Resiliency and Achievement Goal Orientation among Agricultural Students

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Abstract

Resiliency and achievement goal orientations can influence academic achievement and self-regulated learning, but neither has been described in agricultural students. The objective of this study was to characterize both constructs in undergraduate students (n=107; 28 male) enrolled in an introductory agricultural economics course. Students completed 7-point Likert scale goal orientation and resiliency instruments. Non-parametric tests of mean differences evaluated fixed effects of gender and class standing, and relationships among variables were investigated via Spearman rank correlations. Mastery-approach means were greater than those for other forms of goal regulation. Female students scored themselves higher for mastery-approach goals, and freshman rated themselves higher in mastery-approach and mastery-avoidance goals than more advanced students, indicating greater emphasis on learning and achieving intrapersonal measures of success, rather than proving competence relative to peers or external criteria. No effect of gender or class standing on mean resiliency was observed. Resiliency and mastery-approach goal orientation were positively and moderately correlated. Attunement of instructors to apparent student resiliency and achievement goal orientation could allow for more learner-centered instruction or identify those potentially at risk for academically self-handicapping behaviors. Further work is needed to investigate relationships between these constructs, academic performance and aspects of self-regulated learning among agricultural students.

Keywords: Self-regulated learning, learner-centered, motivation

Introduction

Achievement goal orientations represent motivation behind achievement behaviors in particular contexts (Dweck and Leggett, 1988; Nicholls, 1984), and have been associated with academic performance and self-regulated learning in undergraduates (Coutinho and Newman, 2008; Elliot and McGregor, 2001; Pintrich, 2005). In the early literature, achievement goals were divided into two conceptual contexts: *mastery goals*, which focus on task-based and intrapersonal standards of competence, and *performance goals*, which focus on normative or interpersonal standards of competence (Dweck, 1986; Nicholls, 1984). More recently, a 2x2 framework was developed (Elliot and McGregor, 2001) in which the binary constructs of mastery and performance have been bifurcated relative to approach and avoidance dimensions. *Approach goals* focus on attainment of a positive possibilities or results. Contrastingly, *avoidance goals* focus on evasion or prevention of undesirable outcomes. The valence depends on costs and benefits of the activity within the larger context as perceived by the student, and each goal orientation will have different patterns of antecedents and consequences (Cury et al., 2006; Van Yperen et al., 2008). Achievement goals are expected to be positively correlated when they share a dimension and uncorrelated when they do not (Elliot and Murayama, 2008).

Resiliency, in contrast, indicates an individual's ability to maintain, improve and recover mental health following stressful events (Neill and Dias, 2001; Wolin and Wolin, 1993), or one's capacity for positive transformation in the face of uncertainty or change (Lifton, 1993). Resilient individuals are marked by self-determination, emotional intelligence, adaptability and problem-solving skills (Connor and Slear, 2009; Neill and Dias, 2001). College students with higher resiliency were more likely to persist to graduation (Donald et al., 2004) and explicit training in resiliency yielded improved metacognitive development and academic performance (Harnish, 2005).

It is not unreasonable to suspect that individuals with a strong mastery-approach orientation would also exhibit high resiliency. Both are functions of internal locus of control, self-efficacy and self-esteem. Individuals with a strong internal locus of control believe that they direct events which affect them, while those with high self-efficacy believe they are

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capable of achieving desired outcomes (Bandura, 1977; Schunk and Zimmerman, 2006). The two constructs differ in that locus of control is generally less situation-dependent, but both can be significant predictors of goal attainment. Self-esteem is a key intrapersonal component to goal orientation choice. Students with low self-esteem toward to an academic task are likely to resort to performance, rather than mastery goals, in an attempt to secure normative validation for their efforts (Peixoto and Almeida, 2010). Low self-esteem is also strongly correlated with low resiliency, along with increased anti-social and self-handicapping behaviors (Donnellan et al., 2005).

There has been little work exploring connections between resiliency and achievement goal orientations, two constructs which have been shown to contribute to undergraduate academic success. It is hypothesized that students who are inherently resilient will also score highly for mastery-approach goal orientations. Further, although resiliency and achievement goal constructs have been individually described for undergraduate students, they are typically characterized in psychology students, which under-represent populations' naïve to metacognition (Jackson et al., 1989). Few studies involving undergraduates in the life sciences, and no studies involving undergraduate students in the agricultural sciences, were found in the literature. Therefore, the purpose of this study was to characterize resiliency and achievement goal orientations among undergraduates in an agricultural economics course, and investigate relationships between the two constructs.

Materials and Methods

Undergraduate students (n=107; 28 male and 79 female) enrolled in an introductory-level agricultural economics course at a land-grant university completed a goal orientation questionnaire developed and validated by Elliot and McGregor (2001) and a resiliency instrument developed and validated by Neill and Dias (2001). This particular course was chosen for its large size, class level representation (12 freshmen, 54 sophomores, 29 juniors and 12 seniors) and instructor amiability. Further, the course is a pre-requisite for all majors within the College of Agriculture and Life Sciences and is unlikely to be taken by non-majors, although this was not investigated as part of this study. The research protocol was approved by the Institutional Review Board and consent of recruited students was implied from completion of the self-report instruments. The 12-question self-report measure for achievement goal orientation included three questions related to each factor within the 2x2 mastery/ performance and approach/avoidance framework. Questions were randomized and participants indicated level of agreement on a 7-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree). The resiliency instrument consisted of 15 self-report questions answered on a 7-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree). Mean differences were tested via PROC NPAR1WAY of SAS (SAS v9.2, Cary, NC). Relationships among variables were investigated using Spearman rank correlations. Significance is reported at the $P<0.05$ level.

Results and Discussion

Achievement Goal Orientations: Overall, means for achievement goal orientations were above the midpoint (Table 1), indicating students generally agreed with instrument statements. These means are higher than those reported for psychology (Edens, 2006; Elliot and McGregor, 2001) or engineering (Wang et al., 2010) students. Overall, mastery-approach means were greater than those for other forms of goal regulation. Correlations among achievement goal orientations were moderate (Table 2) and similar to previous studies (Coutinho and Neuman, 2008; Wang et al., 2010; Young, 2007).

Female students scored themselves higher for mastery-approach goal orientations than males, but gender differences were not significant for other goal orientations (Figure 1). In schoolchildren, girls are often more likely to use mastery strategies, while

Table 1. Achievement Goal Orientation Means

Achievement goal item	Mean	SD
Mastery Approach		
I want to learn as much as possible from this class.	4.87	1.50
It is important for me to understand the content of this course as thoroughly as possible.	5.60	1.61
I desire to completely master the material presented in this class.	6.16	1.01
Mastery Avoidance		
I worry that I may not learn all that I possibly could in this class.	5.41	1.25
Sometimes I'm afraid that I may not understand the content of this class as thoroughly as I'd like.	5.12	1.36
I am often concerned that I may not learn all that there is to learn in this class.	4.82	1.38
Performance Approach		
It is important for me to do better than other students.	4.87	1.50
It is important for me to do well compared to others in this class.	4.63	1.69
My goal in this class is to get a better grade than most of the other students.	4.79	1.54
Performance Avoidance		
I just want to avoid doing poorly in this class.	5.60	1.61
My goal in this class is to avoid performing poorly.	5.36	1.67
My fear of performing poorly in this class is often what motivates me.	4.98	1.62

Table 2. Achievement Goal Orientation Means and Intercorrelations[1]

Variable	Mean	SD	Variable 1	2	3	4
1. Mastery Approach	5.75	0.92	---			
2. Mastery Avoidance	5.11	1.19	0.35**	---		
3. Performance Approach	4.77	1.43	0.45**	0.27*	---	
4. Performance Avoidance	5.31	1.37	0.21*	0.35**	0.22*	---

[1] **, **Significant at P<0.05, 0.01, respectively using Spearman rank correlations*

boys tend to adopt performance goals (Brdrar et al., 2006; Thorkildsen and Nicholls, 1998), consistent with the notion that boys are more ego- and competitively-oriented while girls favor cooperative efforts (Marsh et al., 2003). Also, boys tend to attribute success to ability, while girls are more likely to attribute success to effort (Ames, 1992). Significant effects of gender on goal orientation have not been prevalent in literature related to undergraduate students (Roebken, 2007; Wang et al., 2010), although agricultural and life sciences students have not been traditional populations for study. Students within the College of Agriculture and Life Sciences are predominantly female and enrolled in curricula strongly influenced by science, technology, engineering, and mathematics (STEM) fields (Food and Agriculture Education Information System, 2010).

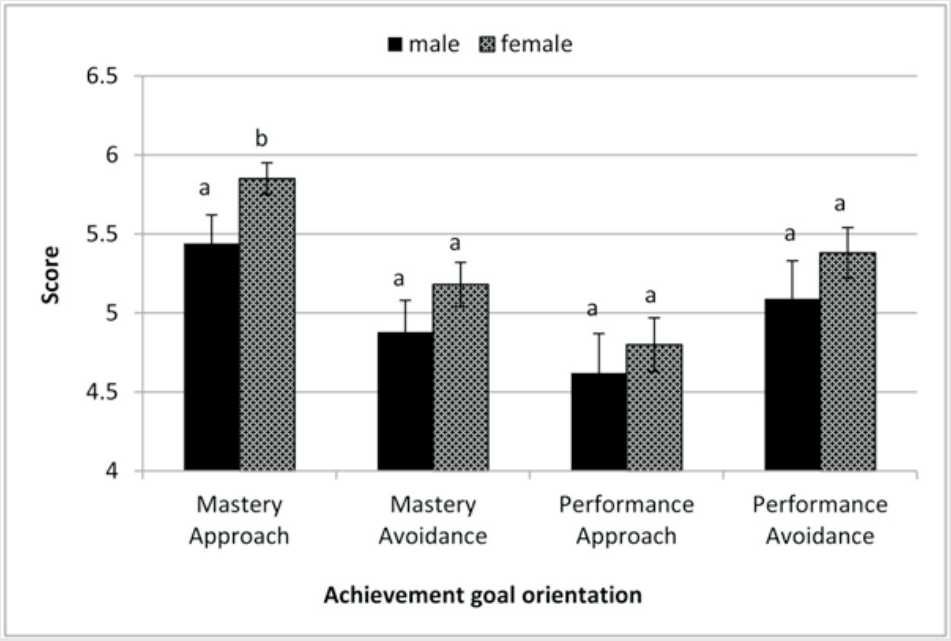

Figure 1. Achievement goal orientations by gender among agricultural science students. Dissimilar letters for each achievement goal orientation indicate significant differences between genders.

Despite their relatively small number, freshmen rated themselves higher in mastery-approach and mastery-avoidance goal orientations than more advanced students (Figure 2). This indicates they are more concerned with learning relevant course material and achieving intrapersonal measures of success, rather than proving normative competence. There are mixed results in the literature relative to the effect of age on goal orientation. In some studies, younger students considered the creation of knowledge as its own reward, while older students were more focused on meeting minimum performance criteria or avoiding excess work (Brdar et al., 2006). This is consistent with the theory that as students develop academically, they become more concerned with obtaining good grades rather than mastering course content (Roebken, 2007). However, other studies have found the opposite effect of age on goal orientation. Roebken (2007) found freshmen were more likely than students from other classes to fall into performance or work avoidance orientations, while seniors exhibited strong mastery goals. This may be explained by professional development associated with increased class standing. As students mature and approach graduation, the proportion of courses directly applicable to their career choice increases, causing a stronger internal drive for achievement. Further, as people age, especially during the late adolescent period, they tend to move away from achievement based on expectations of others, and toward a more internal value system (Kohlberg, 1976).

It is important to note that this study took place during fall, rather than spring, semester. Thus, freshmen participants were enrolled in their first semester at the university. An interesting avenue for further research would be to investigate whether second-semester freshmen displayed the same goal orientations as those newly-arrived on campus. In this study, sophomores were higher for mean performance-avoidance goal orientations than juniors or seniors, which may indeed indicate a shift toward more emphasis on normative assessment once students begin their second year. Additional work is needed to determine if this trend is consistent across the college, or persists for non-agricultural majors.

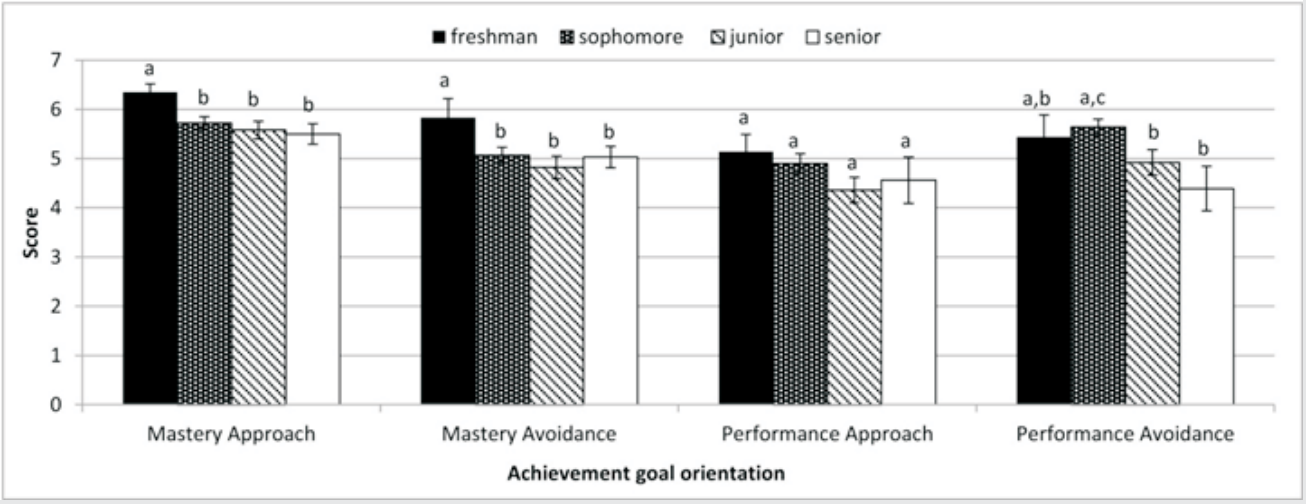

Figure 2. Achievement goal orientations by class among agricultural science students. Dissimilar letters for each achievement goal orientation indicate significant differences among classes.

Goal orientations are linked to student motivation and reflect standards by which students gauge and regulate learning efforts. Empirical evidence suggests students with a mastery-approach goal orientation engage in more self-regulated learning (Pintrich, 2005). Their willingness to take risks, use higher-order thinking skills, seek help and learn independently suggests aptitude for lifelong learning. Wang et al. (2010) found that students strong in mastery-approach goal orientation had stronger feelings of autonomy and value in their learning, exerted more effort and energy toward academic tasks, and were more likely to have incremental vs. entity beliefs about the nature of intelligence (Wang et al., 2010). Thus, these students, when faced with academic challenges, are more likely to show adaptive motivational patterns, persistence and problem solving strategies (Dweck, 1986; Mueller and Dweck, 1998) than students who believe intelligence is a fixed and uncontrollable trait.

Mastery-approach goals highlight intrinsic interest, and would seem optimal for contexts where intrapersonal standards are valued, such as learning, development, improvement and understanding. Other goal forms also have the ability to contribute positively to academic achievement. Performance-approach goals have been shown to result in higher grades (Church et al., 2001; Harackiewicz et al., 2000) and can be associated with more than just superficial learning strategies (Pintrich and Garcia, 1991). Performance-avoidance goals can provide compelling motivation for task completion and minimum competence (Elliot et al., 2005). Yet performance-approach or performance-avoidance mindsets are ultimately motivated by fear of failure (Elliot and Murayama, 2008), rather than need for achievement. While use of these strategies may result in task accomplishment or explicit recognition, they are ultimately maladaptive (Mattern, 2005). Their associated negative socio-cognitive effects of distress, anxiety, defensiveness and anger can outweigh interpersonal benefits of achievement. Mastery-avoidance goal orientations can also yield inimical results, and have been found to have a deleterious effect on performance in repeated tasks (Van Yperen et al., 2008). Although early researchers considered factors in the 2x2 achievement goal framework as mutually exclusive and relatively static (Elliot and McGregor, 2001), contemporary work suggests that learners may employ multiple strategies simultaneously and that goal orientation is highly individual- and context-dependent (Elliot and Murayama, 2008; Mattern, 2005).

Resiliency: Resiliency means were all above the midpoint (Figure 3). Means were highest for items related to long-term self-validation: R13 ("My life has meaning") and R3 ("I feel proud of the things I have accomplished in my life"); and humor: R10 ("I can usually find something to laugh about"). Scores were lowest for items related to intrapersonal lack of control: R6 ("I feel I can handle many things at a time") and R15 ("I have enough energy to do what needs to be done"). Male students scored themselves higher for R4 ("I usually take things in stride") than female students ($p=0.05$), but no other differences were significant across gender. Gender effects have been mixed in the literature (Neill and Dias, 2001). Senior students scored themselves higher for R10 ("I can usually find something to laugh about") than other classes, but differences due to class were not observed for other resiliency items. This single significant for seniors result may be an indicator of a maturing sense of humor as a result of age or successful persistence in the face of adversity during college years, or it simply may be spurious. There was no effect of gender ($p>0.88$) or class ($p>0.37$) on mean resiliency. In freshmen, resiliency has been shown to be significantly and positively correlated with persistence to degree (Donald et al., 2004), but no differences were observed in the present study between freshman, sophomore, and junior classes.

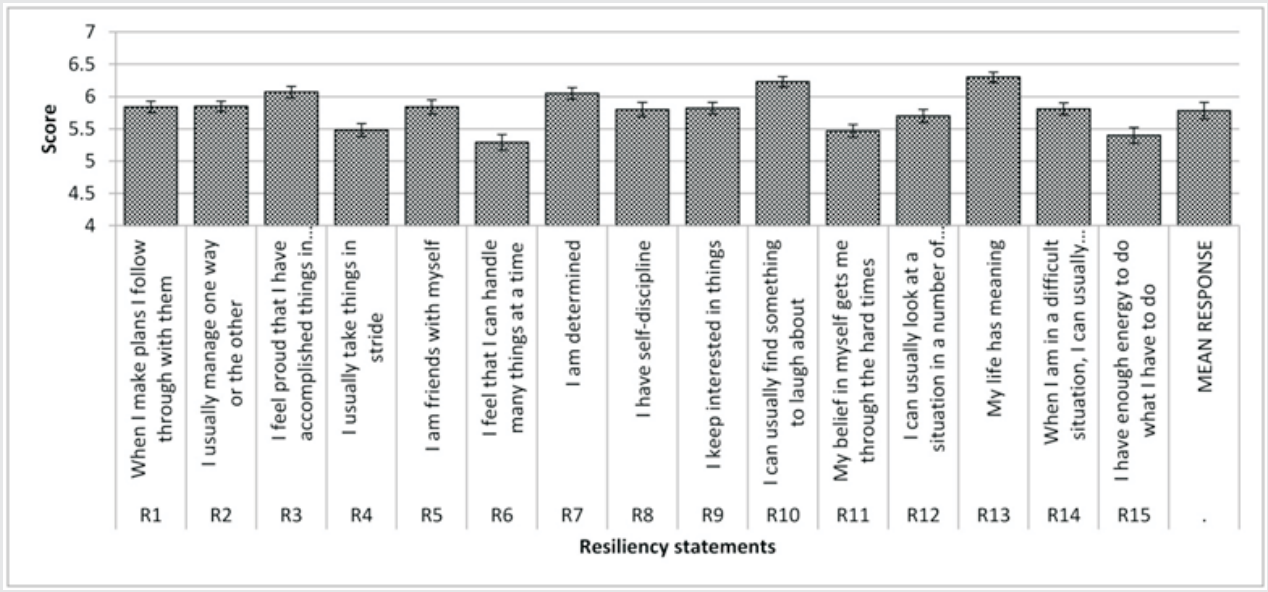

Figure 3. Resiliency scores among agricultural science students.

Historically, students engaged in agricultural majors were from rural or farming backgrounds (Buchanan, 2008). Farming families are inherently resilient (Darnhofer, 2010); coping with uncertainly and change is a necessary skill for those critically dependent on economic and climate variables they are unable to control. As a result, agricultural workers generally show lower levels of job-related stress and related mental health conditions than non-agricultural workers (King et al., 2009). Children from rural communities and farming families can be highly resilient as a result of their upbringing (Larson and Dearmont, 2002). Today, however, the typical student enrolled in a college of agriculture at a land-grant university is from a suburban background, with little connection to traditional production agriculture (Buchanan, 2008), although a geographic bias is expected based on relative population density. Further research is needed to determine if students from farming families have significantly different levels of resiliency than those from non-agrarian backgrounds.

Relationships between resiliency and achievement goal orientation: As hypothesized, there was a significant positive correlation between overall resiliency and mastery-approach goal orientation, with significance reported for 10 of the 15 self-report items (Table 3). Three of the strongest correlations had to do with a strong sense of inherent persistence and tenacity (R7: "I am determined;" R8: "I have self-discipline;" and R9: "I keep interested in things"). Resiliency involves adaptability and self-efficacy in the face of challenge or change, consistent with the intrapersonal need for achievement antecedent from which mastery-approach goals emerge (Elliot and Murayama, 2008). There is consistent evidence that there is a strong positive relationship between self-efficacy beliefs and mastery-approach goal orientations (Sakiz, 2011). Findings are mixed, however, with respect to self-efficacy and performance-approach themes. In this study, only two resiliency items were correlated with performance-approach goals in students. These results are consistent with the work of March et al. (2003) who found that non-traditional college students often employed learning goals and utilized task-oriented coping strategies, as a reflection of their desire to master material rather than simply achieve normative classroom success.

Table 3. Correlations between Resiliency Scores and Achievement Goal Orientations[1]

	Achievement goal orientation			
Resiliency Item	MAP	MAV	PAP	PAV
R1 – When I make plans I follow through with them .	.22*	.01	.04	-.01
R2 – I usually manage one way or the other.	.18	.09	.11	.22*
R3 – I feel proud that I have accomplished things in my life .	.45**	.10	.21*	.29**
R4 – I usually take things in stride.	.03	.00	.06	.12
R5 – I am friends with myself.	-.04	-.05	.02	.05
R6 – I feel that I can handle many things at a time.	.16	.02	.17	.05
R7 – I am determined.	.39**	.09	.18	.16
R8 – I have self-discipline.	.27**	.05	.05	.03
R9 – I keep interested in things.	.40**	.08	.21*	.11
R10 – I can usually find something to laugh about.	.08	.07	-.06	.14
R11 – My belief in myself gets me through the hard times.	.21*	.07	.10	.17
R12 – I can usually look at a situation in a number of ways.	.06	-.03	-.02	.14
R13 – My life has meaning.	.20*	-.01	.15	-.04
R14 – I can usually find my way out of a difficult situation.	.20*	-.04	.10	.12
R15 – I have enough energy to do what I have to do.	.21*	.06	.07	.12
TOTAL	.34**	.02	.18	.18

[1]*, **Significant at P<0.05, 0.01, respectively using Spearman rank correlations*

Interestingly, the strongest correlation between resiliency and mastery-approach goal orientation was with R3 ("I feel proud of what I have accomplished in my life"). There was also a significant positive correlation between scores for this statement and both performance-approach and performance-avoidance goal orientations. The statement, while related to resiliency, can be interpreted to reflect achievement in its simplest form when taken alone. As a result, it is not unexpected that significant correlations would exist between it and all goal orientations except mastery-avoidance, which has been shown to negatively affect performance (Van Yperen et al., 2008). Despite evidence (Pintrich, 2002; Sakiz, 2011) that avoidance and performance strategies result in greater anxiety, anger, distress, and worry regarding a new challenge, there were no significant negative relationships between resiliency and either mastery-avoidance, performance-approach, or performance-avoidance orientations.

Today's agricultural classroom is increasingly learner-centered (Woods et al., 2004). Great strides have been made to recognize and accommodate individual learning styles, which have been shown to impact academic performance and student-teacher interaction in the agricultural sciences (Cano et al., 1992; Garton et al., 2005). Yet learning style is merely a descriptor of behaviors which indicate how a person learns or adapts to their learning environment (Gregorc, 1979). Ultimately, understanding and shaping the motivational factors behind those behaviors will provide the key to educator and student success. Constructs like resiliency and achievement goal orientation are measurable and inherently malleable. If agricultural educators can recognize motivational factors present in their classroom, they can foster positive change in learning behavior, or at the very least, identify students potentially at risk for academic self-handicapping.

Summary

Students enrolled in an introductory agricultural economics class scored themselves higher for a mastery-approach goal orientation than other achievement goal forms. This is consistent with findings in other undergraduate student populations, and is associated with learning behaviors that support self-regulation and deep processing of information. Effects of gender and class standing were found for goal orientations, but did not appear to influence resiliency. Resiliency was positively associated with a mastery-approach orientation, indicating influence of common precursors such as self-efficacy, self-determination, and need for achievement. Achievement goals and resiliency speak to motivation and capacity for academic merit, and maladaptive strategies can hinder professional development of the student while jeopardizing mental health. Attunement of instructors to the apparent resiliency and achievement goal orientations of individual students could allow for more learner-centered instruction, especially for students who are performing poorly. Further work is needed to investigate relationships between achievement goal orientations, academic performance, and aspects of self-regulated learning among agricultural science students.

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