Emerging Adulthood

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What is This?

Female College Students' Media Use and Academic Outcomes: Results From a Longitudinal Cohort Study

Jennifer L. Walsh[1,2], Robyn L. Fielder[1,2,3], Kate B. Carey[4], and Michael P. Carey[1,2,5]

Abstract

This longitudinal study describes women's media use during their first year of college and examines associations between media use and academic outcomes. Female students ($N = 483$, $M_{age} = 18.1$ years) reported on their use of 11 media forms and their grade point average (GPA), academic behaviors, academic confidence, and problems affecting schoolwork. Allowing for multitasking, women reported nearly 12 hr of media use per day; use of texting, music, the Internet, and social networking was heaviest. In general, media use was negatively associated with academic outcomes after controlling for prior academics and demographics. Exceptions were newspaper reading and music listening, which were positively associated with academic outcomes. There were significant indirect effects of magazine reading and social networking on GPA via academic behaviors, confidence, and problems. Results show that female college students are heavy users of new media, and that some forms of media use may adversely impact academic performance.

Young people are heavy media users (Rideout, Foehr, & Roberts, 2010), and research suggests that media use can have detrimental effects on academic outcomes (e.g., Johnson, Cohen, Kasen, & Brook, 2007). However, most research has examined limited media or has focused on adolescents living at home with parental supervision. Relatively little is known about media use during the first year of college, when new freedoms may enhance access to media. Therefore, the current study examines college women's use of 11 media forms at two points during their first year of college. Our goals are to describe patterns of media use and to examine associations with academic performance.

Extent of Media Use in Emerging Adulthood

Although adolescents' media use has been well described, fewer studies have looked comprehensively at media use among emerging adults. Studies examining use of individual media among college students suggest heavy use, with an average day characterized by 2 hr of television use (Budden, Anthony, Budden, & Jones, 2007; Mokhtari, Reichard, & Gardner, 2009), 1 hr of radio use (Budden et al., 2007), 1–2.5 hr of Internet use (Budden et al., 2007; Hargittai, 2008; Mokhtari et al., 2009), 30–60 min of social networking (Budden et al., 2007; Jacobsen & Forste, 2010; Pempek, Yermolayeva, & Calvert, 2009), 45 min of talking and texting on cell

phones (Jacobsen & Forste, 2010), 10–40 min of recreational reading (Gallik, 1999; Mokhtari et al., 2009; Sheorey & Mokhtari, 1994), and 10–20 min playing video games (Jacobsen & Forste, 2010; Lucas & Sherry, 2004). The majority of young women read magazines (Walsh & Ward, 2010); however, hours devoted to reading magazines or newspapers have not been documented. Although research has not sampled both college students and adolescents, comparing data from studies of college students with data from a study of adolescents (Rideout et al., 2010) suggests that adolescents are heavier users of television (averaging 4.5 hr per day) and video games (averaging 1.2 hr per

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day) and lighter users of cell phones (33 min of talking per day); adolescents and college students appear to devote equivalent amounts of time to other media.

Although research suggests extensive media use among college students, gaps remain in our knowledge. First, the media climate is rapidly changing, and few recent studies have documented students' division of time among multiple media forms. Second, studies of different media forms have employed different measures of use, making comparisons across forms difficult. Third, to our knowledge, the amount of time devoted to some media forms (e.g., magazines, newspapers, cell phones, and texting) by college students has not been documented. We address these gaps by looking at college women's daily minutes of use of 11 media forms, both traditional and new, using recently collected data (August 2009 to August 2010). We also compare media use during the academic year and the summer to examine how being in the college environment affects media habits.

Media Use in the Context of Emerging Adulthood

There are several reasons why we should expect different patterns of and consequences of media use in college versus adolescence. As a life stage, emerging adulthood has been framed as a time of independent exploration when many individuals are free of the responsibilities of adulthood (Arnett, 2000). In particular, full-time, residential college students, no longer living at home, have significant freedom from parental monitoring, and indeed may be subject to less monitoring than at any other life stage (Arnett, 2007). Emerging adults spend more of their leisure time alone than anyone other than the elderly (Larson, 1990), which may allow for media choices unconstrained by familial or other social influences (Arnett, 2007).

Media use may also play a role in two of the key tasks of emerging adulthood: identity development and establishment of intimacy. Identity development is central in emerging adulthood (Arnett, 2004; Côté, 2006), and media may be used to both establish and express identity during this period. For example, one study found that 70% of college students reported a celebrity idol, and many of these students said this idol influenced their attitudes and values (Boon & Lomore, 2001). Additionally, social media may be used to express identity to peers (Pempek et al., 2009). A second developmental goal of establishing intimacy (Arnett, 2000) might also be aided by social media, because social networking and texting can be used to establish (and maintain) relationships with peers. These technologies might take on new importance in college, when peer circles widen and new peer relationships need to be established.

We might expect media effects to differ in emerging adulthood as compared to adolescence for additional reasons. Media effects diminish from childhood to adolescence (Huesmann, Moise-Titus, Podolski, & Eron, 2003), and this may continue into emerging adulthood (Arnett, 2007). Emerging adults are able to think in more complex and insightful ways than

adolescents, possibly allowing them to evaluate or resist media in ways adolescents cannot (Arnett, 2007). However, it is also possible that, without parental monitoring, media use may increase and have greater power to displace academics for emerging adults. Whereas adolescents are required to attend a structured day of high school and are usually subject to at least some parental monitoring, college students generally have fewer restrictions on their time and behavior, potentially allowing for dramatic shifts in media use. First-year college students, in particular, must learn to balance many options for their free time and academic responsibilities.

Media Use and Academic Outcomes

Potential effects of media use on young people's academic achievement have long been of concern. Researchers have hypothesized that media use may be associated with negative academic outcomes because it displaces activities such as homework and reading (Harrison & Williams, 1986; Valkenburg & van der Voort, 1994), promotes passivity and requires little intellectual effort (Collins, 1982; Koolstra & van der Voort, 1996), and encourages attention problems and impulsivity (Anderson, Huston, Linebarger, & Wright, 2001).

Evidence From Research With Adolescents. Multiple studies have explored associations between television viewing and Internet use and academic outcomes in adolescence. Studies focused on television have generally found negative associations with academic achievement, grade point average (GPA), school performance, homework completion, time spent studying, and time spent reading (e.g., Dumais, 2009; Johnson et al., 2007; Pool, Koolstra, & van der Voort, 2003; Roberts & Foehr, 2008; Sharif, Wills, & Sargent, 2010; Shin, 2004). Notably, some studies have found no associations after controlling for demographics and prior achievement (Dumais, 2008; Gaddy, 1986; Schmidt & Vandewater, 2008), and other studies have found positive associations between television use and achievement for adolescents in low-income families (Smith, 1990, 1992). Studies have generally found positive associations between Internet use and computer availability and GPA, reading achievement, scientific knowledge, and academic orientation (Jackson et al., 2006; Notten & Kraaykamp, 2009; Rocheleau, 1995; Willoughby, 2008).

Few studies have examined other media forms. Exposure to R-rated movies and preferences for action–adventure movies are associated with lower academic performance (Aluja-Fabregat & Torrubia-Beltri, 1998; Sharif & Sargent, 2006; Sharif et al., 2010), while listening to music is associated with less growth in reading achievement (Smith, 1992). Additionally, music may have negative effects on high school students' reading comprehension scores (Anderson & Fuller, 2010), although other experiments have found no negative effects (Pool et al., 2003). Excessive use of video games may be associated with lower GPAs for adolescents (Jaruratanasirikul, Wongwaitaweewong, & Sangsupawanich, 2009), although another study found no such association after controlling for

prior achievement (Dumais, 2008). Leisure reading generally has positive associations with achievement in adolescence (Gaddy, 1986; Smith, 1990).

Evidence From Research With Emerging Adults. Fewer studies have focused on emerging adults. Looking at the impact of television on learning, one experiment with college students found that background television disrupted recall memory (Armstrong & Chung, 2000), while another found a negative association between time spent watching television and movies and GPA (Jacobsen & Forste, 2010).

Although research with adolescents reveals positive associations between Internet use and academic outcomes, studies with college students suggest negative consequences of Internet use. Studies have found that Internet use (especially heavy use) in college is associated with lower grades, lower learning satisfaction, and reduced motivation to study (Chen & Peng, 2008; Chen & Tzeng, 2010; Englander, Terregrossa, & Wang, 2010; Kubey, Lavin, & Barrows, 2001; Yi & Huang, 2008). Similarly, instant messaging has been associated with distractibility on academic tests (Levine, Waite, & Bowman, 2007) and reduced reading speed (Bowman, Levine, Waite, & Gendron, 2010; Fox, Rosen, & Crawford, 2009). Time spent on social networking sites is negatively associated with college GPA (Jacobsen & Forste, 2010). In addition to studies suggesting negative effects, two experiments have found no effects of instant message interruptions on college students' reading comprehension scores (Bowman et al., 2010; Fox et al., 2009), and a study of social networking found no associations between levels of use and academic performance (Hargittai & Hsieh, 2010).

Few studies have addressed other media forms. Similar to studies of adolescents, one study of college students found that video game use was associated with lower GPAs (Jacobsen & Forste, 2010). Additionally, students who spent more time playing video games were more likely to report that playing games interfered with their sleep and preparation for classes (Ogletree & Drake, 2007). Also in line with adolescent findings, college students who spend more time reading are less distractible on academic tasks (Levine et al., 2007). Finally, an experiment with college students found that cell phone ringing during a film disrupted note-taking ability and test performance (End, Worthman, Mathews, & Wetterau, 2010), and a separate study found a negative association between time spent talking and texting on cell phones and GPA (Jacobsen & Forste, 2010). Research has not explored associations between movie viewing and academic outcomes in emerging adulthood, and a number of media forms (e.g., magazine reading, newspapers) have received little or no study in either adolescents or emerging adults.

Pathways to Media Effects. The primary outcome of interest in most research focused on media use and academics is academic achievement as measured by GPA. Theory and past research suggest several possible mechanisms through which media use may influence GPA, which we explore in the current study.

First, as suggested by the displacement hypothesis (Huston, Wright, Marquis, & Green, 1999; Shin, 2004), media use may displace *academic behaviors* such as studying and attending class. The displacement hypothesis proposes that because media are attractive, perceptually demanding, and low in cognitive complexity, media use may be a more appealing way to spend time than other, less immediately reinforcing activities. Students who devote more time to any media form may spend less time preparing for class, and some forms of media use may even be so appealing that they are chosen as an alternative to attending class. Additionally, attending to highly mobile media forms such as texting and social networking may distract students from paying attention in classes (Jacobsen & Forste, 2010); such multitasking decreases performance and efficiency (Fox et al., 2009). Homework completion and class attendance are important predictors of GPA (Conard, 2006; Credé, Roch, & Kieszczynka, 2010; Kitsantas & Zimmerman, 2009).

Second, research on common media messages suggests that some forms of media use may decrease *academic confidence*, especially for women. Specifically, research has found that television, movies, music, magazines, and video games depict limited roles for women. For example, magazines directed at girls and young women typically emphasize traditional roles, focusing on appearance and sexual relationships rather than education or occupational opportunities (Duffy & Gotcher, 1996; Schlenker, Caron, & Halteman, 1998; Signorielli, 1997; Walsh & Ward, 2008). Television programs convey similar gender stereotypes (Lauzen, Dozier, & Horan, 2008; Walsh & Ward, 2008). Exposure to these messages may decrease women's confidence in their academic abilities. Academic self-efficacy has been found to be a key predictor of academic performance (Chemers, Hu, & Garcia, 2001).

Third, media use may increase other *problems affecting schoolwork*. For example, media use may lead to or exacerbate problems sleeping (Thomee, Harenstam, & Hagberg, 2011), mental health difficulties (Primack, Swanier, Georgiopoulos, Land, & Fine, 2009), social problems (Kim, LaRose, & Peng, 2009), or substance use (Anderson, de Bruijn, Angus, Gordon, & Hastings, 2009; Robinson, Chen, & Killen, 1998); these problems have all been associated with poor academic performance (Hysenbegasi, Hass, & Rowland, 2005; Pascarella et al., 2007; Richardson, Abraham, & Bond, 2012; Robbins et al., 2004; Taylor, Vatthauer, Bramoweth, Ruggero, & Roane, 2013).

Summary. Overall, most forms of media use are negatively associated with academic outcomes, although reading books and Internet use may be beneficial. However, extant studies have four limitations. First, many focus exclusively on adolescents and have not included emerging adults in college; the lives of adolescents and college students differ in important ways. Second, of those studies that do examine college media use, most have been cross-sectional or experimental; longitudinal studies are rare. Third, most studies focus on a narrow range of media; because media evolve rapidly and new media (e.g., social networking, and texting) are used most frequently, investigation of

a broader range of media is needed. Finally, the mechanisms by which media use may affect academic performance have received little attention. These limitations are addressed by the current study, a longitudinal examination of associations between college women's use of 11 forms of media and academic outcomes.

Gender and Media Use

Gender may play an important role when examining media effects on academics. First, although overall levels of media use are similar for young women and men (Roberts & Foehr, 2008), they differ in use of several individual media forms. Among adolescents and emerging adults, girls devote less time to video games than do boys (Lucas & Sherry, 2004; Padilla-Walker, Nelson, Carroll, & Jensen, 2010; Rideout et al., 2010). Additionally, adolescent girls spend less time reading newspapers and using computers and more time listening to music, talking and texting on cell phones, reading books, and social networking than do boys (Rideout et al., 2010). Second, young women and men may use media in different ways. For example, there is evidence that women and men differ in their online activities (Jones, Johnson-Yale, Millermaier, & Perez, 2009; Padilla-Walker et al., 2010), with men using the Internet more frequently for entertainment, news, and pornography, and women using the Internet more for communication and schoolwork.

Third, media effects may differ for women and men in a variety of domains. For example, video game use is associated with lower levels of self-worth and social acceptance for young women, but not young men (Padilla-Walker et al., 2010). In the realm of academics, online chatting and socializing are negatively associated with test scores for adolescent girls, but not boys, while online game playing is negatively associated with test scores for boys, but not girls (Chen & Fu, 2009). Finally, research has suggested that the media present different images of, and messages about, women and men (Walsh & Ward, 2008), with women often depicted as nurturing, deferent, and dependent and portrayed as sexual objects. Based on these gender-related differences, and on our interest in the potential mediating mechanism of academic confidence, which seems especially likely to be negatively impacted by media use for women, we focused our analyses on a large sample of first-year college women.

Research Objectives

The current study addressed two broad research objectives. First, in order to describe the amount of time women devote to media use during their first year of college, we examined women's use of 11 media forms and compared levels of use during the academic year and the summer. We predicted that use of newer "social-type" media (i.e., social networking, cell phone use, and texting) would be more prevalent than older media (i.e., magazines, newspaper, books, and television). We made no a priori predictions regarding differential use by time of year (i.e., summer vs. academic year).

Second, we tested the hypothesis that media use would undermine academic performance, using Spring GPA as an outcome. We predicted that media use would be negatively associated with academic behaviors, academic confidence, and GPA, but positively associated with problems affecting schoolwork. Additionally, we hypothesized that behaviors, confidence, and problems would partially mediate associations between media use and Spring GPA.

Because of our interest in the association between media use and academics, we controlled for a number of demographic variables that have been shown to relate to both media use and academic success, including age, race/ethnicity, social class, and religiosity. Dramatic differences in media use patterns exist for youth of different ethnicities (Rideout et al., 2010); there are also differences based on socioeconomic status (SES; Roberts, 2000) and religiosity (e.g., Armfield & Holbert, 2003). Additionally, academic achievement differs based on race/ethnicity (Kao & Thompson, 2003), SES (Machin, 2006), and level of religiosity (Jeynes, 2003). Age is also a predictor of academic achievement in college (Ullah & Wilson, 2007).

Method

Participants

Participants were 483 female first-year college students (M_{age} = 18.1, SD_{age} = .29) at a Northeastern university who participated in a larger study of health behaviors and relationships. The larger study, which included only women, explored a variety of health behaviors (e.g., substance use, exercise, and sleep) as well as sexual behavior and psychosocial adjustment. Most participants were Caucasian (67%); other self-identified racial/ethnic identities included Asian (12%), African American (12%), and other (10%). Nine percent identified as Latina. The ethnic distribution of the sample was representative of the incoming first-year female students at the university in Fall 2009.

Procedures

This research was approved by the university's Institutional Review Board. Participants were recruited via a mass mailing sent to incoming first-year female students. Campus flyers, word of mouth, and the psychology department participant pool were also used to bolster recruitment. Interested students attended an orientation session, after which they provided informed consent and completed the initial survey. Subsequently, participants completed monthly online assessments for 1 year; surveys were completed during the first week of each month reporting on the previous month. Surveys focused primarily on health behaviors and psychosocial adjustment; however, women reported on media use and academics at several points throughout the year. For each survey, participants received $10 to $20.

Measures

Media Use. Participants reported on their media use at the end of January and July. They estimated the number of minutes they spent using 11 forms of media (i.e., television, movies, music, the Internet [not including social networking], social networking, cell phone talking, texting, magazines, newspapers, nonschool-related books, and video games) on the average weekday and weekend day during the past week. This method of measuring media use is similar to that used in large surveys of adolescents (Iannotti, Kogan, Janssen, & Boyce, 2009), and forms of media assessed were based on Kaiser Family Foundation studies of adolescents (Rideout et al., 2010). For each medium, weekday reports were multiplied by 5 and weekend day reports were multiplied by 2; these reports were then summed and the total divided by 7 to yield an average number of minutes per day and normalized using a log transformation.

Grade Point Average. In January and June, participants reported their GPAs for the Fall and Spring semester, respectively. Previous studies have shown that self-reported GPA correlates well with official GPA, mean $r = .90$ (Kuncel, Credé, & Thomas, 2005).

Academic Behaviors. In October and April, participants indicated the frequency of three academic behaviors (using a planner or to-do list, attending course meetings, and feeling prepared for class) on a 6-point scale (*never* to *always*). Items were averaged (αs = .51 and .61).

Academic Confidence. In October and April, participants reported their confidence that they would do well that semester on a 6-point scale (*strongly disagree* to *strongly agree*).

Academic Problems. In June, participants reported whether each of 15 problems (e.g., alcohol use, anxiety) had affected their schoolwork during the academic year (yes/no; American College Health Association, 2010). These indicators were summed to yield a total ($\alpha = .78$), which was normalized using a log transformation.

Religiosity. Participants reported to what extent they considered themselves religious (from *not religious* to *very religious*) and their frequency of attending religious services (from *never* to *more than once a week*). These items were averaged ($\alpha = .80$).

SES. Participants described their family's SES on a 5-point scale (*poverty level or very close to poverty level* to *rich, wealthy, affluent*).

Other Demographic Controls. Age and ethnicity were also included in the study as controls.

Data Management and Analysis

Outliers were recoded to three *SD*s from the mean; between 0 and 12 cases per variable were recoded (0–2.5%). Because measures were taken over 1 year, individual predictors and outcomes were missing for between 0% and 21% of participants. Longitudinally, 3% of women were missing October measures, 9% January measures, 8% February measures, 11% April measures, 16% May measures, and 16% June measures. There were no significant demographic differences between participants with and without missing data. In order to maintain the entire sample, multiple imputation (MI) was used to replace missing values (Rubin, 1996; Schafer, 1997). MI is a modern method for dealing with missing data that avoids biases associated with using only complete cases or single imputations (Schafer, 1999). We imputed 100 complete data sets (Graham, Olchowski, & Gilreath, 2007) using the R program Amelia (Honaker, King, & Blackwell, 2011). All study variables were included in the imputation. Analyses were conducted with all 100 data sets, and parameter estimates were pooled using the imputation algorithms in Mplus 5 (Muthén & Muthén, 1998–2012).

To test hypotheses, we constructed a structural model in Mplus 5 (Muthén & Muthén, 1998–2012), examining second-semester academic behaviors, academic confidence, and problems affecting schoolwork as potential mediators of associations between January media use and Spring GPA while controlling for Fall GPA, first-semester behaviors and confidence, and demographic variables. We tested for direct, indirect, and total media effects on Spring GPA. All media variables were initially included in this model. To increase parsimony and stabilize estimates, media forms that did not correlate significantly with any outcome variable (all *p*s > .10) were then excluded from the model, and coefficients that were highly nonsignificant ($T < 1$) were constrained to zero. Standardized coefficients and 95% confidence intervals (CIs) are reported throughout, except in the case of indirect and total effects (where unstandardized coefficients and 95% CIs are reported). When testing for mediation, we report tests of indirect effects with bootstrapped CIs.

Results

Table 1 provides full descriptive statistics on sociodemographic variables and academic outcomes, and Table 2 presents zero-order correlations between all variables included in structural models. Participants were generally academically successful, with a mean GPA over 3.0 both semesters. Additionally, participants regularly attended and prepared for class and reported fairly high levels of academic confidence. Women experienced an average of 4 (of the 15) problems affecting their schoolwork.

Extent of Media Use

Women reported 11.8 hr of media use per day in January and 12.1 hr per day in July (Table 3). These reports did not account for media multitasking (e.g., texting while using the Internet). Music, texting, and the Internet were used the most, followed by social networking, television, cell phones, and movies. Books, newspapers, magazines, and video games were used

Table 1. Descriptive Statistics for Sociodemographic and Academic Variables.

Measure (Month)	Range	M (SD)
Sociodemographics		
Age	18–21	18.07 (.29)
Religiosity	0–3	1.10 (.84)
Socioeconomic status	1–5	3.11 (.92)
Academic outcomes		
Grade point average		
Fall	0–4	3.27 (.53)
Spring	0–4	3.28 (.55)
Academic behaviors		
October	1–6	5.15 (.75)
April	1–6	4.91 (.88)
Academic confidence		
October	1–6	4.54 (1.05)
April	1–6	4.48 (1.14)
Problems affecting schoolwork (June)	0–15	4.04 (3.27)

less frequently. Some forms of media use were nearly universal during the school year, including Internet use, listening to music, social networking, cell phone use, and texting. Although fewer women made use of video games (9%), magazines (24%), books (41%), and newspapers (44%), those participants who did use these media forms did so for 20–50 min a day on average. There were low to moderate correlations between different forms of media use.

Media use in January and July were moderately correlated (rs = .25 to .61), but use patterns differed somewhat across time (Figure 1). In January, during the school year, women talked on their cell phones more and used social networking sites and the Internet more as compared to July. In July, during the summer months, women watched more TV and movies and read more magazines and books as compared to January. Listening to music, texting, newspaper reading, and video game play did not differ across time; nor did overall hours devoted to using media.

Media Predictors of Academic Outcomes

A structural model explored whether (a) January media use predicted second-semester academic behaviors, academic confidence, problems affecting schoolwork, and GPA and (b) academic behaviors, academic confidence, and problems affecting schoolwork mediated associations between January media use and Spring GPA. This model controlled for Fall GPA, academic behaviors, and academic confidence as well as demographics.

This model (Figure 2) fit the data well, $\chi^2(N = 483, 28) = 27.77$, $p = .47$, comparative fit index (CFI) = 1.00, Tucker–Lewis Index (TLI) = 1.00, root mean square error of approximation (RMSEA) = .000, and explained 59% of the variance in Spring GPA. As expected, this model showed that women with higher levels of academic confidence and women who reported fewer problems affecting schoolwork reported higher Spring GPAs; women who reported more academic behaviors had marginally higher Spring GPAs.

Demographically, older age and religiosity were positively associated with Spring GPA, $\beta = .09$, CI [.02, .16], $p < .05$, and $\beta = .07$, CI [.01, .14], $p < .05$, respectively. Additionally, Fall GPA was a strong predictor of Spring GPA, $\beta = .58$, CI [.51, .64], $p < .001$, as well as second-semester confidence, $\beta = .25$, CI [.15, .34], $p < .001$, behaviors, $\beta = .15$, CI [.07, .24], $p < .001$, and problems, $\beta = -.34$, CI [−.42, −.25], $p < .001$. First-semester confidence was associated with second-semester confidence, $\beta = .27$, CI [.18, .35], $p < .001$, and first-semester behaviors were associated with second-semester behaviors, $\beta = .52$, CI [.45, .60], $p < .001$.

Direct Effects. This model showed that women who spent more time reading magazines reported fewer academic behaviors and lower levels of academic confidence. Women who spent more time watching television also reported lower levels of academic confidence, and those who spent more time social networking reported fewer academic behaviors. Women who spent more time talking on their cell phones and watching movies reported lower Spring GPAs. However, women who spent more time watching movies also reported *fewer* problems affecting their schoolwork. Women who spent more time reading newspapers reported more academic behaviors and higher Spring GPAs, and those who spent more time listening to music reported more academic behaviors. Thus, results generally supported the hypothesis that media use would be negatively associated with academic behaviors, academic confidence, and GPA and positively associated with problems affecting schoolwork. However, newspaper reading and listening to music were positively associated with academic outcomes.

Indirect and Total Effects. There were a number of indirect effects of media on GPA via academic behaviors, academic confidence, and problems affecting schoolwork. There was a negative indirect effect of *social networking* on GPA via a combination of problems and behaviors, $\beta = -.01$, CI [−.02, −.0002], $p < .05$ (total indirect effect), indicating that women who spent more time social networking reported lower GPAs as a result of experiencing more problems affecting their schoolwork and engaging in fewer academic behaviors.

Magazine reading had a significant indirect effect on GPA via a combination of academic confidence and academic behaviors, $\beta = -.01$, CI [−.02, −.001], $p < .05$ (total indirect effect), indicating that women who spent more time reading magazines had lower Spring GPAs due to having less academic confidence and practicing fewer academic behaviors.

Although *movie viewing* was negatively associated with problems affecting schoolwork, the total effect of movie viewing on GPA was negative, $\beta = -.02$, CI [−.04, −.0003], $p < .05$, indicating that, overall, more time spent viewing movies was associated with a lower GPA despite fewer problems.

The total effect of *cell phone use* on GPA (including direct and indirect effects) was negative, $\beta = -.04$, CI [−.07, .003], $p < .05$, indicating that women who spent more time talking on cell phones reported lower Spring GPAs.

Table 2. Correlations Among Study Variables.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
1. Age	—																					
2. Asian	.34***	—																				
3. Black	−.04	−.14**	—																			
4. SES	.00	−.08	−.22***	—																		
5. Religiosity	−.07	−.13**	.11*	.06	—																	
6. Behav. (Oct)	.03	−.04	−.16***	.13**	.11*	—																
7. Behav. (Apr)	−.05	−.06	−.16***	.05	.11*	.60***	—															
8. Conf. (Oct)	−.01	.00	−.01	.06	.09+	.38***	.30***	—														
9. Conf. (Apr)	−.03	−.04	−.07	.01	.08+	.34***	.42***	.35***	—													
10. GPA (Fall)	.00	.05	−.30***	.11*	.11*	.28***	.28***	.26***	.30***	—												
11. GPA (Spr.)	.07	.04	−.24***	.09+	.15**	.18***	.32***	.19***	.40***	.70***	—											
12. Problems	−.04	−.05	.12*	−.03	−.02	−.15**	−.18***	−.16**	−.27***	−.34***	−.37***	—										
13. TV	−.08	−.07	.05	−.04	.06	.05	.01	−.02	−.10*	−.05	−.05	−.02	—									
14. Movies	.02	.04	−.11*	.01	−.02	−.05	−.08	−.06	.00	.00	−.06	−.11*	.20***	—								
15. Music	.01	.02	−.03	−.03	−.06	−.05	.01	−.08+	.02	−.06	−.05	.02	.08	.15**	—							
16. Cell	.07	.01	.10*	−.01	.09+	.02	.02	−.06	−.07	−.07	−.12*	.12*	.09+	−.02	.20***	—						
17. Texting	−.21***	−.23***	.13**	−.01	.01	.04	−.04	.02	−.09+	−.14**	−.19***	.06	.14**	.07	.18***	.25***	—					
18. Soc. Net.	−.05	−.01	.05	.02	−.02	.06	−.08	−.03	−.06	−.04	−.08	.10*	.17***	.04	.27***	.20***	.36***	—				
19. Internet	.05	.14**	.06	−.06	−.04	.01	.04	.05	−.05	−.04	−.03	.09+	−.01	.03	.31***	.24***	.18***	.39***	—			
20. Magazines	.05	−.06	−.09+	.10+	−.02	.08+	−.09+	.03	−.09+	−.03	−.03	.02	.14**	.17***	.11*	.12*	.10*	.13**	.13**	—		
21. Newspapers	.04	.12*	−.18***	.09+	.00	.23***	.20***	.13**	.12*	.11*	.18***	−.08	.02	.08+	.05	.00	−.14**	−.10*	.09+	.23***	—	
22. Books	−.03	−.11*	−.02	.02	−.04	−.02	.03	.02	.07	.07	.10+	−.01	.01	.08+	.11*	.02	−.01	−.02	.00	.08	.08+	—
23. Video G.	−.04	−.01	−.02	−.06	−.06	−.05	−.02	−.04	−.04	−.02	−.02	.05	.05	.05	−.02	−.04	.01	.02	.08+	.08+	−.05	−.05

Note. Apr = April; Behav. = academic behaviors; Books = leisure reading; Cell = talking on cell phone; Conf. = academic confidence; GPA = grade point average; Oct = October; Problems = problems affecting school-work; SES = socioeconomic status; Soc. Net. = social networking; Spr. = Spring; Texting = texting on cell phone; Video G. = video games. All media-use measures are the log of the number of minutes per day.
+p < .10. *p < .05. **p < .01. ***p < .001.

Table 3. Minutes of Media Use per Day.

	Media Form	Percentage Using	M (SD) Overall	M (SD) Users	α	Percentage of Daily Use
January	Television	82	58.0 (58.5)	71.1 (57.2)	.75	8
	Movies	63	38.8 (50.2)	61.4 (51.0)	.53	6
	Music	98	137.5 (122.3)	141.1 (121.8)	.85	19
	Internet	100	132.7 (121.9)	133.0 (121.9)	.94	19
	Social networking	98	113.4 (101.9)	115.8 (101.6)	.93	16
	Cell phone	98	54.9 (58.1)	55.9 (58.1)	.86	8
	Texting	98	134.8 (151.5)	137.9 (151.9)	.96	19
	Newspapers	44	9.9 (16.4)	22.5 (18.0)	.84	1
	Books	41	21.4 (45.4)	52.2 (58.6)	.92	3
	Magazines	24	6.9 (19.5)	28.7 (31.1)	.91	1
	Video games	9	2.9 (14.9)	32.8 (39.6)	.32	0
	Overall	100	705.4 (432.2)	707.0 (431.4)	—	—
July	Television	88	87.8 (85.3)	100.1 (84.0)	.80	12
	Movies	73	61.6 (67.3)	84.6 (65.4)	.67	8
	Music	96	130.3 (122.0)	135.8 (121.5)	.89	18
	Internet	97	109.6 (124.4)	113.4 (124.8)	.92	15
	Social networking	97	94.1 (103.4)	97.3 (103.7)	.95	13
	Cell phone	92	45.1 (55.9)	49.3 (56.7)	.89	6
	Texting	97	135.2 (162.3)	141.3 (163.1)	.97	19
	Newspapers	40	7.6 (13.8)	19.4 (16.1)	.82	1
	Books	64	47.0 (72.1)	73.3 (78.6)	.88	6
	Magazines	42	10.2 (18.0)	24.2 (20.7)	.85	1
	Video games	10	4.7 (22.8)	48.0 (57.3)	.94	1
	Overall	100	725.0 (468.7)	726.8 (467.9)	—	—

Note. α for weekday and weekend reports. Percentage of daily use indicates the percentage of total media minutes accounted for by each media form and does not account for media multitasking.

The total effect of *newspaper reading* on GPA (including direct and indirect effects) was positive, β = .03, CI [.01, .05], $p < .05$, such that spending more time reading newspapers was associated with a higher Spring GPA.

Discussion

First-year female college students reported heavy media use, especially of new media (i.e., social networking and texting) and music. They devoted more hours to new media and fewer to traditional media (e.g., magazines and books) during the academic year than during the summer. Using a longitudinal design that allowed us to control for earlier academics, we found that cell phone use, social networking, television and movie viewing, and magazine reading in January were negatively associated with second-semester academic outcomes, suggesting some forms of media use may adversely impact academics. However, newspaper reading and music showed positive associations with academic outcomes. Our structural model identified some indirect effects of media use on later GPA via academic behaviors, academic confidence, and problems affecting schoolwork, suggesting these constructs as mechanisms of media effects on academic achievement.

Extent of Media Use

Our study found college women consumed nearly 12 hr of media per day. Although we did not specifically assess media

multitasking in our study, a study of adolescents (Rideout et al., 2010) found that 29% of media use time was spent multitasking. If that were the case in our study, women would have devoted over 8.5 hr per day to media use. We found female college students to be especially heavy users of music, the Internet, social networking sites, and texting; participants devoted close to 2 hr per day to each of these media forms during the school year, and only slightly less during the summer. Our estimates of Internet use are similar to previous studies (e.g., Mokhtari et al., 2009); however, earlier studies showed less than 1 hr of social networking per day on average (e.g., Budden et al., 2007; Pempek et al., 2009). Although social networking is more popular among females than males (Hargittai & Hsieh, 2010), the much larger amount of time spent social networking in our study suggests that use of these sites has increased substantially during recent years. Previous research has suggested most college students use cell phones (Lenhart, Purcell, Smith, & Zickuhr, 2010), but this study allows us to separately estimate the time college females devote to texting and talking, finding each to be considerable. Reports of music use in our study were higher than those in past studies (Budden et al., 2007), perhaps reflecting the increased popularity of digital media players.

Although use of new media and music was heavy among women in our study, other forms of media use occupied less time than suggested by past studies. Previous studies reported nearly 2 hr per day of television use among college students (Budden et al., 2007; Mokhtari et al., 2009), but women in our
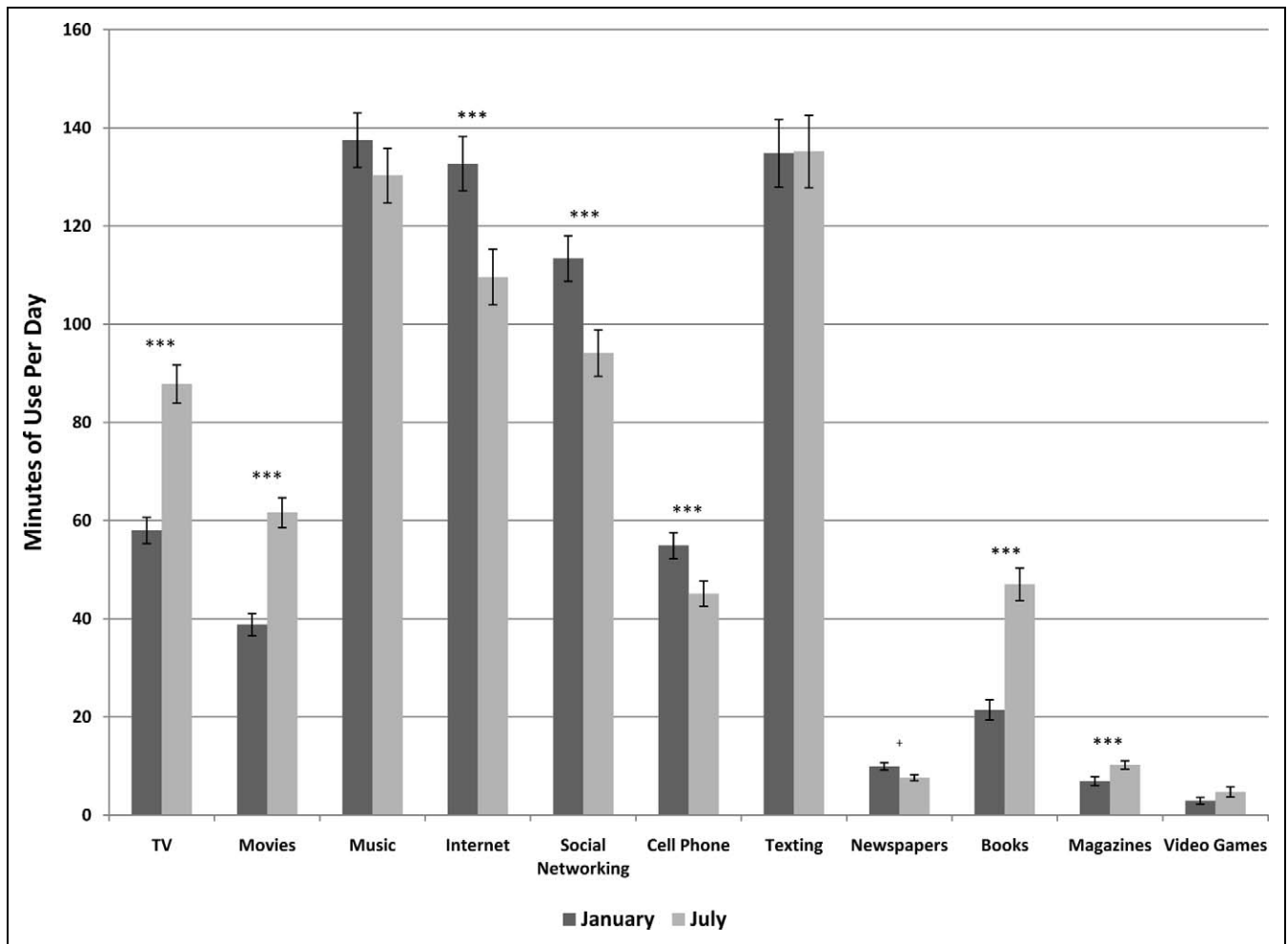
Figure 1. Comparison of college women's media use in January and July.
Note. $^+p < .10.$ $^{***}p < .001.$

study watched TV for only 1 hr per day during the school year and 1.5 hr per day during the summer. We also found time devoted to movies and magazines by college students to be less than in studies of younger adolescents (Roberts & Foehr, 2008). These findings may reflect a displacement of some traditional forms of media use by the Internet and social networking, or differences between college and high school students. Additionally, it is now possible to access TV, movies, and magazines on the Internet, so some time devoted to Internet use may be spent consuming these media. Finally, use of video games in our study was lower than in previous studies of college students (Jacobsen & Forste, 2010), including a study focused on women (Lucas & Sherry, 2004).

Differences in Media Use Between the Academic Year and Summer

Comparisons of media use during the academic year and the summer revealed differences for 7 of the 11 media forms. New media seem to be more popular while at school, whereas traditional media play a larger role in college students' lives when

they are at home (where over 90% of our sample lived during the summer). The college context may encourage use of certain media forms—for example, the Internet may be used while studying (Foehr, 2006; Jacobsen & Forste, 2010; Selwyn, 2008), while social networking and cell phones may be primary means of communicating with peers (Leung, 2007; Pempek et al., 2009; Quan-Haase, 2007) and keeping in touch with family (Chen & Katz, 2009) during the school year. Due to these differences in media use at different times of the year, researchers exploring media effects should carefully consider the timing of their media measures. Measures taken at a single time point may over- or underestimate college students' overall exposure to different media forms and media messages.

Negative Associations Between Media Use and Academic Outcomes

Many previous studies examining associations between media use and academic outcomes have used point prevalence data without controlling for demographics or prior achievement. Here, controlling for these factors, we found that women who
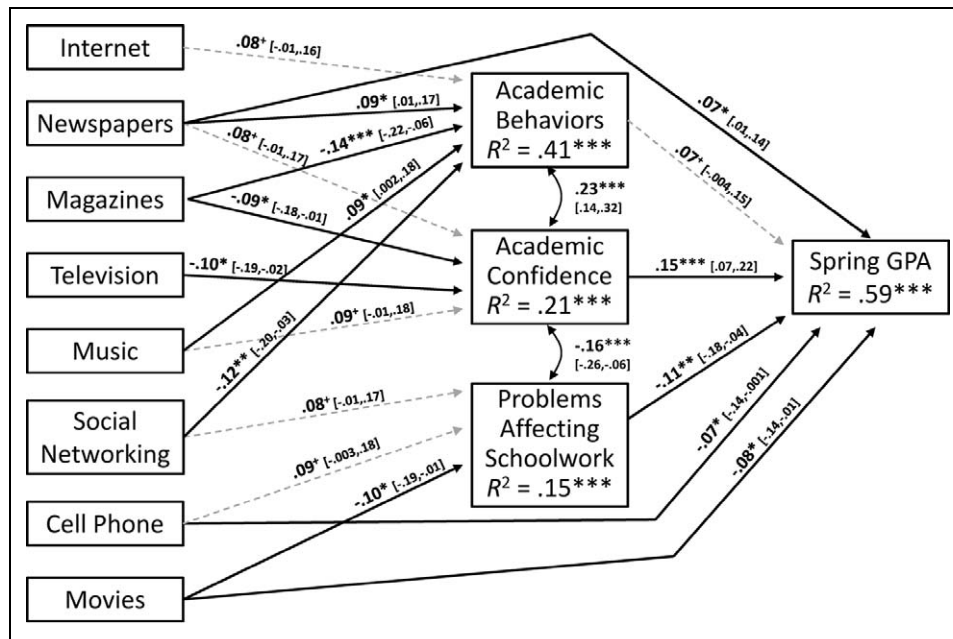
Figure 2. Structural model depicting associations between January media use, academic behaviors, academic confidence, problems affecting schoolwork, and Spring grade point average (GPA). This model controlled for demographic factors (age, ethnicity, socioeconomic status, and religiosity); Fall GPA; and earlier academic behaviors and confidence; control variables are not depicted in the figure. The model fit the data well, $\chi^2(N = 483, 28) = 27.77$, $p = .47$, CFI = 1.00, TLI = 1.00, RMSEA = .000. Standardized coefficients are reported (with 95% confidence intervals in brackets), and only significant paths are shown.
Note. $^+p < .10$. $^*p < .05$. $^{**}p < .01$. $^{***}p < .001$.

watched more movies and talked on cell phones more had lower GPAs, women who spent more time social networking and reading magazines reported fewer academic behaviors, and women who spent more time watching television and reading magazines reported lower academic confidence.

Cell phone use and social networking may distract from concentration on academics. In addition to the direct negative effects of cell phone use on GPA, social networking had a significant indirect effect on GPA via academic behaviors and problems affecting schoolwork, supporting the idea that social networking may disrupt activities such as preparing for class. Experiments have suggested that cell phone rings and instant messages may break concentration and increase the time required to complete reading tasks (End et al., 2010; Fox et al., 2009). Use of these social media forms might also reflect personality differences (e.g., Wilson, Fornasier, & White, 2010) or the prioritization of social activities over academics. A portion of the indirect effect of social networking on GPA was via problems affecting schoolwork. Some problems that may affect schoolwork include substance use and social issues, which may be exacerbated by (or reflected in) high levels of social networking. Given the popularity of social networking and mobile technology, it seems unlikely that educators will be able to reduce students' use of these media forms. Instead, professors might aim to integrate social media into their classrooms to remind students of assignments, refer them to resources, and connect them with their classmates.

The associations between magazine reading and academic behaviors and confidence, which resulted in a significant

indirect effect on GPA, have not previously been reported. Most participants did not devote substantial time to reading magazines, so it seems unlikely that magazine reading displaced academics, although the association with behaviors indicates that women who spend more time reading magazines were less likely to prepare for and attend class. It is possible that magazine reading (occupying an average of 7 min per day) is associated with other activities (e.g., grooming, dating, and exercising) that also take away time from academics. Although we did not assess type of magazine, magazines directed young women tend to focus on appearance and sexual relationships rather than educational or occupational opportunities (Walsh & Ward, 2008). These types of gendered messages may both encourage women to devote time to nonacademic activities and negatively affect academic confidence.

The findings related to movie and television viewing are in line with previous studies finding negative associations between screen media exposure and GPA and recall (Armstrong & Chung, 2000; Jacobsen & Forste, 2010). Interestingly, movie viewing had a significant, negative total effect on GPA despite the fact that women who viewed more movies reported fewer problems affecting their schoolwork. It is possible that devoting time to watching movies as a leisure-time activity may provide fewer opportunities for some types of problems, such as those involving alcohol and drugs, but that this benefit is outweighed by negative effects of background viewing on concentration while studying (cf. Armstrong & Chung, 2000). Television viewing was negatively associated with academic confidence. Television programs can convey many of

the same gender stereotypes as magazines (Lauzen et al., 2008), which may negatively impact academic confidence. Future studies should differentiate between different types of television programs and magazines to pinpoint messages that may decrease academic confidence.

Positive Associations Between Media Use and Academic Outcomes

Positive associations emerged between some forms of media use and academic outcomes. Women who spent more time reading newspapers had higher GPAs, which could be partially attributed to both behaviors and confidence. This finding is in line with previous studies with younger samples that report positive associations between reading and academic achievement (Gaddy, 1986; Notten & Kraaykamp, 2009; Smith, 1992), although we found no associations between other leisure reading and academic outcomes. Keeping up with current events and academic behaviors may both reflect conscientiousness; newspaper reading may also serve as preparation for classes in some fields.

Listening to music was positively associated with academic behaviors. Women may listen to music while studying (Foehr, 2006); although there is some evidence that music may interfere with comprehension (Anderson & Fuller, 2010), it may also make studying more appealing. Future experiments testing the impact of music on academic outcomes might consider integrating additional outcome variables, such as enjoyment of the tasks involved or the duration for which participants are willing to study.

Limitations and Future Directions

Several limitations of the current study suggest directions for future research. First, our data came exclusively from female students at one university. Future studies should assess male students and include emerging adults who are not attending college (the ''forgotten half''; William T. Grant Foundation Commission on Work Family and Citizenship, 1988), who may show different patterns of media use. Second, our measures did not allow us to account for media multitasking, which is common for youth (Rideout et al., 2010). Third, concerns about respondent burden led us to assess only minutes using different media forms; we did not assess media content. Future research should explore associations between exposure to different media messages and academic outcomes. Media use motivations (Ruggiero, 2000), which may differ for more passive media forms used for entertainment (e.g., television) and more active media forms used to communicate (e.g., social networking), might also be important in explaining associations with academics. Fourth, although we measured several different academic outcomes, future studies might make use of objective measures of academic performance, including official GPA. Additionally, an alternative, more extensive measure of academic behaviors might be developed, as the various behaviors in our measure (class attendance, use of a planner, and preparation for class) were only moderately correlated, resulting

in low reliability for the scale. Fifth, although our structural model explained 59% of the variance in Spring GPA and suggested some paths through which media use may affect academic outcomes, other mechanisms might also be important and should be explored in future studies. For example, heavy media use could lead to decreases in academic motivation or to changes in normative perceptions regarding academics. Finally, although the longitudinal nature of our data is a major strength, we are unable to determine if associations between media use and academic outcomes are causal. Longer term longitudinal studies of media and academics in college as well as experimental manipulations are necessary.

Conclusions and Implications

In conclusion, the current study contributes to the literature and to our knowledge of media use in emerging adulthood by making use of longitudinal data; assessing multiple media forms, including new media; and investigating media use during the important transition to college. This study provides recent data pertaining to college women, showing them to be heavy media users. Findings demonstrate the central role of social media in the lives of college students, and suggest that these social media are used even more on campus than off. Our results show that talking on cell phones, social networking, movie and television viewing, and magazine reading are negatively associated with later academic outcomes, while newspaper reading and listening to music are positively associated with later academics. This study was one of the first to explore mechanisms of media effects on academic outcomes, and showed that academic behaviors, academic confidence, and problems affecting schoolwork are mechanisms through which media use may influence GPA. These findings will interest students, parents, educators, and future employers, who share a common goal of academic success for students. Academic counselors may consider assessing college students' media use and encouraging them to take breaks from media, particularly while in class, studying, or completing assignments.

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