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A Student Experience in the Research University (SERU) Project Research Paper*

UNDERGRADUATE TIME USE AND ACADEMIC OUTCOMES: Results From UCUES 2006

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ABSTRACT

Class attendance and out-of-class study time are known to be strongly associated with academic engagement and college GPA. The paper examines two other uses of time as influences on academic outcomes: those devoted to active engagements with friends and community as opposed to passive entertainments, and those that connect students to campus life rather than separating them from campus life. Controlling for students' socio-demographic backgrounds, previous academic achievements, and social and psychological stressors, we find that "activating" uses of time are associated with higher levels of academic engagement and higher GPAs. However, uses of time that connect students to campus life show inconsistent effects.

Hours of class attendance and academic study are known to be predictors of academic engagement and high grades, even after prior academic performance and ability are controlled (see Pascarella and Terenzini 2005: 186-7; Lahmers and Zulauf 2000; Nonis, Philhours and Hudson 2006; Stinebrickner and Stinebrickner 2004). However, researchers have not yet established in well-controlled studies the extent to which non-academic uses of time contribute to or detract from desirable academic outcomes. Nor have they established which types of non-academic uses of time are most conducive to academic success.

Following theoretical suggestions in the literature on student success, we develop a three-dimensional framework for understanding the academic implications of student time use, and consider time investments in each dimension as predictors of academic outcomes. Our framework focuses on 1) scholarly versus non-scholarly uses of time; 2) active versus passive uses of time; and 3) uses of time that connect students to or

* The SERU Project is a collaborative study based at the Center for Studies in Higher Education at UC Berkeley and focused on developing new types of data and innovative policy relevant scholarly analyses on the academic and civic experience of students at major research universities. For further information on the project, see http://cshe.berkeley.edu/research/seru/

separate students from campus life. The results of analysis of time use among 6300 University of California (UC) undergraduate students support the first and second dimensions of this model, but provide only very mixed and partial support for the third dimension. The time use results remain robust even after an extensive battery of socio-demographic, academic background, and social and psychological affect variables are controlled.

This study is important for five reasons. First, it confirms that out-of-class study is the time investment most strongly associated with academic success. Second, it confirms that non-academic uses of time can contribute to desirable academic outcomes for students and provides evidence on the types of non-academic uses of time that are most conducive to academic engagement and achievement. Third, it contributes to recent scholarly questioning of the academic involvement model of Astin (1984, 1996) and the student departure model of Tinto (1975, 1993), because some "connecting" activities do not appear to support academic success while some "separating" activities do appear to support academic success. Fourth, it develops the concepts of "time use core" and "time use periphery" to describe the activities associated with academically desirable outcomes and to identify the profile of students who are located in each of these two time use spheres. Fifth, it establishes that some groups – notably, male students and students from less advantaged racial-ethnic and socio-economic backgrounds — are less likely than others to engage in academically desirable uses of time, and it establishes some of the reasons why this is true. As we will discuss, the study has important implications for institutional policymakers whose goal it is to improve undergraduate academic success.

Historical Context of the Study

American undergraduates attend class and study out of class, on average, between 25 and 30 hours a week (Babcock and Marks 2007). Out-of-class study accounts for a little less than half of this sum (ibid.). Thus, on average, hours of out-of-class study now account for less than half of the conventionally prescribed two hours of study out of class for every hour of study in class. Research indicates that average hours of out-of-class study have been declining for more than 40 years, and they have declined in every type of institution, in every departmental major, and among every demographic group (ibid.). Out-of-class study remains somewhat higher at selective institutions and in natural science and engineering fields, particularly engineering (ibid.).

Although some scholars and journalists have attributed declines in out-of-class study to students' job and family responsibilities (see, e.g., Kulm and Cramer 2006; McCartan 1988; NCES 1996; Nonis, Philhours, and Hudson 2006; Pascarella et al. 1998; Stern and Nakata 1991), research indicates that time investments in work and family do not overshadow time investments in social and leisure activities. Indeed, the research evidence is consistent in showing that college students spend, on average, many more hours per week on social and leisure activities than on paid work and family responsibilities (NSSE 2007; Saenz and Barrera 2007; U.S. Bureau of Labor Statistics 2007). The most detailed set of time use categories are found in the 2006 University of California Undergraduate Student Experience Survey (UCUES). According to UCUES, students spend, on average, more than 40 hours a week on social and leisure activity and only about 11 hours on paid employment and family responsibilities (see Table 1).

Table 1. Average Weekly Time Use, UC Undergraduates	Mean	S.D.	Range	N
Time Use: Attending Classes	15.67	6.11	0-35	6300
Time Use: Studying	12.72	8.32	0-35	6300
Time Use: Entertainment	3.03	3.19	0-35	6300
Time Use: Exercise	5.53	5.45	0-35	6300
Time Use: Socializing with Friends	11.86	8.42	0-35	6300
Time Use: Student Clubs/Student Organizations	3.90	5.73	0-35	6300
Time Use: Volunteering	2.22	3.79	0-35	6300
Time Use: Computer for Fun	11.43	8.66	0-35	6300
Time Use: Watching TV	5.73	6.21	0-35	6300
Time Use: Hobbies	5.47	5.91	0-35	6300
Time Use: Family	4.36	6.95	0-35	6300
Time Use: Religious Activities	1.75	3.62	0-35	6300
Time Use: Work for Pay[1]	7.66	8.90	0-35	6300
Time Use: Working on Campus[1]	4.16	6.96	0-35	6300
Time Use: Working Related to Major[1]	2.85	6.19	0-35	6300
Time Use: Commuting	3.54	4.76	0-35	6300
Time Use: Sleeping (daily)	6.5	1.37	0-11.5	6300

As these data indicate, current cultural norms among U.S. undergraduates support a conception of schooling as an important, but part-time activity. Other parts of life, notably, social and leisure activities, are at least as important, and many students also work part-time (but usually less than 15 hours a week) to help pay their bills and to provide themselves with discretionary income.

Undoubtedly, the limited number of hours most students spend on their studies affects their capacity to master subject matter material. At the same time, previous research suggests that some non-academic uses of time may contribute to, rather than detract from, academic success. We focus, therefore, on the extent to which *both* academic and non-academic uses of time contribute to desirable academic outcomes.

A Three-Dimensional Framework

Our theoretical framework emphasizes the joint importance of three dimensions of student time use. The first dimension posits that scholarly habitus (Bourdieu 1986), the regular and habitual practices of scholarly life, is consequential for academic achievement. We label this the scholarly/non-scholarly dimension. The second dimension, a staple of educational thought since the time of John Dewey (see, e.g., Dewey 1916), posits that experiences that encourage students to engage others and to construct their worlds actively are conducive to academic success, while passive entertainments tend to create obstacles to the motivation and skills required for study. We label this the active/passive dimension. The third dimension, which has roots in the work of Astin (1984, 1996) and Tinto (1975, 1993), posits that activities that connect students to the social and intellectual life of the campus are conducive to academic success, while those that separate students from campus life create obstacles to academic success. We label this the connecting/separating dimension.

Although each of these three dimensions has many partisans, they are rarely considered together, as complementary influences on student success. Indeed, progressive educators have, at times, been inclined

to emphasize the stultifying impact of scholarly habitus, while traditionalists have been inclined at times to dismiss the progressives' emphasis on active learning experiences as peripheral compared to the development of sheer time on task (see Brint 2006: ch. 8). Moreover, time use activities reflecting the three dimensions have not been compared explicitly for the size of their contribution to desirable academic outcomes.

Previous Research

Each of these three dimensions of time use has received some attention from researchers. Previous studies of the scholarly/non-scholarly dimension show that, controlling for tested ability, the more one works at learning course materials, the more likely one is to achieve high grades (Chickering and Gamson 1991; Michaels and Miethe 1989; Rau and Durand 2000; Schuman et al. 1985) and to express attitudes consistent with discipline-specific forms of academic engagement (Brint, Cantwell, and Hanneman 2008).[1] Research on primary and secondary schooling is supportive; time-on-task, or time plus energy, is an important influence on the amount of subject matter material that students learn (see, e.g., Good and Brophy 1986).

Much less research addresses the active/passive dimension in our framework. While "activating" projects of self and civic improvement are often described as academically beneficial (Astin 1996a; Astin 1996b; Astin and Sax 1999; Astin, Sax, and Avalos 1999; Astin et al. 2000; Eyler and Giles 1999; Giles and Eyler 1994; Markus, Howard, and King 1993; Winniford, Carpenter, and Grider 1995), studies show conflicting results on physical exercise (Taras 2005), involvement in student political organizations (Ethington 1990; Galston 2001), and community volunteering (Myers-Lipton 1998). Passive enjoyments, such as watching television and using the computer for fun, are often criticized by educators (Postman 1985), but they too have partisans, who argue that new interactive media improve cognitive quickness and flexibility, and stimulate creative responses (Johnson 2005).

A large body of research addresses the connecting/separating dimension in our framework, but this research also has not reached conclusive results (see, e.g., Braxton, Sullivan, and Johnson 1997; Braxton 2000). Work off campus and commuting are often considered detrimental to study (see Pascarella and Terenzini 2005: 399-402; Chickering 1974; King and Bannon 2002; Kuh, Gonyea, and Palmer 2001; Pascarella et al. 1998), but some research has suggested that paid employment can be beneficial because it encourages students to budget and manage their time (Kuh 1995). Similarly, although involvement in student clubs and organizations has often been described as an academically beneficial connection (Ory and Braskamp 1988; Pace 1987, 1990; Pascarella 1989; Terenzini and Wright 1987; Wilson, Woods, and Gaff 1974; see Pascarella and Terenzini 2005: 147-149), other researchers find some types of student organizations, such as Greek organizations and participation in athletics, to be detrimental to academic success (Hood, Craig, and Ferguson 1992; Pascarella, Bohr, and Terenzini 1995; Pascarella et al. 1999; Pike 2003; Umbach et al. 2004), or to have little to no effect (Braddock II 1981; Hanks and Eckland 1976; Hayek et al. 2002; Pascarella, Flowers, and Whitt 2001; Pike 2000). Family responsibilities were once widely considered to detract from students' time to focus on studies (Bean 1990; Nora et al. 1996), but more recent data suggests that time spent with family tends to reinforce academic commitments (Bank, Slavings, and Biddle 1990; Rendon, Jalamo, and Nora 2000).

The existing literature has a number of limitations. The literature is based, for the most part, on categories of activity rather than quantities of activity. This can lead to the impression that participation is the most important variable, rather than the amount of time spent in participation. Many reports of non-academic uses of time rely on data from freshmen (Astin 1998; Hurtado et al. 2007; Pryor et al. 2005, 2006, 2008). It is unclear that freshmen are the best source of information, because time use changes considerably from freshman to senior year (Saenz and Barrera 2007). Some sources of information about student time use, such as the American Time Use Study (U.S. Bureau of Labor Statistics 2007) and the National Survey of Student Engagement (NSSE 2006) are based on restricted categorizations of social and leisure activities.

Perhaps the most important limitation of previous studies, however, is that they have failed to develop an integrated theoretical understanding that is susceptible to empirical verification across the full range of student time use. Instead, the studies have examined specific activities (such as participation in paid employment, family, athletics, or Greek organizations) in a piecemeal way. These studies have failed to produce a broader understanding of student time use and its influence on academic outcomes. Our study aims to contribute to the development of such a broader understanding.

Data and Methods

Our study is based on analysis of the University of California's Undergraduate Experience Survey (UCUES) conducted in winter and spring 2006. The data are drawn from the eight large undergraduate campuses in the UC system.[2] The UC system is the largest system of publicly supported research universities in the country.

Students must graduate in the top 12.5 percent of high school students statewide to be eligible for admission into the university. The sample, therefore, constitutes a relatively high-achieving group of students (see Douglass 2007). Nonetheless, high levels of variability exist within the population, both in academic engagement and on all characteristics related to academic engagement and achievement. While mean scores on variables undoubtedly differ between UC undergraduates and the population of all college students, we expect the form of key relationships observed for UC students to generalize to the population of students attending comparable research universities. Our confidence that the principal findings of the study can be generalized is heightened by the comparability of findings in separate analyses conducted on data from each of the eight campuses.[3] In reporting results, we mask the identity of campuses using formulations such as "campus A" and "campus B."

UCUES has been operating for seven years as a web-based census. Incentives are provided to students for participation in the survey. All participating students complete a set of core items and, in addition, one of five randomly assigned modules. Data on student backgrounds, high school records, SAT scores, and UC GPA are appended to the data file by UC staff. In the 2006 survey, response rates of students at the eight campuses ranged from nearly half of all undergraduates to approximately one-third. Validity studies indicate that the completed surveys significantly over-represent high GPA students, but were otherwise broadly representative of the UC student population, both as a whole and on each of the eight large undergraduate campuses (Chatman 2006). Because of the census approach adopted in UCUES, the student development/core sample was large (6300 students), in spite of the modular design, and responses were well distributed across campuses and majors.

Time use is the focal variable in these analyses. UCUES measures time use categorically, asking students to estimate the average number of hours they spend in 17 categories of experience. Time use categories range from "0" to "more than 30" (see Appendix 1). We have constructed estimates of means from midpoints in the category ranges.

Previous research indicates that retrospective accounts of time use are less accurate and reliable than accounts based on time diaries (Robinson 1985; Robinson and Godbey 1997; Stinebrickner and Stinebrickner 2004). In retrospective accounts, adults tend to overestimate the hours they spend at work (Frazis and Stewart 2004), and it is reasonable to suppose that students might, in an analogous way, overestimate the hours they spend on study. However, retrospective accounts are not an insurmountable problem. By asking students about their frequency of participation in various activities during the school year, we provide a reference point by which students can estimate their use of time, thus enhancing memory recall (Converse and Presser 1989; Engle and Lumpkin 1992; Sudman and Bradburn 1973). Since we are interested primarily in the patterns of student time use, rather than the exact number of hours spent

on each activity, the validity of our work depends, not on perfect recall, but only on the capacity of students to judge the approximate number of hours they spent on activities during the week.

Our initial categorizations of time use were based on straightforward assumptions. We measured *scholarly* uses of time as a composite measure of hours in class and hours of out-of-class study time per week. We measured *active* uses of time as hours spent each week in: 1) physical exercise and sports, 2) socializing with friends, 3) student clubs and organizations, and 4) community volunteering. Each of these uses of time can be conceived as requiring active involvement either in self-improvement, friendships, or community.[4] We measured *passive* uses of time by examining hours spent each week in 1) attending entertainment events, 2) watching television, and 3) non-academic ("fun") use of computers. Each of these uses of time can be considered passive entertainment. We measured *connecting* uses of time as hours of time spent each week in 1) student clubs and organizations, 2) work on campus, and 3) work related to major. Each of these uses of time connects students to campus life. We measured *separating* uses of time as hours spent each week in 1) religious activities, 2) family responsibilities/activities, 3) commuting, and 4) employment off campus. Each of these uses of time separates students from campus life.

Our analysis examines the influence of time use on academic engagement and UC GPA, controlling for socio-demographic background, academic background, and social and psychological stressors. Socio-demographic background variables include gender, race/ethnicity, self-identified social class, and first-generation college student status.[5] Academic background variables include high school GPA, composite SAT score (math and verbal), campus, major, and lower or upper-division student. Social and psychological stressors were measured by student assessments of "obstacles" to their academic success. Eleven obstacles to success were measured, each as a frequency measure ranging from "not at all" to "all the time." These obstacles include both social stressors (family, job, difficult living situation, volunteering, and social life) and psychological stressors (depression, stress, tiredness, poor health, and emotional distress).

We first examine time use as an influence on academic engagement. We measured academic engagement as a factor-weighted scale variable. Items loading high on the academic engagement scale include: willingness to meet high academic standards, interaction with instructors, and helping classmates (see Table 2). The second analysis examines time use as an influence on cumulative UC GPA.

In these first two analyses, we entered independent variables in four blocks corresponding to four models of the sources of academic success. The first model examines socio-demographic background variables only. The second model adds academic background characteristics of students. The third model adds social and psychological stressor variables. The fourth model adds time use variables. Because of the extensive battery of controls in this study, any statistically significant influence of time use is more likely to be robust across student samples.

Table 2. Factor Loadings for Engagement Scale N = 6300

	Factor Loadings
Raised own standard due to high standards of faculty	.46
Extensively revised a paper at least once	.55
Sought help from instructor or tutor	.70
Worked on class projects of studied as a group outside of class	.62
Helped a classmate better understand course material	.72

Alpha = .75
Minimum = -2.71 Maximum = 2.46

These analyses show that scholarly/non-scholarly and active/passive uses of time are keys to understanding the effects of time use on academically desirable outcomes. In the third analysis, we therefore examine five groups of students who hold the keys to understanding academically advantageous and disadvantageous uses of time. These are the "scholars," the "scholar-actives," the "actives," the "workers," and the "passives."

In this analysis, we alter our initial assumptions about time use categories to take into account the empirical findings from the regression analyses; we form groups solely on the basis of time uses that showed statistically significant net associations in the regression analyses. For the category of scholars, these time uses included time spent attending and preparing for class. For actives, these time uses included physical exercise, socializing with friends, attending entertainment events, and community volunteering. For workers, these time uses included only working for pay. For passives, these time uses included playing on the computer for fun and watching television.

We formed the five time use groups by summing hours spent in activities that compose the category. The analysis compares students who score above the mean in these categories of time use, and, importantly, it excludes students who score above the mean in more than one category.[6] Because many students scored above the mean in more than one category, the time use groups in this analysis are the purest expression of the type they exemplify. They are, in a sense, specialists in the five critical forms of time use. The scholars, for example, are those who score above the mean on attending and studying for class, but do not score above the mean in the other key uses of time: socializing, work, or involvement with passive entertainments. In this analysis, we examined the socio-demographic and academic background characteristics of students in each of these five time use categories.

Results

We present the results of our analysis in two sections. In the first section, we analyze the influence of time use on academic engagement and UC GPA. In the second section, we provide a profile of the five key time use categories among UC undergraduates: the scholars, the scholar-actives, the actives, the workers, and the passives.

Time Use and Academic Outcomes

In Table 3, we report results for our models of academic engagement. The first model, based on socio-demographic background variables only, explained very little of the variance in the academic engagement scale. Men were less engaged than women, and Hispanic/Latino and "other ethnicity" students (many of whom have mixed racial-ethnic backgrounds) were slightly more engaged than students from European-American, Asian-American, and African-American racial-ethnic backgrounds. The second model, which adds academic background variables, improved R^2 moderately. As expected, arts, humanities, and social science majors scored lower on our engagement measure than science and engineering majors. Cumulative UC GPA contributed to academic engagement. High SAT scores were negatively related to engagement, however, perhaps owing to the easier time that high-scoring students have with their studies (see also Carini, Kuh, and Klein 2006).

Social and psychological stressor variables, introduced in the third model, contribute as much as academic background to explaining students' academic engagement scores. Depression and emotional distress were, not surprisingly, negatively associated with academic engagement, while reports of participation in campus activities as an obstacle to success were positively associated with academic engagement. Surprisingly, self-reports of feeling tired and stressed were also positively associated with academic engagement, perhaps because feelings of tiredness and stress tend to motivate students to engage more with their studies to fight through these feelings. Some other variables that can be interpreted as drawing

students away from campus life – self-reports of family and community volunteering as obstacles to success – were also positively associated with academic engagement.

Table 3. Standardized Regression Coefficients for Engagement Models N = 6300

		Model 1	Model 2	Model 3	Model 4
Demographics	Male	-.06***	-.04***	-.03*	-.03*
	European American	REF	REF	REF	REF
	Asian American	ns	ns	ns	ns
	African American	ns	ns	ns	ns
	Hispanic/Latino	.03*	ns	ns	ns
	Other Ethnicity	.08***	.07***	.06***	.06***
	Social Class	ns	ns	ns	ns
	First Generation Student	ns	-.05***	-.05***	-.03**
Academic Characteristics	High School GPA	--	ns	ns	ns
	SAT Score	--	-.25***	-.22***	-.19***
	Lower Division	--	-.07***	-.06***	-.08***
	UC GPA	--	.18***	.18***	.13***
	Campus A	--	REF	REF	REF
	Campus B	--	ns	ns	-.06**
	Campus C	--	ns	ns	ns
	Campus D	--	ns	.04*	ns
	Campus E	--	ns	ns	ns
	Campus F	--	ns	ns	ns
	Campus G	--	-.04*	-.03*	-.04**
	Campus H	--	ns	ns	ns
	Arts	--	-.05*	-.04*	-.06***
	Humanities	--	-.06**	-.05*	-.06**
	Psychology	--	-.06**	-.05**	-.06***
	Social Science	--	-.08**	-.07**	-.09***
	Business	--	REF	REF	REF
	Biological Science	--	ns	ns	ns
	Physical Science	--	ns	ns	ns
	Engineering	--	.06**	.07**	ns
	Other Major	--	ns	ns	-.07*
Obstacles	Depression	--	--	-.12***	-.10***
	Stress	--	--	.11***	.09***
	Being Tired	--	--	.03*	ns
	Participation in Campus Activities	--	--	.12***	.10***

	Emotional Distress	--	--	-.04*	ns
	Family	--	--	.05***	.05***
	Health	--	--	ns	ns
	Job	--	--	ns	ns
	Difficult Living Situation	--	--	ns	ns
	Volunteering	--	--	.03*	ns
	Social Life	--	--	ns	ns
Time Use	Attending Classes and Studying	--	--	--	.23***
	Entertainment	--	--	--	.03*
	Exercise	--	--	--	.06***
	Friends	--	--	--	.09***
	Student Clubs/Campus Activities	--	--	--	-.03*
	Volunteering	--	--	--	.04***
	Computer for Fun	--	--	--	-.07***
	Hobbies	--	--	--	ns
	Watching TV	--	--	--	-.05***
	Family	--	--	--	ns
	Religious Activities	--	--	--	ns
	Work for Pay	--	--	--	ns
	Working on Campus	--	--	--	ns
	Working Related to Major	--	--	--	.04**
	Commuting	--	--	--	-.04**
	Sleeping	--	--	--	-.03*
R^2		.01***	.08***	.13***	.20***

*p<.05 **p<.01 ***p<.001

The fourth model adds self-reported time use, and, even after the introduction of this large battery of controls, time use variables contributed more than variables in the other three models to explaining academic engagement. Time spent attending and studying for classes was the most important variable in the analysis. The standardized regression coefficient for study time was more than twice as large as that of any other time use variable in the analysis. It was also larger than any other variable in the analysis. Other active time use variables – socializing with friends, physical exercise, and volunteering – were all positively associated with academic engagement. By contrast, passive activities – using the computer for fun, watching television, and commuting – were negatively associated with academic engagement. This analysis suggests that attending entertainment events is unlike other passive entertainments, perhaps because it usually involves other people and stimulates conversation rather than being a solitary activity.

Table 4 reports the results of our analysis of UC GPA. We were able to explain nearly twice as much variance in GPA than in academic engagement, and most of the explanatory power came, not surprisingly, from the academic background variables in Model 2. Men and racial-ethnic minorities (other than African-Americans) reported lower GPAs, but socio-demographic background characteristics explained only 9 percent of the variance in UC GPA, or one-fourth of the total explained variance in Model 4. High school

GPA, SAT scores, and academic engagement all contributed to higher UC GPAs; high school GPAs and SATs were both strongly associated with UC GPA. Consistent with previous research, the analysis indicated that high grades were tougher to earn in the natural sciences and engineering than in the arts and humanities (Brint, Cantwell, and Hanneman 2008; Johnson 2003). As Model 3 shows, most self-reported social and psychological stressors were associated with lower GPAs. Participation in campus activities and community volunteering were exceptions; students who said they are obstacles to their academic success nevertheless had higher GPAs.

Time use variables contributed much less to the explanation of UC GPA than to the explanation of academic engagement. Moreover, only two time use variables stood out as important predictors of GPA. Hours of time spent attending and studying for class was an important predictor of higher GPAs. Hours of off-campus employment was an equally important predictor of lower GPAs. Other time use variables were either relatively weak or insignificant predictors of GPA. Time devoted to religious activities, exercising, and the computer were all associated with lower GPAs, net of other significant covariates, while time spent on family and on-campus work involvements were associated with higher GPAs. These findings suggest that a new conceptualization of connecting and separating activities may be necessary. Some groups on campus (e.g., student clubs and organizations) may absorb student energies away from academic achievement, while some groups off campus (especially families) appear to support achievement, perhaps by reinforcing the value of study.

Table 4. Standardized Regression Coefficients for Cumulative GPA Models N = 6300

		Model 1	Model 2	Model 3	Model 4
Demographics	Male	-.08***	-.07***	-.07***	-.07***
	European American	REF	REF	REF	REF
	Asian American	-.14***	-.10***	-.09***	-.09***
	African American	-.04**	ns	ns	ns
	Hispanic/Latino	-.18***	-.08***	-.09***	-.08***
	Other Ethnicity	-.08***	-.05***	-.05***	-.05***
	Social Class	.03**	ns	.02*	.02*
	First Generation Student	-.16***	ns	ns	ns
Academic Characteristics	High School GPA	--	.31***	.29***	.28***
	SAT Score	--	.36***	.34***	.35***
	Lower Division	--	-.10***	-.10***	-.11***
	Engagement	--	.13***	.13***	.10***
	Campus A	--	REF	REF	REF
	Campus B	--	.05**	.04**	ns
	Campus C	--	.09***	.09***	.09***
	Campus D	--	.06***	.06***	.06***
	Campus E	--	.09***	.09***	.10***
	Campus F	--	.16***	.14***	.14***
	Campus G	--	.04**	.04**	ns
	Campus H	--	.04*	.03*	.03*

	Arts	--	.07***	.07***	.07***
	Humanities	--	.04*	.04*	.04*
	Psychology	--	ns	ns	ns
	Social Science	--	ns	ns	ns
	Business	--	REF	REF	REF
	Biological Science	--	-.10***	-.10***	-.12***
	Physical Science	--	-.04*	-.04*	-.05**
	Engineering	--	-.10***	-.11***	-.13***
	Other Major	--	ns	ns	ns
Obstacles	Depression	--	--	-.04**	-.04*
	Stress	--	--	ns	ns
	Being Tired	--	--	-.05***	-.03**
	Participation in Campus Activities	--	--	.03*	ns
	Emotional Distress	--	--	ns	ns
	Family	--	--	-.05***	-.06***
	Health	--	--	-.04***	-.04***
	Job	--	--	-.02*	.03*
	Difficult Living Situation	--	--	ns	ns
	Volunteering	--	--	.05***	.04***
	Social Life	--	--	-.09***	-.07***
Time Use	Attending Classes and Studying	--	--	--	.10***
	Entertainment	--	--	--	ns
	Exercise	--	--	--	-.03*
	Friends	--	--	--	ns
	Student Clubs/Campus Activities	--	--	--	ns
	Volunteering	--	--	--	ns
	Computer for Fun	--	--	--	-.05***
	Hobbies	--	--	--	ns
	Watching TV	--	--	--	ns
	Family	--	--	--	.02*
	Religious Activities	--	--	--	-.04***
	Work for Pay	--	--	--	-.13***
	Working on Campus	--	--	--	.04***
	Working Related to Major	--	--	--	.04**
	Commuting	--	--	--	ns
	Sleeping	--	--	--	.06***
R^2		.09***	.33***	.36***	.38***

*p<.05 **p<.01 ***p<.001

Profile of Key Time Use Groups

Table 5 reports results of logistic regressions to identify the characteristics of five key time use groups at the University of California. We will use the terms "time use core" and "time use periphery" to discuss students whose uses of time are, respectively, in keeping or out of keeping with the priorities of academic institutions. From this institutional perspective, the scholars and the scholar-actives are students in the time use core. Both have higher GPAs and higher academic engagement scores than other students. By contrast, the workers and the passives are students on the time use periphery. Both had lower GPAs and lower academic engagement scores than other students. The pure actives (those scoring above the mean on social activity, but not above the mean on scholarly activity) were not significantly more academically engaged than other students, and they were slightly less likely to have high GPAs. They were not located decisively on the time use periphery, but they were also not located in the time use core.

Table 5. Logistic Regressions for Students Above the Mean[1] N=6300

		Scholars[1]	Scholar Actives[1]	Actives[1]	Workers[1]	Passives[1]
	N for students in group	1006	478	579	361	496
Demographic Characteristics	Male	.75***	ns	ns	.66**	1.31**
	European American	REF	REF	REF	REF	REF
	Asian American	1.20*	.64***	.59***	.52***	2.03***
	African American	ns	ns	ns	2.39*	ns
	Hispanic/Latino	ns	ns	ns	ns	ns
	Other Ethnicity	ns	ns	ns	ns	ns
	Social Class	ns	ns	ns	ns	ns
	First Generation Student	ns	.66***	.60***	1.47**	ns
Academic Characteristics	High School GPA	ns	ns	ns	ns	ns
	SAT Score	.99*	ns	ns	ns	1.00**
	Lower Division	1.31***	1.61***	1.29*	.38***	ns
	Campus A	REF	REF	REF	REF	REF
	Campus B	1.91***	ns	ns	.51**	.67*
	Campus C	ns	ns	ns	ns	ns
	Campus D	ns	ns	ns	ns	ns
	Campus E	ns	ns	.66*	ns	ns
	Campus F	ns	ns	ns	.55*	1.59*
	Campus G	1.44*	ns	ns	.44***	ns
	Campus H	ns	ns	ns	.58**	ns
	Arts	2.89***	2.29*	na	ns	ns
	Humanities	2.13*	ns	ns	ns	ns
	Psychology	ns	ns	ns	ns	ns
	Social Science	ns	ns	ns	ns	ns
	Business	REF	REF	REF	REF	REF
	Biological Science	4.54***	2.76**	ns	ns	ns
	Physical Science	3.86***	ns	.43**	ns	ns
	Engineering	5.45***	2.29*	.44***	.32**	ns
	Other Major	2.56**	ns	ns	ns	ns
	UC GPA	1.20***	1.08**	.95*	.89***	.95*

Engagement	1.53***	2.12***	ns	.76***	.52***
Log Likelihood	-2554.55***	-1581.42***	-1856.06***	-1255.16***	-1638.70***
Pseudo R^2	.08***	.07***	.04***	.09***	.06***

*p<.05 **p<.01 ***p<.001

Campuses and majors played an important role in the formation of the scholar and worker categories. Two of the campuses showed a decided tilt in the direction of scholars rather than workers, perhaps because students at these campuses were more likely to be able to afford not to work. Two other campuses had fewer workers, but this under-representation was not balanced by an over-representation of scholars. The quantitative STEM (science, technology, engineering, and mathematics) majors elicited more scholarly work effort from their undergraduate students, perhaps largely because demands were higher, and the arts and humanities also elicited more scholarly work effort compared to the social sciences and business. Perhaps because of the relatively demanding study expectations in engineering, students in these majors were also much less likely than other students to work long hours in paid employment

Ethnicity also played an important role in the formation of the time use groups. African-Americans were no less likely to be scholars or actives, but they were far more likely to be workers. Asian-American students were more likely to be among both the scholars and the passives, and they were less likely to be among the actives and the workers. From the time use perspective, male students and, to a lesser degree, first-generation college students were also disadvantaged groups. Male students were over-represented among the passives and under-represented among the scholars. First-generation students were more likely to be among the workers, and less likely to be among the actives (including the scholar-actives).

Discussion

This study is based on a three-dimensional theoretical framework for interpreting the effects of time use on academic outcomes. One dimension – scholarly/non-scholarly – was fully supported by the analysis. The second dimension – active/passive uses of time – received substantial support in these analyses, but only for one of the dependent variables: academic engagement. Academic engagement was, in turn, related to higher grades. By contrast, time investments indicating more passive experiences (watching television, computer use for fun) were negatively associated with academic engagement.[7] The third dimension – connection to/separation from campus life – received only partial and mixed support in these analyses. The only connections to campus life that mattered greatly for academic outcomes were academic in nature: namely, class attendance, out-of-class study, work on campus, and work related to major. Indeed, one important type of connection to campus life, through student clubs and organizations, showed a modest net negative association with academic engagement. Some separating involvements – time spent in paid employment off-campus, in commuting, and in religious activities – were, as predicted, negatively associated with at least one of the academic outcomes we analyzed. However, time spent with family – theoretically a separating activity – showed a modest net positive association with GPA.

These mixed results indicate that some separating involvements – particularly off-campus work – are far more consequential for students' academic prospects than others. They also indicate that the groups to which students are connected on campus matter greatly. Many student organizations foster practices and values antithetical to academic engagement. Greek organizations are a notable example on many campuses (Pike 2000, 2003). By contrast, time spent with family apparently reinforces academic commitments for most students. These mixed results will also contribute to the recent rethinking (see, e.g., Rendon, Jalamo, and Nora 2000) of Astin's academic involvement and Tinto's student departure theories, because they suggest the extent to which nominally "integrating" activities can either integrate students into

the academic study culture or into non-academic "collegiate" or "party" cultures on campus (Flacks and Thomas 2007; Rau and Durant 2000; Wechsler 1996).

Our study introduces the concept of time use core and periphery. These concepts help to identify uses of time that pay off academically, and those that are associated with lower levels of academic engagement and achievement. Our analysis shows that the time use periphery, from the perspective of academic institutions, is composed of students who work long hours (workers) and students who spend long hours watching television and on the computer for fun (passives). Passives are the group most clearly on the campus time use periphery. They were less academically engaged than other students, and they had lower GPAs, while workers had lower GPAs but were not also less engaged academically. Male students, racial-ethnic minority students, and first-generation students were more likely to be on the time use periphery or less likely to be in the time use core. Many male and Asian students choose to be in the time use periphery, by watching television and playing computer games many hours a week.

These analyses have implications for university policy makers. It is clear that university campuses will need to find ways to "unplug" many men and also many Asian students from television and computer games. It will be necessary to find ways to bring these students into time uses that support academic engagement, most notably, time spent on out-of-class study, but also on social activities that are associated with academic engagement, such as physical exercise, socializing with friends, and community volunteering. Institutional leaders will also need to work on ways to bring first-generation students into these study-enhancing time uses.

One of the important findings of the study is that the pure actives were not as academically engaged as other students, and their GPAs were lower (cf. Pascarella and Terenzini 2005: 187-198). Together with the findings that student clubs and organizations do not reinforce academics, this data from UCUES reinforces the finding of some researchers that social life unconnected to academics is more likely to integrate students into the non-academic "collegiate" or "party" culture than into the academic culture of the campus. In so far as the goal of institutional leaders is to strengthen the academic ethos on campus, student organizations will need to be given incentives to connect to campus intellectual and cultural life. Without these connections, campus social life is likely to detract from, rather than add to, academic achievement.

Leaders of public universities will likely also want to continue to think about ways to increase the academic challenges their non-STEM students are expected to meet. Some majors may require more attention than others. In particular, these findings suggest that the social sciences will need to find ways to institutionalize higher academic expectations and more engaging teaching practices so that more of the students in these majors find reasons to move from the time use periphery into the time use core.

More generally, if universities hope to bring those on the time use periphery closer to the center, they will have to provide opportunities for more students of all types to work for pay on campus and to live on or near campus. On-campus work opportunities could be particularly important sources of connection for first-generation and African-American students, who currently spend more hours working off campus than other students.

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NOTES

[1] Decades of research suggest some important qualifications to this proposition, however. First, institutional environments and skillful classroom teachers can help to motivate diligent, focused work by engaging the interest of students, providing opportunities for interaction and participation, and making challenging assignments (see, e.g., Kuh 2003; 2005; Pascarella and Terenzini 2005: 178-186). Second, out-of-class study differs significantly between academic majors. Hours of out-of-class study are higher, on average, in the sciences and engineering, but are more closely connected to achieving high grades in the arts, humanities, and social sciences (Babcock and Marks 2007; Brint, Cantwell, and Hanneman 2008).

[2] Because of the small size of the UC-Merced student body, responses from UC-Merced were excluded from the analysis.

[3] Results from the individual campuses are available on request.

[4] Hobbies are an ambiguous case. Time use for hobbies can be relatively passive, as in stamp collecting, or relatively active, as in rebuilding computers. Because of this ambiguity, we did not allocate hobbies to any of the more general categories.

[5] Previous research has indicated that these socio-demographic variables are the strongest predictors of academic outcomes in the UC sample (reference masked). Parents' educational levels are strongly correlated with first-generation and were not included to avoid potential problems of multi-collinearity.

[6] We allocated students to these categories on the basis of cumulated number of hours in uses of time that were exemplary of the category. Scholars spent more than the mean 28 hours a week attending class and studying. Workers spent more than the mean 14 hours a week working for pay. (This mean was derived from only those students who worked for pay to provide a more accurate account of how long working students work during the week.) Actives spent more than the mean 22 hours a week socializing with friends, exercising, attending entertainment events, and volunteering. The scholar-actives spent both more than the mean 28 hours a week studying and more than the mean 22 hours in social activities positively related to academic engagement. The passives spent more than the mean 17 hours a week watching TV and using the computer for fun. Only 1108 students (18 percent) of the 6300 in the sample do not fit into any of the five categories. Approximately 40 percent (2442) fit into only one category. The remaining 42 percent of students (2750) scored above the mean in more than one of the four categories. These students were excluded from the analysis reported in Table 5 with the exception of scholar actives. Before excluding these students, we compared the time use means of students who only fit in just one category with all students that fit into the category, allowing students to fit into more than one category. The means were the same for the scholars, workers, and passives categories. However, means varied significantly (by 2.2 hours) for the actives, with students who fit only in this category spending less time in the activities comprising the category.

[7] The data do not allow us to determine whether somatic or social causality lies behind these correlations, or perhaps a combination of the two. It may be that more energetic people are more inclined to be involved in activities involving others, and, correspondingly, activities involving others also tend to encourage the production of more physical and emotional energy (see Kessler 1982; Collins 2004).

APPENDIX. Independent and Dependent Variables

A. Continuous Dependent Variables

	Mean	SD	Range	N
Cumulative GPA	5.42	2.21	1-9	6300
Engagement[7]	0	1	-2.71-+2.46	6300

B. Categorical Dependent Variables

	Percent	N
Scholars[7]	16.0%	1006
Active Scholars[7]	7.6%	478
Actives[7]	9.2%	579
Workers[7]	5.7%	361
Passives[7]	7.9%	496

C. Continuous Independent Variables

	Mean	SD	Range	N
Social Class[7]	2.85	.99	1-5	6300
SAT Score	1235.95	157.87	650-1600	6300
High School GPA	9.11	2.08	1-14	6300
Obstacle[7]: Depression	2.43	1.06	1-5	6300
Obstacle: Stress	3.34	.95	1-5	6300
Obstacle: Being Tired	3.33	.93	1-5	6300
Obstacle: Participation in Campus Activities	2.42	1.08	1-5	6300
Obstacle: Emotional Distress	2.63	1.07	1-5	6300
Obstacle: Family	2.40	1.09	1-5	6300
Obstacle: Health	2.19	.92	1-5	6300
Obstacle: Job	2.28	1.24	1-5	6300
Obstacle: Difficult Living Situation	2.44	1.19	1-5	6300
Obstacle: Volunteering	1.62	.86	1-5	6300
Obstacle: Social Life	2.27	1.03	1-5	6300
Time Use[7]: Attending Classes	15.67	6.11	0-35	6300
Time Use: Studying	12.72	8.32	0-35	6300
Time Use: Entertainment	3.03	3.19	0-35	6300
Time Use: Exercise	5.53	5.45	0-35	6300
Time Use: Friends	11.86	8.42	0-35	6300
Time Use: Student Clubs/Campus Activities	3.90	5.73	0-35	6300
Time Use: Volunteering	2.22	3.79	0-35	6300

Time Use: Computer for Fun	11.43	8.66	0-35	6300
Time Use: Hobbies	5.47	5.91	0-35	6300
Time Use: Watching TV	5.73	6.21	0-35	6300
Time Use: Family	4.36	6.95	0-35	6300
Time Use: Religious Activities	1.75	3.62	0-35	6300
Time Use: Work for Pay	7.66	8.90	0-35	6300
Time Use: Working on Campus	4.16	6.96	0-35	6300
Time Use: Working Related to Major	2.85	6.19	0-35	6300
Time Use: Commuting	3.54	4.76	0-35	6300
Time Use: Sleeping	6.5	1.37	0-11.5	6300

D. Categorical Independent Variables

	Percent	N
Campus	Masked	---
First-Generation College Student	33.8%	2130
Male	39.7%	2503
Lower Division	57.5%	3625
Ethnicity: Euro-American	37.2%	2342
Ethnicity: Asian-American	42.6%	2686
Ethnicity: African-American	1.9%	118
Ethnicity: Hispanic/Latino	13.1%	824
Ethnicity: Other	6.6%	330
Major: Art	5.6%	352
Major: Humanities	7.1%	445
Major: Psychology	6.6%	418
Major: Social Sciences	18.4%	1162
Major: Business	3.7%	232
Major: Biological Science	21.1%	1332
Major: Physical Science	5.5%	348
Major: Engineering	10.9%	689
Major: Other	21.0%	1324