academic domain (Catterall, 1998; Finn & Rock, 1997; Gonzalez & Padilla, 1997; Martin & Marsh, 2006, 2008; Overstreet & Braun, 1999). Given this, it is reasonable to propose that they are also sites in which factors such as resilience and buoyancy are highly relevant.

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An important dimension to our study is that buoyancy is proposed to be different from resilience. Resilience is typically defined as the capacity to overcome "acute" and "chronic" adversities that are seen as "major assaults" on the developmental processes (e.g., see Garmezy, 1981; Lindstroem, 2001; Luthar & Cicchetti, 2000; Masten, 2001; Werner, 2000). Indeed, the ongoing expansion of this capacity contributes to the maintenance and enhancement of good mental and/or physical health. Studies dealing with resilience in the educational setting tend to focus on ethnic groups situated in adverse conditions and situations (e.g., poverty—Overstreet & Braun, 1999; gang violence—Catterall, 1998), chronic underachievers (e.g., Finn & Rock, 1997), and the interaction of ethnicity and underachievement (e.g., Gonzalez & Padilla, 1997). Other research touches on the issue of resilience in the academic setting for students with learning disabilities (e.g., Margalit, 2004; Meltzer, 2004; Miller, 2002). Hence, traditional constructions and operationalizations of resilience refer to a relatively small number of individuals who experience quite extreme adversity and problems that in their own right are important to assist but are different from the target stakeholder in the present study.

Consistent with Martin and Marsh (2008), we propose that the traditional resilience concept does not address the many individuals who are faced with setbacks, challenges, and pressures that are part of "regular" life. This, we contend, reflects an "everyday" resilience or "buoyancy" that is relevant to the many that must negotiate the ups and downs of everyday life as distinct from acute and chronic adversities relevant to traditional constructions of resilience (see Coleman & Hagell, 2007; Cunningham, Brandon, & Frydenberg, 1999; Luthar, 2003; Masten, 2001; Rutter, 1985; Werner, 2000). Hence, buoyancy can be differentiated from resilience (see also Martin & Marsh, 2008, for differences between buoyancy and academic "hassles" and academic "coping") and is defined as an individual's capacity to successfully overcome setbacks and challenges that are typical of the ordinary course of everyday life (e.g., poor performance, competing deadlines, performance pressure, difficult tasks; Martin & Marsh, 2008). However, similar to resilience, we propose that the ongoing development of this capacity contributes to the maintenance and enhancement of good mental and/or physical health.

Given the potential importance of buoyancy, we need to know more about this construct from a measurement perspective, which can then inform substantive and intervention considerations. Accordingly, from a construct validity perspective, the present study conducts a psychometric scoping of buoyancy in a context that is known for the multitude of challenges and pressures presented on a daily basis. Specifically, it examines the buoyancy of personnel and students in the school setting.

A Construct Validity Approach to Understanding Buoyancy

In determining an approach to better understanding buoyancy among school personnel and students, we emphasize the useful construct validity work conducted in recent years (e.g., see Marsh, 1997, 2002; Martin, 2007a, 2007b). Studies that adopt a construct validation approach can be classified as within-network or between-network studies.

Within-Network Approaches to Understanding Buoyancy

Within-network approaches typically employ empirical techniques such as confirmatory factor analysis (CFA) to examine factor structure and assess invariance across key subgroups. Other within-network approaches include assessment of distributional properties of items, the reliability of scales (including diagnostic parameters relevant to reliability), and item-level means and variances. The present study examines buoyancy in the workplace and the academic setting from each of these perspectives with the aim of exploring in both contexts the extent to which the construct is internally robust and well defined from a measurement and psychometric perspective.

Between-Network Approaches to Understanding Buoyancy

In contrast, between-network approaches entail an examination of relationships between hypothesized predictors/correlates and buoyancy. Typically, this involves, on one hand, relationships between demographics and buoyancy, and on the other hand, relationships between a set of key correlates and buoyancy.

Gender, age, and buoyancy. A key step in understanding buoyancy from a between-network perspective is to examine the extent to which gender and age predict it. In the workplace, it has been found that men react more unfavorably to negative feedback (Geddes, & Konrad, 2003) and this may render them more vulnerable to fear of failure (Martin & Marsh, 2003) and thus lower buoyancy. On the other hand, Martin and colleagues (Martin, 2003a, 2003b, 2004, 2007a; Martin & Marsh, 2005) have shown that females tend to score higher on anxiety—a key predictor of low buoyancy (Martin & Marsh, 2006, 2008). Of similar importance to the gender effects in adult buoyancy are the effects of age. Research among teachers and other school personnel indicates that they receive little support in their early years (Lui, 2003; McCormack et al., 2006), that younger staff have similar workloads to more experienced staff (Kardos, 2003; Organisation for Economic Co-operation and Development, 2000), and that schools pay little attention to the unique needs of early-career school staff (Kardos, 2003). It seems, then, that if there are to be challenges for school personnel they might lie among the younger personnel more than the older personnel, and so the strains on buoyancy might be greater among younger age groups.

In terms of school students, the findings are more clear-cut, as Martin and Marsh (in press) have examined the present measures of buoyancy among this population (but only in relation to mathematics and not school more broadly). They found that at both Times 1 and 2 of a longitudinal study, girls scored significantly lower on academic buoyancy. In terms of age, higher levels of buoyancy were found among the younger students. In terms of the students, then, it is predicted that males and younger students will evince relatively higher levels of buoyancy than girls and older students, respectively.

Key correlates and buoyancy. Another key step in understanding buoyancy from a between-network perspective is to identify associations between it and a set of key and cognate correlates. It does so using two sets of constructs. In terms of the first set of key correlates, we use the Motivation and Engagement Scale (MES; Martin, 2001, 2003b,

2007a, 2007c), a multidimensional instrument used to assess each component of the Wheel, which is demonstrated to be psychometrically robust and useful in establishing between-network validity. The MES comprises 11 factors subsumed under the following clusters: adaptive cognitions, adaptive behaviors, impeding/maladaptive cognitions, and maladaptive behaviors. These 11 factors are detailed in the Method section, below. In addition to the MES, the present study incorporates other additional measures of workplace/academic behavior and affect, including workplace/classroom participation, enjoyment of work/school, positive intentions, absenteeism, homework/assignment completion (students only), and participation in extra workplace duties (personnel only). These factors have been included in previous between-network analyses (Martin, 2006b, 2007a, 2007b; Martin & Marsh, 2006, 2008), have been shown to be psychometrically sound, and have been significantly related to motivational and behavioral responses, and so they are deemed useful correlates in the present study. In line with previous work (Martin & Marsh, 2006, 2008), buoyancy is hypothesized as an adaptive construct and so is predicted to be positively associated with adaptive correlates (e.g., persistence, participation) and negatively associated with more maladaptive correlates (e.g., self-handicapping, disengagement). Importantly, given that these hypotheses are based on prior findings into academic buoyancy, the present study is an opportunity to test the generalizability of buoyancy's validity to the workplace.

Aims of the Present Study

The broad aim of the present study is to conduct a psychometric scoping of buoyancy among school personnel and students. There are two central components to achieving this aim. The first is to explore the within-network properties of buoyancy by examining the consistency of item means and variances, item distributional properties, corrected item-total correlations, reliability coefficients with respective deletion of items, one-factor congeneric CFA loadings, and the invariance of the factor across personnel and students. The second is to better understand buoyancy from a between-network perspective by identifying specific demographic, motivation, engagement, and behavioral factors that are associated with buoyancy.

Method

Participants

The school personnel sample comprises 637 personnel from 18 Australian schools. Eight were government schools, 8 were systemic Catholic schools, and 2 were independent schools. Eight were elementary schools, 7 were high schools, and 3 were both. Two thirds (68%) of the respondents were female and 32% were male. The mean age of respondents was 43.77 years (SD = 10.70), working in schools for an average of 16.71 years (SD = 10.96). Most participants (81%) were teachers; 3% were counseling staff, 3% were administrative staff, and 13% were executive staff. The student sample comprises 3,450 high school students in junior high school (Years 7 and 8; 51%; approximately 12 to 14 years

old), middle high school (Years 9 and 10; 36%; approximately 14 to 16 years old), and senior high school (Years 11 and 12; 13%; approximately 16 to 18 years old) from six Australian high schools. Just more than one third (38%) of the respondents were female and 62% were male. The mean age of respondents was 14.03 (*SD* = 1.58) years. In both samples, less than 5% of the data were missing and so the EM Algorithm was considered an appropriate procedure (see Brown, 1994; Graham & Hoffer, 2000).

Materials

Workplace and academic buoyancy. Buoyancy was assessed using the Buoyancy Scale (Martin & Marsh, 2008; see also Martin & Marsh, 2006, for the first presentation of items)—a scale originally developed for school students, but readily adapted to other performance contexts, including, in the case of the present study, the workplace. Consistent with our intent to capture everyday resilience (or, buoyancy), in developing the Buoyancy Scale, we sought to identify and operationalize some of the more "typical" challenges that might be considered part of the ordinary course of work or academic life (e.g., stress, poor results, negative feedback, poor performance). Workplace buoyancy (e.g., "I think I'm good at dealing with work pressures"; Cronbach's $\alpha = .80$) refers to employees' ability to effectively deal with setback, challenge, adversity, and pressure in the workplace setting. Academic buoyancy (e.g., "I think I'm good at dealing with schoolwork pressures"; Cronbach's $\alpha = .80$) refers to students' ability to effectively deal with setback, challenge, adversity, and pressure in the academic setting.

Hence, for the purposes of the present study, *buoyancy* is operationalized as a specific self-perceived (and self-reported) adaptive response to a challenge or setback. Inevitably, then, there is some level of subjectivity involved here; however, for the purposes of a cross-domain intrapsychic construct, this is deemed defensible (but see limitations in the Discussion section). We recognize that individual items may also map onto other cognate constructs (e.g., coping), as a set (and through modeling it as a latent factor that can differentially weight items through correcting for measurement error associated with each item) they are intended to reflect and assess the broader notion of individuals' adaptive responses to everyday setbacks in the workplace and academic setting. Both personnel and student buoyancy scales were assessed through four items, rated from 1 (*strongly disagree*) to 7 (*strongly agree*), and are presented in Table 1.

Between-network motivation and engagement correlates. The Motivation and Engagement Scale—Work (MES-W; Martin, 2006a, 2007c) is a recently developed parallel form of the Motivation and Engagement Scale—High School (MES-HS; Martin, 2001, 2003b, 2007a, 2007c). Being the original form of the MES, the MES-HS is an instrument that measures high school students' motivation and engagement. It assesses motivation and engagement rated from 1 (*strongly disagree*) to 7 (*strongly agree*) through three adaptive cognitive dimensions, three adaptive behavioral dimensions, three impeding/maladaptive cognitive dimensions, and two maladaptive behavioral dimensions. Each of the eleven factors comprises four items; hence, it is a 44-item instrument. The MES-W comprises the same number of items (44) and the same number of factors (11) as the high school instrument (MES-HS).

Table 1
Item Statistics for Workplace and Academic Buoyancy (Buoyancy Scale)

	M/7	*SD*	Skew	Kurtosis	Corrected Item-Total Correlation	Alpha if Item Deleted	Congeneric Loading CFA
Workplace buoyancy (personnel): Cronbach's alpha = .80							
1. I don't let work stress get on top of me	3.93	1.63	–.06	–.99	.55	.79	.61
2. I think I'm good at dealing with work pressures	5.16	1.27	–.89	.77	.64	.74	.71
3. I don't let a bad performance or outcome at work affect my confidence	4.62	1.44	–.35	–.69	.62	.75	.73
4. I'm good at dealing with setbacks at work (e.g., poor performance, negative feedback)	4.50	1.37	–.34	–.31	.67	.72	.80
Academic buoyancy (students): Cronbach's alpha = .80							
1. I don't let study stress get on top of me	4.59	1.69	–.36	–.67	.59	.76	.66
2. I think I'm good at dealing with school work pressures	4.71	1.45	–.49	–.11	.60	.75	.67
3. I don't let a bad mark affect my confidence	4.65	1.59	–.41	–.50	.62	.74	.73
4. I'm good at dealing with setbacks at school (e.g., bad mark, negative feedback on my work)	4.79	1.45	–.53	–.03	.63	.73	.75

Adaptive cognitions comprise Self-Efficacy, Valuing, and Mastery Orientation. Adaptive behaviors comprise Planning, Task Management, and Persistence. Impeding/maladaptive cognitions comprise Anxiety, Failure Avoidance, and Uncertain Control. Maladaptive behaviors comprise Self-Handicapping and Disengagement. Martin (2007a) provides sample items for each subscale.

Between-network behavioral and affective correlates. Because the present study aims to conduct a broad scoping of factors associated with buoyancy, a number of other measures were included in the study that addressed additional behavioral and affective dimensions. Hence, personnel and students were also administered items that explored their Enjoyment of work/school (4 items), workplace/class Participation (4 items), Positive Intentions (4 items), participation in Extra Workplace Duties (personnel only: single item), Homework Completion (students only: single item), and Days Absent From Work/School (single item). All items

except the latter two were rated from 1 (*strongly disagree*) to 7 (*strongly agree*). These measures were adapted directly from Martin (2007a, 2007b; see also Martin & Marsh, 2006, 2008) who has shown them to be reliable and a good fit to the data in CFA. Martin (2007a) provides sample items for each subscale.

CFA

CFA, performed with LISREL 8.80 (Jöreskog & Sörbom, 2006), is the primary method used to test the psychometric properties of workplace and academic buoyancy, invariance across personnel and student samples, and relationships between buoyancy and key motivation and engagement factors. Maximum likelihood was the method of estimation used for the models. In evaluating goodness of fit of alternative models, the comparative fit index (CFI) and the standardized root mean squared residual (SRMR) are emphasized (see Hu & Bentler, 1998, 1999; Jöreskog & Sörbom, 1993; Marsh, Balla & Hau, 1996; Marsh, Balla, & McDonald, 1988; Schumacker & Lomax, 1996). For SRMR, values at or less than .05 and .08 are taken to reflect a close and reasonable fit, respectively (see Hu & Bentler, 1998, 1999). The CFI varies along a 0-to-1 continuum in which values at or greater than .90 and .95 are typically taken to reflect acceptable and excellent fits to the data, respectively (McDonald & Marsh, 1990).

Multigroup CFA and Tests of Invariance

Testing for factor invariance essentially involves comparing a number of models in which aspects of the factor structure are systematically held invariant across groups and assessing fit indices when elements of these structures are constrained. Relatively invariant fit indices are indicative of comparable factor structure. The present analyses examined the comparative fit indices for a number of models that held successive elements of the factor structure invariant across personnel and students. We propose two levels at which to assess parameter invariance. The first—and most critical—is invariance in factor loadings, identified as the minimum criterion for establishing comparability (Marsh, 1993). The second level is invariance in correlations, variances, and uniquenesses—with invariance in uniquenesses desirable but not indicative of poor instrumentation in the context of invariance in loadings, correlations, and variances.

Structural Equation Multiple-Indicator-Multiple-Cause (MIMIC) Models

As mentioned earlier, from a between-network perspective, there is reason to investigate the effects of gender and age on buoyancy. Kaplan (2000; see also Grayson, Mackinnon, Jorm, Creasey & Broe, 2000) suggested the MIMIC approach, which is similar to a regression model in which latent variables (e.g., buoyancy) are "caused" by discrete grouping variables (e.g., gender, age, gender × age) that are represented by single indicators. The present MIMIC model included the effects of gender, age (treated as a continuous variable) and the Gender × Age interaction. Consistent with recommendations by Aiken and West (1991), age was zero-centered (put in deviation score form so that the mean is zero) so as to reduce the multicollinearity between age and the corresponding interaction term. The interaction term was calculated by multiplying gender and the zero-centered age variable.

Explained Variance and Effect Sizes

Correlation and structural equation modeling findings can be interpreted in terms of explained variance and effect sizes. In terms of correlational analyses, we present percentage of variance explained (i.e., r^2). Indeed, the r^2 is one of the more "classic" effect sizes available in parametric analyses (Cohen, 1988, 1992). When presenting structural equation modeling findings, we report the completely standardized solution, which can be interpreted in the traditional effect size manner such that a change of 1 SD in the independent variable will result in a change of *.zz* (where *.zz* is the completely standardized beta coefficient) SD in the dependent variable.

Descriptive Analyses

In addition to the multivariate quantitative techniques described above, a series of univariate techniques are used to examine descriptive, reliability, and distributional properties of the items and scales. Specifically, to examine reliability, Cronbach's alpha coefficients are examined. To assess distributional properties, means, standard deviations, skewness, and kurtosis are computed.

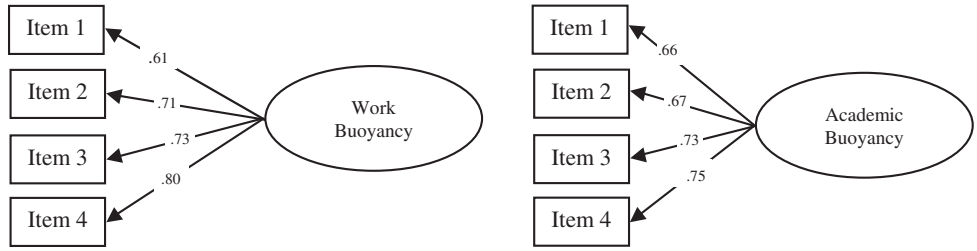
Results

Within-Network Analyses

Item-level and factor-level analyses. The first component of within-network analyses comprised a set of item analyses that assessed the consistency of item means and variances, analysis of distributional properties, corrected item-total correlations, and reliability coefficients with respective deletion of items. Findings are presented in Table 1. These findings show that both personnel and students are broadly comparable in their endorsement of buoyancy items, with the majority of respondents reporting agreement to items. The variances associated with each item are also comparable across personnel and students. For both samples, the distributional properties of each item approximate a normal distribution as indicated by skewness and kurtosis values. The corrected item-total correlations are all high for both personnel and students. This comparable pattern is also reflected in the reliability coefficients derived when respective items are deleted from analyses. Two one-factor congeneric models were then estimated (one for personnel and one for students). In this model, four loadings are freed to be estimated along with the uniquenesses (residual) for each item and the variance of the factor (leaving 2 degrees of freedom in a one-factor model). The one-factor congeneric CFAs fit the data well for personnel ($\chi^2 = 22.55$, $df = 2$, CFI = .98, SRMR = .03) and students ($\chi^2 = 195.94$, $df = 2$, CFI = .96, SRMR = .04). Loadings for both samples are also high (see Table 1 and Figure 1), ranging from .61 to .80 (mean = .71) for personnel and from .66 to .75 (mean = .70) for students. Taken together, these data demonstrate that the buoyancy scale and its component items are valid for both personnel and students from a within-network perspective.

Multigroup CFA assessing invariance across samples. A more formal test of comparability across samples is to examine factor structure—and its various components (factor

Figure 1
One-Factor CFA Loadings



loadings, factor variance, uniquenesses)—across personnel and student samples. The first multigroup CFA examined the factor structure for personnel and students and allowed all factor loadings, uniquenesses, and variance to be freely estimated. This model yielded an excellent fit to the data ($\chi^2 = 218.49$, $df = 2$, CFI = .97, SRMR = .03). Although this model is a good fit to the data, it is important to test formally for invariance between personnel and students. The present study therefore examined the comparative fit indices for four additional models across these two samples in which successive parameters were held invariant. Results in Table 2 indicate that when successive elements of the factor structure are held invariant across personnel and students, the fit indices for the minimum criterion (i.e., factor loadings—see Marsh, 1993) are predominantly comparable. Indeed, the application of recommended criteria for evidence of lack of invariance at the factor loading level (i.e., a change of greater than 0.01 in fit indices; see Cheung & Rensvold, 2002) indicates that there is similarity of constructs (in terms of correlations among items) across the two samples. We then conducted subsequent multigroup testing to determine the specific parameters on which the groups vary. Using the recommended criterion by Cheung and Rensvold (2002; i.e., a change of greater than 0.01 in fit indices), we found two significant points of discrepancy between the two samples: the variance of the two latent factors and the uniqueness associated with Item 2 (see Table 1 for item wording). Taken as a whole, then, notwithstanding two parameters, the factor structure for both samples can be considered broadly comparable.

Between-Network Analyses

Gender and age effects using structural equation MIMIC modeling. It was also of interest to explore the possible influence of gender and age on buoyancy for personnel and students. MIMIC modeling was the analytical method used to examine this issue. This involved a structural equation model in which gender, age, and their interaction were used as predictors of the latent buoyancy factor. This model yielded an excellent fit to the data for personnel ($\chi^2 = 31.28$, $df = 11$, CFI = .98, SRMR = .02) and for students ($\chi^2 = 260.31$, $df = 11$, CFI = .96, SRMR = .03). Derived beta coefficients are presented in Table 3 and significant effects for gender and age as well as the significant interaction effects are also indicated.

Table 2
Invariance Tests Across School Personnel and Students for Workplace and Academic Buoyancy, Respectively

	χ^2	*df*	CFI	SRMR
All parameters are free (no invariance)	218.49	4	.97	.03
Loadings are invariant	221.70	7	.97	.04
Loadings and uniquenesses are invariant	262.12	11	.96	.06
Loadings and variance are invariant	224.03	8	.97	.06
Loadings, variance, and uniquenesses are invariant	267.60	12	.96	.10

Note: CFI = comparative fit index; SRMR = standardized root mean squared residual.

These results show that there are gender differences on buoyancy with males reporting significantly higher buoyancy than females in both personnel and student samples. Interestingly, the effects for age are different across the two samples. In the student sample, younger students report higher levels of buoyancy. In the personnel sample, on the other hand, older respondents report higher levels of buoyancy. There was also a significant interaction for the student sample but not for the personnel sample. In the student sample, there was a significant age difference in buoyancy for females (younger > older, $t(1269) = 5.30$, $p < .001$) but not for males. In considering these findings, however, we make the point that the effect sizes here are small (a change of 1 *SD* in the independent variable results in only a small change in the dependent variable) and must be interpreted accordingly. Following from this, clearly there are additional factors that account for variance in workplace and academic buoyancy, and we refer the reader to work by Martin and Marsh (2006, in press) that looks specifically at this issue in relation to academic buoyancy.

Relationships with key correlates. Also consistent with the between-network approach, it was of interest to explore the nature of relationships between buoyancy and a set of key correlates. To this end, personnel and student samples were also administered items that explored their motivation, engagement, behavior, and affect in the respective domains. For each sample, the CFA was a 16-factor model comprising buoyancy and 15 correlates (see the Method section and Table 4). Of particular interest are the model fit of the CFA for each sample and the correlations between buoyancy and the other 15 factors. The personnel-based CFA yielded an excellent fit to the data ($\chi^2 = 3{,}795.92$, $df = 1{,}695$, CFI = .97, SRMR = .05) as did the student-based CFA ($\chi^2 = 9{,}651.22$, $df = 1{,}695$, CFI = .98, SRMR = .04). Correlations and percentage explained variance are presented in Table 4.

Because a structural equation model in which buoyancy predicts the set of correlates is an equivalent model to the CFA (personnel: $\chi^2 = 3{,}795.92$, $df = 1{,}695$, CFI = .97, SRMR = .05; students: $\chi^2 = 9{,}651.22$, $df = 1{,}695$, CFI = .98, SRMR = .04), for completeness and readier interpretation we also provide a path diagram of completely standardized beta coefficients (hence, in this model we notionally position buoyancy as the independent variable and the 15 other factors as the dependent variables). Indeed, these completely standardized beta coefficients can be interpreted in terms of effect sizes as well (see the Method section). As Table 4 and Figure 2 demonstrate, correlations/beta parameters for both samples are

Table 3
Completely Standardized Beta Coefficients: Multiple-IndicatorMultiple-Cause Analyses

	Workplace Buoyancy	Academic Buoyancy
Gender (β)	.13*	.14**
Effect	M > FM	M > FM
Age (β)	.17**	–.12**
Effect	O > Y	Y > O
Age × Gender (β)	–.02 (*ns*)	.06*
Effect	(*ns*)	FM: Y > O; M: *ns*

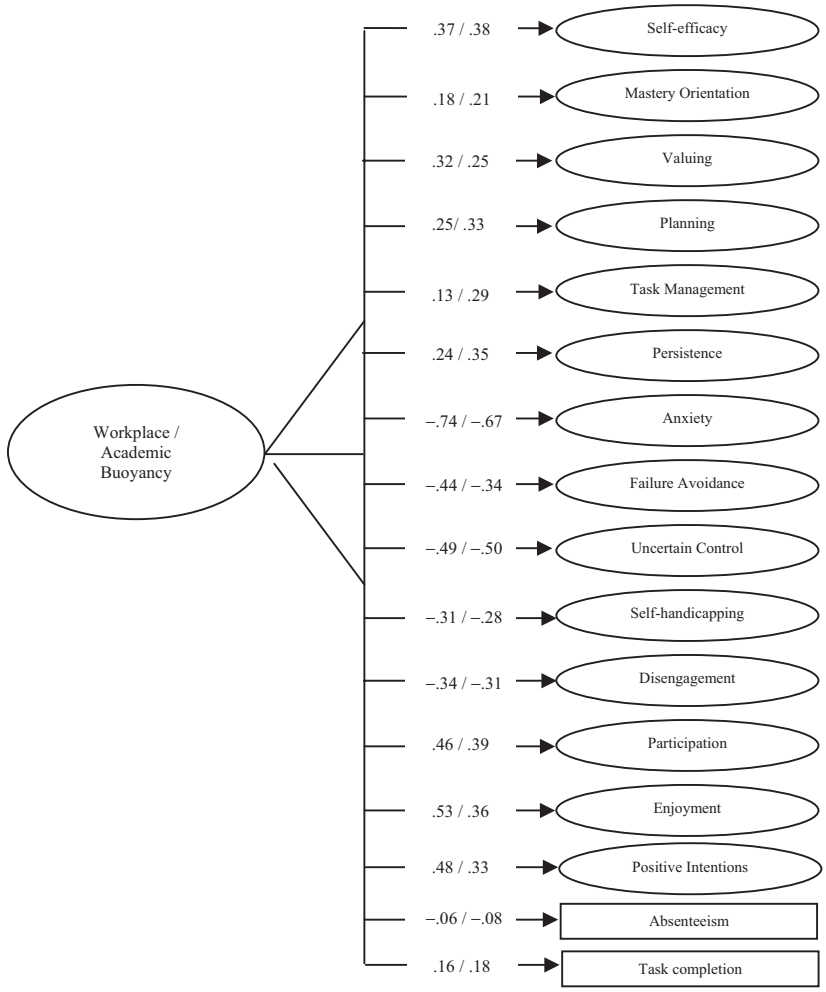
Note: FM = Females; M = Males; Y = Younger; O = Older; *ns* = not statistically significant at p < .05.
* $p < .01$. ** $p < .001$.

Table 4
Workplace and Academic Buoyancy Correlations with Between-Network Constructs

	Workplace Buoyancy (Personnel)	Academic Buoyancy (Students)
	r (% Var.)	*r* (% Var.)
Adaptive cognitions		
Self-efficacy	.37 (14)**	.38 (14)**
Mastery orientation	.18 (03)**	.21 (04)**
Valuing (work/school)	.32 (10)**	.25 (06)**
Adaptive behaviors		
Planning	.25 (06)**	.33 (11)**
Task management	.13 (02)*	.29 (08)**
Persistence	.24 (06)**	.35 (12)**
Impeding/maladaptive cognitions		
Anxiety	–.74 (55)**	–.67 (45)**
Failure avoidance	–.44 (19)**	–.34 (12)**
Uncertain control	–.49 (24)**	–.50 (25)**
Maladaptive behaviors		
Self-handicapping	–.31 (10)**	–.28 (08)**
Disengagement	–.34 (12)**	–.31 (10)**
Other behaviors and affect		
Class/workplace participation	.46 (21)**	.39 (15)**
Enjoyment of work/school	.53 (28)**	.36 (13)**
Positive intentions	.48 (23)**	.33 (11)**
Absenteeism	–.06 (01) *ns*	–.08 (01)**
Extra duties/task completion	.16 (03)**	.18 (03)**

Note: *ns* = not statistically significant at p < .05.
** $p < .01$. *** $p < .001$.

Figure 2
Structural Equation Model Path Diagram
(Personnel/Students)—Standardized Beta Coefficients



Note: Personnel: betas > .10 significant at $p < .01$; personnel: betas > .13 significant at $p < .001$; students: all betas significant at $p < .001$.

broadly parallel, and consistent with between-network hypotheses; buoyancy is (a) positively and significantly associated with adaptive cognitive and behavioral dimensions of the MES; (b) negatively and significantly related to impeding/maladaptive cognitions and maladaptive behavioral dimensions of the MES; (c) positively and significantly associated with participation at work/class, enjoyment of work/school, positive work/academic intentions, participation in extra workplace duties (personnel), and homework completion (students); and (d) negatively and significantly associated with absenteeism among students.

Discussion

In terms of congruencies and discrepancies between personnel and student data, the broad pattern of findings suggests that in their structure and correlates, the two samples are consistent, demonstrating similar loadings, reliability, distributional properties, and between-network correlations. However, in terms of mean-level differences, participant subgroups diverge in some instances—but on a within-group basis (i.e., gender and age within work and academic samples).

The fact that the psychometric properties of personnel and student data are quite congruent and, in particular, that there is similarity in factor loadings, holds implications for data analysis as well as for educational practice and intervention. Such findings provide some support for pooling groups in subsequent data analysis (but see the limitations discussed below) which greatly enhances the utility of the data set and the possible substantive questions relevant to buoyancy that can be answered as a result of such pooling. When administered to personnel and students in the same school/setting, possible substantive questions include: (a) What is the relationship between teachers' buoyancy and students' buoyancy? (b) Administering buoyancy measures at two or more time points; what is the causal ordering of teacher and student buoyancy? (c) What are the effects on student outcomes of teacher buoyancy? (d) What are the effects on teacher processes and outcomes of student buoyancy? (e) Using multilevel (hierarchical linear) modeling, what is the proportion of variance explained in buoyancy at student, teacher, and school levels? These questions, and more, rely on the researcher's ability to administer constructs that at a measurement level are shown to be broadly comparable and on data that are pooled on this basis. The congruency of structure also holds implications for intervention programs. In particular, the data suggest that if buoyancy is a construct that is psychometrically similar across personnel and student samples, then there is scope for the development of similar intervention programs for personnel and students that might vary more in the level of intensity and duration than in fundamental orientation, construction, or application.

Assessing mean-level gender and age effects also provided further support for some congruencies between personnel and students but also some notable incongruencies. In terms of congruencies, males in both samples were found to evince higher buoyancy scores. Previous explanations of gender effects in relation to students have been based on large gender differences in anxiety (females higher than males) shown to be a strong inverse predictor of academic buoyancy (Martin & Marsh, 2006, 2008). This strong inverse association between anxiety and buoyancy is replicated in the present study (see Table 4) and is perhaps a key explanation for the congruency of gender effects across personnel and students. In considering these findings, however, we again make the point that the effect sizes are small and that clearly there are additional factors that account for variance in workplace and academic buoyancy (see Martin & Marsh, 2006, 2008, which look specifically at this issue in relation to academic buoyancy).

Interestingly, however, counter to the consistent gender effects, inverse age effects (though effect sizes were relatively small) were found in the two samples with younger participants in the personnel sample reporting lower buoyancy (consistent with contentions by

others reporting on the stressors and challenges facing younger personnel: Kardos, 2003; Lui, 2003; McCormack et al., 2006) and older participants in the student sample reporting lower buoyancy (consistent with Martin & Marsh, 2008). One possible explanation for the student finding is that the older students are entering the high stakes testing phase of their schooling with elevated levels of anxiety (shown by Martin & Marsh, 2006, 2008, to be a strong predictor of buoyancy) and that this constitutes a substantial challenge to their everyday resilience. In a similar vein, younger personnel are faced with a diversity of new demands, receive little support in their early years (Lui, 2003; McCormack et al., 2006), and have similar workloads to more experienced staff (Kardos, 2003; Organisation for Economic Co-operation and Development, 2000). Hence, younger staff (a) may be more likely to experience elevated anxiety (an inverse predictor of buoyancy) and (b) have rarely (or never) activated work-related buoyancy in the face of these (novel) everyday challenges.

Further broad congruencies were found in relation to the between-network correlates. We hypothesized (consistent with Martin & Marsh, 2006, 2008) that the validity of buoyancy would be demonstrated if it were positively associated with adaptive correlates (e.g., persistence, participation) and negatively associated with more maladaptive correlates (e.g., self-handicapping, disengagement). In the case of correlations and path coefficients, this hypothesis was supported and so the between-network validity of buoyancy was supported. It was also heartening to find that in the context of validity-related hypotheses based on prior work into academic buoyancy, the present study provides preliminary support for the validity of buoyancy in the workplace.

The present study also builds on work by Martin and Marsh (2008) by providing additional data on everyday resilience—or buoyancy—in the workplace and academic setting, which is relevant to a large number of individuals who are faced with setbacks, challenges, and pressures that are part of the ordinary course of everyday life. Martin and Marsh (2006) reported that traditional or "classic" definitions of resilience were confined to the relative (but important) few who experienced extreme adversity, and yet the reality was that multitudes of individuals face less extreme but nonetheless problematic setbacks and challenges as part of everyday life. In the present study, simple inspection of mean levels of buoyancy items (Table 1) show predominant agreement to survey statements supporting the proposition that buoyancy is a characteristic relevant to "the many." This study, then, further progresses everyday resilience—or buoyancy—to complement the more classic treatments of resilience that typically focus on acute, chronic, intense, and sustained adversity experienced by the relative few (e.g., Garmezy, 1981; Lindstroem, 2001; Luthar & Cicchetti, 2000; Masten, 2001; Werner, 2000). Indeed, a possible fruitful direction for future research is to now administer buoyancy and resilience measures in the one study to better understand their relationship from a direct empirical perspective.

There were also a number of potential limitations important to consider when interpreting findings and which provide some direction for further research. The data presented in this study were self-reported; hence, it is important to conduct research that examines the same constructs using data derived from additional sources such as, for example, school executives in relation to personnel buoyancy and parents in relation to students' buoyancy. Related to this, for the purposes of the present study, buoyancy was operationalized as a specific unidimensional self-perceived adaptive response to a challenge or setback and so

inevitably there was some level of subjectivity involved, even in the context of it being something of an intrapsychic construct; there is, then, a need for objective and multidimensional indicants of buoyancy. Indeed, further research might also develop an inventory of everyday challenges and setbacks and develop multidimensional buoyancy framework around these. Also, on the constructs themselves, it is important to recognize that the items across the two samples were not identical and that this must be considered when interpreting findings relating to analyses such as invariance tests. The data were collected at the one time point and so future longitudinal work is needed to explore the possible causal ordering of buoyancy and workplace and academic outcomes. Also important to note is that the data were collected from schools and so further research is needed in other workplace settings. Moreover, it is important to recognize that staff and student data were not matched in a formal sense and so future research might recruit data in a way that enables formal matching to further test the ideas presented here. Also in relation to the data is the recognition that the present study is domain general. Targeted intervention and support are likely to be more effective than global support hoping to affect specific dimensions (Martin, in press; O'Mara, Marsh, Craven, & Debus, 2006). Hence, future research should test interventions in buoyancy in the context of the specific domains in which individuals operate.

To conclude, the present investigation provides information about the measurement, analysis, and generalizability of buoyancy across two groups that operate in the same challenging context. The findings hold substantive (e.g., in terms of introducing workplace buoyancy, progressing academic buoyancy, identifying the (in)congruency of gender and age effects, and conceptually positioning everyday resilience in relation to classic resilience) and measurement (e.g., in terms of psychometrics, data management, and pooled analyses) implications for researchers seeking to investigate the buoyancy of individuals operating in challenging contexts and who on a daily basis must deal with a diversity of everyday setbacks and difficulties.

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