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Assessing the Personal Negative Impacts of Hooking Up Experienced by College Students: Gender Differences and Mental Health

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Abstract

Hooking up is a normative behavior among college students that is associated with a range of positive and negative consequences. While previous research has primarily focused on women's negative experiences of hooking up, the current study explores the relationships among hooking up behaviors, psychological distress, and a broad range of negative effects of hooking up in both male and female college students. Using a multi-site sample of college students, we developed the 14-item Negative Impact of Hookups Inventory (NIHI) to assess negative health outcomes, emotional responses, and social consequences associated with hooking up. Unprotected sex and having more hookup partners were associated with greater negative experiences of hooking up. Contrary to expectations, there were no gender differences in the total number of negative hookup effects, although males reported more frequent hookups. In addition, negative impacts of hooking up were positively associated with psychological distress regardless of gender. The NIHI may offer a useful tool to assess the negative impacts of hooking up. Understanding students' hookup experiences is an important step toward developing targeted health interventions related to hooking up behavior in young adult populations.

Keywords

hooking up; hookup consequences; item response theory; college students

Hooking up has been defined as a casual consensual sexual encounter (e.g., kissing, oral sex, vaginal intercourse) between non-romantic partners (Bogle, 2008; Garcia & Reiber, 2008; Owen, Rhoades, Stanley, & Fincham, 2010; Paul & Hayes, 2002). Hookups may occur once or several times with the same partner (Fielder & Carey, 2010b) and are viewed as a

normative behavior among college students (Bogle, 2008; Holman & Sillars, 2012), with around 69% to 75% of college students reporting having hooked up (Engalnd, Shafer, & Fogarty, 2007; Olmstead, Pasley, & Fincham, 2013; Paul & Hayes, 2002). Hooking up can have both a positive and negative impact on college students. For example, most students describe hooking up as a positive experience (Lewis, Granato, Blayney, Lostutter, & Kilmer, 2012; Owen & Fincham, 2011) associated with feelings of empowerment, attractiveness, and excitement (Fielder, Walsh, Carey, & Carey, 2013; Paul & Hayes, 2002). Hooking up is also associated with a range of negative emotional, health and social consequences (Lewis et al., 2012; Owen et al., 2010; Paul & Hayes, 2002). Despite the limited research examining the negative impacts of hooking up (Fielder et al., 2013), there have been calls for efforts to examine ways to educate students about the potential risks of hooking up, promote safer hookups, and address the negative emotions experienced following hookups (Fielder et al., 2013; LaBrie, Hummer, Ghaidarov, Lac, & Kenney, 2014; Lewis et al., 2012; Owen et al., 2010). A more in depth understanding of the variety of negative outcomes associated with hooking up for both males and females could inform college intervention and prevention efforts (Lewis et al., 2012).

Negative Emotional Responses

While most students report more positive than negative affect following a hookup, (Lewis et al., 2012; Owen & Fincham, 2011), feelings of embarrassment, loss of self-respect and sexual regret are also common (Lewis et al., 2012; Owen et al., 2010; Paul & Hayes, 2002). For example, approximately three quarters of sexually active college students report at least some regret over past sexual experiences (Eshbaugh & Gute, 2008; Fisher, Worth, Garcia, & Meredith, 2012; Oswalt, Cameron, & Koob, 2005). Overall, females appear to experience more sexual regret than males following a hookup (Fisher et al., 2012), and the sources of this regret differ for males and females. For instance, while regret for females is more likely to be related to feelings of shame or being used, males are more likely to report regret over choice of sexual partner and partner unattractiveness (Fisher et al., 2012; Paul & Hayes, 2002).

In addition to sexual regret, casual sex is associated with psychological distress, including anxiety and depression, as well as low self-esteem and reduced life satisfaction (Bersamin et al., 2014). Research specifically examining hooking up suggests that having engaged in a hookup (Fielder, Walsh, Carey, & Carey, 2014) and number of hookup partners (Grello, Welsh, & Harper, 2006) are related to greater symptoms of depression. Further, those who have more negative hookup experiences or greater sexual regret are more likely to report poor psychological well-being (Grello et al., 2006; Owen & Fincham, 2011; Owen et al., 2010). While the majority of past studies are correlational and the causal relationship between hooking up and psychological well-being remains unclear, there does appear to be a positive relationship between hooking up and psychological distress, and this relationship may be stronger for female than male students. For example, in comparison to male students, females who engage in penetrative sex during hookups may be at increased risk of psychological distress (Fielder & Carey, 2010a). Further research is needed to examine gender differences in negative responses to hooking up.

Negative Health Outcomes

In addition to negative emotional responses, hooking up is related to a number of health risks. High-risk sexual activities, such as unprotected sex and inebriated sex, are common themes in students' self-reports of their hooking up experiences (Holman & Sillars, 2012); however, students are sometimes unaware of these risks. For example, Downing-Matibag and colleagues (2009) found that approximately half of students report being unconcerned about the risks of contracting a sexually transmitted infection (STI) from hooking up, and most were unaware of the risks of STIs from unprotected oral sex performed while hooking up. Students' reports of condom use during hookups are relatively low (Fielder & Carey, 2010b; Lewis et al., 2012). For example, in a sample of female college students, reports of condom use during hookups ranged from 69% for vaginal sex to 0% for oral sex (Fielder & Carey, 2010b). Hookups commonly involve alcohol use (LaBrie et al., 2014; Lewis et al., 2012; Paul & Hayes, 2002) and are often spontaneous; these factors may increase the likelihood of unprotected sex. In addition to unprotected sex, hooking up is related to having multiple, concurrent partners (Paik, 2010), further increasing sexual health risk. Given these findings, it is not surprising that engaging in more hookups is associated with a greater likelihood of STIs (Fielder et al., 2014).

Social Consequences

One consequence of hooking up that has received relatively little attention in the literature is the impact of hooking up on social relationships. Hookup partners are commonly friends or casual acquaintances, rather than strangers (Fielder & Carey, 2010b; Lewis et al., 2012), and students' relationships with hookup partners as well as non-hookup friends can be negatively impacted by hooking up encounters (Owen, Quirk, & Fincham, 2014). More broadly, engaging in hooking up may have implications for a student's reputation, particularly for female students. Although sexual double standards are diminishing, females continue to face stigma and criticism for hooking up (Allison & Risman, 2013; Stinson, 2010). Indeed, females are more likely than males to report concerns over loss of reputation after causal sex (Campbell, 2008).

Assessing the Negative Impacts of Hooking Up

Despite the growing interest in the negative impacts of hooking up for college students, there has been a dearth of research aimed at developing measures of negative consequences experienced as a result of hooking up. Existing measures are often limited in scope and few studies report on the psychometric properties of the measures employed. For example, most measures have focused on exclusively affective responses to hooking up such as feelings of sexual regret, disappointment, confusion, being used, or isolation (Fisher et al., 2012; Owen & Fincham, 2011; Owen et al., 2010; Victor, 2012). In a notable exception, Owen and colleagues (2014) developed the more comprehensive Social, Academic, Romantic, and Sexual Hooking Up Reaction Scale (SARS). This 16-item measure examines both positive and negative responses to hooking up and includes a 7-item subscale assessing social and academic problems associated with hooking up (e.g., "This hookup has negatively impacted relationships with my friends" and "My school work has been negatively impacted as a

result of this hookup”). While this measure expands on the negative responses to hooking up assessed in previous studies, the measure was not designed to assess more general negative emotional responses and health outcomes associated with hooking up (e.g., sexual regret, feeling of being used, disappointment that the hookup did not lead to a relationship, STIs). Further, this scale was developed in a sample of female students, and research examining a broader range of negative impacts of hooking up in more diverse samples is needed.

Current Study

The current paper explores the relationships among the negative impacts of hooking up, hooking up behaviors, and psychological distress in college students. While hooking up is predominantly a positive experience for most students, a better understanding of the negative impacts of this behavior has the potential to inform college sexual health intervention efforts. Past research suggests that more frequent hookups and a greater number of hookup partners are associated with negative affect and health outcomes (Fielder et al., 2014; Grello et al., 2006). We, therefore, anticipated that students who engage in more frequent hookups and have more hookup partners would report more negative impacts. Further, given research demonstrating that negative experiences of hooking up are associated with poorer psychological well-being (Grello et al., 2006; Owen & Fincham, 2011; Owen et al., 2010), we expected that experiencing more negative consequences would be associated with greater symptoms of psychological distress. In order to assess the range of negative impacts associated with hooking up (i.e., emotional, social, health-related), we used an Item Response Theory (IRT) model to develop a brief measure of the negative impacts of hookups (NIHI: Negative Impact of Hookups Inventory).

An additional aim of the current study was to explore gender differences in the negative impacts of hooking up. Based on prior research (Campbell, 2008; Fielder & Carey, 2010a; Fisher et al., 2012; Owen & Fincham, 2011), we hypothesized that females would report more negative consequences from hooking up than males and that consequences would be more closely associated with poor mental health for females than males. Further, differential item functioning (DIF) analysis was used to examine whether NIHI items performed differently for males and females. DIF occurs when the probability of endorsing an item at a given level of the trait assessed (i.e., negative impact of hooking up) differs for males and females. It is possible that gender differences in NIHI scores reflect true gender differences in the underlying trait or differences in how males and females interpret and respond to items. Given gender differences in societal norms surrounding sexual behaviors (Allison & Risman, 2013; Stinson, 2010), it may be that items assessing the negative impact of hooking up behave differently for males and females. For example, a partner not making contact after a hookup could have a different meaning for males and females. Examining DIF provides an approach for exploring one potential source of gender differences on measures of negative hooking up outcomes (Smith & Reise, 1998).

Method

Participants and Procedure

Participants were undergraduate students from three US universities taking part in a larger alcohol intervention study. The sites included a large public university in the Northwest, a private West Coast university, and a large public university in the South. All data reported in the current analyses were collected prior to any alcohol intervention. The registrar's office on each campus provided a random list of enrolled students ($N = 9,524$). These students were sent an email invitation to participate in the study and a link to an online informed consent. Participants who provided informed consent were immediately directed to an online survey. Of the 2,139 students who completed this screening survey, 1,532 participants were excluded from the analyses either because they did not report hooking up in the past three months ($n = 1,510$) or because they did not complete the hooking up related questions ($n = 22$). The final sample of 607 participants who completed the hookup consequences measure was adequate for both factor analysis and IRT analysis (Brown, 2006; de Ayala, 2009). As part of the larger alcohol study, a subset of 280 participants who reported heavy episodic drinking (e.g., males who reported consuming 5 or more drinks on one occasion in the past three months, and females who reported consuming 4 or more drinks per drinking occasion in the past three months) also completed additional measures of mental health.

Participants were 18 to 26 years old ($M = 20.3$ years, $SD = 1.75$). The proportion of males (51%, $n = 309$) and female participants (49%, $n = 298$) was fairly similar. The majority of the sample identified as White (58.2%), followed by Asian (16.8%), Black / African American (7.6%), Multi-ethnic (7.4%), Native American / Alaskan Native (1.3%), Native Hawaiian / Pacific Islander (0.7%), identified as "other" (7.6%), and 0.5% did not provide their race. In terms of ethnic composition, 20.4% identified as Hispanic / Latino.

Measures

Negative Impacts of Hooking Up—Prior to answering hookup related questions, participants were provided with an operational definition of hooking up used in prior research (e.g., Kenney, Lac, Hummer, & LaBrie, 2014; LaBrie et al., 2014; Napper, Kenney, & LaBrie, 2015): "'Hooking up' is defined as engaging in physically intimate behaviors ranging from kissing to sexual intercourse with someone with whom you do not have a committed relationship. 'Hooking up' is defined as something both people agree to (consensual), including how far they go." Participants were then asked whether they had experienced 17 negative effects during or after a hookup in the past three months. Negative impacts included "I felt that I had been taken advantage of during a hookup" and "A hookup has negatively affected a relationship with a hookup partner" (see Table 1 for final item content). The items were based on previous qualitative and quantitative research examining the negative emotional, social, and health impacts of hooking up (Campbell, 2008; Fisher et al., 2012; Owen et al., 2014; Paul & Hayes, 2002). For example, some items were developed based on students' descriptions of their worst hookup encounter (Paul & Hayes, 2002). Participants indicated whether they experienced each effect as a result of hooking up in the past three months ($Yes = 1$, $No = 0$).

Hookup Behaviors—Participants reported the number of times they had hooked up and the number of different partners they had hooked up with in the past three months. In addition, participants were asked if they have had unprotected sex during a hookup in the past three months (*Yes* = 1, *No* = 0).

Mental Health—A subset of participants ($n = 280$) completed the 21-item Depression Anxiety Stress Scale (DASS-21; Lovibond & Lovibond, 1995). The DASS-21 has three subscales assessing depression ($\alpha = .89$), anxiety ($\alpha = .77$), and stress ($\alpha = .80$). Item response options range from: 0 (*Did not apply to me at all*) to 3 (*Applied to me very much, or most of the time*). Sum composites of all items within a subscale were created, with higher scores indicating greater levels of distress.

Analytic Approach

IRT calibration was used to examine item characteristics. IRT has a number of benefits over the classical test theory approach including the estimation of standard error conditional on trait level and the evaluation of item equivalence across groups (i.e., differential item functioning [DIF]). IRT models can be used to describe the probability of a participant endorsing a negative consequence as a function of their level on the trait assessed (θ ; i.e., hooking up risk) and item characteristics. Before fitting the IRT model, we examined whether the data were sufficiently unidimensional for IRT analysis by performing exploratory factor analysis (EFA) in a confirmatory factor analysis (CFA) framework using MPLUS (Muthén & Muthén, 1998–2012). Mean and variance adjustment weighted least-squares estimation was employed with a Geomin rotation. Sufficient unidimensionality was determined by examining the ratio of the first and second eigenvalues (greater than 1:5) and model fit indices: root mean square error of approximation (RMSEA; values less than .06), RMSR (values less than .07) and CFI (values close to 0.95) (Brown, 2006; Deng, Wells, & Hambleton, 2008).

A two-parameter IRT model was applied to the data using Multilog version 7.03 (Thissen, Chen, & Bock, 2003). This model provides estimates of both slope (α) and location (b) parameters. An item's slope indicates how well that item discriminates among participants at different levels of hookup risk. Larger values of a indicate that an item is more discriminating. Item location (b) indicates item difficulty with larger b values indicating that a participant needs to be at higher risk in order to be likely to endorse an item. MODFIT (Stark, 2007) was used to produce plots of empirical and predicted item response functions (IRFs) and adjusted χ^2/df ratios to examine model-data fit and problems of local independence. In addition, item information functions (IIFs), test information, and test standard error of measurement plots were obtained. Item information indicates how well each item differentiates among individuals and provides an index of item precision. Test information provides an indicator of how well the total group of items estimates hookup risk across the range of trait scores.

Following IRT calibration, IRTLRDIF (Thissen, 2001) was used to identify items that exhibited differential item functioning across gender. IRTLRDIF involves an iterative process of identifying items without DIF (anchor items) and with DIF (study items). First, a

model with all parameters constrained to be equal for the two groups was compared to a model where parameters for each item were estimated separately. A likelihood-ratio test statistic (G^2) was used to test the null hypothesis that parameters (i.e., slope and location) did not differ between groups. Following the recommendations of Millsap and Maydeu-Olivares (2009), a G^2 value of less than 3.84 was used to identify potential anchor items. Each potential anchor item was then evaluated against the other potential anchor items, and items that did not demonstrate DIF at this stage were retained as anchors. Anchor items were used to evaluate DIF in the remaining 10 study items. A Benjamini-Hochberg adjustment was used to control for Type I error (Thissen, Steinberg, & Kuang, 2002). For items exhibiting DIF, each parameter was separately constrained to be equal to determine whether DIF reflected differences in item discrimination and / or item difficulty. To interpret DIF, a two-group model where separate parameters were calculated for each group for items with DIF was specified in MULTILOG.

Finally, we examined the relationship between the 14-item NIHI and number of hooking partners, frequency of hooking up, and occurrence of unprotected sex during a hookup. Pearson's correlations were used to examine the relationship between the NIHI scores and psychological distress. Gender differences in negative consequences were also examined.

Results

Descriptive Statistics

On average, participants reported having 2.1 ($SD = 1.71$) hookup partners and hooking up approximately six times ($SD = 8.5$) in the past three months. In total, 34.8% of students reported having unprotected sex during a hookup. The most commonly reported negative hooking up outcomes included regret over a specific partner (45.0%), feeling sexually unsatisfied (39.0%), regret that a hookup went too far (35.3%), and embarrassment (35.1%).

Dimensionality

An EFA provided evidence that data were sufficiently unidimensional to meet the assumptions of the IRT analysis ($RMSEA = .053$, $RMSR = .09$, $\chi^2(119) = 319.18$, $CFI = .94$, ratio of the first to second eigenvalue = 5.5:1). All items were positively loaded on the single factor (factors loading .36 to .83).¹

Item Fit

Poorly fitting items were eliminated from the measure based on fit plots and adjusted χ^2/df ratios (Stark, Chernyshenko, & Drasgow, 2005). Adjusted χ^2/df ratios greater than three for single, double and triplet items were candidates for deletion (Drasgow, Levine, Tsien,

¹In addition to examining whether the data were sufficiently unidimensional for IRT analysis, EFA in a CFA framework was used to explore two, three, and four factor solutions. Overall, the four-factor solution provided the best fit to the data ($RMSEA = .027$, $RMSR = .048$, $\chi^2(74) = 106.60$, $CFI = .99$). The first factor, *Emotional Responses*, included items assessing regret, embarrassment and shame (i.e., items 1, 2, 3, 4, 5, 6). The second factor, *Health Outcomes*, assessed problems related to STIs and pregnancy (i.e., items 9, 11, 17). The third factor, *Social Problems*, includes items related to problems with friends and family (i.e., items, 8, 10, 12, 16). The final factor, *Isolation*, included items related to loneliness and disappointment related to no further contact with a hookup partner (i.e., items 7, 13, 14, 15). Given the small number of items in each subscale and the dichotomous response format, analysis focuses on total scores on the NIHI and not the subscales.

Williams, & Mead, 1995). A single item “I have felt disappointed that a hookup did not make me feel better about myself the following day” was deleted based on poor item fit.

Table 1 presents the parameter estimates and standard errors of the remaining 16 items. Item slopes (a) ranged from 0.69 to 2.84. The location parameters (b) ranged from 0.14 (regretting a hookup) to 2.73 (contracting an STI). IIFs and item discrimination (a) were examined to identify items to be retained in the final measure. Items that had low discrimination and low item information were candidates for deletion, and two items (“I have worried that I may have gotten pregnant or gotten my hookup partner pregnant” and “My friends have teased me about a hookup.”) were eliminated from the measure ($a = 0.69$ and 0.87 respectively). Removing these items from the measure had little effect on the marginal reliability for θ (16 items $r = 0.78$ and 14-items $r = 0.76$). The final 14-item version had acceptable levels of reliability and standard error of measurement (Figure 1). The measure was most reliable at assessing negative outcomes for those whose θ fell between the mean ($\theta = 0$; $r = .85$) and 1.5 standard deviation above the mean ($\theta = 1.5$; $r = .84$).

Differential Item Functioning

IRTLRDIF was used to identify four anchor items (items 4, 8, 12, and 14). Using these anchor items, we identified six additional items that were DIF free (items 1, 3, 5, 7, 10, 13) and four items with DIF (items 2, 6, 9, 11). All four items showed significant DIF in the b parameter (difficulty), but not the α parameter (discrimination). The final calibration of the four items with DIF is shown in Table 2. In each case, males needed higher levels of the latent trait in order to endorse the item. For example, while females who had a latent trait score approximately 0.65 SD above the mean had a 50% probability of indicating they had felt disappointed that a hookup partner has not contacted them after the hookup, males with a latent trait score around two SD above the mean had a 50% probability of endorsing the same item.

Gender Differences and Mental Health

Using the final 14 NIHI items, Multilog was used to estimate person location (θ , negative impacts of hooking up latent trait scores) using maximum a posteriori (MAP) estimation. Total scores ranged from -0.95 to 2.69 ($M = .05$, $SD = 0.80$). In total, 22.4% of participants received the lowest score on the measure (-0.95), indicating they experienced no negative impacts as a result of hooking up. On average, students reported 3.33 negative hookup consequences ($SD = 3.11$). The relationship between hookup behaviors and negative impacts was examined for both the total score (sum of 14 negative outcomes) and θ , and the results were very similar using both methods of scoring; therefore, only results for the total score are presented below. The 14-item total score had excellent internal consistency ($\alpha = .81$).

Overall, there was no significant difference in the number of negative hookup experiences reported by females ($M = 3.50$, $SD = 3.14$) and males ($M = 3.17$, $SD = 3.07$), $t(605) = 1.29$, $p = .20$. In order to evaluate the impact of DIF, we also examined group differences on the NIHI excluding the four items with DIF. There were no gender differences in reported hooking up impacts on this reduced measure, $t(605) = .62$, $p = .54$.

While there were no overall gender differences in the number of negative impacts, males did report more hookup partners ($M = 2.41$, $SD = 2.1$) than females ($M = 1.84$, $SD = 1.10$), $t(583) = 4.14$, $p < .001$, $d = .34$, and more frequent hookups ($M = 6.99$, $SD = 9.2$) than females ($M = 5.4$, $SD = 7.56$), $t(582) = 2.30$, $p = .022$, $d = .19$. There was also a marginally significant sex difference in reports of unprotected sex during a hookup, $\chi^2(1, N = 607) = 3.56$, $p = .059$. Males (38.5%) were more likely to report unprotected sex than females (31.2%).

For both female and male students, the total number of hooking up negative impacts was positively correlated with number of hookup partners, $r(284) = .33$, $p < .001$ and $r(297) = .24$, $p < .001$ respectively, but not frequency of hooking up in the past three months (see Table 3). In support of the criterion-related validity of the NIHI, participants who reported having engaged in unprotected sex at least once during a hookup in the past three months reported greater negative hookup consequences ($M = 4.48$, $SD = 3.46$) than students who did not have unprotected sex ($M = 2.72$, $SD = 2.71$), $t(605) = 6.89$, $p < .001$, $d = .59$.

For both female and male students, the negative impacts of hooking up were positively associated with symptoms of depression, anxiety and stress (Table 3). There were no significant differences in the relationships among negative hookup experiences and depression, anxiety or stress for males and females. While these negative personal impacts were related to poorer mental health, neither number of hookup partners nor frequency of hooking up were associated with mental health for males or females. Excluding items with DIF did not significantly change the pattern of the relationships between variables.²

Discussion

Using a multi-site sample of college students, we assessed a broad range of negative personal impacts associated with hooking up (e.g., feeling lonely after a hookup, problems with friends or family because of a hookup, and contracting an STI from a hookup). Despite a substantial body of literature on hooking up among young adults, to our knowledge this is the first study to explore a broad range of negative impacts resulting from hooking up in a sample of both men and women. The NIHI demonstrated excellent internal consistency and there was evidence of criterion-related validity with the number of hookup partners, unprotected sex, and poorer mental health. Contrary to our hypothesis, where we expected females to experience more negative hookup consequences than males, the results show no statistically significant gender differences in the negative impacts of hooking up. In addition, negative effects were positively associated with psychological distress regardless of gender.

Although hooking up is commonly associated with positive outcomes (e.g., excitement, feeling attractive; Lewis et al., 2012; Owen & Fincham, 2011), the current findings are

²To further examine the criterion validity of the NIHI, a separate sample of 46 college students (54.3% female) completed the NIHI, SARS and the negative affect scale of the PANAS. As expected, the NIHI total score was significantly, positively associated with the negative personal reactions SARS subscale, $r(44) = .59$, $p < .001$, but not the subscales assessing the positive responses of sexual/romantic reactions (e.g., "I have gained more confidence about sex (and related behaviors) based on this hookup"), $r(44) = .13$, $p = .41$, or social/academic engagement (e.g., "I have performed better in my classes after this hookup"), $r(44) = .22$, $p = .15$. Further, the NIHI was positively associated with the negative affect score of the PANAS, $r(43) = .38$, $p = .01$, while scores on the negative reaction scale of the SARS were not significantly related to negative affect, $r(43) = .25$, $p = .10$. Scores on both the SARS, $r(43) = .46$, $p = .001$, and the NIHI, $r(43) = .46$, $p = .001$, were related to number of hookup partners, but not frequency of hooking up.

consistent with the extant literature demonstrating that college students also experience a range of negative consequences as a result of hooking (Fielder et al., 2014; Owen et al., 2010). Based on the NIHI, the majority of participants (77.4%) experienced at least one negative impact associated with a hookup in the past three months. While negative emotional responses, such as regret and embarrassment, appeared to be the most common consequences, social and health related outcomes were also frequently mentioned. For example, around 25% of students reported concern over an STI as a result of a hookup and 20% said hooking up had negatively affected their relationship with a hookup partner. By providing a measure that assesses a range of negative social consequences, emotional responses, and health-related outcomes, the NIHI could provide a valuable addition to the hookup literature. Indeed, understanding the breadth of negative impacts is an important first step in mitigating these outcomes. While the results of the study highlight the range of negative impacts that researchers and practitioners may wish to consider when developing harm-reduction interventions, further research is needed to determine what strategies are most effective for reducing negative hookup experiences.

While the number of hookup partners was positively associated with negative hookup experiences, frequency of hooking up was not. One possible explanation for these divergent results is that assessing the number of partners captures a more risky pattern of hooking up with unfamiliar partners. In contrast, more frequent hookups could reflect multiple hookups with a regular casual partner. Among females, hooking up with an unfamiliar partner is associated with less contentment surrounding hookups and more sexual regret (Eshbaugh & Gute, 2008; LaBrie et al., 2014). Further research is needed to examine whether the relationship between hookup frequency and consequences is moderated by partner familiarity.

Contrary to previous reports (Fisher et al., 2012; Owen et al., 2010), there were no statistically significant gender differences in the overall experience of hookup negative impacts. However, given that females reported less frequent hookups and fewer partners than males, this finding could suggest that females are more likely than males to experience negative consequences when they do hook up. The lack of overall gender differences in negative responses could also reflect that the NIHI assesses a broader range of consequences experienced by both men and women than those included in existing research. Indeed, the most commonly endorsed NIHI item, regret over a specific hookup partner, reflects a dominant form of sexual regret reported by men (Paul & Hayes, 2002). While previous studies have often focused on women's hookup experiences (Fielder & Carey, 2010b; Fielder et al., 2014; Owen et al., 2014), the current results highlight the need to include both men and women in studies assessing the negative effects of hooking up.

DIF analysis was used to examine a possible source of gender differences in negative hooking up outcomes. Four of the NIHI items exhibited DIF in the location parameter indicating that responses to these items are determined by both the underlying latent trait and gender. For example, if a male and female student had the same underlying level of negative impact from hooking up, the male would still be less likely to report regret over how far he went sexually, pressure to engage in sexual behaviors, or disappointment over lack of contact with a partner after a hookup. A male would have to have a higher level of

underlying negative impact in order to endorse these problems. While including the items with DIF in the NIHI did not affect the results of any of the other analyses using the measure, identifying DIF could have important implications for understanding gender differences in the negative impact of hooking up. For instance, it is possible that gender differences in negative consequences described in previous research may, in part, reflect differences in how items behave for males and females and not overall differences in negative impact. For males and females different types of consequences may reflect different levels of negative impact. Measures of hooking up consequences that include many items that are endorsed at lower levels of the latent trait for females than males are likely to show gender differences. Using IRT to explore DIF could help inform the interpretation of gender differences in these types of measures. While IRT analysis can help identify items with DIF across gender, it does not explain why males and females respond differently to the items. Future research exploring gender differences in the perceptions of the severity of negative hookup experiences may be beneficial.

Consistent with prior research, depression, anxiety, and stress were all found to be positively correlated with negative outcomes as measured by the NIHI (Grello et al., 2006; Owen & Fincham, 2011; Owen et al., 2010). Although causality cannot be determined in the current study, existing research supports both a causal relationship in which poor mental health temporally precedes hooking up in younger adolescents (Grello, Welsh, Harper, & Dickson, 2003) and in which psychological distress is a result of hooking up in female college students (Fielder & Carey, 2010a). Students with poor mental health may hook up in order to cope with negative emotions, poor self-image (Kenney et al., 2014) or other reasons that heighten the risk of experiencing negative consequences. Mental distress is associated with poor decision-making skills (see Castaneda, Tuulio-Henriksson, Marttunen, Suvisaari, & Lönnqvist, 2008 for review), low self-esteem (Hubbs, Doyle, Bowden, & Doyle, 2012; Merianos, Nabors, Vidourek, & King, 2013), and a lack of perceived social support (Ruthig, Haynes, Stupnisky, & Perry, 2009). In turn, negative hookup experiences may further exacerbate distress and lead to more risky hookup behaviors. Prospective studies would provide a useful avenue to clarify the relationship between hookup behaviors and mental health outcomes.

Past studies suggest that females with more experience hooking up report greater psychological distress and depressive symptoms than females with less experience (Fielder & Carey, 2010a; Grello et al., 2006). In contrast, distress does not appear to differ by hooking up experience for males (Fielder & Carey, 2010a; Grello et al., 2006). Fielder and colleagues (2010a) suggest that for male college students hooking up may be associated with positive factors such greater self-esteem and masculine identity (Fielder & Carey, 2010a). In the current study, negative hookup experiences were associated with poorer mental health for both males and females. This is consistent with research demonstrating that sexual regret is associated with more depressive symptoms regardless of gender (Grello et al., 2006). Taken together, these studies suggest that for male students experiencing greater hookup consequences, but not hooking up in general, may be related to poorer mental health. These findings highlight the importance of assessing the negative impacts of hooking up, in addition to hooking up behavior, in order to more fully understand the relationship between hooking up and psychological distress for males.

The current study is limited in several ways. First, it assessed only negative experiences related to hooking up and did not assess positive experiences that have been reported elsewhere in the literature (Fielder et al., 2013; Lewis et al., 2012; Paul & Hayes, 2002). However, understanding the negative impacts associated with hooking up is important and was the focus of this particular project. In future studies it may be beneficial to explore whether positive experiences moderate the relationship between negative impacts and psychological distress. Further, while we collected data on negative hookup experiences over a three month period, we did not capture information related to the particular event in which the negative outcomes occurred. A limited number of past studies have examined event-level hooking up data (Fielder & Carey, 2010b; LaBrie et al., 2014), but no study to date has examined event-level negative consequences as a result of a specific hookup. An event-level approach could be used to better understand the contextual factors that lead to increased negative hookup experiences, including the role of partner familiarity and alcohol consumption. In addition, only students reporting heavy episodic drinking completed the measure of mental health. Future studies should examine the relationship between mental health and hooking up consequences in a more heterogeneous sample of college student drinkers and non-drinkers. Moreover, students were not provided with a definition of what sexual behaviors constitute unprotected sex and thus may have included personal idiosyncratic concepts of unprotected sex in their responses (no birth control, no condom use during vaginal or anal intercourse, no condom use during oral sex, etc.). Finally, the NIHI used a dichotomous response format to capture negative experiences. In future studies, researchers may wish to consider using a Likert scale to explore the frequency of negative impacts and employ IRT models to test whether this type of response format improves item discrimination. Indeed, it may be that more pronounced gender differences in negative experiences would be observed if students reported on the frequency or intensity of negative impacts rather than on whether or not they occurred.

The results from the current study provide preliminary evidence for the reliability and validity of the 14-item NIHI as a measure of the negative emotional, social, and health impacts experienced as a result of hooking up in college students. Overall, the majority of students reported at least one negative impact as a result of hooking up. With growing research attention on hooking up, measures that reliably assess the consequences of this behavior are increasingly important. Measures that assess a broad range of hookup consequences beyond sexual regret could help inform intervention efforts aimed promoting positive hookup experiences.

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Appendix

Negative Impact of Hookups Inventory (NIHI)

“‘Hooking up’ is defined as engaging in physically intimate behaviors ranging from kissing to sexual intercourse with someone with whom you do not have a committed relationship. ‘Hooking up’ is defined as something both people agree to (consensual), including how far they go.

Below is a list of things that sometimes happen to people either during or after hooking up. Next to each item, please select either YES or NO to indicate whether the item describes something that has happened to you in the past 3 months during or after a hookup.

	Yes	No
1. I have regretted that I hooked up with a particular partner.		
2. I have wished that I had not gone as far sexually during a hookup.		
3. I have felt ashamed after hooking up.		
4. I have felt embarrassed by things I have said or done with a hookup partner.		
5. I felt that I had been taken advantage of during a hookup.		
6. I was pressured to engage in sexual behaviors that I did not want to engage in.		
7. I have been judged or labeled negatively by others because of a hookup.		
8. I have contracted a sexually transmitted infection from a hookup.		
9. I have felt lonely after a hookup.		
10. I have worried about getting a sexually transmitted infection after a hookup.		
11. I have felt disappointed that a hookup partner has not contacted me after the hookup.		
12. I felt sexually unsatisfied or unfulfilled by a hookup experience.		
13. A hookup has caused problems with my family or friends.		
14. A hookup has negatively affected a relationship with a hookup partner.		

Figure 1. Test information and standard error of measurement functions for 14-item measure. Solid line indicates total information; dotted line indicates standard error. Theta is plotted from 2 SD below the mean to 3 SD above the mean.

Table 1**Negative Impact of Hookups Inventory Item Content and Estimated Item Parameters**

Negative Impact of Hookups Inventory (NIHI) Items	% endorsing item	% Male		% Female		α	b
1. I have regretted that I hooked up with a particular partner.	45.1	45.6	44.3	2.84	0.14		
2. I have wished that I had not gone as far sexually during a hookup.	35.3	41.9	28.8	2.53	0.44		
3. I have felt ashamed after hooking up.	28.9	27.5	30.1	2.50	0.65		
4. I have felt embarrassed by things I have said or done with a hookup partner.	35.2	36.2	34.0	2.32	0.46		
5. I felt that I had been taken advantage of during a hookup.	17.2	19.8	14.6	2.18	1.16		
6. I was pressured to engage in sexual behaviors that I did not want to engage in.	9.2	13.1	5.5	1.84	1.78		
7. I have been judged or labeled negatively by others because of a hookup.	12.5	11.1	13.9	1.71	1.59		
8. I have contracted a sexually transmitted infection from a hookup.	3.0	2.7	3.2	1.69	2.73		
9. I have felt lonely after a hookup.	27.0	31.9	22.3	1.27	0.98		
10. I have worried about getting a sexually transmitted infection after a hookup.	23.3	20.8	25.6	1.27	1.18		
11. I have felt disappointed that a hookup partner has not contacted me after the hookup.	23.9	30.9	17.2	1.17	1.21		
12. I felt sexually unsatisfied or unfulfilled by a hookup experience.	39.1	38.3	39.8	1.15	0.46		
13. A hookup has caused problems with my family or friends.	14.9	12.8	16.8	1.16	1.82		
14. A hookup has negatively affected a relationship with a hookup partner.	19.5	17.4	21.4	0.96	1.71		
15. My friends have teased me about a hookup. ^a	26.4	23.5	29.1	0.87	1.33		
16. I have worried that I may have gotten pregnant or gotten my hookup partner pregnant. ^a	19.3	21.5	17.2	0.69	2.24		

^aItems not included in the final measure.

Table 2

Differential Item Functioning Across Gender

	Female <i>b</i> (<i>SE</i>)	Male <i>b</i> (<i>SE</i>)	<i>G</i> ²
2. I have wished that I had not gone as far sexually during a hookup.	-.49 (0.15)	0.18 (0.15)	11.4 ***
6. I was pressured to engage in sexual behaviors that I did not want to engage in.	1.86 (0.26)	2.57 (0.36)	10.5 **
9. I have felt lonely after a hookup	0.45 (0.27)	1.28 (0.30)	8.1 **
11. I have felt disappointed that a hookup partner has not contacted me after the hookup.	0.65 (0.31)	2.07 (0.37)	18.2 ***

**
 $p < .01$,

 $p < .001$

Table 3
Summary of Intercorrelations for Negative Impact of Hookups and Measures of Mental Health.

Variable	V1	V2	V3	V4	V5	V6
V1 NIHI total score	--	.33***	.05	.25**	.35***	.35***
V2 Number of partners	.24***	--	.28***	.03	.03	.03
V3 Hook up frequency	.03	.39***	--	-.07	.01	.04
V4 Depression	.25**	-.04	.10	--	.68***	.70***
V5 Anxiety	.26**	-.04	-.03	.68***	--	.77***
V6 Stress	.28***	-.02	.07	.72***	.69***	--

Note. Intercorrelations for females are presented above the diagonal, and intercorrelations for males are presented below the diagonal.

**
 $p < .01$,

 $p < .001$