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Hooking up during the college years: is there a pattern?

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Hook ups are sexual encounters that can include a variety of behaviours (e.g., kissing to intercourse) with no expectation of future contact or a committed relationship. Although hooking up is reported to be common on college campuses across the USA, little is known about whether the frequency of hooking up changes over the course of the college experience. Using cross-sectional data and the covariates alcohol use, gender and relationship status, we examined a synthetic cohort of undergraduate students ($n = 1003$) on rates of hooking up using (1) logistic regression and (2) an applied form of survival analysis. Whereas both analytic techniques produced similar results, survival analysis provided a more complete picture by showing an increase in the rate of hooking up that peaked between spring semester of the first year of college and autumn semester of the second year of college, followed by a gradual decline in hook up rates over subsequent semesters. Findings indicate that gender is significantly related to hooking up in the logistic regression analysis, with women reporting fewer hook ups; however, gender was not significantly related to hooking up in the survival analysis, indicating that there are no differences in the pattern across cohorts. Implications for promoting the sexual health of college students and future research are discussed.

Keywords: hook ups; young people; USA; sexual development

Introduction

In the past decade, a large body of research has emerged on the casual sex experience, commonly referred to as 'hooking up' (Garcia et al. 2012). Common behaviours and expectations associated with hooking up (referred to as the 'hook up script') have been documented (Holman and Sillars 2012) and recent studies on hook ups using US college student samples have examined potential patterns of hooking up (Fielder and Carey 2010a; Olmstead, Pasley, and Fincham 2013). One common approach to studying hook up patterns is to compare the frequency of hooking up or number of hook up partners between less advanced students (first and second year) and more advanced students (third and fourth year) (see, e.g., Olmstead, Pasley, and Fincham 2013). Another common approach is to examine the influence of past hook up behaviour on future hook up encounters (Fielder and Carey 2010a; Olmstead et al. 2013). The purpose of the current study is to build on this research by examining hook up patterns among a synthetic cohort of college students across semesters in college. We further examine how this pattern varies based on three correlates of hooking up frequently studied in the literature: alcohol consumption, gender and relationship status.

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Hooking up in college

Most college students fit within the life course period known as emerging adulthood (age 18–25: Arnett 2000). Today in the USA, a majority of individuals attend college after completing high school (Aud et al. 2011). Relationship and sexual identity exploration is considered to be one of the developmental tasks associated with emerging adulthood (Arnett 2004). Hooking up and other casual sex relationships are increasingly considered a normative form of relationship exploration during this period (Beres 2010; Claxton and van Dulmen 2013; Stinson 2010).

A hook up pattern

Previous studies examining college student hook ups have used a variety of methods, samples and analyses to identify potential patterns of hooking up. Although not the intent of her qualitative study on hooking up, Bogle (2008) discussed the process of socialisation into campus 'hook up culture', reporting that it was common for younger (i.e., first year) students (particularly women) to hook up frequently as a means to forming a committed relationship. When students realised that this was not a viable path to relationship formation, the frequency of hooking up typically decreased. Thus, we might expect hook up rates to decrease, specifically among women, during their progression through college.

One approach to examining a hook up pattern is by comparing students based on their year of study. A few studies have made comparisons of college students by dichotomising students as less advanced (first and second year) and more advanced (third and fourth year). For example, Olmstead and colleagues (2013) found in a study using college men, that less advanced students were more likely to hook up; however, these findings did not remain in multivariate analyses. In another study, Garneau and colleagues (2013) found that both male and female students who were less advanced reported fewer different hook up partners in the past 12 months, a finding that remained in multivariate analyses.

Using short-term prospective studies, other scholars examined a hook up pattern by studying the influence of previous hook up experience on future hook up behaviour. Several studies have shown that those who previously hooked up are more likely to hook up again in the future. For example, using a sample of college students, Owen, Fincham and Moore (2011) found that those who had hooked up in the 12 months prior to the study were more likely to hook up during the semester in which the study occurred. Using a sample of college men, Olmstead and colleagues (2013) found that men with previous hook up experience (four months prior to the study) were 3.58 times more likely to hook up during the semester of their study. Whereas these studies focused on students from a variety of years in college, greater attention has turned to students making the transition into college (i.e., first year students).

A few studies have examined hook up patterns across the transition to college among first year students by examining pre-college hook up experience and hook up behaviour during the first semester. Wade and Heldman's (2012) qualitative data showed that many freshmen hold the expectation of becoming involved in hook up culture during their college experience, and some actually find it difficult to escape. Generally, studies on hooking up among first year students showed that those who hooked up prior to coming to college were more likely to hook up during their first semester. For example, Fielder and Carey (2010a) found among a sample of first year women, that the percentage of women with oral, vaginal and anal sex hook up experience significantly increased from pre-college reports to end of first semester reports (51–60%). In another study, Olmstead,

Roberson and colleagues (2013) examined a sample of first year men. They found that the number of men's hook up partners during their first semester significantly increased as the number of pre-college hook up partners increased, even after controlling for pre-college binge drinking experience.

Although this body of literature has identified a potential pattern for hooking up during college, no studies were found that have specifically examined whether a hook up pattern exists across semesters in college. Based on the literature, we expected a pattern to emerge across semesters, and that this pattern would show a general decline: that is, a greater percentage of first year students hook up and this percentage declines across subsequent semesters in college.

Alcohol consumption

A frequently examined correlate of hooking up is alcohol use (Garcia et al. 2012). Studies have consistently found a positive relationship between consuming alcohol and hooking up (Claxton and van Dulmen 2013). College students consume alcohol as a means of lowering inhibitions, which serves to facilitate or justify hooking up (Vander Ven and Beck 2009). Scholars (e.g., Fielder and Carey 2010b; Lewis et al. 2012; Owen et al. 2010) have examined both typical drinking and situational drinking (i.e., consuming alcohol just prior to or during a hook up) and its relationship with hooking up. Olmstead, Roberson and colleagues (2013) found that first year men who engaged in more frequent episodes of binge drinking in the 30 days prior to college also reported a greater number of hook up partners during their first semester. Regarding situational alcohol use, Fielder and Carey (2010b) found that first semester college women consumed a greater number of alcoholic beverages before hook ups compared to women who engaged in sexual activity with a committed romantic partner. Lewis and colleagues (2012) examined both typical and situational alcohol use in a sample of college students and found that typical alcohol consumption predicted a greater likelihood of engaging in oral sex and vaginal sex hook ups, but situational alcohol use was not related to penetrative sex hook up behaviour (i.e., oral sex, vaginal intercourse, anal intercourse). For the purposes of this study, we examined whether hook up patterns differ based on reports of typical binge drinking by measuring it at the beginning of the semester. We expected that patterns will differ based on reported frequency of binge drinking. Specifically, we hypothesised that rates of hooking up will be lower among those who binge drink less frequently, and that this relationship will emerge across semester in college.

Gender

Gender is also a commonly examined correlate in studies on hooking up. Although several studies have examined differences in hooking up between men and women, findings are mixed. For example, Garneau and colleagues (2013) found that compared to men, women reported fewer hook up partners in the 12 months prior to the study, and this relationship held after controlling for year in school, relationship status, binge drinking, family structure and attachment. Using a sample of first year students, Katz and Schneider (2013) found that compared to women, a greater proportion of men reported involvement in hooking up since the age of 14. They also found that a greater proportion of men reported hooking up during their first year of college compared to women. Contrary to these findings, Owen and colleagues (2010) found no differences between men and women who reported hooking up in the year prior to their study.

In addition, Fielder and Carey (2010a) and Flack and colleagues (2007) compared men and women on their engagement in hook up behaviour and found no differences. Studies on hooking up continue to examine the relationship between gender and hooking up given the mixed results found in previous studies. For the current study, we expected that men and women would differ in their hook up pattern. Specifically, we hypothesised that men would report a higher rate of hooking up across semesters compared to women.

Relationship status

A few studies have examined the relationship between hook up behaviour and relationship status. A lack of research on this variable exists because it is common for studies to omit participants who report being in a romantic relationship (e.g., Owen et al. 2010). We argue that given the frequent occurrence of extradyadic behaviour among college students who engage in casual sex (21%: Grello, Welsh, and Harper 2006) it is important to consider how relationship status influences involvement in hook ups. Olmstead and colleagues (2013) found that men who were in a committed relationship throughout the semester of their study were 63% less likely to hook up during the semester. Also, Garneau and colleagues (2013) found that the college students in their sample reported significantly fewer hook up partners in the 12 months prior to their study if they were in a romantic relationship. For this study, we expected the hook up pattern to differ based on relationship status during the semester of the study. Specifically, we hypothesised that those in committed relationships throughout the semester would report a much lower rate of hooking up compared to those who were not in a committed relationship the entire semester.

Current study

In this study we aimed to contribute to the literature on college student hook ups by developing a synthetic cohort to examine changes in the rates of hook ups across semester in college. Several scholars have pointed out the potential increased exposure to health risks associated with hooking up, including exposure to sexually transmitted infections, unplanned pregnancy, shame, regret, feeling victimised and negative emotional reactions (Fisher et al. 2012; Flack et al. 2007; LaBrie et al. 2014; Lewis et al. 2012; Owen and Fincham 2011). Knowing the extent to which a hook up pattern exists across semesters in college, as well as how this pattern varies by alcohol use, gender and relationship status, would help to promote relationship and sexual health education among college students, which has been suggested by scholars examining emerging adult relationships generally (Fincham, Stanley, and Rhoades 2011; Negash 2012), and hooking up among college students specifically (Katz and Schneider 2013; Lewis et al. 2012; Olmstead, Pasley, and Fincham 2013; Olmstead et al. 2013). Based on the extent literature on hooking up, we set out to test the following hypotheses:

H1:   Rate of hook ups is related to semester in college. We expected the pattern to indicate a higher rate of hooking up during the first year semesters, with a gradual decline across subsequent semesters.

H2:   Rate of hooking up will differ based on frequency of binge drinking, gender and relationship status. We expected hook up rates to be higher among those who binge drank more frequently, men, and those who reported not being in a romantic relationship for part or all of the semester.

Methods

Participants

Participants were undergraduate students enrolled in a family development course at a large public university in the Southeast USA that met a campus-wide liberal studies requirement. Data derive from a larger project about emerging adults and romantic relationship development, which was approved by the university institutional review board. The sample was limited to emerging adults (age 18–25) who reported their number of hook up partners during waves 2 and 3 of data collection. Data were combined from two independent but consecutive semesters: autumn 2009 ($n = 844$) and spring 2010 ($n = 839$). Because this original sample consisted of a disproportionate percentage of men (25.0%), we conducted random quota sampling so that the proportion of men and women in our final sample reflected their proportion in the broader college population (Borzelleca 2012). The final sample ($n = 1003$) consisted 58.88% women ($n = 590$) and 41.1% men ($n = 412$).

Participants were on average 19.2 years old ($SD = 1.25$). Most (71.7%) reported their race/ethnicity as White, followed by Latino/a (11.4%), African American (11.3%), Asian American (2.5%) and Asian/Pacific Islander (<1%), with 3.0% reporting as Other. A majority (98.5%) identified their sexual orientation as heterosexual and 1.5% identified as gay or lesbian. In terms of year in school, 39.7% were first year students, followed by second year (32.2%), third year (19.9%) and fourth year (8.2%).

Procedures

Individuals who chose to participate in the study provided informed consent and then completed three surveys at different times during the semester (T1 = week 1, T2 = week 8, T3 = week 15). Participants were provided with a link to a restricted access online survey during each of these time points. Surveys were completed during a time and in a location that was convenient and comfortable for participants. Those who chose to participate in the study received partial course credit, whereas those who did not participate completed an alternative assignment for the same amount of credit.

Measures

Independent variables

Semester in college. At T1, participants reported their current year in college (i.e., first year, second year, third year, fourth year). For our first set of analyses (logistic regression), time in college was treated as a continuous variable, with scores ranging from (0) 'autumn semester of the first year' to (7) 'spring semester of the fourth year'. For our follow-up analyses (survival analysis), each participant was assigned two variables indicating the college semester in which they participated in the study so we could analyse the data through cross-sectional survival analyses: Interval1 and Interval2. Interval1 denotes the time the participant entered the time series and is scored from (0) 'the beginning of autumn semester of the first year' to (7) 'the beginning of spring semester the fourth year'. Interval2 denotes the time the participant left the time series and ranges from (1) 'the end of autumn semester of the first year' to (8) 'the end of spring semester of the fourth year'.

Binge drinking. Participants' engagement in binge drinking was based on their response to a single item measured at T1: 'How often in the last 30 days did you have five or more

drinks on one occasion?' Responses ranged from (1) 'never happened' to (9) 'more than 10 times'. This item has been used in other studies on hooking up to assess binge drinking (e.g., Garneau et al. 2013).

Gender. At T1 participants indicated their gender as (0) 'male' or (1) 'female'.

Relationship status. At T2 and T3, participants indicated if they were in a romantic relationship by responding to the question 'Are you currently in a romantic relationship?' These two items were coded into a single dichotomous item to indicate relationship status during the semester, (0) 'not in a relationship for some or all of the semester' or (1) 'in a relationship for the entire semester'.

Dependent variable

Hooking up. At T2 and T3, participants were provided with the following definition of hooking up: 'Some people say that a "hook up" is when two people get together for a physical encounter and don't necessarily expect anything further (e.g., no plan or intention to do it again)'. Participants then responded to the following question: 'Based on this definition, how many different people did you hook up with since the last survey?' The T1 to T2 and the T2 to T3 intervals were equal (7 weeks). Responses ranged from '*0*' to '*6 or more*'. For this study, responses were dichotomised for each time point (0 = 'no hook ups', 1 = 'one or more hook ups) and then dichotomised for the semester (0 = 'no hook ups during the semester', 1 = 'one or more hook ups during the semester').

Results

Analytic procedure

The data used in this study is a synthetic cohort of college men and women spanning autumn semester of the first year to spring semester of the fourth year. A synthetic cohort is a grouping of individuals across different ages but samples are taken in the same year. Even with a synthetic cohort, data with a time component is not appropriate for many statistical analyses within the generalised linear model (e.g., linear regression, logistic regression). This is because data with a time component violates two statistical assumptions: equality of variance and normally distributed variables, and results cannot be trusted due to assumed bias or error in estimating the parameters. Because of the suspected bias, we tested the hypotheses of this study using two different statistical analyses that handle dichotomous outcomes: logistic regression and cross-sectional survival analysis.

The data used in the current study is challenging to analyse because it is both cross-sectional and has a time component. Therefore, consideration must be made to determine the analysis with the least bias or error. Logistic regression is commonly used with cross-sectional data but is not appropriate for data with a time component; the opposite could be said for survival analysis, where it is more commonly used with repeated measure or longitudinal studies. However, survival analysis has been used with cross-sectional data in epidemiological studies to examine potential changes in synthetic cohorts (Barros and Hirakata 2003) and drug use among youth (Adler and Kandel 1983; Reardon, Brennan, and Buka 2002). This technique is used because the odds ratio derived from logistic regression leads to a bias that tends to overestimate prevalence rates (Thompson, Myers, and Kriebel 1998). Further, when using multiple covariates of the prevalence ratio, the

hazard function is preferred over logistic regression (Thompson, Myers, and Kriebel 1998). Cross-sectional survival analysis may better estimate data with a time component compared to logistic regression because the entire hazard function calculates the probability of an event occurring for each interval of time for all of those individuals for whom the event has not occurred independent from the previous probability. Moreover, survival analysis assesses instantaneous change in the rate of the outcome variable, whereas logistic regression assesses a single odds-ratio as a function of time.

An additional challenge to this data is the unbalanced distribution of participants across year in college. Survival analysis is an appropriate analytical technique for this data because its calculation assesses each interval independently (Cleves et al. 2010), therefore this technique is not biased by unequal group sizes in each time interval and so should be less biased compared to logistic regression for this data. Because logistic regression assesses a single odds-ratio across all semesters, the unbalanced distribution of this data may bias the results. According to these analytic theoretical underpinnings, survival analysis should provide less biased results for the given data's limitations.

Descriptive analyses

At T2, 42.3% of participants reported that they had hooked up during the first seven weeks of the semester. Those who hooked up had an average of 2.0 hook up partners ($SD = 1.33$) and reported a variety of behaviours during their hook ups including kissing (92.0%), sexual touching (67.8%), oral sex (46.1%) and intercourse (vaginal/anal: 48.3%). At T3, 41.9% reported that they had hooked up in the last seven weeks of the semester, with an average of 2.87 ($SD = 1.33$) hook up partners. hook up behaviours reported included kissing (92.0%), sexual touching (68.1%), oral sex (48.2%) and intercourse (vaginal/anal: 45.0%). A large proportion of participants (40.6%) reported that they had not consumed five or more drinks on one occasion in the past 30 days, followed by 1 time (15.4%), 2 times (10.2%), 5–6 times (8.3%), 7–8 times (7.3%), 4 times (5.9%), 3 times (5.7%), more than 10 times (4.0%) and 9–10 times (2.5%).

Logistic regression analysis

First, we conducted a binary logistic regression in Stata using list-wise deletion for missing data. We included semester in college, binge drinking, gender and relationship status as independent variables. The overall model was significant, $\chi^2(4, n = 977) = 83.32$, $p \leq .001$. In this model, semester in college was not significant (OR = .96, $p = .30$); however, for each unit increase in binge drinking, individuals were more likely to hook up (OR = 1.29, $p \leq .001$), women were less likely to hook up (OR = .62, $p \leq .05$) and individuals who were in a relationship the entire semester were less likely to report hooking up (OR = .33, $p \leq .001$). Overall, the inclusion of these variables correctly classified 65.7% of participants.

Though semester in college was not a significant linear predictor of the likelihood of hooking up, we considered an alternative model with a quadratic relationship between semester in college and likelihood of hooking up. Thus, we followed up our initial analysis with the addition of a quadratic term. Although the model remained significant, $\chi^2(5, n = 977) = 164.64$, $p \leq .001$, the addition of the quadratic term was non-significant (OR = 1.01, $p = .72$). The quadratic term did not improve the percent of participants correctly classified (66.0%).

Survival analysis

Because the linear and quadratic terms were non-significant in the logistic regression, we next sought to examine how survival analysis might explain the data. We first utilised non-parametric analyses and then tested the non-parametric findings using parametric survival analysis.

Non-parametric survival analyses

Due to the cross-sectional nature of the data, time-discrete analyses could not be used to determine the shape of the data without prior specification of a hazard function. To circumvent this, a non-parametric survival analysis technique (Kaplan-Meier analyses) was initially used to assess the shape of the data. A visual assessment of the Kaplan-Meier survival results (see Figure 1) and the smoothed hazard estimation (see Figure 2) was then performed. The visual inspection of the Kaplan-Meier showed a decrease in the probability of hooking up as a function of time in college. The smoothed hazard estimation showed an increase in the probability of having a hook up at the start of the first year, peaking around the spring semester of the first year, followed by a gradual decline in the probability of having a hook up in each subsequent semester in college. After visually assessing the data and confirming that there was adequate reason for moving forward with survival analysis (i.e., the probability of hooking up is a function of time in school), a more robust parametric analysis was performed.

Parametric survival analysis

To determine the *a priori* specifications of the shape of the hazard function, we examined the Akaike score (an indication of fit) for each of the hazard functions (see Table 1). The
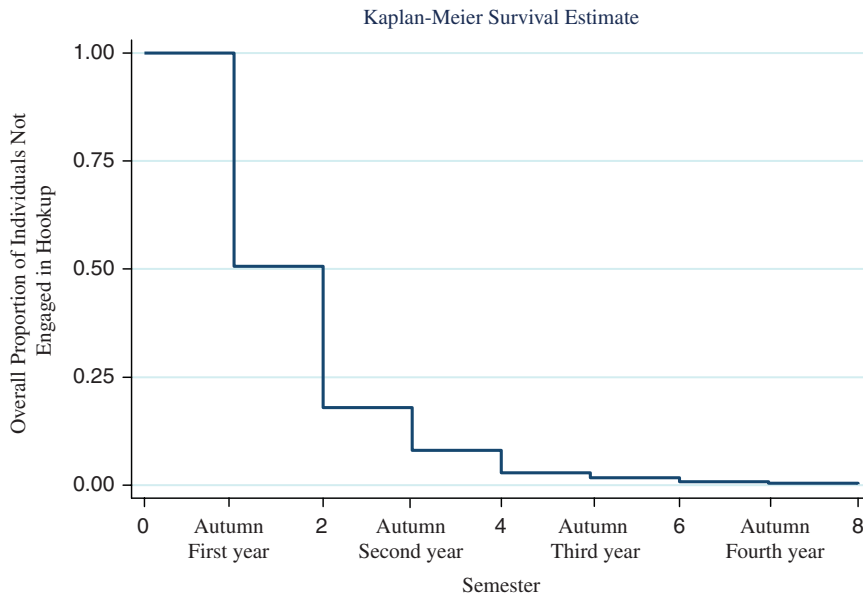

Figure 1.   Non-parametric estimate, Kaplan-Meier, for proportion of individuals not engaged in a hook up.
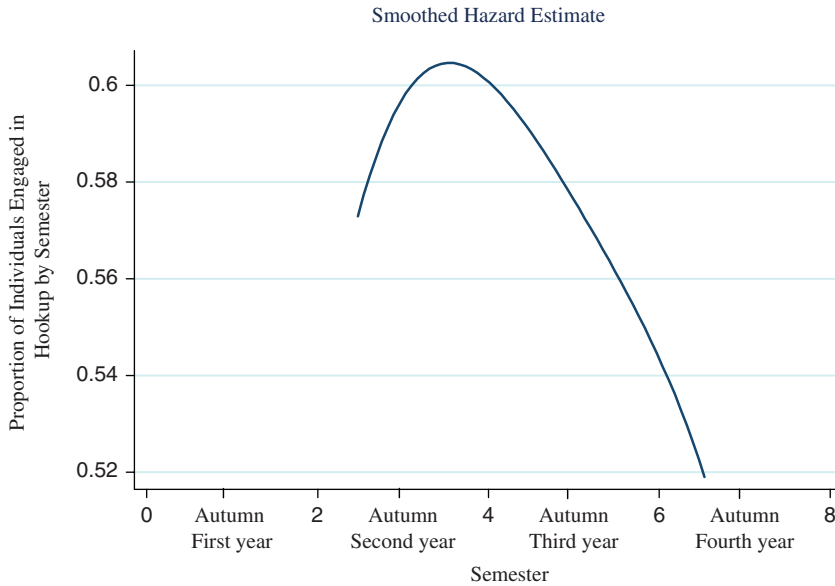
Smoothed Hazard Estimate

Figure 2. The non-parametric smooth hazard estimate for individuals who engaged in a hook up.

lowest Akaike score is an indicator of the best fit, and the lognormal distribution for this analysis had the lowest Akaike score (493.4544).

A lognormal distribution was then performed using binge drinking, gender and relationship status. Binge drinking ($B = -.04$, $p \leq .05$), relationship status ($B = .38$, $p \leq .001$) and the constant of semester in college ($B = .44$, $p \leq .05$) were all significant in the model; however, gender ($B = .10$, $p = .17$) was not significant (see Table 2) and the model was a statistically significant representation of the data, LR $\chi^2(3) = 41.75$, $p \leq .001$. Results were similar to logistic regression in that those who engaged in binge drinking more frequently also had a higher rate of engaging in a hook up and those who were in a romantic relationship the entire semester were less likely to hook up. However, unlike the logistic regression, semester in college was a significant predictor of the rate of hooking up and gender was not significant. The plotted lognormal distribution based on gender (see Figure 3) showed that men reported a higher rate of hooking up across all semesters in college; however, the rate of change in the probability of hooking up remained similar for men and women (i.e., was not statistically significant).

Table 1. Akaike Scores ($n = 981$).

Model	df	Akaike
Exponential	3	594.61
Weibull	4	538.14
Gompertz	4	576.36
Lognormal	4	493.45
Loglogistic	4	542.73
Gamma	5	495.36

Table 2.   Lognormal survival analysis output ($n = 999$).

Variable	B	SE B
Binge drinking	$-.04*$	0.01
Gender	.10	0.14
Relationship status	.38**	0.07
Constant	.44*	0.08
$LR\chi^2$	41.75**	
Df	3	

Note: The rates of surviving refer to the rates of not engaging in a hook up; the sample size is smaller for this analysis due to missing data; $*p \le .05$, $**p \le .001$.

Discussion

Hooking up is a common experience among men and women who attend college in the USA (Bogle 2008; Garcia et al. 2012; Owen et al. 2010). A majority of the participants in our study reported having one or more hook up partners during the semester, and a large minority of those who hooked up reported having penetrative sex hook ups (i.e., oral sex and/or intercourse). Given the potential for exposure to health risks associated with hooking up (e.g., STIs: Lewis et al. 2012), the purpose of this study was to examine whether a pattern of hooking up existed across semester in college using two statistical methods: logistic regression and cross-sectional survival analysis. Knowing such a pattern and the influences on a pattern has the potential to assist in the optimal timing of promoting awareness and safer-sex practices on college campuses among individuals who choose to hook up.

   When examining the correlates of hooking up, logistic regression and survival analysis produced somewhat similar results. In general, individuals who reported more frequent binge drinking at T1 were more likely to hook up throughout the semester, whereas women (logistic regression only) and individuals in a relationship the entire semester were
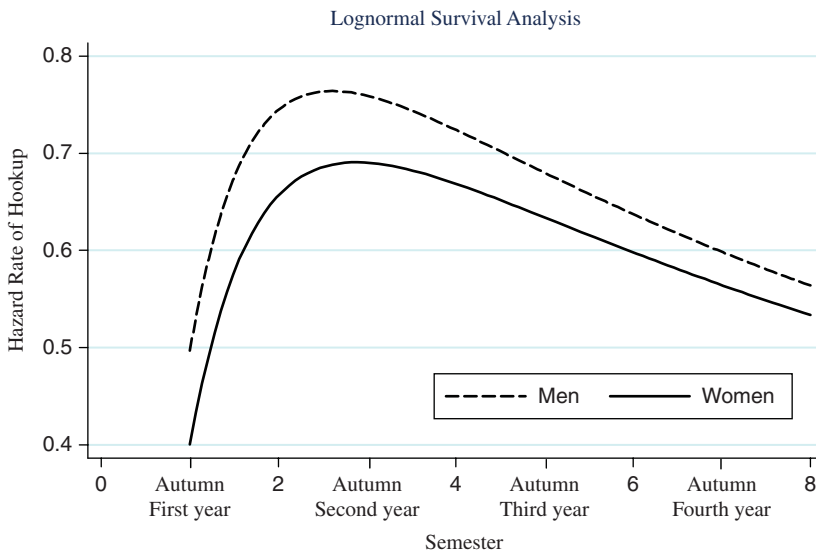

Figure 3.   The parametric hazard rate of hook ups across semesters of college.

less likely to hook up. According to the logistic regression results, the linear and quadratic relationship between semester in school and the probability of hooking up was not significant. However, in the survival analysis, the influence of semester in college on the rate of hooking up emerged.

Our findings from the survival analysis are consistent with the results of recent studies that have used other measures of time (e.g., less advanced and more advanced) to examine patterns of hooking up (e.g., Olmstead, Pasley, and Fincham 2013). Although individuals are motivated to hook up for a variety of reasons (Fielder and Carey 2010a; Garcia and Reiber 2008), one motivation is the desire to form a potential romantic relationship. Bogle (2008) suggested, based on her qualitative findings, that using hook ups to begin relationships is a common practice among first year women and that they learn over time that hook ups are not a viable pathway to forming committed relationships. Based on her qualitative findings, we expected a negative relationship between time and hook up rates. In this regard, our hypothesis about a pattern of hooking up across semester was supported by the survival analysis, but not the logistic regression. Additionally, we contribute to the literature by extending the dichotomous more and less advanced conceptualisation of college time.

An important difference between survival analysis and logistic regression is that by using survival analysis we were able to show this curvilinear relationship between college semester and hooking up. In our sample, hook ups appear to peak between the spring semester of the first year and autumn semester of the second year, followed by a gradual decline each semester of subsequent years in school. The increase in hooking up from autumn to spring of the first year has several potential explanations. A common event that occurs during spring semester is spring break. Spring break, for college students, often includes expectations about engagement in casual sex encounters, particularly among men (Maticka-Tyndale, Herold, and Mewhinney 1998). Several studies examining behaviour, rather than intentions, have shown that casual sex is common during spring break (Maticka-Tyndale and Herold 1997). Casual sex practices on spring break are often mixed with consuming large amounts of alcohol, more so than typical amounts (Sönmez et al. 2006).

Another potential explanation is that the autumn semester of the first year is often the first semester of the college experience (although some first year students may begin spring semester of the first year). Introduction to a new context with limited supervision and increased autonomy may help explain why hook up rates are higher among first year students. For example, becoming involved in a new subculture where hooking up is a normative behaviour may increase the likelihood of hooking up (Holman and Sillars 2012). Also, perceiving that others are involved in hook ups, regardless of actual hook up rates among one's peers, is also associated with a greater level of comfort with hooking up (Barriger and Vélez-Blasini 2013; Lambert, Kahn, and Apple 2003). The first semester also requires adaptation to a new environment, navigating campus and courses, balancing schoolwork with social life and, for some, working to pay for school or other necessities. Although such balance likely remains throughout the college experience, having completed the first semester may allow first year students to engage in greater self-exploration, including exploring relationships and contexts that require sexual decision making around hooking up (Arnett 2004; Wade and Heldman 2012).

Although such explanations are certainly plausible, spring break and adapting to the college environment are not limited to college students in their first year. Based on our findings, it appears that something occurs between the end of spring semester of the first year and autumn semester of the second year that may trigger this gradual decline in the rate of hooking up. It is possible that in between these semesters some college students

may engage in a self-reflective experience of their first year of college and perhaps choose to decrease or forego involvement in the hook up culture. Given that many students return to living with one or both parents in the interim summer break, parents may be involved in helping these new emerging adults evaluate their first year experiences. It is also possible that many choose to become involved in committed romantic relationships and become more involved in serial monogamy as a context for sexual experience as opposed to casual sex opportunities (Regnerus and Uecker 2011). Our results partially support this interpretation as those who were involved in a romantic relationship the entire semester were less likely to engage in a hook up.

Because this data set is a synthetic cohort, there is an additional explanation for the decrease in hook up rates after spring semester of the first year. Individuals who hook up may not progress in college and therefore may no longer be part of the campus upperclassmen. As previously mentioned, hooking up is highly correlated with alcohol use (Fielder and Carey 2010a; Lewis et al. 2012; Owen et al. 2010). Also, approximately 57% of college students graduate from college after five years (Aud et al. 2011). If these two statistics are related, then perhaps those individuals who drop out of the college population are also the individuals who tend to hook up and drink alcohol more frequently. Thus, rates of hooking up may decrease for more advanced students because individuals who hook up are no longer part of that group. Alternatively, the decrease in rates of hooking up maybe due to older individuals defining their sexual activities outside of a committed romantic as something other than a hook up. For example, they may be involved in a friends-with-benefits relationship or an ongoing hook up relationship. Neither of these types of relationships is captured in our definition of hooking up. Future research may consider broadening the definition of hook up and casual sexual encounters when examining these behaviours during the college years.

A second difference between the logistic regression and survival analysis results is that logistic regression indicated a significant gender difference for hooking up, whereas survival analysis did not. Perhaps these differences stem from how the statistics are calculated. With logistic regression, the results indicated that the odds ratio (a single rate across all semesters) is significantly different depending on gender. However, with survival analysis we examined how gender influenced the curvilinear relationship between semester in college and hook up rates. In survival analysis, gender was not a significant predictor. This indicates that there is no difference in the shape of the pattern of hook up rates across semester but there is a difference in the overall probability of hooking up. What this means is that men and women may adapt to the hook up script similarly though they may report engaging in hook ups with different probabilities. Future research should use longitudinal data to examine if this difference is a function of a cohort effect, due to the current data being a synthetic cohort, or if gender differences for the rate of hooking up disappear when examining how hook up rates change over time.

Another important finding, consistent with previous studies on hooking up, is the role of alcohol use (Fielder and Carey 2010a; Lewis et al. 2012; Owen et al. 2010). We found in both logistic regression and survival analysis that those who binge drank more frequently were also more likely to report hooking up. Thus, it seems clear that scholars should continue to account for alcohol use when examining hooking up among college students.

Limitations

Our findings should be considered in the light of several limitations. First, our sample was from one university, limiting the generalisability of the results. Replication of the study

using student samples from multiple colleges would increase confidence in our findings. Also, our sample was limited to college students, thus study findings may not be relevant to emerging adults not attending college. Similar patterns need to be tested among emerging adults not attending college and examine age rather than year in college.

Another limitation was the use of a synthetic cohort rather than a longitudinal cohort. Following individuals from college entrance to graduation would provide a more accurate portrayal of the pattern of hooking up over the course of the college experience. It may be that longitudinal data would show other important variations in hooking up during college, such as a bimodal distribution or other patterns not found in our sample. In addition, incorporating qualitative interviews would give voice to this pattern, particularly the decline between the first and second years.

Third, our inclusion of independent variables beyond time in college was limited to binge drinking, gender and relationship status. The literature on hooking up among college student populations has identified a series of potentially important variables that, had these been measured and included, our findings regarding the pattern of hooking up might have differed. For example, attitudes towards casual sex, religiosity, personality and attachment have all been shown to be related to hooking up in this population (Fielder and Carey 2010a; Garneau et al. 2013; Olmstead, Pasley, and Fincham 2013; Owen et al. 2010).

Implications and conclusion

Our study has important implications for future research and intervention. One contribution of this study is the use of two different analytic techniques. Although there were similar findings using logistic regression and survival analysis, from the latter there emerged a more detailed picture of the pattern of hooking up among college students. Future research should continue to explore analyses most appropriate for the data and move beyond simple group membership. For example, studies on hooking up could examine mediator and moderator relationships among well-known predictors of hooking up and frequency or number of hook up partners using similar techniques. These studies would require model building and the use of structural equation analyses. Although more difficult to conduct, these types of analyses would provide information about *why* certain variables predict hooking up more or less often, or with a greater or fewer number of hook up partners. Also, longitudinal studies following individuals throughout the college experience would yield a more accurate picture of hook up patterns among this population. Although intensive in nature, diary-method studies and event-level analyses would also yield a more detailed insight of hooking up over a short period of time and would likely decrease recall bias.

Because survival analysis has not been used with cross-sectional data in developmental research, future statistical research should be undertaken to ensure the robustness of this technique. For example, Monte Carlo simulation methods (Robert and Casella 2010) can determine bias in this method and the power necessary to reduce bias. If cross-sectional survival analysis is a robust technique, researchers can examine their data using a different approach and perhaps discover new patterns across cohorts of interest.

Hooking up may be considered a risky sexual behaviour, depending on the behaviours that occur during the hook up (penetrative or non-penetrative), the consumption of greater amounts of alcohol, number of hook up partners and the use of condoms if the hook up included oral sex and/or intercourse (vaginal or anal). Many of the participants in our study who hooked up reported penetrative sex hook ups (i.e., included oral sex and/or

intercourse). Although we did not measure condom use during hook ups, studies have shown that condom use is inconsistent when hook ups include intercourse, and condoms are rarely used when oral sex occurs (Fielder and Carey 2010a). Further, a small number of individuals have reported experiencing unplanned pregnancy or contracting STIs from hook ups (Lewis et al. 2012). Thus, identifying an optimal time to promote awareness and safer-sex practices is important for educators and college administrators. Based on our study findings, the beginning of the first year would appear to be an important time to educate students regarding potential health risks associated with sex in general, and casual sex specifically. Also, promoting condom or other prophylactic use (e.g., female condoms, dental dams) at this time would encourage general sexual health. College administrators should consider this awareness and education as a part of college orientation. Another option would be encouraging seminar courses or events aimed at first year students to promote safer-sex practices (e.g., sexual health seminars, sex week). Further, the relevance of this education and awareness seems appropriate to repeat at the beginning of or during the spring semester of the first year. helping orient first year students regarding contraceptive options and resources available from the university health clinic should one contract an STI or experience an unplanned pregnancy is also critical.

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Résumé

Les hookups sont des rencontres sexuelles qui peuvent englober des comportements différents (allant des baisers aux rapports sexuels) et qui n'engagent à aucun contact ou aucune relation durable. Bien que cette pratique soit fréquente sur les campus américains, il existe peu de données permettant de savoir si cette fréquence change au cours de la vie universitaire. À partir des données transversales et des covariables que sont la consommation d'alcool, le genre et le statut des relations, nous avons examiné les taux de hookups dans une cohorte synthétique d'étudiants de premier cycle (N=1.003) en utilisant la (a) régression logistique et (b) une forme appliquée d'analyse de survie. Alors que les deux méthodes analytiques ont donné des résultats similaires, l'analyse de survie a donné un meilleur aperçu de ces taux en montrant leur augmentation, avec un paroxysme entre le semestre de printemps de la première année universitaire et le semestre d'automne de la deuxième, puis une baisse progressive au cours des semestres suivants. La régression logistique indique que le genre est sensiblement lié au hookup, les femmes ayant rapporté moins de hookups que les hommes; cependant, ce résultat n'a pas été constaté dans l'analyse de survie, ce qui indique qu'il n'existe pas de différences entre les cohortes. Les implications de ces résultats pour la promotion de la santé sexuelle auprès des étudiants universitaires et les futures recherches sont discutées.

Resumen

Los ligues son encuentros sexuales vinculados a una variedad de comportamientos (que abarcan desde besarse hasta el coito), sin que existan expectativas de contactos futuros o de relaciones duraderas. A pesar de que los ligues son comunes a nivel de los planteles universitarios de ee. uu., el conocimiento en torno a si la frecuencia de los ligues experimenta modificaciones a lo largo de los años universitarios es reducido. Mediante el empleo de datos transversales y de las covariables uso de alcohol, género y estado de las relaciones, los autores examinaron una cohorte sintética de estudiantes de licenciatura (N=1003) para determinar la frecuencia de ligues, usando para ello (a) una regresión logística y (b) una forma aplicada del análisis de supervivencia. Si bien ambas técnicas reportaron resultados similares en las pruebas, el análisis de supervivencia brindó un cuadro más completo, evidenciando un aumento en la tasa de ligues durante los primeros años universitarios. En este sentido, dicha tasa alcanza su punto máximo en los semestres correspondientes a la primavera del primer año universitario y al otoño del segundo año, siguiendo un descenso paulatino durante los siguientes semestres. Los hallazgos obtenidos al respecto dan cuenta de que en la regresión logística el género se encuentra relacionado significativamente con el ligue, en tanto las mujeres reportaron menos ligues que los hombres. Sin embargo, el análisis de supervivencia reveló que el género no se relaciona significativamente con éstos, mostrando que no existen diferencias en los patrones de las cohortes. El artículo analiza las implicaciones que el estudio tiene para la promoción de la salud sexual entre los estudiantes universitarios, indicando las áreas de investigación que pueden explorarse en el futuro.