Does living on campus influence first year GPA?

It is generally acknowledged that first time freshmen who live on campus during the first year at a four year college or university have higher grade point averages at the end of the first year than students who do not live on campus. This analysis examines whether this national phenomenon applies at UC Merced.

In Fall 2009, 75.6% of the cohort of 1128 entering first time freshmen lived on campus during their first year. The mean GPA after one year for students who lived on campus was 2.63, whereas the mean GPA for students who lived off campus was 2.41. Analysis of variance revealed that this difference in means is statistically significant.

To determine whether this difference in mean GPA is a caused or impacted by factors other than residency status, the effect of possible mediating or moderating variables, including high school GPA, SAT scores, Pell grant eligibility (a proxy for low income status), and school, was examined.

The mean SAT score for first time freshmen who lived on campus during their first year (1551) is higher than the mean SAT score for students who lived off campus (1497), which might lead one to think that the difference in first year GPAs is more a function of academic preparation for college than living on campus. However, extensive evidence, including evidence provided by the College Board (which administers the SAT) indicates that high school GPA is a better predictor of first year GPA in college than SAT scores, and first time freshmen at UC Merced who lived off campus during the 2009-10 academic year had higher high school GPAs (3.49) than students who lived on campus (3.42). The differences both in SAT scores and high school GPAs are statistically significant, so it would be inappropriate to claim that academic preparation accounts for the difference in mean first year GPAs between students who lived on campus and students who did not.

Because 79% of the 535 first time freshmen who were not Pell eligible, but only 73% of the 593 students who were Pell eligible, lived on campus during their first year, it is plausible that one factor mediating the relationship between living on campus and first year GPA is poverty (i.e., higher income students do better academically). To control for this possibility, a second analysis of variance was undertaken that examined differences within the Pell eligible group and the non-Pell eligible group. Within the Pell eligible group, the mean first year GPA for first year students who lived on campus (2.53) is higher than the GPA for those who lived off campus (2.33). In addition, within the group that was not Pell eligible, the mean first year GPA for first year students who lived on campus (2.73) is higher than the GPA for those who lived off campus (2.52). Because these significant differences within each income category are in the same direction as the statistically significant differences overall (i.e., students who lived on campus had higher first year GPAs than those who did not), it does not appear that income level is a primary explanation for observed differences in mean GPA between students who lived on campus and those who did not.

To control for the possibility that students in engineering or natural sciences may experience living on and off campus differently from students who have not declared a major or who are majoring in social sciences, humanities, or arts, a third analysis of variance was conducted that controlled for school in which the student was enrolled during their first semester. In all cases, the students who lived on campus had higher first year GPAs than students who did not. The mean GPA at the end of the first year for first year freshmen who had not declared a major by the third week of their first semester and lived on campus (2.58) is higher than the mean GPA of those who lived off campus (2.22). Similarly, the mean first year GPA for engineering majors who lived on campus (2.58) is higher than for those who lived off campus (2.35). In natural sciences, the mean first year GPA for students who lived on campus (2.53) is higher than the mean GPA for students who lived off campus (2.41). Finally, the mean first year GPA for students who majored in social sciences, humanities, or arts who lived on campus their first year is 2.80, while for those who lived off campus, the mean GPA is 2.60.

In each of the cases examined, the mean GPA of first year freshmen who lived on campus during their first year is higher than the mean GPA of students who lived off campus their first year. While other variables not examined might explain the higher grade point averages of students who lived on campus, the pattern of evidence indicates that it is plausible to assert that first year students who live on campus at UC Merced will earn higher grades after their first year than students who do not.

Frequencies

Statistics

		housing Is student living in campus housing this term?	pell_eligible	dept1 Primary department
N	Valid	1128	1128	1128
	Missing	0	0	0

Frequency Table

housing Is student living in campus housing this term?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	N	275	24.4	24.4	24.4
	Y	853	75.6	75.6	100.0
	Total	1128	100.0	100.0	

pell_eligible

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0 No	535	47.4	47.4	47.4
	1 Yes	593	52.6	52.6	100.0
	Total	1128	100.0	100.0	

dept1 Primary department

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0000 Undeclared	224	19.9	19.9	19.9
	E Engineering	195	17.3	17.3	37.1
	NS Natural Sciences	398	35.3	35.3	72.4
	SSHA Social Sciences, Humanities, & Arts	311	27.6	27.6	100.0
	Total	1128	100.0	100.0	

Crosstabs

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
housing Is student living in campus housing this term? * pell_eligible	1128	100.0%	0	.0%	1128	100.0%
housing Is student living in campus housing this term? * dept1 Primary	1128	100.0%	0	.0%	1128	100.0%

department	1128	100.0%	0	.0%	1128	100.0%

housing Is student living in campus housing this term? * pell_eligible Crosstabulation

% within pell_eligible

		pell_eligible		Total
		0 No	1 Yes	
housing Is student living in campus housing this term?	**N**	21.1%	27.3%	24.4%
	Y	78.9%	72.7%	75.6%
Total		100.0%	100.0%	100.0%

housing Is student living in campus housing this term? * dept1 Primary department Crosstabulation

% within dept1 Primary department

		dept1 Primary department				Total
		0000 Undeclared	E Engineering	NS Natural Sciences	SSHA Social Sciences, Humanities, & Arts	
housing Is student living in campus housing this term?	**N**	24.6%	26.2%	26.1%	20.9%	24.4%
	Y	75.4%	73.8%	73.9%	79.1%	75.6%
Total		100.0%	100.0%	100.0%	100.0%	100.0%

Means

Case Processing Summary

	Cases					
	Included		Excluded		Total	
	N	Percent	N	Percent	N	Percent
gpa_ucm_lvl_cum_cen Cumulative GPA for courses taken at UCM as of census date * housing Is student living in campus housing this term?	1122	99.5%	6	.5%	1128	100.0%
gpa_hs_verified High School GPA (verified by transcripts) * housing Is student living in campus housing this term?	1114	98.8%	14	1.2%	1128	100.0%
actorsatr * housing Is student living in campus housing this term?	1118	99.1%	10	.9%	1128	100.0%
satr * housing Is student living in campus housing this term?	1088	96.5%	40	3.5%	1128	100.0%

Report

			gpa_ucm_lvl_cum_cen Cumulative GPA for courses taken at UCM as of census date	gpa_hs_verified High School GPA (verified by transcripts)	actorsatr	satr
		Mean	2.407506	3.493978	1508.30	1497.26
	N	**N**	271	274	269	263
		Std				

		Std. Deviation	.8882016	.3432508	230.324	230.536
housing Is student living in campus housing this term?	Y	Mean	2.628645	3.422333	1567.30	1551.25
		N	851	840	849	825
		Std. Deviation	.8201964	.3236425	234.814	237.369
	Total	Mean	2.575233	3.439955	1553.11	1538.20
		N	1122	1114	1118	1088
		Std. Deviation	.8420638	.3298647	234.998	236.762

ANOVA Table

			Sum of Squares	df	Mean Square	F	Sig.
gpa_ucm_lvl_cum_cen Cumulative GPA for courses taken at UCM as of census date * housing Is student living in campus housing this term?	Between Groups	(Combined)	10.052	1	10.052	14.345	.000
	Within Groups		784.817	1120	.701		
	Total		794.869	1121			
gpa_hs_verified High School GPA (verified by transcripts) * housing Is student living in campus housing this term?	Between Groups	(Combined)	1.061	1	1.061	9.824	.002
	Within Groups		120.046	1112	.108		
	Total		121.106	1113			
actorsatr * housing Is student living in campus housing this term?	Between Groups	(Combined)	711096.128	1	711096.128	13.015	.000
	Within Groups		60974041.418	1116	54636.238		
	Total		61685137.546	1117			
satr * housing Is student living in campus housing this term?	Between Groups	(Combined)	581226.160	1	581226.160	10.459	.001
	Within Groups		60351842.958	1086	55572.599		
	Total		60933069.118	1087			

Measures of Association

	Eta	Eta Squared
gpa_ucm_lvl_cum_cen Cumulative GPA for courses taken at UCM as of census date * housing Is student living in campus housing this term?	.112	.013
gpa_hs_verified High School GPA (verified by transcripts) * housing Is student living in campus housing this term?	.094	.009
actorsatr * housing Is student living in campus housing this term?	.107	.012
satr * housing Is student living in campus housing this term?	.098	.010

Means

Case Processing Summary

	Cases					
	Included		Excluded		Total	
	N	Percent	N	Percent	N	Percent
gpa_ucm_lvl_cum_cen Cumulative GPA for courses taken at UCM as of census date * pell_eligible * housing Is student living in campus housing this term?	1122	99.5%	6	.5%	1128	100.0%
gpa_hs_verified High School GPA (verified by transcripts) * pell_eligible * housing Is student living in campus housing this term?	1114	98.8%	14	1.2%	1128	100.0%
actorsatr * pell_eligible * housing Is student living in campus housing this term?	1118	99.1%	10	.9%	1128	100.0%
satr * pell_eligible * housing Is student living in campus housing this term?	1088	96.5%	40	3.5%	1128	100.0%

Report

					gpa_ucm_lvl_cum_cen Cumulative GPA for courses taken at UCM as of census date	gpa_hs_verified High School GPA (verified by transcripts)	actorsatr	satr
pell_eligible	0 No	housing Is student living in campus housing this term?	N	Mean	2.521054	3.465804	1604.94	1584.77
				N	111	112	111	111
				Std. Deviation	.8373087	.3581525	208.558	209.718
			Y	Mean	2.725482	3.389469	1661.10	1644.55
				N	421	414	421	413
				Std. Deviation	.7630791	.3048172	211.004	213.701
			Total	Mean	2.682829	3.405722	1649.38	1631.89
				N	532	526	532	524
				Std. Deviation	.7827616	.3181053	211.537	214.065
	1 Yes	housing Is student living in campus housing this term?	N	Mean	2.328731	3.513457	1440.41	1433.36
				N	160	162	158	152
				Std. Deviation	.9161723	.3322842	220.996	224.576
			Y	Mean	2.533835	3.454272	1475.04	1457.72
				N	430	426	428	412
				Std. Deviation	.8629096	.3382503	220.231	222.858
			Total	Mean	2.478214	3.470578	1465.70	1451.15
				N	590	588	586	564
				Std. Deviation	.8816220	.3373744	220.785	223.385
				Mean	2.407506	3.493978	1508.30	1497.26

	Total	housing Is student living in campus housing this term?	N	N	271	274	269	263
				Std. Deviation	.8882016	.3432508	230.324	230.536
			Y	Mean	2.628645	3.422333	1567.30	1551.25
				N	851	840	849	825
				Std. Deviation	.8201964	.3236425	234.814	237.369
			Total	Mean	2.575233	3.439955	1553.11	1538.20
				N	1122	1114	1118	1088
				Std. Deviation	.8420638	.3298647	234.998	236.762

ANOVA Table

			Sum of Squares	df	Mean Square	F	Sig.
gpa_ucm_lvl_cum_cen Cumulative GPA for courses taken at UCM as of census date * pell_eligible	Between Groups	(Combined)	11.712	1	11.712	16.750	.000
	Within Groups		783.157	1120	.699		
	Total		794.869	1121			
gpa_hs_verified High School GPA (verified by transcripts) * pell_eligible	Between Groups	(Combined)	1.168	1	1.168	10.827	.001
	Within Groups		119.938	1112	.108		
	Total		121.106	1113			
actorsatr * pell_eligible	Between Groups	(Combined)	9407521.910	1	9407521.910	200.828	.000
	Within Groups		52277615.635	1116	46843.742		
	Total		61685137.546	1117			
satr * pell_eligible	Between Groups	(Combined)	8873088.651	1	8873088.651	185.098	.000
	Within Groups		52059980.467	1086	47937.367		
	Total		60933069.118	1087			

Measures of Association

	Eta	Eta Squared
gpa_ucm_lvl_cum_cen Cumulative GPA for courses taken at UCM as of census date * pell_eligible	.121	.015
gpa_hs_verified High School GPA (verified by transcripts) * pell_eligible	.098	.010
actorsatr * pell_eligible	.391	.153
satr * pell_eligible	.382	.146

Means

Case Processing Summary

	Cases					
	Included		Excluded		Total	
	N	Percent	N	Percent	N	Percent
gpa_ucm_lvl_cum_cen Cumulative GPA for courses taken at UCM as of census date * dept1 Primary department * housing Is student living in campus housing this term?	1122	99.5%	6	.5%	1128	100.0%
gpa_hs_verified High School GPA (verified by transcripts) * dept1 Primary department * housing Is student living in campus housing this term?	1114	98.8%	14	1.2%	1128	100.0%
actorsatr * dept1 Primary department * housing Is student living in campus housing this term?	1118	99.1%	10	.9%	1128	100.0%
satr * dept1 Primary department * housing Is student living in campus housing this term?	1088	96.5%	40	3.5%	1128	100.0%

Report

					gpa_ucm_lvl_cum_cen Cumulative GPA for courses taken at UCM as of census date	gpa_hs_verified High School GPA (verified by transcripts)	actorsatr	satr
	0000 Undeclared	housing Is student living in campus housing this term?	N	Mean	2.216094	3.358909	1473.46	1475.49
				N	53	55	54	51
				Std. Deviation	.8899534	.3040082	262.083	272.531
			Y	Mean	2.582325	3.359820	1582.98	1563.15
				N	169	167	168	162
				Std. Deviation	.8374055	.3196392	236.105	246.867
			Total	Mean	2.494892	3.359595	1556.34	1542.16
				N	222	222	222	213
				Std. Deviation	.8625073	.3151590	246.607	255.354
	E Engineering	housing Is student living in campus housing this term?	N	Mean	2.354118	3.539200	1516.36	1526.46
				N	51	50	50	48
				Std. Deviation	.7793967	.3187785	243.739	240.394
			Y	Mean	2.584569	3.509149	1619.32	1610.57
				N	144	141	144	141
				Std. Deviation	.9343307	.3159871	234.284	230.272
			Total	Mean	2.524297	3.517016	1592.78	1589.21
				N	195	191	194	189
				Std. Deviation	.9001957	.3161562	240.396	235.121

dept1 Primary department	NS Natural Sciences	housing Is student living in campus housing this term?	N	Mean	2.413481	3.565096	1512.65	1485.98
				N	104	104	101	102
				Std. Deviation	.8827702	.3326329	230.486	224.695
			Y	Mean	2.532517	3.467396	1568.42	1545.70
				N	292	288	292	286
				Std. Deviation	.7554720	.3211073	229.193	230.138
			Total	Mean	2.501255	3.493316	1554.09	1530.00
				N	396	392	393	388
				Std. Deviation	.7914696	.3266441	230.526	229.942
	SSHA Social Sciences, Humanities, & Arts	housing Is student living in campus housing this term?	N	Mean	2.601889	3.459692	1524.53	1511.13
				N	63	65	64	62
				Std. Deviation	.9563723	.3768826	189.643	194.406
			Y	Mean	2.800370	3.361762	1524.64	1514.36
				N	246	244	245	236
				Std. Deviation	.7889265	.3152760	234.652	237.437
			Total	Mean	2.759903	3.382362	1524.62	1513.69
				N	309	309	309	298
				Std. Deviation	.8280262	.3309607	225.780	228.848
	Total	housing Is student living in campus housing this term?	N	Mean	2.407506	3.493978	1508.30	1497.26
				N	271	274	269	263
				Std. Deviation	.8882016	.3432508	230.324	230.536
			Y	Mean	2.628645	3.422333	1567.30	1551.25
				N	851	840	849	825
				Std. Deviation	.8201964	.3236425	234.814	237.369
			Total	Mean	2.575233	3.439955	1553.11	1538.20
				N	1122	1114	1118	1088
				Std. Deviation	.8420638	.3298647	234.998	236.762

ANOVA Table

			Sum of Squares	df	Mean Square	F	Sig.
gpa_ucm_lvl_cum_cen Cumulative GPA for courses taken at UCM as of census date * dept1 Primary	Between Groups	(Combined)	14.644	3	4.881	6.995	.000
	Within Groups		780.225	1118	.698		

department	**Within Groups**		780.223	1118	.698		
	Total		794.869	1121			
gpa_hs_verified High School GPA (verified by transcripts) * dept1 Primary department	**Between Groups**	**(Combined)**	4.709	3	1.570	14.969	.000
	Within Groups		116.397	1110	.105		
	Total		121.106	1113			
actorsatr * dept1 Primary department	**Between Groups**	**(Combined)**	558891.835	3	186297.278	3.395	.017
	Within Groups		61126245.711	1114	54870.957		
	Total		61685137.546	1117			
satr * dept1 Primary department	**Between Groups**	**(Combined)**	700141.995	3	233380.665	4.200	.006
	Within Groups		60232927.122	1084	55565.431		
	Total		60933069.118	1087			

Measures of Association

	Eta	**Eta Squared**
gpa_ucm_lvl_cum_cen Cumulative GPA for courses taken at UCM as of census date * dept1 Primary department	.136	.018
gpa_hs_verified High School GPA (verified by transcripts) * dept1 Primary department	.197	.039
actorsatr * dept1 Primary department	.095	.009
satr * dept1 Primary department	.107	.011