Learner Self-Efficacy, Goal Orientation, and Academic Achievement: Exploring Mediating and Moderating Relationships.

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Recommended citation

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Abstract

Within the context of Pintrich’s self-regulated learning model, recent reviews of the literature show that motivational factors are the strongest predictors of academic performance. Even so, gaps remain in terms of which goal orientation constructs are most strongly related to performance, and whether academic self-efficacy is involved in such relationships, either as mediator or moderator. This study addresses these gaps using a sample of 478 university students; 409 females aged 17-62 ($M = 23.28, SD = 7.22$) and 69 males, aged 18 - 47 ($M = 22.5, SD = 6.31$). Analyses revealed that academic self-efficacy (ASE) mediated relationships between both mastery and performance-approach goal orientation with achievement, though the mediation effect was larger for the relationship involving mastery approach goal orientation. ASE did not moderate the relationship between performance-approach goal orientation and achievement. Findings suggest teaching programs should foster learning environments that encourage persistence and effort when learning, and consider how course delivery and feedback can enhance academic self-efficacy, regardless of the goal orientation adopted by students.

Keywords: Academic self-efficacy; academic achievement; goal orientation; higher education; self-regulated learning.
Academic achievement is of great research interest due to its theoretical and practical implications. Academic achievement is linked to high levels of student success across a range of socially desirable outcomes, including job attainment (Lamb & McKenzie, 2001) and job performance (Roth, BeVier, Switzer, & Schippmann, 1996; Kanfer, Wolf, Kantrowitz, & Ackerman, 2010). In contrast, academic underachievement is predictive of adverse outcomes such as student drop-out (DeBerard, Spielmans, & Julka, 2004), substance use (Bryant, Schulenberg, O’Malley, Bachman, & Johnston, 2003), and future unemployment (Needham, Crosnoe, & Muller, 2004). While efforts by educators to foster a positive and enriching learning environment are important for success (Hattie, 2015), much of the learning effort that contributes to academic performance, particularly within the context of higher education, is achieved outside of the classroom context by the student themselves (Panadero, 2017). Accumulated literature suggests that student motivation is a key determinant of success (Richardson, Abraham, and Bond, 2012). However, not all forms of self-motivation are effective, and they may also depend on how confident one is in their study abilities. Guided by Pintrich’s (2000b) model of self-regulated learning, the present study focuses on the independent and interacting influences of these motivational predictors (goal orientation and self-efficacy) for student academic performance.

Goal orientation and self-efficacy are implicated as key motivational variables that influence academic attainment according to Pintrich’s model of self-regulated learning (Pintrich, 2000b). Self-regulated learning (SRL) explains the way in which learners exercise control over cognitive processes, feelings and actions, in a self-directed manner in order to achieve academically (Zimmerman & Schunk, 2001). The motivational variables identified in this model, for which goal orientation and self-
efficacy prominently feature, have shown to be critical for self-regulation (Schunk, 2005), and subsequent academic performance (Richardson et al., 2012).

**Goal Orientation and Academic Achievement**

Goal orientation (GO) refers to the underlying achievement outcome an individual strives for, which motivates engagement in a learning task (Elliott & Dweck, 1988). GO can be classified according to four goal types that explain learning motivation: mastery-approach, mastery-avoidance, performance-approach, and performance-avoidance. Mastery goals reflect a focus on the acquisition of knowledge, ability, and competence (Pintrich, 2000a), with the approach subtype emphasising the acquisition of competency and skill, and the avoidance subtype avoiding adverse outcomes such as losing skills or becoming incompetent (Coutinho & Neuman, 2008; Kamarova, Chatzisarantis, Hagger, Lintunen, Hannandra, & Papaioannou, 2017). Performance goals reflect an individual’s desire to demonstrate competency by outperforming others (Neuville, Frenay, & Bourgeois, 2007), with the approach subtype characterised by demonstrating competence and competition, and the avoidance subtype working to evade demonstrations of incompetence (Coutinho & Neuman, 2008).

Existing literature suggests that goal orientations characterised by the approach subtype are more beneficial in learning contexts than the avoidance subtypes. Avoidance goal orientation subtypes are shown to negatively correlate with academic achievement (Diseth, 2011; Soric, Penezic, & Buric, 2017), while approach subtypes show a positive relationship to academic achievement (Coutinho & Neuman, 2008; Phan, 2010; Phan, 2013; Soric et al., 2017). Students who adopt mastery-approach goals seem to work harder, see intrinsic value in learning, and experience stronger academic achievement (Diseth, 2011; Senko & Tropiano, 2016; Soric et al.,
In contrast, those who adopt performance-approach goals are shown to compete in the learning environment and evade challenging tasks (Friedal et al., 2007). Findings have been less consistent regarding links between performance-approach goal orientation and academic achievement, with some studies finding a positive relationship (Bong, 2005, Coutinho & Neuman, 2008; Soric et al., 2017), while others have not (Harackiewicz, Barron, Tauer, Carter, & Elliot, 2000; Hsieh, Sullivan, & Guerra, 2007; Parajes, Britner, & Valiante, 2000).

**Academic Self-Efficacy as a moderator and mediator of the GO-performance relationship**

Academic self-efficacy (ASE) may explain how and when goal orientation influences academic performance. ASE is an individual’s judgement of their capabilities to organise and execute courses of action required to achieve desired outcomes, such as educational goals (Bandura, 1997; Elias & MacDonald, 2007). Engagement in learning for the purposes of mastery may engender feelings of ASE that, in turn, foster further effort and, ultimately, better performance. In contrast, focus on performance goals may deprioritize the ‘how-to’ part of achievement that would otherwise increase self-efficacy. Further, performance GO may make one more sensitive to failures to achieve the goal, thus threatening their ASE.

Empirical evidence supports links between GO, ASE, and academic performance (Bandalos, Finney, & Geske, 2003; Coutinho & Neuman, 2008; Diseth, 2011; Hsieh, Sullivan, Sass, & Guerra, 2012; Huang, 2016; Midgley, Kaplan, & Middleton, 2001), although effects have been weaker and less consistent for relationships involving performance GO (Cho et al., 2010; Fenollar, 2007; Harackiewicz, Barron, Tauer, Carter, & Elliot, 2000; Neuville, Frenay, & Bourgeois, 2007; Parajes, Britner, & Valiante, 2000). Individuals with mastery GO have higher
levels of ASE and academic achievement in comparison to those who adopt performance-approach goals (Friedal, Cortina, Turner, & Midgley, 2007). Several studies have found a mediating role of ASE on the mastery GO-achievement relationship (Bandalos et al., 2003; Bandura, 1991; Coutinho & Neuman, 2008), though we are unaware of any similar studies testing mediation effects for performance GO. Finally, in the few longitudinal studies that have investigated ASE, mastery GO, and achievement, mastery GO has been shown to predict both ASE and achievement (Bandalos et al., 2003), suggesting it may have temporal precedence in any potential causal relationship.

ASE may also moderate the goal orientation-performance relationship, and potentially account for inconsistencies in prior findings with respect to relationships between ASE and performance GO, and performance GO and achievement. ASE may act as a motivator to maintain one’s focus on previously set academic goals. It may also be an indicator of the extent to which they are capable of meeting their goals (Dweck, 1986; Nicholls, 1984). Previous findings show that performance GO adoption, coupled with low ASE produce behaviours characteristic of learned helplessness, whilst those with high ASE persist during learning tasks and maintain positive affect (Elliott & Dweck, 1988; Smiley & Dweck, 1994). As such, ASE may offset some of the negative effects of performance GO on academic outcomes.

To date, the few studies that have directly tested the moderating effect of ASE have yielded mixed results. Elliott and Dweck (1988), as well as Smiley & Dweck, (1994), found support for a moderating effect, whereas Cho, Weinstein, and Wicker (2011) and Harackiewicz et al. (2000) did not. The positive moderating effects of ASE on performance approach GO have been found regardless of whether achievement was measured in terms of task choice (which task the individual chose to
do) and task effectiveness (how well the individual elicited information about the task; Elliott & Dweck, 1988) or task success (successful completion of a task; Smiley & Dweck, 1994).

**Gaps in the literature**

Despite this accumulated literature, several gaps remain in our understanding of how ASE, GO, and performance inter-relate. First, we are unaware of any studies that have tested mediation of the performance GO-academic performance relationship by ASE. Although the less consistent pattern of correlations involving performance GO suggest that ASE may have a weaker mediating effect on performance GO-academic outcome, this has yet to be formally tested. Second, the inconsistent findings for the relationship between performance GO and academic performance may hint at moderating effects that suggest context is important for this relationship. The mixed findings for this proposed moderation effect by ASE may be due to dichotomization of the GO variable, which splits into high vs low rather than considering the variable along a continuum. High vs low distinctions made based on median splits are highly sample dependent, and ignore the possibility of within group heterogeneity (Rucker, McShane, & Preacher, 2015). Therefore, we recommend re-testing this moderation effect with a continuous form of the GO construct. Finally, those prior moderation tests evaluated performance within the context of specific, lab-based tasks, rather than ecologically valid alternatives such as academic grades.

**The current study**

The present study seeks to address these gaps in the literature, re-examining the inter-relationships between GO, performance, and ASE. First, the mediating effect of ASE was tested for both performance GO-academic performance and mastery GO-academic performance relationships. Based on the weaker correlational findings
involving performance GO, it was hypothesized that the mediation effect would be stronger for the mediation model involving mastery GO rather than performance GO. Second, it was hypothesized that ASE would moderate the relationship between performance-approach goal orientation (as a continuous rather than dichotomized variable) and academic achievement, whereby high levels of ASE will strengthen the relationship between performance-approach goal orientation and academic achievement.

**Method**

**Participants**

The sample included 478 participants, 409 females aged 17 – 62 years, \((M = 23.28, SD = 7.22)\) and 69 males aged 18 - 47 \((M = 22.5, SD = 6.31)\). An independent samples \(t\)-test revealed no significant difference in age across gender, \(t(476) = -0.790, p = .43\). Demographically, 47.7% of the participants were first year students, 22.4% were second year students, 16.7% were third year students, and 13.2% being fourth year students. The majority of participants were primarily enrolled in on-campus mode \((n = 395)\), with the remainder of participants \((n = 83)\) studying in online mode. Participants were studying across a range of faculties within the University.

**Materials**

_Edemographic information._ Demographic information such as age, sex, current year level, and study mode (on/off campus) was collected.

_Self-report measures._ Measures of academic self-efficacy and goal orientation were from the Motivated Strategies for Learning Questionnaire (MSLQ; Pintrich, Smith, Garcia & McKeachie, 1991) to be consistent with the theoretical framework used in the present study. Participants gave responses to each item using a 7-point response scale \((1 = \text{not at all true of me} \text{ and } 7 = \text{very true of me})\). Total scores for each
subscale were calculated by averaging the items within the subscale. The academic self-efficacy and goal orientation measures all had acceptable fit as uni-dimensional models using confirmatory factor analysis (CFI > .95, SRMR < .08, RMSEA < .10; Schermelleh-Engel, Moosbrugger, & Muller, 2003). Further, hetero-trait mono-trait testing revealed that these scales all had sufficient discriminant validity (HTMT values < .85; Kline, 2011).

**Academic Self-Efficacy.** Eight questions from the self-efficacy for learning and performance subscale of the expectancy component of the motivation scale of the MSLQ. Self-efficacy includes judgement about one’s ability to accomplish a task as well as one’s confidence in one’s skills to perform the task. This definition is consistent with accepted definitions of self-efficacy as learner judgments about ability to successfully achieve educational goals (Elias & MacDonald, 2007). The self-efficacy for learning and performance subscale of the MSLQ has been widely used in efficacy research (see Honicke & Broadbent, 2016). An example question is ‘I believe I will receive an excellent grade in this class’. The scale was found to have an excellent level of internal consistency ($\alpha$=.93), with higher scores indicating greater levels of ASE.

**Goal Orientation.**

**Mastery goal orientation.** Four questions from the intrinsic goal orientation subscale of the value component of the motivational scale of the MSLQ. Intrinsic goal orientation concerns the degree to which the one perceives one’s self to be participating in a task for reasons such as challenge, curiosity, and mastery. Having this orientation means that the one participates in the task as an end in itself. This is congruent with the definition of mastery goal orientation provided by prominent researchers in goal theory (Pintrich, 2000a). An example question is ‘The most
satisfying thing for me in this course is trying to understand the content as thoroughly as possible’. The scale was found to have an acceptable level of internal consistency (α=.70), with higher scores indicating greater levels of mastery goal orientation.

Performance goal orientation. Four questions from the extrinsic goal orientation subscale of the value component of the motivational scale of the MSLQ. Extrinsic goal orientation complements intrinsic goal orientation, and concerns the degree to which the one perceived one’s self to be participating in a task for reasons such as grades, reward, performance, evaluation by others, and competition. This is congruent with the definition of performance goal orientation provided by prominent researchers in goal theory (Pintrich, 2000a). An example question is ‘If I can, I want to get better grades in this class than most of the other students’. The scale was found to have an acceptable level of internal consistency (α=.71), with higher scores indicating greater levels of performance goal orientation.

Academic Achievement. Academic achievement was measured by the official final grade for a subject taken from University records. Grade included all the assessments for the specified subject and was scaled from 0 to a maximum of 100, with higher scores reflecting better achievement. Even within the same subject, students may have markedly different learning experiences due to exposure to different tutors and lecturers, particularly if the subject is spread across multiple campuses and study modes (as is most often the case for the authors’ university). For these reasons, we expect that this operationalization, in which the current study allowed students to specify the subject, would still provide sufficient variability in scores to meaningfully test modelled associations. Impact of this choice are discussed further in the Results section.

Procedures
The University Ethics Committee approved this study. Students were recruited through Facebook, in lectures, through word of mouth, and flyers placed on university noticeboards and on subject homepages of the university’s Learning Management System (LMS). Participants read the plain language statement and gave informed consent before completing the questionnaire. Whilst completing the survey, participants were instructed to answer the questions in relation to a specific semester based subject currently being completed. Recruitment was conducted over four semesters from April 2014 until October 2015. Students could participate anytime during the semester before final grades were released. Completion of the survey took approximately 30 minutes. Participants granted permission for the research team to access official grades at the end of the trimester and were offered the chance to win one of two gift vouchers as an incentive to participate.

Results

Preliminary data cleaning and assumptions testing

The final sample consisted of 478 participants, after removing 73 participants due to either duplicated data, high percentages of missing data, or completing a course outside of the undergraduate suite of courses. Following deletion of these data, missing value analysis revealed no remaining missing data. Key assumptions of the General Linear Model were met following removal of 14 influential univariate outliers, after analysis of Cook’s distance revealed these cases had a value greater than 1 (Field, 2013). Additionally, leverage statistics identified four influential multivariate cases, which were also removed from the dataset.

Descriptive statistics

Means, standard deviations, score range, and zero-order bivariate correlations for ASE, mastery goal orientation, performance goal orientation, and academic
achievement are presented in Table 1. On average, participants reported moderate to high scores on all scales. Mean academic achievement was also observed at a moderate to high level, with large variability in the range of scores for this variable.

**Correlation analysis**

The mean, standard deviation, range and correlation analysis are presented in Table 1. The range of scores on all measure indicates that despite allowing participants to specify the chosen subject, there is sufficient variability in scores to suggest that range restriction is not a problem in the present sample. The correlation analysis indicates significant positive correlations among all included variables. A moderate positive correlation was found between ASE and academic achievement ($r = .27, p < .01$), which indicates those with higher levels of ASE also had high levels of academic achievement. Of the other significant correlations, the strongest observed relationship existed between mastery-approach goal orientation and ASE ($r = .50, p < .01$), indicating that individuals that displayed high ASE were also more likely to have adopted high mastery approach goal orientation.
Table 1

*Mean Scores, Standard Deviations, Range and Correlation matrix of Predictor and Outcome Variables*

<table>
<thead>
<tr>
<th></th>
<th>M</th>
<th>SD</th>
<th>Min</th>
<th>Max</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
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</table>
| 1 | Academic achievement  
 a | 73.39 | 10.43 | 39 | 95 | 1   |     |     |     |
| 2 | Academic Self-Efficacy  
 b | 5.27  | 1.02  | 1.88 | 7  | .27** | 1   |     |     |
| 3 | Performance Goal Orientation  
 b | 5.5   | 1.04  | 2   | 7  | .16** | .32** | 1   |     |
| 4 | Mastery Goal Orientation  
 b | 5.07  | 0.99  | 2.25 | 7  | .12*  | .50** | .25** | 1   |

*Note.* **p < .01 (2-tailed); *p < .05 (2-tailed); a possible range of academic achievement = 1-100; b possible range on academic self-efficacy, mastery goal orientation, and performance goal orientation scales= 1-7.
Mediation and Moderation analysis

Mediation and moderation analysis was conducted using the SPSS plug-in Process (Hayes, 2013). For both types of analysis, several covariates were used to control for potential effects of these on the target and outcome variables, which have been identified as influential in the extant literature. These included age and gender (Richardson et al., 2012), study mode (on campus or online; Broadbent & Poon, 2015; Broadbent, 2017) and student year level (due to the disproportionate amount of first year students included in the study).

*Fig 1*: Mediation pathway model for the indirect effect of mastery GO on academic achievement via academic self-efficacy.
The mediating pathway model (Figure 1) for the indirect effect of mastery–approach GO and achievement via ASE was significant, $a*b = .39$, BCa 95% CI [0.26, 0.57]. Further, when controlling for the influence of ASE on academic achievement, the relationship between mastery-approach goal orientation and academic achievement dropped to non-significance, $b = -.07$, $t(471) = -0.51$, $p = .62$.

**Fig 2**: Mediation pathway model for the indirect effect of performance GO on academic achievement via academic self-efficacy

The pathway model, which tested the hypothesis that ASE would mediate the relationship between performance-approach GO and achievement is shown in Figure 2. This mediating pathway was also significant though weaker than the effect for
mastery-approach GO, \( a\times b = .19 \), BCa 95% CI [0.11, 0.31]. When controlling for the influence of ASE on academic achievement, the relationship between performance-approach goal orientation and academic achievement dropped to non-significance, \( b = .19, t(471) = 1.64, p = .10 \).

Results of the moderation analysis indicated no significant moderating relationship between these variables. Performance-approach goal orientation and ASE made a significant combined contribution, accounting for 22 percent of the variance in academic achievement, \( R^2 = .35 \) (adj. \( R^2 = .12 \)), \( F(7, 470) = 7.95, p<.001 \). However, the additional variance accounted for the interaction term did not significantly differ from zero, \( \Delta R^2 = .003 \), \( F(1, 470) = .997, p = .32 \). In this model only ASE (\( b = .31, t(470) = 5.16, p < .001 \)) made a significant unique contribution to predicting academic achievement.

**Discussion**

Although Pintrich’s (2004) self-regulated learning (SRL) model proposes cognitive, behavioural, contextual, and motivational variables as being influential for academic performance, subsequent meta-analytic findings suggest that motivational factors may be the most important of these contributors (Richardson et al., 2012). The present study explored this motivational component of the SRL model in greater detail by evaluating how two key aspects of motivation (goal orientation and self-efficacy) may inter-relate to predict academic performance within a higher education setting. As detailed below, findings support the mediating effect of ASE on goal orientation-achievement relationships but offer limited support for ASE as a moderator of this relationship.
ASE as a mediator between goal orientation subtypes and academic achievement

In the present study, ASE mediated relationships between both: (i) mastery-approach goal orientation and academic achievement, and (ii) performance-approach goal orientation and academic achievement. These findings extend earlier work showing cross-sectional associations between these variables (Coutinho & Newman, 2008; Phan, 2010). However, when the present mediation effects were considered jointly with the pattern of bivariate associations, it is clear both ASE and achievement linked more strongly to mastery-approach than performance-approach goal orientation. This is further supported by recent research findings (Huang, 2016; Soric et al., 2017).

The stronger results for mastery than performance-approach goal orientation predicting achievement makes sense in light of prior findings. This demonstrates that individuals with mastery-approach goal orientation are more likely to persist in adversity, see intrinsic value in learning, and employ deep learning strategies (Diseth, 2011; Senko & Tropiano, 2016). Hence these individuals may be more likely to achieve a good grade than performance-approach focused individuals, who are characterised as challenge-evading and less persistent in adverse learning situations (Friedal et al., 2007). The finding that mastery-approach goal orientation has a stronger link than performance-approach to ASE may thus indicate that stronger ASE development occurs from understanding how to achieve a desired goal rather than the actual attainment of that goal. Indeed, individuals with higher mastery-approach GO appear better able to generalize learnt skills across various cognitive tasks than individuals focusing purely on result attainment, which can be attributed to the enhanced use of deep learning strategies, which assist in skill acquisition that can be applied in a range of academic situations (Phan, 2010).
The goal-oriented approach students take to study – and their resultant self-efficacy – may also relate to their academic identity. Recent findings suggest that one’s identity influences how they approach their studies (Rodriguez, 2009; Vogel & Human-Fogel, 2018). Academic identities associated with normative commitment to others’ academic values (such as performance GO) may result in academic underperformance because of the lack of self-regulated skills and use of suboptimal learning strategies to the detriment of the individual (Hejazi, 2012). Further, students pursuing performance-approach goals tend to believe that those who have high ability do not need to work hard, and that having to work hard implies that one is not very gifted (Komarraju & Dial, 2014). On this basis, the belief system that forms the academic identity of individuals with performance GO may discourage them from engaging in the level of study necessary to achieve their goals. Further research should incorporate some measure of identity to evaluate the extent to which it helps to shape and enact performance vs mastery goal orientation in pursuit of academic outcomes. Broader considerations may also be given to how academic self-efficacy and academic identity fit with global self-efficacy and overall identity constructs. Students who underperform may deprioritize academics in their overall identity in order to protect themselves, whereas those who attain mastery of learning strategies may more strongly (and possibly over-) represent academic performance in their sense of self-worth and identity.

**ASE as a moderator between performance-approach goal orientation and academic achievement**

Research by Elliot and Dweck (1998) and Smiley and Dweck (1994) propose that learners who adopt performance GO with low ASE produce behaviours characteristic of learned helplessness, and those with high ASE persist during learning
tasks and maintain positive affect. Such findings provide the basis for investigating a moderating influence of ASE on the relationship between performance GO and achievement, whereby those with performance GO, and high level of ASE would experience greater academic success than those with low levels of ASE. Although the interaction term in the present study was in this proposed direction, the effect was both non-significant and of small magnitude. Whereas Cho et al. (2011) – who also failed to find a significant moderation effect – dichotomised performance goal orientation, retention of this construct in continuous form for the present study did not lead to a significant result.

Given the high level of ASE for the sample as a whole, it is possible that the null result in the present study is at least partially attributable to range restriction. That is, if the majority of participants had adequate levels of ASE, the moderating effect would be constant due to lack of a comparison group (i.e., those with low ASE) to demonstrate the interaction effect. It is also likely that a student who is more academically successful, and has higher levels of ASE may be more inclined to participate in a study of this type, when afforded the opportunity.

Interestingly, many of the studies that have shown moderating effects of ASE on the GO-achievement relationship have been found under experimental conditions in which GO and ASE are measured immediately before measuring performance on the task. This proximity between predictor and outcome, as well as a focus on measuring ASE and GO in relation to the task in question, may promote stronger effects. Indeed, given the temporal gap between ASE, GO, and achievement measurements in the present study, it is possible that levels of ASE changed in the intervening period, and that levels of ASE closer to the performance appraisal may have led to enhanced prediction. Several prior studies have shown a higher
association the closer ASE is measured to tasks that evaluate academic achievement (Gaylon et al., 2012; Gore, 2006). Further research is needed to explore the impacts of temporal interval and general versus task-specific ASE and GO on relations to achievement.

**Limitations**

Present findings have several design limitations. First, the cross-sectional design precludes causal inference despite establishing an important condition for causality, namely, covariation between predictor and outcome measures. In the context of the mediation models, it is possible that ASE instead or as well predicts GO, which, in turn, predicts achievement. Similarly, an individual’s academic performance may have a feedback loop such that how an individual performs on earlier tasks may influence their ASE and, consequently, the level of effort and subsequent achievement in future tasks. Given that many college and university subjects have multiple assessment tasks, it is surprising that few studies have explored these effects longitudinally to: (i) tease apart temporal precedence, and (ii) evaluate these potential feedback loops. It appears that current research is beginning to investigate such relationships (Wilson & Narayan, 2016), however, this has not been extensively studied.

Furthermore, the present study does not take account of the cultural diversity that is likely to exist in higher education. This is particularly important given research has reported differences in levels of SE among collectivist and individualist cultures (Kim & Park, 2006), coupled with the literature’s already strong understanding of characteristics of white, educated, industrialised, rich and democratic (WEIRD) populations in higher education. These fundamental differences in levels of motivation have not been accounted for in the present study and it is difficult to
measure the impact that this may have had on the findings as a result. Further research of the effects of culture on relations between achievement goals and SE is recommended, and has been acknowledged in recent literature (Huang, 2016).

Finally, the present study chose to focus in more detail on the motivational component of the SRL model, given gaps in this literature and that the motivational aspect has been shown previously to be the strongest predictor of performance (Richardson et al., 2012). Even so, this means that other potentially relevant constructs were omitted from modelling. This raises the possibility that several of the present effects are over-estimated due to not controlling for these alternate influences. Present findings suggest ASE is relevant for both mastery and performance GO (though not in terms of moderation), and that these should be included in future studies attempting to more comprehensively evaluate the SRL model.

**Conclusion and Future Directions**

The current study extends literature on the effect of motivational factors on academic performance by evaluating moderating and mediating relationships involving two key motivational factors (self-efficacy and goal orientation). The study reduces some of the gaps in the literature by first, testing mediation of the performance GO-academic performance relationship by ASE, which has not been previously done. Second, the inconsistent findings for the relationship between performance GO and academic performance may hint at moderating effects that suggest context is important for this relationship. As the mixed findings for this proposed moderation effect by ASE may be due to dichotomization of the GO variable, the current study utilised a continuous form of the GO construct. Finally, the current study evaluated performance using ecologically valid measurement of academic grades, rather than within the context of specific, lab-based tasks.
Present findings show that academic self-efficacy is a stronger mediator of the relationship between mastery GO and academic performance than for performance GO and academic outcome. We speculate that this may relate to avoidance strategies employed by performance focused individuals once they encounter a challenge, and may also relate to unrealistic expectations they have as part of an extrinsically driven performance identity. Further testing is needed, preferably with longitudinal designs, to disentangle direction of effects and to ascertain whether there is evidence for causal relations among these constructs.

The failure to find a moderating effect of self-efficacy on the performance GO-academic outcome relationship is consistent with several prior findings, even though we adopted a continuous form of the GO variable and explored in relation to academic performance in an enrolled subject rather than discrete, lab-based tasks. The lack of significance in this moderating influence may be due to significant temporal gaps in which ASE, GO and achievement are measured. If measures of ASE and GO are taken early in the student semester and testing in a moderating relationship with academic achievement, measured at the end of the academic semester, this may influence capacity to observe the moderating effect.

The mediation findings have implications for tertiary educators and administrators involved in the development and implementation of student courses and effective intervention programs. Specifically, teaching programs should promote learning environments that encourage persistence when engaged in learning, and consider how the delivery of course material and feedback can result in increased levels of academic self-efficacy, regardless of the reason for participating in learning. The current findings suggest that such considerations appear beneficial to student academic achievement, regardless of the adopted goal orientation. Additionally, when
applying these findings in a practical context, intervention strategies and programs are particularly important when considering students in higher education contexts, who are likely to benefit more from such interventions as a result of the higher levels of autonomy and enhanced application of SRL strategies associated with this level of education (Peverly, Brobst, Graham, & Shaw, 2003; Zimmermann, 1998).

In sum, the present results suggest that the adoption of either mastery or performance GO facets, coupled with self-efficacious beliefs about an individuals ability to perform academically can result in positive achievement outcomes. Regardless of the adopted GO, attempts to enhance ASE should be made, as this is likely to increase student academic achievement.

Acknowledgements: This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Compliance with Ethical Standards: The authors declare that they have no conflict of interest. The University Ethics Committee approved this study, and all participants provided informed consent.

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