



The Case for Academic Regulation: Preliminary Results from an Innovative Intervention for Entry-Level College Students

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Abstract

Although there are many benefits to a college degree, student attrition continues to be an issue in higher education. Students in low socioeconomic status (SES), rural areas may be disproportionately impacted by the general factors that influence attrition, including lack of academic preparation and psychological distress. Combining academic skills training and the therapeutic approach of Dialectical Behavioral Therapy (DBT) may help alleviate both issues, promoting student success in college. The current study examines a small pilot application of TIGER PAWS (Targeted Intervention for enhancinG Educational Readiness and Promoting Affective Wellbeing in Students) in sample of 33 entry-level undergraduate students (73% female, age = 18-33 years) in the southern United States. Before and directly following the 8-week intervention, students completed measures of self-efficacy for learning, anxiety symptoms, depressive symptoms, and emotional dysregulation. Results indicated encouraging improvements in self-efficacy for learning ($t(32) = -5.205, p < .001$). There was no change in anxiety symptoms ($t(32) = .862, p > .05$). Surprisingly, there were modest increases in depressive symptoms ($t(32) = -2.219, p < .05$), which may be the result of enhanced emotional awareness, rather than symptoms per se, as emotion dysregulation significantly decreased ($t(32) = 2.336, p$

< .05). Although these findings need replication in a larger RCT design, results indicate early promise of a novel intervention to address the academic preparation and psychological wellbeing of entry-level college students.

Introduction

It is widely understood that having a college degree leads to improved life circumstances; despite this advantage, undergraduate student attrition has been a problem for decades (Tight, 2020). Many studies have investigated this phenomenon to understand not only why student attrition occurs, but how to address it (Babineau, 2018; Tight, 2020). Seymour et al. (1997) wrote *Talking about Leaving*, a book describing their multi-year study of student attrition from STEM programs at universities across the United States, which identified major causes of that attrition and multiple means to address them. Despite such illumination more than twenty-five years ago, attrition in STEM majors remains of great concern (Seymour et al., 2019). Indeed, the student attrition problem evident in STEM programs is representative of a problem that spans across all of higher education, underscoring the complexity of the issue (Seymour et al., 2019; Tight, 2020)

“Attrition” and “leaving” are terms commonly used for the phenomenon of “student dropout” and “departure,” while “retention” and “persistence” are terms often used interchangeably to describe students remaining in school to degree completion (Babineau, 2018; Elkins et al., 2000; Tight, 2022; Tinto, 1988). In many instances, reasons for dropout are the negative aspects of reasons for persisting; for example, if a student considers leaving school due to financial reasons, then providing financial support becomes the reason for persisting. There are various reasons why students drop out of school, and students in underrepresented groups (i.e., first generation, low socioeconomic status, ethnic minorities, and students from rural areas) are more commonly affected by these adverse situations (Babineau 2018; Morton et al., 2018), often because a single bad situation touches multiple areas of need. Underrepresented students are more likely to lack the training in K12 needed to prepare them for college (i.e., academic content and learning culture of college); they are aware of this shortfall and are very anxious about it affecting their success once they start college (Morton et al., 2018). This lack of training not only leaves underrepresented students greatly concerned, but it has also created a noticeable achievement gap (Portch, 2002). Underrepresented students are also more likely to lack social and financial support from their families, and due to the lack of support, are more likely to be adversely affected by personal problems (Babineau, 2018; Bitzer & Troskie-De Bruin, 2004; Martin, 2019; Morton et al., 2018). The majority of student dropouts occur during the first year of post-secondary schooling and support seems to be the most important factor in determining whether students persist to graduation or not (Aina et al., 2022; Elkins et al., 2000).

Support is important, because the first-year transition into higher education is associated with unique challenges (Tight, 2020). Seminal work by Tinto (1988) posited a three-step process of acculturation through which students must progress as they become formal members of their college community. During their first year of college, students must learn to separate themselves from their home culture, transition from their former ways of doing things into the college routine, and come to identify and incorporate themselves as members of their college culture (Elkins et al., 2000; Guzmán et al., 2021; Tinto, 1988). Recognizing the levels of difficulty inherent to this student acculturation process, Tinto’s work has been applied widely to improve the acculturation process on college campuses across the United States, resulting in the expansion of student

support from academics to a much more holistic approach (Elkins et al., 2000; Guzmán et al., 2021; Tight, 2020); yet even with this changed approach, student attrition is still a problem. An improved, and much more inviting and supportive atmosphere at college is clearly helpful for many students, but it does not fully address the extant external and internal struggles most underrepresented students bring with them when they arrive on campus. By directly addressing underrepresented students' psychological distress, both in relation to academic readiness and generally, interventionists can disrupt theorized pathways to attrition (Aina et al., 2022).

Psychological Distress

The fact that transitioning to college for incoming first-year students is a stressful time has been well established (Bewick et al., 2010; Bruffarts et al., 2018; Conley et al., 2023). Indeed, the first semester for incoming college first-year students is among the most stressful semesters in college, and many college students face untreated mental health symptoms (Bewick et al., 2010; Bruffarts et al., 2018). A number of studies across various countries have found that college students exhibit more psychological distress than age matched peers who do not attend college (Bore et al., 2016; Lacombe et al., 2016; Stallman, 2010; Ibrahim et al., 2013; Leahy et al., 2010; Stewart-Brown et al., 2000). Transition to college is a time of heightened stressors that may increase the risk for psychological distress. It has been reported that as many as 30-50% of college students meet criteria for at least one psychological disorder during any year (Blanco et al., 2008; Bruffarts et al., 2018). Suicide remains the second leading cause of death among college students (Casey et al., 2022; Suicide Prevention Resource Center, 2004). Sher et al. (1996) first noted more than two decades ago that elevated distress may be part of adaptation to college or young adulthood, but also that some students experience chronic distress in their first year and significant distress throughout their undergraduate years that necessitate symptomatology be taken seriously. Recent work continues to support this understanding of the college transition as moderately stressful for most and acutely stressful for some, including those from underrepresented groups (Conley et al., 2023).

Psychological distress is among the stressors that may lead to poorer student outcomes (Cvetkovski et al., 2018). Unmitigated stressors in college may play a role, potentially mediating the pathway from low family financial and social support to student attrition. Although interest in these connections is growing, currently there is little research regarding the effects of psychological distress on academic outcomes; however, a recent systematic review and meta-analysis of the limited studies concluded that student stress and depression significantly elevated attrition, albeit with a small effect size (Leow et al., 2024). Indeed, the small pool of existing research indicates some mixed findings regarding mental health symptoms and academic outcomes, or more specifically, student dropout rate. A study conducted in the United States examining dropout rates of first-generation college students with psychological distress found that psychological distress predicted dropout rates among this student population (Martinez et al., 2009). It is noteworthy that a sizable portion of college freshman from rural communities are first generation college students. However, a study completed by Cvetkovski et al. (2018) found that Australian students with psychological distress had significantly lower odds of dropping out and higher degree completion rates than their counterparts who did not suffer from psychological distress. One possibility is that the harmful effects of psychological distress may be buffered by intrapersonal psychological resources (Cvetkovski et al., 2018). While the research outcomes

regarding effects of psychological distress are mixed, rural, first-generation students may be disproportionately affected by psychological distress.

Certain psychological variables enhance the chance for psychological distress and consequently, poorer college adjustment. For instance, Aydin (2023) found that the psychological characteristics of psychological inflexibility, rumination, and worry were contributors to freshman college adjustment. Other researchers have delineated psychological variables that undermine college adjustment, such as poor emotional regulation. Conversely, researchers have identified psychological variables that enhance student adjustment to college. In the same study as previously mentioned, Aydin (2023) also identified that self-compassion as a protective factor to college adjustment. Examples of additional helpful characteristics include reappraisal, introspection, and resiliency. Research suggests that psychological composition plays a role in how well or poorly students transition to college life.

Intervention for Academic Regulation

Intervention science allows for the development of treatment and prevention models to assist vulnerable groups at specific points in development. The creation of screenings and/or interventions can provide tools necessary to evaluate and treat those who may be considered at-risk. Utilization of intervention science improves understanding of how individuals may respond to specific environments and the skills/tools needed to improve their process. Screening individuals and intervening in their processes can provide growth opportunities in vulnerable populations while simultaneously reducing ineffectual behaviors, which could limit one's ability to thrive (Romano, 2015). The current study was conducted to test a novel intervention combining emotion-focused teaching and academic skills training (Targeted Intervention for enhancing Education Readiness and Promoting Affective Well-being; TIGER PAWS), designed to improve the educational outcomes of undergraduate students.

Dialectical Behavioral Therapy (DBT), combines components from Cognitive Behavioral Therapy (CBT), Dialectics, and Existential Therapy to address difficulties with emotional dysregulation (Linehan, 2015). The therapy is based in dialectical and biosocial theory with a focus on addressing thinking, feelings, behaviors, and interpersonal relationships to help establish increased ability to regulate emotions. The goal of the therapy is to help develop a life worth living with radical acceptance of reality (Lineham, 2015). DBT used with college students has been found to decrease depression and suicidal thinking, increase resilience and general mental health, and reduce distress during the Covid-19 lockdowns (Lee & Mason, 2019; Pistorello et al., 2012; Rizvi et al., 2022).

Self-regulation training has been found to be beneficial in improving students' ability to use metacognition to manage their learning, leading to greater wellbeing (Hadwin et al., 2022). Enabling academic engagement protects against burn out leading to dropout intentions (Alves et al., 2022). Improving academic self-regulation skills assists students as academic achievement and performance in college are related to these skills (Hammer et al., 2018; Kaur et al., 2018; Onivehu et al., 2018). Lack of academic self-regulation skills has a relationship with student procrastination and struggle (Balkis et al., 2016), especially among first-generation students who report lower self-regulation skills compared to second-generation students (Williams & Hellman, 2004).

Not only do increased academic self-regulation skills improve academic outcomes, but they also help alleviate student stress, which was found to impact student well-being (Barbayannis et al., 2022). Student mental well-being was found to impact student academic self-efficacy (Grotan et al., 2019). The inability to use effective coping skills relates to increased intentions to dropout (Alves et al., 2022). Consequently, an intervention to build both academic self-regulation skills and emotional regulation skills, such as using DBT skills, addresses two areas of concern related to improving students' ability to be successful in college.

The Present Study

Underrepresented students in higher education, including first-generation, low socioeconomic status, ethnic minorities, and students from rural areas face added challenges to graduating from college (Morton et al., 2018). In particular, lack of academic preparation for college that may undermine self-efficacy for learning, and psychological distress, stand out as important, modifiable risk-factors facing entry-level college students (Babineau, 2018; Cvetskovski et al, 2018). Intervention science highlights the growth opportunities possible if these risk-factors can be targeted early in the college career. The goal of the current study was to test the feasibility and efficacy of a novel intervention combining academic skills training with DBT skills training (TIGER PAWS), in order to enhance student perceived self-efficacy for learning and to alleviate psychological distress. As such, the study aims were to 1) test the feasibility of the intervention for entry-level college students and 2) examine changes in student self-efficacy for learning and psychological distress. In accordance with aim 2, we hypothesized that students' post intervention change scores would indicate enhanced self-efficacy for learning and decreased psychological distress.

Participants

Data were derived from 33 undergraduate students (73% female, age = 18-33 years) who participated in a novel academic regulation intervention (N = 57 recruited) to improve academic readiness and affective wellbeing. All students were enrolled in an introductory psychology course at a rural, teaching-focused university in the southern United States. All students over the age of 18 enrolled in the course, regardless of course section, were eligible to participate in the intervention. The current sample consisted only of students who completed the study, including the pre- and post-assessment. Demographically, the sample is representative of the area. Twenty-seven percent of students reported a combined annual parental income of \$30,000 or less, 40% reported between \$30,001 and \$83,000, and the remaining 33% reported a combined parental income of more than \$83,000 per year. Students reported that 49% of mothers and 43% of fathers had completed, on average, less than or equal to a high school education/GED. Forty percent self-identified as first-generation college students. Students also self-identified as white (70%), Hispanic/Latinx (6%), Native American (3%), and multi-racial or multi-ethnic (21%).

Procedure

All students were informed about the study by their course instructors, including dissemination of an information sheet and collection of a signed consent form. Students completed the pre- and post-assessments on personal computers, approximately one week before the start of intervention and within two weeks of intervention completion, respectively. The intervention consisted of eight weekly sessions, each lasting approximately 30 minutes. In-person sessions

took place in the classroom where the introductory psychology class was held, with a remote option for students via zoom. Students received skills training in the sessions. The academic self-regulation skills addressed organizing a student planner, note taking, critical thinking, reading comprehension, metacognition, and study skills. Students were also given writing skills training to include tips for better organization, grammar use, and finding reliable sources. The emotional regulation skills addressed mindfulness, distress tolerance, emotional education, finding maladaptive thoughts and emotions, building mastery, coping, self-care, and radical acceptance. A trained clinician administered the intervention curriculum. Students received course credit in exchange for participation. The intervention took place during the first half of the fall semester in 2022. The authors' Institutional Review Board (East Central University) approved all study procedures.

Measures

Students first completed a demographic questionnaire for participant gender, race/ethnicity, age range, parental income, parental education, and first-generation status.

Self-Efficacy for Learning. Students completed the Self-Efficacy for Learning Form (SELF) to gauge their self-efficacy related to academic learning in college (Zimmerman & Kitsantas, 2005). Students rated their own self-efficacy beliefs on 57 questions using an 11-point Likert scale with answers rated on a sliding scale between 0 % (*Definitely cannot do*), 50% (*Maybe I can do it*), and 100% (*Definitely can do it*). Example items include “When a lecture is especially boring, can you motivate yourself to keep good notes” and “When you have time available between classes, can you motivate yourself to use it for studying?” In the current sample, $\alpha = .96$ and $.95$, at pre- and post-assessment, respectively.

Anxiety symptoms. Students completed The Screen for Child Anxiety Related Disorders, a report of students' anxiety symptoms (SCARED; Birmaher et al., 1995). The scale contains 41 items on a 3-point Likert scale from 0 (*not true or hardly every true*) to 2 (*very true or often true*). Students were asked to think about their feelings and experiences over the past three months. Example items include “People tell me that I worry too much” and “I am nervous.” Higher scores indicate more anxiety symptoms. Extant work supports the psychometric properties of the SCARED, including in older adolescent and emerging adult samples (Birmaher et al., 1995; Christiaens et al., 2021; Kretschmer et al., 2018). In the current sample, $\alpha = .95$ and $.95$, at pre- and post-assessment, respectively.

Depressive symptoms. Students completed the Patient Health Questionnaire-9, a report of students' depressive symptoms (PHQ-9; Spitzer et al., 1999). The scale contains 9 items on a 4-point Likert scale from 0 (*not at all*) to 3 (*Nearly every day*). Students were asked to assess how often they felt bothered by symptoms in the past two weeks. Example items include “Feeling down, depressed, or hopeless” and “Feeling tired or having little energy.” Higher scores indicate more depressive symptoms. Previous work supports the psychometric properties of the PHQ-9 (Kroenke et al., 2001). In the current sample, $\alpha = .89$ and $.87$, at pre- and post-assessment, respectively.

Emotional Dysregulation. Students completed the Difficulties in Emotion Regulation Scale, a multidimensional report of emotion dysregulation (DERS; Gratz & Roemer, 2004). The total scale

contains 36 items on a 5-point Likert scale from 1 (*Almost always*) to 5 (*Almost never*). Students were asked to select the response most true for them. Example items include “I have difficulty making sense of my feelings” and “When I am upset, I believe there is nothing I can do to make myself feel better.” Higher scores indicate greater emotional dysregulation. Prior work supports the psychometric properties of the DERS (Gratz & Roemer, 2004). In the current sample, $\alpha = .95$ and $.95$, at pre- and post-assessment, respectively.

Plan of Analysis

Descriptive statistics of key study variables were examined for pre- and post-assessment, including correlations and variable means. Next, paired-sample *t*-tests investigated potential differences in pre- and post-assessment scores for anxiety symptoms, depressive symptoms, emotional dysregulation, and self-efficacy for learning. All analyses were conducted in SPSS version 28.

Results

Table 1 includes pre- and post-assessment measure descriptive statistics and correlations. Learning self-efficacy was unrelated to all other measures for both assessments. Anxiety symptoms, depressive symptoms, and emotional dysregulation were all positively correlated with one another at each assessment. Table 2 includes results from the paired sample *t*-tests and the associated effect sizes. Results indicate a significant increase in learning self-efficacy ($t(32) = -5.205$, $p < .001$). There was not a significant change in anxiety symptoms ($t(32) = .862$, $p > .05$) between pre- and post-assessment. However, there was a significant increase in depressive symptoms ($t(32) = -2.219$, $p < .05$). Furthermore, there was a significant decrease in emotion dysregulation ($t(32) = 2.336$, $p < .05$) from pre- to post-assessment. In summary, students reported greater learning self-efficacy after the intervention than before. Students’ anxiety symptoms appeared unchanged across the intervention, whereas their depressive symptoms showed a modest increase. Importantly, students reported significantly less emotional dysregulation and greater learning self-efficacy after the intervention than before.

Table 1 Correlations, Means, and Standard Deviations for Study Variables at Pre- and Post-Assessment

Variable	1	2	3	4	Mean	SD
1. Learning Self-Efficacy	1	-.151	-.231	-.295	3455.36	852.92
2. Anxiety Symptoms	.050	1	.776***	.723***	32.850	17.65
3. Depressive Symptoms	-.014	.649***	1	.654***	5.79	4.58
4. Emotion Dysregulation	-.190	.698***	.679***	1	89.76	24.90
Mean	4105.61	31.06	7.58	81.88	--	--
SD	833.85	18.35	6.25	24.64	--	--

Note. Means and correlations for pre and post are presented above and below the diagonal, respectively. * $p < .05$; ** $p < .01$; *** $p < .001$

Table 2 Paired-Sample *t*-tests with 95% Confidence Intervals and Effect Sizes

	t	df	p	Mean Difference	95% CI		Cohen's D
					Lower	Upper	
Learning Self-Efficacy	-5.21	32	<.001	-650.24	-904.73	-395.76	-.91
Anxiety Symptoms	.86	32	.39	1.78	-2.44	6.01	.15
Depressive Symptoms	-2.22	32	.03	-1.78	-3.43	-0.15	-.39
Emotion Dysregulation	2.34	32	.03	7.87	1.01	14.75	.41

Discussion

The first aim of this study was to examine the feasibility of the novel academic regulation intervention TIGER PAWS. In general, recruitment and retention for the study provided challenges. Although 57 individual students were enrolled in the study at the pre-test, only slightly more than half completed the study, including post-assessment (n=33). One possible cause of attrition may include students dropping out of the course. However, the sizable attrition was likely due largely to issues surrounding post-assessment completion. For the pre-test, one instructor made course time available for students to complete the assessments on their laptops. For the post-test, these students were expected to complete the assessment on their own time. With respect to future scaling of the intervention, incentivizing participants may help to alleviate attrition issues. Additionally, working with all course instructors to ensure that students may use class time to complete both the pre- and post-assessments may further enhance retention and study completion.

The second aim of the study was to explore changes in students' self-efficacy for learning and psychological distress. As hypothesized, students reported greater self-efficacy for learning at the post-assessment than the pre-assessment. Although the effect size for this change is extremely large, these results should be interpreted with caution, given the small sample size (Westlund & Stuart, 2017). The goal of the study was to increase academic self-regulation in new college students with sessions specifically designed to give students more skills to be successful in college, which the results suggest were effective. The students were able to use these skills to increase their academic success. However, another possible explanation may be that students feel more confident in college after gaining experience by attending classes and completing their classwork. Further research needs to utilize a control group in order to demonstrate the effectiveness of the intervention above and beyond any general gains over the first half of the semester for students.

Pre-assessment average scores for psychological distress measures, including anxiety and depressive symptoms, reiterate the need for intervention. For example, pre-assessment average scores for depressive symptoms exceeded the suggested cutoff for mild depression (Spitzer et al., 1999). Similarly, pre-assessment average scores for anxiety symptoms exceeded the diagnostic criteria for an anxiety related emotional disorder (Canals et al., 2012). These initial data echo the warranted concerns of educators for students' psychosocial well-being. Encouragingly, students reported significant decreases in emotion dysregulation from the pre- to the post-assessment. The skills training students received to address emotional regulation were designed to be easy to use, relevant to students' experiences, and helpful to address emotional tumultuousness. Another possible explanation for this improvement includes students' feelings of

mastery and accomplishment in their college experience, which might increase their confidence in their own emotional regulation skills.

Interestingly, however, students also reported significantly increased depressive symptoms from pre- to post-assessment. Although unexpected, this counter-intuitive finding may actually reflect increased awareness of emotions, including negative emotions, as evinced through the changes in emotion dysregulation. Before regulation of emotion can occur, the individual must first recognize and appropriately label those emotions (Gross et al., 2015). In participating in the short 8-week intervention, students may have enhanced their self-reflection and emotional awareness but not yet fully utilized coping skills learned to regulate depressive symptoms. Alternatively, it is also possible that the timing of the post-assessment, which occurred during the stressful midterm exam period of the semester, may also help to explain the increased depressive symptoms over the last two weeks. During midterms, students may be experiencing temporary disruptions in sleep, eating, and other routines. In scaling the study, future assessments at the end of the semester, one year out, and two years out may be useful in clarifying the context of the changing depressive symptoms.

Although hypothesized, there were no significant changes in anxiety symptoms between the pre- and post-assessments. Of note, mean anxiety scores were trending down at the post-assessment but were not significantly different. It is possible that the time interval of assessment, which instructed students to think about feelings over the past three months, may not have been sensitive enough to capture change during the brevity of the intervention. Alternatively, the severity of anxiety symptoms observed in this sample may simply not be amenable to brief intervention. Relatedly, the timing of the post-assessment may also be a factor, as midterms are a stressful point in the semester for students, which might mask longer term changes. In the future, additional data points using a more time-sensitive measure of anxiety symptoms, such as the Depression Anxiety Stress Scales (Henry & Crawford, 2005) may help to clarify the putative impact of the intervention on anxiety symptoms.

Overall, this study's novel intervention for academic regulation (TIGER PAWS) shows promise for the potential enhancement of student learning self-efficacy and for supporting student emotion regulation, important modifiable factors for entry-level student success in higher education. A replication with a larger sample in an RCT design is needed in order to clarify mechanisms with respect to the impact of the intervention on anxiety and depressive symptoms and to more accurately estimate effect sizes.

Limitations and Implications for Future Research

Despite the innovation of the intervention and encouraging findings from this small pilot sample, the current study is not without limitations that would need to be addressed in a larger trial. First, this pilot study lacks a control group. Although the supremacy of the Randomized Controlled Trial has been called into question recently, one advantage of the control group is the comparison with the treatment group (Sullivan, 2011). Secondly, the pilot study lacks any data on student retention and grade point average (GPA), despite the theorized linkage between intervention and these outcomes. A larger study would need to incentivize student survey completion beyond the post-test to gather this essential data and examine if the intervention has the desired effects on these

variables. Thirdly, overall participation was low, including a low completion rate for the post-test, which could be masking selection effects. A larger study would need to ensure greater study retention, which could also be achieved through the incentivization of students beyond the course participation credit offered in this pilot study. Despite these concerns, the pilot study shows promise, as the limited data from this small sample indicate gains in perceived learning self-efficacy and emotion regulation.

Conclusion

The TIGER PAWS study was a pre- and post-pilot study using the intervention of an 8-session academic and emotional regulation skills training with entry-level undergraduate students. Students showed significant improvement in self-efficacy for learning and significant decrease in emotional dysregulation. However, there was no change in anxiety symptoms and a significant increase in depressive symptoms, which may be impacted by the post measure occurring during mid-terms. Also, an increase in depressive symptoms may relate to examining negative emotions while engaging emotional regulation skills. Although the study does have limitations, the gains of the students in self-efficacy for learning and emotional regulation skills suggest future studies would be beneficial as an improved intervention might further assist entry-level undergraduates, especially those in rural communities, develop the needed skills to remain in college. This study adds to the field of knowledge of academic self-efficacy, emotional regulation skills, and rural undergraduate retention.

References

- Abreu Alves, S., Sinval, J., & Neto, L.L., Maroco, J., Ferreira, A.G., & Oliveira, P. (2022). Burnout and dropout intention in medical students: The protective role of academic engagement. *BMC Medical Education*, 22, 83. <https://doi.org/10.1186/s12909-021-03094-9>
- Aina, C., Baici, E., Casalone, G., & Pastore, F. (2022). The determinants of university dropout: A review of the socio-economic literature. *Socio-Economic Planning Sciences*, 79, 101102. <https://doi.org/10.1016/j.seps.2021.101102>.
- Aydin, Y. (2023). Psychological inflexibility, ruminative thinking, worry and self-compassion in relation to college adjustment. *Bartın University Journal of Faculty of Education*, 12(2), 422-434. <https://doi.org/10.14686/buefad.1022706>
- Babineau, K. (2018). *Closing the Gap: An Overview of the Literature on College Persistence and Underrepresented Populations*. New Orleans, LA: Cowen Institute.
- Balkis, M., & Duru, E. (2016). Procrastination, self-regulation failure, academic life satisfaction, and affective well-being: Underregulation or misregulation form. *European Journal of Psychology of Education*, 31, 439–459. <https://doi.org/10.1007/s10212-015-0266-5>
- Barbayannis, G., Bandari, M., Zheng, X., Baquerizo, H., Pecor, K. W., & Ming, X. (2022). Academic stress and mental well-being in college students: Correlations, affected groups, and COVID-19. *Frontiers in Psychology*, 13, 886344. <https://doi.org/10.3389/fpsyg.2022.886344>
- Bewick, B., Koutsopoulou, G., Miles, J. Slaa, E. & Barkham, M. (2010). Changes in undergraduate students' psychological well-being as they progress through university. *Studies in Higher Education*, 35(6), 633-645. <https://doi.org/10.1080/03075070903216643>

- Bitzer, E., & Troskie-De Bruin, C. (2004). The effect of factors related to prior schooling on student persistence in higher education. *South African Journal of Education*, 24(2), 119-125. <https://hdl.handle.net/10520/EJC31989>
- Blanco, C., Okuda, M., Wright, C., Hasin, D. S., Grant, B. F., Kiu, S. M., & Olfson, M. (2008). Mental health of college students and their non-college-attending peers; Results from the national epidemiological study on alcohol and related conditions. *Archives of General Psychiatry*, 65(12), 1429-1437. <https://doi.org/10.1001/archpsyc.65.12.1429>
- Bore, M., Pittolo, C., Kirby D., Dluzewska, T., & Marlin, S. (2016). Predictors of psychological distress and well-being in a sample of Australian undergraduate student. *Higher Education Research & Development*, 35(5), 869-880. <https://doi.org/10.1080/07294360.2016.1138452>
- Bruffaerts, R., Mortier, P., Kiekens, G., Auerbach, R. P., Cuijpers, P., Demyttenaere, K., Green, J. G., Nock, M. K., & Kessler, R. C. (2018). Mental health problems in college freshmen: Prevalence and academic functioning. *Journal of Affective Disorders*, 225, 97–103. <https://doi.org/10.1016/j.jad.2017.07.044>
- Casey, S. M., Varela, A., Marriott, J. P., Coleman, C. M., & Harlow, B. L. (2022). The influence of diagnosed mental health conditions and symptoms of depression and/or anxiety on suicide ideation, plan, and attempt among college students: Findings from the Healthy Minds Study, 2018–2019. *Journal of Affective Disorders*, 298, 464-471. <https://doi.org/10.1016/j.jad.2021.11.006>
- Christiaens, A. H., Nelemans, S. A., Meeus, W. H., & Branje, S. (2021). Identity development across the transition from secondary to tertiary education: A 9-wave longitudinal study. *Journal of Adolescence*, 93, 245-256. <https://doi.org/10.1016/j.adolescence.2021.03.007>
- Coles, A. S., Conley, D. T., Davies, G. K., King, J. E., Portch, S. R., & Tinto, V. (2002). The challenge of access and persistence. University of Wisconsin, Madison, WI.
- Conley, C. S., Huguene, B. M., Shapiro, J. B., & Kirsch, A. C. (2023). Developmental trajectories and predictors of psychological well-being and distress across the college years. *The Journal of Higher Education*, 94(6), 792-821. <https://doi.org/10.1080/00221546.2023.2171213>
- Cvetkovski, S., Jorm, A. F., & Mackinnon, A. J. (2018). Student psychological distress and degree dropout or completion: A discrete-time, competing risks survival analysis. *Higher Education Research & Development*, 37(3), 484-498. <https://doi.org/10.1080/07294360.2017.1404557>
- Elkins, S. A., Braxton, J. M., & James, G. W. (2000). Tinto's separation stage and its influence on first-semester college student persistence. *Research in Higher Education*, 41(2), 251-268. <https://doi.org/10.1080/07294360.2017.1404557>
- Gross, J. J. (2015). Emotion regulation: Current status and future prospects. *Psychological Inquiry*, 26(1), 1-26. <https://doi.org/10.1080/1047840X.2014.940781>
- Grøtan, K., Sund, E. R., & Bjerkeset, O. (2019). Mental health, academic self-efficacy and study progress among college students – The SHoT Study, Norway. *Frontiers in Psychology*, 10, 408316. <https://doi.org/10.3389/fpsyg.2019.00045>
- Guzmán, A., Barragán, S., & Cala Vitery, F. (2021). Dropout in rural higher education: A systematic review. *Frontiers in Education*, 6, 1–14. <https://doi.org/10.3389/educ.2021.727833>
- Hadwin, A. F., Sukhawathanakul, P., Rostampour, R., & Bahena-Olivares, L. M. (2022). Do self-regulated learning practices and intervention mitigate the impact of academic challenges

- and COVID-19 distress on academic performance during online learning? *Frontiers in Psychology*, 13, 813529. <https://doi.org/10.3389/fpsyg.2022.813529>
- Hammer, D., Melhuish, E., & Howard, S.J. (2018). Antecedents and consequences of social-emotional development: A longitudinal study of academic achievement. *Archives of Scientific Psychology*, 6(1), 105–116. <http://dx.doi.org/10.1037/arc0000034>
- Ibrahim, A. K., Kelly, S. J., Adams, C.E., & Glazebrook, C. (2013). A systematic review of studies of depression prevalence in university students. *Journal of Psychiatric Research*, 47, 391-400. <https://doi.org/10.1016/j.jpsychires.2012.11.015>
- Kretschmer, T., Veenstra, R., Branje, S., Reijneveld, S. A., Meeus, W. H., Deković, M., Koot, H. M., Vollegergh, W. A. M., & Oldehinkel, A. J. (2018). How competent are adolescent bullying perpetrators and victims in mastering normative developmental tasks in early adulthood? *Journal of Abnormal Child Psychology*, 46, 41-56. <https://doi.org/10.1007/s10802-017-0316-3>
- Larcombe, W., Finch, S., Sore, R., Murray C. M., Kentish, S., Mulder, R.A., Lee-Stecum, P., Baik, C., Tokatlidis, O. & Williams, D. A. (2016). Prevalence and socio-demographic correlates of psychological distress among students at an Australian university. *Studies in Higher Education*, 41(6), 1074-1091. <https://doi.org/10.1080/03075079.2014.966072>
- Leahy, C. M., Peterson, R. F., Wilson, I. G., Newbury, J. W., Tonkin, A. I. & Turnbull, D. (2010). Distress levels and self-reported treatment rates for medicine, law, psychology, and mechanical engineering tertiary students: Cross-sectional study. *Australian and New Zealand Journal of Psychiatry*, 44(7), 608-615. <https://doi.org/10.3109/00048671003649052>
- Lee, S., & Mason, M. (2019). Effectiveness of brief DBT-informed group therapy on psychological resilience: A preliminary naturalistic study. *Journal of College Student Psychotherapy*, 30(1), 25–37. <https://doi.org/10.1080/87568225.2018.1425646>
- Leow, T., Li, W. W., Miller, D. J., & McDermott, B. (2024). Prevalence of university non-continuation and mental health conditions, and effect of mental health conditions on non-continuation: a systematic review and meta-analysis. *Journal of Mental Health*, 1-16. <https://doi.org/10.1080/09638237.2024.2332812>
- Lineham, M. (2015). *DBT skills training handouts and worksheets* (2nd ed.). The Guildford Press.
- Martin, J. (2019). Small rural high schools and college completion. *Student Research Submissions*. 382. https://scholar.umw.edu/student_research/382
- Martinez, J.A., Sher, K. J., Krull, J. L., & Wood, P. K. (2009). Blue-collar scholars? Mediators and moderators of university attrition in first-generation college students. *Journal of College Student Development*, 50(1), 87-103. <https://doi.org/10.1353%2Fcsd.0.0053>
- Morton, T. R., Ramirez, N. A., Meece, J. L., Demetriou, C., & Panter, A. T. (2018). Perceived barriers, anxieties, and fears in prospective college students from rural high schools. *High School Journal*, 101(3), 155-176. <https://www.jstor.org/stable/90024241>
- Onivehu, A.O., Kabir, A.A., Onyinyehci, E.O., & Bunmi, J.O. (2018). The relationship among information and communication technology utilization, self-regulated learning and academic performance of prospective teachers. *Acta Didactica Napocensia*, 11(1), 69–85. <https://doi.org/10.24193/adn.11.1.6>
- Pistorello, J., Fruzzetti, A.E., Maclane, C., Gallop, R., & Iverson, K.M (2012). Dialectical behavior therapy (DBT) applied to college students: A randomized clinical trial. *Journal of Consulting and Clinical Psychology*, 80(6), 982-94. <https://doi.org/10.1037/a0029096>

- Rizvi, S.L., Finkelstein, J., Wacha-Montes, A., Yeager, A.L., Ruork, A.K., Yin, Q., Kellerman, J., Kim, J. S., Stern, M., Oshin, L. A., & Kleiman, E. M. (2022). Randomized clinical trial of a brief, scalable intervention for mental health sequelae in college students during the COVID-19 pandemic. *Behaviour Research and Therapy*, 149, 104015. <https://doi.org/10.1016/j.brat.2021.104015>
- Romano, J. L. (2015). *Prevention psychology: Enhancing personal and social well-being*. American Psychological Association.
- Seymour, E., & Hewitt, N. M. (1997). *Talking about leaving: Why undergraduates leave the sciences* (Vol. 34). Westview Press, Boulder, CO.
- Seymour, E., & Hunter, A. B. (2019). *Talking about leaving revisited: Persistence, relocation, and loss in undergraduate STEM education*. Springer Nature, Switzerland AG.
- Sher, K. J., Wood, P. K., and Heather, G. J. (1996). The course of psychological distress in college: A prospective high-risk study. *Journal of College Student Development*, 37, 42-51.
- Stallman, H. M. (2010). Psychological distress in university students: A comparison with general population data. *Australian Psychologist*, 45(4), 249-257. <https://doi.org/10.1080/00050067.2010.482109>
- Stewart-Brown, S., Evans, J., Patterson, J., Petersen, S., Doll, H., Balding, J., & Regis, D. (2000). The health of students in institutes of higher education: An important and neglected public health problem? *Journal of Public Health Medicine*, 22(4), 492-499. <https://doi.org/10.1093/pubmed/22.4.492>
- Suicide Prevention Resource Center. (2004). *Promoting Mental Health and preventing Suicide in College and University Settings*. Education development Center. Newton, MA.
- Tight, M. (2020). Student retention and engagement in higher education. *Journal of Further and Higher Education*, 44(5), 689-704. <https://doi.org/10.1080/0309877X.2019.1576860>
- Tinto, V. (1988). Stages of student departure: Reflections on the longitudinal character of student leaving. *The Journal of Higher Education*, 59(4), 438-455. <https://doi.org/10.1080/00221546.1988.11780199>
- Westlund, E., & Stuart, E. A. (2017). The nonuse, misuse, and proper use of pilot studies in experimental evaluation research. *American Journal of Evaluation*, 38(2), 246-261. <https://doi.org/10.1177/1098214016651489>
- Williams, P.E., & Hellman, C.M. (2004). Differences in self-regulation for online learning between first- and second-generation college students. *Research in Higher Education* 45, 71–82. <https://doi.org/10.1023/B:RIHE.0000010047.46814.78>
- Zimmerman, B.J., & Kitsantas, A. (2005). *Self-efficacy for learning form (SELF)*. APA PsycTESTS. <http://dx.doi.org/10.1037/t21623-000>