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An Examination of College Student Academic Social Supports with Diverse College Students.

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Abstract

This study examined the validity of seven academic support scales and their relationships with demographics, achievement and retention of diverse college students. In study one, 207 students completed an online survey containing five scales assessing student perceptions of faculty, university, family and peer supports. Exploratory factor analysis results supported the hypothesized five-factor structure. In study two, 633 students responded to the five initial scales and two additional scales related to family and peers to replicate and extend the factor structure. EFA results supported the hypothesized seven-factor structure. In study three, we examined relationships between the academic social support scales, student demographics, college GPA and fourth semester retention. Demographic differences were present on student perceptions of faculty, university community, family academic discussions, family college persistence, and family financial supports. Moreover, the academic social supports predicted college GPA across four semesters and fourth semester retention. Implications for research and practice are discussed.

Introduction

Student persistence and graduation rates are important outcomes for postsecondary institutions. As a result, higher education professionals dedicate substantial efforts towards understanding their students' challenges to develop effective interventions [1,2]. These efforts are no surprise given low U.S. college student six-year graduation rates with 41.5% of the 2008 cohort of first-time college students failing to graduate within six years [3]. Increasing the importance of these efforts are racial disparities with 68.9%, 61.4%, 52.3%, 41.2%, and 39.7% of Asian, White, Hispanic, Black/African American and American Indian students from the 2008 cohort graduating in 6 years, respectively.

Postsecondary degree completion is associated with economic opportunity. Recent analyses demonstrate possessors of bachelor's degrees earn 50% more than those with high school degrees or less [4]. In addition, there are significant financial and psychological costs associated with failing to complete a college degree once one has started. Recent analysis of national data indicates 24% of college dropouts and 9% of college graduates default on student loans. These individuals likely experience increased psychological distress when departing college and the negative impacts extend to families and communities [5,6].

College degree attainment in the United States has remained relatively stable while steadily increasing in advanced countries [7]. While the global economy is demanding workers with higher levels of education, the United States lags in responding. Extensive higher education research focuses on correlates of college completion. As a result, postsecondary achievement has well-established relationships with high school grade point average (GPA), standardized measures of achievement (e.g., SAT) and socioeconomic status [8-10]. These factors are largely restricted in utility to informing student admissions decisions and identifying students at-risk of academic failure. Furthermore, these characteristics are not causally explanatory. Instead, high school GPA, standardized measures of achievement, and socioeconomic status correlate with structural inequities, opportunity to learn, and academic social supports.

Conceptual Framework: Psychosocial Constructs from Educational Persistence Models

Psychosocial factors involve the interplay of psychological and social dynamics. Academic social supports are psychosocial factors implicated by several postsecondary persistence theories [11-15]. Tinto's Theory of Student Departure is likely the dominant theoretical explanation of college student persistence [16]. According to Tinto, psychosocial factors that positively influence academic and social integration are essential for postsecondary persistence

[15]. Postsecondary integration can be formal and informal with the former institutionally driven and the latter individually driven. For example, student academic achievement and faculty interactions are examples of formal and informal indicators of academic integration, respectively. Correspondingly, participating in university sanctioned extracurricular group activities and studying with peers are examples of formal and informal indicators of social integration. Recent evidence indicates differences in student preferences for types of formal and informal social integration, and that relationships between the types of postsecondary integration and intent to persist differ by demographic characteristics [17].

Tinto's student departure model has received criticism for theorizing that successful postsecondary academic and social integration requires separation from family, ignoring forces external to postsecondary contexts, failing to consider financial concerns, and privileging the experiences of traditional college students [13,14]. Theoretical limitations aside, Tinto's student departure model is the most cited persistence theory in the postsecondary literature [18]. As a result of focusing on a single theory of postsecondary persistence less empirical research examines competing persistence theories that implicate, among other factors, family and financial supports [11,13,14]. Furthermore, evidence indicates family-related academic supports play crucial roles in students' postsecondary persistence and attainment [19,20].

The present study focuses on the validation of academic social support scales aligned with key factors cited in contemporary postsecondary persistence theories and related empirical research. Academic social supports may be important to higher education success for several reasons. First, numerous students flourish while experiencing unchangeable risk factors associated with prior achievement and economic status. After accounting for risk factors, variability in academic achievement remains, and academic social supports are potential correlates [21]. Second, experiencing robust academic social supports can facilitate transfer experiences for underrepresented minority students who are first-generation college freshman [13]. Third, psychosocial characteristics are associated with student adjustment, persistence and attainment [19,20]. For these reasons, in depth knowledge of college student academic social supports in relationship to meaningful postsecondary outcomes is needed. Researchers and practitioners attempting to gather in-depth knowledge of these relationships require psychometrically sound scales.

Measurement of Postsecondary Social Supports

The definition of social support guiding our present study is provided by Robbins and colleagues as the "students' perception of the availability of the social networks that support them in college" (p. 267). According to theory and, peers, faculty and institution [16,21-24]. Relevant related measures are university social capital, perceived social support, social stress and family support [25-29]. Most research examining social supports used single-item indicators that are present in large datasets or are researcher-constructed [30,31]. Hence, a primary gap in the literature motivating the present study centers on the fact that these measures are not specific to college contexts and/or are not validated multidimensional assessments of academic social support. Furthermore, findings from postsecondary persistence studies implicate academic social support from family, peers, faculty and institutions as crucial factors in student success, which motivates our validation of dimensional scales that measure college students' perceptions of academic social support.

Academic Social Support and Achievement

Evidence indicates that academic social supports associated with family, peers, faculty and institution are related to academic achievement. Each of these supports are considered in the following sections.

Family academic supports

Family members establish and maintain academic behavior. Meta-analytic results found that general parental involvement predicts the academic achievement of middle school children [32]. Hill and Tyson further categorized parental involvement as home-based, school-based, and academic socialization. Academic socialization, defined as discussion of academic expectations and values, was the largest positive predictor of achievement measures in several domains of study. With college students, these relationships may differ, and parental support through academic socialization may increase relative to home- and school-based involvements.

Higher education research demonstrates that parental involvement is associated with beneficial postsecondary outcomes. Parental academic socialization factors are positive correlates of college enrollment, transitions, aspirations, persistence and achievement [20,33-37]. However, not all family academic supports are beneficial, for instance, intrusive parental involvement (i.e., "helicopter parenting") may result in lower psychological well-being, retention and achievement [38-40].

Peer academic supports

The primacy of family relationships is gradually replaced by peer relationships in adolescence. The student departure model proposes that separation is necessary for successful college integration [15,16]. Peers are central to growth and play significant roles in the transition to college and may provide support or encouragement that promotes college achievement and completion [41]. Research supports the positive influence of peers on postsecondary outcomes. Peers are associated with first-year college adjustment [23]. Palmer and Gasman conducted interviews with Black/African American males, their informants reported peers with similar educational goals influenced persistence [42]. Tierney and Venegas examined access to peer counseling with high school students [43]. Supportive peers increased student access to important information (e.g., financial aid deadlines) related to postsecondary success. In addition, with first-generation Hispanic college students perceived academic support from peers may mitigate limited family support for achievement [19].

Faculty and university supports

Two factors associated with student postsecondary integration are faculty and college supports [17, 44]. Research shows that the quantity of faculty interactions is positively associated with college achievement [45]. Further, Chang found that college community involvement is a strong predictor of quantity of faculty contact. Although quantity of interactions is important, faculty-student interaction benefits are likely attributable to the quality of faculty support. For example, Lundberg and Schreiner found that student perceptions of quality faculty interactions positively predicted student learning [46]. This relationship was particularly strong for historically underrepresented minorities.

Students also have many opportunities to participate in formal and informal social activities at postsecondary institutions and preferences

for type of activities varies by demographic characteristics. For example, students oftentimes interact in formal community events sponsored by cultural organizations and informal events such as study groups outside of classes. Recent evidence suggests that Black/African American students are more likely to engage in formal events and white students are more likely to participate in informal study groups and discussions [17]. In the same study, and contrary to Tinto's theory regarding academic socialization, participating in study groups and discussions was associated with departure intentions for white students. Comparable differences and relationships based on race and ethnicity may exist among other groups but the area is relatively understudied.

The Present Study

This three-part study focused on the valid measurement of academic social supports, because (a) academic social supports are essential to achievement, and (b) validity evidence for extant measures is limited. In three studies, scales representing seven dimensions of college student academic support in accordance with the reviewed literature were developed and examined; see Table 1 for scales, definitions and example items. In study one, we identified, developed, and tested the internal structure of the scales using exploratory factor analysis with a sample of college students. In the second study, we revised the scales and tested the internal structure with a unique sample of college students. In the final study, external measures from institutional records, GPA and retention of college students, were correlated with the developed subscales using multiple and logistic regression.

Table 1. College Student Academic Support Scales, Definitions and Sample Items.

Source of Academic Social Support	Scale Name	Definition	Sample Item
Parents/Guardian	Family College Persistence Support	Degree to which parents/ guardians socialize a student to persist and complete college.	"My family's expectations of my academic success motivate me to do well in college."
	Family Academic Discussions*	The frequency of discussions with parents/guardians related academic topics	"How often do you discuss with your parents/guardians topics studied in classes?"
	Family Financial Support	The degree to which a student can receive college financial support from parents/guardians.	"My family helps me pay tuition and fees."
Peers	Peer College Persistence Support	Degree to which peers support student persistence and completion of college degree.	"My friends support my pursuit of a college degree."
	Peer Academic Values*	Importance of academic-related behaviors among peer group.	"Among friends you spend time with how important is it attend classes regularly."
Faculty	Faculty Support	Degree to which faculty support college students' academic success.	"Faculty are supportive of my academic success at the university."
University	University Community	Degree to which student is integrated with community.	"I feel I am part of the university community."

*Scale added in Study Two

According to the Standards for Educational and Psychological Testing evidence based on internal structure and relationships with external variables supports the construct validity of scales [47]. Evidence based on internal structure means exploratory factor analytic results indicate a simple structure through within-scale items correlating highly and between-scale items exhibiting low correlations [48,49]. Evidence based on relationships with external variables means scale scores correlate with other variables in accordance with theory and prior evidence. For example, based on postsecondary persistence theories and related evidence, parent college persistence support should positively predict student persistence [14,36].

We performed two factor analytic studies with college students to examine evidence based on internal structure. First, we administered the academic social support scales and refined the scales based on exploratory factor analysis (EFA) results (Study 1). Second, we replicated and extended the EFA results from study 1 with a unique sample and the addition of two scales (Study 2). For evidence based on relationships to external variables, we aggregated the two samples to increase statistical power and examined the scales in relationship to student demographics, four semesters of

achievement and fourth semester persistence (Study 3). We predicted the EFA results would indicate items with related content loading on a single factor (Studies 1 and 2) and correlational evidence (Study 3) would show the scales have predictable relationships with demographics, semester achievement and end of fourth semester persistence. Additionally, we examined differential relationships associated with underrepresented minority students between the scales with achievement and persistence that were observed previously in the literature [13, 17,19].

Study 1: Materials and Methods

Participants

Participants included 233 freshman students (37.3% male and 62.7% female) from a large southwestern university; 26.6% were Asian, 13.1% were African/Black American, 18.2% were Hispanic, 2.8% were American Indian, 30.8% were White, and 9.4% other. Participants' mean age was 19.02 years (SD = 0.56 years) and mean high school and college GPAs were 3.47 (SD = 0.42) and 3.28 (SD = 0.65) respectively.

Procedures

Items were identified and developed from the reviewed literature. A pilot of 15 students completed the measure to reveal items with floor and ceiling effects. After revision, a five scale 35-item survey was administered online. Participants were randomly selected from institutional records and received an email inviting participation the first semester of their freshman year. The final response rate was 38%.

Instrumentation

Participants completed scales assessing support from family, peers, faculty and university community. In addition, sex, race, first generation college student status, age, expected family contribution (a measure of socioeconomic status), high school cumulative GPA, four semesters of college GPA and fourth semester retention were gathered from institutional records.

Family supports

Two scales measured social support provided by family. The first subscale, Family College Persistence Support, contained items related to the college persistence expectations of family members (e.g., "My family supports my pursuit of a college degree"). The scale had response options ranging from 1 = strongly disagree to 6 = strongly agree. The second subscale, Family Financial Support, contained items assessing family financial support (e.g., My family helps me pay tuition and fees"). Response options for the scale were 0 = no and 1 = yes.

Peer support

Using the same six-point scale, we measured Peer College Persistence Support, an informal measure of academic integration using Tinto's framework. The questions asked whether the friends of the respondents supported their college aspirations. For example, "My interactions with my friends has influenced my commitment to finishing my degree" assessed the level of academic support peers provide students for college completion. The scale had response options from 1 = strongly disagree to 6 = strongly agree.

Faculty and university community supports

Two scales ascertain the level of support provided by the faculty and university. The first scale, Faculty Support, a measure of informal academic integration, assessed faculty support for students (e.g., "I can talk to faculty members when I have problems"). The second scale, University Community, contained items focused on social integration with the college community (e.g., "Interacting with people at the university makes me feel like a part of a larger community"). Both scales had response options ranging from 1 = strongly disagree to 6 = strongly agree.

Analysis

To determine internal structure of the measure, we analyzed the data using exploratory factor analysis (EFA) with Geomin rotation (i.e., the factors were allowed to correlate) and robust weighted least squares (WLSMV) estimation in MPLUS V8.1. WLSMV estimation is robust to violations of normality and appropriate for models containing categorical and continuous indicators [50]. We selected factor solutions based on a combination of the following considerations: difference tests using DIFFTEST, Kaiser's criterion that retained factors have eigenvalues greater than 1.00, presence of simple structure (i.e., items load on only one factor) and fit indices. To evaluate fit indices, models with a RMSEA less than .05, SRMR less than .08 and CFI greater than .90 are considered adequate to excellent fitting [51,52].

Results

The initial model resulted in two family and two friend support items loadings below .30, and a faculty support item with a negative loading. Faculty and university support items had high loading so four items were removed to reduce item redundancy. A follow-up EFA with the refined 26-item scale and a five-factor solution achieved simple structure. The five-factor solution accounted for 72.2% of item variance. The first five eigenvalues were greater than 1.747, meeting Kaiser's criteria that an eigenvalue be greater than 1.00 for factor selection. Relative to the four-factor model the five-factor model better fit the data, $\Delta\chi2 = 125.233$, $p < .001$, RMSEA = .043, SRMR = .043 and CFI = .924. The six-factor model fit the data slightly better according to the $\chi2$ difference test, $p = .035$, and model fit indices (see Table 2). However, we selected the hypothesized five-factor model because the eigenvalue for the sixth factor was 0.907 and the six-factor solution contained split loadings, see item content and factor loadings for the five-factor model in table 3 and scale correlations in table 4. The scales had acceptable (>.70) to excellent reliabilities (> .90), with all Cronbach's αs > .75.

Table 2. Model Fit and Difference Test Results for Four- through Eight-Factor Models (Studies 1 and 2).

Model	DF	X^2	DIFFTEST	RMSEA (90% CI)	SRMR	
Study One Models						
4-Factor	227	471.855		0.072 (0.063, 0.081)	0.068	0.722
5-Factor	205	272.141	125.233**	0.043 (0.026, 0.052	0.043	0.924
6-Factor	184	243.702	34.129*	0.040 (0.025, 0.052)	0.033	0.932
Study Two Models						
6-Factor	429	1,420.424		0.060 (0.057, 0.064)	0.045	0.810
7-Factor	399	915.925	340.763**	0.045 (0.041, 0.049)	0.029	0.901
8-Factor	370	726.346	151.503**	0.039 (0.035, 0.043)	0.023	0.932

Notes: Model DIFFTEST comparisons are with the model in the row above. *p < .05 **p < .01

Table 3. Study 1. Factor loadings for Refined College Student Academic Support Scale

	F1	F2	F3	F4	F5
Faculty Support					
1. Faculty are supportive of my academic success at the university.	755				
2. Faculty are available to help me succeed.	798				
3. The faculty care about me.	901				
4. My interactions with faculty positively influence my commitment to succeed.	952				
5. I interact with faculty on this campus on a regular basis.	615				
6. I can talk to faculty members when I have problems.	731				
University Community					
1. I feel I am part of the university community.		866			
2. I am interested in what goes on at the university.		913			
3. The university is a good place to be.		781			
4. Interacting with people at the university makes me want to try new things.		703			
5. Interacting with people at the university makes me feel like a part of a larger community.		858			
Family College Persistence Support					
1. My family influences my academic persistence.			654		
2. My interactions with my family influence my commitment to finishing my degree.			903		

3. My family is the most important factor in completing my degree.			783		
4. Skills that I learned from my family help me navigate the university.			478		
5. My family's expectations of my academic success motivate me to do well in college.			797		
Peer College Persistence Support					
1. My friends support my pursuit of a college degree.				938	
2. My friends support my academic success.				902	
3. My interactions with my friends has influenced my commitment to finishing my degree.				445	
4. My friends would be disappointed if I quit school.				518	
Family Financial Support					
1. My family helps me pay tuition and fees.					829
2. My family helps me pay my housing.					933
3. My family helps me pay for food.					767
4. My family provides me with extra spending money.					747
5. If an emergency were to happen, my family would help financially.					856
6. If I received an unexpected bill, my family would help pay for it.					730

Notes: Geomin rotation. Standardized Factor Loadings < .30 not Shown.

Table 4. Study 1 Scale Correlations with Reliabilities in Bold on the Diagonal.

Scale	1	2	3	4	5
1. Faculty Support	911				
2. University Support	476**	037			
3. Family College Persistence Support	305*	341*	867		
4. Peer College Persistence Support	221*	345*	302*	806	
5. Family Financial Support	037	055	097	156*	757

*p < .05 **p < .001

Study 2: Materials and Methods

The purpose of study two was to replicate the five scales and add two scales, parent academic discussions and peer academic values. Literature suggesting parent academic discussions and peer academic values may influence student outcomes motivated the addition of the two scales [14,32].

Participants

Participants for study 2 included 633 students (44% male, 56% female) from the same southwestern U.S. University; 20.8% Asian, 20.78% Black/African American, 26.64% Hispanic, 5.2% American Indian, 33.3% White, and 1% other. Mean age was 18.92 years (SD = 1.53 years), mean high school and college GPAs were 3.39 (SD = 0.42) and 3.16 (SD = 0.68) respectively. The response rate was 40%.

Instrumentation.

We analyzed the five previously refined scales along with two new scales with exploratory factor analysis. The seven item Parental Ac-

ademic Discussions scale contained items related to the frequency of academic discussions (example content, "How often do you discuss with your parents/guardians topics studied in classes?") had response options of 1 = never to 4 = often. The five item Peer Academic Values scale assessed academic values provided by peers ("Among your friends you spend time with how important is it to study on a regular basis") had response options were 1 = not important to 4 = very important. This resulted in seven hypothesized scales for factor analysis.

Results

An EFA was performed on the student responses to the 38 items in the same manner described in study one. The seven-factor solution accounted for 67.86% of the variance. The first seven eigenvalues were greater than 1.451, meeting Kaiser's criterion that retained factors have eigenvalues greater than 1.00. Relative to the six-factor model the seven-factor model had better fit, $\Delta\chi 2 = 340.764$, $p < .001$, RMSEA = .045, SRMR = .029 and CFI = .901. The eight-factor model fit the data slightly better statistically (see Table 2). We selected the seven-factor model because the eigenvalue for the eighth factor was 1.009, indicating it accounted for little more variance than a single item, and the differences in model fit was substantively negligible. In addition, the eight-factor solution did not result in simple structure and the eigenvalues for the seven-factor model were all greater than 1.451. Parent academic discussions and peer academic values items loaded onto two distinct factors and original five scales replicated. See Table 5 for factor loadings and Table 6 for correlations between factors.

Table 5. Study 2. Standardized Factor loadings for College Student Academic Support Scale.

	F1	F2	F3	F4	F5	F6	F7
Faculty Support							
1. Faculty are supportive of my academic success.	873						
2. Faculty are available to help me succeed.	756						
3. The faculty care about me.	886						
4. My interactions with faculty positively influence my commitment to succeed.	833						
5. I interact with faculty on this campus on a regular basis.	610						
6. I can talk to faculty members when I have problems.	619						
University Community							
1. I feel I am part of the community.		792					
2. I am interested in what goes on at the University.		859					
3. The university is a good place to be.		730					
4. Interacting with people at the university makes me want to try new things.		822					
5. Interacting with people at the university makes me feel like a part of a larger community.		920					
Family Academic Discussions							
How often do you discuss with your parents/guardians:							
Topics studied in classes							
1. School activities			662				
2. Getting good grades.			564				
3. Finishing college.			642				
4. Continuing college after your four-year degree.			635				
5. Work after college			610				
Family College Persistence Support							
1. My family influences my academic persistence.				790			

2. My interactions with my family influence my commitment to finishing my degree.				918			
3. My family is the most important factor in completing my degree.				715			
4. My family's expectations of my academic success motivate me to do well in college.				612			
Family Financial Support							
1. My family helps me pay tuition and fees.					910		
2 My family helps me pay my housing.					957		
3 My family helps me pay for food.					861		
4. My family provides me with extra spending money.					621		
5. If an emergency were to happen, my family would help financially.					894		
6. If I received an unexpected bill, my family would help pay for it.					778		
Peer College Persistence Support.							
1. My friends support my pursuit of a college degree.						902	
2. My friends support my academic success at the university.						948	
3. My interactions with my friends has influenced my commitment to finishing my degree.						386	
4. My friends would be disappointed if I quit school.						383	
Peer Academic Values							
Among friends you spend time with how important is it to							
1. Attend classes regularly.							638
2. Get good grades.							771
3. Finish a four-year degree.							674
4. Continue education past a four-year degree.							552
5. Study on a regular basis.							552

Note: Geomin Rotation. Standardized Factor Loadings < .30 not Shown

Table 6. Study 2 Scale Correlations with Reliabilities in bold on the Diagonal.

Scale	1	2	3	4	5	6	7
1. Faculty Support	904						
2. University Community	477**	926					
3. Family Academic Discussions	247**	222**	819				
4. Family College Persistence Support.	283**	295**	452**	873			
5. Family Financial Support	168*	085	246*	261**	783		
6. Peer Academic Values	242**	326**	201**	120*	040	787	
7. Peer College Persistence Support.	319**	402**	213**	277**	152*	319**	860

*p < .05 **p < .01

Study 3: Materials and Methods

Participants

Participant responses from study one and two were aggregated to increase statistical power. This resulted in analytical samples between 633 and 840 participants. The analytic sample sizes differed because the parent academic discussions and peer academic values

scales were not administered in study one.

Analysis

The scales, semester GPAs and fourth semester retention status were analyzed as dependent variables using multiple and logistic regression. First, the academic support scales were regressed on demographic characteristics. Second, semester GPA and end of year two retention status were regressed on the scales and demographic characteristics. In both sets of analyses, we entered all possible interactions stepwise in a final block to explore relationships for future study. We report multiple R2 as a measure of effect size with values of .01, .09 and .25 interpreted as small, medium and large effects [53].

Results

The following section reports the results of multiple and logistic regression results. The first set of multiple regressions, examined whether student demographic characteristics predict academic social supports (see Table 7). The second set of multiple regressions analyzed the relationships between academic social supports and academic achievement as measured by semester GPA and whether these relationships differed by demographic characteristics (see Table 8). The logistic regression investigated the relationships between academic social supports and end of fourth semester retention.

Table 7. Multiple Regression Results with Academic Social Supports as Dependent Variables (Standard Errors in Parentheses).

	Faculty Support	University Community	Family Academic Discussions	Family College Persistence Support	Family Financial Support	Peer College Persistence Support	Peer Academic Values
Independent Variables							
Intercept	4.224 (0.086)*	4.642 (0.083)*	2.866 (0.055)*	4.567 (0.088)*	4.373 (0.124)*	4.949 (0.079)*	3.373 (0.043)*
Demographics							
Race/Ethnicity (ref = White)							
Black/African American	0.067 (0.123)	0.268 (0.116)*	0.096 (0.076)	0.261 (0.123)*	0.193 (0.174)	0.125 (0.112)	0.106 (0.059)
Asian	0.077 (0.113)	-0.082 (0.110)	-0.015 (0.076)	0.256 (0.117)*	0.616 (0.165)*	0.226 (0.106)*	0.115 (0.059)
Hispanic	0.114 (0.108)	0.198 (0.104)	0.103 (0.069)	0.265 (0.111)*	0.179 (0.156)	0.102 (0.100)	0.089 (0.054)
Native	0.538 (0.224)*	0.129 (0.217)	0.270 (0.143)	0.688 (0.231)*	-0.198 (0.327)	-0.029 (0.209)	0.165 (0.112)
Gender (ref = female)	-0.087 (0.080)	-0.151 (0.078)	-0.158 (0.052)*	-0.154 (0.082)	0.185 (0.116)	-0.107(0.075)	-0.046 (0.040)
Age	0.007 (0.052)	-0.059 (0.051)	-0.042 (0.030)	-0.004 (0.054)	-0.235 (0.076)	0.025 (0.049)	-0.006 (0.024)
Expected Family Contribution (SES)	0.037 (0.044)	0.005 (0.039)	0.002 (0.025)	0.040 (0.042)	0.363 (0.059)*	-0.014 (0.041)	0.015 (0.020)
High School GPA	0.048 (0.057)	-0.079 (0.040)*	-0.045 (0.027)	-0.107 (0.042)*	0.022 (0.060)	-0.003 (0.038)	0.009 (0.021)
First Generation College (ref = no)	0.162 (0.324)	0.420 (0.364)	-0.087 (0.193)	0.108 (0.336)	-1.072 (0.474)*	0.044 (0.303)	0.152 (0.150)
Interactions							
Black/African American by GPA	-0.320 (0.108)*						

Hispanic by GPA	-0.185 (0.092)*						
Hispanic by SES	-0.249 (0.110)*						
Black/African American by First		-1.457 (0.725)*					
Generation							
Asian by SES					-0.388 (0.124)*	0.228 (0.100)*	
R^2	0.031*	0.034*	0.035*	0.028*	0.099*	0.015	0.013

Table 8. Prediction of First Four Semesters' GPA and Fourth Semester Retention by Demographics and Academic Social Support Scales. (Standard Errors in Parentheses).

	GPA Fall First Semester	**GPA Spring Second Semester**	**GPA Fall Third Semester**	**GPA Spring Fourth Semester**	**Enrollment Fourth Semester**
Intercept	3.310 (0.049)*	3.206 (0.060)*	3.216 (0.067)*	3.127 (0.079)*	2.221 (0.301)*
Demographics					
Race/Ethnicity (ref = White)					
Black/African American	-0.186 (0.067)*	-0.227 (0.083)*	-0.258 (0.092)*	-0.191 (0.109)	-0.349 (0.367)
Asian	0.003 (0.067)	0.059 (0.083)	0.003 (0.093)	-0.041 (0.109)	1.713 (0.756)*
Hispanic	-0.090 (0.061)	-0.161 (0.075)*	-0.222 (0.084)*	-0.335 (0.098)*	0.103 (0.369)
Native	-0.747 (0.126)*	-0.623 (0.164)*	-0.794 (0.188)*	-1.194 (0.228)*	-2.221 (0.540)*
Gender (ref = female)	-0.031 (0.046)	-0.096 (0.057)	-0.141 (0.063)*	-0.053 (0.074)	0.126 (0.271)
Age	0.051 (0.027)	-0.014 (0.033)	-0.021 (0.036)	0.019 (0.042)	0.118 (0.154)
Expected Family Contribution (SES)	0.011 (0.022)	0.002 (0.028)	0.118 (0.039)*	0.040 (0.036)	-0.141 (0.134)
High School GPA	0.317 (0.024)*	0.316 (0.029)*	0.322 (0.033)*	0.373 (0.038)*	0.553 (0.146)*
First Generation College (ref = no)	-0.156 (0.169)	0.044 (0.242)	-0.151 (0.242)	-0.246 (0.288)	-0.380 (0.826)
Academic Social Supports					
Faculty Support	0.015 (0.026)	0.070 (0.033)*	0.013 (0.037)	0.029 (0.043)	-0.323 (0.169)
University Community	0.053 (0.027)*	-0.014 (0.034)	0.061 (0.039)	0.069 (0.046)	0.360 (0.154)*
Family Academic Discussions	0.031 (0.026)	-0.031 (0.033)	0.017 (0.036)	-0.041 (0.042)	-0.095 (0.160)
Family Financial Support	-0.013 (0.023)	0.012 (0.029)	-0.071 (0.036)*	-0.023 (0.043)	0.252 (0.125)*
Family College Persistence Support	-0.058 (0.029)*	-0.021 (0.036)	-0.134 (0.040)*	-0.053 (0.048)	0.329 (0.154)*

Peer College Persistence Support	0.019 (0.026)	-0.045 (0.033)	-0.043 (0.036)	-0.027 (0.042)	-0.070 (0.153)
Peer Academic Values	-0.003 (0.024)	0.008 (0.030)	0.000 (0.034)	0.028 (0.041)	0.108 (0.136)
Interactions					
Demographics by Demographics					
Asian by SES			-0.125 (0.063)*		
American Indian by First Generation		-1.142 (0.559)*			
Demographics by Academic Social					
Supports					
Black/African American by Family	0.162 (0.054)*	0.257 (0.069)*	0.284 (0.078)*	0.207 (0.094)*	
College Persistence Support					
Asian by Family Financial Support			0.240 (0.082)*	0.205 (0.096)*	
Asian by Faculty Support					1.894 (0.559)*
American Indian by Peer Academic				0.912 (0.233)*	
Values					
R^2	0.332*	0.276*	0.293*	0.278*	0.216*

Student demographic characteristics and academic social supports

Males reported fewer family academic discussions, B = -0.158, than females. Black/African American, Hispanic, American Indian and Asian students reported greater family persistence support, Bs = 0.261, 0.256, 0.265, 0.688, respectively, than white students. High school GPA was a negative predictor of family persistence support, B = -0.107. Age was a negative predictor, B = -0.235 and SES was a positive predictor, B = .363 of family financial support. First generation students reported less family financial support, B = -1.072. Asian students reported greater family financial support than white students, B = 0.616, but SES moderated this relationship with higher SES Asian students reporting less support, B = -0.388. Neither multiple regression for peer persistence support or peer academic values was statistically significant (i.e., both ps > .05).

American Indian students reported greater faculty support than white students, B = 0.538. Race moderated the relationship for high school GPA and SES with faculty support. High school GPA was a negative predictor of faculty support for Hispanic and Black/African American students, Bs = -0.185 and -0.320, respectively, and SES was a negative predictor for Hispanic students, B = -0.249. High school GPA negatively predicted university community, B = -0.179. Black/African American students reported greater perceptions of the university community than white students, B = 0.268. However, first generation status moderated this relationship for Black/African American students, B = -1.457, with these students reporting lower perceptions of the university community.

Prediction of achievement and retention with academic social supports.

Black/African American and American Indian students had lower first-semester GPAs than white students, Bs = -0.186 and -0.747, respectively. High school GPA was a positive predictor of first-semester GPA, B = 0.317. University community and family persistence supports were positive, B = 0.053, and negative predictors of first-semester GPA, B = -0.058, respectively. Race moderated the relationship between family college persistence support and first-year GPA with a positive relationship observed for Black/African American students, B = 0.162.

Hispanic, Black/African American and American Indian students had lower second-semester GPAs relative to white students, Bs = -0.227, -0.161 and -0.623, respectively. First generation status moderated race, with American Indian first-generation students earn-

ing lower second-semester GPAs, B = -1.142. High school GPA, B = .316, and faculty support, B = 0.070, were positive predictors of second semester GPA. Family college persistence support was a positive predictor of second-semester GPA for Black/African American students, B = .257.

Hispanic, Black/African American and American Indian students had lower third semester GPAs, Bs = -0.258, -0.222 and -0.794, respectively. Males had lower third-semester GPAs, B = -0.141 than females. SES, B = 0.118, and High school GPA, B = .322, were positive predictors. Family financial support, B = -0.071, and college persistence support, B = -0.134, were negative predictors of third-semester GPA. Race moderated these relationships with third-semester GPA, a positive relationship for financial supports with Asian students, B = .240, and a positive relationship for family college persistence support with Black/African Americans, B = .284, were observed.

Hispanic and American Indian students had lower fourth-semester GPA relative to white students, Bs = -.335 and -1.194. Black/African American students had a positive relationship for family college persistence support, B = .207 and American Indians had a positive relationship for peer academic values, B = 0.912 on fourth-semester GPA.

Fourth-semester retention

American Indians dropped out, B = -2.221 OR (odd ratio) = 0.109, and Asian students were retained, B = 1.713 OR = 5.554, at greater rates than white students. High school GPA positively predicted retention, B = 0.553 OR = 1.739. University community, B = 0.360 OR = 1.433, family college persistence, B = 0.329 OR = 1.390, and family financial support, B = 0.252 OR = 1.286, were positive predictors of fourth semester retention. Faculty support positively predicted retention, B = 1.894 OR = 6.648, for Asian students.

Discussion

Studies 1 and 2 provide evidence based on internal structure for three family-related academic supports. The correlational analyses provide incremental validity evidence for the family college persistence and financial support scales. Incremental validity evidence for family academic discussions is limited with one relationship with an external variable observed. In this case, males engaged in fewer academic conversations than their female counterparts; a finding that converges with prior research examining gender differences in parent support [54].

As noted by Reason, the role of family in student persistence is relatively unexplored due to the prevalence of studies situated in student departure theory [14,15,16]. Our data supports theoretical models of postsecondary persistence that acknowledge the role of family [13,14,55]. Contrary to Tinto's hypothesis that separation from family enhances social and academic integration, our results indicate family academic supports are important correlates of formal academic integration as measured by GPA and fourth semester persistence. Family college persistence support was associated with demographics, achievement and retention. The predictive validity of college persistence support may be due to it being a form of parental academic socialization. Parental academic socialization is the largest predictor of achievement in younger populations [32]. Underrepresented minority students reported greater levels of parent persistence support, this may be due to parents recognizing their students are underrepresented in college contexts and compensating with persistence support.

Unexpectedly, parent college persistence support negatively correlated with GPA, a finding that adds nuance to the parental academic socialization literature. It may be that when their students are in college, parents encourage persistence when academic challenges occur instead of when their students are performing highly. For Black/African American students, this relationship differed, family persistence support positively correlated with GPA. Analogous findings are present in the parenting styles research [56]. These findings suggest greater hands-on parenting is associated with achievement for Black/African American students. Furthermore, regardless of background, family college persistence support positively predicted student retention. When considered in conjunction with the negative relationship with GPA, it seems that parental persistence support may mediate the relationship between academic challenges and college retention.

Socioeconomic status (SES), as measured by expected family contribution, positively predicted family financial support, providing construct validity evidence, as a positive relationship between these two variables is expected. After adjusting for SES, family financial support negatively predicted third semester GPA. A possible explanation is that economic privilege may act as a deterrent to productive academic behaviors. These relationships were moderated by race with family financial support positively predicted by GPA and negatively predicted by SES support for Asian American students. Both of these findings indicate cultural differences exist among Asian American students in college finance-related behaviors. Further strengthening the incremental validity of the family financial support scale is its positive relationship with fourth-semester retention. Experiencing financial stress is a common reason for dropping out of college and access to additional financial support from family likely facilitates student persistence [57].

The exploratory factor analysis results provide evidence based on internal structure supporting the validity of peer college persistence and academic values scales. However, peer supports were not uniformly predictive of academic outcomes. Although speculative, the relationship between peer supports and academic achievement may be mediated by academic achievement goals, with high peer academic values associated with mastery learning goals. In support of this hypothesis are studies showing positive relationships between peer characteristics and achievement motivations [58,59]. In terms of differential relationships, as SES increased Asian American students reported greater peer persistence support. For American Indian students, peer academic values positively predicted

end of second year GPA, suggesting that future studies focusing on peer academic values and student achievement may be beneficial for this understudied and underserved student population [30].

According to the student departure model, formal and informal student integration increases the likelihood of college completion [15,16]. With a strong positive relationship observed between university community and fourth semester retention our results partially support this theory. In addition, and comparable to the findings of Xu and Weber, Black/African American students rated the university community higher than their comparable white peers [17]. However, this relationship varied, with first generation Black/African American students rating the university community considerably lower than their white peers. The first semester of college is a strategic time to build a sense of belonging and for first generation Black/African American students who perceive the university community as uninviting college departure may be more likely [60].

The EFA and correlational results provide evidence for the construct validity of the faculty support scale. According to prior research, quality of student-faculty interaction is associated with academic achievement [45]. In our study, American Indian students reporting greater faculty support relative to white students is of interest because the participating university is currently focusing efforts on improving academic outcomes for this population of students. The faculty support scale may be sensitive to this initiative. However, the negative faculty support relationships with GPA for Hispanic and Black/African American students were unexpected. A speculative explanation for this finding is that faculty may view high achieving Hispanic and Black/African American students as successful. As a result, faculty may devote their efforts to lower performing Black/African American and Hispanic students. Lastly, faculty support positively predicted second semester GPA, suggesting that the quality of first semester student relationships with faculty carries into subsequent semesters.

Implications for Practice

There are three implications for practice for postsecondary professionals. First, a recent survey found 35%, 42%, and 22% of academic affairs professionals develop interventions, conduct interventions, and assess interventions respectively [1]. Postsecondary interventions focused on enhancing social supports require valid assessments. The scales are sufficiently reliable for program evaluations where group differences are of primary interest. For example, a program interested in the quality of student interactions with family and peers may find the scales useful for charting student perceptions over time. Second, it is recommended higher education personnel encourage students to interact with faculty and college community [61]. With score reliabilities greater than .90 the college and faculty scales are appropriate for assessing individual students. College personnel interacting with students individually should consider utilizing these scales for discussing the college experience with students. Third, summer bridge programs seeking to integrate transitioning students may benefit from assessing student academic supports before and after students participate in a program and during their first year of college [2].

Strengths and Limitations

The study's primary strength is that the results are based on large samples; EFA requires 5-10 subjects per item for stable solutions and with 8.96 and 18.86 subjects per item in studies one and two the solutions should be robust [49]. The second strength is we replicated five of the initial academic support factors in study two. Replication of findings with unique samples strengthens the validity of conclusions. As with all research, the present study has limitations that reduce the ability to make valid inferences from the scales. Four primary limitations require careful consideration. First, five of the seven scales had reliabilities between .75 and .90. While adequate for group research, these scales are not appropriate for individual inferences [62]. Second, the scales may need additional elaboration related to cultural supports. Underrepresented minority students may benefit from other home and community supports [13,14,63]. Third, although the results of the present study often converged with prior research, the analyses were exploratory, and the newly identified relationships require replication. Lastly, the correlational design of the study does not allow for causal claims [64]. If the relationships between family and university supports are robust, intervention research designs that allow stronger causal claims are warranted.

Conclusions and Future Directions

Future studies should further confirm the measurement validity of the scales while examining substantive relationships of interest to higher education researchers and professionals. First, the scales need to be free of bias to examine group differences and to determine whether the academic social supports are associated with college outcomes. Underrepresented minority students may interpret item content differently than majority students and rate items more or less favorable. This form of measurement bias can result in the appearance of group differences and associations when none exist. Second, the academic support scales were not uniformly predictive of GPA longitudinally or across demographic groups. This lack of uniform prediction may be due to substantive issues of interest associated with developmental trends and cultural differences. Third, the relationship of the scales relative to external variables needs further establishment [47,65]. Lastly, the relationships observed between academic support from family with GPA and fourth semester retention are fertile areas for intervention researchers. Inexpensive interventions focused on families productively supporting their college students by discussing expectations, finances and academics may improve postsecondary persistence if the observed relationships are causal.

The investigated scales have considerable potential for shedding light on students' college experiences and testing dimensions of contemporary persistence theories. The present examination addresses a clear gap in the postsecondary persistence literature.

Namely, there is a paucity of measurement validity evidence for commonly used academic support scales. Furthermore, items often used to measure academic social supports are single indicators that do not allow researchers to ascertain scale reliability and dimensionality. The present study found initial evidence for the proposed factor structure and identified theoretically specified relationships of the scales with demographics, GPA and retention. Future research with the scales should provide many opportunities to shed light on academic support-related correlates of postsecondary transitions, persistence and completion

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