

Residential Academic Programs (RAPs) and Academic Success

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Summary

- **RAP participants entering as new summer/fall freshmen from 2012 through 2014 outperformed their expected first-year GPA and 2nd-fall retention rate, while non-RAP students had lower than expected success**, after statistically accounting for pre-existing differences in academic readiness (high school grades and test scores), residency, college, admission date, and financial resources. **The gap in GPA was .11 points in favor of RAP students, while the gap in retention was 3 percentage points.** In addition, RAP students outperformed non-RAP students by 4 percentage points in their actual vs. expected percentages with a GPA above 2.0, the cutoff point for academic probation in most UCB colleges.
- **The 6-year graduation rate for RAP participants was 6 percentage points higher than that of non-RAP students**, after statistically accounting for pre-existing differences in academic readiness, residency, college, admission date, and financial resources, among summer/fall 2009 entering freshmen.

Details

Grades and 2nd-fall retention

- We studied full-time degree-seeking entering freshmen in summer/fall 2012, 2013, and 2014. Of the total 16,920 students in the population, 7,737 (46%) were in RAPs, while 9,183 (54%) were not.
- RAPs¹ are programs that new freshman students have the opportunity to select at the time they select their residence hall preference. Students in a given RAP not only live together in the same residence hall, but also, within the residence hall location:
 - take small seminar classes
 - meet with faculty who teach the classes, who maintain regular office hours there
 - have upper-division students as mentors
 - participate in residence hall activities that reinforce the RAP's academic theme.
- There were 14 different RAPs in the current study. Students in RAPs pay an extra housing fee of \$850/year. For more information see <http://www.colorado.edu/campus-life/housing-dining>. Students in Living & Learning Communities (LLCs), which share some characteristics of RAPs (students live together in residence halls that reinforce a particular theme) but not others (e.g., they don't have the small seminar classes together) were considered non-RAP students.
- Overall results in Table 1 below show that RAP students had better outcomes than non-RAP students, among both Colorado residents and non-residents:

¹ RAPs in the current study included Baker, Communication, Engineering Honors (Andrews Hall), Farrand, Global Engineering, Global Studies, Health Professions, Honors, Leadership, Leeds, Libby, Sewall, Sustainability and Social Innovation (SSI, formerly SEEDS), and Sustainable By Design.

Table 1. Outcomes by RAP status, fall 2012-14 freshmen, by residency.

Residency	RAP Status	N	Average 1 st - year GPA	GPA above 2.0	Retained 2 nd fall
Non-resident	RAP	3,594	2.85	89%	83%
	Not RAP	4,136	2.66	83%	81%
Resident	RAP	4,143	3.09	93%	91%
	Not RAP	5,047	2.85	87%	85%
Overall	RAP	7,737	2.98	91%	87%
	Not RAP	9,183	2.77	85%	83%

- These results were also generally quite consistent across colleges, as shown in Table 2. The exception is the retention rate in CMCI.

Table 2. Outcomes by RAP status, fall 2012-14 freshmen, by college.

Entry College	RAP Status	N	Average 1 st - year GPA	GPA above 2.0	Retained 2 nd fall
Arch & Planning	RAP	102	2.83	87%	86%
	Not RAP	163	2.63	85%	80%
Arts & Sciences	RAP	5,556	2.95	90%	86%
	Not RAP	5,964	2.67	83%	80%
Business	RAP	1,132	3.03	93%	92%
	Not RAP	974	2.84	87%	85%
CMCI	RAP	200	3.26	96%	85%
	Not RAP	123	3.13	96%	89%
Engineering	RAP	704	3.11	93%	93%
	Not RAP	1,820	2.97	91%	91%
Music	RAP	43	3.53	98%	88%
	Not RAP	139	3.42	96%	86%
Overall	RAP	7,737	2.98	91%	87%
	Not RAP	9,183	2.77	85%	83%

- If students had been randomly assigned to be in RAPs or not, interpreting the above results as very positive for RAPs would be straightforward. Unfortunately, that is not the case -- students self-select into RAPs, and those who choose RAPs are overall quite different from those who don't.

Compared to non-RAP students, RAP students

- **Are more academically prepared at entry**, as measured by Predicted GPA (PGPA), a measure derived by formula from high school GPA and standardized test scores;

- **Have a higher level of financial resources**, as measured by their Expected Family Contribution to their education, which was categorized into 5 levels. RAP students were much less likely to be in the lowest 2 resource categories;
 - **Are earlier to apply, be admitted, and confirm their intent to enroll by paying an admissions deposit.** We measure time by week in a 52-week admissions cycle. On the average, RAP students applied 2 weeks earlier, were admitted nearly 2.5 weeks earlier, and confirmed more than 3 weeks earlier than non-RAP students.
 - All of these factors are statistically related to academic success, regardless of RAP participation.
 - Anecdotally, we have learned that many students choose RAPs not for academic reasons, but based on location – many of the RAP dorms are in central campus locations seen as more desirable. This may partially explain the tendency for RAP students to have applied, been admitted, and confirmed earlier than non-RAP students, and also why they have better high school grades and test scores. The early-admitted students tend to have stronger academic credentials, and they also have the opportunity to confirm first. In addition, students with more financial resources are likely to be in a position to pay admission and housing deposits earlier. These early-admitted and early-confirming students get the first opportunity at RAP housing, and they fill it up, leaving later-admitted and confirming students for non-RAP housing.
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- In an attempt to ascertain the relationship between RAP participation and academic success while controlling for these pre-existing differences, we used regression techniques, the SAS General Linear Models (GLM) procedure for assessing first-year GPA, and the Logistic procedure for the dichotomous outcomes of having a GPA above 2.0 and retention to the 2nd fall.
 - We entered PGPA, financial resources category, residency, entry college, and week admitted into the GLM procedure, and produced an expected GPA for each student. We did the same using Logistic, to produce the probability of a GPA above 2.0 and probability of retention. We then compared these to actual GPA and retention, and produced a residual. Average residuals for RAP and non-RAP students were then calculated.
 - Average residuals for RAP vs. non-RAP students are shown below in Table 3. These can be interpreted as differences between RAP and non-RAP students, after accounting for differences in academic preparation, financial resources, residency, entry college, and week admitted.

Table 3. Actual vs. predicted academic outcomes, summer/fall 2012-14 freshmen.

RAP Status	N	Average 1 st - year GPA residual	Actual minus predicted probability of GPA above 2.0	Actual minus predicted probability of retention to 2 nd fall
RAP	7,737	+0.06	+0.02	+0.02
Not RAP	9,183	-0.05	-0.02	-0.01
Overall	16,920	.00	.00	.00

- **After accounting for pre-existing differences between them, compared to non-RAP students the RAP students had a first year GPA that was 0.11 points higher, a probability of a GPA above 2.0 that was 4 percentage points higher, and a 2nd-fall retention rate that was 3 percentage points higher.**
- Outcomes by individual RAP are shown below in Table 4. With few exceptions, students in all RAPs had better outcomes than predicted.

Table 4. Actual vs. predicted outcomes by individual RAP.

RAP	N	Average 1 st -year GPA residual	Actual minus predicted probability of GPA above 2.0	Actual minus predicted probability of retention to 2 nd fall
Baker	1,169	+0.05	+0.01	+0.03
Communication	499	+0.07	+0.01	-0.01
Engin Honors (Andrews Hall)	343	+0.12	+0.03	+0.03
Farrand	1,071	+0.07	+0.02	+0.02
Global Engineering	69	+0.09	+0.01	+0.05
Global Studies	540	+0.06	.00	-0.01
Health Professions	495	-0.05	-0.01	-0.01
Honors	776	+0.08	+0.02	+0.02
Leadership	239	+0.01	-0.02	-0.05
Leeds	384	+0.04	+0.01	+0.02
Libby	942	+0.11	+0.05	+0.03
Sewall	852	+0.06	+0.03	+0.03
SSI/SEEDS	124	+0.12	+0.01	+0.03
Sustainable By Design	234	+0.02	.00	.00
No RAP	9,183	-0.05	-0.02	-0.01

Graduation rate

- We did a similar analysis of the graduation rates of summer/fall 2009 entering freshmen who were either in a RAP their first year or not. Unadjusted grad rates are in Table 5 below:

Table 5. Unadjusted six-year graduation rates of summer/fall 2009 freshmen, by RAP status and residency.

Residency	RAP Status	N	6-year graduation rate
Non-resident	RAP	797	73%
	Not RAP	1,481	62%
Resident	RAP	1,035	82%
	Not RAP	2,189	72%
Overall	RAP	1,832	78%
	Not RAP	3,670	68%

- **After controlling for PGPA, entry residency, entry college, admission week, and financial resources category, the difference between actual and predicted graduation rate was 6 percentage points in favor of the RAP participants.** Table 6 below shows results.

Table 6. Actual vs. predicted graduation rates by RAP status, summer/fall 2009 freshmen.

RAP Status	N	Actual minus predicted 6-year graduation rate
RAP	1,832	+.04
Not RAP	3,670	-.02
Overall	5,502	.00

- Although we used slightly different methods, these results are generally in line with earlier RAP studies from 2003, 2011, and 2013. These can be found here (the 2003 study is linked within the 2011 report): <http://www.colorado.edu/oda/records/campuslife.html>.