
COSUMNES RIVER COLLEGE

OFFICE OF RESEARCH & EQUITY

# Factors Associated with New Student First-Term and Second-Term Retention

## The Office of Research & Equity

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# Executive Summary

## Background

In Spring 2023, the Research Office at Cosumnes River College (CRC) investigated factors associated with the persistence of new students. This research was conducted at the request of Student Services and in response to a decline in persistence rates observed after the onset of the global pandemic. Here persistence rates are defined as the percentage of students enrolled in a given term who then enroll in the next major term (Fall-into-Spring or Spring-into-Fall). In the present investigation, four fall cohorts of new CRC students (from Fall 2018 to Fall 2021) were tracked for three terms. Student factors like unit load, withdraw rate, term success rate, visiting a counselor, etc., from these cohorts were evaluated for their potential association with persistence.

Additionally, in order to assist Student Services in planning interventions for new students, predictive factors were organized into two groups – factors that can be monitored *during* the term and factors that can be monitored *after* the term. For example, the unit load of a student is something that can be monitored before/during the term, whereas the student's individual success rate can only be learned after final grades are submitted.

## Summary of Findings

*Factors Predicting New Student Persistence from Their First Term into Their Second Term*

1. Several factors were associated with first-into-second term persistence that could be monitored *during* the term:
    a. Visiting a counselor, completing a comprehensive educational plan, participating in EOPS, and enrolling in a higher unit load were associated with higher rates of persistence.
    b. Having a higher withdraw rate and/or an undecided major was associated with lower rates of persistence.
2. Several factors were associated with first-into-second term persistence that could only be monitored *after* the term was over:
    a. Higher cumulative units completed, a higher success rate, and whether or not the student completed transfer-level English were associated with higher persistence rates.
    b. Note: One could monitor transfer-level English enrollment during the semester.
3. Visiting a counselor had the strongest association with persistence into the second term.

*Factors predicting New Student Persistence from Their Second Term into Their Third Term*

1. Several factors were associated with second-into-third term persistence that could be monitored *during* the term:
    a. Enrolling in a higher unit load, completing a comprehensive educational plan, and visiting a counselor were all associated with higher persistence rates.
    b. Having a higher withdraw rate and/or an undecided major was associated with lower rates of persistence.
2. Several factors were associated with second-into-third term persistence that could be monitored *after* the term:

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   a. Having a higher success rate, completing more cumulative units, and/or completing transfer-level English were all positively associated with persistence.
   b. Note: One could monitor transfer-level English enrollment during the semester.
3. Success rate had the strongest association with persistence into the third term.

**Conclusions and Recommendations**

On the basis of the findings reported here, outreach and student services should monitor and design interventions around the predictive factors reported here. Interventions should ideally focus on variables that can be measured during the term in order to provide on-time assistance.

**Caveats and Limitations**

The findings reported here are correlational, and therefore, readers should be careful in making causal interpretations. For example, seeing a counselor by the end of the term may be associated with other factors. The student may have more free-time, motivation, social connections, etc. These alternative factors may explain the association between counseling and persistence, rather than counseling itself.

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## Background and Methodology

### Method

As previously stated, the goal of the present investigation was to search for factors related to the persistence of students – from their first-into-second term and their second-into-third term. Persistence data were gathered for three fall cohorts of new students at CRC – from Fall 2018 to Fall 2021. Headcounts for each cohort can be found in table 1 below. A total of 10309 students were included in the investigation of first-into-second term persistence, and a total of 7352 students were included in the investigation of second-into-third term persistence. Several variables were gathered as potential predictors of persistence. First, student demographic data and program participation were gathered: age, gender, EOPS status, foster youth status, veteran status, first generation status, Career and Academic Community (CAC), and race/ethnicity. Second, behavioral and success variables were gathered for each student. These variables included: whether or not the student visited a counselor by the end of the term, their unit enrollment for the term, their transfer-level unit enrollment for the term, whether or not the student enrolled in and completed transfer-level math/English (two variables for enrollment and completion, respectively), whether or not the student completed a comprehensive educational plan by the end of the term, cumulative units completed by the end of the term, cumulative transfer-level units completed by the end of the term, the term success rate of for the student, the term withdraw rate for the student, and whether or not the student was undecided in the term. The success rate for a student was calculated by dividing their total number of successful grades (A, B, C, or P) by their total number of enrollments. The withdraw rate was calculated similarly – dividing the number of W, EW, and MW grades by the total number of enrollments. These aforementioned behavioral/success variables were the central focus of the evaluation.

*Table 1.* Cohort Sizes

| Cohort Year | First-Term Cohort Sizes | Second-Term Cohort Sizes |
|---|---|---|
| 2018-2019 | 2434 | 1806 |
| 2019-2020 | 2618 | 1992 |
| 2020-2021 | 2674 | 1853 |
| 2021-2022 | 2583 | 1701 |
| **Total** | **10309** | **7352** |

Data were analyzed with logistic regressions assuming binomial error. Analysis were conducted for each variable of interest while controlling for all other variables simultaneously. For example, the association of unit load was tested while holding demographic (age, gender, etc.) and behavioral variables (transfer level units completed) constant. Continuous variables (unit enrollment, units completed, and success/withdraw rates) were centered by their mean and divided by their standard deviation prior to analysis. Regression slopes for these variables should therefore be interpreted as the increase in the log of the odds associated with a one standard deviation increase in the given variable.

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## Findings and Analysis

### Variables Predicting First-into-Second Term Persistence

The first analysis was conducted using the data for 10309 students (see *Table 1*). Persistence rates and headcounts by demographic group can be found in the *Table 2* below. Means and standard deviations for the continuous variables can be found in *Table 3*. Several variables were significantly associated with persistence into the second term. These significant associations can be found in *Table 4* below. The associations are ordered from largest to smallest by their "odds ratio" - which is useful in measuring the relative "size" of an association. An odds ratio that is above the value of one indicates a positive association and an odds ratio that is below the value of one indicates a negative association. A larger value above one means a stronger association, and a smaller value below one measures a more negative association. Note: in this case, for the continuous variables (e.g. unit load), the odds ratio measures the size of the effect for a one standard deviation increase in that variable.

In terms of behavioral/success variables, visiting a counselor, completing a comprehensive educational plan, participating in EOPS, and enrolling in a higher unit load were associated with higher rates of persistence. On the other hand, having a higher withdraw rate and/or an undecided major was associated with lower rates of persistence. These factors can be proactively monitored during the term. For example, outreach/support specialists could reach out to students who withdrew from a class prior to the end of the term. This may increase the chances of helping a student before they decide not to return. Three other behavioral/success variables were associated with persistence: Higher cumulative units completed, a higher success rate, and whether or not the student completed transfer-level English were associated with higher persistence rates. These variables could only be monitored after the term was completed and final grades were reported. It is however possible to monitor transfer-level English enrollment as a leading indicator of whether or not a student completes transfer-level English. Finally, among all behavioral/success variables, visiting a counselor by the end of the term was the strongest predictor.

Note that univariate success rate comparisons for the aforementioned significant associations can be found in the appendix of this report.

*Table 2.* First Term Persistence by Group

| Group | N | Persistence |
|---|---|---|
| Race/Ethnicity | | |
| African American | 921 | 64.7% |
| Asian | 2375 | 80.4% |
| Filipino | 564 | 83.5% |
| Hispanic/Latinx | 3256 | 68.2% |
| Multi-Race | 793 | 70.9% |
| Native American | 38 | 55.3% |
| Pacific Isl. | 136 | 75.7% |
| Unknown | 189 | 56.1% |
| White | 2037 | 66.5% |
| Gender | | |

| | | |
|---|---|---|
| Female | 5235 | 72.6% |
| Male | 4944 | 69.7% |
| Unknown | 130 | 70.8% |
| Age | | |
| 24 and younger | 9318 | 73.6% |
| 25 and older | 991 | 48.7% |
| Foster Youth | 257 | 52.1% |
| Veteran | 94 | 52.1% |
| First Generation | 2835 | 68.3% |
| EOPS | 408 | 91.9% |
| Career and Academic Communities (CAC) | | |
| Agriculture, Food & Natural Resources | 255 | 63.9% |
| Arts, Media & Entertainment | 680 | 72.4% |
| Automotive, Construction & Design Technology | 455 | 60.0% |
| Business & Computer Science | 2019 | 70.5% |
| English & Language Studies | 131 | 70.2% |
| General Education/Undecided | 2161 | 69.3% |
| Health & Human Services | 995 | 65.6% |
| Science, Math & Engineering | 2335 | 77.5% |
| Social & Behavioral Sciences | 1277 | 73.4% |
| Unclassified | 1 | 100.0% |
| **Total** | **10309** | **71.2%** |

*Table 3.* First-Term Continues Variables - Means and SDs

| Continuous Variable | Mean | SD |
|---|---|---|
| First Term Success Rate | 0.60 | 0.41 |
| First Term Withdraw Rate | 0.18 | 0.31 |
| First Term Units Enrolled | 10.10 | 4.35 |
| First Term Transfer Units Enrolled | 8.25 | 4.64 |
| First Term Cumulative Units Completed | 7.49 | 5.86 |
| First Term Transfer Units Completed | 6.32 | 5.61 |

*Table 4.* First-Term Persistence Significant Predictors and Odds Ratios

| Predictor | Slope | Standard Error | *z* | *p-value* | Odds Ratio |
|---|---|---|---|---|---|
| (Intercept) | 1.39 | 0.30 | 4.55 | < .001 | 4.01 |
| Visited a Counselor by First Term | 0.67 | 0.06 | 10.96 | < .001 | 1.96 |
| Completed a Comprehensive Ed Plan by First Term | 0.53 | 0.09 | 5.96 | < .001 | 1.70 |
| First-Term Units Enrolled | 0.51 | 0.06 | 7.99 | < .001 | 1.67 |
| First-Term Cumulative Units Completed | 0.49 | 0.12 | 4.25 | < .001 | 1.63 |

| | | | | | |
|---|---|---|---|---|---|
| First-Term Success Rate | 0.37 | 0.04 | 8.44 | < .001 | 1.45 |
| Transfer English Completed by First Term | 0.23 | 0.10 | 2.26 | < .05 | 1.26 |
| First-Term Withdraw Rate | -0.24 | 0.03 | -7.55 | < .001 | 0.79 |
| Ethnicity - Hispanic/Latino (Compared to African American) | -0.29 | 0.10 | -2.90 | < .01 | 0.75 |
| First-Term Undecided Major | -0.34 | 0.14 | -2.35 | < .05 | 0.71 |
| Ethnicity - White (Compared to African American) | -0.36 | 0.11 | -3.44 | < .001 | 0.69 |
| 25 and Older | -0.60 | 0.09 | -6.52 | < .001 | 0.55 |
| Did not Participate in EOPS | -0.80 | 0.21 | -3.83 | < .001 | 0.45 |

**Variables Predicting Second-into-Third Term Persistence**

The second analysis was conducted using data for 7352 students in their second term. Persistence rates by demographic/program participation group can be found in *Table 5* below. Additionally, means and standard deviations of continuous variables can be found in *Table 6*. Several significant associations were revealed by the analysis, and these associations can be found in *Table 7* – which is again sorted from largest to smallest by the odds ratio. In terms behavioral/success variables enrolling in a higher unit load, completing a comprehensive educational plan, and visiting a counselor were all associated with higher persistence rates. Moreover, having a higher withdraw rate and/or an undecided major was associated with lower rates of persistence. As previously stated, these factors could be monitored during the term to provide proactive interventions. Finally, having a higher success rate, completing more cumulative units, and/or completing transfer-level English were all positively associated with persistence. Of all the variables predicting persistence, success rate had the strongest predictive association with persistence into the third term.

Note that univariate success rate comparisons for the aforementioned significant associations can be found in the appendix of this report.

*Table 5.* Second-Term Persistence by Group

| Grouping | N | Persistence |
|---|---|---|
| Race/Ethnicity | | |
| African American | 599 | 67.3% |
| Asian | 1905 | 79.3% |
| Filipino | 470 | 79.6% |
| Hispanic/Latinx | 2217 | 73.0% |
| Multi-Race | 564 | 72.3% |
| Native American | 21 | 61.9% |
| Pacific Islander | 103 | 70.9% |
| Unknown | 107 | 70.1% |
| White | 1366 | 72.0% |
| Gender | | |
| Female | 3822 | 76.2% |
| Male | 3437 | 72.1% |
| Unknown | 93 | 73.1% |

| | | |
|---|---|---|
| Age | | |
| 24 and younger | 6858 | 75.3% |
| 25 and older | 494 | 59.9% |
| Foster Youth | 136 | 55.9% |
| Veteran | 51 | 54.9% |
| First Generation | 1930 | 71.3% |
| EOPS | 377 | 84.4% |
| Career and Academic Communities (CAC) | | |
| Agriculture, Food & Natural Resources | 148 | 64.9% |
| Arts, Media & Entertainment | 507 | 73.6% |
| Automotive, Construction& Design Technology | 274 | 60.6% |
| Business & Computer Science | 1503 | 74.1% |
| English & Language Studies | 107 | 84.1% |
| General Education/Undecided | 1374 | 72.9% |
| Health & Human Services | 649 | 70.9% |
| Science, Math & Engineering | 1762 | 77.3% |
| Social & Behavioral Sciences | 1027 | 77.5% |
| Unclassified | 1 | 100.0% |
| **Total** | **7352** | **74.2%** |

*Table 6.* Second-Term Continues Variables - Means and SDs

| Continuous Variable | Mean | SD |
|---|---|---|
| Second-Term Success Rate | 0.65 | 0.39 |
| Second-Term Withdraw Rate | 0.19 | 0.31 |
| Second-Term Units Enrolled | 10.66 | 4.09 |
| Second-Term Transfer Units Enrolled | 9.25 | 4.59 |
| Second-Term Cumulative Units Completed | 16.91 | 9.34 |
| Second-Term Transfer Units Completed | 14.64 | 9.45 |

*Table 7.* Second-Term Persistence Significant Predictors and Odds Ratios

| Predictor | Slope | Standard Error | *z* | *p*-value | Odds Ratio |
|---|---|---|---|---|---|
| (Intercept) | 0.96 | 0.28 | 3.47 | < .001 | 2.61 |
| Second-Term Success Rate | 0.45 | 0.05 | 9.47 | < .001 | 1.57 |
| Second-Term Units Enrolled | 0.35 | 0.07 | 5.14 | < .001 | 1.42 |
| Second-Term Cumulative Units Completed | 0.31 | 0.11 | 2.97 | < .01 | 1.37 |
| Completed a Comprehensive Ed Plan by Second Term | 0.25 | 0.07 | 3.44 | < .001 | 1.28 |
| Transfer English Completed by Second Term | 0.22 | 0.08 | 2.84 | < .01 | 1.25 |
| Visited Counselor by Second Term | 0.16 | 0.08 | 1.99 | < .05 | 1.18 |
| Male Gender | -0.16 | 0.06 | -2.60 | < .01 | 0.85 |

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|---|---|---|---|---|---|
| Second-Term Withdraw Rate | -0.17 | 0.04 | -4.46 | < .001 | 0.85 |
| Ethnicity - White (Compared to African American) | -0.32 | 0.12 | -2.59 | < .01 | 0.73 |
| 25 and Older | -0.46 | 0.12 | -3.90 | < .001 | 0.63 |
| Second Term Undecided Major | -0.73 | 0.22 | -3.29 | < .01 | 0.48 |
| Veteran Status | -0.93 | 0.33 | -2.77 | < .01 | 0.40 |

## Conclusions and Recommendations

On the basis of the findings reported here, outreach and student services should monitor and design interventions around the predictive factors reported here. Interventions should focus on variables that can be measured during the term, so that assistance does not reach a student when it is too late.

## Caveats and Limitations

The findings reported here are correlational, and therefore, readers should be careful in making causal interpretations. For example, seeing a counselor by the end of the term may be associated with other factors. The student may have more free-time, motivation, social connections, etc. These alternative factors may explain the association between counseling and persistence.

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## Appendices

First-into-second term course success comparisons for significant behavioral/success associations. The "Grouping" column indicates the categorical level of the variable in question. For example, in the "Counseling Visit" row, data in the "No" grouping is for students who did not visit a counselor by the end of their first term. For simplicity, groupings for continuous variables were split into students above and below the mean for that variable.

| Variable | Grouping | Headcount | Persistence |
|---|---|---|---|
| Course Success | <= 60.5% | 4400 | 52.9% |
| | > 60.5% | 5909 | 84.9% |
| Counseling Visit | No | 2922 | 48.0% |
| | Yes | 7387 | 80.4% |
| Comprehensive Ed Plan | No | 7940 | 65.4% |
| | Yes | 2369 | 90.8% |
| Transfer English Completed | No | 6885 | 60.9% |
| | Yes | 3424 | 91.9% |
| Units Enrolled | <=10.099 | 4711 | 54.0% |
| | > 10.099 | 5598 | 85.7% |
| Cumulative Units Completed | <=7.486 | 5331 | 51.4% |
| | > 7.486 | 4978 | 92.5% |
| Undecided Major | Not Undecided | 9947 | 72.2% |
| | Undecided | 362 | 45.3% |
| Withdraw Rate | <= 18.3% | 6899 | 78.0% |
| | > 18.3% | 3410 | 57.5% |

Second-into-third term course success comparisons for significant behavioral/success associations. The "Grouping" column indicates the categorical level of the variable in question. For example, in the "Counseling Visit" row, data in the "No" grouping is for students who did not visit a counselor by the end of their first second term. For simplicity, groupings for continuous variables were split into students above and below the mean for that variable.

| Variable | Grouping | Headcount | Retention |
|---|---|---|---|
| Course Success | <= 64.9% | 2813 | 56.4% |
| | > 64.9% | 4539 | 85.3% |
| Comprehensive Ed Plan | No | 4537 | 68.0% |
| | Yes | 2815 | 84.3% |
| Transfer English Completed | No | 3190 | 59.8% |
| | Yes | 4162 | 85.3% |
| Counseling Visit | No | 1091 | 59.0% |

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| | | | |
|---|---|---|---|
| | Yes | 6261 | 76.9% |
| Units Enrolled | <=10.662 | 3148 | 61.1% |
| | > 10.662 | 4204 | 84.1% |
| Cumulative Units Completed | <=16.913 | 3543 | 58.1% |
| | > 16.913 | 3809 | 89.3% |
| Withdraw Rate | <= 19.0% | 4759 | 80.9% |
| | > 19.0% | 2593 | 61.9% |
| Undecided Major | Not Undecided | 7245 | 74.6% |
| | Undecided | 107 | 48.6% |