

**Academic Performance at Simon Fraser University:  
SFU Residence Students vs.  
Non-Residence Students**

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## Introduction:

The Residence and Housing Office at Simon Fraser University asked the Office of Analytical Studies to conduct a study to determine whether living in SFU residence leads to greater academic success. The research **hypothesis** is the following:

*Freshman students who enter SFU and choose to stay in residence perform better academically than similar freshman students who do not stay in residence.*

Numerous studies have been conducted at a variety of US post-secondary institutions on this topic. In studies that did not control for entering grade, the residence students appeared to out-perform the non-residence students, but in studies that did control for entering grade, results were more likely to conclude that there was no difference in the academic performance of those who stay in residence versus those who live elsewhere.<sup>1</sup> This study will control for entering grade and other variables that might influence academic performance.

This report summarizes the steps we took at SFU to test the hypothesis that residence students perform better academically than non-residence students. First, the research methodology is explained. Then, baseline academic performance comparisons of the two groups are presented. Next, while controlling for factors that might influence academic performance between the two groups, ten academic performance differences between the two groups are tested. Finally, an additional investigation of residence only students will be presented, where we will determine if length of time in residence has any effect on academic performance at SFU.

## Methodology:

The Residence and Housing Office identified all students living in SFU residence in each semester from the Fall of 1995 to the Fall of 2005. Students identified as a residence student lived in residence for one or more terms during the course of their studies at SFU, with the majority entering residence in their admission term and the average length of stay was 3.5 terms. The Office of Analytical Studies extracted demographic and academic performance data for these students from the time of their admission through to graduation or completion of the Fall, 2005 term<sup>2</sup>. This dataset was further reduced to those 1,318 students admitted to SFU in the fall semesters only

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<sup>1</sup> Blimling, Gregor S., A Meta-Analysis of the Influence of College Residence Halls on Academic Performance, American Counseling Association, Sept/Oct 1999.

<sup>2</sup> Data was extracted from the student retention database, a longitudinal database of students admitted and registered at SFU and extracted from Student Information System (SIMS) reporting database.

from 1997 to 2004 (0977 through 1047) on the basis of their BC secondary school qualifications and admitted within one year of their high school graduation (see file description in *Appendix A*).

A comparison or control group of students not living in SFU residence was also selected for the analysis. These 1,307 freshman direct-entry students from BC secondary school students were randomly selected from the student retention database across the same eight fall admission terms (0977 to 1047). The distribution of students in the residence and non-residence groups are summarized by admission term in *Table 1*.

**Table 1: Distribution of students in the Residence and Non-Residence Groups by Admission Term**

Admit Term	Residence	Non-Residence	Grand Total
0977	179	140	319
0987	171	145	316
0997	165	152	317
1007	167	160	327
1017	140	142	282
1027	142	178	320
1037	179	187	366
1047	175	203	378
<b>Grand Total</b>	<b>1,318</b>	<b>1,307</b>	<b>2,625</b>

To determine if the academic performance of the residence group is statistically significantly different (i.e. better) than that of the non-residence group, a number of SFU academic performance measures will be examined, including the following:

1. First term survival rate<sup>3</sup>.
2. Entry shock or the drop in GPA that normally occurs from admission to the end of the first semester at SFU<sup>2</sup>. A shock of roughly -0.5 to -1.0 grade points is common among new students to university.
3. % of students placed on academic probation within two years of admission to SFU<sup>4</sup>.
4. % of students required to withdraw within two years of admission to SFU<sup>4</sup>.
5. 30-credit survival rate (first year survival rate).
6. Cumulative grade point average on the first 30 hours at SFU.
7. 90-credit survival rate (third year survival rate)<sup>5</sup>.
8. Degree completion rate<sup>6</sup>.
9. Graduation GPA<sup>7</sup>.
10. Time to degree completion<sup>8</sup>.

<sup>3</sup> First term survival rate and entry shock of residence students are limited only to those who were in residence in their admission term.

<sup>4</sup> 2-Year OAP and RTW rates are limited to students admitted before fall 2004.

<sup>5</sup> 90-Credit survival rate is limited to students admitted prior to fall 2003.

<sup>6</sup> Degree completion rate is limited to students admitted before fall 2002.

<sup>7</sup> Graduation GPA is limited to students who graduated before fall 2005.

<sup>8</sup> Time to Degree Completion only includes students who have graduated.

Throughout this analysis, it is important that we control for a number of independent variables that might otherwise explain the variations in the academic performance of residence (Res) and non-residence (NR) students. The following factors could influence academic performance and we must therefore control for them in the analysis: admission GPA, gender, age at admission, international student status, credit load, and location of graduation secondary school. With the exception of age at admission, the differences between the two groups of students on each of these variables are statistically significant (see *Table 2*).

**Table 2: Differences in Independent Variables between Residence and Non-Residence Students**

Variable	N		Mean		Sig. Diff.
	Res	NR	Res	NR	
Admission GPA	1,318	1,307	3.53	3.36	*
% Male	1,318	1,307	43.0%	49.0%	*
Avg Age at Admission	1,318	1,307	17.6	17.6	
% International	1,318	1,307	2.0%	1.0%	*
First Term Credit Load	1,318	1,307	12.7	11.9	*
SFU Career Credit Load	1,318	1,307	8.8	8.6	*
Lower Mainland HS Graduate	1,318	1,307	53.0%	98.0%	*

\* Indicates a statistically significant difference in means ( $p < .05$ ).

Two of the most striking differences between the two groups is the fact that residence students enter SFU with higher admission GPA's and are much more likely to come from non-lower mainland secondary schools. In addition, residence students have a higher representation of females, they have a higher representation of international students and they have higher credit loads over the duration of their stay at SFU. Given these differences, we can now appreciate how these might influence some of the differences in academic performance between the residence and non-residence students. Using statistical techniques, such as analysis of variance and logistic regression, we are able to factor out these extraneous differences between the two groups to determine if there are any statistically significant differences between them that can be attributed to their living situation (see section on **Statistical Analysis of Performance Differences** on page 6).

### **Baseline Comparisons Between Residence and Non-Residence Groups:**

Before embarking on the statistical analysis, a baseline comparison between the residence and non-residence students is provided in *Table 3*. *Without controlling for differences between the two groups*, statistically different values exist on all performance variables, with the exception of the first term survival rate, entry shock and 90-credit survival rate.

**Table 3: Differences in Academic Performance between Residence and Non-Residence Students**

Variable	N		Mean		Sig. Diff.
	Res	NR	Res	NR	
First Term Survival % <sup>a</sup>	1,018	1,307	99.0%	98.0%	
Entry Shock <sup>a</sup>	1,018	1,307	-0.78	-0.78	
% OAP Within First 2 Yrs <sup>b</sup>	1,143	1,104	21.0%	28.0%	*
% RTW Within First 2 Yrs <sup>b</sup>	1,143	1,104	6.0%	9.0%	*
30-credit Survival %	1,318	1,307	88.0%	84.0%	*
CGPA @ 30 Credits	1,172	1,124	2.92	2.77	*
90-credit Survival % <sup>c</sup>	964	917	70.0%	68.0%	
Graduation Rate <sup>d</sup>	822	739	57.0%	57.0%	
Graduation GPA <sup>e</sup>	466	421	3.07	2.88	*
Terms to Graduate <sup>f</sup>	466	423	15.8	15.8	

\* Indicates a statistically significant difference in means ( $p < .05$ ).

a. First term survival rate and entry shock of residence students are limited only to those who were in residence in their admission term.

b. 2-Year OAP and RTW rates are limited to students admitted before fall 2004.

c. 90-Credit survival rate is limited to students admitted prior to fall 2003.

d. Degree completion rate is limited to students admitted before fall 2002.

e. Graduation GPA is limited to students who graduated before fall 2005.

f. Time to Degree Completion only includes students who have graduated.

Although the above table reveals statistically significant differences in academic performance between the residence and non-residence groups, these differences almost disappear when we control only for admission GPA. When comparing residence students to non-residence students (see *Appendix B Charts a-j*), we can make the following observations:

- a. The difference in first-term survival rates remains at 2% or smaller across all admission GPA's.
- b. The entry shock is generally larger for residence students, especially among those admitted with GPA's below 3.20.
- c. Residence students have lower OAP rates within their first two years of admission to SFU if they are admitted below 3.20.
- d. Both groups have roughly equal RTW rates, with lower RTW rates for students admitted below 3.20.
- e. Both groups have roughly equal 30-credit survival rates.
- f. Both groups have roughly equal CGPA's at 30 credits.
- g. The 90-credit (or 3-year) survival rate of residence students is higher among those admitted below 3.20.
- h. Residence students have lower graduation rates, except for those admitted below 3.20.
- i. The graduation GPA's of both groups vary across admission GPA ranges.
- j. Non-residence students graduate sooner, except for those admitted above 3.80.

## Statistical Analysis of Performance Differences:

This report has presented the baseline differences between the residence and non-residence students, and revealed that these baseline differences become smaller when we control for admission GPA alone. Next we performed a more formal statistical analysis to test for academic performance differences between the two groups, while controlling for other non-academic performance variables that might be contributing to these differences.

In order to control for these non-academic performance variables, various statistical models were fit<sup>9</sup>. The results of the models are summarized in Table 4.

**Table 4: Summary of the Regression Models**

Performance Measure	Is Residence Significant?	Significant Variables						
		Admission GPA	Sex (F)	Age at Admission	International	First term Credit Load	SFU Career Credit Load	Lower Mainland HS Graduate
First Term Survival	No						+	
Entry Shock	No	-				+	+	
OAP within First 2 Yrs	No	+	+	-		+	+	
RTW within First 2 Yrs	No	+	+				+	
30-credit Survival	No	+	+			+	+	
CGPA @ 30 Credits	No	+		-		+	+	
90-credit Survival	No	+	+			+	+	+
Graduation	No	+	+			+	+	
Graduation GPA	No	+				+	+	
Terms to Graduate	No		+				+	

+ Indicates that the presence or size of the variable contributes to improved performance.

- Indicates that the presence or size of the variable contributes to decreased performance.

In general, improved performance implies an increase in the performance measure. Exceptions to this are "OAP", "RTW", and "Time to Degree Completion", for which a decrease in the measure corresponds to improved performance

The models indicate that when we control for important baseline variables, being in residence does not make a statistically significant difference in any of the performance measures. In other words, **freshman students who enter SFU and choose to stay in residence do not perform better academically than similar freshman students who do not stay in residence.** The table also shows which baseline variables are

<sup>9</sup> Analysis of Variance Models were fit for Models 2, 6, 9, and 10, which have continuous performance measures. Logistic Regression Models were fit for Models 1, 3, 4, 5, 7, and 8, which have binary (Yes/No) performance measures.

significantly associated with each academic performance measure. The most important variables are admission GPA, sex (with females performing better than males), and credit loads.

These results seem to differ from anecdotal evidence, which suggests that residence students perform better than non-residence students. There appear to be three reasons for this perceived difference:

1. Residence students have higher admission GPAs, on average, than non-residence students.
2. More females than males go into residence.
3. Students in residence tend to take more credits per term than non-residence students.

These differences between residence and non-residence students were shown in the statistical models to contribute to differences in academic performance at SFU.

### **Residence Student Graduates - Effect of Length of Time in Residence:**

In addition to these models, a second analysis was performed on residence students who had graduated. Analysis of variance regression models were fit to determine whether, among residence students, the length of time spent in residence has an effect on “CGPA @ 30 Credits”, “Graduation GPA”, or “Terms to Graduate”. As with the previous models, the analysis controlled for the important baseline student characteristics. In all cases, it was determined that the length of time spent in residence does not significantly affect these performance measures.

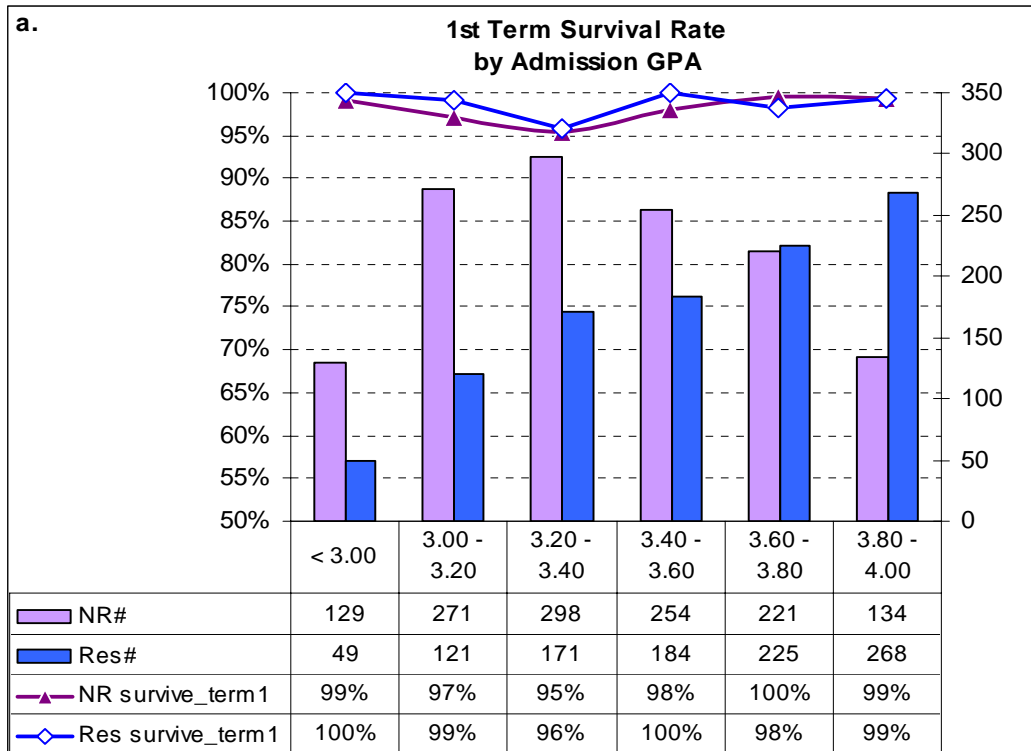
### **Conclusion:**

From the analyses, we can conclude that academic performance is *not* affected by whether or not a student lives in residence. Variables that *do* affect performance include admission GPA, sex (with females performing better on average), and credit load. Finally, among residence students, the length of time spent in residence does *not* affect academic performance.

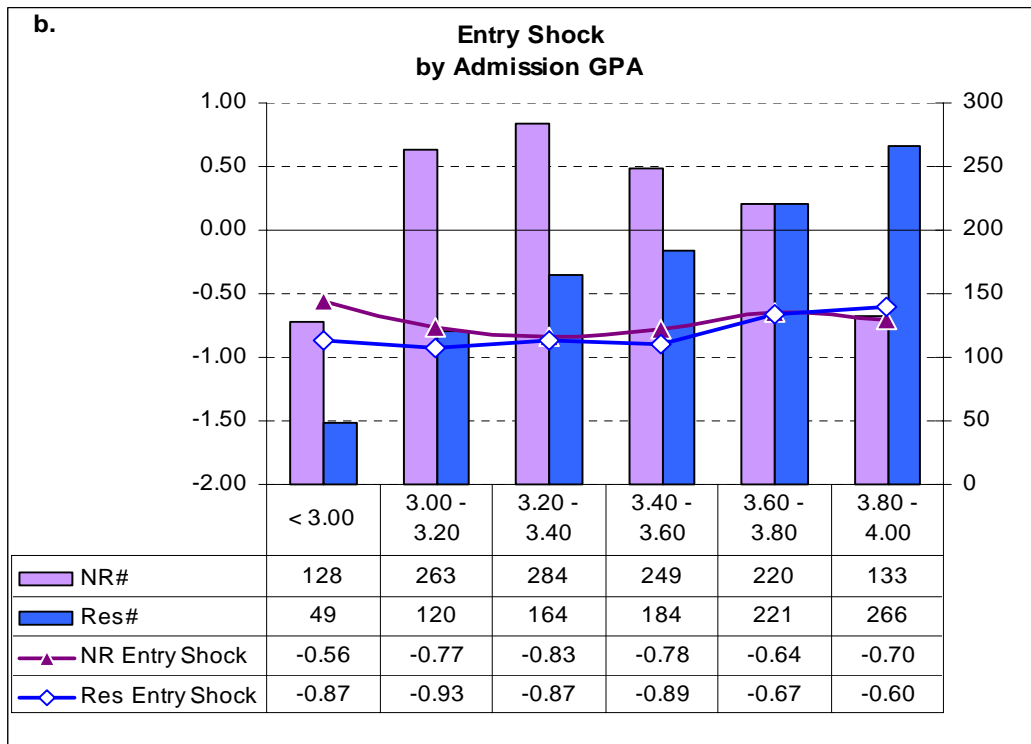
## Appendix A: Residence Analysis File Description

Variable	Position Label	Meas. Level	Width
emplid	1 Emplid	Nominal	9
admit_term	2 Admit term	Nominal	4
boagr	3 Basis of admission group	Nominal	4
avgtpe	4 Type of admission average	Nominal	5
adm_gpa	5 Admission GPA, if available	Scale	8
adm_pct	6 Admission PCT score, if available	Scale	8
adm_gpaconv	7 Common Admission GPA	Scale	8
resstu	8 Residence Student	Nominal	8
admres	9 In residence in admit term	Nominal	8
minres	10 First residence term	Nominal	4
maxres	11 Last residence term	Nominal	4
resterms	12 Number of residence terms	Nominal	8
birthdate	13 Birthdate	Scale	11
entry_age	14 Age at admission	Nominal	8
sex	15 Sex	Nominal	8
country	16 Country	Nominal	3
school_district	17 School district	Nominal	3
lmdist	18 Graduated from Lower-Mainland School	Nominal	8
intl	19 International Student Indicator	Nominal	8
tuition_res	20 Tuition residency code	Nominal	4
entry_fac	21 Faculty at admission	Nominal	5
entry_prog	22 Program at admission	Nominal	5
tfratadm	23 Transfer credits at admission	Nominal	8
unt_taken_gpa1	24 Units taken in first term	Nominal	8
unt_passd_gpa1	25 Units passed in first term	Nominal	8
cgpa1	26 CGPA @ first term	Scale	8
acad_stand1	27 Academic standing @ first term	Nominal	3
oap	28 OAP within 2 years of SFU admission	Nominal	8
oapterm	29 OAP term	Nominal	8
rtw	30 RTW within 2 years of SFU admission	Nominal	8
rtwterm	31 RTW term	Nominal	8
entry_shock	32 Entry shock (AdmGPA - CGPA1)	Scale	8
lastreg	33 Last term registered at SFU	Scale	8
survive_term1	34 Survived term 1	Nominal	8
survive_year1	35 Survived year 1	Nominal	8
survive_year2	36 Survived year 2	Nominal	8
survive_year3	37 Survived year 3	Nominal	8
survive_year4	38 Survived year 4	Nominal	8
survive_year5	39 Survived year 5	Nominal	8
maxsfuhrs	40 SFU hours passed	Scale	8
maxcumhrs	41 Cumulative hours passed (SFU + TFR)	Scale	8
maxtfrhrs	42 TFR hours passed	Nominal	8
survive_30hrs	43 Survived 30 credits	Nominal	8
survive_60hrs	44 Survived 60 credits	Nominal	8
survive_90hrs	45 Survived 90 credits	Nominal	8
survive_120hrs	46 Survived 120 credits	Nominal	8
strm30	47 Term in which 30 credits completed	Nominal	4
credits30	48 Number of credits closest to 30 in strm30	Nominal	8
cgpa30	49 CGPA @ 30 credits	Scale	8
creditload	50 SFU career credit load	Scale	8
ft	51 FT student, on average over SFU career	Nominal	8
passrate	52 Credit pass rate (credits passed / credits taken)	Scale	8
grad	53 Graduated with degree from SFU	Nominal	8
grad_term	54 Graduation term	Nominal	4
grad_elapsed_terms	55 Elapsed number of terms to graduate	Nominal	8
grad_degree	56 Degree of graduation	Nominal	8
grad_faculty	57 Faculty of graduation	Nominal	4
grad_prog	58 Program of graduation	Nominal	5
grad_gpa	59 Graduation GPA	Scale	8
filter_res1	60 (resstu=1 and admres=1) or (resstu=0 and admres=0)	Scale	10

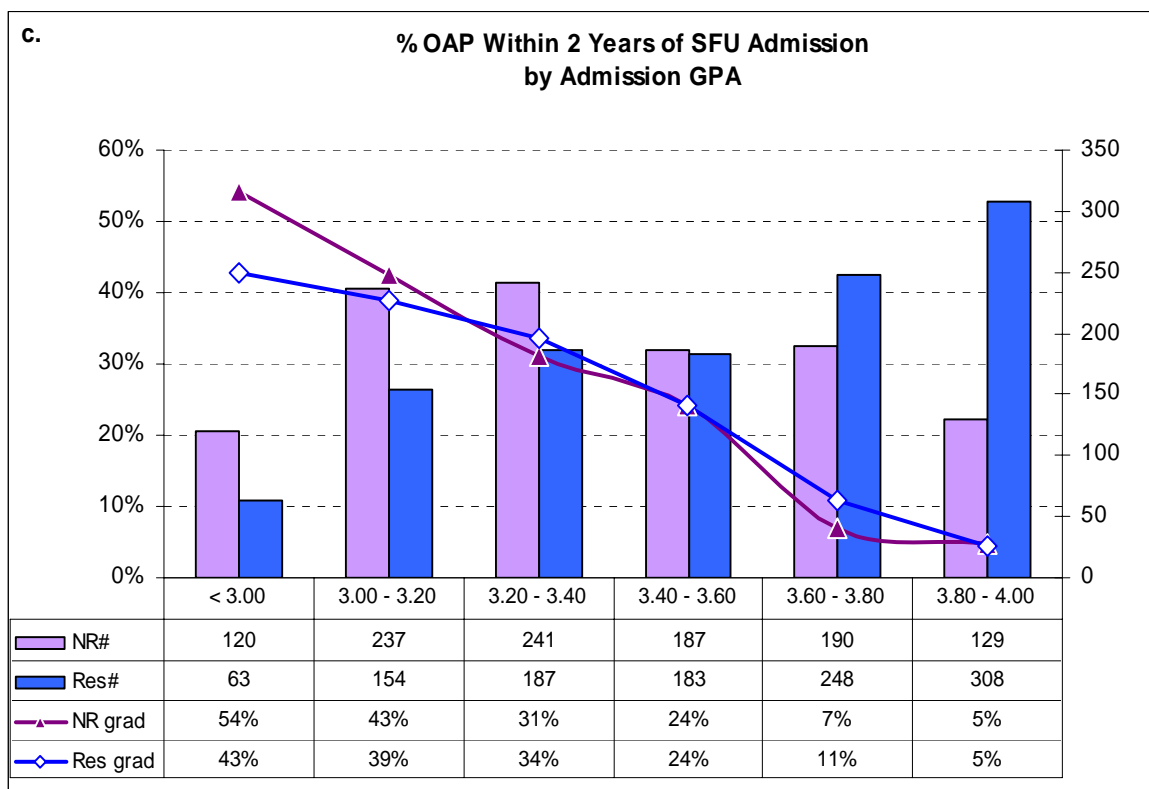
**Appendix B: Academic Performance of Residence and Non-Residence Students by Admission GPA**



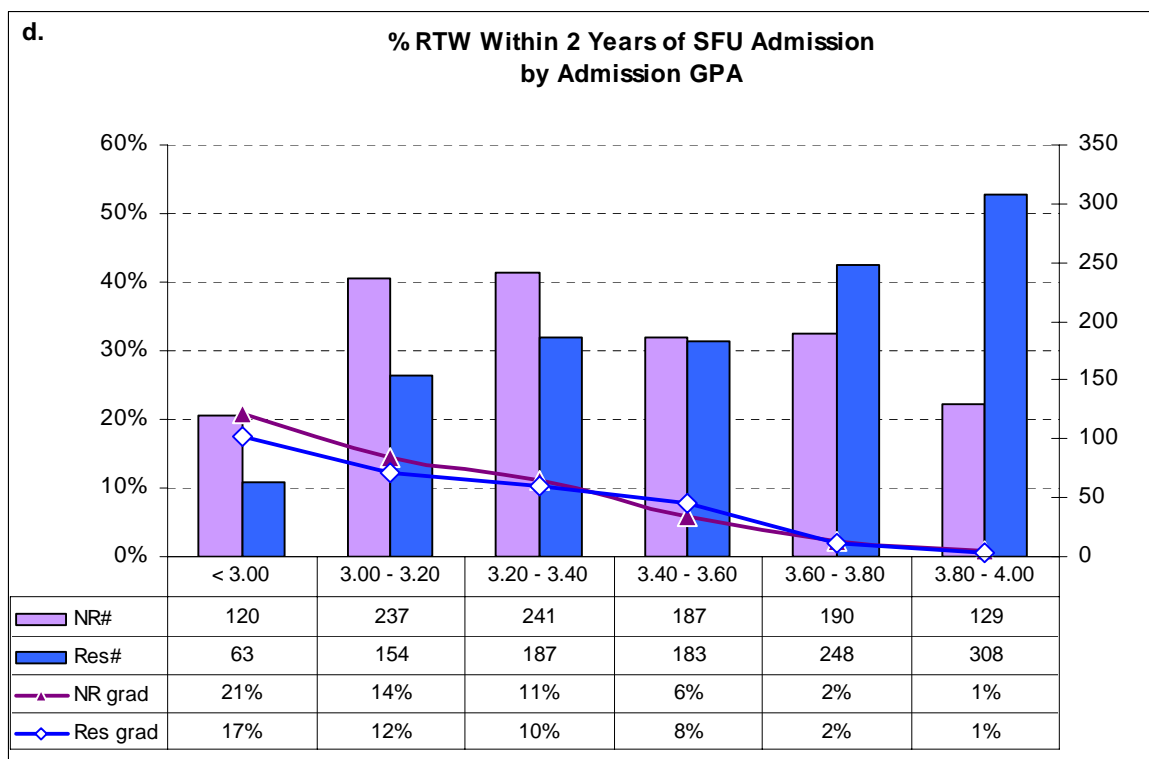
Residence students who were in residence in their first term are compared to non-residence students.



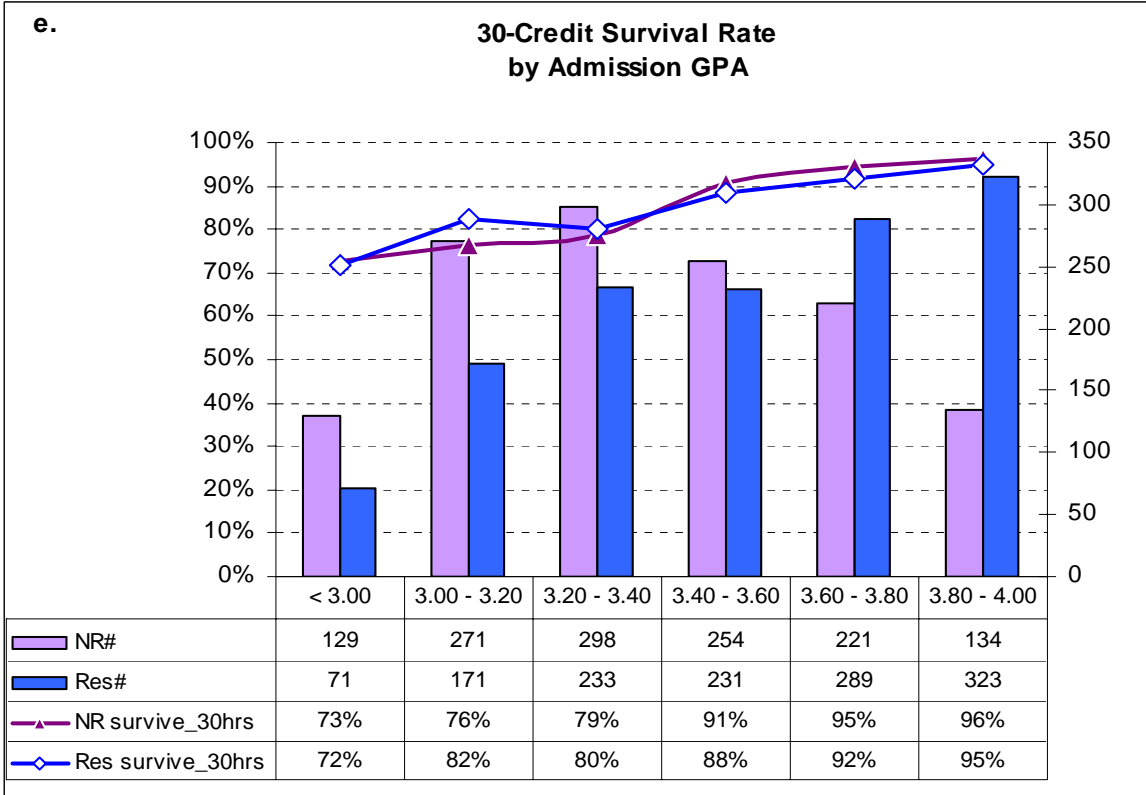
Residence students who were in residence in their first term are compared to non-residence students.



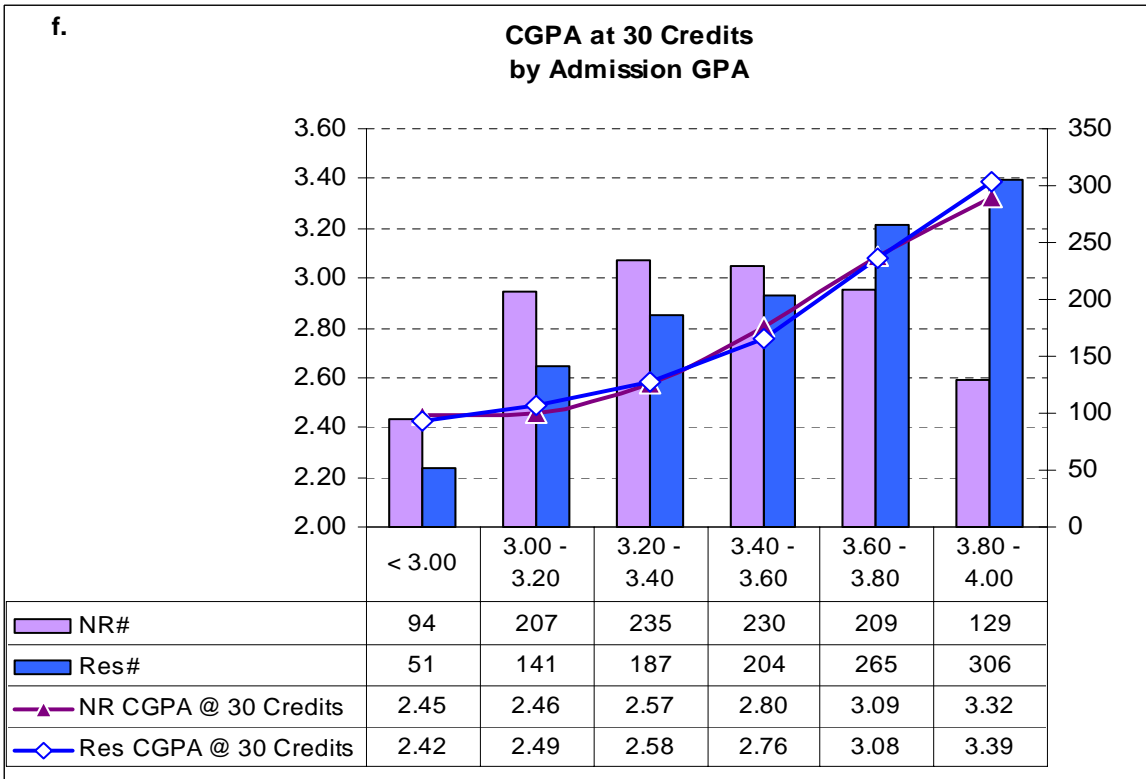
Includes students admitted to SFU in Fall terms 0977 to 1037.



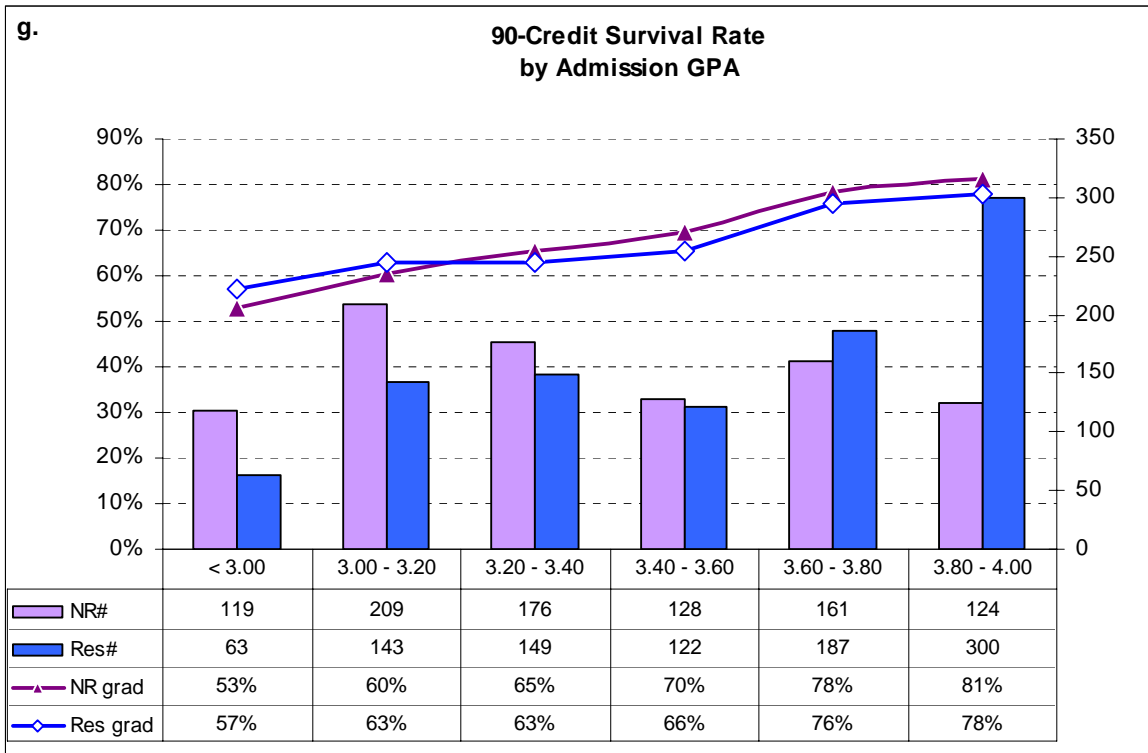
Includes students admitted to SFU in Fall terms 0977 to 1037.



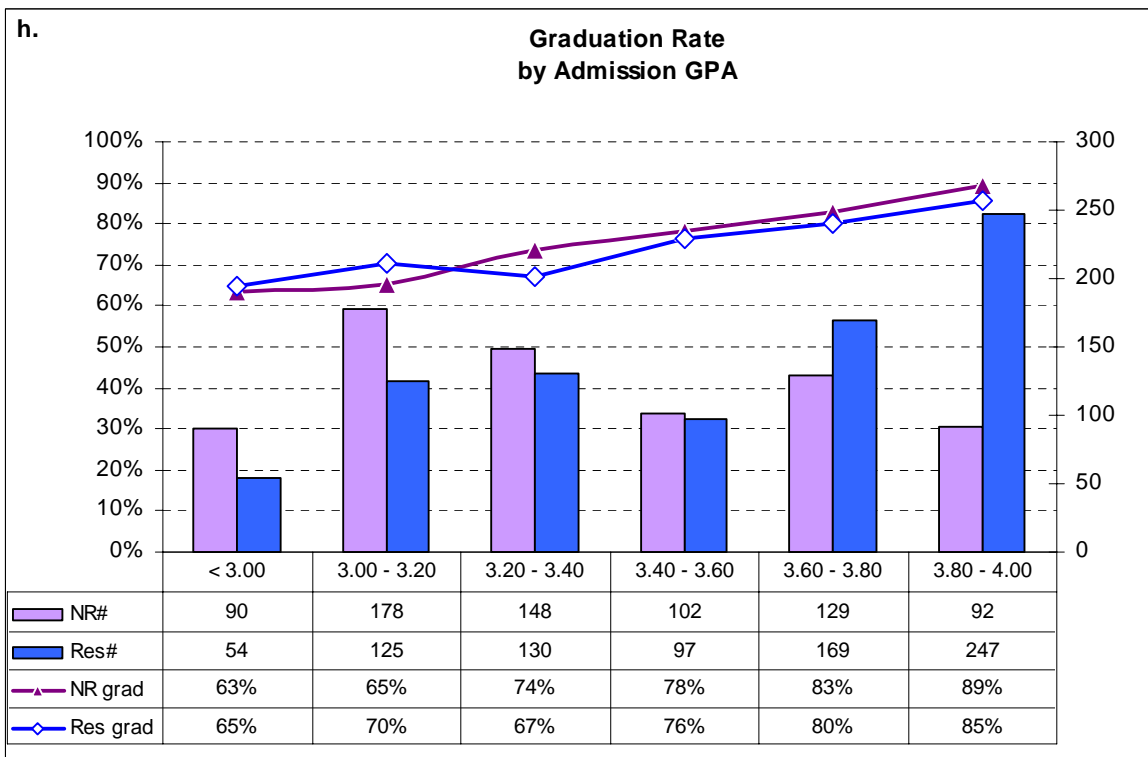
Includes students admitted to SFU in Fall terms 0977 to 1047.



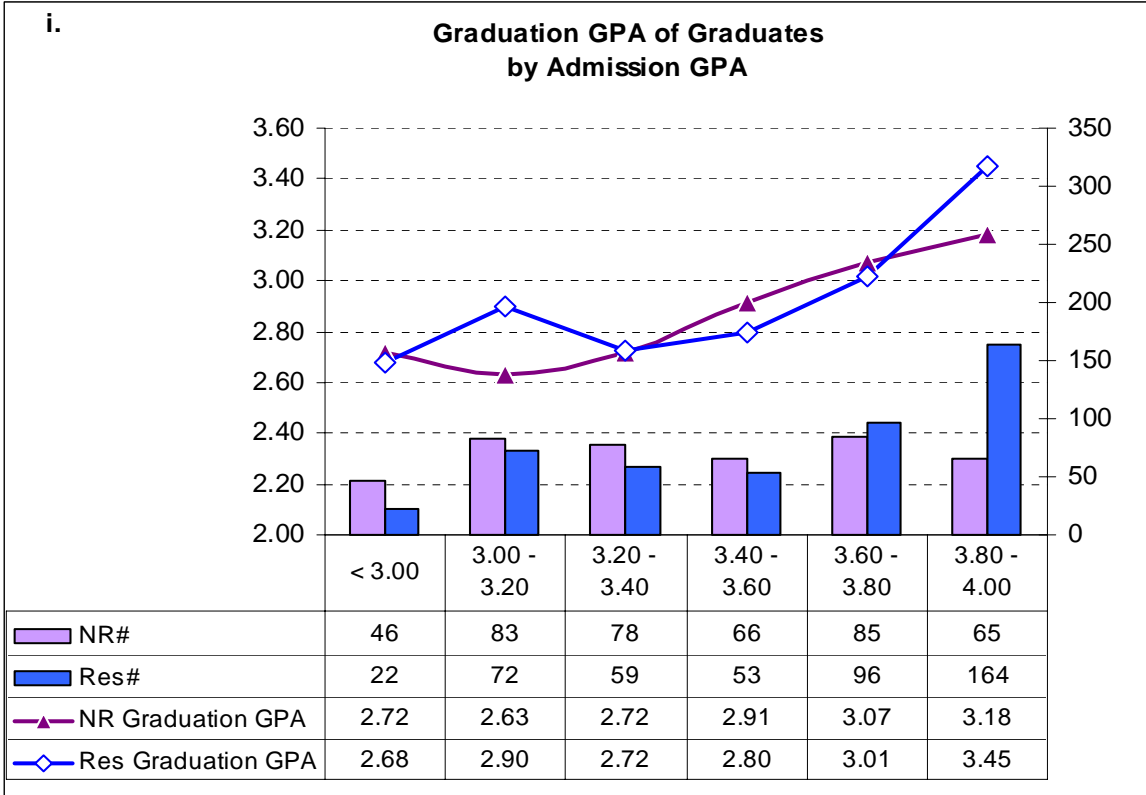
Includes students admitted to SFU in Fall terms 0977 to 1047.



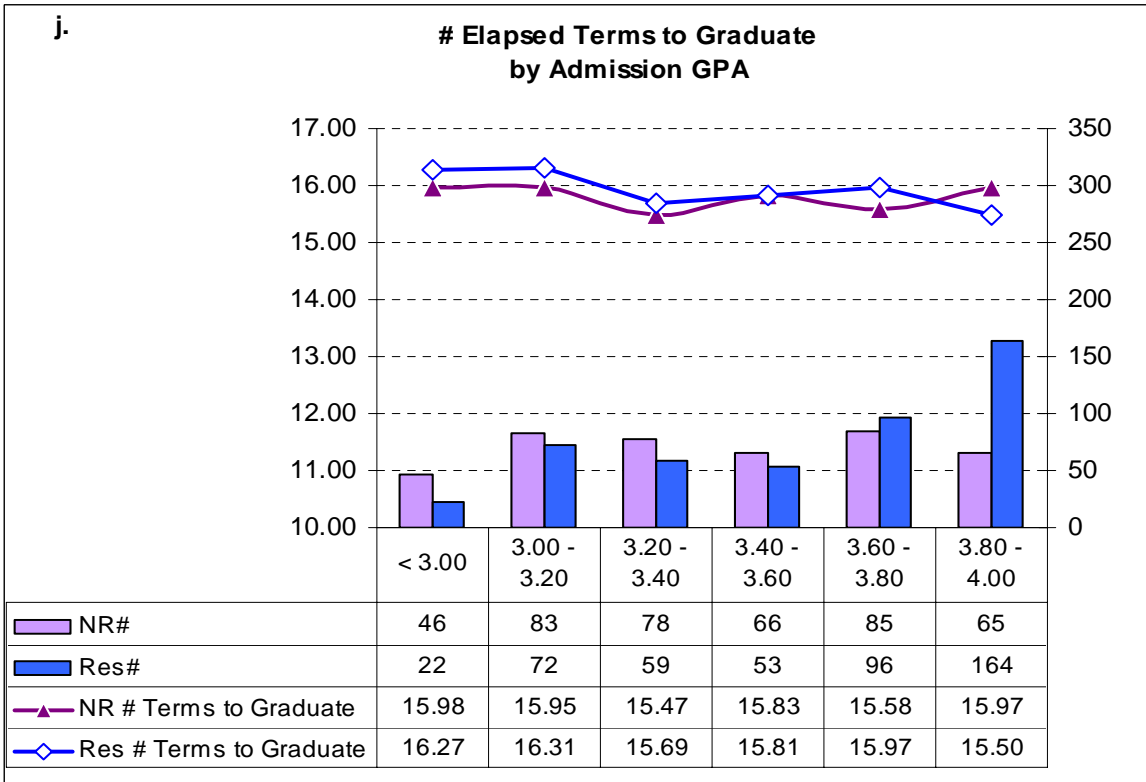
Includes students admitted to SFU in Fall terms 0977 to 1027.



Includes students admitted to SFU in Fall terms 0977 to 1017.



Includes students admitted to SFU in Fall terms 0977 and later who have graduated before Fall 2005.



Includes students admitted to SFU in Fall terms 0977 and later who have graduated.