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An Evaluation of the HASS 01 Course, Winter 2006

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Summary of findings: The results suggest that, relative to a similar set of non-HASS 01 students, HASS 01 students experienced an improvement in their GPA of 0.35 points (fall to winter) and 0.24 points (fall to spring). Both effects are statistically significant. Among targeted students on academic probation during the fall, HASS 01 students experienced a 20 percentage point difference in the probability of first-year retention relative to similar non-HASS 01 students. Whereas the average student in the target probation population had a 63% probability of being retained through the end of freshman year, that same student would have possessed an 83% probability of retention had they taken the HASS 01 course. This effect was also statistically significant.

This report offers an evaluation of the impact of HASS 01 on student performance and retention. HASS 01 was first offered to freshmen in academic difficulty in the winter quarter of 2006. The 2-unit course dealt with the following sorts of issues: making informed choices, academic culture and expectations, academic success skills, critical thinking, social issues, and major selection and career preparation. It provided students with individualized assessment and assigned experiential activities utilizing campus resources, reflection papers and a portfolio. The target population for the course was freshmen with a fall quarter GPA of between 1.0 and 2.5, although any freshman was ultimately free to enroll.

Students learned of the course in a variety of ways. All students on academic probation after the fall quarter were invited to a Probation Workshop on the Saturday before the start of winter quarter. Strategies for improving academic performance, such as the HASS 01 course, were discussed at the workshop. (Turnout was only moderate and was arguably composed of students who were highly motivated to improve their academic standing.) An e-mail was also sent to all freshmen within the target population prior to the beginning of the winter quarter, inviting them to enroll in HASS 01. The course was

initially filled virtually to capacity, at 100 students, and 82 students ultimately completed the course. The course was graded on a Satisfactory/No Credit basis.

The following analysis utilizes data drawn directly from the data warehouse.[1] The data pertain to the entire entering freshman class of '05. It contains information on the background and personal characteristics of students (e.g., high school GPA, SAT score, parental income and education), involvement in the HASS 01 course (0/1), and information about students' academic record (fall, winter, and spring) at UCR, including their GPA, whether or not they were dismissed after winter or spring quarters (no freshman in CHASS is ever dismissed following fall quarter), and units earned.

We focus in this report on the impact of the course on student retention and improvement in academic performance, as measured by the difference in GPA between fall and spring quarters. Table 1 gives the variable definitions and Table 2 the descriptive statistics.

Retention

We begin with the impact on retention – a dichotomous variable indicating whether or not (0/1) a student was dismissed in either winter or spring quarters for academic reasons. A decision must first be made with regard to those students who left voluntarily over the course of the year. How should they be treated in this analysis? We chose to conduct the analysis both excluding them and including them in the "retained" (i.e., not dismissed) population. The results are not substantively different, and so we present those in which voluntary leavers are excluded from the sample.

For this analysis, we focus on the population on academic probation (i.e., less than a 2.0 GPA) during fall quarter. This restricts the sample size fairly dramatically, but identifies the population that is a candidate for dismissal if fall quarter academic performance were to continue. We chose a parsimonious number of control variables – and indeed treated some categorical variables as though they were continuous quantitative measures – in order to maximize the degrees of freedom.

Table 3 gives the results for all students on academic probation from fall quarter, and Table 4 gives the results for the target population within this group – i.e., those with fall GPA's less than 2.0, but greater than 1.0. HASS 01 students compose roughly 25% of the first sample and 21% of the second sample. Thus, students with fall quarter GPA's below the 1.0 target minimum did indeed enroll in the course in significant numbers. The results suggest that the HASS 01 course did indeed help to retain students. Regardless of the population chosen – all students on academic probation from the fall or just those on academic probation in the target group – the impact of the HASS 01 course was statistically significantly different from zero.

Probit regression results are not immediately interpretable in quantitative terms without further adjustment. When estimated coefficients are converted into a measure of "the

[1] Thanks are due to Chuck Rowley and José Beruvides for help with the data collection process.

additional probability of retention due to attendance in HASS 01" the results for the target population (Table 4) suggest that HASS 01 students experienced a roughly 20 percentage point difference in the probability of retention over similar non-HASS 01 students. The average student on academic probation from the fall (and in the target population) would have experienced a 63% chance of being retained at the end of spring if they had not enrolled in HASS 01, whereas that probability of retention would have risen to 83% given enrollment in the HASS 01 course. For all students on academic probation, there was only an 8 percentage point difference in the probability of retention, from 55% to 63%. Thus, the HASS 01 course was far superior in rescuing students in the target population.

In both this and the GPA-improvement analysis to follow, one must be concerned about selection into the HASS 01 course. Suppose that only the truly motivated students enrolled in HASS 01. In this case, the estimated impact on retention and GPA improvement may not be entirely attributable to HASS 01, but rather to the fact that HASS 01 drew in the truly motivated. Indeed, perhaps the entire estimated difference in retention rates would have been experienced in the absence of HASS 01, since the truly motivated would have persisted even in the absence of the help offered them in the course. There are no perfect ways of adequately removing this possible bias in our estimated effects, but one less-than-perfect fix is to proxy for motivation. We do this based on attendance at the Probation Workshop, which, we suspect, offers one measure student motivation. When this variable is added to the Table 4 specification, the HASS 01 coefficient falls to 0.84 and the z-statistic falls to 1.88. Thus, some of the estimated HASS 01 effect may be due to the fact that more motivated students enrolled in the course as part of their strategy for improving academic performance. However, the HASS 01 effect remains both statistically and quantitatively significant.

Improvements in Grade Point Averages

Better grades are no doubt the reason for the higher retention numbers for HASS 01 students. But, by how much, exactly, did HASS 01 students improve grades from fall to spring as compared to the control group of students not enrolled in HASS 01? Table 5 gives the results of this analysis, focusing on the original target population – namely, students with a fall quarter GPA greater than 1.0 but less than or equal to 2.5. The results suggest that GPA improvement was only marginally statistically significantly greater for HASS 01 students compared to the control group population, but that the quantitative magnitude of the difference was in fact quite substantial – roughly a quarter of a grade point average. (The results are very similar if we restrict the sample to students with a GPA in fall quarter less than or equal to 2.5. But, if we restrict the sample to students with less than a 2.0 fall GPA, the estimated coefficient falls to 0.15 and the t-statistic falls to 0.7)

However, we may worry about these findings in that they exclude all freshmen who were dismissed at the end of winter quarter. If HASS 01 was indeed a success in rescuing students on the margins of academic difficulty, and thereby decreasing their probability of dismissal in the winter (as appears to be the case from the retention results above),

then the non-HASS 01 population in spring is culled of students in dire academic difficulty whereas the HASS 01 population is not – perhaps leading to a downward bias in the estimated HASS 01 effect. To address this concern, in Table 6, we estimate the relative difference in GPA improvement from fall to winter for the HASS 01 and non-HASS 01 populations. (Note that since the HASS 01 course is taken S/NC, performance in that course does not affect winter GPA's.) The results are significantly different, suggesting that the fall to spring comparison may have produced biased results. Here, we find that the relative boost in GPA's is 0.35 GPA points, and the t-statistic is a healthy 2.5. (These numbers jump to 0.60 and 3.5, respectively, if the populations are restricted to freshmen with less than 2.0 GPA in fall. And these numbers fall only slightly (0.55/2.9) if we control for level of motivation by adding the variable "attended the probation workshop.")

Conclusion

We view these findings (especially given the small sample sizes and healthy attempts to control for other correlates) as at least suggestive that HASS 01 was a success in improving student performance. Comparing HASS 01 students with similar non-HASS 01 students, the course appeared to have quite a significant impact on relative academic performance from fall to winter quarter. This relative impact was somewhat more fleeting come spring, but the fall to spring comparison may be biased due to an initial round of dismissals in the winter that culled the poorest academic performers disproportionately from the non-HASS 01 population. The enhanced performance of HASS 01 students led to their having significantly higher retention rates. Differences in first-year retention rates were quantitatively sizeable and statistically significant.

Table 1. Variable Definitions

Variable		Definition
Sid		Student ID Number
gen_coding		If female, =1; male =0
major_coding		refer to "detail code"
Highschool~a		Highschool gpa
hslevel_co~g	*	Highschool quality level
Satiiwriting		Score of SAT II Writing
Satiimath		Score of SAT II Math
parentalin~e		Parental income
f_edu_leve~g	**	Father's education level
m_edu_leve~g	**	Mother's education level
Fgpa		GPA in fall quarter in 2006
funitsearned		Earned units in Fall quarter
elwr_bucr	***	If passed elwr before matriculation, =1; otherwise =0
Wgpa		GPA in winter quarter in 2006
wunitsearned		Earned units in Winter quarter
w_dismis_c~e	****	If Dismissed based on GPA in winter quarter, =1 ; if not , =0
Sgpa		GPA in spring quarter in 2006
sunitsearned		Earned units in Spring quarter
dismissed06s		If Dismissed based on GPA in spring quarter, =1; if not , =0
elwr_aft~06s		If failed to pass elwr before end of spring quarter '06, =1; if passed before, =0
hhas01		If in HASS 01 course, =1; otherwise =0
grade_hass~o		If satisfactory grade in HASS 01, =1 ; otherwise, =0
att_workshop	*****	If attend probation workshop, =1; otherwise, =0

Table 2. Descriptive Statistics

. sum

Variable	Obs	Mean	Std. Dev.	Min	Max
term_F06	0				
sid	1637	8.61E+08	45302.09	8.60E+08	8.61E+08
gen_coding	1637	0.612706	0.487281	0	1
major_coding	1637	16.88332	5.35036	1	24
major5	1637	0.029322	0.168759	0	1
major6	1637	0.024435	0.154442	0	1
major9	1637	0.027489	0.163554	0	1
major11	1637	0.0281	0.16531	0	1
major13	1637	0.035431	0.184922	0	1
major16	1637	0.088577	0.284219	0	1
major17	1637	0.304215	0.460215	0	1
major18	1637	0.12584	0.33177	0	1
major21	1637	0.032376	0.177052	0	1
major24	1637	0.199145	0.399479	0	1
highschool~a	1612	3.437816	0.368333	2.5	4.73
hslevel_co~g	1637	6.004276	3.811494	0	11
satiiwriting	1515	519.8086	84.31574	200	800
satiimath	1523	532.5542	88.49436	290	800
parentalin~e	1376	65916.43	70173.71	100	900000
lnpa_income	1376	10.70595	0.93562	4.60517	13.71015
f_edu_leve~g	1637	4.238241	1.932714	1	7
m_edu_leve~g	1637	4.214417	1.750609	1	7
fgpa	1637	2.715522	0.812081	0	4
funitsearned	1637	12.28528	3.610953	0	21
elwr_bucr	1637	0.419059	0.493556	0	1
wgpa	1586	2.659945	0.868192	0	4
wunitsearned	1586	13.40227	4.018518	0	22
w_dismis_c~e	1586	0.038462	0.192368	0	1
sgpa	1481	2.706545	0.886349	0	4
sunitsearned	1481	13.54355	3.82554	0	24
dismissed06s	1481	0.035111	0.184124	0	1

elwr_aft~06s		1481	0.971641	0.166053	0	1
hhas01		1637	0.050092	0.218201	0	1
grade_hass~o		82	0.768293	0.42452	0	1
att_workshop		1637	0.018326	0.134169	0	1
d_gpa_f_s		1481	-0.12099	0.806604	-3.233	3.767
d_gpa_f_w		1586	-0.08836	0.747061	-4	2.933
retention		1586	0.928752	0.257321	0	1

Table 3. Retention Results: Freshmen with <2 Fall GPA

```
Probit regression                                 Number of obs   =        166
                                                  LR chi2(10)     =      36.95
                                                  Prob > chi2     =     0.0001
Log likelihood = -95.123355                       Pseudo R2       =     0.1626

------------------------------------------------------------------------------
  retention |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
------------+-----------------------------------------------------------------
     hhas01 |   .5897459   .2701849     2.18   0.029     .0601932    1.119299
       fgpa |   1.022142   .1894571     5.40   0.000     .6508131    1.393471
 gen_coding |   .2196217   .2413149     0.91   0.363    -.2533468    .6925902
major_coding |   .0033979   .0192831     0.18   0.860    -.0343962    .0411921
highschool~a |   .0996436   .3729293     0.27   0.789    -.6312844    .8305715
hslevel_co~g |   .0252617   .0283144     0.89   0.372    -.0302335    .0807569
f_edu_leve~g |    .077021   .0882346     0.87   0.383    -.0959155    .2499576
m_edu_leve~g |  -.0371771   .0927284    -0.40   0.688    -.2189214    .1445672
satiiwriting |  -.0002402   .0014335    -0.17   0.867    -.0030498    .0025694
  satiimath |   .0002537   .0014731     0.17   0.863    -.0026335     .003141
      _cons |  -2.086405   1.555701    -1.34   0.180    -5.135523    .9627126
------------------------------------------------------------------------------
```

Table 4 Retention Results: Freshmen with <2 but >1 Fall GPA

```
Probit regression                                 Number of obs   =        112
                                                  LR chi2(10)     =      34.65
                                                  Prob > chi2     =     0.0001
Log likelihood = -53.729242                       Pseudo R2       =     0.2438

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   retention |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
     hhas01 |   1.168955   .4077827     2.87   0.004     .3697154    1.968194
       fgpa |   3.228131   .6824286     4.73   0.000     1.890596    4.565667
 gen_coding |   .0640361    .339883     0.19   0.851    -.6021225    .7301946
major_coding |  -.0415213   .0296314    -1.40   0.161    -.0995978    .0165553
highschool~a |  -.2746103    .479496    -0.57   0.567    -1.214405    .6651845
hslevel_co~g |   .0333322   .0370213     0.90   0.368    -.0392282    .1058925
f_edu_leve~g |   .1016917   .1203159     0.85   0.398    -.1341232    .3375065
m_edu_leve~g |   .0026807   .1229863     0.02   0.983    -.2383681    .2437294
satiiwriting |  -.0018723   .0022088    -0.85   0.397    -.0062013    .0024568
   satiimath |   .0001018    .002083     0.05   0.961    -.0039808    .0041844
       _cons |  -3.081642   2.250199    -1.37   0.171    -7.491951    1.328668
```

Table 5. Change in GPA, Fall to Spring: Freshmen with Fall GPA <=2.5 but >1

```
 Source |       SS       df       MS              Number of obs =     387
-------------+------------------------------           F( 18,   368) =    1.11
       Model |  16.1951673    18  .899731516           Prob > F      =  0.3436
    Residual |  299.298272   368  .813310522           R-squared     =  0.0513
-------------+------------------------------           Adj R-squared =  0.0049
       Total |   315.49344   386  .817340517           Root MSE      =  .90184

------------------------------------------------------------------------------
      d_gpa |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
     hhas01 |   .2396265   .1596965     1.50   0.134    -.0744057    .5536586
     major5 |   .2966168    .314627     0.94   0.346    -.3220756    .9153093
     major6 |  -.5448673   .4879461    -1.12   0.265     -1.50438    .4146451
     major9 |   .1191933   .3357022     0.36   0.723     -.540942    .7793286
    major11 |   .3061017   .4894972     0.63   0.532    -.6564608    1.268664
    major13 |   .3709641   .3263075     1.14   0.256    -.2706972    1.012625
    major16 |   .1066921   .2368161     0.45   0.653    -.3589905    .5723746
    major17 |   .3055841   .1913447     1.60   0.111    -.0706821    .6818503
    major18 |  -.0046802   .2058098    -0.02   0.982     -.409391    .4000306
    major21 |  -.1800376   .2748327    -0.66   0.513    -.7204772    .3604019
    major24 |   .2034874   .2011189     1.01   0.312    -.1919992    .5989739
 gen_coding |   .0081395   .1049294     0.08   0.938     -.198197     .214476
highschool~a |   .1910969   .1554011     1.23   0.220    -.1144886    .4966824
hslevel_co~g |   .0041785   .0132983     0.31   0.754    -.0219717    .0303286
f_edu_leve~g |    .005122   .0324721     0.16   0.875    -.0587322    .0689761
m_edu_leve~g |   .0471805   .0363656     1.30   0.195    -.0243299    .1186909
satiiwriting |   .0001563   .0006894     0.23   0.821    -.0011994     .001512
  satiimath |  -.0010691    .000696    -1.54   0.125    -.0024378    .0002996
      _cons |  -.4841942   .7149693    -0.68   0.499    -1.890132    .9217438
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Table 6. Change in GPA, Fall to Winter: Freshmen with Fall GPA <=2.5 but >1

```
   Source |       SS       df       MS              Number of obs =     423
-------------+------------------------------           F( 18,   404) =    0.90
       Model |  10.5393828    18  .585521269           Prob > F      =  0.5758
    Residual |  262.110754   404  .648788996           R-squared     =  0.0387
-------------+------------------------------           Adj R-squared = -0.0042
       Total |  272.650137   422  .646090373           Root MSE      =  .80547

------------------------------------------------------------------------------
  d_gpa_f_w |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
     hhas01 |   .3482321   .1410339     2.47   0.014     .0709802     .625484
     major5 |   .2101942   .2753274     0.76   0.446     -.331059    .7514474
     major6 |  -.2638975   .3909068    -0.68   0.500    -1.032363    .5045679
     major9 |   .3571128   .2949439     1.21   0.227    -.2227036    .9369292
    major11 |  -.1576472   .3638244    -0.43   0.665    -.8728725    .5575781
    major13 |   .0852737   .2774961     0.31   0.759     -.460243    .6307904
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    major16 |   .0631914   .1984948     0.32   0.750    -.3270203    .4534031
    major17 |  -.0499133   .1610124    -0.31   0.757    -.3664401    .2666134
    major18 |  -.0135096   .1740524    -0.08   0.938    -.3556711    .3286519
    major21 |   .0673746   .2274661     0.30   0.767    -.3797903    .5145395
    major24 |   .0030504   .1686845     0.02   0.986    -.3285585    .3346593
 gen_coding |    .109245   .0903334     1.21   0.227    -.0683371    .2868272
highschool~a |   .1154034   .1278736     0.90   0.367    -.1359774    .3667841
hslevel_co~g |   .0076648   .0112496     0.68   0.496    -.0144503    .0297799
f_edu_leve~g |  -.0167597   .0278584    -0.60   0.548    -.0715252    .0380058
m_edu_leve~g |   .0446975   .0312411     1.43   0.153    -.0167178    .1061129
satiiwriting |   .0002323   .0005947     0.39   0.696    -.0009368    .0014014
  satiimath |   .0003413   .0005949     0.57   0.567    -.0008282    .0015107
      _cons |  -.7963338   .5981537    -1.33   0.184    -1.972216    .3795485
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