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### Employment and first-year college achievement: the role of self-regulation and motivation

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## **Employment and first-year college achievement: the role of self-regulation and motivation**

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Students often work in order to meet monetary requirements for college. However, employment reduces the time students can devote to their studies, which can hinder performance. This study examined whether motivation (self-efficacy goal orientation) and self-regulated learning (help-seeking, metacognitive self-regulation, time management and effort regulation) are related to potential achievement differences between employed and unemployed students, and whether reduction in hours worked over time translates to better performance. A total of 591 US first-year college students completed surveys at the beginning of their first semester and 243 completed a similar survey at the end of the term. Work status and student grade point average (GPA) were also obtained. Results revealed that the number of hours worked was negatively associated with performance, and reducing the number of hours worked over the first year was associated with increased academic performance. Working students who were able to maintain a high GPA had stronger time management skills and effort regulation compared to working students receiving lower grades. Finally, numerous aspects of motivation and self-regulation declined in students over the first semester suggesting the need for universities to offer programmes to help all students maintain healthy motivational profiles.

**Keywords:** self-regulation; motivation; employment; achievement

The Bureau of Labor Statistics (2009) reports that 76% of part-time and 39% of full-time college students are employed. Riggert et al. (2006) suggest that the growing employment rate among undergraduates indicates that students are increasingly forced to work in order to meet the monetary requirements for college. In fact, Riggert et al. (2006) suggest that universities can no longer expect that students will devote their full attention to meeting academic demands. With such a large number of college students who work, it is important to examine the strategies that students use to cope with the

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potentially competing demands of work and school. Existing research regarding employment among undergraduate students suggests that time spent on paid employment can hinder (Furr and Elling 2000) or promote (Bradley 2006) academic achievement. With evidence suggesting that employment can have both positive and negative impacts on achievement, it is necessary to reconcile these differences with additional research that explores potential mediating and moderating variables linking work status and academic achievement among college students. The purpose of the present study was to examine the role that self-regulation and motivation may play in predicting achievement among working and non-working students, as well as the patterns of motivation and self-regulation within working students who are doing well in college.

Self-regulation and motivation are important components related to adjustment in college (Garcia-Ross, Perez-Gonzalez, and Hinojosa 2004; Zimmerman and Schunk 2008). Zimmerman (2008) suggests that self-regulated learning is the cyclic interaction of behaviours, cognitions and motivations that enhance learning. For instance, a student who has the motivation to excel but lacks the proper self-regulatory skills required for achievement will probably not meet his/her goals. A first-year student who has just been introduced to the new social and academic college environment may struggle to manage time efficiently and find it difficult to plan and organise tasks. This may be even more difficult for employed students who must work in addition to attending classes (Hawkins et al. 2005). In this scenario, poor grades may be the result of low self-regulation rather than low ability. With systematic training and guidance, students can acquire the self-regulatory skills that are important for academic success (Zimmerman 2008).

### **Work–school conflict**

Getting good grades in college takes considerable time and effort (Britton and Tesser 1991; Garcia-Ross, Perez-Gonzalez, and Hinojosa 2004; Lahmers and Zulauf 2000) and many researchers have linked greater hours worked in external employment with lower student achievement (Furr and Elling 2000; Hawkins et al. 2005; Hood, Craig, and Ferguson 1992; Markel and Frone 1998; Ruscoe, Morgan, and Peebles 1996; Salamonson and Andrew 2006). More specifically, the more hours a student works, the less time he or she has for studying, social activities and recreation (Manthei and Gilmore 2005). Lahmers and Zulauf (2000) studied the relationship between study time and academic achievement in college students and concluded that studying one additional hour per week increased students' grade point averages (GPAs) by 0.025 of a point. This suggests that a significant increase in time must be put into academics in order to see a distinct increase in GPA, not just a few extra hours a week. However, full- or part-time work in addition to school may make it difficult for employed students to significantly

increase their study time (Hammer, Grisby, and Woods 1998). For example, if students are faced with a financial obligation (e.g. rent, bills) that requires them to work while they are in school, they may find it difficult to allocate enough time to study. Disregarding the actual number of hours worked, one study found that the perceived amount of interference of work with school also had negative associations with GPA (Hawkins et al. 2005).

Robotham (2009) notes that although student employment has mostly been examined in North America, international research regarding links between employment and achievement has emerged. For example, Robotham (2009) found that undergraduate college students in the UK typically work as customer service employees (e.g. retailing, hotels, bars) and suggested that college students generally lack the specific skills required to work in higher level, specialised settings related to their academic majors. Although many of the students reported positive benefits to working (e.g. communication skills and time management), negative outcomes (e.g. problems concentrating due to being tired, less time to devote to studying) were more frequently cited. Additionally, Wang et al. (2010) investigated how employment impacted college students' academic performance in a public university in Macau. Results showed that work status by itself was not predictive of academic achievement, however, other aspects of work, such as reasons for working, hours worked and relevance of work experience were found to significantly influence achievement. Specifically, the number of hours worked to gain experience and develop skills and knowledge was associated with higher GPAs, while number of hours worked out of boredom was associated with decreased GPAs. Based on these studies, it can be assumed that although the time invested in employment may conflict with the time that is needed for being academically successful, employment may not interfere with achievement if students have the necessary preconditions such as high academic motivation (e.g. the type of work is intrinsically valuable to the student), that are associated with students' ability to balance work and study.

Clearly, one important aspect to consider in the working student is the number of hours worked. Specifically, Manthei and Gilmore (2005) conducted a survey of 83 British undergraduate students to examine perceptions of how employment impacted their academic life. Most of the students reported that if the number of working hours is manageable (generally speaking, 15 h or less a week), employment is considered to increase the student's organisational skills and future employability. Additionally, Salamonson and Andrew (2006) found that nursing students who worked more than 16 h per week were negatively impacted in terms of academic performance. Employment can also influence cognitive skills such as comprehension, math skills and critical thinking skills. Specifically, Pascarella et al. (1994) found that students who work less than 10 h a week showed no

significant differences in cognitive skills. However, if students worked more than 10 h a week, the only skill that decreased over time was reading comprehension – critical thinking and math skills remained at the same level. Although the studies reviewed above take into account the number of hours worked, there is no research to our knowledge that has examined how change in hours worked across time may impact student achievement. The specific decisions students make in terms of changing their number of hours worked to fit their needs, and how this may be related to academic achievement has not been addressed. Therefore, in addition to examining number of hours worked, the present study also examines how changes in the number of hours worked across the first semester relate to student achievement.

### **Self-regulation and motivational beliefs**

Riggert et al. (2006) suggest that researchers have not based their studies regarding student employment and achievement on strong theoretical frameworks. The present study uses self-regulated learning (Zimmerman 2008) as a theoretical framework for understanding the nature of achievement in working students. Why are some working students able to maintain high levels of academic achievement while others do not? Although prior research has identified factors such as work load (Salamonson and Andrew 2006) and reason for work (Ruscoe, Morgan, and Peebles 1996; Wang et al. 2010) as important for achievement in working students, it is not clear what specific cognitive and behavioural processes are involved. Therefore, the present study sought to identify the self-regulatory and motivational factors that impact the relationship between employment and academic achievement in first-year college students. Understanding such processes may help in lessening the potential negative academic consequences of employment on students.

Self-regulation refers to how a student regulates his/her motivational beliefs and behaviours to enhance learning (Zimmerman 2008). Self-regulation is multidimensional and includes several aspects that influence one another (Zimmerman 2008). For example, self-regulated students show positive motivational beliefs, such as self-efficacy, and set appropriate learning goals. Having such beliefs would likely motivate the student to engage in activities and behaviours such as planning and time management that would most effectively promote learning. As a result, motivational beliefs are typically viewed as factors that facilitate self-regulated behaviour. Research suggests that students who are self-regulated tend to develop study skills earlier and have increased levels of self-efficacy as compared to students who are not as self-regulated (Kitsantas 2002; Zimmerman and Kitsantas 1997). However, research regarding freshman student learning shows that students often experience a decreased sense of efficacy over time which leads to ineffective use of learning strategies across their first year of college (Pajares 2008). In fact, first-time freshmen students tend to experience a high

attrition rate (i.e. 23% reported by the National Center for Higher Education Management Systems (2012)) that can partially be explained by study skills, self-regulation and motivation deficiencies, prompting many universities to establish first-year seminars or study skills courses (Young and Ley 2005). Thus, one of the main goals of the present study was to examine the trajectory of self-regulated learning processes in the first semester and to see whether employment relates to that trajectory. Specifically, this study examined four motivational variables: self-efficacy and three variations of goal orientation (mastery, performance-approach and performance-avoidance), and four self-regulatory processes including metacognitive self-regulation, effort regulation, time management and help-seeking.

### *Self-efficacy*

Self-efficacy is a context-specific and multidimensional construct that refers to the degree to which students believe that they are capable of successfully accomplishing a task (Bandura 1997). There is strong evidence that self-efficacy is a key belief that influences students' effort and persistence in completing tasks (Shell and Husman 2008) and use of effective self-regulatory learning strategies (Bandura 1997). Indeed, self-efficacy plays an important role in academic performance (Chemers, Hu, and Garcia 2001; Robbins et al. 2004). For example, in a meta-analysis of 109 studies, Robbins et al. (2004) found that out of nine constructs, academic self-efficacy was the strongest predictor of GPA. Similarly, in another meta-analysis, Multon, Brown, and Lent (1991) found that academic accomplishments significantly and positively correlate with positive self-efficacy beliefs.

Self-efficacy, combined with student goals, may together play an important role in academic performance. Hull-Banks et al. (2005) found that students who had strong, well-defined career goals and who were more efficacious were more likely to persist and achieve higher than students who had ambiguous goals and who were less efficacious. However, research also shows that self-efficacy of freshmen students generally declines across the first year of college (Pajares 2008). It is unclear, though, whether self-efficacy declines over time more for employed students than for unemployed students.

### *Goal orientation*

Goal orientation refers to the reasons why students choose to achieve. Of interest for the present study are three types of goal orientations: mastery, performance-approach and performance-avoidance. Research has generally found that mastery goal orientation (defined as the student's desire to increase one's understanding or competence in a given area) is related to greater motivation (Ames 1992), higher levels of self-efficacy (Pintrich 2000) and

academic performance (Meece and Holt 1993). Ames (1992) provides evidence that having a mastery goal orientation promotes positive self-perceptions and increases the student's likelihood of utilising self-regulatory strategies. Students who are more performance-oriented are either focused on doing better than their peers (performance-approach, defined as the student's primary goal being demonstrating competence relative to others), or not appearing incompetent and being evaluated negatively in public (performance avoidance, defined as the student's primary goal being to avoid negative evaluations from others), typically show more negative outcomes, such as lower academic performance (Pintrich 2000).

Recent research has found that goal orientation may influence the relationship between workload and frustration (Whinghter et al. 2008). Specifically, Whinghter et al. (2008) found that students who were more performance-avoidance oriented were more likely to be frustrated with course and research assistant demands while students who were more mastery-oriented were less frustrated. In fact, students who were highly mastery-oriented tended to perceive the workload as beneficial and even sought additional work. The conceptualisation of workload frustration in the Whinghter et al. (2008) study is similar to balancing the demands of both school and work in this present study. Therefore, there may be a moderating relationship between goal orientation, work and academic achievement, where relations between achievement and workload may vary across different types of goal orientation. For example, if a working student is more mastery-oriented, he/she may achieve higher and be more motivated to face the challenges of balancing employment and school responsibilities than a working student who is more performance oriented.

Zimmerman (2008) suggests that goal orientation and self-efficacy play critical roles in motivating students to become proactive in their own learning process. Specifically, students with higher levels of efficacy and more adaptive achievement goals are more likely to engage in effective learning behaviours such as metacognition (e.g. the ability to think about one's own cognitions while learning), time management (e.g. effectively managing study time), help-seeking (e.g. the ability to recognise when help is needed and ask the appropriate person(s) and effort regulation (e.g. the ability to persist in successfully finishing uninteresting tasks). In contrast, students who are not as motivated tend to resort to less effective learning strategies, such as memorisation and rehearsal.

### ***Metacognitive self-regulation***

Pintrich et al. (1993) define metacognitive self-regulation as a combination of three processes: planning, monitoring and regulating. For example, students who are metacognitively self-regulated would set adaptive goals, engage in various learning strategies to facilitate understanding and learning

and be cognizant of how effective the strategies are at supporting their learning. Metacognition is positively associated with achievement (Kornell and Metcalfe 2006; Shivpuri et al. 2006) and has been found to support effective learning (Kornell and Metcalfe 2006). Kornell and Metcalfe (2006) found that college students who use metacognitive learning strategies: (a) identify the materials that need to be studied and learned; (b) organise the materials from least to most difficult and (c) begin studying simple concepts that are easy to learn and then slowly work up to more difficult problems. This allows students to learn most efficiently in the least amount of time. Therefore, the ability to metacognitively self-regulate may have important implications for performance in working students, especially since researchers find that students' main complaint in college is a lack of time to complete all of their assigned work (Garcia-Ross, Perez-Gonzalez, and Hinojosa 2004).

### *Time management*

Time management refers to how effectively the student structures his/her time to successfully accomplish certain goals (Pintrich et al. 1993). Specifically, time management components as described by Pintrich et al. (1993) include effectively scheduling, planning and managing one's study time. Additionally, students who are effective at managing time tend to study in an environment free of distractions. Prior research confirms that the ability to manage time is positively related to academic achievement (Kitsantas, Winsler, and Huie 2008; Landrum, Turrisi, and Brandel 2006). Kitsantas, Winsler, and Huie (2008) examined several motivation and self-regulation variables and their ability to predict academic achievement in college students and found that time management was the strongest predictor of academic performance. Additionally, Landrum, Turrisi, and Brandel (2006) found that students who earned mainly As and Bs used more efficient time management and study strategies than those earning Cs and Ds. Nonis, Phil-hours, and Hudson (2006) showed that differences in achievement among students who work may be related to time management. Being able to manage time is an important skill for working students to possess, given that working has an adverse effect on academics (Curtis and Shani 2002). However, devoting more time to academics may not be sufficient, and working students may not have enough additional time to apply to studying. Therefore, it is important to examine different strategies that working students may use to cope with the limited amount of time to study.

### *Help-seeking*

When students come across problems in understanding content while studying, an important strategy to engage in is help-seeking. Help-seeking involves the ability to recognise when help is needed and request assistance

from those who can help, whether peers or teachers (Newman 2008). Help-seeking is an adaptive social process of self-regulation in that the act of seeking help typically involves interacting with other people (Newman 2008). Although help-seeking is an important component of achievement (Karabenick 2003), Newman (2008) suggests that students often fail to take the initiative to do so, mainly because they are afraid to be perceived as incompetent by their classmates. Research suggests that students who are not afraid to seek help in large college classes are more likely to have mastery-oriented goals, use more adaptive learning strategies, be more motivated and achieve higher than students who are afraid to seek help (Karabenick 2003). It is especially important for employed college students to seek help when needed because students who do not seek help are likely to use lower level processing strategies such as memorisation (Karabenick 2003). Engaging in such strategies takes more time and is less effective for students as they try to understand and learn the material.

### *Effort regulation*

Effort regulation refers to how students persist in completing uninteresting or difficult tasks (Pintrich et al. 1993). Research examining effort regulation has found that it is a significant predictor of academic achievement for both freshmen students and students enrolled in upper level, more difficult college courses (Lynch 2008), and that it differentiates between high- vs. low-achieving students (Langley et al. 2004). Effort regulation is also related to self-efficacy, (Schunk, Pintrich, and Meece 2008) where higher efficacy will likely result in higher effort regulation. In addition to efficacy beliefs, goal orientation is also related to how much effort a student will exert on a task (Schunk, Pintrich, and Meece 2008). For example, a student who is more mastery-oriented is more likely to use deep processing strategies such as metacognitive self-regulation, not hesitate to seek help when needed and attempt to manage time and the environment more effectively than a student who is more performance oriented.

In summary, motivational beliefs interact with contextual, behavioural, and cognitive variables to influence the self-regulatory processes in which one engages (Pintrich 2000; Schunk 2005). Therefore, motivational beliefs are closely and cyclically linked to self-regulatory processes (Zimmerman 2008). A primary goal of the present study was to examine how these factors can work to differentiate working and non-working students. Previous research reveals mixed findings on the effects of employment on achievement (Riggert et al. 2006) and little has been done in terms of exploring how the number of work hours may influence achievement in employed students over time (Manthei and Gilmore 2005). However, no research to our knowledge has examined how social cognitive processes (e.g. motivation and self-regulation) may work to explain differences in achievement among

working students, as well as how changes in work schedules over time may relate to achievement. Considering the high number of currently employed college students, it is critical to examine factors that may mitigate the effects of employment on achievement.

### **The present study**

The present study adds to the literature in several ways. First, we examined a number of variables (academic self-efficacy, goal orientation, help-seeking, time management, effort regulation and metacognitive self-regulation) that may play a role in determining the academic outcomes of working students. Second, we examined relations between work status and academic performance, and the role of these motivation and self-regulated learning variables longitudinally over the course of the first semester in college. Third, we examined whether changes over time in student working hours are associated with changes in academic performance, a longitudinal analysis not found in the literature to date. Overall, the aim of the present study was to investigate how self-regulation and motivation variables influence the relationship between employment and achievement, and how this relationship may change over time. In order to investigate these relationships, we first examined the motivation, self-regulation and achievement differences between employed and unemployed students. Following, we focused the analyses on motivation, self-regulation and achievement patterns across time with employed students only. Finally, we investigated how changes in student work patterns are related to motivation and self-regulation. As a result, a total of six research questions were formulated:

- (1) Is student employment in the first year of college associated with poor academic performance, both in terms of comparing working students to non-working students, and examining relations between number of hours worked and college performance? We hypothesised that working students would earn significantly lower GPAs than non-working students, and that the number of hours worked would be significantly and negatively related to academic achievement. Additionally, this performance difference between working and non-working students would be partially explained by employed students having weaker motivation and self-regulatory strategies than unemployed students.
- (2) To what extent are employed students different from non-working students on self-regulated learning and motivation from the beginning to the end of the first semester in college? It was hypothesised that both employed and unemployed students would experience a decrease in self-regulation and motivation over the first year, with employed students experiencing a greater decrease than unemployed students.

- (3) Are relations between motivation and academic performance different for working students than for non-working students?
- (4) Are there differences in motivation and self-regulation between employed students doing well academically and those who are not performing as well? It was hypothesised that employed students who were doing well academically would report more adaptive patterns of self-regulation and motivation than low-achieving employed students.
- (5) Are there corresponding changes in student GPA over time for students who change (increase or decrease) the number of hours they work over their first year in college? It was hypothesised that students who increased the number of hours worked over the first semester would have lower GPAs than students who decreased their number of hours worked over time.
- (6) Are students who increase or decrease the number of hours that they work over time different in terms of motivation and self-regulation? It was hypothesised that students who decreased their number of hours worked would show higher levels of self-regulation and motivation than students who increased their hours worked over time.

## Method

### *Participants*

First-year students ( $n=591$ ) at a large and ethnically diverse mid-Atlantic state university participated in this research by completing questionnaires. Students were recruited through courses that enroll many first-year students (University 100/Freshmen Study Skills Classes, Psychology 100, Communication 100, and/or Biology 103) and students in some of these courses received extra credit for completing the survey. The median age of the participants was 18.9 years, 62% of the sample was female and self-reported race/ethnicity was 62% White, 7% Black, 5% Hispanic, 17% Asian, and 9% Other/Mixed. Although all students were in their first semester on-campus, 8% had transferred from another institution and had a semester or two experience at another (typically community) college. Eighty-eight percent of the sample was born in the USA and 79% reported English as their first language. Approximately 61% of the students resided in a campus dorm, 32% stayed at home and 7% lived independently off-campus. Average Scholastic Aptitude Test (SAT) scores were 546 ( $SD=0.37$ ) for math and 530 ( $SD=3.63$ ) for Verbal. Average American College Test scores for the sample was 22.3 ( $SD=3.6$ ), and high school GPA was 3.27 ( $SD=0.37$ ).

Questionnaires were completed across two different time periods. Participants ( $n=591$ ) were surveyed in the first two-three weeks of their first semester ( $T1$  – Fall) and the second survey ( $T2$  – Fall) was administered

12–16 weeks later, near the end of the same first semester ( $n=243$ ). Fall ( $T1$  and  $T2$ ) surveys were distributed in the courses in which students were recruited. As seen in the sample sizes reported above, there was attrition in that not all students were reachable or chose to complete the survey at the end of the semester. Students who completed the survey at  $T2$ , compared to those who did not, had higher effort regulation at  $T1$  ( $M=4.96$ ,  $SD=1.13$ ;  $M=4.71$ ,  $SD=1.05$ ;  $t(585)=2.68$ ,  $p<0.01$ ), managed their time more efficiently ( $M=5.04$ ,  $SD=0.90$ ;  $M=4.87$ ,  $SD=0.89$ ;  $t(585)=2.29$ ,  $p<0.05$ ) and worked less hours ( $M=4.83$ ,  $SD=6.59$ ;  $M=6.82$ ,  $SD=7.74$ ;  $t(580)=3.24$ ,  $p<0.001$ ), respectively. Additionally, students who completed the survey at  $T2$  had higher overall SAT scores ( $M=1112.36$ ,  $SD=4.19$ ;  $M=1083.64$ ,  $SD=112.21$ ;  $t(452)=2.21$ ,  $p<0.05$ ), and achieved a higher high school GPA ( $M=3.37$ ,  $SD=0.38$ ;  $M=3.23$ ,  $SD=0.38$ ;  $t(538)=4.52$ ,  $p<0.001$ ) than those who did not. See Table 1 for descriptive statistics on for (a) all those who completed the  $T1$  survey, (b) those who participated during only  $T1$  and c) those who participated during both  $T1$  and  $T2$ . Intercorrelations between the variables are also provided in Table 1.

## **Variables**

### *Employment status*

Students reported at each time point whether or not they were working for pay, and this created a dichotomous (yes/no) indicator of working status at each time point. Also, students were asked to report the number of hours worked per week at each time point. At the beginning of the semester, 302 (54%) students were employed and they worked on average 16.5 h a week ( $SD=9.5$ ). Of the 302 working students, 210 (70%) reported that they were working off-campus while 58 (19%) reported working on-campus (34 students did not report whether their work was on or off-campus). At the end of the semester ( $T2$ ), 79 (33%) students were employed and worked on average 15.25 h a week ( $SD=8.61$ ). Change in work status variables over time were created on the basis of the above. Working students were classified into groups based on whether they had reduced their work hours or quit their job altogether from  $T1$  to  $T2$  ( $n=66$ ), or whether student work hours stayed the same or increased from  $T1$  to  $T2$  ( $n=61$ ).

### *Motivated strategies for learning questionnaire (MSLQ)*

The MSLQ developed by Pintrich et al. (1993), is a widely used measure of student self-regulated learning (Kitsantas, Winsler, and Huie 2008; Pintrich and DeGroot 1990) that was completed by students at each time point. The MSLQ is a self-report measure that utilises a seven-point Likert scale (1=not at all true of me, and 7=very true of me) to

Table 1. Descriptive statistics and intercorrelations among variables at *T1* and *T2*.

	<i>T1</i> (all) ( <i>N</i> =591)		<i>T1</i> for those with <i>T2</i> data ( <i>N</i> =243)		<i>T2</i> ( <i>N</i> =243)		Intercorrelations								
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7	8	9
1. Self-efficacy	3.99	0.73	3.98	0.72	4.18	1.06	–	0.51	0.17	0.08	0.42	0.28	0.33	0.17	–0.03
2. Mastery	4.26	0.71	4.28	0.72	4.22	0.88	0.54	–	0.03	0.01	0.37	0.37	0.36	0.23	–0.05
3. Performance- approach	2.76	1.12	2.67	1.12	2.92	1.25	0.29	0.25	–	0.74	0.05	–0.18	–0.17	–0.01	0.04
4. Performance- avoidance	2.97	1.00	2.94	0.95	3.04	1.14	0.24	0.21	0.85	–	0.03	–0.12	–0.17	–0.11	0.05
5. Metacognition	4.38	0.84	4.36	0.86	4.31	0.86	0.35	0.47	0.11	0.10	–	0.45	0.45	0.41	–0.12
6. Time management	4.94	0.90	5.04	0.90	4.69	0.98	0.23	0.35	–0.09	–0.16	0.37	–	0.67	0.26	–0.12
7. Effort regulation	4.82	1.09	4.97	1.13	4.65	1.00	0.26	0.37	–0.17	–0.21	0.31	0.57	–	0.22	–0.09
8. Help-seeking	4.46	1.04	4.47	1.08	4.20	1.02	0.23	0.21	0.12	0.06	0.40	0.08	0.14	–	–0.09
9. Hours worked	5.99	7.34	4.83	6.59	2.09	6.11	–0.12	–0.15	–0.04	0.00	–0.13	–0.30	–0.18	–0.04	–

Notes: Values above the diagonal indicate intercorrelations between variables at *T1*. Values below the diagonal indicate intercorrelations between variables at *T2*.

evaluate student motivation and application of learning strategies. All the learning strategies examined in this study were assessed by the Learning Strategies scale of the MSLQ which are: metacognitive self-regulation (12 items, ‘When studying for a course I try to determine which concepts I don’t understand well’,  $\alpha = 0.74$ ); time and study environment (8 items, ‘I make good use of my study time for courses’,  $\alpha = 0.71$ ); effort regulation (4 items, ‘I work hard to do well even if I don’t like what we are doing’,  $\alpha = 0.66$ ); and help-seeking (4 items, ‘I ask the instructor to clarify concepts I don’t understand well’,  $\alpha = 0.50$ ).

#### *The patterns for adaptive learning scale (PALS)*

The PALS was also completed by the students at each time point. The PALS, developed by Midgley et al. (1998), assesses motivation on a five point Likert scale (1=‘Not at all true’, and 5=‘Very true’) by using achievement goal theory as a theoretical framework. The PALS includes scales for mastery goal orientation (5 items, ‘One of my goals is to master a lot of new skills this year’,  $\alpha = 0.79$ ), performance-approach goal orientation (5 items, ‘It’s important to me that I look smart compared to others in my class’,  $\alpha = 0.87$ ) and performance-avoidance goal orientation (4 items, ‘One of my goals is to keep others from thinking I’m not smart in class’,  $\alpha = 0.70$ ). Additionally, the PALS academic self-efficacy (5 items, ‘Even if the work is hard, I can learn it’,  $\alpha = 0.75$ ) subscale was used.

#### *Student achievement*

Student GPA at the end of the first semester and cumulative GPA at the end of the first year were obtained from university records with student and institutional review board consent, and these were used to measure student academic performance. Cumulative GPA at the end of the first year was examined in analyses because we reasoned that it would take time for changes in student employment hours to have an effect on performance. Perhaps students chose to reduce their number of hours worked because they were seeing negative effects on their performance, but by the time that that was observable, the first-semester GPA damage would have already been done. In addition to the continuous variable, employed students were classified into two groups for some group-based analyses – those who were doing well academically at the end of the first semester (defined as receiving a GPA of 3.00 or higher) and those who were not doing as well (defined as receiving a GPA less than 3.0). This dichotomization in achievement is consistent with that used in prior research (Landrum, Turrisi, and Brandel 2006), and the 3.0 (B average) cut-off point is often used by the university and by honours/scholarship/dean’s list programmes to note good academic performance.

## Results

### *Differences between employed vs. non-employed students*

The first research question focused on whether students who were working would have lower GPAs than students who were not working. T-tests were employed to examine if GPA at the end of the first semester and at the end of the first year differed significantly for students who were or were not employed. No significant differences in GPA were noted between working ( $M=2.68$ ,  $SD=0.78$ ) and non-working students ( $M=2.72$ ,  $SD=0.83$ ) at  $T1$  for first semester GPA ( $t(551)=0.57$ ,  $p>0.05$ ;  $d=-0.04$ ) or between working ( $M=2.67$ ,  $SD=0.82$ ) and non-working students ( $M=2.76$ ,  $SD=0.79$ ) at  $T2$  for second semester GPA ( $t(551)=1.27$ ,  $p>0.05$ ;  $d=-0.11$ ). Correlational analyses were employed to determine if number of hours worked was related to achievement. Results revealed that students who reported working more hours at  $T1$  in the first semester tended to achieve lower grades by the end of the first year ( $r=-0.10$ ,  $p<0.05$ ) but no relationship was found for the number of hours worked at end of first-semester GPA. GPA was, however, related to whether students worked on or off-campus. Students who worked on-campus earned higher first-semester GPAs ( $M=2.88$ ,  $SD=0.71$ ) than students who worked off-campus ( $M=2.60$ ,  $SD=0.83$ ):  $t(98)=-2.45$ ,  $p=0.02$ ;  $d=0.36$ . These achievement differences continued to persist at the end of the first year, as cumulative GPA for on-campus students ( $M=2.80$ ,  $SD=0.75$ ) was still higher than that for off-campus ( $M=2.61$ ,  $SD=0.86$ ) working students ( $t(98)=-2.05$ ,  $p=0.04$ ;  $d=0.24$ ).

The second research question investigated whether working students were different from non-working students in terms of motivation and self-regulation across the first semester of studies. This question was explored in two ways. First, to take advantage of the full  $T1$  sample, two analysis of variance (ANOVA) were run comparing working and non-working students on just their  $T1$  scores on the motivation and self-regulation measures. There were no significant differences on any of these variables at  $T1$  as a function of work status (see Table 2). Second, due to our interest in change over time, we also ran repeated-measures mixed multivariate analysis of variances (MANOVAs) (one for the motivation variables and one for the self-regulation variables), with one between-subjects factor (working vs. non-working) and one within-subjects factor (time –  $T1$  and  $T2$ ) including the smaller subset of only those who had both  $T1$  and  $T2$  data. Table 2 provides the means for each of these variables for the overall sample available at each time point. (The patterns for the  $T1$  means for those with complete data at  $T1$  and  $T2$  did not change considerably from those listed in the Table and are thus not tabled for simplicity). The MANOVA for student motivation revealed a significant multivariate time effect, ( $F(4223)=5.78$ ,  $p<0.001$ ;  $\eta^2=0.09$ ) with no work effect or interaction between work status and time. Univariate follow-up analyses revealed that, regardless of employment status, both groups of students experienced an increase in aca-

Table 2. Motivation and self-regulation for employed and unemployed students across the first semester.

	T1				T2			
	Employed (N=300)		Unemployed (N=271)		Employed (N=126)		Unemployed (N=121)	
	M	SD	M	SD	M	SD	M	SD
<i>Motivation</i>								
Self-efficacy <sup>a</sup>	3.95	(0.72)	4.03	(0.75)	4.15	(0.73)	4.20	(1.31)
Mastery	4.28	(0.71)	4.23	(0.71)	4.28	(0.82)	4.17	(0.94)
Performance-approach <sup>a</sup>	2.71	(1.14)	2.82	(1.11)	2.92	(1.21)	2.86	(1.28)
Performance-avoidance	2.91	(1.02)	3.03	(0.97)	3.07	(1.10)	2.96	(1.16)
<i>Self-regulation</i>								
Metacognition	4.42	(0.82)	4.30	(0.86)	4.37	(0.80)	4.26	(0.91)
Time management <sup>a</sup>	4.94	(0.85)	4.94	(0.94)	4.59	(1.03)	4.77	(0.93)
Effort regulation <sup>a</sup>	4.82	(1.04)	4.81	(1.14)	4.54	(0.92)	4.75	(1.06)
Help-seeking <sup>a</sup>	4.50	(1.01)	4.40	(1.07)	4.38	(0.88)	4.03	(1.10)

<sup>a</sup>Time effect  $p < 0.05$ .

demic self-efficacy across T1 to T2 ( $M_{T1} = 3.97$ ,  $M_{T2} = 4.18$ ,  $F = 5.40$ ,  $p < 0.05$ ;  $\eta^2 = 0.02$ ), and an increase in performance-approach goal orientation ( $M_{T1} = 2.62$ ,  $M_{T2} = 2.89$ ,  $F = 11.31$ ,  $p < 0.01$ ;  $\eta^2 = 0.05$ ).

In terms of student self-regulatory behaviour, results reveal similar findings in that a significant multivariate time effect emerged  $F(4233) = 15.77$ ,  $p < 0.001$ ;  $\eta^2 = 0.21$ ) with no significant differences with regard to work status nor an interaction between time and work status. Specifically, univariate statistics revealed that regardless of employment status, both groups of students experienced a decrease from T1 to T2 in time management ( $M_{T1} = 5.06$ ,  $M_{T2} = 4.69$ ,  $F = 38.81$ ,  $p < 0.001$ ;  $\eta^2 = 0.14$ ), effort regulation ( $M_{T1} = 4.98$ ,  $M_{T2} = 4.65$ ,  $F = 24.02$ ,  $p < 0.001$ ;  $\eta^2 = 0.09$ ) and help-seeking ( $M_{T1} = 4.47$ ,  $M_{T2} = 4.20$ ,  $F = 14.86$ ,  $p < 0.001$ ;  $\eta^2 = 0.06$ ). These results suggest that, overall, students tend to experience a decrease in self-regulated learning across time, regardless of employment status.

### ***Relations between motivation and performance by work status***

To assess the extent to which relations between motivation/self-regulation and GPA may be different for working and non-working students, a series of moderated multiple regressions were conducted. The analytical approach here was to first control for student gender and ethnicity in step one, and then to add the motivation and self-regulation predictors, work status, and the relevant cross-product interaction term to test whether work status moderated the relationship between each motivation or self-regulation construct and GPA. In other words, these analyses determine if relations between motivation/self-regulation and achievement were different for workers and non-workers. Spe-

cifically, first-semester GPA was entered as the dependent variable and each of the motivation and self-regulation variables assessed at *T1* was entered individually as the independent variable along with both the dichotomous variable of work status, and then the interaction term created by crossing work status with the relevant motivational variable. The results revealed that at *T1*, mastery (interaction term  $t = -2.45$ ,  $p = 0.01$ ), and performance-approach ( $t = -2.03$ ,  $p = 0.04$ ) were related to GPA differently for employed and unemployed students. Correlations run separately within group indicated that mastery orientation was more strongly (and positively) related to achievement for unemployed students ( $r = 0.17$ ) than for employed students ( $r = -0.04$ ), that performance-approach goal orientation was negatively related to achievement for employed students ( $r = -0.18$ ) but unrelated to performance for unemployed students ( $r = 0.05$ ). The same regressions were performed with *T2* (end of the first semester) data as well. At *T2*, the same interaction was observed for performance-approach goal orientation ( $t = 20.9$ ,  $p = 0.04$ ) such that it was negatively associated with GPA for employed students ( $r = -0.58$ ) but not for unemployed students ( $r = -0.06$ ).

### ***Motivation and self-regulation differences between high- and low-achieving employed students***

Similar to the strategy followed above, we first analysed the full *T1* sample to examine differences in motivation between high-achieving and low-achieving working students at the beginning of the semester with ANOVAs. Then, to examine change in self-regulation and motivation over the first semester, two repeated-measures one-way MANOVAs (e.g. the first MANOVA with only the motivation variables and the second MANOVA with only the self-regulation variables) were performed, with one between-subjects factor (high-achieving working students vs. low-achieving working students) and one within-subjects factor (time – *T1* and *T2*). See Table 3 for the means and standard deviations for high- and low-achieving employed students on measures of self-regulation and motivation for *T1* and *T2*.

At *T1*, the ANOVA analyses revealed that working students with GPAs over 3.00 showed more effort regulation than those who had GPAs below 3.00 ( $M = 5.01$ ,  $SD = 0.97$ ;  $M = 4.66$ ,  $SD = 1.07$ ;  $F(1, 298) = 8.67$ ,  $p < 0.01$ ), and that the higher-performing working students had more effective time management strategies than working students who received poorer grades ( $M = 5.04$ ,  $SD = 0.97$ ;  $M = 4.85$ ,  $SD = 0.73$ ;  $F(1, 298) = 3.92$ ,  $p < 0.05$ ). No other significant group effects emerged suggesting that out of all the motivation and self-regulation variables examined, working students with high and low GPAs are distinguished predominately by their levels of effort regulation and use of time management strategies.

In terms of the changes in motivational beliefs across the first semester of studies (*T1* and *T2*) among working students who were and were not

Table 3. Motivation and self-regulation patterns between working students with high and low GPA across the first semester.

	T1				T2			
	Hi GPA (N=262)		Low GPA (N=319)		Hi GPA (N=30)		Low GPA (N=42)	
	M	SD	M	SD	M	SD	M	SD
<i>Motivation</i>								
Self-efficacy <sup>a</sup>	3.97	(0.77)	4.01	(0.70)	4.36	(0.70)	4.05	(0.79)
Mastery	4.30	(0.71)	4.22	(0.71)	4.50	(0.84)	4.38	(0.73)
Performance-approach <sup>a,b</sup>	2.69	(1.08)	2.81	(1.16)	2.33	(1.19)	3.20	(1.32)
Performance-avoidance	2.93	(0.98)	3.00	(1.01)	2.65	(1.09)	3.24	(1.18)
<i>Self-regulation</i>								
Metacognitive self-reg.	4.42	(0.85)	4.34	(0.83)	4.54	(0.78)	4.32	(0.73)
Time management <sup>c,d</sup>	5.06	(0.97)	4.84	(0.82)	4.89	(0.95)	4.51	(0.77)
Effort regulation <sup>c</sup>	5.02	(1.06)	4.64	(1.08)	4.94	(0.84)	4.52	(0.93)
Help-seeking	4.39	(1.11)	4.52	(0.98)	4.37	(1.01)	4.29	(1.06)

<sup>a</sup>Marginally significant time effect,  $p < 0.10$ .

<sup>b</sup>Significant group effect in T1–T2 RM ANOVA,  $p < 0.05$ .

<sup>c</sup>Significant group effect at T1,  $p < 0.05$ .

<sup>d</sup>Significant time effect,  $p < 0.05$ .

doing well academically, a significant multivariate time,  $F(4, 63) = 2.68$ ,  $p < 0.05$  and group effect  $F(4, 63) = 2.74$ ,  $p < 0.05$  was found with no notable interaction. Univariate analyses reveal that, regardless of GPA, both groups of students experienced slight increases in self-efficacy from T1 to T2 ( $M_{T1} = 3.96$ ,  $M_{T2} = 4.20$ ,  $F = 3.91$ ,  $p < 0.10$ ) and increases in performance-approach goals ( $M_{T1} = 2.53$ ,  $M_{T2} = 2.84$ ,  $F = 3.29$ ,  $p < 0.10$ ). Additionally, at both time points, low-achieving students displayed more performance-approach goal orientation than high-achieving students (Low:  $M_{T1} = 2.77$ ,  $M_{T2} = 3.21$  – High:  $M_{T1} = 2.21$ ,  $M_{T2} = 2.32$ ;  $F = 8.82$ ,  $p < 0.01$ ). With regard to self-regulatory strategies, analyses across the first semester of studies (T1 and T2) revealed a significant multivariate time effect,  $F(4, 67) = 4.60$ ,  $p < 0.01$ , with no group effect or interaction. This suggests that both groups of working students' self-regulatory processes changed significantly over time, regardless of academic standing. More specifically, univariate analyses revealed that, regardless of GPA, both groups of students specifically experienced decreases from T1 to T2 in time management skills ( $M_{T1} = 5.04$ ,  $M_{T2} = 4.67$ ,  $F = 13.35$ ,  $p < 0.001$ ).

### **Motivation and self-regulation differences between students who increased vs. decreased work hours**

The fifth research question explored whether academic performance at the end of the first semester would be better for those students who decreased

their number of work hours over the same time period. This turned out to be the case. Students were categorised into two groups based on their pattern of employment across *T1* to *T2* – those that increased or remained stable in their work hours over the year, and those who decreased their work hours. Students who were grouped under the ‘increased work hours (or stayed the same)’ category were required to meet one of three conditions: (a) number of hours worked at *T1* had increased by *T2*; or (b) employment status changed from not employed during *T1* to employed during *T2*; or (c) number of hours worked at *T1* stayed the same as that for *T2*. Students grouped under the ‘decreased work hours’ category included those whose number of hours worked from *T1* had decreased by the end of the semester or those who were working at *T1* but reported not working later. Students who decreased the number of hours worked (or quit) between *T1* and *T2* earned a significantly higher first-semester GPA ( $M = 3.02$ ,  $SD = 0.57$ ) than students whose work hours either increased or stayed the same over the semester ( $M = 2.78$ ,  $SD = 0.71$ ;  $t(124) = -2.13$ ,  $p < 0.05$ ).

The final research question explored potential differences in motivation and self-regulation between students who increased or decreased their work hours over the course of the first semester. MANOVAs were conducted comparing the *T1* and then the *T2* motivation and self-regulation variables as a function of whether students increased or decreased their hours worked. Also, repeated-measures ANOVAs were conducted to explore change over time. No significant differences emerged in any of the analyses indicating that students who decreased their work hours over the course of the first semester were no different than those whose work hours increased or stayed the same in terms of the motivation and self-regulation variables examined.

## Discussion

Given the large number of college students who work, it is important to understand the strategies that employed students use to cope with the demands of work and school. Also, with 31.3% of freshmen students not returning for their sophomore year (ACT 2008), it is critical that researchers evaluate potential factors that relate to performance over the first year. Increased knowledge about the motivational qualities and self-regulated learning strategies present in first-year students who are and are not working outside of school may help researchers and higher education professionals implement more effective intervention programmes to increase student performance, motivation and persistence in college. The present study examined aspects of motivation, self-regulated learning and performance between (a) working and non-working first-year college students; (b) working students with high and low GPAs and (c) students who increased or decreased their number of hours worked over time. This study adds to the literature in that previous research in this area has typically not examined motivation

and self-regulation, not examined longitudinal change over time, and has included somewhat more homogenous samples in terms of ethnicity than the present study.

Our first hypothesis regarding achievement differences between employed and unemployed students received mixed support. Employed and non-employed first-year college students, overall, were found to achieve at similar levels during the first semester of studies. Although differences in GPA between working students and non-working students were not significant in the first semester, the differences grew larger from the beginning to the end of the year, and number of hours worked was negatively related with GPA. Perhaps, achievement differences between working and non-working students develop over time and assessment in the first semester is too early to see cumulative long-term effects of employment. Pascarella et al. (1994) suggests that the college environment is new to incoming, first-time freshmen students and that it takes some time before students make the transitions necessary to meet the demands of higher education. If relations between work status and performance become more clear and change over time, then that may be one explanation for mixed results in previous research on links between work and GPA. Studies differ in terms of when they measure student performance and work status. Future research should examine relations between work status and academic performance longitudinally and extend into longer periods past the first year of studies.

Our second hypothesis predicted that there would be noticeable differences in terms of goal orientation, self-efficacy and self-regulated learning between students who were or were not working, and that such differences might help explain any performance differences that were observed between groups. There was no support for this hypothesis. Students who were working and going to school at the same time were no different than those who were just taking classes in terms of self-efficacy, goal orientation, time and effort management, help-seeking and metacognitive self-regulation. Although number of hours worked was related to performance, no difference was found in motivational profiles between the students who were and were not working. This may suggest that the amount of time worked can influence performance in working students, where time spent working may take away from study time. Working students appear to be just as skilled at time management as non-working students, but they have less time to work with when organising their studies and balancing multiple commitments.

A number of potentially disturbing longitudinal trends were observed. On average, for all students combined, mastery goals were less common over time, and performance-approach goal orientation became stronger over the course of the first semester. Furthermore, decreases in time management, effort regulation and help-seeking behaviours were also observed from *T1* to *T2*. Prior research suggests that students generally have elevated levels of confidence and motivation at the beginning of the school year, and then

experience a decline as the year progresses, with the decline being even more significant when students are transitioning to new environments (Chemers, Hu, and Garcia 2001; Pajares 2008). Interestingly, however, self-efficacy was found to increase across time. This finding is puzzling, especially when students were also found to adopt more performance-oriented goals and engage in less effective self-regulatory strategies. Perhaps, analyses extending beyond the first year would reveal more information about the developmental pattern of self-efficacy. Specifically, after freshmen students have completed their first year, students have much more information about their own performance, about academic demands and expectations and about how things are going to work in college, and it would appear that such experience influences their self-reported motivational beliefs and self-regulated learning (Pajares 2008). Additionally, as students became more pre-occupied with displaying their performance to others, as indicated by increased performance-approach orientation, their help-seeking behaviours decreased. Help-seeking is social in nature and the act of help-seeking is sometimes attributed to lack of ability (Karabenick 2003; Newman 2008), thus, if students become more pre-occupied with how others perceive their abilities over time, they may also be less willing to ask for help when it is needed.

It is important for professors and university administrators who run transition and student-support programmes to know that first-year students appear to have labile motivational beliefs that are likely influenced by their experiences in their first semester. Given that the changes seen in student motivation over the course of the first year were mostly negative (decrease in mastery orientation, increase in performance-approach decrease in help-seeking, effort regulation and time management), interventions may be necessary to help students maintain the relatively healthy motivational profiles that they started with. It is also critical for researchers to note the dynamic nature of these motivational and self-regulated learning constructs and the need for measurement of such constructs to occur longitudinally with multiple data collection time points.

Although no group differences (working vs. not) were observed in mean levels of student motivation and self-regulation, there were several interesting group differences in the way goal orientation and self-regulated learning variables were related to academic performance. Mastery orientation was positively related to achievement for students who were not working, but unrelated to GPA for employed students. Relatedly, performance-approach goal orientation was negatively related to achievement for employed students, but unrelated to performance for students who were not working. Typically, prior research has found mastery goals to be positively related to performance and performance-approach goals to be negatively associated with academic performance (Ames 1992; Meece and Holt 1993), but not all studies have found this pattern (Pintrich 2000) suggesting that there may be other variables that moderate relations between goal orientation and performance.

The present study suggests that student work status is another potential variable that may be important in determining whether mastery and performance orientations are linked to increased performance. Perhaps, the motivational context of the workplace, (say, unduly valuing performance and making comparisons with co-workers, and unduly devaluing mastery goals) makes it such that those who are working and have high performance-approach goals are particularly at risk for doing poorly in the academic context. Another possibility is that students who are not working have enough time to spend to satisfy their mastery goals and actually improve, thereby augmenting their GPA, but that working students with high mastery goals simply do not have the time to do what it takes to master the academic material. If this hypothesis is correct, perhaps working students need tailored interventions to help them learn to recognise and differentiate the goals that are effective for the workplace and the goals that are particularly effective for the classroom. Future research will need to explore these possibilities more directly.

In terms of self-regulatory differences between working students who manage still to do quite well in school and working students who are not doing so well, several differences were found. Students who were able to work outside of school and still obtain a high GPA were better at time management and regulating their effort (in the form of increasing persistence when the studying and material got tough and boring) and were less performance-approach oriented than working students who were not able to maintain a 3.00 GPA. These results suggest that employed students who are able to manage their time and effort efficiently are also more likely to maintain high levels of performance while in school, compared to working students who are not as effective at time management and effort regulation.

The present study was the first, to our knowledge, to examine whether changes over time in number of hours worked were related to either academic performance or motivational beliefs and self-regulatory skills. Indeed, students who decreased the number of hours that they worked (or who quit their job altogether) at some point in their first semester achieved significantly higher grades than did students who remained working the same number of hours or more. This finding is important as it shows, longitudinally, that getting first-year students to reduce their number of hours worked over time may actually lead to improved academic performance. Interestingly, although there were performance differences between students who did and did not reduce their hours worked, there were no differences observed in any of the motivation or self-regulation variables as a function of increasing or decreasing work hours over time. Thus, contrary to our hypotheses, students who were better at time management, for example, were not more likely to reduce their number of hours worked. It remains unclear, therefore, what factors led students to make the apparently wise decision (in terms of GPA) to reduce their outside workload. Future research should explore this question specifically.

Results of the present study have implications for higher education students, parents and professionals. Students in this study who worked more hours had lower GPAs, and reducing one's hours worked over time was associated with increases in performance. These findings are consistent with prior research finding negative outcomes associated with employment for students (Hammer, Grisby, and Woods 1998; Markel and Frone 1998) and suggest that students are well advised, if possible, either not to work at all or to reduce the number of hours that they do work for pay while in the early years of college. If students absolutely need to continue to work for financial reasons, the results of this study suggest that this is OK in terms of maintaining high levels of student performance, as long as the working student is particularly high in time management skills, high in persistence/effort regulation and low in performance-approach goals. Therefore, findings here emphasise the need for university personnel to try to equip students with effective self-regulated learning strategies and to instill adaptive mastery-oriented goals in order to help students ultimately achieve at the highest levels. It may be especially important for professors of first-year students to stress mastery-oriented goals in the classroom. Previous research suggests that the most adaptive outcomes come when students' goals start off as process oriented and then shift to being more outcome oriented (Zimmerman and Kitsantas 1997). Specifically, students who initially focus their attention to mastering the processes required to successfully complete a task before focusing their attention on the actual outcomes of the task perform higher than those who just focus on the outcomes. However, the process of shifting attention from process- to outcome-oriented goals typically comes from instruction. Students can be taught how and when to change their goals for optimal performance. Perhaps, this pattern may also apply in terms of goal orientation, where students could benefit from a shift from performance-approach oriented goals in the workplace to mastery-oriented goals in the classroom. However, professors and support personnel may be required to help students recognise the types of goals they adopt across different contexts and shift their goals as necessary. Since these aspects of motivation and self-regulated learning are modifiable through intervention (Zimmerman 2008), universities should design intervention programmes to specifically teach students how to manage their time, regulate their effort and provide resources for students to seek help when needed.

Finally, our finding that students who worked on-campus did better academically than those working off-campus may suggest that working students should be encouraged to find employment on-campus, and that universities may wish to increase opportunities for on-campus student employment. Employment on-campus may provide students with easier access to academic support services (e.g. meeting with a professor or retrieving a book from the library during a lunch break) and opportunities to work in a setting that is relevant to their study major or career/academic goals. However, the

GPA differences observed between on- and off-campus employed students must be interpreted with great caution since it is possible that those who employ students on-campus may place more emphasis on academic merit in their selection criteria than employment opportunities off-campus.

Although the present study broke new ground in terms of examining change over time in student work hours and including motivational moderators of relations between student work and performance, there are several limitations of this study. First, the sample was drawn from just one North-American university, thereby limiting the generalisability of the results to similar samples. Second, we did not have additional information pertaining to the type of employment in which the students were engaged. All we knew was the number of hours worked. Given that others have found that certain features of employment, such as whether it is related to the student's major/career are related to working student outcomes (Wang et al. 2010), future research should endeavour to collect such information. Additionally, notable and systematic attrition of students from  $T1$  to  $T2$  was observed, with students with lower self-regulation, motivation and achievement tending not to complete the  $T2$  survey, thereby limiting our power to detect significant effects, as well as the clarity of the population to which results may generalise. It is also important to note that because it is not possible to randomly assign students to working vs. not working groups, our study, as is the case with all studies in this area of research, necessarily suffers from self-selection bias. Additionally, our dichotomisation of students into achievement groups based on GPA and the low reliability coefficients for the effort regulation and help-seeking scales may have limited the power to detect significant effects. Finally, using end-of-the-year GPA as an indicator of semester-one work effects may have influenced the results in unknown ways, given that student semester-two work patterns were unknown. Future research would do well to obtain larger samples, ensure student participation at all time points and perhaps use other indices of student performance, including retention, graduation rates and perhaps qualitative and portfolio-based indicators of performance.

### Notes on contributors

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