Swipe-Matching & The Cost of Sex: Relationships in the Age of Tinder

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Abstract: Is Tinder truly the death of love? We examine the impact of the release of the popular swipe-to-match dating application on relationship habits among undergraduates in the United States. People in the United States are increasingly prone to using digital dating, but the nature of platforms are continually shifting. Using a cross-sectional survey of American undergraduates graduating between 2008-2012 and 2016-2020, we examined the changes to relationship length, casual sex habits, and preferences in regards to sex between the two cohorts and between Tinder users and non-users. The study finds that while casual sex doesn't differ significantly between older and younger cohorts, Tinder has a large impact on the the length of average relationships. Tinder has shaped many of the new social ideals around sex as well, as demonstrated by the changes in ideal and actual sex waiting periods.

Introduction & Background Literature

   The economic nature of relationships has been evolving for the past century. With introductions of new technologies such as the birth control pill (Goldin and Katz 2002), and more widespread acceptance and participation of females in the workplace (Goldin 1994), the dynamics of the marriage market have altered to accommodate the shift in dating opportunity costs. Initial economic studies, like Becker's *Assortative Mating in Marriage Markets*, apply the market model to marriage, and show how various cost-benefit analyses affect how a partner is chosen. There will always be a better match, but at some point, the cost of the search outweighs the benefit of finding a marginally better partner, and a person generally settles for a less-than-perfect match.

   As technology evolves, dating practices have evolved with it, not only accounting for the shifts in dating opportunity costs presented by changing societal norms, but also optimizing dating, making it more efficient than ever before to make it more efficient. Online dating sites such as Match.com and eHarmony claim to help couples find good matches for marriage by using algorithms such as Gale-Shapley—which aims to find the most perfect possible matches. However, algorithms can only go so far into understanding how people find perfect matches. In addition to more perfect matching, newer dating technologies also allow for lower search costs. Later studies build off Becker by considering alterations to the model by phenomena such as speed dating and online dating, which reduce costs in the search for a partner. Belot and Francesconi demonstrate that in a fast-paced matching environment, like speed-dating, participants mostly chose matches based on attributes such as physical appearance, income, and education level as opposed to expressed values, such as charitable causes and hobbies. Additionally, Belot and Francesconi find that meeting opportunity may be even more important than physical appearance and similarity of attributes; that is, assortative mating is actually caused by low search friction that arises from naturally being in an environment together, such as a college campus. Similarly, in *Matching and Sorting*

in Online Dating, Hitsch, Hortascu, and Ariely find that online dating sites drastically lower the cost of searching and lead to more efficient matching overall, showing higher levels of assortative mating. In more recent years, mobile applications such as Tinder, all of which are modeled on the same swipe-based format, have been a popular replacement to earlier online dating apparatuses. Swipe-based matching applications mimic speed-dating, as they predominantly use pictures, education, and professional status of partners to prompt users to swipe left or right on a potential match, indicating interest or rejection. Additionally, Tinder offers a pool of potential partners based on proximity to the user, emphasizing the importance of location over other attributes. While dating sites such as Match.com and eHarmony are focused on establishing connections based on common interests and for the purpose of long term relationships, Tinder and other swipe-based apps are marketed as low-commitment, casual hook-up facilitators based mostly on visual preferences. Since Tinder's rise to popularity in 2013, hook-up culture, especially on college campuses, has become a topic of interest among social circles and scholars alike. However, due to the more recent nature of the phenomenon, very little research has been done to ascertain the changing dynamics of casual sex and relationships on college campuses.

Although few studies have been conducted on Tinder, *Modern Romance,* a sociological study by comedian Aziz Ansari and NYU Sociologist Eric Klinenberg, seeks to analyze the move away from traditional dating methods and towards newer technology-infused dating methods like Tinder. Ansari writes, "As of October 2014, the app has more than fifty million users" (111) making Tinder one of the fastest growing mobile apps. Tinder was initially created in 2011 and targeted towards party schools like USC and UCLA and proliferated through campuses from there. For this reason, our study will analyze Tinder's impacts on the relationships and sexual activities of undergraduate populations. Specifically, Tinder creators targeted "the kind of people who didn't need to date online" (Ansari 112) or highly attractive people in order to recruit others to join the database and recruit more users.

Tinder's main draw was its two-sided matching: the creators of the gay dating app Grindr, which allows homosexual males to connect with those in close proximity, had a hard time creating a version for heterosexual people—specifically women. With Tinder's two-sided matching system, both users must mutually swipe on each other in order to establish contact, diminishing the concern of unwanted advances from either party. Tinder also diminishes the risk of reaching out to people because it's easier to stop communicating if either party loses interest—much easier than leaving an in-person meeting at a bar—making it more enticing to its users. Moreover, the app is described as "entertaining and gamelike" and "fun and social" (Ansari 114) highlighting the way Tinder alters dating so that it is casual instead of serious and for-marriage. Tinder is criticized for its reliance on physical attributes and proximity, but Ansari likens this to walking into a bar and approaching someone based on appearance (117). Overall, as *Modern Romance* details from their survey candidates, Tinder's growth can be attributed to its low-risk approach to dating and relationships as well as its ability to increase access to a larger pool of close-proximity partners.

Since scholars have just begun investigating the mobile dating phenomenon, there is a minimal amount of data available to base our study off of. For this reason, we have conducted our own survey, which is detailed in the Appendix and Data section of this paper, however we utilized past data in order to ascertain general changes in matching methods. For example, Ansari writes, "between 2005 and 2012 more than one third of couples who got married in the United States met through an online dating site…[more] than work, friends, and school combined" (79) pointing to the shift in dating methods since the early 2000s. Since then, another study by the PEW Research Center shows that "9% of American adults of American Adults have ever used a dating app on their cellphone" (Smith), which has increased by threefold since early 2013. This correlates with the development and rise of Tinder usage over the last couple of years. Additionally, between the ages of 18 to 24 years old, 22% (as of February 2016) report

mobile dating app usage, a large increase from 5% in early 2013 (Smith) pointing to heightened use from undergraduate students--our population of interest.

Not only has mobile app usage increased over the last few years, but the 2014 "Relationships in America Survey," sponsored by the Austin Institute for the Study of Family and Culture, shows that "College-aged young adults now average more hook-ups during their college years than they do first dates" (RiAS, 46) which indicates a potential rise in the popularity of casual sex over long-term relationships. Furthermore, the report states that "men are more likely to approve of casual sex than women (43% vs. 30%)" (RiAS, 46) spawning the idea that increased use of Tinder among men has perhaps driven more women to join the casual sex market over time.

Discussion & Hypothesis

To determine the Tinder's influence on sex and relationships on college campuses, this study will attempt to uncover if, how, and why casual sex has been more prevalent in campus cultures. First, we would like to determine whether or not Tinder and similar swiping apps have increased the overall rate of casual sex in undergraduate campuses, by studying how much of the population actually uses Tinder, and how closely any rise in Tinder usage correlates with any rise in casual sex. If there is a rise in casual sex due to Tinder, it is very possible that this has serious impacts on relationships and sexual behaviors as well. Tinder would likely influence the overall number of sexual partners a student has during undergraduate years, the number and length of long-term relationships students have, and the point at which a couple first has sex. We aim to understand the magnitude of each of these potential impacts through our survey and analysis. Essentially, this study examines whether Tinder has behavior-altering effects on campus, or if it has simply made discussing previously hidden behaviors and preferences more common. If there is an impact on relationships, this study also aims to determine the extent of that impact. As shown in Hitsch et. al's study of online dating, web platforms and algorithms decrease the overall search costs associated with finding a partner. Drawing from this, we hypothesize that an application such

as Tinder would have a greater impact on search costs as compared to previous online dating platforms. This impact will resemble a combination of the results of Hitsch et. al and Belot & Francesconi, as it is a speedy online dating method. Therefore, we hypothesize that Tinder will dramatically reduce the cost of search, especially since Tinder is marketed as a quick hook-up app and users are presumably not concerned with long-term commitments or consequences. Without making assumptions regarding preferences of users, Tinder simply makes available a cheap way to seek out potential partners, changing the relative cost of all other methods. For example, making casual sex very cheap presumably makes the cost of "meaningful" or simply non-casual sex, relatively costlier, therefore altering the dynamic of the dating and even marriage market. We expect this impact to mainly manifest in undergraduate settings because Tinder's original user-base was found at undergraduate campuses.

Tinder's platform promotes casual sex while simultaneously lowering search costs, implying that users can utilize lower search costs to attain casual sex as opposed to relationships and perfect matches. So by applying the cost-benefit model to Tinder, we demonstrate how a low search cost affects the overall cost and consumption of the good, sex. In traditional relationship models, men or women pay for sex by investing time in a committed relationship with their partner. Commitment is a much costlier way of attaining sex than a one-night-stand, but if search costs of a one-night-stand are very high, a relationship would be more efficient way of securing a dependent and continual source of sex. Tinder decreases the search cost of sex by making it more private and efficient. The search can be conducted in the solitude of one's home. A swipe left or right takes considerably less time and effort than evaluating each individual person in a bar, and sending an instant message is much quicker and less risky than approaching a stranger. Overall, since Tinder decreases the search cost significantly, consumers can now choose a bundle of multiple partners associated with low search costs over a single partner with the same search cost and a high relationship cost. Therefore, assuming college undergraduate students are one of the main

populations interested in casual sex, we hypothesize that casual sex will increase and long-term relationships will decrease as a result of Tinder.

Another aspect of relationships we believe Tinder could impact is the population's beliefs surrounding casual sex and relationships. Particularly, we examined participants' ideal waiting times between meeting a potential partner and having sex as compared to their actual waiting times. This effect would be a bit more nuanced, as Tinder could either motivate people to wait longer as they know they can find sex more easily if they so desire, or it may motivate people to have sex before their ideal waiting time is up, because it is becoming more "expected" as an outcome of Tinder or because it has lost some amount of value to them as a result of the cheaper search costs. In that regard, we hypothesized that there would be an ambiguous result here, but would vary between Tinder users and non-Users and men and women. We speculate that Tinder users would be more likely to have shorter actual and ideal waiting times, as shown by their choice to use Tinder. Additionally, we suspect men to have shorter ideal waiting times as compared to women; a common stereotype within college-aged Americans. The impact seen from Tinder will likely be found in a difference between ideal and actual waiting times; we suspect this discrepancy to be larger for women than men. For example, we expect more women to wait a less than ideal amount of time for sex as a result of Tinder's push away from relationships and towards casual sex.

Method & Data

To gain an understanding of Tinder's effect on relationships, we conducted a cross-sectional study examining American college undergraduates who graduated just before the release of Tinder in 2012 and their counterparts graduating college in the years in which Tinder had already gained popularity. We defined the older cohort as graduating between 2008 and 2012, while the younger must have graduated or have a predicted graduation date between 2016-2020. We asked the both cohorts to report all their answers in regards to their final or most recent 12 months of college, as the "final" would be most applicable to both the older cohort and the members of the younger cohort who had already graduated.

Participants who had not yet graduated answered for their most recent 12 months of college. A point of consideration with this aspect of the survey is that not all members will have been the same age during their 12-month period of the survey; while most will have been 21-22 years old, many in the younger cohort may have been younger (the Class of 2020 is comprised of current 19-20 year olds, not accounting for students who took gap years or have other special circumstances). We did not require participants to list their exact age, rather just self-categorize into the possible four-year graduation ranges, for the sake of skip-logic in our survey. Consequently, all variables reported are in regards to participants 12-month reported time period, rather than their entire life. For example, their longest relationship is any relationship that occured within the 12 months specified (but may have continued before/after those months).

We asked each cohort a series of questions regarding their relationship and sexual habits during the specific 12-month period of their undergraduate careers, while the 2016-2020 cohort was asked additional questions about their usage of Tinder and other swipe-based matching applications, including if they met sexual partners and/or significant others through these applications. The full survey can be found in the appendix. Our main goal was to understand any changes in habits regarding casual sex as well as significant-other style relationships, so many questions revolved around number and length of relationships, number of casual sex partners, instances of casual sex, and so on. An additional aspect we examined was participants' ideal waiting time before having sex and their actual sex-timing habits. For example, do people from both cohorts ideally wait three dates before having sex with a partner? Has their ideal timing remained the same over time while the actual timing became shorter, or vice versa? These questions aim to give perspective on social expectations surrounding relationships, but also how strictly people adhered to these expectations: for example, if the actual time of sex is earlier now than in the past, is it because people have a lower threshold for what a partner must "pay" or show in commitment before they are willing to have sex?

The cross-sectional nature of this study not only allowed us to examine a group before Tinder and a group after, but also the group of people who choose to use Tinder and who choose to not within the younger cohort, and compare that will the older group. The study explores whether the older cohort is closer in habits to current Tinder-users or non-Users, making specific notes of areas where there are large differences.

As college students, recruitment for most of the younger cohort involved posting our survey in many social media groups. However, recruitment for the older cohort was not so simple; neither of us knew a large enough circle of people who graduated between 2008-2012 to manually recruit, so we decided to use the online platform Mechanical Turk to pay respondents to take the survey. Participants recruited through Mechanical Turk first needed to pass a screener which determined they were in the correct cohort, then were paid between $0.10-$1.00 to submit their responses to our Qualtrics survey. The amount they were paid varied on the timing of their participation. Earlier participants were paid lower amounts, as over time we increased the reward in order to recruit more respondents. Many of the 2016-2020 respondents were also recruited this way, out of convenience and relatively low cost, for a total of 169 of our respondents. Answers were screened to weed out any participants randomly answering in order to be paid for their responses; only legitimate and complete responses were counted. For example, if a respondent said they graduated in 2016 in the screener survey and then said 2008 in the final survey, their response was disqualified.

The Qualtrics survey used logic to ask only applicable questions to each participant based on previous responses. If a respondent was in the older cohort; they did not receive any questions about Tinder usage, as it would have been impossible to use Tinder before it was released. Additionally, those who indicated they had not been sexually active in the given time period were not asked questions about their sexual habits, only their relationship habits. For example, if someone indicated they were not sexually active, our survey still requested an answer to what their perfect world waiting period before sex

was, but did not ask for their actual habit, as they had not had sex. While all cohorts answered all questions that were significant to them, our survey filtered out questions that did not apply to certain participants. This allowed the paid participants to optimize time, but also simply made the survey make more sense to all participants. One impact of the decision to organize the survey this was the lack of individual graduation years of each participant; we only collected their four-year range, so as to allow filtering by those ranges.

	Count	% Women	
2008-2012	98	50.3%	
2016-2020	219	77.1%	
	% Sexually Active	**% Tinder Users**	
2008-2012	83.7%	N/A	
2016-2020	74.9%	52.50%	
	% Single	**Number Sexual Partners***	
2008-2012	21.4%	2.99	
2016-2020	38.4%	3.40	
		*Given active	
	% Straight	**Mean Relationship Length****	
2008-2012	82.6%	23.32	
2016-2020	69.4%	18.76	
		reported in months	

Table 1.1

Table 1 shows a selection of key outcomes from our survey. "Single" and "No Relationship" refer to participants who had no relationships within the 12 month period and "Tinder User" refers to participants who indicated they used Tinder or any other swipe-based dating application. Other variables of importance that we examine later include casual sex encounters, defined as the instances of casual sex reported by participants, number of sexual partners, defined as any partner (casual or significant-other) that the participant had sex with, and relationship length, which was reported in ranges and converted to days or months depending on what was applicable (and will be clarified whenever necessary). We had roughly double the amount of respondents graduating between 2016-2020 than 2008-2012. There was an

even split of self-identified genders among the 2008-2012 cohort, while the 2016-2020 cohort was more heavily woman, with 77.1% women. A majority of respondents were straight, though a noticeably smaller fraction in the 2016-2020 cohort. In both cohorts, a vast majority were sexually active. Of those who had relationships during their final or most recent 12 months of college, the averages fell between 1.5 to 2 years for both cohorts, and of the sexually active, the older cohort averages about 3 partners while the younger averaged 3.4.

An interesting selection of data collected in this survey revolved around participants ideal waiting times between having a partner and having sex as well as their general habits (if sexually active). Data for this variable was originally collected as a variety of ranges, such as "First Encounter," "First Date," "Third Date," all the way to "1-2 years," "2+ years," and "Post-marriage." We converted all of these values to days, spacing each date 7 days apart, ascribing 30 days for each month, and using an midpoints between ranges. We used the average time to marriage of 5 years to differentiate between the 2+ years and post-marriage category, and converted that to days as well. These variables are referred to as "Ideal" and "Actual" waiting periods. Table 2 shows the data collected for these questions, separated by males and females. Interestingly, within cohorts, women's ideal waiting periods tend to be longer than men's, and the discrepancy between women's ideal and actual waiting periods tend to be larger than men's discrepancy in actual and ideal periods. We will further explore this in our discussion of results.

	Mean Ideal Waiting Period, Women	Mean Ideal Waiting Period, Men
2008-2012	135.63	28.43
2016-2020	187.88	101.42
	reported in days	reported in days
	Mean Actual Waiting Period, Women	Mean Actual Waiting Period, Men
2008-2012	97.61	83.65
2016-2020	50.07	23.00
	reported in days	reported in days

Table 1.2.

Results

The most interesting economic question surrounding swipe-matching dating apps is their effect on relationships in the undergraduate population. In the Hypothesis & Discussion section, we discuss how lower search costs in the consumption of the good sex can lead to a decrease in length of relationships and heightened instances of casual sex. We also discuss how general population ideals for sex change and differ from actual sexual habits—indicating a shift in the population's expectations when consuming sex.

Variable Effects on Relationship Length						
Variables	1	2	3	4	5	6
Tinder Users	-264.7***	-266.7***	-269.1***	-386.2***	-391.9***	-391.4***
	(61.61)	(60.05)	(59.77)	(76.74)	(71.79)	(71.43)
Women	-44.58	-46.98		26.23	19.39	
	(73.89)	(72.52)		(84.66)	(82.47)	
Straight	12.05			27		
	(63.47)			(82.61)		
Constant	511.9***	523.1***	488.0***	720.8***	747.5***	761.6***
	(96.94)	(74.86)	(51.52)	(119.20)	(82.66)	(57.43)
Observations	218	218	218	134	134	134
R-squared	0.092	0.092	0.09	0.188	0.187	0.187

Robust standard errors in parentheses
*** $p<0.01$, ** $p<0.05$, * $p<0.1$

Note: The dependent variable is relationship length (in days). Highlighted columns 4, 5, & 6 control for participants that have not had a relationship in the last 12 months. All columns control for the second cohort 2016-2020. Standard errors are shown in

Table 2.1

To begin, we looked at the difference in average relationship lengths both between cohorts and between Tinder users and non-users. In Table 1.1, we have already noted that there is an increase in the number of people in the 2016-2020 cohort that haven't had a relationship in the last 12 months--38% as opposed to 21%. Moreover, an initial regression of relationship length against the two cohorts shows that

the latter cohort (2016-2020) faces a coefficient of -203.6 compared to a mean relationship length of 549.6 days; this means that average relationships for cohort 2 are almost half as long as those of cohort 1 at statistically significant levels (refer to Appendix Table 4.2). The significant decrease in average relationship lengths could possibly be due to retrospective bias: that is, the older cohort has the benefit of knowing what happens after college in terms of their relationship whereas the younger cohort may be in a relationship that may or may not last longer. To control for this bias and other potential biases, we conducted a multilinear regression and controlled for cohort 2. As Table 2.1 shows, when controlling for gender, sexuality, and cohort, Tinder Use still has a large and extremely significant effect on length of relationships, cutting it short by half or almost half of the total relationship length. Interestingly enough, neither the dummy variable for women nor the dummy variable for heterosexual participants yielded any significant results in this regression. Additionally, we conducted the same multilinear regression and discluded participants who hadn't been in a relationship at all in the last 12 months: columns 4, 5, and 6 in Table 2.1 show that there is an even greater significant effect of Tinder use on relationship length under this control. Since these results could point to the fact that different people are more inclined to use Tinder, we ran a final regression comparing the length of relationships for non-Tinder users in the 2016-2020 range versus the 2008-2012 range (refer to Appendix Table 4.1). The younger cohort had a marginally shorter relationship than the older cohort by approximately 61 days, but this statistic was insignificant, demonstrating that Tinder has a true impact on average length of relationships.

To test for an increase in casual sex we constructed a simple regression between the variable of casual sex instances and the two cohorts using an equation with dummy variables: $Y_{Output} = \beta_0 + \beta_1 X + e_1$ where $Y_{CasualSex} = \beta_0 + \beta_1 X_{Cohort2} + e_1$ (this same equation model is used throughout the regressions). Looking at the 2008-2012 cohort as compared to the 2016-2020 cohort, the second cohort actually shows a slightly smaller number of casual sex encounters or instances of casual sex in the past 12 months, as well as a slightly higher number of casual sex partners--both of which were marginal and statistically insignificant.

Similarly, there were no differences in overall number of sexual partners between the 2008-2012 and 2016-2020 cohort. To control for the possibility that the younger cohort contains responses from younger survey takers who are not yet in their final 12 months of college and may not yet be sexually experienced, but plan to be sexually active by the time they graduate, we controlled for participants who were sexually inactive during the 12 month period the survey indicates. However, we still found no significant differences for casual sex instances, casual sex partners, and overall sexual partners between the two cohorts, disproving the idea that casual sex has increased due to the rise in popularity of Tinder.

On the other hand, when comparing casual sex variables for Tinder users and non-Tinder users in the 2016-2020 cohort, we found that Tinder use leads to significant increases in overall number of sexual partners while increased instances of casual sex were found insignificant. Appendix Table 5.2 illustrates that Tinder users have 2.6 more sexual partners than their non-Tinder counterparts with an average number of 2 sexual partners per person. This correlation held true even while holding constant sexually inactive participants. Additionally, we tested to see if Tinder users are more or less sexually active than their non-Tinder counterparts, but this proved insignificant. However, by controlling for and testing only users that hadn't had a relationship in the past 12 months, we found that using Tinder makes those participants more likely to be sexually active: participants without relationships were 0.3x more likely to be sexually active if they used Tinder as compared to the mean constant of 0.19. This perhaps indicates that select participants are "paying" for sex through Tinder instead of through the conventional route of traditional relationships. This perhaps indicates that certain people prefer Tinder use and subsequent Tinder style hook-ups as compared to those who don't prefer Tinder use.

Exploring deeper into which participants in the population are more likely to use Tinder, we analyzed certain characteristics like gender and sexuality. By regressing Tinder use against the Woman dummy variable, we found that women were marginally more likely to use Tinder, but insignificantly so. This result may arise from the fact that we have a larger percentage of participants who are women in our

2016-2020 cohort; in order to determine the true extent to which men or women are more likely to use Tinder, we would need a larger sample size. Interestingly enough, the effect of being a women on average number of sexual encounters was significant at a coefficient of -4.3 as compared to a constant of almost 9 sexual encounters--implying that women have fewer instances of casual sex than men. We ran a similar regression analyzing the differences between the sexual habits of straight versus queer participants and found no significant differences between the two populations.

Variables	Actual Sex Waiting Time
Ideal Waiting Time	0.00139
	(0.00)
Woman	-53.18***
	(18.07)
Ideal*Woman	1.000***
	(0.00)
Constant	52.93***
	(18.32)
Observations	317
R-squared	0.661

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Note: The dependent variable actual sex waiting time (in days).

Table 2.2

To investigate the casual sex differences between women and men further, we utilized the ideal waiting period and actual waiting period variables for differences and disparities between both cohorts and genders. We initially regressed the ideal variable on the actual variable and found no significant differences in the number of days a person waits to have sex. Next, we regressed the ideal variable along with the women dummy variable on actual wait time and found no significant results. Finally, we created an interaction variable between the ideal variable and the women variable which demonstrated significant differences in the ideal time for sex and actual time for sex for women. As shown in Table 2.2, women's ideal time differs greatly from their actual time, such that they have sex much earlier than they would like. Interestingly, their ideal waiting period is much higher than that of men. This result points to the idea that men may prefer casual sex more than women, and the rise in the popularity of Tinder leads to more

women having casual sex because men find casual sex cheaper. The cost of a relationship for women may be less than that of men if women gain more utility out of non-sexual acts in relationships, thus making casual sex comparatively more expensive for women than for men. However, as more men leave the relationship market for the casual sex market, the higher costs of finding a man looking for a relationship could lead women to sacrifice relationship ideals to consume sex through other methods.

Finally, to test for various errors we utilized the probit models which uses medians instead of the means in order to eliminate any outlier bias (that might arise from dummy variables) and found no difference significantly different regressions. We also controlled for responses received from Mechanical Turk vs. responses received anonymously from peers on social media and found no significant differences from the two sources. As we mentioned before, there were also few or insignificant differences when controlling for homosexual populations over heterosexual populations, possibly due to the limited number of homosexual responses in our survey. In order to truly test for differences in the homosexual and heterosexual populations, we would need a much larger sample size. .

In addition to the limits expressed earlier in the paper, other limitations may include recall bias for the older cohort and false modesty from participants in dealing with topics such as sex. The 2008-2012 cohort is asked to recall information that is up to a decade old: participants may not exactly remember their relationships and experiences or they could impose biases of upon past experiences. Similarly, all participants may respond to the survey in terms of what they believe is socially acceptable as opposed to reporting their true sexual history--skewing the data to be more conservative or more liberal.

Conclusion

We determine that Tinder has had a significant impact on relationships and casual sex on undergraduate campuses. We hypothesized that casual sex would increase as a result of Tinder use and the app's hook-up focused marketing strategies. Between Tinder users and non-Tinder users, we found

that Tinder users have more casual sex partners. However, we found no differences in instances of casual sex between the two cohorts. We also hypothesized that long term relationships would decrease as a result of the lowered search costs that Tinder provides. The decrease in average length of relationship was highly significant, both when comparing both cohorts and comparing Tinder users to non-Tinder users. Finally, by analysing ideal sex waiting times and actual sex waiting times, we found that there is a larger discrepancy in the two for women specifically and that the disparity has grown over time (from the first to second cohort). Overall, our hypothesis were proven with significant results in all three areas, aside from casual sex between the two cohorts.

APPENDIX

Figure 1. Distribution of majors among participants

Distribution of Majors of Participants
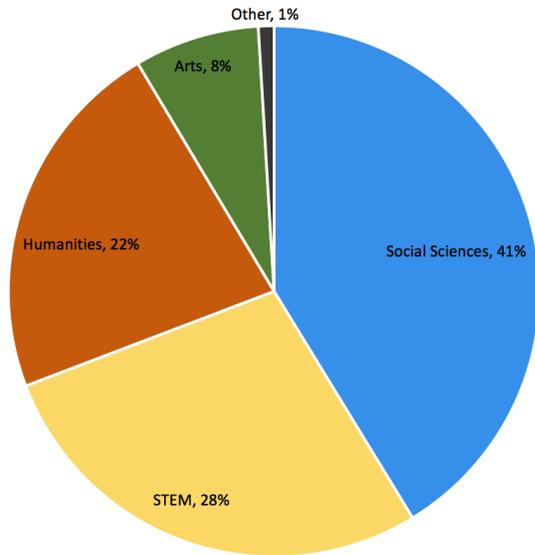
Table 3. Casual Sex Encounters in 2016-2020 cohort by gender

VARIABLES	Casual Sex Encounters
Woman	-4.264**
	(1.99)
Constant	8.980***
	(1.91)
Observations	219
R-squared	0.039

Notes: Comparing women and men in 2016-2020 cohort

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 4.1. Relationship Length among 2016-2020 Non-Tinder Users compared to 2008-2012 cohort.

VARIABLES	Relationship Length
2016-2012 Non-Tinder User	-61.63
	(75.02)
Constant	549.6***
	(54.51)
Observations	201
R-squared	0.003

Notes: Comparing 2016-2020 non-Tinder users to entire 2008-2012 cohort

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 4.2. Relationship Length by cohort.

VARIABLES	Relationship Length
2016-2020 Graduate	-203.6***
	(62.37)
Constant	549.6***
	(54.41)
Observations	316
R-squared	0.037

Notes: Comparing entire 2016-2020 cohort to 2008-2012 cohort

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 5.1. Sexual Activity for Tinder Users vs. Non-Users.

VARIABLES	Sexually active
Tinder User	0.300***
	(0.10)
Constant	0.189***
	(0.07)
Observations	84
R-squared	0.097

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
Notes: Given participant has not been in a relationship

Table 5.2. Sexual Partners for Tinder Users vs. Non-Users.

VARIABLES	Number of Sexual Partners
Tinder User	2.614***
	(0.59)
Constant	1.952***
	(0.15)
Observations	164
R-squared	0.09

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
Notes: Given participant is sexually active

Survey

This is a survey about relationships and sexual activity during undergraduate college. By clicking the "next" button, you consent to participation in this survey, which is collecting anonymous data for a undergraduate study. Thank you for your participation!

What is your graduation year?
- Between 2008 and 2012
- Between 2016 and 2020

Please indicate the gender you most identify with:
- Man
- Woman
- Nonbinary / Nonconforming
- Other [write-in box]

Please indicate the sexual orientation you most identify with:
- Straight
- Gay / Lesbian
- Bisexual
- Asexual
- Queer
- Other [write-in box]

What general area was/is your college major in? Writing in your specific major is optional.
- Humanities [write-in box]
- Social Sciences [write-in box]
- STEM [write-in box]
- Arts [write-in box]
- Other[write-in box]

During your final or most recent 12 months of undergraduate college, were you sexually active?
- Yes
- No

[Branch if **NOT** sexually active]

Please indicate the total number of significant others, boyfriends, or girlfriends, you have had during that 12-month period.
- 0
- 1-2
- 3-5
- 6-10
- 11-20
- 21-30
- 31+

[Branch again if graduation year is **Between 2008 and 2012**]

In your perfect world, how long after meeting a partner would you have sex? Think of this in the mindset of the 12 months indicated.
- First encounter
- First date
- Second date
- Third date
- 1 month
- 2-3 months
- 4-6 months
- 6 months-1 year
- 1-2 years
- 2+ years
- Post-marriage

[Branch if graduation year is **Between 2016 and 2020**]

In the specified 12 month period, did you use Tinder and/or other swipe-based matching apps? Check all that apply.
- Tinder
- Other swipe-based matching apps (Bumber, Grindr, etc)
- I don't use swipe-dating apps

During that 12-month period, did you meet a significant other/boyfriend/girlfriend through Tinder and/or another swipe-based matching app? Check all that apply.
- Tinder
- Other swipe-based matching apps (Bumble, Grindr, etc)
- I did not meet a significant other/boyfriend/girlfriend through a swipe-based matching app

In your perfect world, how long after meeting a partner would you have sex? Think of this in the mindset of the indicated 12-month period.
- First encounter
- First date
- Second date

- Third date
- 1 month
- 2-3 months
- 4-6 months
- 6 months-1 year
- 1-2 years
- 2+ years
- Post-marriage

[Branch if **IS** Sexually Active]

How many sexual partners did you have during that 12-month period?
- 0
- 1-2
- 3-5
- 6-10
- 11-20
- 20-30
- 30+

How many of those partners do/did you consider a significant other, boyfriend, or girlfriend?
- 0
- 1-2
- 3-5
- 6-10
- 11-20
- 21-30
- 31+

Of your significant others/boyfriends/girlfriends in the specified 12 months, please indicate the length of your longest relationship.
- NA
- 0-1 months
- 2-4 months
- 5-8 months
- 8 months - 1 year
- 1 - 2 years
- 2+ years

Please estimate your total instances of casual sex (with a non-Significant Other partner) over those 12 months.
- 0-5 times
- 6-15 times
- 16-30 times
- 30+ times

Please indicate the total number of significant others, boyfriends, or girlfriends that you were not sexually active with during that 12 month period.
- 0
- 1-2
- 3-5
- 6-10
- 11-20
- 21-30
- 31+

[Branch if graduation year is **Between 2008 and 2012**]

In your perfect world, how long after meeting a partner would you have sex? Think of this in the mindset of the indicated 12 month period.
- First encounter
- First date
- Second date
- Third date
- 1 month
- 2-3 months
- 4-6 months
- 6 months-1 year
- 1-2 years
- 2+ years
- Post-marriage

In general, how long after meeting a partner did you typically have sex during that 12 month period?
- First encounter
- First date
- Second date
- Third date
- 1 month
- 2-3 months
- 4-6 months
- 6 months-1 year
- 1-2 years
- 2+ years
- Post-marriage

[Branch if graduation year is **Between 2016 and 2020**]

During that 12 month period, did you use Tinder and/or other swipe-based matching Apps? Check all that apply
- Tinder
- Other swipe-based matching apps (Bumble, Grindr, etc)
- I don't use swipe-based matching apps

During that 12-month period, did you meet a significant other/boyfriend/girlfriend through Tinder and/or another swipe-based matching app? Check all that apply.
- Tinder
- Other swipe-based matching apps (Bumble, Grindr, etc)
- I did not meet a significant other/boyfriend/girlfriend through a swipe-dating app

During that 12-month period, did you meet a sexual partner through Tinder and/or swipe-dating app? Check all that apply.
- Tinder
- Other swipe-based matching apps (Bumble, Grindr, etc)
- I did not mett a sexual partner through a swipe-based matching app

In your perfect world, how long after meeting a partner would you have sex? Think of this in the mindset of the 12 months indicated.
First encounter
- First date

- Second date
- Third date
- 1 month
- 2-3 months
- 4-6 months
- 6 months-1 year
- 1-2 years
- 2+ years
- Post-marriage

In general, how long after meeting a partner did you typically have sex during the indicated 12 months?

- First encounter
- First date
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- 1 month
- 2-3 months
- 4-6 months
- 6 months-1 year
- 1-2 years
- 2+ years
- Post-marriage

To receive approval for survey completion, you must insert the following confirmation code back into Mechanical Turk. Thank you again for participating!

[Code is displayed]

To enter this code, hit "Accept HIT," enter the confirmation code, and hit "Submit."

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