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Original Paper

An Assessment of Bridging Program Participants' Sources of Academic Self-Efficacy at a Regional Australian University

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Abstract

Academic bridging and other remedial programs are designed to maximize outcomes for all students and are designed around an inclusive framework which targets the most disadvantaged or at need students. This study questions the validity of this practice through an evaluation of Bandura's sources of academic self-efficacy for bridging program participants within two distinct cohorts, first-in-family and non-first-in-family students. The study comprised students at a regional Australian university (N=1806) which prides itself on high rates of first generation student enrolment. Data was analyzed using SPSS® software to construct regression analyses for each cohort and determine for each which of Bandura's sources of academic self-efficacy predicted current academic self-efficacy. For both first-in-family and non-first-in-family students who did not participate in bridging programs, all four of Bandura's sources of academic self-efficacy were significant predictors of current academic self-efficacy. For first-in-family students who participated in bridging programs, vicarious learning did not significantly predict academic self-efficacy. For non-first-in-family students who participated in bridging programs, mastery experience and social persuasion did not predict academic self-efficacy. Some suggestions for the disparity between the results for bridging program participants and the bulk of accepted literature are offered as are some implications for bridging program pedagogy.

Keywords

academic self-efficacy, bridging programs, first-in-family

1. Introduction

Academic educational bridging programs are designed to maximise outcomes for students across a disadvantaged student cohort (Neiterman et al., 2018; Whannell et al., 2010). There is a belief that an academic program designed around an inclusive framework, one which targets the perceived needs of

the most disadvantaged or at need students, will provide a generally comprehensive learning environment in which all students can potentially flourish (Atkins, 2014; Australian Government, 2016). This research challenges that notion through an evaluation of the sources of academic self-efficacy as predictors of current academic self-efficacy for two distinct cohorts, First-In-Family (FIF) and non-First-In-Family (non-FIF) students enrolled at a regional Australian university where a disparity was found between the empirically derived literature and which of the sources of self-efficacy act as significant predictors of academic self-efficacy for bridging program participants within each cohort.

Academic Self-Efficacy (ASE) is reported to be a significant predictor of academic outcomes for students (Wiederkehr et al., 2015) and improving ASE has become an integral component in the curriculum of remedial and bridging programs. There is a plethora of research that evaluates the predictors of academic self-efficacy (Bandura, 1997; Green, 2004; Wiederkehr et al., 2015) and the academic self-efficacy/academic outcomes relationship (Bandura et al., 1996; Klassen & Usher, 2010; Pajares, 1996). There is also much interest in the differences in academic self-efficacy for discrete cohorts (Klassen, 2002; Metcalf & Wiener, 2018). Where research is lacking, and this deficit has been previously identified (Fong & Krause, 2014) is in the differences in the way that the sources of academic self-efficacy directly influence academic self-efficacy.

Metcalf and Wiener (2018) examined academic self-efficacy under a mediation model and found each of Bandura's (1986, 1987) purported sources of academic self-efficacy to mediate the relationship between generational status and academic self-efficacy. Consistent with previous research, the researchers found that non-first-in-family students reported higher levels of academic self-efficacy than first-in-family students. Additionally, all four of Bandura's empirically supported sources of self-efficacy were found to contribute significantly to the academic self-efficacy of all student cohorts. However, the hypothesised higher academic self-efficacy for students who had participated in bridging programs was not supported for the first-in-family nor non-first-in-family cohort. Data from a cross sectional survey of students' self-reported academic self-efficacy, and self-reported *sources* of academic self-efficacy, were used to differentiate which of the theoretically derived sources of academic self-efficacy were statistically significant predictors of academic self-efficacy for; FIF students who did not participate in bridging programs, FIF who did participate in bridging programs, non-FIF who did not participate in bridging programs, and non-FIF who did. All four sources of academic self-efficacy were significant predictors of academic self-efficacy for students who had *not* participated in bridging programs but this was not the case for students who had participated. The variations from expected findings are discussed as are possible reasons for the incongruities.

1.1 Definition: Bridging Programs

Academic bridging programs may take many forms. By definition, bridging programs are designed to provide *a bridge* of learning for students, addressing key learning areas that may not have been covered previously including assumed knowledge for their particular course or where an assumed level of education has not been met but the student has displayed aptitude equivalent to that expected and

requires formal recognition for this knowledge. This is a broad generalization as bridging programs are as varied as the topics covered. The current study did not differentiate between types of bridging courses and many programs are based on similar pedagogic structure as mainstream courses offering what is usually an intense, shorter duration, condensed version of either pre-requisite or foundational subject knowledge. Both generalised subject and specific subject courses were included in the current study.

1.2 Academic Self-Efficacy

Academic self-efficacy can be defined as the belief one has in their ability to achieve within an academic environment (Bandura et al., 1996; Caprara et al., 2008). Albert Bandura (1986) purported self-efficacy to be different to other self-concepts such as internal locus of control, self-confidence, and self-esteem, each of which demonstrate generalisability across tasks while self-efficacy is considered task specific. Bandura et al. (1996) expanded on prior research of the relationship between self-efficacy and academic achievement via the inclusion of factors from Social Cognitive Theory. They found support for the hypothesised relationship between Academic Self-Efficacy (ASE) and successful academic outcomes. The research demonstrated the importance of enactive and vicarious learning, social support and other psychosocial predictors on students' academic self-efficacy and learning outcomes. Since then, empirical support for the ASE and academic achievement relationship has been overwhelming (Caprara et al., 2008; Fong & Krause, 2014; McKenzie & Schweitzer, 2001; Pajares, 1996; Phan, 2012a, 2012c; Usher & Pajares, 2009; Williams & Williams, 2010).

High levels of ASE have been empirically demonstrated to mediate positive learning outcomes for students (Fong & Krause, 2014; Phan, 2012a, 2012b, 2012c; Vogel & Human-Vogel, 2016; Wiederkehr et al., 2015). Bandura purported that a process of reciprocal influence, termed *reciprocal determinism*, involving the evaluation and re-evaluation of experiences, cognitions, and environment, were employed in the development of self-efficacy. This process was thought to draw on cognitive and affective processes, influencing the perception and evaluation of both implicit and explicit stimuli, resulting in modifications to thought and behaviour through cognitive learning processes (Bandura, 1997).

Some contemporary ASE research involves evaluation of the underlying cognitive processes and their influence on learning, and offers suggestions of how re-evaluation of prior learning influences current learning (Ohlsson, 2011). Experimental testing through reaction time measurement, and evaluation of retained details, complements this research and supports the notion of flexibility and adaptation of stored information (Sweegers et al., 2015). While these studies go beyond the scope of the current research, their support of the underlying cognitive processes believed to be involved in reciprocal determinism are important to the suggestion that differences in the way that learning is processed by different cohorts can result in variations in the learning processes themselves.

1.3 Academic Self-Efficacy and Pedagogy

The correlation between ASE and academic outcomes becomes crucial to the delivery of pedagogy, and further insight into the factors that influence the development of ASE would allow educational

programmers to better develop courses which meet students' needs. Bandura's (1996) study of self-efficacy purported that fostering self-efficacy within the educational environment was important for not only providing students with the agency to succeed at their present tasks, but for the development of personal self-capabilities required for continued self-education. It is vitally important that pedagogy practices support ASE development. The theoretically determined sources of academic self-efficacy are Mastery Experience, Vicarious Learning, Social Persuasion, and Physiological Arousal.

1.4 Mastery Experience

Mastery experience is the experience gained from the success or failure of past tasks. Mastery experience has been repeatedly found to have the greatest predictive capabilities for ASE (Bandura, 1997; Cantrell et al., 2013; Metcalf & Wiener, 2018; Pajares, 1996; Phan, 2012c). Contemporary educational pedagogy utilises the self enhancement model of academic achievement in the delivery of both mainstream and supplementary program teaching (Kennedy & Deshler, 2010; Lösch et al., 2017). This model employs scaffolding, a process by which initial tasks are set at levels of difficulty well within an individual's ability, becoming incrementally more complex and difficult as the student progresses to the next task. Students' self-competence is raised through enactive attainment and reinforcement via the reciprocal re-evaluation processes previously discussed (Bandura et al., 1996; Ohlsson, 2011). Phan (2012c) suggested that mastery and positive experience were more important to academic outcomes than encouragement or situational classroom factors. Students were more motivated when previous learning experience had been positive (Phan, 2012c; Wiederkehr et al., 2015) with even minor accomplishments invoking positive thought patterns and emotional responses (Phan, 2012c).

1.5 Vicarious Learning

Vicarious learning is that which occurs from observing the successes or failures of others (Bandura, 1997; Fong & Krause, 2014; Phan, 2012c). Learning vicariously has the greatest influence when the learner emulates others who have succeeded, and who the learner considers to be similar to themselves in ability or attributes (Cantrell et al., 2013; Kozar et al., 2015; Usher & Pajares, 2009). The similarity of the role model to the learner determines the degree of information that is processed, along with other factors such as timeline and length of exposure, and how significant the role model is to the individual (Kozar et al., 2015). This has implications both within and outside the learning environment, particularly where students' backgrounds are quite diverse. Cantrell et al. (2013) emphasised modelling and social interaction between diverse members of a cohort as a method of improving student outcomes.

1.6 Social Persuasion

Social persuasion influences learning through social and verbal messages from peers, teachers, and significant others (Bandura, 1997). Both positive and negative forms of social persuasion have an influence on academic self-efficacy. It has been empirically determined that positive social persuasion

has a positive influence on academic self-efficacy for *all* student cohorts (Hampton & Mason, 2003; Wiederkehr et al., 2015) but negative social persuasion is less definitive. Social persuasion was found to be correlated to mastery experience in a study of underachieving students (Fong & Krause, 2014) and has consistently been demonstrated to be an important aspect in the development of a student's academic self-efficacy (Fong & Krause, 2014; Hampton & Mason, 2003; Phan, 2012c; Wiederkehr et al., 2015).

1.7 Physiological Arousal

Physiological arousal refers to the physiological reaction to external stimuli, experienced within the context of a particular emotional state, and which affects perceptions of capability to perform a task (Klassen & Usher, 2010). Mild to moderate states of physiological arousal can result in heightened attentiveness, and have a beneficial effect on a person's perception of their capability to perform a task (Klassen & Usher, 2010). Regression analyses conducted during development of the Sources of Academic Self-efficacy Scale (Hampton & Mason, 2003) found that physiological arousal did not individually add substantially to the overall variation of academic self-efficacy. However, inclusion of the construct in studies of ASE remains theoretically supported by others (Klassen & Usher, 2010; Phan, 2012b, 2012c; Wiederkehr et al., 2015).

1.8 Academic Self-Efficacy Development within Bridging Program Participants

Bandura (1997) made the connection between cognitive processes and self-efficacy through his proposal of reciprocal determinism. While Bandura's explanation of the underlying cognitive processes involved in reciprocal determinism are broad and may seem somewhat imprecise by today's research standards, contemporary researchers have provided a more comprehensive explanation for these cognitive processes (Ohlsson, 2011; Sweegers et al., 2015).

While the intricacies of Ohlsson's (2011) and Sweegers et al. (2015) discussions are beyond the scope of this paper, the research supports Bandura's (1997) theory that previous learning experience will influence how sensory input with new learning is perceived and processed. Bandura (1997, p. 216) noted that children in a learning environment would "… vary in how they interpret, store, and recall their successes and failures", resulting in variations in how academic self-efficacy was derived and ultimately in variations to academic performance. Additionally, Ohlsson's (2011) paper provides insight into how cognitive processes allow the learner to override existing learning experiences in a changed learning environment. Sweegers et al. (2015) places emphasis on the increased processing of information which is congruent with existing schemas. This concept has relevance to the differences in previous learning experiences for FIF and non-FIF students. Bridging program development does not consider the likely differences in prior learning for discrete cohorts, and it is plausible that cognitive processing within learning varies for the cohorts. Academic self-efficacy development relies to a large degree on the context/environment where previous learning has occurred (Ohlsson, 2011). Therefore, programs which target the most disadvantaged and treat all disadvantaged groups as a single entity may not necessarily offer the greatest benefit across a diverse student body. This may seem counter-intuitive

to the purpose of the bridging programs, however, these programs are not intended to be remedial programs but instead a supplemental form of learning for discrete groups.

1.9 First-in-Family

First-in-Family (FIF) is a term used interchangeably with first generation, and is a descriptive for students who are in the first generation in their family to attend, or graduate from University. O'Shea (2016) applied a stricter definition of the term FIF, by excluding students from this category if any of their siblings had enrolled in or completed a university degree. This project adopted the more conservative definition consistent with the bulk of the literature that classified students as first-in-family if neither parent/guardian graduated from university.

Generational status is sometimes assumed to influence academic self-efficacy and academic outcomes in a similar manner to other discriminating factors, like ethnicity or socio-economic status (Devlin & O'Shea, 2011; Wiederkehr et al., 2015). However, Longmire-Avital and Miller-Dyce (2013) interviewed FIF and non-FIF economically diverse African American, Caribbean, and Latino students in an American historically non-white college on factors pertaining to psychosocial, sociodemographic, and self-perception issues and found first generational status to be independent of these factors. First-in-family students purportedly internalised factors such as economic status differently than NON-FIF students, and different sources were drawn on for development of self-perceptions (Longmire-Avital & Miller-Dyce, 2013). An important finding was that removal of ethnicity as a factor did not alter the differences between the FIF and non-FIF cohorts. This suggests that first-in-family status is a genuinely distinct element of students' identities, and any disadvantage which might be inferred through FIF status is separate to that inferred by low SES or membership of other minority groups (Longmire-Avital & Miller-Dyce, 2013).

There is an acknowledgement that FIF students are a unique cohort whose idiosyncrasies are worth exploring, particularly in relation to the sources of academic self-efficacy (Ramos-Sanchez & Nichols, 2007; Wang & Castaneda-Sound, 2008). Wang and Castaneda-Sound (2008) found FIF students scored significantly lower on academic self-efficacy than their non-FIF counterparts and attributed this to lower perceived social support and the internalisation of conflicting loyalties and values. They encouraged further research on generational status and psychosocial factors, which had utility for educational counsellors and university personnel. Research by Metcalf and Wiener (2018) supported this finding and suggested that more attention might be directed to evaluation of intrinsic factors influencing academic self-efficacy for first-in-family students.

Ramos-Sanchez and Nichols (2007) found generational status significantly predicted academic self-efficacy as well as grade point average in favour of non-FIF students. First-in-family students are reported to study fewer hours, take fewer advanced subjects, and be less likely to aspire to participation in honours programs (Ramos-Sanchez & Nichols, 2007). It has also been suggested by other researchers that it is a disparity in perceptions, rather than simply exposure to different environmental stimuli, that results in lower academic self-efficacy (Chiu, 2012; Wiederkehr et al., 2015).

1.10 Bridging the Gap

The Bradley Report (2008), a report commissioned by the Australian Government to assist in the development of a model of education for the next decade, identified first-in-family generational status as one of the barriers to higher education in Australia. Part of this report led to the implementation of strategies which improved the opportunities for university participation for Australians (Carpenter et al., 2015). Strategies included funding to universities for many academic and school to university linkage programs. Some of those available programs are described here.

1.11 First Degree Program

The *First Degree* program is a Higher Education Participation and Partnerships Program (HEPPP) funded by the Department of Education and was has been in effect at selected Australian universities since 2014. The university where the current study was undertaken boasts a first-in-family cohort of approximately 70% of the total student population. The program aims include identifying first-in-family students and matching them to appropriate resources, maintaining contact intermittently throughout their degree, and advising them of the availability of new appropriate resources as they become available. Bridging programs at the university are not exclusive to first-in-family students but the needs of FIF students consider predominantly in their design.

1.12 StudyLink Bridging programs

Studylink programs are short duration programs completed online at students' own pace and are suggested to take between 16 and 40 hours to complete. They were designed to improve student knowledge in specific subject areas, and increase self-efficacy by employing strategies such as scaffolding. These programs are usually offered immediately prior to, or in the early weeks of, a course.

1.13 School to University Linkage Programs

Many universities are developing programs in cooperation with high schools and TAFE colleges that better prepare students for entry to specific courses by focussing on learning relevant to the specific subject area. Some have a guaranteed entry to the selected course on satisfactory completion of the linkage program, and provide additional resources for students to assist with the transition from school to university, such as week-long on-campus experiences for high school students and early exposure to first year university subject content.

1.14 Hypotheses

H1: It was hypothesised that, consistent with empirical literature, for first-in-family students who *had* participated in bridging programs, all four sources of academic self-efficacy are significant predictors of students' academic self-efficacy.

H2: It was hypothesised that, consistent with empirical literature, for first-in-family students who *had not* participated in bridging programs, all four sources of academic self-efficacy are significant predictors of students' academic self-efficacy.

H3: It was hypothesised that, consistent with empirical literature, for non-first-in-family students who *had* participated in bridging programs, all four sources of academic self-efficacy are significant

predictors of students' academic self-efficacy.

H4: It was hypothesised that, consistent with empirical literature, for non-first-in-family students who *had not* participated in bridging programs, all four sources of academic self-efficacy are significant predictors of students' academic self-efficacy.

2. Method

A cross-sectional survey was used to gather data about students' current sense of academic self-efficacy as well as their self-reported perceptions of past learning experience. Participants were allocated to groups according to self-disclosed demographic information. Students were invited to participate in this study via SONA® Research Participation System, a Facebook® fourth year psychology students' closed group homepage, and emailed to current students via student central bulk mail out using the Survey Monkey® platform for data collection. No remuneration was given for participation in the survey. Informed consent was implied by participation and this was explained in the participant information statement. The research was approved by the Charles Sturt University Faculty of Arts Human Ethics Committee, approval number 100/2016/149.

2.1 Participants

A total of 2253 students completed the on-line survey. After data checking there were 1807 valid responses including from SONA (n = 116), Facebook (n = 5), and email invitation (n = 1686). The 1807 participants were comprised of current students (n = 1721), recently active students who had completed their degree (n = 64), and recently active students who were currently on leave (n = 22). Age of respondents ranged from 18 to 82 years (M = 37.32, SD = 12.89). Students identified as male (n = 497), female (n = 1299), or other gender (n = 11). First in family students represented 62.7 percent (n = 1134) of the respondents, aligning with the university's FIF enrolment approximations of 65-70 percent of total student numbers. Within the FIF cohort, 14.9 percent (n = 170) disclosed having participated in a bridging program and85.1 percent (n = 964) did not.

2.2 Measurements

2.2.1Academic Self-Efficacy Scale (Zajacova et al., 2005)

The Academic Self-efficacy Scale (ASES), is a 27 item scale designed to measure current perceptions of students' academic self-efficacy (Zajacova et al., 2005). Participants were required to rate each self-report statement on an eleven point scale according to how confident they were that they could successfully complete the listed task, from 0 (not at all confident) to 10 (extremely confident). The ASES has a high reported reliability (α = .87) and is designed specifically for use with college and university level students (Zajacova et al., 2005). In the current study, Cronbach's alpha coefficient was .95 indicating a very high internal consistency reliability for the scale with this sample. Respondents were asked to rate their level of confidence to successfully complete specific tasks, for example, taking good class notes, meeting parents' expectations of grades, and talking to lecturers.

2.2.2 Sources of Academic Self-Efficacy Scale (Hampton, 1998)

The Sources of Academic Self-efficacy Scale (SASES), a 46 item scale designed to measure the four theorised sources of academic self-efficacy; mastery experience, vicarious learning, social persuasion, and emotional and physical states (Hampton, 1998). Participants were required to rate statements on a 5 point scale from 1 (never) to 5 (very often) on how they felt the statements applied to them in the past.

Examples of items included in the measurement instrument were;

"I identified myself with the students in my classes who took detailed notes",

"My parents encouraged me to stay cool while taking exams",

and, "I got uptight when I could not figure out what my teachers had said during lectures".

The SASES has a high reported reliability (α = .85 to .91), and test-retest reliability estimated at .91 (Hampton, 1998). The instrument demonstrated a good level of reliability for all four sources of academic self-efficacy in this study and coefficients for each construct are shown in Table 1.

Table 1. Cronbach's Alpha Coefficients for the Sources of Academic Self-Efficacy (Hampton, 1998) Subscales

Construct measured	number of items	Cronbach's alpha
Mastery experience	12	.779
Vicarious learning	14	.900
Social persuasion	10	.819
Physiological arousal	10	.868

2.3 Procedure

Data was collected online using the Survey Monkey® platform over an eight week period mid-year in 2016. Raw data was imported to SPSS® version 24 and checked for completeness.

3. Results

The data set was examined for adherence to parametric assumptions of normality. Univariate outliers in eight data sets with an absolute *z*-score value > 3.29 were marked as missing values, as recommended by Field (2007, p. 76). Scores for skew and kurtosis were converted to *z*-scores for analysis. Some skew *z*- scores demonstrated a variation from a normal distribution, therefore normality was also assessed using histograms. The data was also checked for linearity using Q-Q plots. It was determined that the data satisfactorily fulfilled the parametric requirements and assumptions.

Participants were divided into the following groups (Group 1, First-in-family students who had participated in bridging programs; Group 2, First-in-family students who had not participated in bridging programs; Group 3, Non-first-in-family students who had participated in bridging programs; and Group 4, Non-first-in-family students who had not participated in bridging programs).

3.1 Correlations

All correlations with the exception of the relationship between physiological arousal and social persuasion showed moderately significant relationships. This suggests that each of the sub-scales have measured distinct constructs. Correlations are represented in Table 2.

Table 2. Pearson Product Moment Correlations between Measures of Academic Self-Efficacy, Mastery Experience, Vicarious Learning, Social Persuasion, and Physiological Arousal for the Non-First- in-Family Student Cohort. (N = 1807) ASE – Academic Self-Efficacy; ME – Mastery Experience; VL – Vicarious Learning; SP – Social Persuasion; PA – Physiological Arousal; **p < .01 (2 Tailed)

	ASE total	ME scale	VL scale	SP scale	PA scale
ASE total	1				
ME scale	.532**	1			
VL scale	.496**	.776**	1		
SP scale	.276**	.411**	.485**	1	
PA scale	.419**	.380**	.282**	-.035	1

3.2 Regression Analyses

Individual multiple regression analyses were performed for each of the four groups to evaluate the ability of each of the sources of academic self-efficacy (mastery experience, vicarious learning, social persuasion, and physiological arousal) to predict academic self-efficacy for each of the groups. For Group 1, total ASE explained by the model was 33.8%, $F(4, 165) = 21.093$, $p < .001$; Group 2, 36.6%, $F(4, 959) = 138.516$, $p < .001$; Group 3, 39%, $F(4, 81) = 12.92$, $p < .001$; and Group 4, 35.2%, $F(4, 685) = 79.01$, $p < .001$. Consistent with the literature, the sources of self-efficacy accounted for the variance between 33.8 and 39 percent to predicting academic self-efficacy. Individual regression coefficients inform which of the coefficients contributed significantly to the individual regression models and are shown in Tables 3 to 6.

Table 3. Beta Values and Significance Factors for the Sources of Academic Self-Efficacy for FIF Students Who Participated in Bridging Programs. ME – Mastery Experience; VL – Vicarious Learning; SP – Social Persuasion; PA – Physiological Arousal

Source	unstandardisedB	SE B	Standardised β	*t*	*p-value*
constant	111.724	29.734		3.757	.000
ME	2.215	.793	.279	2.792	.006
VL	-.042	.521	-.008	-.082	.935
SP	1.062	.419	.180	2.537	.012
PA	2.000	.404	.354	4.952	.000

The co-efficient findings suggest that mastery experience, social persuasion, and physiological arousal significantly predicted academic self-efficacy in FIF students who attended the bridging programs. Vicarious learning was not a predictor for this cohort. This result suggests that first-in-family students who participated in bridging programs did not consider the learning achieved from interactions with family, peers, and other role models to have a significant effect on their university scholastic experience, and H1 was therefore not supported.

Table 4. Beta Values and Significance Factors for the Sources of Academic Self-Efficacy for FIF Students Who Did not Participate in Bridging Programs. ME – Mastery Experience; VL – Vicarious Learning; SP – Social persuasion; PA – Physiological Arousal

Source	unstandardised B	SE B	Standardised β	*t*	*p-value*
constant	84.927	10.650		7.974	.000
ME	1.763	.305	.245	5.784	.000
VL	1.021	.222	.197	4.590	.000
SP	.541	.191	.087	2.825	.005
PA	1.565	.160	.276	9.754	.000

For first-in-family students who did not participate in bridging programs, all four sources of self-efficacy were found to significantly predict academic self-efficacy. This finding supported H2.

Table 5. Beta Values and Significance Factors for the Sources of Academic Self-Efficacy for Non-FIF Students Who Participated in Bridging Programs. ME – Mastery Experience; VL – Vicarious Learning; SP – Social Persuasion; PA – Physiological Arousal

Source	unstandardised B	SE B	Standardised β	*t*	*p-value*

constant	131.513	52.749		2.493	.015
ME	-.135	1.211	-.017	-.112	.911
VL	2.243	.739	.417	3.037	.003
SP	.191	.707	.025	.271	.787
PA	2.094	.649	.345	3.228	.002

For non-first-in-family students who participated in bridging programs the co-efficient findings suggest that vicarious learning and physiological arousal significantly predicted academic self-efficacy, but mastery experience and social persuasion were not predictors of academic self-efficacy. This suggests that non-first-in-family students did not consider their previous accomplishments to make a significant contribution towards their current university scholastic experience, and further did not consider the social and verbal messages of positive encouragement offered by peers, teachers, and others who are important to the student as being significantly helpful to their current learning. H3 was not supported.

Table 6. Beta Values and Significance Factors for the Sources of Academic Self-Efficacy for Non-FIF Students Who Did not Participate in Bridging Programs. ME – Mastery Experience; VL – Vicarious Learning; SP – Social Persuasion; PA – Physiological Arousal

Source	unstandardised B	SE B	Standardised β	*t*	*p-value*
constant	81.136	13.960		5.812	.000
ME	1.945	.391	.278	4.969	.000
VL	.832	.278	.166	2.994	.003
SP	.574	.255	.089	2.250	.025
PA	1.360	.205	.245	6.648	.000

For non-first-in-family students who did not participate in bridging programs, all four sources of self-efficacy were found to significantly predict academic self-efficacy. This finding is consistent with the accepted literature and supported H4.

4. Discussion

Overall the findings suggest that bridging program participation may have a negative influence on the manner in which some of the empirically accepted sources of self-efficacy influence academic self-efficacy for distinct cohorts. Where this occurs, certain constructs no longer significantly predict academic self-efficacy. For all students who *did not* participate in bridging programs, all four of the empirically supported sources of ASE were found to contribute to ASE. For students from both FIF and non-FIF who *did* participate in bridging programs, however, contributions of the sources of ASE did

not contribute in the same manner. Previous literature supported the notion of a lower level of academic self-efficacy for FIF students than that reported by their non-FIF counterparts. Additionally, previous findings demonstrated that all four of Bandura's (1997; 1996) empirically supported sources of academic self-efficacy mediated the relationship between generational status and academic self-efficacy. However, the current evaluation of bridging program participation has provided unexpected inconsistencies to our previous understanding, demonstrating that each of the sources of ASE do not contribute to ASE in the same way for all cohorts.

An abundance of empirical support for the positive relationship between academic self-efficacy and academic outcomes has been reported on since the development of Bandura's (1997) self-efficacy theory and has led to contemporary researchers' general acceptance of the relationship. As in previous research (Metcalf & Wiener, 2018) assumptions were made about the findings based on acceptance of the ASE/academic outcomes relationship. To date there has been little reason to question the legitimacy of these assumptions. Fong and Krause (2014) identified a deficit in research that directly linked the sources of academic self-efficacy with academic achievement, contributing to the knowledge base with their evaluation of the sources of academic self-efficacy in underachieving students. Despite a lack of significant differences in academic self-efficacy between under-achievers and over-achievers, there was a disparity in the antecedents of ASE. Similarly for the current research, a disparity in the antecedents of ASE for FIF and non-FIF students may provide legitimate reason to question the practice of accepting incontestably a generalised academic self-efficacy and academic outcomes relationship.

First-in-family students who participated in bridging programs reported that vicarious learning did not significantly predict academic self-efficacy. Vicarious learning occurs through observation and social comparison, with the greatest influence being exerted where the role model has a significant role in the learner's life and is perceived by the learner to be similar (Bandura, 1997). One suggestion is that for these students, they had already perceived themselves as *different* from family members and peers, and their enrolment in bridging programs was partly an attempt to fit into the, for them, foreign environment of university life. A second suggestion is that bridging program participation encourages the establishment of new role models and a modification to the processes of social comparison that contribute to self-efficacy. If the second is true, it needs to be discerned whether this is to the detriment of retention of positive family values that students would find beneficial in the world of academia. Qualities such as work ethic, punctuality, perseverance, empathy, camaraderie, respect, and pride of achievement are suggested to contribute to students' success at university. Discounting previous role models may have a detrimental effect if previously revered positive qualities are not embraced in the new learning environment.

For non-first-in-family students who participated in bridging programs, mastery experience and social persuasion are the two constructs that did not predict academic self-efficacy. Mastery experience and social persuasion were the distinguishing constructs in a previous study between under- and over-achievers (Fong & Krause, 2014) and psychological mechanisms were suggested to be the

instigator. This might be true also for students with a familial background of university education who may feel somewhat inadequate, or that there is a stigma attached to their participation in bridging programs, despite these programs not being remedial education programs per se. A plausible explanation is that then on-FIF student may dismiss previous successes and the encouragement of others if there is a perception that the bridging program is somehow deficit framing their abilities. It could be argued that higher expectations placed on these students by family members who had completed university, particularly where this involved prestigious qualifications, might contribute to such a perception. While beyond the responsibility of bridging program pedagogy, consideration of expectations placed on students from family and peers is an important aspect of student wellbeing. The current findings might provide an awareness of the possibility that such stressors are having a negative influence on academic self-efficacy for these students, and could provide the impetus for further research into the phenomenon.

4.1 Limitations and Future Directions

The current research is in response to a previously reported evaluation of academic self-efficacy which found discrepancies in ASE between FIF students who participated in bridging programs and those who had not, warranting further investigation. The findings in the current study are potentially controversial, and should provide an impetus for research into how the sources of academic self-efficacy are influenced by bridging program participation for discrete cohorts, and whether the existing approach to bridging program development is universally beneficial across all cohorts. A qualitative study which delves into the intricacies of bridging program enrolment and academic self-efficacy across a range of tertiary environments for discrete cohorts might be warranted. A limitation of this study is that it was limited to a single Australian regional university with a high enrolment percentage of FIF students, and the findings may not extrapolate to larger metropolitan student cohorts.

A *chicken and egg* scenario presents itself for the researchers in deciphering the findings of this research. It cannot be emphatically determined whether the inconsistencies in which of the sources of academic self-efficacy predict ASE for discrete cohorts are an artefact of earlier learning and the reason that participants enrolled in bridging programs in the first instance, or an artefact of bridging program participation in itself. This research does, however, identify a divergence from the accepted notion that all four of Bandura's (1997) sources of self-efficacy predict academic self-efficacy universally across a variety of student cohorts.

4.2 Conclusion

This study has demonstrated that, within at least one Australian university, bridging program participation may be having a previously not considered influence on academic self-efficacy for the participants. This discrepancy in the expected findings and a deficit of research into this area provides an opportunity for future original research into academic self-efficacy. As some researchers (Ohlsson, 2011; Sweegers et al., 2015) are delving into the neuropsychology of the learning processes involved in the development of academic self-efficacy, there is an opportunity for concurrent research of how this

translates to practical implications for students with varying prior learning experiences.

This research appears to be one of the first of its kind to evaluate the individual contributions that the sources of self-efficacy may make in predicting academic self-efficacy for discrete cohorts. It suggests that renewed research of self-efficacy theory might be a timely undertaking for developers of academic bridging programs, in particular how academic self-efficacy develops within discrete student cohorts

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